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Title: BRT in Makassar (BRT Trans Mamminasata), Indonesia: Explaining the Effect of Current Performance to Its User's Satisfaction

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BRT in Makassar (BRT Trans Mamminasata), Indonesia: Explaining the Effect of Current Performance to Its User's Satisfaction

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Summary

BRT is one of the best alternative systems to address transportation issues in big cities. A lot of cities have been implementing the system and some of those cities are notable as successful BRT systems. As one of the biggest cities in Indonesia, and with >1.7 million of inhabitants, Makassar and the adjacent cities (Mamminasata) have been suffering from transportation issues, including traffic jam. The central government has issuing a policy to urge every capital city in Indonesia to implement BRT in order to address transportation issues along with other issues attached to it. Thus, BRT Trans Mamminasata was launched several years ago by the Indonesian Ministry of Transportation, and it is operated by Perum Damri. Despite all the efforts done by the government and other parties, the BRT is still lacking of passengers. That is the main problem which indicates that it is likely that the performance of the BRT has not satisfying its users yet.

This research aims to explain the effect of current BRT Trans Mamminasata performance to user's satisfaction, thus the research questions are figuring out to what extent the current BRT Trans Mamminasata performance (service, accessibility, availability, and time) affect the user's satisfaction, and the sub questions are trying to figure out: first, the current performance of the BRT, second is figuring out how different SES perceive the current performance of the BRT, and lastly is figuring out which dependent variable is more significant compared to the others in term of satisfying the BRT users.

Methodology used in this research is relying on qualitative method, in which it is related to the fact that it has only a small unit of research, and that outcomes are not obviously measurable and quantifiable. Instruments used in this research are interview and online questionnaire, where the interview is conducted with 10 key informants, and the online questionnaire is using random sampling. Moreover, single case study is used as research strategy in this research.

The analysis are conducted using Atlas ti to analyse the interview transcripts, while SPSS is used to analyse the online questionnaire output. Factor analysis, reliability test, and multi regression analysis conducted on the SPSS.

The main findings of this research is that the current performance of BRT Trans Mamminasata does affect its user's satisfaction, and generally users are satisfied enough with the current performance, although there are a few aspects need to improve. The result regarding to correlation between SES with the satisfaction variable shows a positive relation.

Keywords: BRT Trans Mamminasata, performance, user's satisfaction, socio-economic status (SES).

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Abbreviations

BRT	Bus Rapid Transport
SES	Socio-economic status

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Chapter 1. Introduction

1.1.Background

Transportation is always be an issue in big cities. As one of the biggest cities in Indonesia, Makassar undeniably has such issue, mainly triggered by a slight growth of population. According to mayor's statement, Ramdhan Pomanto in a local newspaper, the population currently reaches 1.7 million[1]. This figure has increased by nearly 40% since 2010, when the city inhabited by 1.3 million people[2]. This trend has increased the demands of transportation in terms of carrying capacity, speed, coverage area, and affordability. Despite all the positive impacts of transportation, such as to create jobs and to help cities to develop, it cannot be neglected that transportation also has several negative impacts to the economy caused by the rising numbers of private vehicles that stretch local infrastructure to its breaking point (Perschon, 2012).

In the last few decades, there seem to be a transition in sustainable transportation around the world. Transition to a sustainable transport system "would make a positive contribution to the environmental, social, and economic sustainability of the communities they serve" (Geerlings, Shiftan, et al., 2012). There is a significant growth in BRT (Bus Rapid Transit) as one of sustainable systems of transportation, replacing or complementing the previous transportation mode which was dominated by private vehicles. As one of the best practices of BRT system in the world, Curitiba BRT has shown 30% of road traffic reduction in the first 30 years of its operation since 1974 (Bräuninger, Schulze, et al., 2012), meaning that BRT can contribute to the reduction of traffic jams in big cities, and it was already proofed in Curitiba, as a case in a developing country, Brazil. In terms of environmental benefits of transitioning to BRT, the example of BRT implementation in Colombia showed that carbon emission has been reduced close to 1 million tons per year, other air pollutants such as SO_2 declined by 43% and NO_x by 18% (Turner, Kooshian, et al., 2012). Furthermore, those transitions to BRT systems began in 1972 in Lima, Peru, and began to gain popularity when the system was successfully implemented and run in Curitiba, Brazil in 1974. TransMilenio, which was began to operate in 2001 in Bogota, was also considered as the best BRT system in the world (EMBARQ, 2013). Reflecting from Transmilenio BRT project in Bogota and three other BRT systems in three different countries in the world, Metrobus in Mexico City, Rea Vaya in Johannesburg, and Metrobus in Istanbul, all of those cities have "positive net present benefits and benefits exceeding costs" (Carrigan, King, et al., 2013, p. 14) which means that those BRT systems are financially viable and could produce more income to the service provider in a long term, moreover travel time reduction and improved road safety are also benefitted from those BRTs. Other reasons to implement BRT system are: lower initial investment and operating and maintenance cost than investing on rail system or subway system, high capacity and flexibility, faster due to its segregated lanes, less air pollution and less noise (Banister, 2008, EMBARQ, 2013). Thus, implementing BRT system can be seen as one of the best solutions to address transportation issues in big cities, and Makassar is not an exception.

Makassar as one of the big cities in Indonesia started to do the same thing to address its transportation issues. Traffic congestion caused by the imbalance of number of vehicles and road capacity (motorized vehicle: 2.4 million from which are 1.3 million cars and 1.1 million

[1] Antara Sulsel, 2014. *Jumlah Penduduk Makassar Tumbuh 1,7 Juta* (Makassar Growing Population to 1.7 Million). Available at: http://www.antarasulsel.com/berita/57957/jumlah-penduduk-makassar-tumbuh-17-juta [Accessed 2016]

[2] Statistics Indonesia, 2010. *Jumlah dan distribusi penduduk Sulawesi Selatan* (Numbers and distribution of South Sulawesi inhabitants). Available at: http://sp2010.bps.go.id/index.php/site?id=73&wilayah=Sulawesi-Selatan [Accessed 2016]

of motorcycles, while roadway expansion is only 0.001% per year) is one of the major issues the city has been facing as the effect of economic growth and followed by population growth[3]. With 1.7 million of inhabitants, the city needs a sustainable transportation system to address the issue caused by the increasing number of vehicles, especially from private vehicles. And as one of the alternatives, the city began to implement the BRT system, as it was stated by Indonesian Department of Transportation (Indonesian Transportation Department, 2015).

Figure 1. Makassar position

Source: Free Vector Maps, 2016[4]

BRT Trans Mamminasata system has been planned since 2007. However, the project was delayed for several times. And in 2011, the Indonesian Ministry of Transportation appointed three cities (Padang, Surabaya and Makassar) to implement the BRT system in that year. Still, the project was delayed until the next few years[5]. Bus Rapid Transit system has been start operating in Makassar since March 2014, this BRT is named BRT Trans Mamminasata.

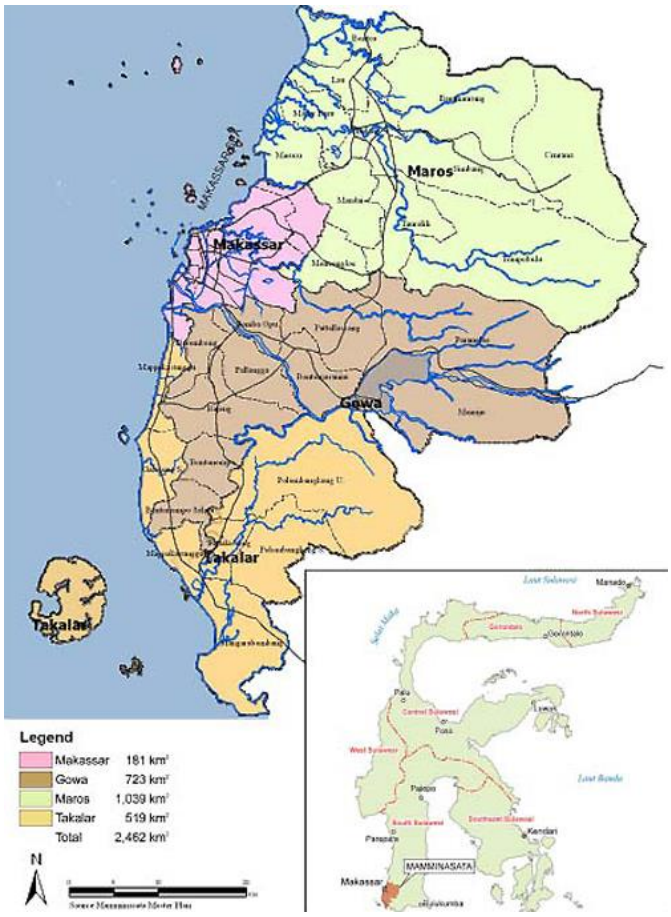
BRT Trans Mamminasata is aimed to serve as BRT system for 4 different cities (Makassar City, Maros Regency, Sungguminasa Regency, and Takalar Regency). Those cities are adjacent to each other, therefore the central government planned this BRT will be operated in a bigger scale. However, until now, the BRT itself mostly operating in Makassar City, which is the capital city of South Sulawesi Province.

[3] Indonesian Transportation Department, *Benahi transportasi kota Makassar, harus ada langkah ekstrim* (To fix Makassar Transportation Issue, there should be an extreme step), available at: http://hubdat.dephub.go.id/berita/1515-benahi-transportasi-kota-makassar-harus-ada-langkah-ekstrim [accessed April, 2016]

[4] Maps of Indonesia, available at: 'https://freevectormaps.com/Indonesia [accessed May, 2016]

[5] Kompas, Busway untuk Makassar, Padang, Surabaya (Busway for Makassar, Padang, and Surabaya), available at: http://nasional.kompas.com/read/2011/01/05/07375315/Busway.untuk.Makassar..Padang..Surabaya [accessed April, 2016]

Figure 2. Map of Maminasata (Makassar City, Maros Regency, Sungguminasa Regency, Takalar Regency)



Source: Indonesian Public Works, 2006[6]

BRT Trans Mamminasata is a new system applied by the local government to provide a public transportation alternative to the people in order to reduce the traffic congestion in the city. It is planned that the BRT will be running in 11 corridors, where the whole corridors will be completed in the next few years. Corridor, as defined by Institute for Transportation & Development Policy on their website[7] is defined as "a section of road or contiguous roads served by a bus route or multiple bus routes with a minimum length of 3 kilometers (1.9 miles) that has dedicated bus lanes." However, unlike the other well-established BRT systems in the world, BRT Trans Mamminasata lanes are still not dedicated ones. They are still incorporated with other vehicle lanes on the roadway. Currently the system consists only of 3 corridors (2, 3 and 8), which mostly cover central business districts, campus, markets, Hasanuddin International Airport and Soekarno Hatta Port. The operation of the BRT starts from 07.00 until 19.00. The following is the table of BRT Trans Mamminasata corridors:

[6] Metropolitan development cooperation agencies Mamminasata - South Sulawesi Province, cooperating with JICA, Integrated Spatial Planning for Mamminasata Metropolitan Area. Available at: http://open_jicareport.jica.go.jp/pdf/11834132_01.pdf [accessed August, 2016]

[7] ITDP, *what is BRT?* available at: https://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/what-is-brt/ [accessed May, 2016]

Table 1. Corridors and routes of BRT Trans Mamminasata

Corridor	Route
1	Hasanuddin International Airport – GTC Mall
2	**GTC Mall – Panakkukang Mall**
3	**Daya Terminal – Pallangga Terminal**
4	Daya Terminal – Maros Terminal
5	Untia – Pallangga Terminal
6	Pallangga Terminal – GTC Mall
7	Pallangga Terminal – Takalar Terminal
8	**Takalar Terminal – GTC Mall**
9	Daya Terminal – Pallangga Terminal
10	Daya Terminal – Pallangga Terminal
11	Maros Terminal – Barombong

Source: Jawa Pos National Network[8]

Bolded corridors written above (2,3,8) are the current operating corridors. Corridor 2 has a length of 14.9 km which is running through central business districts (CBD) in Makassar. Corridor 3 has a length of 21.8 km, which runs through several main roads of the city, and also through big campuses in the city, such as Hasanuddin University and Makassar State University. Currently there is no official data about corridor 8 length. The rest of the corridors are planned to be operated in the next few years.

1.2. Problem statement

The main problem of BRT Trans Mamminasata is likely to be the lack of passenger number. It is proofed by the statements of several stakeholders and experts who pointed out that the current load factor of BRT Trans Mamminasata only reaches 20% averagely. This is still considerably low, while ideally a public transportation such as BRT should have at least 70-80% of loading factor. The underlying factors which contribute to the problem should be figured out, in order to find in which aspect that the service provider can improve their service. So that in the future they could improve their loading factor to close to the ideal point. The operational target of BRT Trans Mamminasata based on the operator (Perum Damri) view is aimed to generate more revenue from their service, as basically Perum Damri is a State Owned Enterprise (SOE). Although, on the other hand, the operational target for BRT Trans Mamminasata according to Indonesian Ministry of Transportation via the Provincial Transportation Department is to provide a mass public transportation in order to reduce traffic issues, including traffic jam.

Despite the Indonesian central government's effort on promoting BRT to overcome transportation issues in the Makassar, which was initiated by Ministry of Transportation since 2007, and finally implemented since mid-2014, the BRT in Makassar is still not become people's main choice of public transportation. Socialization such as "*Ayo Naik Bus*" (Let's Ride Bus) by the local government to attract public using the BRT system is still not effective to bring more people to use the BRT in Makassar, proved by the low ridership of the BRT

[8] JPNN, Inilah koridor busway Makassar *(Here are Makassar busway corridors)*, 2014. Available at: http://www.jpnn.com/read/2014/01/23/212475/Inilah-Koridor-Busway-Makassar [Accessed May, 2016]

Trans Mamminasata, that is often the bus only occupied by less than 10 passengers in peak hours[9], while the current bus can transport up to 84 passengers per trip (30 seats, and 54 for standing passengers). As the result, the operator, Perum Damri (a State Owned Enterprise) keeps losing money on its service. Every day the operator spent 2,500,000 rupiahs to run the buses (5 buses), but the income is less than 500,000 rupiahs (€33)[10] . It means that every operating day the operator lost 2,000.000 rupiahs (€133), which is count for 80% of the operating cost. The operator itself has 30 buses, which means that only 16% of the fleets that is currently in operation[11]. Moreover, the BRT operation cost is not subsidized by government, and by far it is obviously that BRT Trans Mamminasata is still not profitable, while "subsidisation is needed until such time as the enterprise becomes efficient and profitable" (Sungkar, 2008, p. 103).

Delivering service that meets customer's satisfaction will give a positive impact on customer's loyalty, and it will increase the profit of service provider (Agbor, 2011). The profit itself will be used to improve the performance of the service, in order to satisfy the customers. Makassar BRT system in this case seems still not showing performance which comply its user's satisfaction. Moreover, users from different socio-economic statuses (particularly based on income) will have their own view towards service which provided by the service provider.

BRT Trans Mamminasata operator will have to deal with those different classes, since passenger of public transportation is not limited to certain socio-economic status, vehicle ownership, or any occupancy, but as a public service, it has to be able to serve everyone. Success to attract passengers regardless to their economic statuses will bring positive impact on the BRT operator's profit, and the city, Makassar will be benefitted from it, due to maximisation of BRT usage, which can contribute to lower private vehicle usage.

Regarding to social economic status of the people, different SES from high, middle, and low class can perceive the performance of the BRT in different ways. People from high economic status tend to have a high standard of need, while people from middle and low economic status are usually do not have as high standard as the high economic status' standard of need. This research will try to figure out whether the statements are true or not, according to the research findings. Social economic status (high, middle, and low) will be used as moderator in this research.

1.3.Research Objective

To explain the effect of current Makassar BRT (BRT Trans Mamminasata) performance to user's satisfaction

This research aims to explain the current situation in which BRT Trans Mamminasata system still not being the main choice of public transportation in Makassar. It is presumed that the current performance of BRT Trans Mamminasata system still not satisfying its users, thus the system suffers loss as a result of low ridership.

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[9] Kurniawan, A., 2015. Inilah 5 Keistimewaan Naik BRT di Kota Makassar (Here are 5 privilages of using BRT in Makassar). Kompasiana [blog] December, 28th, 2015. Available at: http://www.kompasiana.com/aniskurniawan/inilah-5-keistimewaan-naik-brt-di-kota-makassar_56801a006723bd5f1b47da70 [Accessed April, 2016].

[10]Ujung Pandang Express, 2015. *Halte BRT Ditambah* (BRT bus stops has been added). Available at: http://upeks.co.id/utama/halte-brt-ditambah.html [Accessed 2016]

[11] Nurfahraeni, I., 2015. *BRT Mamminasata resmi beroperasi di Makassar* (Mamminasata BRT officially operates in Makassar). Available at: http://nasional.tempo.co/read/news/2015/07/01/058680111/brt-mamminasata-resmi-beroperasi-di-makassar [Accessed 2016](Nurfahraeni, I., 2015)

1.4. Provisional Research Question

To what extent does the current Makassar BRT (BRT Trans Mamminasata) performance affect the user's satisfaction?

1.5. Provisional Sub Questions

a. What is the current performance of BRT Trans Mamminasata?
b. How does BRT Trans Mamminasata users (from different socio-economic status) perceive the current BRT system performance?

Revised research question and sub questions can be found at chapter 3 (please see: sub chapter 3.1)

1.6. Significance of the Study

Scientific contribution:

The outcome of this research is expected to contribute in the field of satisfaction and dissatisfaction theory (Aigbavboa and Thwala, 2013). Theories range from BRT in general, including its components, and classification, user's satisfaction theory, and socio-economic status of BRT are used in this research, and more or less this research is also influenced by theories from different field, i.e. from marketing field of study, where user's satisfaction formulation of this research is strongly influenced by it.

Research relevance:

There have been plenty of research (Cao, Cao, et al., 2016, Mahmoudi, Verdinejad, et al., 2010, Baghini, Ismail, et al., 2014) in related field to user's satisfaction of public transportation, and particularly research in user's satisfaction on BRT system. Some studies explored user's (some studies used customers, passengers, and some others used riders term to refer to user's) satisfaction of BRT compared to other public transportation modes, such as metro, and conventional bus, other studies measured user's satisfaction focus on conventional bus. However, there seems to be a chance to contribute in the body of knowledge, where a study can be conducted, especially in this present study where the focus is only on BRT performance and its user satisfaction.

Policy relevance:

This research is relevant with the Indonesian urban transport policy[12], which in short-term Ministry of Transportation encourage BRT/ Busway development, and in the mid-term, it is encouraged to expand BRT network and its feeder system. Development and operation of BRT is a result of implementation of vision and mission of Indonesian governance period 2014-2019 in order to increase society's productivity by providing modern and advanced mass transportation[13]. This research can contribute as a preliminary research regarding to satisfaction level of the passengers towards the current service of BRT Trans Mamminasata, although there is still no guarantee that the result of this research will be utilized by the stakeholders or in any policy implementation in Makassar particularly.

[12] Directorate of Indonesian Urban Transportation System (unpublished) 2013. *Kebijakan umum transportasi perkotaan* (Urban Transport Policy). Presentation.

[13] Indonesian Law no. 22 of 2009, about traffic and road transportation and its implementation regulations, Indonesian government regulation no. 74 of 2014, which mandated development of road-based mass transportation.

1.7.Scope and Limitation

Scope:

This research will be cover the effect of current performance of the BRT in Makassar. This research will only focus on the current operating corridors (3 out of 11 corridors/ adjusting with any update of operating corridor), which to date only in corridor 2, 3, and 8.

Respondents (samples) of this research are the passengers, or people who have used BRT Trans Mamminasata before, to give their opinion about the current performance of BRT Trans Mamminasata, regarding to their satisfaction. The respondent samples of this research are taken randomly by using online questionnaire.

Other information as additional information, for instance about plan to add more bus stops or more routes in the future in order to improve the reliability (in terms of triangulation) of this research, will be gained from interview with representative(s) of BRT Trans Mamminasata operator, its project planner, and also second opinion from local transportation expert who have studied BRT Trans Mamminasata.

Limitation:

Limitation for this research will be related to data collection, analysis and methodology used in this research. In terms of data collection, getting a representative number of respondents in a short field-work period, will be quite challenging. Duration of data collection will be about two weeks (second or third week of June to early of July 2016), adjusting the existing situation in Makassar, where it will be long holidays, and most offices will close earlier during Ramadan month.

In terms of variables which are used in this research, they will be limited to services, accessibility, availability, time (performance → independent variables) and expectation, as well as recommendation (user satisfaction → dependent variable). Another independent variable which also often used in assessing the performance of BRT (environment) is excluded due to limitation of data and the absence of measurement tool to measure air pollution produced by the BRT.

Respondents of this research are expected to be 120-150, referring to estimated current number of passengers (see sub chapter 3.4: sample size and selection) which according to the early information, the daily number of passengers of BRT Trans Mamminasata were up to 500 passengers, those number of samples are more than enough (roughly 30% of the population).

It is expected to get balanced number for each socio-economic status (from different income level: low, middle, and high). This is particularly can be another limitation for this research, where it will be difficult to collect a balanced number for each socio-economic status respondents, due to characteristic of online questionnaire where it is hard to control the number of each socio-economic status, while the number of total population itself is not big enough.

Additionally, willingness of passengers, people who have used BRT Trans Mamminasata, objective opinion from the representative(s) of the operator, project planner, and local transportation expert to participate in giving their opinion will be needed.

Limitation in terms of low participation during direct (face to face) interview should be tackled by deploying data collection instruments via online (if the direct interviews were still not enough in giving information that essential to this research). The instrument (interview questions) is sent to the respondent by email.

In terms of analysis, sufficient analysis by using combination of qualitative and quantitative approaches will be addressed by using correct analysis tool, for instance in analysing

quantitative data reliability, SPSS analysis of finding Cronbach alpha will be helpful, and in qualitative data analysis, correct coding technique will be the main choice to keep the reliability of the data. Another tool to help in analysing qualitative data by using Atlas ti, in case there will be more qualitative data that emerges from field-work. Furthermore, interpretation in a right manner will be required during data analysis. Literatures, tutorials, guidance from supervisor and lecturers are expected to help improve the quality of data analysis of this research.

In terms of methodology, correct approach in using case study which in this research will use single case study will strongly affect the quality of this research. This research will use case study sub-groups where it will gain information from different socio-economic status. Again, cross-check with literatures will be required to secure the level of correctness in terms of research method that is used in this research. The limitation of single case study which used in this research can be an issue of replicability if this similar kind of research aimed to be replicate in other research notably to BRT passenger satisfaction related research. However, it is make sense that replicability can be an issue in this kind of research, due to different research objective of the respective research.

1.8. Hypothesis

As it has been discussed earlier in the background and problem statement parts, it can be suggested that the hypotheses are:

a. Passengers of BRT Trans Mamminasata are still not satisfied with the current service from the service provider (PerumDamri).
b. People with different economic statuses have different expectation in using BRT Trans Mamminasata.

Chapter 2. Literature review

2.1 State of the art of the theories/ concepts of the study

This chapter discuss BRT performance, its user's satisfaction, which shows difference between socio-economic status. Since this research is about the effect of current BRT Trans Mamminasata performance to user's satisfaction, this chapter will be focus on theories, concepts, and insights from previous studies, published material that are related to the research topic.

2.2 BRT Definition

There have been dozens of definition regarding to Bus Rapid Transit. Those definitions have several things in common, such as flexibility of the bus, rapid transit modes, dedicated lanes, and integrated system which distinguish it from the regular bus service. the following are some definitions of BRT from several literatures:

Federal Transit Administration has been defined BRT as "*a rapid mode of transportation that can provide the quality of rail transit and the flexibility of buses*"(Levinson, Zimmerman, et al., 2002, p. 2), while at the same document, Transit Cooperative Research Program report 90 volume 2 defines BRT as "*a flexible, rubber-tired form of rapid transit that combines stations, vehicles, services, running ways, and ITS elements into an integrated system with a strong identity*" (Levinson, Zimmerman, et al., 2002, p. 2). The late definition by Levinson, et.al was one of the most used BRT definitions in several reports, theses, dissertation including in (Rizvi, 2014) and journals (Vilchis, Tovar, et al., 2010).

According to American Public Transport Association (APTA), Bus Rapid Transit (BRT) is "*Frequent, faster and higher-capacity bus service designed as an integrated system of service, facilities and strategies that distinguish it from regular bus service*" (Roberts, Scrimgeour, et al., 2010, p. 24). A year later, Taotao Deng and John D. Nelson defined BRT as "*a modern breed of urban passenger transportation with a consistently growing global importance due to evidence of an ability to implement mass transportation capacity quickly and at a low-to-moderate cost*" (Deng and Nelson, 2011, p. 1).

Although definitions have been formulated according to several sources, Dr. Alexandros and Prof. MariAnne Karlsson (Nikitas and Karlsson, 2015) further compiled seven points from several sources that composed BRT system, they are:

- **Vehicles**, which considered have a significant effect on every aspect of measurable system performance of the BRT, and have impact on community and customer perception of quality of the entire system (Zimmerman and Levinson, 2004).
- **Stops, stations, terminals, and corridors**, which define the system's area of operation. Moreover, "BRT stations are designed according to the standard of rail transit, with a variety of amenities such as traveler's information system, shelters, enhanced lighting, and security"(Cao, Cao, et al., 2016, p. 2).
- **A wide variety of rights-of-way**, which is more importantly, the BRT lanes are separated from road traffic. BRT routes can be operated almost anywhere—on abandoned rail lines, within a highway median, or on city streets (Jarzab, Lightbody, et al., 2002).
- **Pre-board fare collection**, to disengage ticketing from the on-board user experience and to provide a hypothecation mechanism for the system's long term viability

- **The use of information and communication technologies**, to improve the quality of the services provided in terms of customer convenience, speed, reliability, integration, and safety
- **All-day service** that, according to Levinson et al. (2003), should operate at least 16 hours per day with peak headways of 10 minutes or less
- **Brand or identity**, which consists of perceptual constructs substantiated by the strategic deployment, placement, and management of communication elements that allow people to recognize the unique qualities of a specific BRT system; including visual and nominal identifiers (system name and logo), a color palette, and long-term strategic marketing and advertising plans (Hess and Bitterman, 2008).
  Source: (Nikitas and Karlsson, 2015)

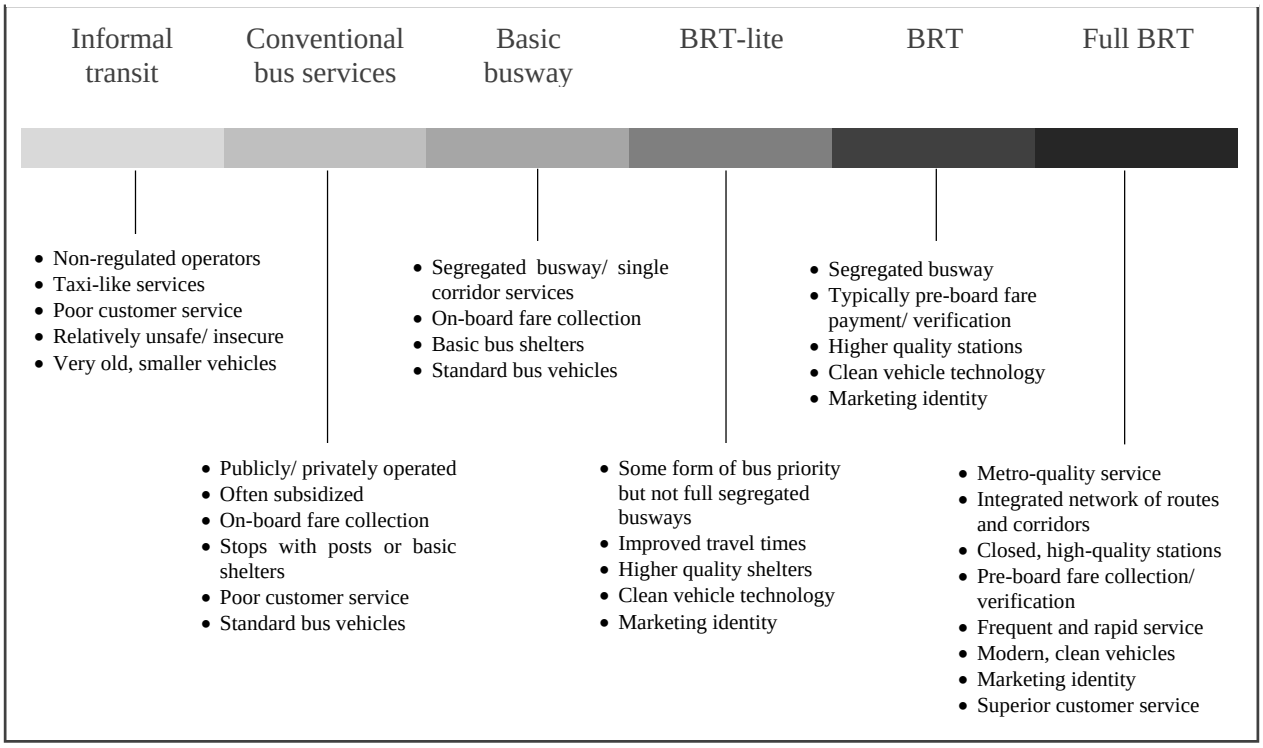
Those definitions above affect this research in terms of acknowledging more about BRT in general and could learn to distinguish a BRT system from a regular bus service.

According to several definitions above, it can be formulated that BRT is an integrated public bus rapid transit system, which serves frequently and has a higher capacity and has convenient facilities which distinguish it from the regular bus service.

2.3 BRT classification

To distinguish bus rapid transit system, regular bus service, and other tyre-based public transport, Wright and Hook provided a quality spectrum of tyre-based public transport which consist of six different categories. The following figure can be used to classify in which category is the BRT system that we discuss.

Figure 3. Quality spectrum of tyre-based public transport



Source: (Wright and Hook, 2007)

According to the table above, BRT itself divided into three different criteria, which are: BRT-lite, BRT, and full BRT. On the other hand, the other tyre-based public transport which are not considered as BRT are: informal transit service, conventional bus services, and basic busway. Those characteristics defined by Wright and Hook seem quite clear, however, in reality, in defining which category is the BRT that we discussed according to the table can be challenging. Since, in some cases, what a public transportation providers said about their service they classified as BRT, although their fare collection is an on-board one. However, in the same time, they have clean vehicle technology on their buses, and marketing identity which distinguish them from the other tyre-based public transportations, including conventional bus, and even basic busway. To address this issue, further identification should be conducted in order to gain a clearer understanding about the classification of tyre-based public transportation that we discuss.

2.4 BRT user satisfaction (dependent variable)

User satisfaction, in this case, passengers' satisfaction is determined as the dependent variable. The reason is, the satisfaction of the passengers is strongly affected by the performance of the service given by the service provider. Generally, the better the performance given by the service provider, the more satisfied the users/ customers/ passengers are. This variable responds to the independent variable (performance).

2.4.1. Customer Satisfaction theory

This research is strongly discussing about satisfaction of the users of BRT Trans Mamminasata. Therefore, relevant theories regarding to satisfaction have to be taken into account in order to improve the quality of this research. Although this sub chapter is namely "customer satisfaction theory," passengers, and users are considered have similar meaning with customers. Since all of them are considered as people who use a certain product/ service. Hence, it is expected that all of those terms (users, passengers, customers) of the BRT Trans Mamminasata will not confusing the reader of this study.

Furthermore, to justify about the naming of this sub chapter, customer satisfaction is considered a right one compared to "satisfaction theory" only, which is much wider than the "customer satisfaction theory[14]" terms, and not relevant with this present research.

Positive disconfirmation (satisfaction) emerges when a product/ service has a better quality than the expectation, while the negative disconfirmation (dissatisfaction) will emerge if the performance of the service/ product is worse than the expectation (Aigbavboa and Thwala, 2013, p. 49). This theory reflects that the quality of a product/ service is significant in affecting the satisfaction of the customers.

In Customer Satisfaction and Retention by Hansemark and Albinson, stated that customer satisfaction is a general attitude of customer about a service/ product, or an emotional reaction to the difference between what the user/ customers foresee and what they get, regarding to their contentment of need, desire or goal (Hansemark and Albinsson, 2004). In line with this theory, Parker and Mathews stated that satisfaction is an evaluation process between what the customers gets and the expectation that they have before (Parker and Mathews, 2001).

Justifying the socio-economic status (namely moderator in this research) linked to theory of customer satisfaction, Pierre Bourdieu stated that lower economic status and cultural capital makes barriers for subgroups in society to obtain and use social capital. Moreover, he

[14] Satisfaction theory (not customer satisfaction theory) is commonly linked to satisfaction theory of atonement, in which it is strongly related to concept of theology.

highlighted that there are inequalities and power differences in regard to different socio-economic status, and social capital creates inequality by allowing some people to distribute their capitals to their advantage. Bourdieu defines social capital as "the accumulation of the real or potential resources related to possession of a reliable network of approximately institutionalized relationships of mutual acquaintance or recognition" (Bourdieu, 1986 in, Uphoff, E, et al., 2013). It means that different socio economic status could have a different taste in using a product/ service. And it is likely that higher economic status have a higher expectation towards a service.

Borrowing from marketing field of study, "Satisfaction can also be a person's feelings of pleasure or disappointment that results from comparing a product's perceived performance or outcome with their expectations" (Kotler and Keller, 2008 in, Agbor, 2011, p. 6). Furthermore, Shifmann and Karun defined customer satisfaction as a measure of how products and services provided by producer/ service provider meet or exceeding user's satisfaction (Schiffman and Kanuk, 2004). By other authors, consumer satisfaction is defined as a response (emotional or cognitive) which pertains to a particular focus (expectations, product, consumption experience, etc.) and it occurs at a particular time (after consumption based on accumulated experience) (Giese and Cote, 2002). In an overview, it can be said that user satisfaction deals with response of the user of product that they use according to their expectation. While the user satisfaction has been quite clearly defined previously, expectation on the other hand is defined as "beliefs about service delivery that serve as standards or reference points against which performance is judged" (Zeithaml, Bitner, et al., 2006, p. 81).

Dozens of research have been conducted in field of user's satisfaction in public transportation. Some of those research, for instance the one which was conducted by Jason Cao, et.al in 2013 compared user's satisfaction in BRT, metro and a regular bus system in Guangzhou. The research found that the three most influential attributes for satisfaction on BRT system are: ease of use, safety while riding, and comfort while riding. Furthermore, compared to other modes of public transport that they studied, BRT placed in the second place behind metro, but slightly better than conventional bus service (Cao, Cao, et al., 2016). Their research mostly used primary data from surveys during weekdays in 20 stations from morning peak hours to the peak hours of the evening. Respondents were asked to rate the attributes and indicate it to five-point ordinal scale from very poor (1) to very good (5). Respondents were asked to express their opinion regarding to the service performance. Questions of the questionnaire were based on questions designed by Cain, et al. (2009) and literature review as well as focus -group study.

Customer satisfaction as a concept/ theory has been used in many different field of studies, from medical field of study (hospital service evaluation according to patient satisfaction), satisfaction of employees in office evaluation, customer's satisfaction towards quality of product or service, and also in the field of marketing where this concept is significantly used. For this research, the satisfaction theory is also important to be used, where it is aimed to measure customer's satisfaction toward current performance of BRT Trans Mamminasata.

To conclude, customer satisfaction is a feeling of a person whether he/ she is pleased or disappointed resulted from comparing the service/ product with his/ her expectation, the more the customer satisfied, the more he/ she will repeat the purchase of the service/ product.

2.4.2. Measuring user satisfaction

Measuring user satisfaction can be tricky, since it "is an attempt to measure human feelings" (Agbor, 2011, p. 7) which tends to be varied by everyone. Moreover, citing from the same source (Agbor, 2011) said that to know customers' feeling about the service provided and what they want is to by simply ask them.

Discussing about user satisfaction measurement, it is also linked to approach of behaviour of the user and the approach of psychology to assume that user satisfaction is a mental condition of the user. To assess the performance of a system/ service/ product it is largely subjective and it should be compared to some extent of standard (Grigoroudis and Siskos, 2004, p. 336), which is also including Socio-economic status (SES).

2.5 BRT system performance (independent variable)

The BRT system performance in this research is determined as the independent variable. The reason being, that several indicators which representing the performance of the BRT system (see figure 5. Conceptual framework) are affecting the dependent variable (user's satisfaction).

Bus Rapid Transit system is very dependent on infrastructure where it is operated. As it mentioned that "*BRT system performance will be defined more by the infrastructure on which it operates than by any other factor*" (Kulyk and Hardy, 2003, p. 5). A reliable infrastructure which is integrated with the BRT system, for instance a dedicated lane will contribute to the speed of BRT, since it is separated from the mixed traffic with other road transportation. Such infrastructure (dedicated lane) will also contribute to the safety of the bus, which hindered the bus way from intrusion by other vehicle, like motorcycles. Sufficient infrastructure will certainly improve BRT performance in general (in terms of service, accessibility, availability, and time).

As a part of public service, performance of the BRT system has to be measured in order to evaluate that the current performance has already meet the public's need or not. Mentioned by Mihaiu, et. al, that "*measuring the public sector performance, in the conception of the authors, implies taking into consideration the distinction between: the means used (inputs), the process (throughput), the product (output) and the effect achieved (outcome)"* (Mihaiu, Opreana, et al., 2010, p. 138). Furthermore, according to Alina Profiroiu and Marius Profiroiu, performance assessment can be achieved through these measurement categories:

- Measuring the resource economy
- Measuring the costs
- Measuring the efficiency
- Measuring the effectiveness
- Measuring the quality of services
- Measuring the financial performance
- Measuring the overall performance
  Source: (Profiroiu and Profiroiu, 2007 in, Mihaiu, Opreana, et al., 2010)

Since this thesis is about BRT performance and user's satisfaction toward its system, acknowledging about BRT system performance concept will be required. There have been a lot of studies conducted related to measuring BRT performance. One of those studies is conducted by Robert Cervero, whom in his working paper "Bus Rapid Transit (BRT): An Efficient and Competitive Mode of Public Transport" formulated five key performance measures to review a BRT system performance: operating speed, levels of comfort, safety, environmental impacts, and social equity (Cervero, R., 2013).

- **Operating speed**
  The faster the speed of the BRT system, the better performance it has. And as the result, the more competitive BRT becomes compared to private cars and metro rail in term of travel time. Speed of BRT is likely to be slower if the system is running on surface (overpass, tunnels, and other forms that separated the lanes from regular traffic). The average operating speed of surface running BRT is 20 km/h (Hensher and Golob, 2008).

Although segregated lanes are provided for BRT in the central cities, the speed is even lower, a high-end BRT system average speed in the city center is 16-18 km/h. a study conducted in Istanbul Metrobus revealed that faster travel speed and lower risk of traffic congestion were the major reasons passengers choose the BRT (Yazici, Levinson, et al., 2013).

- **Levels of comfort**
  According to BRT Standard 2014, BRT stations should have an internal width of 3 meters, protected from rain, wind, snow, heat and or cold depends on where it is located. Moreover, a to create attractive stations is significant to the image of the BRT system performance and creates a sense of permanence and attractiveness that will attract not only riders but developers as well (ITDP, 2014). Compared with rail based public transportation, BRT could have higher score, surveys from Adelaide showed that BRT rated higher by customers than on-street bus or rail services (Currie, 2006).
- **Safety**
  Safety precautions have a modest effect on reducing BRT bus speeds thus the safety benefits are viewed as more than offsetting slight declines in service quality. Previous study in Istanbul showed that BRT system contributed in reducing bus accidents to 64% in one year (Currie, 2006). In Bogota, Colombia, TransMilenio as BRT system has proven to contribute in overall reduction in traffic accident in two corridors, Caracas Avenue and Norte-Quito-Sur Avenue. However, in some specific area, the result was vice versa. The increase of traffic accidents occurred mainly around the busiest stations, where speed went up significantly as a result of elimination of traffic lights (Bocarejo, Velasquez, et al., 2012).
- **Environmental impacts**
  BRT system offers a great potential for greenhouse gas reductions due to its lower CO2 emissions per passenger per mile than other transportation system. Moreover, in term of noise impact, BRT system is also likely to contribute in reducing overall noise level, by determining suitable noise management systems (Baghini, Ismail, et al., 2014).
- **Social equity**
  Previous study in assessing the equity impact of BRT in Johannesburg and Mexico City showed that ideally BRT system helps promote social justice, poverty reduction and equity among urban society (Venter, Hidalgo, et al., , 2013). In another case, Bogotá's decision to investment in BRT was driven in part by a desire to deliver a lower cost, more affordable mobility option that serves outlying informal settlements as much as downtown financial districts and other commercial clusters typically served by rail.
  Source: (Cervero, R., 2013)

Another research in the same field, conducted by Rabiul Islam, Mohammed S. Chowdbury, et al. in 2014. However, this study was focus on conventional Bus service without comparing it with the other public transportation modes (metro and BRT) like Cao, Cao, et al. did. They measured customers' satisfaction regarding to impact of service quality by bus operator in Kedah, Malaysia. The research was based on service quality dimensions and their relationships to customer satisfaction, and after doing literature review and interaction with Bus service administration, they decided to analyse five criteria to measure the overall user's satisfaction based on several **performance variables**:

- **Services**: Include the price of ticket, the service of personnel (behaviour of bus driver), service inside the bus (comfort, cleanliness and air condition), service outside the bus (layout of bus stops) and route safety
- **Accessibility**: Consists of the access in bus stops and access in tickets

- **Availability**: This means coverage of network, connectivity of lines, route frequency, route working hours, bus stop frequency
- **Time**: route precise, route waiting time and route duration
- **Environment**: This limits to bus aesthetics and bus pollution
  Source: (Islam, Chowdhury, et al., 2014)

According to the theory that they used, those criteria used in the diagram as independent variables that directly affect customer satisfaction. The research collected primary data through questionnaires distributed to students of University Utara Malaysia. Contrary with the research that I am about to conduct, respondents of the present research will not be limited to students only, people with different occupancies who have used BRT Trans Mamminasata system will be the respondents in this present study.

Based on those performance variables above, the variables which will be used in this research are focused on 4 items (services, accessibility, availability, and time). Those variables are going to be represented by several indicators which are relevant to each other. Theoretically, those indicators are relevant to cover the performance variable, in which if we refer back to several studies, literatures are quite representative, and reliable (Islam, Chowdhury, et al., 2014, Cervero, R., 2013). However, environment issue is excluded from indicators which will be used in this research, due to limitation in measuring the pollution of the bus. To measure the bus pollution will need data or using a tool to measure the air pollution, while data and the tool are still not available yet in Makassar. The passengers of the BRT can experience any pollution, however, this item can be measured from the service indicator, as it is likely cover the people's experience regarding to pollution (related convenience).

Several studies such as (Mahmoudi, Verdinejad, et al., 2010, Khurshid, Naeem, et al., 2012) including research by Rabiul Islam, Mohammed S. Chowdbury, et al. measured level of service quality using SERVQUAL model which is considered to be objective and not biased, thus it can make the research as a reliable one. Furthermore, as it mentioned in those studies, that SERVQUAL model deals with user expectation and perception (Islam, Chowdhury, et al., 2014).

On the other hand, time is mentioned to be one of the most important aspect in public transportation, as the undesirable feature of it can lead to inconvenience, and is likely to involve transaction cost as well, as mentioned by Wardman (Wardman, 2004). It means that issues related to dissatisfaction regarding to time could increase the cost of using the public transportation to the user's side.

2.5.1. BRT practice guidelines

In order to assess the performance of a BRT system, a comparison between the standard (ideal) guidelines and the existing condition should be taken into account. So there will be a clear measurement to determine whether a certain indicator has already fulfil the criteria. Moreover, it can also appears that certain indicator lacks about certain quality.

Table 2. BRT practice guidelines

Driver	• **Operates bus safely, able to ensure precision docking.** • **Friendly service to passengers**
Ticket price	• Affordable for society
Comfort	• Clean, climate-controlled vehicles that are easy to board and exit
Safety	• Separation of BRT vehicles from other traffic streams reduces hazards.

	• extra signing and pavement marking are important given the potential perception by motorists of unexpected bus maneuvers. • A curb extension for a BRT stop can improve pedestrian safety because the crossing distance is reduced
Accessibility	• Pedestrian access is the most important modal integration aspect and should take into account connectivity, accessibility, safety, and security. • Integration with other modes, motorized and non-motorized, can greatly increase • BRT system performance and help reduce direct costs, since these modes can act as feeders into the system.
Bus stop location (distance)	• Busways should penetrate high-density residential and commercial areas, traverse the city center, and provide convenient access to major downtown activities. • They should be located on their own right-of-way wherever possible • Distance of the bus stop is within walking distance (approx.. 400m)
Availability	• Frequency of bus departure: maximum 15 minutes per bus
Time	• Travel time: common practice applies up to 10 minutes for full-featured BRT. • Waiting time (headway): 15 minutes in the off-peak hours, and 10 minutes in the peak hours.
Corridor selection	• Chose an alignment based on demand, physical limitations, network advantages, costs, implementation, politics, and social equity. • Do not be limited by spatial constraints. One of the main strengths of BRT is that it can adapt to a variety of conditions.
System capacity and speed	• Capacity has to be enough to cope with peak demand and speed has to be competitive with alternative modes. • Both depend on a range of factors but are greatly determined by busway design (one or more lanes, intersection design), vehicle design (size, multiple doorways, boarding level), and station design (off-board fare collection, spacing, stopping bays)
Customer service	• Design the system based on customers' needs and wants. • Do not neglect signage and other forms of customer information. • Be aware of aesthetics. • Make security and cleanliness a priority
Bus	• incorporates high-quality vehicles that are configured for the BRT services offered and markets served and have a unique BRT identity
Fare collection	• Off-board payment methods include payment booths located at each station.

	• On-board methods for fare collection include exact change payments, use of proof-of-purchase tickets, and pass scanners
Operational costs and fares	• The goal in the developing world is to operate without subsidies. This means that the public sector should not subsidize repayment of capital and operating costs (fixed and variable). • If vehicles are included in the concession contract, then they can be considered operational costs; otherwise, they can be bundled with the rest of the capital investment. • Fares should be defined technically, based on operational productivity. • It is recommended that an independent fare company collect the revenues, thus acting as a "trustee" to distribute revenues based on contractual agreements.

Source: (TCRP, 2007, Campo, 2010)

This part (BRT practice guidelines) is incorporated in this research, to give more insights to the author about certain points which can be considered as indicators in this research. However, not all of those points above used in this research due to research limitations.

2.6 Relationship between performance and user satisfaction

Performance of a service provider has a positive relationship with user satisfaction, as it is also mentioned by Magi and Julander, that "… the importance of customer satisfaction and service quality has been proven relevant to help improve the overall performance of organizations." (Magi and Julander, 1996, p. 40). Furthermore, the better user satisfaction can lead to a better customer loyalty, recommendation and repeat their purchase (Wilson, Zeithaml V., et al., 2008)in (Agbor, 2011).

Theoretically, according to a classic literature which was based on Pierre Bourdieu's "The forms of Capital" in 1986, saying that different socio-economic statuses/ status creates differences for each sub group in society to obtain and use their social capital (Uphoff, E, et al., 2013). It means that different socio-economic status uses their capital differently, in order to fulfil their need.

According to the statements above, it can be add into the hypothesis that the better the performance of a service, the more satisfied its users. Furthermore, it is likely that the higher social capital owned by a socio-economic status, the stronger their power to afford a better service.

2.7 Socio-economic status (moderator for this research)

Socio-economic status (SES) in this research is used as the moderator in the conceptual framework. The reason of using it as a moderator is based on the problem statement, where it is presumed that different socio-economic status (high, middle, and low) perceive the service differently, and it can lead to different satisfaction of each class.

Different Socio-economic status in society is occurred including in urban area. Although this term has been used in several field of studies, for instance in health, education, behavioural studies, etc. there is still no standard definition of socio-economic status[15]. However, socio-economic status is a measure of "individual's or family's economic and social position relative

[15] Oakes, M., 2011. Measuring socioeconomic status. [e-Source Behavioral & Social Sciences Research] Available at: http://www.esourceresearch.org/Portals/0/Uploads/Documents/Public/Oakes_FullChapter.pdf [Accessed June, 2016]

to others, based on income, education, and occupation" (Saifi and Mehmood, 2011, p. 119). From that point, it can be seen that income, education and occupation have strong influence in determining someone's socio-economic status. In health sector, better socio-economic status (SES) have a positive association with better health, due to ability to buy health promoting resources and treatments (Baker, 2014). Positive association between SES and ability to get better service does not limited to health sector only, but generally in every service, where people who have higher income can afford a better service. It also including in using transportation mode, where people with higher income tend to choose a better service.

Laureau observed that SES is typically divided into three categories: low, middle, and high, based on three variables assessed: income, education, and occupation (Lareau, 2003 in, Okioga, 2013, p. 38). In terms of mode choice, Sergio and Jorge concluded that income should explicitly incorporated into utility specification, in order to find specifications of modal utility (Jara-Díaz and Videla, 1989). Furthermore, mode choice or commute length is strongly affected by factors such as gender, household composition, and income (Schwanen and Mokhtarian, 2005, p. 83). From what we have seen above, we can be more convinced that income has a strong effect in determining choice of service and mode of choice. This is in-line with the moderator inclusion in this research, where income is chosen as a moderator to see the difference between different socio-economic status in perceiving the BRT system.

Income

Income is defined as wages, salaries, profits, rents, and any flow of earning. Furthermore, it can be looked in two ways, relative and absolute. John Maynard Keynes defines absolute income as the relationship in which income increases. On the other hand, relative income is a person's or a family's saving and consumption based on the family's income in relation to others. Income is mostly used in measuring socio-economic status of people, because it is relatively easy to find out from people (Saifi and Mehmood, 2011, Okioga, 2013).

Economic status in Indonesia, according to Saraswati, divided into three different classes (Saraswati, 2009, p. 44):

- High: > IDR 2,000,000 (>€133)
- Middle: IDR 1,000,000 – IDR 2,000,000 (€67 – €133)
- Low: < IDR 1,000,000 (<€67)

Those classes are based on monthly income earned.

Reflecting from Saraswati's classification of economic status in Indonesia above, it can be seen that the numbers are not relevant anymore, especially when they are compared to current Makassar monthly minimum wage (according to gubernatorial decree in 2016) is at least approximately IDR 2,300,000 (>€154)[16]. Therefore, a new assumption should be taken into account.

Based on the current figure of Makassar city minimum wage, the lowest wage is IDR 2.3 million. To make it easier in determining the classification of people's economic status based on their income, the figure is rounded to IDR 2.5 million (>€167), so from that point, it can be assumed that the low economic status should have a monthly income of IDR 2.5 million.

The next assumption to be made is the middle economic income. In this research, it is assumed that the middle economic status has a monthly minimum income of IDR 5 million (>€334) or twice as the low class' monthly income, which is in line with Saraswati's calculation (middle

[16] South Sulawesi gubernatorial decree number: 2500/XI/2015 on Makassar minimum wage is IDR 2,313,625 (>€154.98)

= 2 x low monthly income. The rest is, the assumption of high economic status income, which we can assume they should have monthly income of more than IDR 5 million. To be clear, here is the new assumption of high, middle, and low economic status monthly income:

- High: > IDR 5,000,000 (>€334)
- Middle: IDR 2,500,000 – IDR 5,000,000 (€167 – €334)
- Low: < IDR 2,500,000 (<€167)

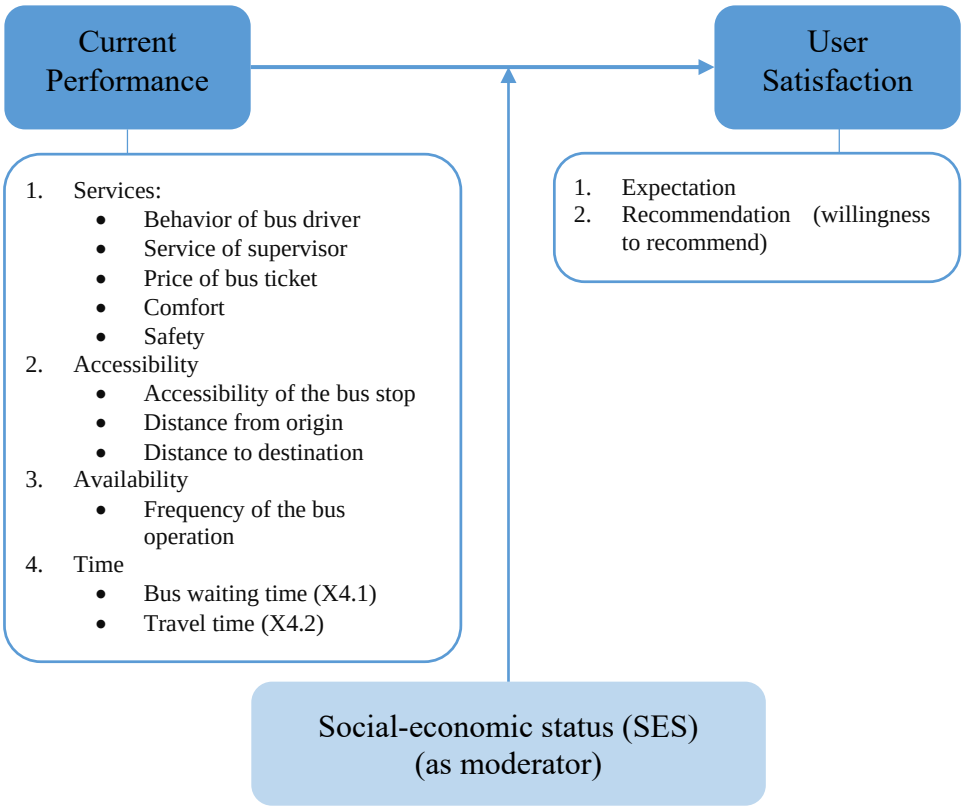
Furthermore, the other reason of why this assumption has to be made (including using a rounded number), beside to make it easier to determine respondent's economic status based on their monthly income, is due to society's habit when they are asked about their income, they are usually answer using rounded numbers. For instance, a respondent is usually mention that his income is IDR 2.5 million. It is rarely to be happen that a respondent mentions IDR 2,345,675 as their monthly income.

2.8 Conceptual framework

The causal relationship between current performance and user's satisfaction of BRT Trans Mamminasata system is reflected in this part. It is considered that current performance of BRT Trans Mamminasata system affects how its users perceive the quality of service delivered by the operator (Perum Damri). The performance of BRT Trans Mamminasata system will be measured using four attributes (services, accessibility, availability, and time). Those attributes will be assessed by the users by using likert scale of 1 to 5. Which 1 is "very dissatisfied", 2 is "somewhat satisfied", 3 is "neither satisfied nor dissatisfied", 4 is "somewhat satisfied", and 5 is "very satisfied", more details of likert scale that is used in the data collection, please see annexes (data collection instrument) part.

The following is the flowchart of conceptual framework of this research:

Figure 4. Conceptual framework



Chapter 3. Research designs and methods

This chapter contains the operationalization, research strategy and methodology, sample size and selection, data collection methods, validity and reliability of the data that are being used in this research, and analysis techniques which are used to answer the research questions.

3.1 Revised research question

To achieve the research objective, which is aiming to explain the effect of current BRT Trans Mamminasata performance to user's satisfaction, the following research questions will be used:

- **Research Questions:**
  To what extent does the current BRT Trans Mamminasata performance (service, accessibility, availability, and time) affect the user's satisfaction?
  This main research question has been modified by specifying four performance variables (service, accessibility, availability, and time) into it, to make this research more specific, as those variables were gathered from literature review and previous studies which were in the same topic.
- **Eventual Sub Questions:**
  a. What is the current performance of BRT Trans Mamminasata?
  b. How do users from different socio-economic status (low, middle, and high income) in Makassar perceive the current BRT Trans Mamminasata system performance?
  c. Which independent variable (service, accessibility, availability, or time) is more significant in term of satisfying BRT Trans Mamminasata users?

  The third sub research question was added, in order to find which factor is actually accounts the most that satisfying the users. So, it will be quite helpful for the operator which sector on their service to be improved in order to satisfy their users.

3.2 Operationalization: indicators for the concepts used

The operationalization contains variable and indicators, which are derived from theories/ concept based on the theoretical framework in the second chapter. Before the operationalization table presented, it should be mentioned in the first place definitions regarding to main points of this research. Started from definitions of BRT, in which it is quite important to know in the first place, due to variations of BRT definitions itself. Among many definitions of BRT, the following is a few definitions that the researcher considered as relevant with this research. Definitions of customer satisfaction and performance particularly about BRT system follow respectively.

Table 3. Definitions of BRT

Source	Definition of BRT (Bus Rapid Transit)
Federal Transit Administration	A rapid mode of transportation that can provide the quality of rail transit and the flexibility of buses (Levinson, Zimmerman, et al., 2002, p. 2)
Taotao Deng and John D. Nelson	a modern breed of urban passenger transportation with a consistently growing global importance due to evidence of an ability to implement mass transportation capacity quickly and at a low-to-moderate cost (Deng and Nelson, 2011)

From definitions above, it can be concluded that *BRT is a road based public transportation mode which runs on segregated lanes, with integrated technology system attached to it and provides a better quality of service than a regular bus*. This definition could help in distinguishing BRT and regular (conventional) bus service, because in some extent, regular bus service could have a similar appearance, however, with the definition above, specific characteristics of the BRT (runs in segregated lanes, for instance) will distinguish it from a regular one.

Table 4. Definitions of customer satisfaction

Source	Definition of customer (user/ passenger) satisfaction
(Kotler and Keller, 2008)	a person's feelings of pleasure or disappointment that results from comparing a product's perceived performance or outcome with his/ her expectations
(Mittal and Kamakura, 2001)	Customer satisfaction is a key factor in formation of customer's desires for future purchase

Justifying from several definitions of user satisfaction above, it can be concluded that *user satisfaction is a feeling of a person whether he/ she is pleased or disappointed resulted from comparing the service/ product with his/ her expectation, the more the customer satisfied, the more he/ she will repeat the purchase of the service/ product*.

Table 5. Definitions of performance

Source	Definition of performance (specifically related to BRT system service)
(Kulyk and Hardy, 2003)	… BRT system performance will be defined more by the **infrastructure** on which it operates than by any other factor
(Mihaiu, Opreana, et al., 2010, p. 138)	… taking into consideration the distinction between: the means used (**inputs**), the **process** (throughput), the **product** (output) and the effect achieved (**outcome**)

Based on those two definitions about performance, it can be concluded that performance of BRT system is strongly influenced by infrastructure in which it is used to produce service/ product which achieves the outcome (goal) of the service provider. In this case, the performance of BRT Trans Mamminasata will affect the service quality in order to satisfy its passengers.

From definitions above, complemented with literature review (see chapter 2), it can be formulated the operationalization as the following table:

Table 6. Operationalization

Concept/ theory	Variable	Indicator	Measurement level
Performance	Service (X1) (Independent variable)	• Behavior of bus driver, staff (X1.1)	• Ordinal
		• Service of supervisor	• Ordinal
		• Price of bus ticket (X1.2)	• Ordinal
		• Comfort (X1.3)	• Ordinal
		• Safety (X1.4)	• Ordinal
	Accessibility (X2) (Independent variable)	• Accessibility of the bus stop (X2.1)	• Ordinal
		• Distance from origin (X2.2)	• Ordinal
		• Distance to destination (X2.3)	• Ordinal
	Availability (X3) (Independent variable)	• Frequency of the bus operation	• Ordinal
	Time (X4) (Independent variable)	• Bus waiting time (X4.1)	• Ratio
		• Travel time (X4.2)	• Ratio
User's satisfaction	Expectation (Y1) (Dependent variable)	• Perception of the users according to their preference (does not meet/ meet/ exceed their expectation)	• Ratio
	Recommendation (Y2) (Dependent variable)	• Willingness to recommend other people to use the BRT	• Ratio
Socio-economic status	Income (moderator)	• Monthly net income (classified into: low, middle, and high)	• Ordinal

Source: Own elaboration

The operationalization table above is used to define variables into measurable items in order to support a robustness of the research as well as to determine how this research conducted, and what kind of data should be collected. The table reveals that basically the operationalization consists of three main concept/ theories, in which "performance" is represented by independent variables, while user's satisfaction is represented by dependent variables.

Socio economic status (SES) is used as the moderator of this research, regarding to one of the sub research questions is aiming to figure out how a different SES perceive the current performance of BRT Trans Mamminasata. Moderator in research itself is a variable which affects the direction and or strength of the relation between dependent variable and the independent variable (Baron and Kenny, 1986, p. 1174).

3.3 Research strategy

This research use case study as the strategy, more precisely a single case study. The unique characteristic of the research object (BRT Trans Mamminasata as the unit of analysis) which in particular is still relatively newly implemented (less than 5 years), thus it is difficult to find similar case in other BRT systems in the world. That is why this strategy (single case study) is chosen as the research strategy. Although there are a lot of BRT systems running in the world,

the other factor, such as different characteristics of the passengers, and cultural differences can affect the reliability of the research, if it is considered to use another research strategy, for instance comparison - case study between two different cases. Moreover, as it is still relatively new system implemented in the city, an initiative to gain in-depth understanding from a single number of case in a real-world context (Bromley, 1986, p. 1, in Yin, 2012) can be a supporting reason as well as taking it into account as a preliminary/ pilot research which can be used as a study comparison for the same case in the future.

Since it is a study about user's satisfaction towards the current BRT Trans Mamminasata system performance, qualitative data will be required to be analysed during the research period. Qualitative data will be gathered from interview with people who have used the BRT. Qualitative data such as user's perception about the quality of service, the affordability of the ticket price, access of the current bus routes through the city, operation time, etc. will be formulated through questionnaire that both will be asked on location and via online. Information from interviews and combination with documents, and previous studies related to the similar cases with BRT Trans Mamminasata system will help to give "profound insight into the way various processes take place, and the reason why they develop in one way instead of another" (Verschuren and Doorewaard, 2010, p. 159). For sure, some other people who have heard about the BRT in Makassar will have their own opinion, or any argument about the service, however, any of them will not be considered as respondents of this research. Despite the information could possibly useful for researchers' own insight.

3.4 Methodology

This section describes the application of specific procedures or techniques used to identify, select, and analyse information to understand the research problem in order to allow the reader to critically assess this research's overall validity and reliability (Kallet, 2004).

In order to reach the research objective which is aiming to explain the effect the current service of BRT Trans Mamminasata to its user's satisfaction, and considering that the sample number of this research is small, this research is relying its method to a **qualitative approach**, where the outcomes are not obviously measurable and quantifiable (Miles and Huberman, 1994, p. 40). Furthermore, the qualitative method used in this research regarding to data collection instruments using direct **interview and online questionnaire** where mostly no significant numerical information collected beside income which is used to determine respondent's SES.

3.5 Sample size and selection

As one of the questions which will be addressed during this research, which asking about the difference between socio-economic status in term of their satisfaction. This research use random sampling, which the sample of this research will be divided into three groups of income level, low, middle, and high (Neuman, 2006a).

By far, there is still no official statement/ data regarding to number or any other passenger data of BRT Trans Mamminasata system, but if we see the revenue estimation by local newspaper, Ujung Pandang Express[17], which said that the revenue was 500,000 rupiahs, while the ticket price was 5,000 rupiahs, it means that the passenger numbers were only 100. However, this number is still debatable, while it is possible that the number would increase.

Data about the exact number of passengers will be collected during the fieldwork, however, before doing so, preparation regarding to the sample size and selection have to be done.

[17] Ujung Pandang Express, 2015. *Halte BRT Ditambah* (BRT bus stops has been added). Available at: http://upeks.co.id/utama/halte-brt-ditambah.html [Accessed 2016]

Preliminarily, I assume that there are 500-1000 daily passengers (N) of BRT Trans Mamminasata, and the sample size is 150 passengers (n) (>10% of total assumed population).

Here is the **procedure** of how the respondents (samples) were taken[18]:

1. Define population: estimated total daily passengers of BRT Trans Mamminasata = 500-1000 passengers (N).
2. Choosing sample size: 150 (15% of total daily passengers). This number can distribute three different es evenly (each of class = 50 passengers)
3. List the population: identify the sample based on their income (one question of the questionnaire asks about the income of the respondents).
4. Assign numbers to the units: the total number of respondents who fill the online questionnaire will be assigned consecutively from 1-n number of respondents.
5. Find numbers: the numbers are generated based on the input time of the online questionnaire.
6. Select the sample: the respondents which are selected only the respondents who filled the online questionnaire once. This is due to, in some cases it is possible that the respondents fill the questionnaire twice or more.

3.6 Data collection methods

In order to gather necessary data for this research, it will use two kinds of data, which are primary and secondary data.

- **Primary data**
  This kind of data including: user satisfaction according to passengers' perception is collected during the fieldwork by survey using **online questionnaire (closed type) as tool/ instrument**. Beside to make it easier to analyse the data, this type of questionnaire will also save time during data collection, as passenger tends to be in hurry when they travel. Another primary data is collected using **interviews** (semi closed), in which the interviews are conducted with key informants.
- **Secondary data**
  This data is including: articles from the internet related to BRT Trans Mamminasata service, BRT financial data from the operator (used to give information about the growth of the revenue/ income of BRT Trans Mamminasata) which shows the growth of demand as well. Other secondary data to be considered is also about the number of current bus stops, and map of the BRT Trans Mamminasata service.

To give more holistic picture and overall view about the subjects (triangulation) (Verschuren and Doorewaard, 2010) requires more efforts. To achieve the triangulation, individual interviews with the operator staffs who are capable of giving a relevant and true information will be conducted, objective observation will also be conducted to get more insight about the BRT system in Makassar, specifically related to service provision by the operator.

3.7 Validity and reliability

Validity means "how well the idea fit the actual reality, it suggests truthfulness", and reliability means "dependability or consistency" (Neuman, 2006b, p. 188). Those criteria are important

[18] Laerd Dissertation, simple random sampling, 2016. Available at: http://dissertation.laerd.com/simple-random-sampling.php [accessed 2016]

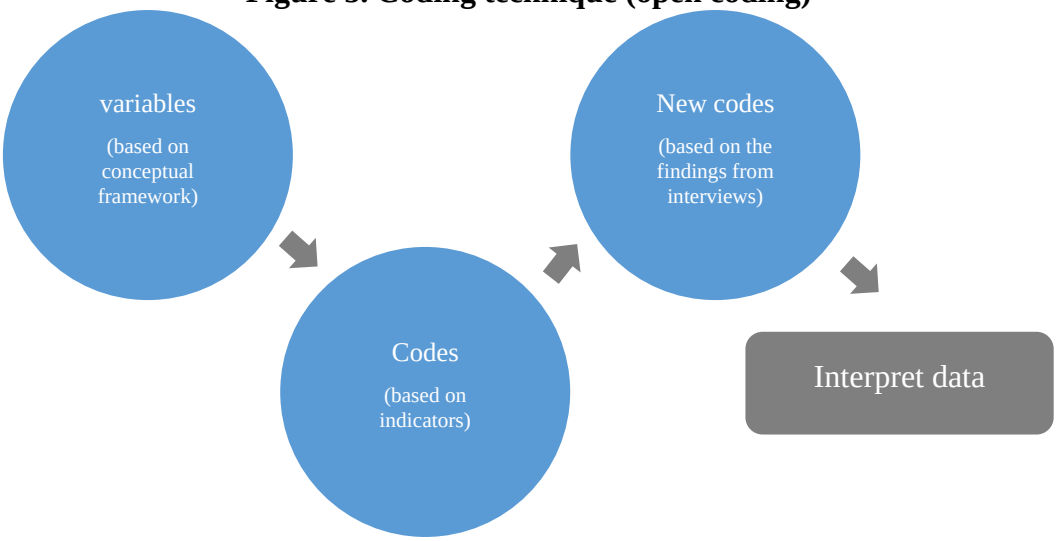
to prove that the research is acceptable, despite perfect validity and reliability are obviously impossible to achieve (Neuman, 2006b) .

- To improve validity of this research, one of the techniques is by triangulation, which is conducted by combining two or more methods used in the study (Rothbauer, 2008). As it was already mentioned before, that this will use survey to provide a more reliable information for this research.
  Triangulation can improve the validity of the research by cross verifying the same information. This research will cross verify the information gained from the respondents (from online questionnaire) with the information from key informants (from direct interviews). This kind of triangulation named data source triangulation, and this triangulation of data can strengthen this research because the data has increased credibility and validity.
- Reliability of this research will be improved (1) by using clear conceptual, by developing unambiguous, clear theoretical definition, and (2) by use multiple indicators of a variable. The conceptual framework and operationalisation table are quite enough to address it.

3.8 Data analysis technique

- Primary data: primary data of this research will be collected using two different techniques.
  The first technique is by using semi closed interview. The result will be analysed by using an **open coding** technique, where the contents of the interview first noted written in Ms Word documents, and then the content will be interpreted according to the coding will be carried out both manually by extracting interview content according to the topic of the questions. Interview using this technique will include interview with: (1) representative of the operator, (2) representative of BRT Trans Mamminasata project planner, and (3) local transportation expert, and other stakeholders. The number of key informants will be at least 10 people, in which it allows the analysis by using Atlas.ti.

Figure 5. Coding technique (open coding)

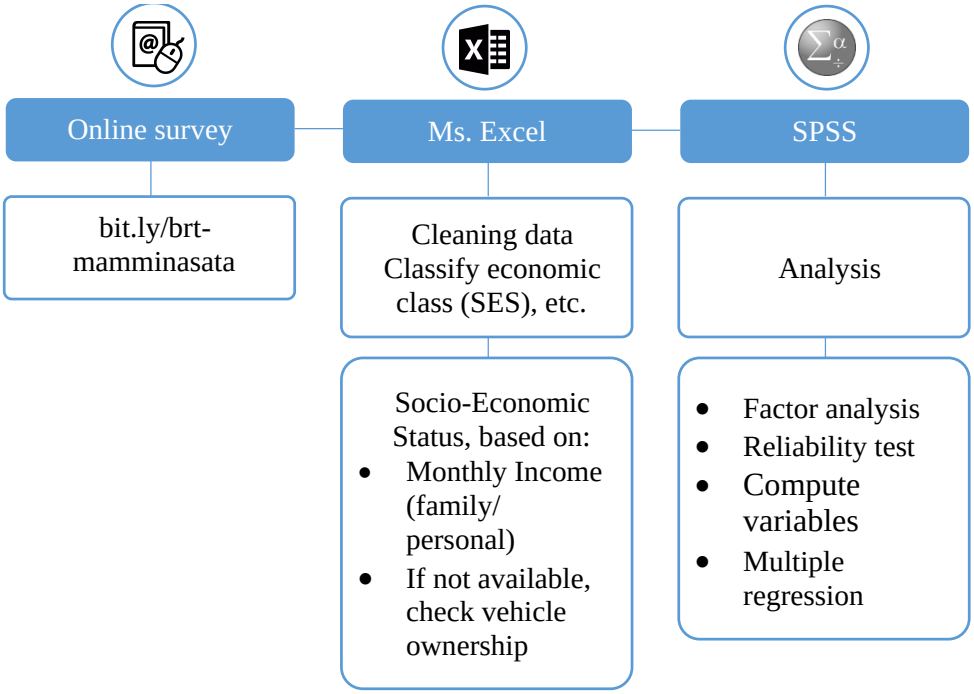


Source: Own elaboration

More about the coding technique, the variables which were defined in the conceptual framework will create codes (based on the indicators), and those codes will be used to mark the quotations from the interview transcripts. During the qualitative analysis, it is more likely to get new codes as the new information emerges from the interviews.

The second technique is by using closed interview, which is using structured questions to gain information about passenger's view of BRT Trans Mamminasata performance. The result of this data collection will be analysed using SPSS, in which analysis of multiple regression will be used.

Figure 6. SPSS analysis flowchart



Source: Own elaboration

The process of this analysis began from collected data from online survey (using google form), after the online survey finished, the raw data imported to Ms. Excel, in which the data cleaned (several respondents removed, due to double-filling), and most importantly the classification of SES has already been determined. The SES classification is based on family monthly income. This is due to some respondents are possibly still do not have personal income. Vehicle ownership is also become a consideration in determining respondents' SES.

The next step is inputting data from Ms. Excel to SPSS, where the further steps to be taken are going to be reliability test in order to find the Cronbach's alpha. This should be done if several variables would like to be combined into a single variables in factor analysis which represents those previous variables. Eventually, multiple regression will

be conducted to predict the value of a variable based on the value of two or more other variables[19].

3.9 SPSS analysis procedure

Before the multiple regression conducted, there are some procedures to conduct in the first place:

1. **Factor analysis and reliability test for each latent variable**
   This procedure is conducted in this research in order to understand the structure of variables and to reduce a data set to a more manageable size without losing the original information (Field, 2009).
   However, before the factor analysis conducted, all variables have to be rescaled into a similar set values (1-10 scale). This step should be conducted in order to avoid miscalculation of the Likert scale used in the coding process of the online questionnaire output in the statistical analysis. There were several Likert scales used, for instance in questions which addressing performance indicators (related to Service, Availability, Accessibility, and Time) from 1-3 scale, 1-5, and 1-10 scale. All of them should be rescaled to 1-10 scale before any analysis conducted. The following is the rescaling adaptation used:

Table 7. Rescaling of Likert scale

Before	After
1; 2; 3	1→ 3; 2→ 5.5; 3→ 10
1; 2; 3; 4; 5;	1→ 1; 2→ 3.25; 3→5.5; 4→ 7.75; 5→ 10

Source: Own elaboration

   As it has been indicated before, this step is important to conduct, not only to avoid the miscalculation during the statistical analysis, but also to improve the reliability of the data. Factor analysis is only used if the variable consists of more than one indicator, otherwise the analysis is not possible to conduct. A variable which consists of only one indicator means that it does not need to be factor analysed.

   After factor analysis conducted, reliability test should also be conducted on each latent variable in order to find out the consistency of internal reliability of the data gathered from fieldwork. Cronbach's alpha (α) is used as the standard of proofing the realiability of the data, and it should incorporate more than one variable in the process. A value of 0.6 or more is considered as good to proof the reliability of the data. All in all, the associations between items are likely to be pretty high due to the fact that the dependent variable has been rescaled from 1-10.
2. **Compute variables**
   After factor analysis and reliability test, the next procedure is to compute variables.
   Computing variable results latent variables based on mean value according to several representative indicators. For instance, "Service" consists of "behaviour of the bus driver", "service of supervisor", "price of bus ticket", "comfort", and "safety" indicators. Those indicators values are then divided according to the N number of the

[19] Laerd Statistics, Multiple regression analysis using SPSS statistics, 2016. Available at: http://statistics.laerd.com/spss-tutorials/multiple -regression-using-spss-statistics.php [Accessed: 2016]

variable. Compute variable of those indicators resulting one latent variable. This step is iterated to the other variables which consists of more than one indicator.

3. **Multiple regression**

   This procedure is conducted to learn more about relationship between one dependent variable and numbers of independent (predictor) variables. This is strongly related to research objective of this thesis, which is aiming to learn the effect of current performance of BRT Trans Mamminasata to its user's satisfaction. However, it should be noted that before conducting multiple regression, VIF values should be checked, to keep it low (below 8). If the VIF values are >8, then the variables should be rescaled. Multicollinearity issue should also be taken care, in which it indicates a strong correlation between two or more variables (predictors) in a regression model (Field, 2009, p. 223).

Chapter 4. Presentation of data and analysis

4.1 Introduction

This chapter provides the findings from data which was collected during fieldwork. Data collected is related to the service given by the service provider, in this case Perum Damri, and to what extent the users feel satisfied with the current service.

Instruments which were used in the data collection period were online questionnaire and direct interview with several stakeholders who were involved in service provision and service delivery. Data collected was mainly primary data from both data collection instruments above, used to answer research questions.

Before the findings from the fieldwork presented on this part, some findings regarding to general information of BRT Trans Mamminasata should be presented, in order to give more knowledge about this BRT.

Figure 7. BRT Trans Mamminasata bus

Source: Documentation during fieldwork

4.2 BRT Trans Mamminasata

With regards to BRT definition, based on findings during fieldwork, it can be implied that BRT Trans Mamminasata is still not considered as a full BRT system, due to its condition which has not being integrated with ITS elements, which is theoretically is one of the qualities of BRT system (Levinson, Zimmerman, et al., 2002, p. 2), whereas from Quality spectrum of tyre-based public transport (see figure 3), BRT Trans Mamminasata is still somewhere between "basic busway" and "BRT-lite" categories (Wright and Hook, 2007). The current characteristics of BRT Trans Mamminasata are: flexible, rubber-tired buses, which has basic bus shelters (bus stops), and has a strong identity which distinguishes it from the regular bus service. However, at the moment, BRT Trans Mamminasata still not running on dedicated lanes.

According to several interviews during fieldwork, there was more information gathered, some of them are particularly about the initiation of BRT system in Makassar, which actually has been started in year 2007 according to a key informant, Jasman[20](more details about key informants, please see **Table 8**, namely Key informants) In that year, Makassar municipality

[20] Based on interview with Mr. Jasman, a Staff of Makassar city's Transportation Department.

has an idea to implement a mass public transportation, which was named Trans Makassar[21], years before BRT Trans Mamminasata, which was initiated as a program of central government (Indonesian Ministry of Transportation). Makassar municipality, in this case, the Makassar Transportation Department conducted studies during 2007-2010, and as the result, it was agreed that Makassar would build 6 corridors which would only built in Makassar. The first corridor was corridor Terminal Daya – A.P. Pettarani street. However, there was problem faced by Makassart Transportation Department, which was related to land acquisition, which hindered the municipality to build bus stops and widen the road section. At that period of time, the number of street lanes in that corridor (corridor Terminal Daya – A.P. Pettarani street) had only 2 lanes. This limitation on street lanes, lack of number of the bus run by the Trans Makassar, as well as inconsistency of the operation by the operator caused the discontinuation of the program a few years after its implementation.

Moreover, another key informant, Lambang Basri[22] stated that Makassar Transportation Society (a Transportation-based NGO in Makassar) BRT should have been implemented in Makassar since 2002, due to its traffic condition which was getting worse over the years. In 2004, the bureaucracy in Makassar municipality held discussions to plan BRT in Makassar. Two years later, in 2006 it was formulated that Makassar would have a BRT running (Trans Makassar). In 2007 as Trans Makassar has started to run in the city, Indonesian central government promised to give 20 buses to Trans Makassar operator, however it was not realized due to political instability, social issues, and unpreparedness of the road infrastructure at that time. Despite those issues, according to Lambang Basri, BRT in Makassar (Trans Makassar) continued to run in 2010, however it was not fully utilized, although the speed has been increased gradually.

Eventually, according to another key informant, Aksan[23], Indonesian central government, in Precidential Decree no. 55, 2011 about Mamminasata[24], mandated that every province in Indonesia should implement BRT system in their capital city. In this case, South Sulawesi Province, should implement the BRT system in Makassar, however it was also including the other adjacent cities with Makassar (Maros, Sungguminasa, and Takalar) in order to encourage regional growth in those areas. The newly BRT system was named BRT Trans Mamminasata, which was named with a spirit to connect 4 different cities in South Sulawesi province.

[21] Trans Makassar is different from BRT Trans Mamminasata, in which Trans Makassar was initiated by Makassar Municipality, while BRT Trans Mamminasata is an Indonesian central government's program, in this case is Indonesian Transportation Ministry.

[22] Representative of Makassar Transportation Society

[23] Staff of Transportation Department of South Sulawesi Province

[24] Mamminasata stands for (Makassar, Maros, Sungguminasa, Takalar), which are consisted of those four different cities

Figure 8. BRT Trans Mamminasata bus stop

Source: Documentation during fieldwork

The realization of BRT Trans Mamminasata has finally started in 2013, with the first official bus stop built in Penghibur street. However, the first real operationalization of BRT Trans Mamminasata was begun in 2014. Numbers of bus stops of BRT Trans Mamminasata increased over years.

Table 8. Number of bus stops

Year	Number of Bus Stops
2013	1
2014	8
2015	36 (33 small bus stops, 3 big bus stops), totally = 44 bus stops
2016	44 + 60 planned bus stops to be built in 2016

Source: Based on interview with Aksan (Staff of Transportation Department of South Sulawesi Province)

According to the interview with key informant, the number of bus stops of BRT Trans Mamminasata are increasing over the years, it indicates that the demand of people to use BRT Trans Mamminasata is likely to increase as well. By far (until fieldwork) BRT Trans Mamminasata has 30 buses, which according to several key informants that number of buses deployed by Perum Damri (BRT Trans Mamminasata operator) depends on market condition. Sometimes only 20s buses deployed, while during peak season, all 30 buses are deployed.

4.3 Research findings from interviews with key informants

In order to gain more information from the respondents (informants) it is necessary to build concepts in the first place. They can be built based on textual data source, which in this case are based on the interviews.

In this part, the qualitative data are from the interviews with 10 key informants from representative stakeholders of BRT Trans Mamminasata. The codes are based on the variables which have been determined on the previous chapter, and the initial codes are based on the indicators of this research. This is conducted to keep codes relevant with this research, although in the process there are more codes that emerge from the interviews.

The qualitative data analysis is using open coding technique in Atlas.ti. The quotations are selected on the interview transcripts based on the variables and indicators of this research. The process of coding using a line-by-line coding which is important to develop concepts and categories.

The interviews were conducted with the following 10 key informants:

Table 9. Key informants

No.	Name	Occupation
1	Misran	Staff of Perum Damri (BRT operator)
2	HM Ilyas	Head of Perum Damri (BRT operator) of South Sulawesi Province
3	Niko	Driver of BRT Trans Mamminasata
4	Aksan	Staff of Transportation Department of South Sulawesi Province
5	Ilyas Iskandar	Head of Transportation Department of South Sulawesi Province
6	Isran Ramli	Transportation expert/ academics in Makassar
7	Jasman	Staff of Makassar city's Transportation Department
8	Lambang Basri	Representative of Makassar Transportation Society
9	Nicolaus	BRT Trans Mamminasata supervisor
10	An Nisa	BRT Trans Mamminasata supervisor

Source: researcher's fieldwork

From the table above, it can be seen that the informants are from numbers of stakeholders, which are including from the operator, bus driver, and supervisors (Perum Damri staffs), provincial transportation department (Transportation Department of South Sulawesi Province staffs), transportation expert (transportation lecturer at a university), Makassar transportation department staff, and another informant is representing a Transportation-based NGO in Makassar (Makassar Transportation Society). Some key informants have a same role, for instance Nicolaus and An Nisa. Both of them are supervisors of the BRT. It was expected that from both of them there would be more information could be collected

The following is the code list which was gathered from interviews, and analysed by using Atlas ti, using open coding technique.

Table 10. Atlas ti Coding Analysis

Variable	Codes	New codes (57)		
Service	• Behavior of bus driver, staff • Price of bus ticket • Comfort • Safety	Accessibility of the bus stop Accessibility to destination Availability of bus Behavior of bus driver BRT as a government program BRT operator BRT Service quality BRT Start operating BRT supervisor Bus capacity Bus delivery cost Bus ownership Bus provider Bus service improvement Bus stops investment Bus waiting time Challenges Comfort Complaints	Different point of view (operator and Transportation Department) Disability issues Distance from origin Distance to destination Driver recruitment Driver sanction Frequency of the bus service Impact on traffic jam reduction Investment Load factor Location of bus stops Loss Maintenance Market condition Mindset of the people Number of bus stops Number of buses	Obstacles Operational cost Passenger number Plan for dedicated lanes Plan to add more bus Plan to add more bus stops/ routes Policy Preferences Profit Provincial Transportation Department Regulation about angkot Revenue Safety Socialization Subsidy Ticket price Travel time User's expectation User's satisfaction Willingness to recommend
Accessibility	• Accessibility of the bus stop • Distance from origin • Distance to destination			
Availability	Frequency of the bus operation			
Time	• Bus waiting time • Travel time			
Expectation	Perception of the users			
Recommendation	Willingness to recommend			
Income	income			

Source: Atlas.ti analysis, conducted by researcher

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Table 11. Interviews Summary

No.	Name	Codes	Quotation
1	Misran	Number of buses	"Totally there are 30 units of bus"
		Market condition	1. "The operating buses are depend on the market condition, if there are more passengers, we operate all of them. If it seems that there are less passengers, then we only deploy 20s buses" 2. "We do it manually, for instance, from Monday to Friday, there are less passengers than Saturday and Sunday or on holidays"
		Passenger number	"Since the BRT is still new in Makassar, so the current passengers are just still trying to ride the bus, otherwise there would be no passengers"
		Number of bus stops	"Totally, there are 37 bus stops, 14 of them are big bus stops, and the rest of them are the smaller ones (23)"
		Bus service improvement	"Currently there are new bus stops being built for the next corridors"
		Operational cost	1. "It comes from Damri itself. We have some business units, we got the operational fees from those units. Fortunately it is sufficient to cover the operational costs" 2. "The daily operational fee is Rp 500,000 (€33) it is including fuel, food cost for the drivers, and small maintenances like air pumping)"
		Revenue	"It is still not much. Fortunately the revenue is getting better over time"
		Safety	"Speaking about crimes, until now there is still no crimes towards the BRT"
		Comfort	"Based on our observation, it is already meeting the requirements"
		BRT supervisor	"There is no conductor actually, only supervisor, whose job is including for ticket sales"
		Bus capacity	"There are 30 seats, and 54 for standing passengers, so totally the capacity is 84 passengers"
		Safety	"There is still no map available on each bus stop, due to safety concern. We still cannot make sure about the map if we put it on the bus stop"
		Socialization	"We promote the BRT through newspapers, social media, even to the local tv station"
		Bus service improvement	"Yes, there is a website. But there is no mobile app, yet. There was a company (Fujitsu) which offered a service to create an app, it was tested for a month, but there is still no new news from them"
2	HM Ilyas	BRT as a government program	"Regarding to the BRT, it was actually for regency level, it should be subsidized in order to be used by societies"
		Subsidy	1. "However, the reality was, there was no subsidy we received" 2. "It should be the Provincial government"

Driver recruitment	1. "before the drivers are starting to work, they have to join a training, which is located in Bali, Tegal, Serpong, and Tambun. They were trained to serve passengers well, give a friendly service, polite, and obey the traffic rules. It is a 6-weeks training, some are 4 weeks, depends on the program" 2. "So, they have to be selected, and then trained. They should be senior high school alumni at least. Some of them have bachelor degree"
Behavior of bus driver	"before the drivers are starting to work, they have to join a training"
BRT supervisor	1. "We also have some conductor (supervisor) staffs. They are deployed to lockets in the bus stops" 2. "But, for us, surely it is satisfying already"
User's satisfaction	"Regarding to the satisfaction level, we cannot give an answer for that, because we are only providing the service. It should be the users who can answer that whether they are satisfied or not"
Ticket price	1. "We agreed to reduce the price of the ticket to Rp. 4500 (€ 0.30), it was Rp. 5000 before. Obviously, the price is quite affordable" 2. "Yes, it is enough to cover the operational cost"
Operational cost	"it is enough to cover the operational cost"
Profit	1. "Now, with the growth of passenger numbers, we can earn some profit" 2. "and then we can earn some profit for about Rp. 10 million (€675) per month. Now we earn about Rp. 38 million (€2,567) per month. It depends on the holiday season, actually"
Comfort	"In terms of comfort, the facilities that we provide, we have big buses equipped with AC, and they are protected from the dust. So, we can say that it is already comfort for the passengers. The bus is spacious, and they have many seat choices" "many benefit that we can get from using the BRT, such as the spacious bus, the buses are equipped with AC, and it is safe"
Bus service improvement	1. "We had a cooperation with Fujitsu, to develop an app to monitor the buses' location. People can access the app, however it is not available yet" 2. "We also have a plan to equip the buses with free wifi so the passengers could feel more comfort" 3. "We have a plan to put a security officer on the bus stops, and also on board, it depends on the necessity" 4. "We expect that there will be an app in 2017, because we have tested it for 3 months, and the result was positive. It was a cooperation with Japanese government (via Fujitsu)"
Safety	"So far, I haven't heard any issue about that"
1. Accessibility of the bus stop	"For this time around, the number of the bus stops are still very limited. So, it is still difficult for people who want to go to their destined bus stops"
2. Accessibility to destination	"The distance between a bus stop to another is still long"

		Location of bus stops	"About the placement of the bus stops, they are determined by the provincial transportation department. From our point of view, the current location of the bus stops are not relevant, not effective, and not profitable. There is only a few passengers and no feeder"
		Plan to add more bus stops/ routes	"We have a plan to build more bus shelter, where passengers can use it to transit, so they will not need to use other public transportation modes, and no need to pay additional fee. It should be realized by next year"
		Travel time	1. "It is still quite long. It would be different if the location of the bus stops are determined by us, because we aimed them adjacent to schools, campuses, settlement areas, so people can benefit from that" 2. "It is not easy to measure, actually. Because there are not many bus stops. So, we cannot predict the exact travel time"
		Frequency of the bus service	"For now, we have to see the market, it depends on the demand. During peak hours, we deploy more buses, while on regular hours, we deploy less buses"
		Loss	"Actually there is a growth in the number of passengers. In the first 3 months of the BRT Trans Mamminasata operation, we lost Rp. 685 million (€46,283)"
		Bus waiting time	"5 minutes top, which is still quite short, actually. The only probl;em is, the bus stops are still not effective, and there are still a few bus stops" "Sometimes people are waiting too long for the bus"
		User's expectation	"User's expectation is actually same with us (Perum Damri), we want the same thing they need. The conclusion is: user's satisfaction is their expectation meeting the service that we provide"
		User's satisfaction	"For now I think that people are still not satisfied with the current BRT Trans Mamminasata service"
		Socialization	"We have a time table, but still not going as we expected, maybe it is due to the poor socialization"
		Willingness to recommend	"Yes, I think they are willing to recommend it. Many people have been recommending the BRT to the others. People who have used the BRT recommend, promote it via social media (twitter, facebook, and Blackberry Messenger)"
			1. "Most of the passengers are from middle-low es. The middle-upper people averagely have their own cars, their own vehicles. The BRT is quite helping the middle-low es" 2. "I rarely saw high people, maybe they have used the BRT, it is only just for trying it, not to use it regularly"
		Preferences	"There are some differences, for sure. If people have a better economic status, then they will have a different needs, they tend to demand a higher standard"
		Investment	"We don't really know about the procurement, actually. Because that it the government's business, we are just the operator. However, I estimate that a bus costs 1.5 billion rupiahs (€101,351) off the road, but it can be approximately up to 1.7 billion rupiahs (€114,864) per bus, on the road price (including the licenses)"
		Plan to add more bus	"It was suggested by the governor of South Sulawesi province to add 50 more units, so there will be 80 units totally"
3	Niko	BRT Service quality	"For me, the current service is still not maximum"
		Behavior of bus driver	"Regarding to the onboard service, I think the service that I give is already good. Because I still haven't got any negative comments from the passengers"

BRT supervisor	1. "There is no conductor in BRT Trans Mamminasata, there is only supervisor, whose job is as the ticket sales and count the number of passengers. Sometimes the driver also can act as the ticket sales staff, depends on the situation" 2. "For me, the supervisor should be polite and wise to the passengers, so that the passengers can feel more comfortable. Generally, there is no problem. It is already satisfying"
User's satisfaction	"Generally, there is no problem. It is already satisfying"
Ticket price	"Sometimes the passengers asked me to lower the price, they said that the bus belongs to the government, so it should be cheaper"
Comfort	1. "In terms of comfort, yes it is satisfying already" 2. "Moreover, the ticket price is affordable, and there is an AC, and the bus is spacious"
Safety	"So far, there is no crime. It was only some angkot (smaller public transportation cars) drivers who shouted to us. Basically, it is safe enough"
Accessibility of the bus stop	"For some passengers, it is still difficult to reach the bus stops from their homes. Sometimes they had to ride other types of public transportation to reach the bus stop"
Bus waiting time	1. "Obviously it is still difficult for them. Regarding to the departure schedule, actually it is available for the passengers, but we cannot realize the schedule, since it depends on the traffic condition. It is really difficult for us to predict the departure/ arrival time" 2. "It is approximately every 5 minutes, and yes it is already satisfying for the passengers"
Plan for dedicated lanes	"For us, of course we want it, people want it too. It would be good, because it can make the travel time to be shorter, and convenient the passengers as well" "However, I personally still don't know whether there is an actual plan for the dedicated lane"
Distance from origin	"In terms of distance, it is still long. Sometimes people needed to ride another transportation mode before arriving to the bus stops"
Frequency of the bus service	"It is good enough. However I think, the number of drivers should be added, so we can work until 11 pm, so there should be 2 shifts"
Travel time	1. "From one bus stop to another, it takes approximately 10 minutes" 2. "The corridor 3 is longer, it is from Sudiang to Sungguminasa, which may take 1.5-2 hours trip"
User's expectation	"From the user's expectation, the service is good, they are also hoping that the number of bus and bus stops to be added in the future. Generally the BRT Trans Mamminasata has been meeting the user's expectation"
Willingness to recommend	"Yes, they are telling their neighbors and other colleagues to use the BRT"
	1. "They are form all es, we can see it from their appearance" 2. "People from high tend to demand more facilities, while the lower people don't demand too much. They assume that the bus is comfortable enough for them (middle-low es)"

		Bus service improvement	"There was a GPS installation, so the company could monitor the buses' location"
		Plan to add more bus	"I have heard about that, but I don't know when it will be realized. We will be happy if there is additional buses, so we can have more options (to drive)"
		Plan to add more bus stops/ routes	"Surely it will be added in the future, because there is a big demand from the passengers to build more bus stops in several locations"
4	Aksan	Bus provider	"Those buses are from the central government."
		Behavior of bus driver	"Well, I don't really know about that (the behavior of the bus drivers) since I haven't used the BRT. But generally, the service is good."
		BRT as a government program	1. "BRT is a central government's program, through the President's Decree number 55, 2011 about Mamminasata areas (Makassar, Maros, Sungguminasa, Takalar). Based on that decree, all provinces have to have BRT, at least in the capital cities. However, the central government has only given buses, whereas the bus stops are built by the provincial Transportation Department" 2. "Obviously, all provinces should have BRT eventually. Makassar is the 19th city which use BRT" 3. "Last year during the bus procurement, central government provided 1000 buses, and BRT Trans Mamminasata got 30 units. The buses were manufactured in Java, and sent here." 4. However, since it is a government program, it should be all es use the BRT, because it is planned to be able to serve anyone"
		Bus ownership	"Here we got 30 buses with a large scale. They are belong to the Ministry of Transportation"
		BRT operator	"Perum Damri as the operator, which has to give a reasonable tariff to the passengers"
		Maintenance	"Until now, since the buses are still new, there still no maintenance cost needed, if it required, Damri will be helped by the central government."
		Subsidy	"Until now, the central government only gives bus, no subsidies given yet. BRT Trans Mamminasata is still unsubsidized to date."
		Different point of view (operator and Transportation Department)	"Provincial Transportation Department have different vision with Damri, in which Damri wants to earn profit from the service, while the current bus stops which we (Provincial Transportation Department) planned are for the sake of the people, to reduce traffic jams, safety, and affordability for the people. So, Damri think that the bus stops locations are not profitable for them."
		Impact on traffic jam reduction	1. "We realize that the traffic jam is still not significantly reduced, because the BRT lanes are still not separated from the other vehicles' lanes" 2. "Obviously it has to reduce traffic jams"
		Plan for dedicated lanes	"So far, it's hardly, because it is still relatively new"

Challenges	"The challenge is, it is hard to replace angkot (smaller public transportation cars) which are already there in the first place"
Plan to add more bus	1. "There is a plan to add 50 more units" 2. "So in the future we hope to add more buses. This year (2016) it is planned to add 50 more buses"
Bus waiting time	1. "because we thought that we needed more buses to reduce the waiting time. We hope that the waiting time is 10-15 minutes top." 2. "It should be one minute, but now it is still take longer" 3. "We hope that we can give a certain time of departure and arrival time for the passengers, because there is still no such thing to date"
Plan to add more bus stops/ routes	1. "Now we are planning to create a new route from Hasanuddin University's old campus to the newer one in Sungguminasa, but we are still waiting for the official license. However, there is still no intermediate bus stops in the route, so it will be a direct trip" 2. "This year (2016), it is planned to add 50 more bus stops"
Bus stops investment]	"the cost is believed tobe 10 billion rupiahs, from regional government budget"
BRT supervisor	"The role of the supervisor is to record the number of passengers, and to supervise the BRT. Actually, their service is good already"
Complaints	" However, the complaint from people is the lack of bus stops. Sometimes, there is an origin bus stop, but there is no bus stops on their destination"
Comfort	1. "The bus itself is convenient already, it has AC. Actually, there seems to be more people who are interested to use the BRT" 2. "It can be said that it is comfort. The bus stops are accommodating people with disabilities, although sometimes there are some disturbance by the street musicians in some bus stops" 3. "It is actually convenient as well, because the buses are equipped with AC"
Ticket price	1. "The ticket price has been reduced to Rp. 4500 (€ 0.30) from Rp. 5000. The most important thing is it is enough to cover the operational cost of the BRT, not necessarily to earn profit. So, it should be kept affordable" 2. "Generally, the ticket price is affordable"
Safety	"So far there has been no crime committed. The bus itself is equipped with glass breaker tool to help evacuation if the bus is having an accident"
Accessibility of the bus stop	1. "For now the most important thing is the bus stops are easy to access, then the next stops will be built close to origin and destination of the passengers. I think the accessibility for the pedestrians is quite easier." 2. "Surely we aimed the bus stops locations to be easy to access"
Obstacles	"Actually, the origin locations for the bus stops are well located already, only there were some obstacles, for example some shop owners did not want us to build the bus stops in front of their property. Sometimes there were some people said that the location of the bus stops were not good for their Feng-Shui. So, there were always other considerations in building the bus stops"
Number of bus stops	Number of bus stops:

			2013= 1 unit, 2014= 8 2015= 36 (33 bus small stops, 3 big bus stops), total 45 bus stops. 2016= 60 additional bus stops planned to be added
		Frequency of the bus service	"Averagely, there are 25 buses operated daily, sometimes all of them were operated (30 buses)" "Generally, the frequency of the bus service is still not enough. We aimed to set 10 minutes per bus in every bus stop, but still far away from that point."
		Travel time	"it depends on the distance of the bus stops. Ideally the distance is 1 km from one to another, now it is still not. But generally, the current condition is already satisfying the passengers"
		User's expectation	"Generally, BRT Trans Mamminasata has been meeting the expectation of the passengers. Although, we have to add more bus stops in the future,"
		Bus service improvement	"We also hope that we can add GPS on the bus, so it eases us to monitor the position of the bus" "I heard that there was a proposal from certain company to develop an app. We have a plan for that"
		Willingness to recommend	"Yes, surely (people are willing to recommend it")"
		Socialization	"It is also suitable with the socialization theme by the government "Let's Ride the Bus" to encourage people to use the BRT more"
			"They are form all es, but I don't really know about the details, because there is still no written report about that. But generally, the majority of the passengers are from middle "
		Investment	"The bus itself costs 1.8 billion rupiahs. The bus stops cost 20 billion rupiahs so far, for the development"
		Bus stops investment	"The bus stops cost 20 billion rupiahs so far, for the development"
5	Ilyas Iskandar	User's satisfaction	1. "Regarding to the satisfaction, it should be the users who know it better, we (Transportation Department of South Sulawesi Province) haven't actually done any survey about that. But based on my observation, so far people are satisfied" 2. "Still, it cannot be ensure yet whether they are satisfied already or not"
		Behavior of bus driver	"Yes, it is. Their (drivers) service is already satisfying the passengers"
		BRT supervisor	"Yes, they are also done a good job (satisfying the passengers)"
		Ticket price	"It is affordable"
		Operational cost	"Regarding to whether the ticket price can cover the operational cost, I don't know about that, that's Perum Damri (the BRT operator) business"

		Comfort	"It is comfort"
		Bus service improvement	"Yes, of course. By installing wifi which can be accessed free"
		Safety	"Yeah, it is safe as well"
		Accessibility of the bus stop	"The bus stops are easy to access, only needs more socialization"
		Socialization	1. "Surely by socialization, it can be via social media as well. The cost is still being formulated this year" 2. "It is only the socialization which is not optimal, yet. So there are still many people who don't know about the routes of the BRT"
		Location of bus stops	"They were built based on the survey results, DED (Detailed Engineering Design), and based on origin-destination"
		Frequency of the bus service	"It is still not good enough, because we still need more buses"
		User's expectation	"Yes, it has been meeting the expectation of the users"
		Obstacles	"Due to some constraints, and there were some demonstration against this BRT, so we have to be carefully to socialize it"
			1. "It is still cannot be ensure yet, because many people are still just trying to use the BRT in the moment" 2. "because in some corridors the BRT hasn't been utilized by every . But we hope that it can be used by all of the es gradually"
		Willingness to recommend	"Yes, they are (willing to recommend other people to use BRT Trans Mamminasata"
6	Isran Ramli	BRT Service quality	"As far as I know, it has been meeting the standards"
		Socialization	"The challenge is only how to change the mindset of the people to use BRT. We have tried to socialize it via radio, neswpapers and tv, to encourage people to use transportation wisely, and environmentally friendly"
		Mindset of the people	1. "The current major has a program, Smart Angkot, to give convenient to the passengers, I think it is not effective enough, yet, because people's mindset has not changed drastically" 2. "The mindset has to be changed in the first place, we have to support that campaign, it has to be supported with a proper policy"
		Policy	1. "it has to be supported with a proper policy, such as by giving discount to employees to use BRT" 2. "On the other hand, there is no car number restriction. Now there is no such policy." 3. "So far, there is still no policy to stimulate people to use BRT. The government should make it, at least they can encourage state owned enterprises employees to use BRT (pull)"
		Obstacles	"The other obstacle is the technical issue, for instance there is still no dedicated lane for the BRT, the size of the bus which is too big for the current traffic condition"

		BRT as a government program	"the trial was 2 years. It was like an enforced program by the central government. They did not consider the size of the city, they only drop the buses without a proper consideration of the size of the road as well"
		Load factor	"The load factor of the BRT Trans Mamminasata was only 0.2 (20%), which was still very low. It means that Damri (the operator) has failed to attract significant number of passenger. "
		Comfort	"I think it is comfort already. Because it meets the standards"
		Safety	"Yes, it is safe on board. But the safety on the bus stops is still questionable, it has something to do with the surrounding's safety, actually"
		Ticket price	"Well, I actually don't really know about that in details, because we haven't conducted any study about the ticket price. But so far, according to Damri, it is a competitive price."
		Profit	"From the business side it is not profitable yet, but at least there is a benefit for that we can get from the reduced traffic jam."
		Impact on traffic jam reduction	"but at least there is a benefit for that we can get from the reduced traffic jam"
		Subsidy	"I personally think that it is not the subsidy only to help increase the number of passengers, but there should be policy to the society, in terms of socialization. If there is a reasonable number of passengers, then the subsidy isn't necessary anymore"
		User's expectation	"Well, it is hard to measure, because if we see the load factor, which is only 20%, then it is likely that people who have been used the BRT would say that it is good"
7	Jasman	BRT as a government program	"BRT is actually a program initiated by Ministry of Transportation of Indonesia. As far as I can remember, there was a program called 3000 buses (current president, Jokowi's program), and those have to be distributed until 2019, when the president has done his service years"
		Maintenance	"Now, the question is, who should maintain the buses, it is not by Perum Damri, and not by the Provincial Transportation Department. While Damri itself says that the BRT suffers loss. Maybe because it is not well operated well. And furthermore, the operator does not get any maintenance cost from the government"
		Socialization	1. "In the first and second year, number of bus stops are still not enough. The socialization is still not maximum yet." 2. "Now it seems that many people still don't know that the bus only stops in their bus stops, because it lacks of socialization" 3. "if the socialization has been succeed, the bus stops are enough already, then we can expect for more people to use the BRT"
		Location of bus stops	"We recommended to locate the stops near origin and destination locations, such as malls, schools, campuses, and offices"
		Obstacles	"However, we always faced land acquisition issues" "It is because the BRT routes are still not dedicated, they are still combined with the other modes"

Behavior of bus driver	"As far as I know, I think it is very satisfying"
Driver recruitment	"Because Perum Damri has recruited BRT drivers openly and transparently, by announcing it via newspaper, and then the candidates were selected based on minimum years of experience"
Bus service improvement	1. "Damri also wants to give a good service, so the drivers should wear uniform, be friendly to the passengers. If it is necessary, there should be woman crew on board, like female attendance on the aircraft. I think it can be a sort of a good think to give a better service especially for the women and children passengers" 2. "As far as I know, now there are 11 corridors. What should be added are the buses and the stops. So that all corridors can be utilized well. Now with 30 units of buses, only 4-5 corridors are utilized. So, it is still not many"
BRT supervisor	"As I see, in Indonesia that's the Standard Operating Procedure of Damri, generally transportation companies have their supervisors. Maybe their jobs are to count the passengers number, to fill certain forms, to give some report to the company about the ticket sales, etc."
Ticket price	"I think, with the current price, Rp 4500 (€0.30), people must be like it, because it has a fixed price, compared to the angkot (smaller public transport cars) which has a unfixed price"
Safety	1. "It is safe, for instance it is safe from pick pockets" 2. "The transportation department cannot secure their bus stops everytime, because there is no staff to look after the bus stops. People can be involved, but the financial constraint is the issue."
	"For now, it is mainly from middle-low . Although it is aimed for all , not only for middle-low , but also for the upper "
Accessibility of the bus stop	"Yes, it is. Because the location of the bus stops are close to origin and destination of the people, which has ease of access to the bus stops"
Location of bus stops	"However, the problem is, although the location is close, but people are still rarely use the BRT. For instance, the students, some bus stops are located in front of their campuses"
Policy	"I believe, if there is some policy like additional tax for private vehicles, maybe more people will use public transportation, but unfortunately there is still no such policy, and there is no limitation for vehicle ownership"
Frequency of the bus service	"So, I think now the current frequency of the bus is still not satisfying. It is due to lack of bus numbers, and other factors like traffic jam which causes the late arrival of the buses"
Bus waiting time	1. "Ideally, it should be 2-3 minutes. But the reality is, it takes longer than that, for instance in Mall Panakkukang's bus stop, where the buses wait for longer, because they are waiting for the passengers" 2. "A long waiting time, which sometimes no certainty of the bus arrival time, while angkot (smaller public transportation car) has already there, so people would choose the angkot" 3. "The bus waiting time (duration) is not certain yet"
Travel time	"As far as I know, the passengers are satisfied already, because the BRT doesn't stop in any place but their bus stops. The problem is the traffic jam"

		User's satisfaction	"As far as I know, the passengers are satisfied already, because the BRT doesn't stop in any place but their bus stops. The problem is the traffic jam" "they showed their satisfaction, and spread the news to other people as well to use it"
		Subsidy	"Until now, there is still no subsidy, but still the BRT should kept running. The operator (Perum Damri) is still trying to get subsidy from the transportation department"
		Profit	"Basically, Perum Damri has not get profit from the BRT, not even get the breakeven point"
		User's expectation	"Generally, the BRT has meet their expectation. They like the service. Even though the service is still not on the best performance"
		Willingness to recommend	"Surely, they will recommend it. I have read from blogs, newspapers, that people were starting to use the BRT"
		Investment	"Well, I don't really know about that. As far as I know, they are only in bus. The bus stops were built Provincial Transportation Department. No investment from us, the Makassar Transportation Department, but we do support this program"
		Regulation about angkot	"That's what we have been planning, now the angkot number is 4113 units. We plan to reduce it, no revitalization, so it will be reduced gradually"
8	Lambang Basri	Behavior of bus driver	"If we talk about the behavior related to the BRT drivers, we have to see it from the recruitment aspect of them" "So, basically, if we talk about the recruitment, they (the drivers) are capable already"
		Driver recruitment	"So, basically, if we talk about the recruitment, they (the drivers) are capable already"
		Complaints	1. "Usually, user's complaint is the late arrival of the bus, which causing unclear and longer waiting time. It is what the passengers complained the most" 2. "The users are only complaining about the arrival and departure time. Those are still not satisfying"
		Travel time	1. "Now the situation is, the travel time is still considered as long" 2. "Travel time from bus top to another is not exactly the same. Ideally, for urban (based on studies), the speed is 15-20 km/hour. That's already good for public transportation. Longer than that is too speedy. And most importantly, it has to ensure that waiting time is only 4-5 minutes"
		Obstacles	"It is caused by the similar routes of the BRT Trans Mamminasata with other smaller public transportation cars (angkot) in the city"
		BRT supervisor	"If there is a supervisor, their role is only to direct the passengers in and out of the bus. They are not aimed to sell the ticket. Ticketing has its own place"
		Challenges	1. "Now it has not been conducted yet, we cannot blame anybody, because it involves social issues. Angkot has been operating in the first place, so we just cannot get rid of them" 2. "Makassar transportation department is in a big dilemma, in one hand they want to authorize the BRT, but it is actually not their job to do so, while if it is not regulated well, it will be in a mess"

	3. "We cannot force the government to make a regulation to make people compulsorily to use the BRT" 4. "Therefore, with the mistake made by Damri to cut the operating bus number causing the waiting time to be increased. While the longer people wait for the bus, the lesser interest of the people to use the BRT" 5. "Now there is still no certainty about departure and arrival time" 6. "here, the weather is hot, and secondly there are no proper waiting place, and thirdly, here people have less patience"
Regulation about angkot	1. "So, we have to replace them gradually, thus BRT and angkot will have their own role in the transportation system" 2. "Number of angkot has been limited since 2006. So, there is no more additional cars, and no more revitalization. Sometimes we did a socialization to the angkot drivers that they have to evaluate their service too" 3. "There is a big question which addressing the issue that in the middle of the massive growth of population, and there is no additional number for angkot, but their load factor is decreasing. It means that people's interest in using angkot is getting lesser"
Policy	1. "So, the angkot has to be given a fluent route, so it can be more continue and efficient. So, that will be the model" 2. "Actually there was a wrong policy in which there were only 15 buses operated in the beginning of the BRT's operation, but then Damri (the operator) cut the numbers of operating bus in the past, because they (Damri) thought that the load factor was really low (only 20-30% at that time)" 3. "we need certain policies to limit private vehicles usage, car-pooling policy, etc"
User's satisfaction	1. "The users are only complaining about the arrival and departure time. Those are still not satisfying" 2. "Yes it is (the users are satisfied with the current performance)" 3. "We cannot wait until people are satisfied, that's why it is our obligation to formulate public transportation system to satisfy them"
Subsidy	1. "However, until now, there is still no subsidy, and actually the amount of the subsidy has to be well formulated" 2. "So, the ideal subsidy should be 100% in the first month, 90% in the second month, 80% in the third month, and so on"
Load factor	"Only the load factor is still poor, because it has the similar route with the other public transportation modes (such as angkot)"
Ticket price	"I think the current tariff is good enough" "The tariff itself has been decreased to Rp 4500, from Rp 5000 before"
Comfort	"The comfort is already ok"
Safety	"The safety on board is good enough. But during the travel it is not. Because the bus line itself is still combined with the other vehicles' line"
Accessibility of the bus stop	"So, basically, there are accessible bus stops, and there are some which are still not well accessible"

		BRT as a government program	"Actually, it has been a dream of Provincial government to make the BRT Trans Mamminasata covers all zones and areas in Mamminasata, in which the BRT will go through the main routes"
		Disability issues	"There are some stops which are not accommodating people with disabilities need"
		Availability of bus	"The current number of buses are only available optimally every 4-5 minutes."
		Bus service improvement	1. "The information system should be improved" 2. "Even there is an idea by the major to integrate public transportation modes in Makassar"
		Bus waiting time	"There should be study conducted to answer the question, but usually here people can only tolerate to wait up to 5 minutes, longer than that, people will leave"
		Socialization	"Even they are getting more surely after they got socialization from the academician. They understood"
		Willingness to recommend	"Yes of course. Gradually, after they feel satisfied with the service, they will bring their family to ride the BRT, and inform it to other colleagues"
			1. "As far as my observation, it is still middle – low . But is not really touching the lowes class, as it is only operated in main corridors" 2. "The upper is still not using this BRT"
		Investment	"I don't know for sure. Provincial government provides bus stops and red marks on the road, while the central government gives buses"
		BRT Start operating	"It was initiated in 2010, but only limited as a trial service. it was started gradually since 2011"
		Plan to add more bus stops/ routes	"Sure, because it is for Mamminasata. Now, the routes are only for 5-6 corridors. It will be covered according to the necessity"
9	Nicolaus	Behavior of bus driver	"Personally, I think the drivers' behavior are good"
		User's satisfaction	"and they are already satisfying the passengers"
		BRT supervisor	"My job here is, firstly, to inform the passengers about the BRT routes according to each corridor. Secondly, to count the passengers number, thirdly, is to fill the forms from the company (Damri)" "Personally, I think it helps the users"
		Complaints	"So far, it's not many, actually. If there is any complaint, it is only related to street musicians, street vendors, who sometimes got into the bus, and also related to the bus arrival time, which sometimes come late"
		Bus waiting time	1. "It stops at longest time at Mall Panakkukang bus stop, Sudiang bus stop, and Sungguminasa bus stop. It took 20 minutes longest" 2. "20 minutes to load the passengers"
		Ticket price	"I think it is affordable compared to the other public transportation modes"

		Profit	"Well, I don't know about that. It belongs to the financial department in our office"
		Comfort	"Yes, I think so, it is satisfying the users already"
		User's satisfaction	"Yes, I think so, it is satisfying the users already"
		Bus service improvement	1. "For now, there are some BRT drivers who put additional accessories in the bus, such as tv, sound system, even dolls to give more convenient to the passengers. It depends on the driver's creativity, they are free to make their bus as comfort as they can. The office is also supporting their ideas, so the drivers feeling motivated to give a better service and make their passengers happy" 2. "Well, I personally don't know about that. But maybe there will be it, and people can use e-money. I think, that's for the long term"
		Passenger number	"Yes, they are using it regularly now, particularly passengers from Sudiang, there are many passengers from that area"
		Safety	"So far, it is safe. There is no crime happened on the bus"
		Location of bus stops	"For now, many passengers said that the current bus stops are not well located with the destination areas"
		Accessibility of the bus stop	"Well, they are not so far, and not so close. Somewhere in between"
		Distance to destination	"Yes, they are. Because it is important for the passengers. The closest ones are the schools and universities"
		Frequency of the bus service	1. "Well, it depends on the traffic condition, because as we know that Makassar is getting more traffic over time" 2. "the frequency of the bus is 20 minutes per bus"
		Travel time	"It is about 45 minutes averagely"
		User's expectation	1. "For now, the expectation of the users is how the bus covers more locations, how Damri (the operator) opens new routes, people want more bus routes" 2. "Generally, this BRT is already filling the expectation of the users"
		Willingness to recommend	"Yes, they are. I often heard comments from the users that they were willing to recommend others to use BRT Trans Mamminasata"
			"It varies, but there are almost every SES use the BRT. There are low , middle, and high. We can see it from their appearance"
		Number of buses	"Totally there are 30 units to date, but only 16-20 operated"
		Plan to add more bus stops/ routes	"I heard during the briefing that there would be new routes opened in the future"
10	An Nisa	Behavior of bus driver	"Yes, it is. It can be seen from their service to the users"

Complaints	“So far, there is no such case”
BRT supervisor	“To check if the bus is coming, to count number of passengers, and also as a timer, who counts the bus arrival time”
Frequency of the bus service	“It’s about every half an hour”
Ticket price	“I think it is already affordable, maybe it is the cheapest one compared to the other public transportation mode”
Profit	“Well, I don’t really know about that, it belongs to our financial department in the office”
Comfort	“Yes it is already comfort, because the buses are equipped with AC, they are clean, and there are also trash bin in the buses”
Safety	“I think yes, it is safe already. However, sometimes there are some other small public transportation cars which are deliberately took the BRT lines ahead of us”
Accessibility of the bus stop	“Yes, they are accessible enough, easy to reach by the pedestrians” “Actually, they are far away from the settlements areas, because people have to ride the other public transportation modes to reach the current BRT bus stops”
Accessibility to destination	“It’s far away.”
Travel time	“It depends on the traffic condition. But it used to be an hour for each arrival”
Bus waiting time	“It is every 30 minutes on time”
Travel time	“It is 1.5 hours top, since it is a long route. But if there is a traffic jam, it can be up to 2 hours”
User's satisfaction	“I think so, it is already satisfying the users”
Willingness to recommend	“Yes, I think so. I often hear people promoting the BRT to the others, they said that BRT is convenient”
Passenger number	“As I observed, it was low in the first few months of the operation of this BRT. However now it is getting more and more passengers over time, because now more people know this service, such as students”
	“They are from all of es. It can be seen from their appearance, their clothes, etc”
Number of buses	“30 units, all operating”
Number of bus stops	“Yes, I think the current bus stops are enough already”

Source: interview transcripts during fieldwork

4.4 Respondents

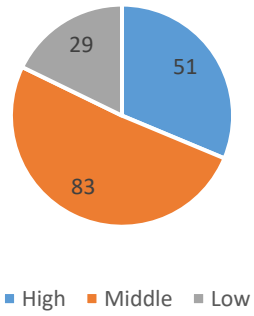
During fieldwork on June 21st until July 19th 2016, total respondents who filled the questionnaire were 167. However due to some double filling, which there were **four** respondents who answered two times, only the first response which was used in this study. Overall, there are 163 valid respondents used in this study. Here is the classification based on their SES (high, middle, and low):

Table 12. Repondents based on SES

High	51
Middle	83
Low	29
Total	**163 Respondents**

Source: Online questionnaire data, conducted by researcher

Figure 9. Numbers of respondents based on socio-economic status (SES)



Source: Online questionnaire data, conducted by researcher

Based on the figure above, we can see that from the field work that the researcher conducted, most respondents are belong to middle class (83 respondents), followed by high SES (51 respondents), and low SES (29 respondents). Those classifications are based on the income level of the respondents (see sub chapter 2.7).

4.5 Performance

To answer the question regarding to performance according to user's opinion, an online survey was conducted.

As it was mentioned in the chapter 3, performance of the BRT Trans Mamminasata represented by 4 variables: service, accessibility, availability, and time. Here are the results of the online questionnaire:

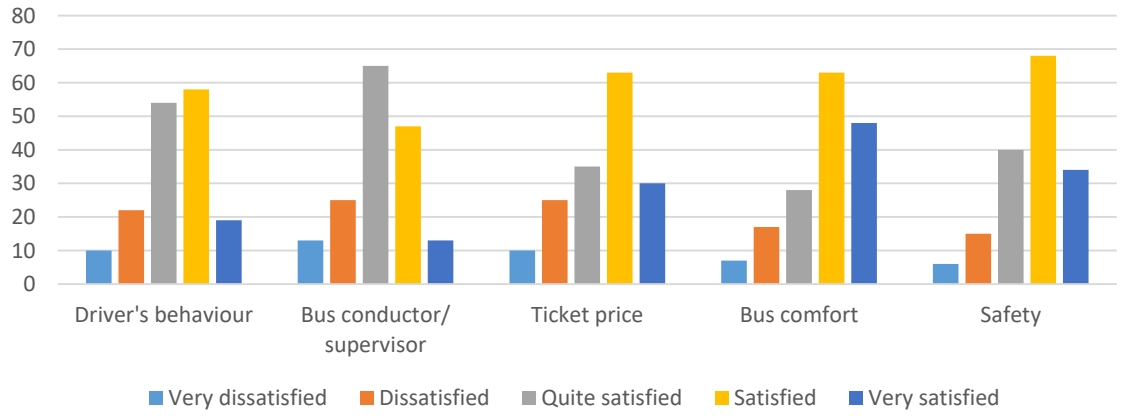
Table 13. Performance indicators

Performance	Service	• Behavior of bus driver, staff • Price of bus ticket • Comfort • Safety
	Accessibility	• Accessibility of the bus stop • Distance from origin • Distance to destination
	Availability	• Frequency of the bus operation
	Time	• Bus waiting time • Travel time

Source: Own elaboration

4.5.1 Service

Figure 10. Respondents' answers regarding to service indicators



Source: Online questionnaire data, conducted by researcher

a. Driver's behaviour

From the figure above, it can be seen that most of the respondents were somewhat satisfied (58 respondents out of 163) with the driver's behaviour during their travel, while it also shows that least users were very dissatisfied by the driver's behaviour.

b. Bus conductor/ supervisor's behaviour

The second graph shows that most of the respondents (65 out of 163) were neither satisfied nor dissatisfied with the BRT's conductor behaviour when they used the service. While very few respondents said that they were very dissatisfied (13 out of 163) and very satisfied (13 out of 163).

c. Ticket price

Regarding to the ticket price, the figure reflects that most of the respondents (63 out of 163) were somewhat satisfied with the current price, which is Rp 4500 (30 cents).

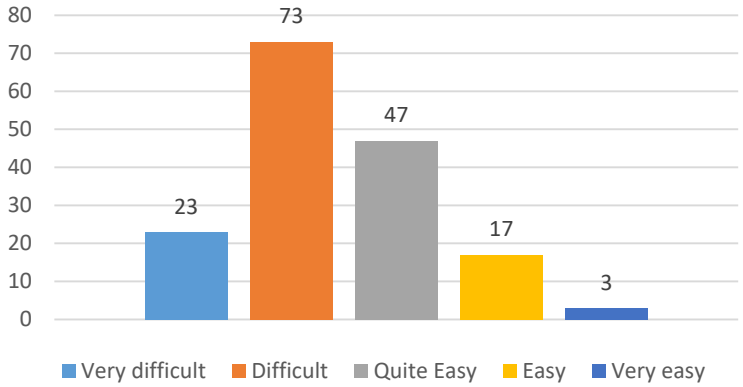
d. Safety

In terms of safety, according to the figure above, most of the respondents (68 out of 163) were somewhat satisfied with the current safety given by the operator of BRT Trans Mamminasata.

4.5.2 Accessibility

a. Accessibility of the bus station in general

Figure 11. Accessibility of the bus in general

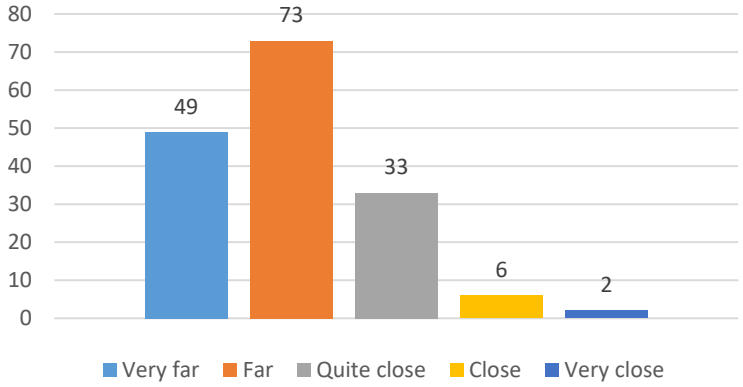


Source: Online questionnaire data, conducted by researcher

Based on the figure above, most of the respondents (73 out of 163) said that the accessibility from the current bus station is somewhat difficult. While only very people respondents (3 out of 163) said that the accessibility of the current bus station is very easy.

b. Distance of bus stations from user's origin location

Figure 12. Distance from user's origin location

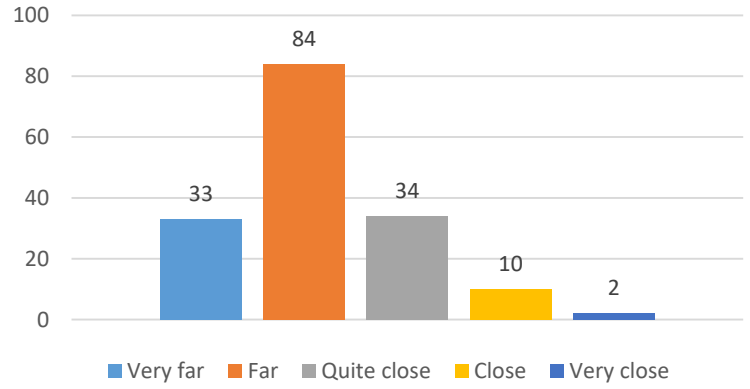


Source: Online questionnaire data, conducted by researcher

Based on the figure above, it can be seen that the distance of the current bus stations from user's origin according to the respondents (73 out of 163) were mostly still quite far. It means that the accessibility to get to the bus station is still not in favour of user's preference, which they certainly want the bus station located close to their origin location.

c. *distance from bus stop to user's destination location*

Figure 13. Distance from bus stops to user's destination



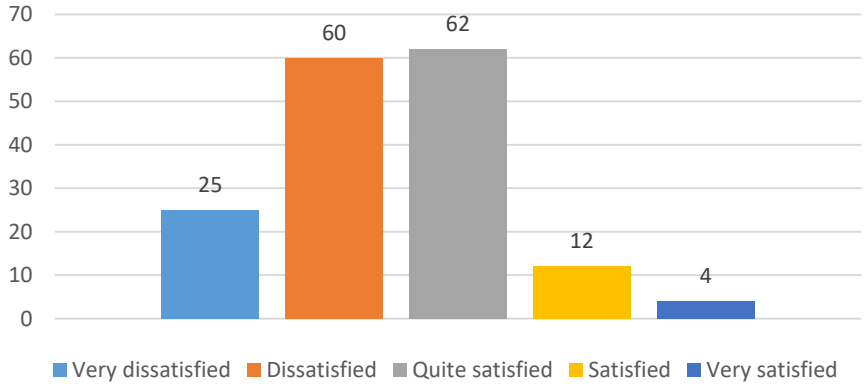
Source: Online questionnaire data, conducted by researcher

The figure above shows that most of the respondents (84 out of 163) assume that the distance from bus stops are still quite far to user's destination location.

4.5.3 Availability

a. Frequency of bus

Figure 14. Frequency of bus



Source: Online questionnaire data, conducted by researcher

Based on the figure above, it can be seen that the current bus frequency is already quite satisfying the passenger's needs. Although there is also a significant number of respondents who are still dissatisfied with the frequency of the bus.

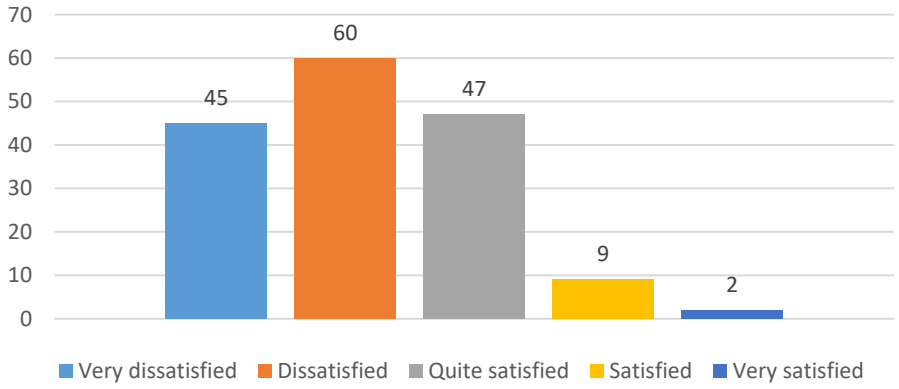
Referring to statement of Mr. Ilyas Iskandar (the head of Transportation Department of South Sulawesi Province), said that the current frequency of the bus service is still not good enough:

"*… currently the bus frequency is still not good enough, because we still have a small number of buses operating*."

4.5.4 Time

a. *Waiting time*

Figure 15. Waiting time



Source: Online questionnaire data, conducted by researcher

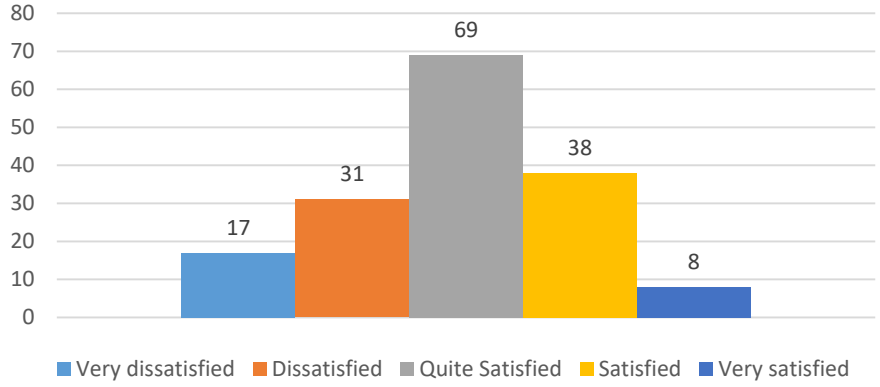
According to the figure of above, it can be assumed that most of the respondents are not satisfied by the waiting time given by the BRT provider. The ideal waiting time for the bus, according to representative of Transportation Department of South Sulawesi Province, which acts as a governing body of this BRT system is 1 minute maximum. While the current waiting time can reach from 10-15 minutes.

"*... So, the maximum waiting time for the bus is 1 minute.*" – Aksan (staff of Transportation Department of South Sulawesi Province).

"*… Bus waiting time here can reach up to 30 minutes*." – An Nisa (BRT Trans Mamminasata supervisor)

b. *Travel time*

Figure 16. Travel time



Source: Online questionnaire data, conducted by researcher

Based on the figure above, we can assume that the current travel time of BRT Trans Mamminasata is quite satisfying the passenger's needs. It is supported by the statement of Makassar city's Transportation Department representative:

"*... Actually, the passengers are already satisfied with the travel time, because the bus does not stop in any place. It is only stop at the bus stop*" – Jasman (Makassar city's Transportation Department representative)

However, the exact travel time of the BRT is still not certain depends on certain corridor. It is supported by the statement of the head of Perum Damri of South Sulawesi Province (the BRT operator):

"*… the bus travel time is difficult to determine, because now we only have a very limited bus stops*." – HM Ilyas (head of Perum Damri of South Sulawesi Province)

4.5.5 Summaries of performance

Based on findings on performance of BRT Trans Mamminasata, according to respondents (from online questionnaire), we can summarize as follows:

1. Service: most of the users are **satisfied** with the current service (driver's behaviour, ticket price, bus comfort, and safety) given by the provider. On the other hand, users are only feel **quite satisfied** with the bus conductor/ supervisor's service.
2. Accessibility: overall, users think that the current accessibility is still considered as inconvenient (users are **not satisfied**) , due to the current conditions where the accessibility is still difficult; in addition, both of distance from user's origin location and user's destination are still far.
3. Availability: most of users are only feeling **quite satisfied** with the current availability of the BRT.
4. Time: most users are **dissatisfied** with the current waiting time of the bus, and they are only **quite satisfied** with the travel time at the moment.

4.6 User's satisfaction

Table 14. User's satisfaction indicators

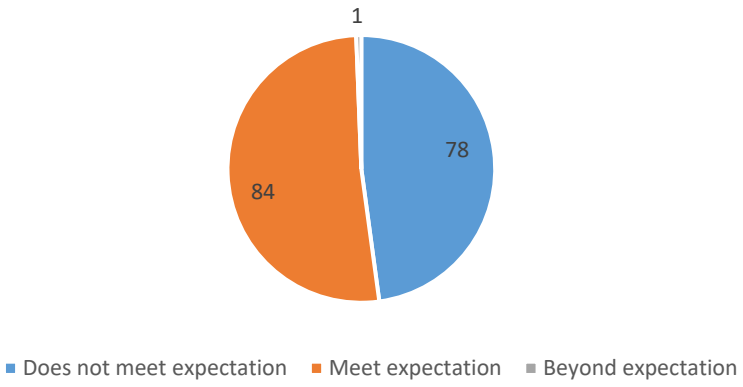
User satisfaction	Expectation	• Perception of the users according to their preference (does not meet/ meet/ exceed their expectation)	• Ordinal
	Recommendation	• Willingness to recommend other people to use the BRT	• Ordinal

Source: Own elaboration

4.6.1 Expectation

a. *Perception of users to their preference (user's expectation in general)*

Figure 17. General user's expectation



Source: Online questionnaire data, conducted by researcher

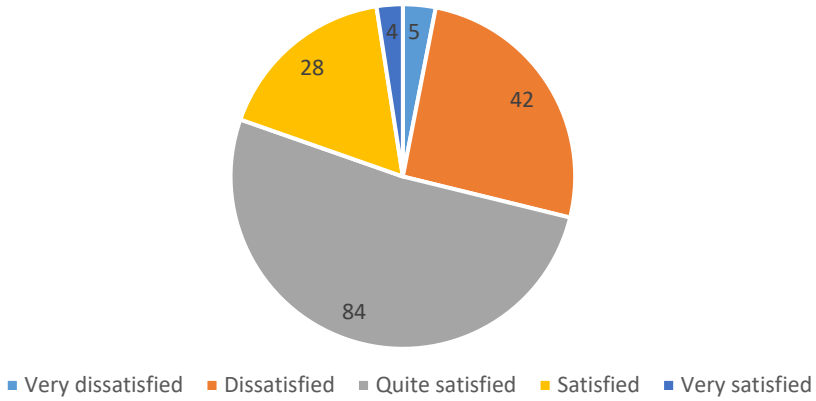
Based on the diagram above, most of the respondents (84) said that the current service of BRT Trans Mamminasata has already meeting their expectation. Although in some indicators which have already been presented previously (*waiting time, distance from bus stop to user's destination location, distance of bus stations from user's origin location, and accessibility in general*) the respondents were still not satisfied.

Those unsatisfying indicators were aligned with the current situation regarding to BRT service provision in Makassar where the number of the bus stops are still very low. It is supported by the statement of one of the BRT supervisor, Mr. Nicolaus, which said:

"*… currently, the expectation of the passengers is how the buses can reach more locations. It is how Perum Damri (the BRT operator) will open new bus stops and routes. People want more routes.*" - Mr. Nicolaus (BRT Trans Mamminasata supervisor)

b. *General user's satisfaction*

Figure 18. General user's satisfaction



Source: Online questionnaire data, conducted by researcher

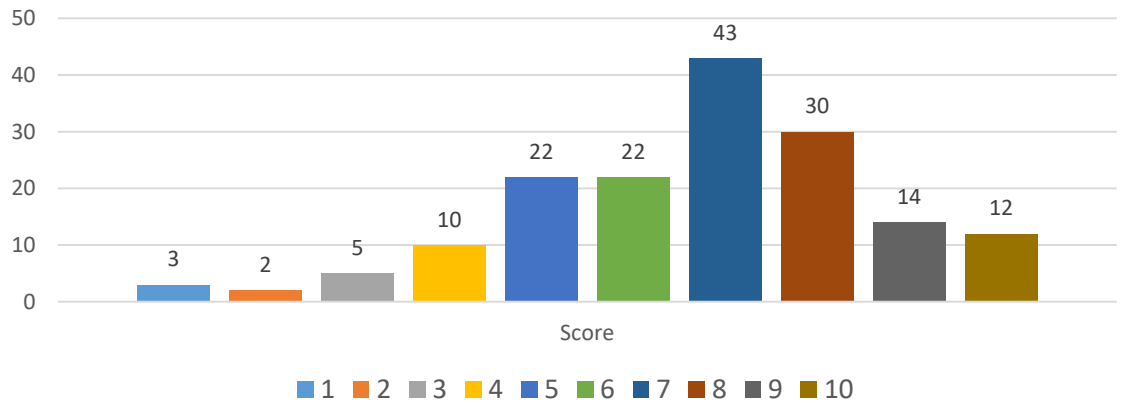
Based on the diagram above, it can be seen that most of the respondents are quite satisfied by the current BRT service, although there is also quite a lot of respondents who are still dissatisfied with the current service. This is supported by the statement of Mr. Jasman (Makassar Transportation Department staff), which said:

"... generally, the passengers are already quite satisfied with the current service. They love it." – Mr. Jasman (Makassar Transportation Department staff)

4.6.2 Recommendation (Willingness to recommend)

How likely users want to recommend the BRT Trans Mamminasata system to other people.

Figure 19. Willingness to recommend



Source: Online questionnaire data, conducted by researcher

Based on the figure above, it can be seen that the respondents are willing to recommend other people to use BRT Trans Mamminasata service. It is also supported by the statement of the head of Perum Damri of South Sulawesi Province:

"... Yes, there are a lot of people who recommend their colleagues to use the BRT. People who have used the BRT, they recommend it via media social like facebook, twitter, BlackBerry Messenger. I often read about it on the media, obviously many people have been promoted it." – Mr. HM Ilyas (head of Perum Damri of South Sulawesi Province).

4.6.3 Summaries of user's satisfaction

Based on findings on user's satisfaction of BRT Trans Mamminasata, according to respondents (from online questionnaire), we can summarize as follows:

1. Expectation: users feel that the current performance of BRT Trans Mamminasata meets their expectation.
2. Recommendation: users are quite willing to recommend their colleagues to use BRT Trans Mamminasata.

4.7 Discussion

Reflecting on the descriptive analysis shown above (see 4.5 to 4.6), we can argue that the current performance of BRT Trans Mamminasata has been likely satisfying the users, proven by the finding which shows that users are satisfied on most of the performance variables. This finding is

contrary with a theory by Kulyk and Hardy who pointed out that performance of a BRT system is strongly affected by infrastructure on which the BRT operated (Kulyk and Hardy, 2003, p. 5), while it is arguably that infrastructure of BRT Trans Mamminasata is still relatively considered as very basic, in which several main qualities of a proper BRT infrastructure are dedicated lanes and integrated ITC system, these are still not there. To date, BRT Trans Mamminasata is still running on regular ways, where the BRT runs along with the other vehicles in the same ways.

Furthermore, regarding to satisfaction in particular, users are satisfied with the current performance of BRT Trans Mamminasata, because they feel that it is meeting their expectation (Parker and Mathews, 2001). In addition, users are expressing their satisfaction, by not only stating that they are literally satisfied with the current performance of BRT Trans Mamminasata, but also they show their satisfaction by recommending the BRT to other people, not limited to their family, they also recommend it to their friends and other people via social media. Willingness to recommend is also an indication of a satisfaction (Wilson, Zeithaml V., et al., 2008)in which if people feel satisfied with a product, they tend to recommend it to other people.

4.8 Statistical analysis

In this part, the analysis of online questionnaire is conducted using a statistics application, SPSS. SPSS is known for its reliable features to analyse quantitative data in multiple ways, and it has been used widely by students, researchers, corporates, etc. This application has a lot of different features to be used on different purpose, depends on the user's objective. This analysis holds an important role in this thesis, due to its purpose to help the researcher to answer the main and sub research questions.

In this research, the core of statistical analysis used is multiple regression, due to its general objective which is to find out the causal relationship of a variable to other(s). In which, in this case, this research is generally aimed to figure out the effect of current performance of BRT Trans Mamminasata to its user's satisfaction.

4.8.1. Factor analysis and reliability test

Factor analysis in this research conducted on four variables (Service, Accessibility, Time, and Satisfaction). Availability is not included in the factor analysis, due to its indicator number which only consists of one indicator, unlike the other variables which are consisted of more than one indicators (please see Table 6. Operationalization). The following is the results of factor analysis conducted on those four variables (please see annexes to see the SPSS syntax used from the SPSS).

a. Factor analysis and reliability test of Service indicators
Service

Table 15. Factor analysis and reliability result of "service" (independent) variable

Item	Factor loadings **(λ)**
X1.1 Behavior of bus driver, staff	.877
X1.2 Service of supervisor	.856
X1.3 Price of bus ticket	.755
X1.4 Comfort	.884
X1.5 Safety	.817
Eigen value = 3.522 70.398 % explained variance Cronbach's Alpha = .893 N= 163	

Source: SPSS Analysis Output

The result in table 15 shows that each of the items (X1.1, X1.2, X1.3, X1.4, X1.5) in service variable is associated to each other with a high correlation (λ= .877, .856, .755, .884, and .817; p>0.70). This high correlations indicate that the items are associated and are likely to be grouped together by the factor analysis.

Eigen value (a measure of explained variance) of 3.522 (>1.0) indicates that the factor explains more information than a single item would have explained (Leech, Barrett, et al., 2005, p. 97). Furthermore, the reliability test, measured by Cronbach's alpha of those 5 items (α= .893), indicates that data from 163 respondents of those items are reliable and have internal consistency. Noted that α value of 0.7 and higher is considered acceptable (Field, 2009, p. 675), although in another book, α value of 0.6 and higher is still acceptable (Leech, Barrett, et al., 2005, p. 67).

b. Factor analysis and reliability test of Accessibility indicators
Accessibility

Table 16. Factor analysis and reliability result of "accessibility" (independent) variable

Item	Factor loadings (λ)
X2.1 Accessibility of the bus stop	.794
X2.2 Distance from origin	.829
X2.3 Distance to destination	.736
Eigen value = 1.860 62.016 % explained variance Cronbach's Alpha = .692 N=163	

Source: SPSS Analysis Output

The result in table 16 shows that each of the items (X2.1, X2.2, X2.3) in accessibility variable is associated to each other with a high correlation (λ= .794, .829, and .736; p>0.70). This high correlations indicate that the items are associated and are likely to be grouped together by the factor analysis.

Eigen value (a measure of explained variance) of 1.860 (>1.0) indicates that the factor explains more information than a single item would have explained (Leech, Barrett, et al., 2005, p. 97). Furthermore, the reliability test, measured by Cronbach's alpha of those 3 items (α= .692, α>0.6), indicates that data (N=163) of those items are reliable and have internal consistency.

c. Factor analysis and reliability test of Time indicators
   Time

Table 17. Factor analysis and reliability result of "time" (independent) variable

Item	Factor loadings (λ)
X4.1 Bus waiting time	.856
X4.2 Travel time	.856
Eigen value = 1.464 73.223 % explained variance Cronbach's Alpha = .633 N=163	

Source: SPSS Analysis Output

The result in table 17 shows that each of the items (X4.1, X4.2) in time variable is associated to each other with a high correlation (λ= .856, and .856; p>0.70). This high correlations indicate that the items are associated and are likely to be grouped together by the factor analysis.

Eigen value (a measure of explained variance) of 1.464 (>1.0) indicates that the factor explains more information than a single item would have explained (Leech, Barrett, et al., 2005, p. 97). Furthermore, the reliability test, measured by Cronbach's alpha of those 2 items (α= .633, α>0.6), indicates that data (N=163) of those items are reliable and have internal consistency.

d. Factor analysis and reliability test of Satisfaction indicators
   Satisfaction

Table 18. Factor analysis and reliability result of "satisfaction" (dependent) variable

Item	Factor loadings (λ)
Y1.1 User's expectation generally	.813
Y2.2 User's satisfaction generally	.894
Y2.3 Willingness to recommend	.837
Eigen value = 2.160 71.997% explained variance Cronbach's Alpha = .794 N=163	

Source: SPSS Analysis Output

The result in table 18 shows that each of the items of the satisfaction (dependent) variable (X4.1, X4.2) is associated to each other with a high correlation (λ= .813, .894, and .837; p>0.60). This high correlations indicate that the items are associated and are likely to be grouped together by the factor analysis.

Eigen value (a measure of explained variance) of 1.464 (>1.0) indicates that the factor explains more information than a single item would have explained (Leech, Barrett, et al., 2005, p. 97).

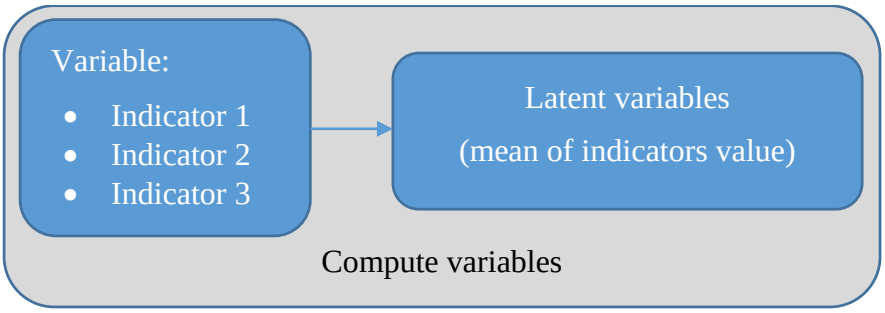
Furthermore, the reliability test, measured by Cronbach's alpha of those 2 items (α= .794, α>0.7), indicates that data (N=163) of those items are reliable and have internal consistency.

From all of the factor analysis above, it can be concluded that variables (service, accessibility, time, and satisfaction) can be reduced in order to be utilized in the more in depth analysis in the next procedure, including computing variables and regression analysis. Please noted that "availability" variable is not incorporated in factor analysis, due to its single number of indicator which is not possible to conduct a factor analysis for it.

4.8.2. Compute variables

As it has been mentioned before, that one of the procedures conducted in the statistical analysis is compute variables. It creates one latent variable based on mean values of number of indicators.

Figure 20. Compute variables flowchart



Source: Own elaboration

Based on figure 7 above, compute variable procedure produces latent variables. It should be conducted since the sample of moderation variable (SES) is not distributed evenly according to each SES. This procedure conducted, in order to adjust composition of samples to control the over or the under representing sample from certain group.

4.8.3. Regression analysis

In this procedure, all latent variables (dependent and independent) and moderator variable are analysed using regression menu, in order to see the correlation between those variables. We have centred the independent variables around their mean value before the regression to deal with the high VIF-values. To further reduce multicollinearity, we have included the independent variables in separate models (see table 1, 2 and 3 below).

Table 19. Regression table 1

Table 1	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Constant	5.615**	0.316	7.628**	0.400	5.737**	0.284	5.627**	0.302
(ref=low)								
middle	-0.693*	0.367	-0.635*	0.294	-0.847*	0.330	-0.746*	0.351
high	-0.494	0.396	-0.554	0.318	-0.634	0.356	-0.534	0.379
Main associations								
Availability (ref=(very) satisfied)								
Quite satisfied			-1.344**	0.383				
Dissatisfied			-2.637**	0.384				
Very dissatisfied			-3.531**	0.435				
Service					0.851**	0.135	0.083	0.259
Accessibility								
Time								
Interaction variables								
middle*Service							1.028**	0.330
high*Service							1.041**	0.346
middle*Accessibility								
high*Accessibility								
middle*Time								
high*Time								
Adjusted R^2	0.010		0.368		0.202		0.249	

Note: *p<0.05; **p<0.01.

Source: SPSS Analysis

From the table above, it can be seen that: First, compared to those individuals who are (very) satisfied with the bus availability, if people become less satisfied with the bus availability, they have less user satisfaction. Second, there is a positive and significant relation between service and user satisfaction (b= 0.851; p < 0.01). This means that the more people are satisfied with the service, the more they are satisfied with the BRT Trans Mamminasata. Third, the association between service and user satisfaction is moderated by SES (b=1.028, b=1.041, p<0.01). It appears that the relation between service and user satisfaction becomes somewhat more positive if individuals belong to a higher SES. However, the main association between service and user satisfaction disappears when the interactions are added. That may imply that the effect of service on user satisfaction for the different groups partials each other out.

Table 20. Regression table 2

Table 2	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Constant	5.615**	0.316	7.628**	0.400	5.573**	0.302	5.603**	0.302
(ref=low)								
middle	-0.693*	0.367	-0.635*	0.294	-0.591*	0.351	-0.601*	0.351
high	-0.494	0.396	-0.554	0.318	-0.525	0.378	-0.534	0.379
Main associations								
Availability (ref=(very) satisfied)								
Quite satisfied			-1.344**	0.383				
Dissatisfied			-2.637**	0.384				
Very dissatisfied			-3.531**	0.435				
Service								
Accessibility					0.747**	0.184	0.211	0.415
Time								
Interaction variables								
middle*Service								
high*Service								
middle*Accessibility							0.798	0.479
high*Accessibility							0.321	0.571
middle*Time								
high*Time								
Adjusted R^2	0.010		0.368		0.097		0.103	

Note: *p<0.05; **p<0.01.

Source: SPSS Analysis

Based on the results from regression table 2 shown above, it can be seen that:

First, there is a positive and significant relation between accessibility and user satisfaction (b= 0.747; $p < 0.01$). Secondly, it means that the more people are satisfied with the accessibility, the more they are satisfied with the BRT Trans Mamminasata. Third, this association between accessibility and user satisfaction is not moderated by SES (b=0.798, b=0.321; $p > 0.05$).

Table 21. Regression table 3

Table 3	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Constant	5.615**	0.316	7.628**	0.400	5.737**	0.284	5.603**	0.302
(ref=low)								
middle	-0.693	0.367	-0.635	0.294	-0.847	0.330	-0.601	0.351
high	-0.494	0.396	-0.554	0.318	-0.634	0.356	-0.534	0.379
Main associations								
Availability (ref=(very) satisfied)								
Quite satisfied			-1.344**	0.383				
Dissatisfied			-2.637**	0.384				
Very dissatisfied			-3.531**	0.435				
Service								
Accessibility								
Time					1.090**	0.138	0.467	0.307
Interaction variables								
middle*Service								
high*Service								
middle*Accessibility								
high*Accessibility								
middle*Time							0.754*	0.364
high*Time							0.813*	0.393
Adjusted R^2	0.010		0.368		0.285		0.299	

Note: *p<0.05; **p<0.01.

Source: SPSS Analysis

Based on the results from regression table 3 shown above, it can be seen that:

First, there is a positive and significant relation between time and user satisfaction (b= 1.090; $p < 0.01$). This means that the more people are satisfied with the time, the more they are satisfied with the BRT Trans Mamminasata. This association between time and user satisfaction is moderated by SES (b=0.754, b=0.813; $p < 0.05$). It appears that the relation between time and user satisfaction becomes somewhat more positive if individuals belong to a higher SES. However, the main association between time and user satisfaction disappears when the interactions are added. That may imply that the effect of time on user satisfaction for the different groups partials each other out.

Chapter 5. Conclusions

5.1 Answering the research questions

To answer the main research question:

> "*To what extent does the current BRT Trans Mamminasata performance (service, accessibility, availability, and time) affect the user's satisfaction?*

Based on the research findings on chapter 4, the answer are:

1. In terms of service, the users are generally satisfied with the current service given by the service provider (Perum Damri), especially in driver's behaviour, ticket price, bus comfort, and safety. However, in terms of the user's satisfaction toward service by conductor/ supervisor, they are only quite satisfied.
2. In terms of accessibility, the users are generally not satisfied with the current situation. It is proved by the findings reflecting that most of the respondents said it is difficult to access the bus stop, and the distance from both user's origin and to user's destination is still far.
3. In terms of availability, generally the respondents are quite satisfied with the current bus frequency. Although, the statistical analysis results (please see part 4.8.3 Regression analysis) show the other way around.
4. In terms of time, the BRT Trans Mamminasata users are dissatisfied by the waiting time. However, in terms of travel time, the passengers are generally quite satisfied. Although, the statistical analysis results show the other way around (please see part 4.8.3 Regression analysis).
5. In terms of expectation, based on the respondents' opinion, the current performance of BRT Trans Mamminasata is already meeting their expectation.
6. And lastly, in terms of willingness to recommend, generally respondents are willing to recommend BRT Trans Mamminasata to their colleagues.

Based on the analysis in the previous chapter, it can be concluded that the current performance of BRT Trans Mamminasata affects its user satisfaction, in which time has the most significant effect to its user's satisfaction (see 4.8.3 Regression analysis). Furthermore, the variables used in this research, particularly the independent ones has been proved statistically as reliable ones. It is also aligned with the theories by Islam, et al. (Islam, Chowdhury, et al., 2014) who emphasized service, accessibility, and time as the underlying variables to measure the user's satisfaction of a bus service.

And to answer the eventual sub research questions (please see chapter 3.1. Revised research question), it can be concluded that:

a. The current performance of BRT Trans Mamminasata has been quite satisfying its users in general, however, there are still some variables that still need to be improved by the service provider (Perum Damri), especially in accessibility and the availability, which can be seen from the statistical analysis . Far location from passenger's origin place (point of departure) has been the biggest issue to be addressed in term of accessibility. Moreover, it can also be concluded that the availability (frequency of the bus) of BRT Trans Mamminasata is the most satisfying variable among all of variables, although, from several key informant's point of view, that the frequency of the bus availability should be improved, because in some cases, people wait for too long for the bus to arrive.

b. The second sub research question is about how different SES perceives the current performance of BRT Trans Mamminasata. It can be concluded, that based on the statistical analysis, the correlation between SES with the satisfaction variable shows a positive relation, which imply that the better the service, users who belong to a higher SES are satisfied with the service of BRT Trans Mamminasata. It means that lower SES users are tend to be easier to satisfy, and higher SES of the users are quite difficult to satisfy, especially with the current performance of BRT Trans Mamminasata. The finding is aligned with the theory, that the higher the SES of the consumers, the more difficult them to be satisfy, since the higher SES people tend to demand a higher standard of service (Lareau, 2003).
c. The third sub research question asks about which independent variable (service, accessibility, availability, or time) is more significant in term of satisfying BRT Trans Mamminasata users. This question is addressed by the regression analysis as well, which implies that time has the more significant effect to the user's satisfaction compared to other variables. Issues related to time in public transportation can be an undesirable feature which can lead to inconvenience, and involves transaction cost as well, as mentioned by Wardman (Wardman, 2004, p. 365).

Regarding to the hypothesis (please see part 1.8 Hypothesis), based on the research findings, we can conclude that:

a. Passengers of BRT Trans Mamminasata are somewhat satisfied with the current performance, although there are a few aspects which should be improved, including the availability and accessibility of the BRT Trans Mamminasata. Then, it can be concluded that the hypothesis is rejected.
b. People who belong to certain SES do have different expectation, it is shown in analysis results, in which people who have a higher SES expect a better service from the service provider. Thus, the hypothesis is accepted.

5.2 Recommendation

5.2.1 Scientific recommendation

From the process of this research, several points can be considered as recommendation to other researchers, in order to conduct a similar research, and to promote the better reliability of the research:

1. This kind of research needs a longer data collection period, in order to gain more respondents. The more respondents gained, the better the chance to have a well distributed number of samples according to SES.
2. Statistical analysis should be done more carefully, and proper type of analysis should be chosen wisely. In the case of this research various ways of SPSS analysis had been conducted over time, in order to find the most proper analysis to address the research questions. Furthermore, in this kind of research, moderator used has a significant effect on SPSS analysis efforts. Several model of regression should be carried out during the analysis. Lastly, interpretation of output should be given a lot of attention, due to its complexity.

5.2.2 Policy recommendation

1. Based on the research findings, policy wise, it can be recommended that in order to improve the performance of BRT Trans Mamminasata and further to increase the user's satisfaction the policy should focus mostly on supporting the accessibility of BRT Trans Mamminasata. Not only limited to the corridors of where the buses trough, but also

about the location of the bus stops as well. It is also pointed out by key informants that at the moment people mostly still find the bus stops are far either from their home or toward their destinations.

2. The policy should also considering availability aspect of the BRT Trans Mamminasata to be improved, in order to encourage more people to use the service, since it is a part of government's long term planning to reduce traffic jam and further to support economic growth in the Mamminasata areas.

   All in all, the policy should be formulated to support BRT Trans Mamminasata to improve the quality of service, in order to satisfy its users, as pointed out by Mittal and Kamakura (Mittal and Kamakura, 2001)that customer satisfaction is a significant factor in forming user's willingness to use the service again in the future.

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Annex 1: Research Instrument

1.1 Questionnaire

Survey questionnaire to gain information of Makassar BRT performance and user's satisfaction
Topic 1: User's satisfaction from passenger's view
Concept: questionnaire (likert scale)

Questionnaire number	
Time	
Location	

Gender

☐ Male (1) ☐ Female (2)

A. Performance

1. Service

a. How do you rate the bus **driver's behavior** during your travel?

☐ Very dissatisfied (1) ☐ Dissatisfied (2) ☐ Quite satisfied (3) ☐ Satisfied (4) ☐ Very satisfied (5)

b. How do you rate the service of bus **conductor** during your travel?

☐ Very dissatisfied (1) ☐ Dissatisfied (2) ☐ Quite satisfied (3) ☐ Satisfied (4) ☐ Very satisfied (5)

c. How do you rate the **ticket price**?

☐ Very dissatisfied (1) ☐ Dissatisfied (2) ☐ Quite satisfied (3) ☐ Satisfied (4) ☐ Very satisfied (5)

d. How do you rate the bus **comfort** during your travel?

☐ Very dissatisfied (1) ☐ Dissatisfied (2) ☐ Quite satisfied (3) ☐ Satisfied (4) ☐ Very satisfied (5)

e. How do you rate the **safety** of this BRT?

☐ Very dissatisfied ☐ Dissatisfied ☐ Quite satisfied ☐ Satisfied ☐ Very satisfied

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

2. Accessibility

a. How do you rate the **accessibility** of the bus stop (in general)?

☐	☐	☐	☐	☐
Very difficult	Difficult	Quite easy	Easy	Very easy
(1)	(2)	(3)	(4)	(5)

b. How far is the **distance from your origin location** to the bus stop?

☐	☐	☐	☐	☐
Very far	Far	Quite close	Close	Very Close
(1)	(2)	(3)	(4)	(5)

c. How far is the **distance from bus stop** to your destination location?

☐	☐	☐	☐	☐
Very far	Far	Quite close	Close	Very Close
(1)	(2)	(3)	(4)	(5)

3. Availability

a. How do you rate the current **frequency of the bus** operation?

☐	☐	☐	☐	☐
Very dissatisfied	Dissatisfied	Quite satisfied	Satisfied	Very satisfied
(1)	(2)	(3)	(4)	(5)

4. Time

a. How do you rate the bus **waiting time**?

☐	☐	☐	☐	☐
Very dissatisfied	Dissatisfied	Quite satisfied	Satisfied	Very satisfied
(1)	(2)	(3)	(4)	(5)

b. How do you rate the bus **travel time**?

☐	☐	☐	☐	☐
Very dissatisfied	Dissatisfied	Quite satisfied	Satisfied	Very satisfied
(1)	(2)	(3)	(4)	(5)

B. <u>User's satisfaction</u>

1. Expectation

a. Overall, how do you rate your **expectation** toward the current service of Makassar BRT?

☐	☐	☐
Does not meet expectation	Meet expectation	Beyond expectation
(1)	(2)	(3)

b. In general, how do you rate your **satisfaction** of using Makassar BRT?

☐ ☐ ☐ ☐ ☐

Very dissatisfied (1) | Dissatisfied (2) | Quite satisfied (3) | Satisfied (4) | Very satisfied (5)

2. Recommendation

a. How likely would you **recommend** this (to use this BRT) to friend, family, or colleague?

0	1	2	3	4	5	6	7	8	9	10
Not all likely										Extreme-ly like

Age

….. years old

Occupation (if respondent agreed to give this information)

…….

Last education (if respondent agreed to give this information)

…….

Personal income

…….

Family income

…….

☐ ☐ ☐

Low (1) | Middle (2) | High (3)

- High: > IDR 5,000,000 (>€344)
- Middle: IDR 2,500,000 – IDR 5,000,000 (€172 – €344)
- Low: < IDR 2,500,000 (<€172)

Frequency of using the service

……..(x times)

Purpose of trip

☐ ☐ ☐ ☐ ☐

Work (1) | School (2) | Shopping (3) | Leisure (4) | Other (5) ……

Data Collection Instrument

Survey questionnaire to gain information of Makassar BRT performance and user's satisfaction

Topic 2: Operator's view (representative) of Makassar BRT

Concept: Semi closed, recorded by using voice recorder (with permission)

Estimated time: 45minute -1 hour

Respondent's name (if he/ she willing to share)*	
Occupation	
Time	

*Personal data will not be published without any approval

A. Performance

1. Service

a. What do you think about the **behaviour of Makassar BRT drivers**, are they able to give a satisfying service to the passengers?

……
……
……

b. In your opinion. what do you think about the **service** that is given by the **bus conductors** during the bus operation, do they already satisfying the passengers with their service?

……
……
……

c. Is the **ticket price** affordable enough for everyone? Is it already enough to make a profit for your company?

……
……
……

d. Is the current bus already **comfort** for the passengers? Is there any additional effort to make the bus more comfort?

……
……
……

e. Is the bus already meet the **safety** criteria? How do you maintain safety during the operation of Makassar BRT?

……
……
……

2. Accessibility

a. Do the bus stops already located in **accessible** points? Is it easy to reach by walk?

……
……
……

b. In your opinion how do people **access the bus stop**? How far is it?

……
……
……

c. How far is it to get **from bus stop to their destination**? Is it far (from central activities points, i.e: school, central business district, office)?

……
……
……

3. Availability

a. How many times a day (**frequency**) the bus operated in a certain corridor? Is it already enough?

……
……
……

4. Time

a. How long does the bus usually **stop to load** the passengers at the bus stop?

……
……
……

b. How long does the bus usually **take time to arrive** at the bus stop from the latest one?

……
……
……

B. User's satisfaction

1. Expectation

a. In general, what do you think about **passenger's expectation** of using this BRT? Do you think it is already meet the expectation of the passengers?

……
……
……

2. Recommendation

a. With the current service that passenger's receive, do you think they will recommend their friends/ colleagues to use Makassar BRT?

……
……
……

C. Socio-economic status of the passengers

1. Income

a. What classes of income are using this BRT system? Are they only belonged to low, middle or high? And how do they perceive it, is there any difference?

……
……

D. Additional questions

a. How much was the investment of this Makassar BRT?
   ……
b. When was it first operated?
   ……
c. How many buses operated, and in which corridors are they operating?
   ……
d. Is there any plan to create any mobile application/ online service?
   ……
e. What are the next plan for this BRT? Is there any plan to add more route/ bus? Or any other plans?
   ……

E. More comments

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Data Collection Instrument

Survey questionnaire to gain information of Makassar BRT performance and user's satisfaction

Topic 3: Project planner's view (representative) of Makassar BRT

Concept: Semi closed, recorded by using voice recorder (with permission)

Estimated time: 45minute -1 hour

Respondent's name (if he/ she willing to share)*	
Occupation	
Time	

*Personal data will not be published without any approval

A. Performance

1. Service

a. In your opinion, do **drivers** of Makassar BRT system able to give a satisfying service to the passengers according to the plan/ procedure?

……
……
……

b. About the **bus conductors,** do you think they are able to serve the passengers in a positive manner during the bus operation? Do they already satisfy the passengers with their service? Or in case it is not what you expected, what is your opinion about them?

……
……
……

c. Is the **ticket price** affordable enough for everyone? Is it already enough to make a profit for the operator?

……
……
……

d. What do you think about **comfort** for the passengers? Is already enough for the passenger? Any other facility to add on the bus to improve it?

……
……
……

e. According to the plan, is the bus already meet the **safety** criteria? What is the strategy to maintain safety during the operation of Makassar BRT?

……
……
……

2. Accessibility

a. Based on the plan, do the current bus stops already located in **accessible** points? Is it easy to reach by walk? Or any other opinion about it?

……
……
……

b. Based on the plan, how do people **access the bus stop**? How far is it? And is there any plan to improve the accessibility to the bus stop?

……
……
……

c. Based on the plan, is it close enough to get **from bus stop to destination** (from central activities points, i.e: school, central business district, office) of the passengers?

……
……
……

3. Availability

a. According to the plan, how many times a day (**frequency**) the bus operated in a certain corridor? Is it already enough? Is there any plan to **increase the frequency** of the bus?

……
……
……

4. Time

a. According to the plan, how long does the bus should **stop to load** the passengers at the bus stop? And what do you think about the current **bus waiting time**?

……
……
……

b. Based on the plan, how long does the bus should **take time to arrive** at the bus stop from the latest one?

……
……
……

B. User's satisfaction

1. Expectation

a. In your opinion as the planner, what do you think about **passenger's expectation** of using this BRT? Do you think it is already meet the expectation of the passengers?

……
……
……

2. Recommendation

a. With the current service that passenger's receive, do you think they will **recommend** their friends/ colleagues to use Makassar BRT?

……
……
……

C. Socio-economic status of the passengers

1. Income

a. Does this BRT have been targeted for everyone? Or is it only planned for certain socio-economic status (**income** level)? And how do they perceive it, is there any difference?

……
……
……

D. Additional questions

b. How much was the investment of this Makassar BRT?

……

c. When was it first operated?

……

d. How many buses operated, and in which corridors are they operating?

……

e. Is there any plan to create any mobile application/ online service?

……

f. What are the next plan for this BRT? Is there any plan to add more route/ bus? Or any other plans?

……

E. More comments

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Data Collection Instrument

Survey questionnaire to gain information of Makassar BRT performance and user's satisfaction

Topic 4: Local transportation expert's view (representative) of Makassar BRT

Concept: Semi closed, recorded by using voice recorder (with permission)

Estimated time: 45minute -1 hour

Respondent's name (if he/ she willing to share)*	
Occupation	
Time	

*Personal data will not be published without any approval

A. Performance

1. Service

a. According to your opinion as a transportation expert, do **drivers** of Makassar BRT system able to give a satisfying service to the passengers according to the plan/ procedure?

……
……
……

b. About the **bus conductors,** do you think they are able to serve the passengers in a positive manner during the bus operation? Do they already satisfy the passengers with their service? What is your opinion about them according to your opinion as an expert in this field?

……
……
……

c. Is the **ticket price** affordable enough for everyone? Is it already enough to make a profit for the operator?

……
……
……

d. As a transportation expert, what do you think about **comfort** for the passengers? Is already enough for the passenger? Any other facility to add on the bus to improve it?

……
……
……

e. According to your opinion as an expert, is the bus already meet the **safety** criteria? Do you think there is any specific strategy to maintain safety during the operation of Makassar BRT?

……
……
……

2. Accessibility

a. Based on the theory, do the current bus stops already located in **accessible** points? Is it easy to reach by walk? Or any other opinion about it?

……
……
……

b. Based on the theory, how do people **access the bus stop**? How far is it? And is there any plan to improve the accessibility to the bus stop?

……
……
……

c. Based on the theory, is it close enough to get **from bus stop to destination** (from central activities points, i.e: school, central business district, office) of the passengers?

……
……
……

3. Availability

a. According to the transportation theory, how many times a day (**frequency**) the bus operated in a certain corridor? Is it already enough? Is there any plan to **increase the frequency** of the bus?

……
……
……

4. Time

a. According to the theory, how long does the bus should **stop to load** the passengers at the bus stop? And what do you think about the current **bus waiting time**?

……
……
……

b. Based on the theory, how long does the bus should **take time to arrive** at the bus stop from the latest one?

……
……
……

B. User's satisfaction

1. Expectation

a. In your opinion as a transportation expert, what do you think about **passenger's expectation** of using this BRT? Do you think it is already meet the expectation of the passengers?

……
……
……

2. Recommendation

a. With the current service that passenger's receive, do you think they will **recommend** their friends/ colleagues to use Makassar BRT?

……
……
……

C. Socio-economic status of the passengers

1. Income

a. Based on your observation, does this BRT have been targeted for everyone? Or is it only planned for certain socio-economic status (**income** level)? And how do they perceive it, is there any difference?

……
……
……

D. Additional questions

a. How much was the investment of this Makassar BRT?

……

b. When was it first operated?

……

c. How many buses operated, and in which corridors are they operating?

……

d. Is there any plan to create any mobile application/ online service?

……

e. What are the next plan for this BRT? Is there any plan to add more route/ bus? Or any other plans?

……

E. More comments

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1.2 SPSS Syntax

```
FACTOR /*Factor analysis for "Service" variables
  /VARIABLES Serv_Driver Serv_Supervisor Serv_Ticket Serv_Comfort Serv_Safety
  /MISSING LISTWISE
  /ANALYSIS Serv_Driver Serv_Supervisor Serv_Ticket Serv_Comfort Serv_Safety
  /PRINT INITIAL CORRELATION SIG DET AIC EXTRACTION
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.


FACTOR /*Factor analysis for "Accessibility" variables
  /VARIABLES Acc_Generally Acc_Dist_From_Origin Acc_Dist_From_Bus_Stop
  /MISSING LISTWISE
  /ANALYSIS Acc_Generally Acc_Dist_From_Origin Acc_Dist_From_Bus_Stop
  /PRINT INITIAL CORRELATION SIG DET AIC EXTRACTION
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.

FACTOR /*Factor analysis for "Time" variables
  /VARIABLES Time_Waiting_Time Time_Travel_Time
  /MISSING LISTWISE
  /ANALYSIS Time_Waiting_Time Time_Travel_Time
  /PRINT INITIAL CORRELATION SIG DET AIC EXTRACTION
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.


FACTOR /*Factor analysis for "Satisfaction" variables
  /VARIABLES Satis_User_Expect_Generally Satis_User_Satisfaction_Generally
    Satis_Willingness_Reccomend
  /MISSING LISTWISE
  /ANALYSIS Satis_User_Expect_Generally Satis_User_Satisfaction_Generally
    Satis_Willingness_Reccomend
  /PRINT INITIAL CORRELATION SIG DET AIC EXTRACTION
  /PLOT EIGEN
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.

/*Reliability*/

RELIABILITY /*Reliability analysis for "Service" variables
  /VARIABLES=Serv_Driver Serv_Supervisor Serv_Ticket Serv_Comfort Serv_Safety
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE CORR COV.


RELIABILITY /*Reliability analysis for "Accessibility" variables
  /VARIABLES=Acc_Generally Acc_Dist_From_Origin Acc_Dist_From_Bus_Stop
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE CORR COV.



RELIABILITY /*Reliability analysis for "Time" variables
  /VARIABLES=Time_Waiting_Time Time_Travel_Time
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE CORR COV.

RELIABILITY /*Reliability analysis for "Satisfaction" variables
  /VARIABLES=Satis_User_Expect_Generally Satis_User_Satisfaction_Generally
    Satis_Willingness_Reccomend
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE CORR COV.

/*Computing*/
COMPUTE Service=(Serv_Driver + Serv_Supervisor + Serv_Ticket + Serv_Comfort + Serv_Safety) /5.
EXECUTE.

COMPUTE Accessibility=(Acc_Generally + Acc_Dist_From_Origin + Acc_Dist_From_Bus_Stop) /3.
```

```
EXECUTE.

COMPUTE Time=(Time_Waiting_Time + Time_Travel_Time) /2.
EXECUTE.

COMPUTE Satisfaction=(Satis_User_Expect_Generally + Satis_User_Satisfaction_Generally +
    Satis_Willingness_Reccomend) /3.
EXECUTE.

* Encoding: UTF-8.
/*Merge categories*/

fre Availability.

RECODE Availability (1=1) (2=2) (3=3) (4 thru 5=4) INTO Availabilitynew.
EXECUTE.

fre Availabilitynew.

/*3 dummies*/

RECODE Availabilitynew (1=1) (2=0) (3=0) (4=0) INTO Very_dissatisfied.
execute.

RECODE Availabilitynew (1=0) (2=1) (3=0) (4=0) INTO Dissatisfied.
execute.

RECODE Availabilitynew (1=0) (2=0) (3=1) (4=0) INTO Quite_satisfied.
execute.

fre Availability Availabilitynew Very_dissatisfied Dissatisfied Quite_satisfied.

/*Dummy coding*/

*SES

fre Economic_Class.

RECODE Economic_Class (1=0) (2=1) (3=0) INTO Economic_Classnewmiddle.
execute.

RECODE Economic_Class (1=0) (2=0) (3=1) INTO Economic_Classnewhigh.
execute.

fre Economic_Class Economic_Classnewmiddle Economic_Classnewhigh.

/*Centring independent variables*/

DESCRIPTIVES Service Accessibility Time.

COMPUTE c_Service = Service - 3.4883.
EXECUTE.

COMPUTE c_Accessibility = Accessibility - 2.1963.
EXECUTE.

COMPUTE c_Time = Time - 2.5460.
EXECUTE.

DESCRIPTIVES Service Accessibility Time c_Service c_Accessibility c_Time.

/*Interactions, due to centring*/

Compute C_Interaction1a=c_Service*Economic_Classnewmiddle.
execute.

Compute C_Interaction1b=c_Service*Economic_Classnewhigh.
execute.

Compute C_Interaction2a=c_Accessibility*Economic_Classnewmiddle.
execute.

Compute C_Interaction2b=c_Accessibility*Economic_Classnewhigh.
execute.

Compute C_Interaction3a=c_Time*Economic_Classnewmiddle.
execute.

Compute C_Interaction3b=c_Time*Economic_Classnewhigh.
execute.

/*Regression*/.

*model 1 and 2, table 1,2,3.

REGRESSION
```

```
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Satisfaction
  /METHOD=ENTER Economic_Classnewmiddle Economic_Classnewhigh
  /METHOD=ENTER Very_dissatisfied Dissatisfied Quite_satisfied.

*model 3 and 4, table 1.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Satisfaction
  /METHOD=ENTER Economic_Classnewmiddle Economic_Classnewhigh
  /METHOD=ENTER c_Service
  /METHOD=ENTER C_Interaction1a C_Interaction1b.

*model 3 and 4, table 2.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Satisfaction
  /METHOD=ENTER Economic_Classnewmiddle Economic_Classnewhigh
  /METHOD=ENTER c_Accessibility
  /METHOD=ENTER C_Interaction2a C_Interaction2b.

*model 3 and 4, table 3.

REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Satisfaction
  /METHOD=ENTER Economic_Classnewmiddle Economic_Classnewhigh
  /METHOD=ENTER c_Time
  /METHOD=ENTER C_Interaction3a C_Interaction3b.
```

Time Schedule

Data Collection Timeline:

	June					July				
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 1	Week 2	Week 3	Week 4	Week 5
Primary data										
Interview with passengers										
Interview with operator representative(s)										
Interview with project planner										
Interview with local transportation expert										
Secondary data										
Daily passenger data										
Data Analysis										
Primary and secondary data										

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