

**DYNAMIC GOVERNANCE: OPTIMIZING SUBSIDY POLICY PUBLIC
TRANSPORTATION WITH DISTANCE-BASED RATES
CASE STUDY: LRT JABODEBEK PT KERETA API INDONESIA (PERSERO)**

THESIS

**In partial fulfilment of the requirements
for the master's degree
from Institut Teknologi Bandung**

By:

**DEWI WAHYU KOCONINGRAHAYU
Student ID: 29120592
(Master of Business Administration Program)**



INSTITUT TEKNOLOGI BANDUNG

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ABSTRACT

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Transportation problems in the Jabodebek area, especially congestion, have become a major challenge for public mobility. Congestion in Jakarta is caused by several factors, including limited roads, dependence on private vehicles, and the increasing number of vehicles. As a solution, the Indonesian government developed the LRT Jabodebek project with the intention of reducing congestion and reducing public dependence on private vehicles. The LRT Jabodebek integrates Communication Based Train Control (CBTC) technology and the GoA 3 operating system (driverless), and connects strategic areas such as Bekasi, Dukuh Atas, and Cibubur with a total length of 44 km. This project is also connected to other modes of transportation such as KRL, BRT Transjakarta, and the Jakarta-Bandung High Speed Train.

However, this project faces various obstacles, such as land acquisition, the impact of the COVID-19 pandemic, and construction delays that have resulted in a delay in operations from 2019 to 2023. In addition, this project has experienced a cost overrun of IDR 2.6 trillion, which has the potential to affect the financial performance of PT Kereta Api Indonesia (KAI). To ensure the financial feasibility of the project, the government provides subsidies aimed at reducing the burden of operational costs that must be borne by KAI.

This study proposes the implementation of a distance-based rates system that better reflects actual costs and provides flexibility for passengers to choose efficient trips. In addition, this study also emphasizes the importance of a zone-based rate system, which is more in line with passenger travel patterns and provides more flexibility for users.

The research method used is quantitative and literature research to analyze transportation policies in the Jabodebek area. The results of the Paired t-test show that the distance-based and zone-based rate systems are preferred by passengers compared to fixed tariff. The distance-based rates scheme increased interest by 16.73%, while the zone-based tariff increased by 17.55%. Both schemes are considered fairer and more in accordance with the distance or zone traveled.

Based on the results of the study, it can be concluded that the public prefers the implementation of a distance-based or zone-based rate system compared to the previously planned fixed tariff. This preference arises because of a greater sense of fairness, considering that distance-based or zone-based rate reflect the actual journey taken by users, so they are more in line with their needs and travel conditions.

This study also shows that the implementation of a distance and zone-based tariff system can increase public interest in using the LRT Jabodebek, because this scheme is considered fairer and more flexible. This finding is supported by the results of statistical tests that show significant differences in public preference for the distance and zone-based rate system compared to fixed tariffs. The concept of Dynamic Governance as a subsidy policy (Public Service Obligation/PSO) also plays an important role, because it allows flexible adjustment of subsidy policies based on demand patterns, operational capacity, and dynamic socio-economic conditions. With the implementation of the dynamic governance concept, the LRT Jabodebek subsidy policy can be more responsive and efficient, ensuring that the subsidies provided are right on target and not excessive, and optimizing the potential revenue from adjusted tariffs. Thus, the implementation of this adaptive tariff system is expected to increase operational efficiency, reduce dependence on subsidies, and create a more sustainable and affordable transportation system for the community.

Keywords: LRT Jabodebek, Dynamic Governance

ABSTRAK

DYNAMIC GOVERNANCE: MENOPTIMALKAN KEBIJAKAN SUBSIDI ANGKUTAN UMUM DENGAN TARIF BERBASIS JARAK STUDI KASUS: LRT JABODEBEK PT KERETA API INDONESIA (PERSERO)

By:

**DEWI WAHYU KOCONINGRAHAYU
Student ID: 29120592
(Master of Business Administration Program)**

Masalah transportasi di wilayah Jabodebek, khususnya kemacetan, telah menjadi tantangan utama bagi mobilitas masyarakat. Kemacetan di Jakarta disebabkan oleh beberapa faktor, antara lain keterbatasan jalan, ketergantungan pada kendaraan pribadi, dan meningkatnya jumlah kendaraan. Sebagai solusi, pemerintah Indonesia mengembangkan proyek LRT Jabodek dengan tujuan mengurangi kemacetan dan mengurangi ketergantungan masyarakat pada kendaraan pribadi. LRT Jabodek mengintegrasikan teknologi Communication Based Train Control (CBTC) dan sistem operasi GoA 3 (tanpa pengemudi), serta menghubungkan kawasan strategis seperti Bekasi, Dukuh Atas, dan Cibubur dengan panjang total 44 km. Proyek ini juga terhubung dengan moda transportasi lain seperti KRL, BRT Transjakarta, dan Kereta Cepat Jakarta-Bandung.

Namun, proyek ini menghadapi berbagai hambatan, seperti pembebasan lahan, dampak pandemi COVID-19, dan keterlambatan konstruksi yang mengakibatkan penundaan operasional dari yang seharusnya pada 2019 menjadi 2023. Selain itu, proyek ini mengalami cost overrun sebesar Rp 2,6 triliun, yang berpotensi mempengaruhi kinerja keuangan PT Kereta Api Indonesia (KAI). Untuk memastikan kelayakan finansial proyek, pemerintah memberikan subsidi yang bertujuan untuk mengurangi beban biaya operasional yang harus ditanggung oleh KAI.

Penelitian ini mengusulkan penerapan sistem tarif berbasis jarak yang lebih mencerminkan biaya sesungguhnya dan memberikan fleksibilitas kepada penumpang untuk memilih perjalanan yang efisien. Selain itu, penelitian ini juga menekankan pentingnya sistem tarif berbasis zona, yang lebih sesuai dengan pola perjalanan penumpang dan memberikan lebih banyak fleksibilitas bagi pengguna.

Metode penelitian yang digunakan adalah kuantitatif dan penelitian kepustakaan untuk menganalisis kebijakan transportasi di wilayah Jabodek. Hasil uji Paired t-test menunjukkan bahwa sistem tarif berbasis jarak dan zona lebih disukai oleh penumpang dibandingkan tarif tetap. Skema tarif berbasis jarak meningkatkan minat sebesar 16,73%, sementara tarif berbasis zona meningkat sebesar 17,55%. Kedua skema ini dianggap lebih adil dan sesuai dengan jarak atau zona yang ditempuh.

Berdasarkan hasil penelitian, dapat disimpulkan bahwa masyarakat lebih memilih penerapan sistem tarif berbasis jarak atau zona dibandingkan tarif tetap yang sebelumnya direncanakan. Preferensi ini muncul karena adanya rasa keadilan yang lebih besar, mengingat tarif berbasis jarak atau zona mencerminkan perjalanan yang sebenarnya ditempuh oleh pengguna, sehingga lebih sesuai dengan kebutuhan dan kondisi perjalanan mereka.

Penelitian ini juga menunjukkan bahwa penerapan sistem tarif berbasis jarak dan zona dapat meningkatkan minat masyarakat untuk menggunakan LRT Jabodek, karena skema ini dianggap lebih adil dan fleksibel. Temuan ini didukung oleh hasil uji statistik yang menunjukkan perbedaan signifikan dalam preferensi masyarakat terhadap sistem tarif berbasis jarak dan zona dibandingkan dengan tarif tetap. Konsep Dynamic Governance sebagai kebijakan subsidi (Public Service Obligation/PSO) juga memainkan peran penting, karena memungkinkan penyesuaian kebijakan subsidi secara fleksibel berdasarkan pola permintaan, kapasitas operasional, dan kondisi sosial-ekonomi yang dinamis.

Dengan penerapan konsep dynamic governance, kebijakan subsidi LRT Jabodek dapat lebih responsif dan efisien, memastikan bahwa subsidi yang diberikan tepat sasaran dan tidak berlebihan, serta mengoptimalkan potensi pendapatan dari tarif yang disesuaikan. Dengan demikian, penerapan sistem tarif yang adaptif ini diharapkan dapat meningkatkan efisiensi operasional, mengurangi ketergantungan pada subsidi, dan menciptakan sistem transportasi yang lebih berkelanjutan dan terjangkau bagi masyarakat.

Kata Kunci: LRT Jabodebek, Dynamic Governance

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Approved

Date: December, 2024

Supervisor



Atik Aprianingsih, S.T, MM, DBA.

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This thesis is dedicated to Allah SWT with all his goodness

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Bandung, December 2024

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CHAPTER I

INTRODUCTION

I.1 Background

Public transportation plays an important role in realizing the vision of Golden Indonesia 2045, especially in creating effective connectivity in various modes of transportation, such as land, sea, air, and rail. Transportation infrastructure serves as a benchmark in supporting regional development, which in turn accelerates economic growth and improves the quality of life of the community. This is in line with the statement of the Indonesian Minister of Transportation (2021), who emphasized the importance of infrastructure development to achieve these goals.

PT Kereta Api Indonesia (Persero) or KAI plays a strategic role in supporting the provision of connectivity infrastructure that can increase productivity. The infrastructure built by KAI is expected to provide long-term benefits, both in terms of economic growth, efficiency of resource use, and improving the quality of life of the community. In addition, this increase in productivity not only has an impact on the macro economy, but also on a larger and optimal economic scale, which shows that there is an improvement in efficiency in using existing resources.

One of the main objectives of developing this transportation infrastructure is to reduce traffic congestion, which is often the main obstacle to urban mobility, especially in the Jabodebek area (Jakarta, Bogor, Depok, and Bekasi). With a better mass transportation system, it is hoped that congestion can be minimized, so that urban mobility can run smoothly and sustainably. This transportation system will encourage more managed urbanization and improve the quality of life of the community as a whole, by facilitating the movement of people from one area to another more quickly, efficiently, and environmentally friendly.

The Light Rail Transit (LRT) Jabodebek project, which has been operational since August 28, 2023, has indeed made a significant contribution to improving connectivity and mobility in the Jakarta, Bogor, Depok, and Bekasi (Jabodebek) areas. With more than 15.2 million passengers transported to date, the LRT Jabodebek shows great potential in reducing congestion and providing efficient and environmentally friendly transportation solutions. However, the main challenge faced by this project, especially in the operational stage, is how to maintain the affordability and accessibility of services for all levels of society, especially considering the high operational costs.

One of the main aspects of the LRT Jabodebek service is the implementation of a distance-based fare system, where the fare charged to passengers is calculated based on how far the trip is made. Although this system aims to create fairness, in reality determining the fare can be a challenge, especially related to the varying purchasing power of the community.

In Indonesia, especially in Jakarta, there is a significant economic gap between low-income and high-income communities. Jakarta as the center of economy and employment, many residents from the regions or outskirts rely on public transportation to earn a living in the city center. In this case, excessive fares can burden low-income communities, preventing them from using the LRT Jabodebek as a more efficient means of transportation.

In addition, fare regulation is also closely related to the principle of social justice. As a means of public transportation, the LRT Jabodebek should provide equal access to all levels of society, without reducing the quality of service. If the fare is too high, people with low or middle incomes may have difficulty accessing transportation that they should be able to use to reach their workplace, education, or other needs.

As a form of government support to the community so that the LRT Jabodebek fare is affordable, the government provides subsidies in the form of PSO (Public Service Obligation). PSO requires the government to provide subsidies to public transportation service providers so that fares remain affordable for the wider community, especially those with low incomes. The distance-based fare system used in the LRT Jabodebek may need to be balanced with appropriate subsidy policies to maintain the financial sustainability of service delivery, while ensuring fairness in transportation access for the community.

Dynamic governance plays an important role in adjusting and optimizing fares to ensure that subsidies provided can address differences in purchasing power between different community groups. With a responsive governance approach, the government and PT KAI can continue to adjust fares based on changes in economic conditions and the ever-growing level of purchasing power of the community. Previous studies have shown that the need for a more complex railway fare structure can provide potential benefits to customers, as far as offering greater opportunities to find a combination of preferred costs, time duration, comfort, and flexibility levels (Anciaes et al., 2019). Therefore, this study believes that in order to face the challenges that arise in the Light Rail Transit (LRT) Jabodebek project, it is important for the government and PT Kereta Api Indonesia (KAI) to adopt a dynamic

governance approach in implementing how to optimize public transportation subsidy policies (LRT Jabodebek) with distance-based fares.

I.2 Company Profile

The history of railways in the archipelago began in 1854 when Namlooze Venootschap Nederlanche Indische Spoorweg Maatschappij built the first railway from Semarang to Surakarta, Central Java. After that, 3 (three) other Dutch companies, namely Staat Spoorwegen, Verenigde Spoorwegenbedrijf, and Deli Spoorwegen Maatschappij, also built railway lines located both in Java and outside Java.

PT Kereta Api Indonesia (Persero) was established on September 28, 1945 as the Republic of Indonesia Railway Service (DKARI) after the independence fighters moved quickly to take over the railway headquarters in Bandung from Japanese control. In early 1946, the Ministry of Transportation of the Republic of Indonesia (RI) issued Decree No. 1/KA which officially authorized DKARI with Ir. Djuanda and Mr. Soewahjo Soemodilogo appointed as Head and Deputy Head of DKARI in its organizational structure.

After officially operating, DKARI underwent changes along with the takeover of the assets of the Dutch East Indies government through the Round Table Conference (RTC) agreement to become the Railway Service (DKA) in 1950. DKA changed again to the State Railway Company (PNKA) on May 25, 1963 to the National Railway Company (PNKA) based on Government Regulation of the Republic of Indonesia No. 22 of 1963. With these changes, PNKA introduced the Wahana Daya Pertiwi logo which expressed the transformation of Indonesian railways as a reliable means of transportation for the welfare of the country. PNKA then changed to the Railway Service Company (PJKA) in 1971 based on Government Regulation of the Republic of Indonesia No. 61 of 1971.

As an effort to improve transportation services, PJKA was changed to Perusahaan Umum Kereta Api (Perumka) in 1999, and then changed back to a Limited Liability Company with the name PT Kereta Api Indonesia (Persero) in 1998 based on Government Regulation of the Republic of Indonesia No. 19 of 1998.

In 2011 the company name of PT Kereta Api (Persero) changed to PT Kereta Api Indonesia (Persero) by launching a new logo.

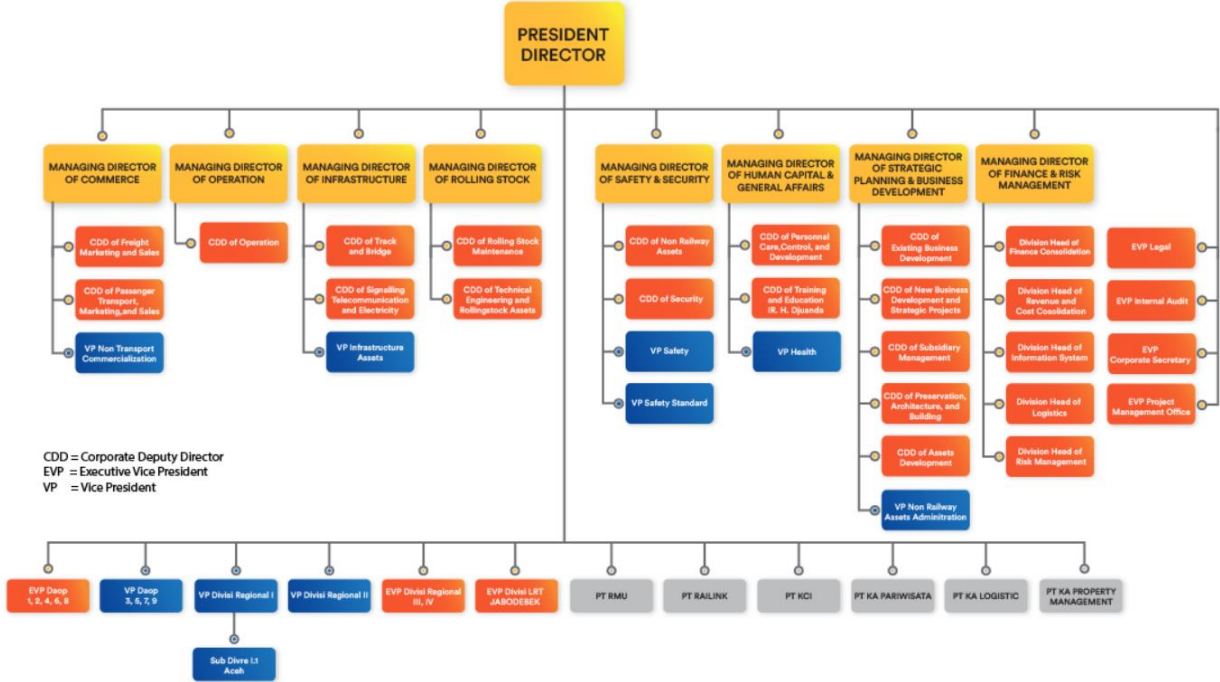


Figure 1.1 Organizational Structure of PT Kereta Api Indonesia (Persero)

PT Kereta Api Indonesia is a Persero led by a President Commissioner who oversees the President Director who is responsible for the management of PT Kereta Api Indonesia. The President Director oversees the Director of Commerce, Director of Operations, Director of Infrastructure Management, Director of Facilities Management, Director of Safety and Security, Director of Human Resources and General Affairs, Director of Strategic Planning and Business Development, Director of Finance and Risk Management. PT Kereta Api Indonesia realizes that HR is an important component in implementing railway services. By 2024, the number of PT KAI Group employees will reach 44 thousand employees.

PT Kereta Api Indonesia (Persero), here in after abbreviated as PT KAI or “Perseroan” is a State-Owned Enterprise that provides, regulates, and manages railway transportation services in Indonesia. PT KAI’s services include passenger and freight transportation. In 2007, the DPR ratified the revision of Law Number 13 of 1992 on Law Number 23 of 2007, which emphasized that private investors and regional governments were given the opportunity to manage railway transportation services in Indonesia. Thus, the enactment of the law legally ended PT KAI’s monopoly in operating trains in Indonesia. However, along with the development of business dynamics and market demands, KAI is

currently spreading its wings by optimizing its resources. KAI currently has 8 subsidiaries and joint ventures, namely:

1. PT Reska Multi Usaha (PT RMU)

It is a subsidiary established in 2003, which aims to implement and support the policies and programs of PT KAI as the parent company, especially the train restaurant business and other businesses. The service business fields on the train include, service on train (SOT), parking, restoration, Loko Cafe, and Catering.

2. PT Railink

PT Railink's business unit is a business activity collaboration carried out by KAI with PT Angkasa Pura II. This business includes the operation, management and management of airport trains, development and management of train stations at airports and in city centers, procurement and maintenance of railway facilities and infrastructure, construction of railway infrastructure, consultation and design of railway systems, and other service businesses that support the main businesses. Airport KAI is implemented by PT Railink which is the result of cooperation between PT KAI and PT Angkasa Pura II (AP II) with a share composition of 60% PT KAI and 40% AP II.

3. PT Kereta Commuter Indonesia (PT KCI)

It is a subsidiary established in 2008 with the main task of organizing the management of commuter train transportation services using Electric Rail Trains ("KRL") in the Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) and surrounding areas as well as management in the non-passenger transportation business sector. PT KCI is a solution to complex urban transportation problems, therefore on October 1, 2020, PT KAI assigned KCI to operate the Electric Train in the Daop 6 Yogyakarta area which was successfully inaugurated on March 1, 2021 by President Jokowi.

4. PT KA Pariwisata (PT Kawista)

KAI Wisata carries out business activities by providing goods and services in the railway sector. KAI Wisata's business activities are run by IndoRailTour. PT Kawista organizes tourist trains that serve across Java with various types of trains offered, including KA Nusantara, Bali, Toraja, Sumatera, Jawa, Imperial, Priority and Kereta Istimewa. PT Kawista also organizes tour and travel services such as ticket reservations, tour packages, and train operations at the Ambarawa Railway Museum.

5. PT Kereta Api Logistik (PT Kalog)

PT Kalog was formed to serve door-to-door service-based logistics distribution. KAI Logistik functions and plays a role in creating added value throughout the value chain of logistics distribution services, including services that have been provided by KAI, such as freight and warehousing. KAI Logistik shares are held by PT KAI at 99.3% and Yayasan Pusaka at 0.7%.

6. PT Kereta Api Properti Manajemen (PT KAPM)

PT KAPM is a subsidiary of PT Kereta Api Indonesia (Persero) which was established in 2009 with core businesses in the fields of construction, property, trade and maintenance of railway infrastructure. The Construction business is focused on providing infrastructure and supporting facilities, while the trading business is focused on meeting the needs of railway spare parts, and the property business focuses on developing and optimizing land owned by KAI and partners.

7. PT Pilar Sinergi BUMN Indonesia (PT PSBI)

This company is a consortium of 4 (four) Indonesian state-owned enterprises, including PT KAI, PT Wijaya Karta (Persero), PT Perkebunan Nusantara VIII (Persero) and PT Jasa Marga (Persero) which was founded in 2015 in collaboration with a consortium of Chinese state-owned enterprises to establish PT Kereta Cepat Indonesia–China (KCIC) which is a company that operates the Indonesian high-speed train network which is planned to be built with the Jakarta–Bandung route.

8. PT Moda Integrasi Transportasi Jabodetabek (PT MITJ)

PT Kereta Api Indonesia's joint venture other than PT PSBI is PT Moda Integrasi Transportasi Jabodetabek (MITJ). This company is a joint venture between PT Kereta Api Indonesia and PT MRT Jakarta with the aim of refining the concept of railway integration and other transportation facilities, as well as developing TOD potential in the Jabodetabek area.

PT Kereta Api Indonesia in carrying out its business activities is guided by the established vision and mission. PT KAI's vision is to become the best transportation ecosystem solution for Indonesia. In order to achieve the vision, PT KAI has a mission, (1) to provide a safe, efficient, digital-based, and rapidly developing transportation system to meet customer needs, (2) to develop integrated mass transportation solutions through investment in human resources, infrastructure, and technology, (3) to advance national development through partnerships with stakeholders, including initiating and implementing the development of important transportation-related infrastructure. In addition, PT KAI,

which is part of a State-owned Enterprises, also implements the AKHLAK corporate culture, including:

- a. Amanah means holding fast to the trust given
- b. Kompeten means continuing to learn and develop capabilities
- c. Harmonis means caring for each other and respecting differences.
- d. Loyal means dedicated to prioritizing the nation and state
- e. Adaptif means continuing to innovate & being enthusiastic in moving or facing change.
- f. Kolaboratif means building synergistic cooperation.

I.3 Business Issue

Transportation problems in the Jabodebek area are indeed very complex, with congestion as one of the main issues faced by the city. Factors causing congestion in Jakarta include the limited ideal road width, people's habits of relying on private cars, and the increasing number of vehicles. The Indonesian government, through national strategic projects such as the LRT Jabodebek, is trying to overcome this urban mobility challenge by developing more efficient and environmentally friendly transportation infrastructure.

The LRT Jabodebek, as one of the modern transportation solutions, is designed using Communication Based Train Control (CBTC) technology and the GoA 3 (driverless) operating system. This LRT will connect strategic areas such as Bekasi, Dukuh Atas, and Cibubur with a total length of 44 km, and is integrated with other modes of transportation such as KRL, BRT Transjakarta, JakLingko, and the Jakarta-Bandung Fast Train. The presence of the LRT Jabodebek is expected to reduce congestion and reduce people's dependence on private vehicles.

However, the development of the LRT Jabodebek has not gone smoothly. Several obstacles such as land acquisition, the impact of the COVID-19 pandemic, and construction delays have caused the delay from the initial planned operation in 2019 to 2023. The project also experienced a cost overrun of IDR 2.6 trillion which has the potential to reduce the financial performance of PT Kereta Api Indonesia (KAI), the operator of the LRT Jabodebek.

To make this project financially feasible, the government provides subsidies aimed at reducing the burden of operational costs that must be borne by KAI. This subsidy is very important because LRT

fares that are too high can burden the community, especially those with low incomes, who are the majority of public transportation users in Jakarta. Therefore, one proposal is the implementation of a distance-based fare scheme, which better reflects the actual costs and provides flexibility for users to choose efficient travel. This is also in line with the government's goal of reducing the gap between regions, where the city center is rich in jobs, while the suburbs are rich in housing.

In addition, to improve the quality of public services, the government and KAI need to adapt quickly to changing community needs. This includes developing more efficient and innovative services in facing challenges in the transportation sector. Improving the quality of service and public satisfaction will be crucial in ensuring the success of the Jabodebek LRT as the preferred mode of transportation in Jakarta. In facing this challenge, it is important for the government and PT KAI to have a dynamic governance approach, which is able to optimize distance-based subsidy and fare policies. Thus, the Jabodebek LRT can not only improve urban mobility, but also provide a positive impact on the environment and the economy of Jakarta as a whole.

I.4 Research Questions and Research Objectives

Based on the explanation of the business problems that have been described above, the questions that are the focus of this research are:

1. Can a distance-based tariff scheme increase public interest in using the LRT Jabodebek?
2. How does dynamic governance become a concept for the LRT Jabodebek subsidy policy?

This research has the following objectives:

1. to determine public interest in using the LRT Jabodebek when using a distance-based tariff design scheme
2. to realize dynamic governance in the LRT Jabodebek subsidy policy

I.5 Research Scope and Limitations

The author provides the scope and limitations of the research which aims to make its implementation more directed towards the intent and purpose of the investigation. The extent of the limitations referred to are as follows:

1. The scope of this research only focuses on the LRT Jabodebek
2. The data used in this study was obtained up to 2023.

3. This study focuses on the provision of government subsidies to provide affordable LRT Jabodebek fares based on distance and measuring people's behavior in using LRT Jabodebek.

This study also estimates some risks and limitations that may arise during the project. In this proposal document we will not list in depth all the risks that may be faced by this project, but we will only highlight the most important risks:

1. Comparisons between alternatives depend on the accuracy of business documents accessible to the author, so there may be some inaccuracies.
2. Information for the case study is limited because specific details of the LRT Jabodebek project are classified so the actual interpretation of the results may not be clear.
3. Political, regulatory and economic instability and other external reasons may change the conclusions of the results.

CHAPTER II

LITERATURE REVIEW

II.1 Literature Review

II.1.1 Dynamic Governance

According to Neo and Chen (2007:52) dynamic governance is formulated as "to how these chosen paths, policies, institutions and structures adapt to an uncertain and fast changing environment so that they remain relevant and effective in achieving the long-term desired outcomes of a society", so that dynamic governance is an approach that emphasizes the ability of organizations, including governments and companies, to adapt by considering elements of culture and capabilities (think ahead, think again, think across) accompanied by driving factors within human resources such as able people and agile processes. External factors also influence the success or failure of the program formed. The attention that can be emphasized in the thinking of dynamic governance is that the government should be able to think of long-term actions to deal with dynamic problems. Very rapid world changes can create uncertainty regarding conditions in the present or in the future.

The following figure shows the framework for dynamic governance system proposed by Neo and Chen (2007:13). The goal achieved is a dynamic government, as shown on the far right of the figure, after adaptive policies are implemented. The foundation of dynamic governance is the institutional culture of a country, which is shown at the bottom of the figure. Three dynamic capabilities, namely: thinking ahead, thinking again, and thinking across are shown in the middle. There are two main tasks to develop dynamic governance capabilities, namely capable people and carried out with good/smart processes (agile processes), which are shown on the left. The external environment influences the governance system through future uncertainty and external practices, which are shown on the left.

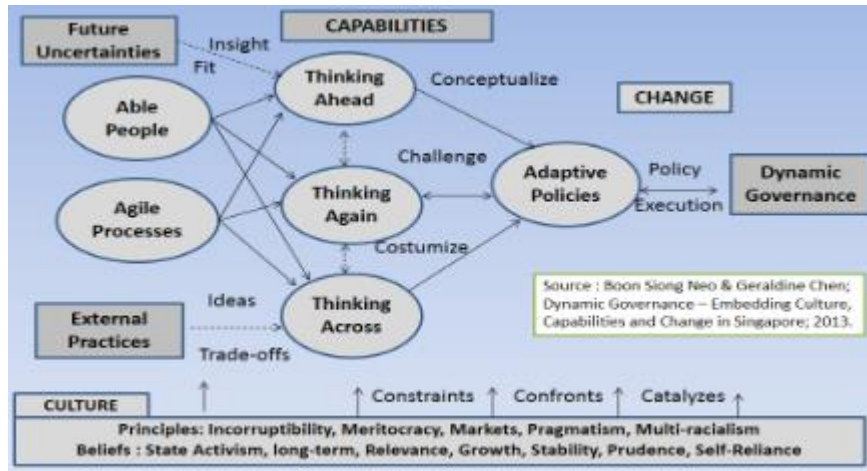


Figure 2.1 Framework for Dynamic Governance System

II.1.2 Transportation Behavior of Jabotadebek Community

Indonesia is the largest economy in Southeast Asia, with a Gross Domestic Product (GDP) estimated to reach IDR 19,624 trillion in 2024. With the fourth largest population in the world, Indonesia has around 276.4 million people, most of whom are of productive age. Indonesia's economic growth is projected to increase by 5.1% in 2024 and continue to grow in the following years, estimated to stabilize at 5.2% per year until 2025. Much of this growth is driven by government spending and investment in the infrastructure sector which is expected to accelerate economic development in the next four years.

Indikator	Satuan	2022A	2023F	2024F	2025F	2026F	2027F
Populasi	Juta Jiwa	272,0	274,2	276,4	278,5	280,6	282,7
Inflasi Rupiah	%	4,2	4,0	2,3	2,1	3,4	3,5
Produk Domestik Bruto ("PDB")	Rp Triliun	17.867	18.671	19.624	20.683	21.759	22.890
Pertumbuhan PDB (Real)	%	5,3	4,5	5,1	5,4	5,2	5,2
Nilai Tukar Asing (Rata-rata)	Rp/USD	14.850	14.897	15.134	15.594	16.213	16.579
Disposable Income ("DI")	Rp Triliun	12.040	12.713	13.760	14.867	16.117	17.502
Pertumbuhan DI (Real)	%	9,2	5,6	8,2	8,0	8,4	8,6

Figure 2.2 Indonesian Economic Outlook

Jabodetabek, consisting of Jakarta and its surrounding areas such as Bogor, Depok, Tangerang, and Bekasi, is the most densely populated and integrated area in Indonesia. Jakarta functions as the center of economic growth, while the areas around Jakarta serve as residential areas for the majority of the population who work in the capital city. However, there is a clear imbalance between the growth of motorized vehicles which is increasing by around 13% per year and road infrastructure which is only growing by 0.01% per year. This condition causes major problems such as traffic congestion, air

pollution, and material losses felt by the community, such as declining air quality, increasing saturation on the roads, and declining quality of life (Sitorus, 2013). To overcome this problem, it is important for the government and companies to design and implement more efficient and sustainable transportation solutions, such as the Light Rail Transit (LRT) Jabodebek.

II.1.2.1 Socio-Economic and Demographic Factors

Socio-economic and demographic factors play an important role in influencing people's transportation behavior in the Jabodetabek area. These factors include:

- **Age:** The productive age group, especially those aged between 20 and 40 years, are the main users of transportation, given their high mobility related to work and social activities. Therefore, understanding the travel patterns of this age group is essential in designing an effective transportation system.
- **Gender:** Gender also influences travel patterns, especially in relation to transportation needs and preferences. For example, women often prefer safe and comfortable public transportation for daily travel, while men tend to use private vehicles more often.
- **Employment Status:** Those working in the formal sector, such as civil servants or employees of large companies, tend to have more regular and scheduled travel patterns than informal sector workers. Therefore, a transportation system that prioritizes punctuality will be more attractive to this group.

II.1.2.2 Travel Characteristics

Travel characteristics are the main factors that influence people's decisions to choose a mode of transportation. Some relevant trip characteristics include:

- **Travel Distance:** The longer the distance traveled, the greater the need to use efficient transportation modes, such as the LRT Jabodebek. Conversely, short-distance trips more often use private vehicles or other more flexible modes of transportation.
- **Travel Time:** Travel time is an important factor in influencing user comfort. Reducing travel time can be a major attraction to encourage people to switch to public transportation. Fast and efficient transportation systems can reduce the burden of long trips, which is a major factor in increasing demand for public transportation (Muro Rodriguez et al., 2017).

- **Travel Costs:** The costs associated with traveling also influence people's decision to use public transportation. People tend to look for affordable modes of transportation, especially those who live in the suburbs and have limited purchasing power.

II.1.2.3 Quality of Transportation

The quality of transportation also plays a key role in determining people's preferences for the mode of transportation used. Some aspects of transportation quality that must be considered include:

- **Speed:** The speed of transportation services is very important, especially in dense areas such as Jabodetabek. The LRT Jabodebek is designed to increase travel speeds, which is expected to reduce congestion and travel time for passengers.
- **Comfort:** Passengers want comfort during the journey, which includes comfortable seats, the right temperature, cleanliness, and safe and clean conditions. Comfort is a determining factor for people in choosing public transportation.
- **Safety:** The transportation system must ensure the safety of passengers from potential accidents or disturbances. LRT Jabodebek, by using Communication Based Train Control (CBTC) technology and the GoA 3 (driverless) system, is expected to increase the sense of safety for passengers.
- **Cost:** Affordable transportation costs are essential to attract users, especially in areas with low-income populations. Fair fare policies, such as the distance-based fare that has been implemented in the LRT Jabodebek, need to be optimized to provide wider access to the community.
- **Practicality:** Ease of use of transportation modes is also an important factor. Transportation that is easily accessible, integrated with other modes (such as KRL and BRT), and can be accessed through digital applications provides greater convenience for passengers.
- **High Mobility:** A mode of transportation that has high frequency and is reliable in terms of departure schedules is the main choice for users who prioritize high mobility. LRT Jabodebek offers better and more stable frequencies, which provides great benefits for people who want fast and efficient transportation solutions.

II.1.3 Distance Based Rates

Distance-based rates are one method used to determine the transportation costs charged to passengers based on how far the distance traveled during the trip. In Peraturan Menteri (PM) 17 of 2018, the

passenger transportation fare is defined as the unit price of services for a certain service route using trains. The basic fare is a fare calculated based on the basic cost plus profit, which is then multiplied by the distance traveled to obtain the distance rate, which is expressed in rupiah per passenger (Rp/pnp). Thus, the fare charged to passengers is highly dependent on the distance traveled during the trip (Transportation, 2018).

Distance-based rate systems have several advantages and challenges that need to be considered. Several studies and practices applied to distance-based rates systems provide important insights into how fares can be optimized and adjusted to the dynamics of passenger demand.

A study by Wang et al. (2018) investigated the problem of passenger congestion at crowded train stations, especially in the Central Business District (CBD). With high passenger volumes, these stations have difficulty in handling passenger boarding/alighting efficiently. The study proposed fare differentiation between crowded stations and less frequented stations. In this way, passengers who usually board/alight at crowded stations would be encouraged to use less frequented stations, which are only slightly further away from their destinations. Rate differentiation at crowded stations would divert some passengers to other stations, thereby reducing congestion and facilitating passenger movement. The purpose of this study is to find the optimal fare that can balance passenger congestion with a more even distribution of passengers across the railway station network (S. Wang et al., 2018).

As another example, the Sydney metro fare system uses a tap-on system that relies on tap-and-go technology. Rates are calculated based on zones that include the passenger's departure and destination stations. Passengers tap at their departure station, and the rate is calculated based on the distance traveled to their destination station, where they tap again. This system provides a more flexible way of setting fares, while also providing transparency and convenience for users.

Batarce & Galilea's (2018) research highlights that increasing the distance traveled can lead to significant increases in costs, but the increase in fares is not always directly proportional to the increase in passenger demand. Although fares increase with distance traveled, passengers are not always interested in paying higher fares for longer trips. This suggests that there is a point at which the increase in travel costs is not offset by the increase in passenger demand, which can affect the effectiveness of distance-based fares in attracting more users.

Various fare schemes have been explored in various studies to determine the optimal fare structure, such as rate complexity and zone-based rates. Rate complexity refers to more complex rate

arrangements that take into account various factors, such as travel time, type of service, and passenger volume. Research by Anciaes et al. (2019) shows that while more complex rates may be fairer in some contexts, many passengers prefer simple and easy-to-understand fare alternatives, which allow them to better plan their travel costs.

Zone-based rates, which are widely used in major cities around the world, offer a more transparent and understandable approach for passengers. With a zone-based rate system, rates are charged according to the number of zones traveled by passengers, not just the distance traveled. Research by S. Wang & Qu (2017) shows that people prefer to have multiple rate options that suit their abilities and preferences. In addition, zone-based rates or complex rates can increase the competitiveness of public transportation with other modes of transportation, such as private vehicles, because they provide a variety of more affordable and efficient rate options.

In the implementation of the LRT Jabodebek, a distance-based rate system is very relevant, considering the length of the track which covers more than 40 km and connects various densely populated areas in Jabodebek. Given the large potential volume of passengers, fair and distance-based fare arrangements will ensure that transportation fares remain affordable for all levels of society.

However, to encourage the use of this mode of transportation, the LRT Jabodebek needs to pay attention to the affordability of rates for low-income people, considering the large number of workers from outside Jakarta who rely on public transportation to reach the city center. Therefore, in addition to distance-based rates, adjusting subsidized rates for certain community groups or for trips at certain hours (for example, lower rates during non-peak hours) can be a solution to improve social justice and encourage more people to switch to public transportation.

II.1.4 Public Service Obligations (PSO)

Public Service Obligation (PSO) is the state's obligation to provide public services that are in accordance with the needs and desires of the community, ensuring that facilities and services provided by the government are accessible to all levels of society, reach all service areas, and have uniform quality throughout the region. In the transportation sector, PSO aims to ensure that transportation facilities, such as public transportation and trains, are accessible to all people, including those living in areas with low demand or long distances that are not financially profitable for service providers.

In Indonesia, the PSO policy in the transportation sector began to be implemented in 2000 through a Joint Decree (SKB) of three Ministers: The Minister of Transportation, the Minister of Finance, and the Minister of National Development Planning/BAPPENAS. This policy emerged as part of structural reforms in the railway sector, where the railway company that was previously Perum Kereta Api Indonesia was changed to PT Kereta Api Indonesia (Persero). This change not only requires PT Kereta Api Indonesia to continue to provide affordable public services, but also to operate within a profit-oriented business framework.

However, even though the business orientation changes, the obligation to continue to provide affordable public services does not disappear, and that is the role of PSO in the transportation sector. PSO ensures that even though transportation companies must seek profit, they can still provide services that are accessible to the entire community, including those who are unable or live in areas with low demand. In the context of the LRT Jabodebek, PSO has a very important role in maintaining affordable transportation rates for the community, especially for those who live in areas with low demand or outside denser areas. The LRT Jabodebek, as a new mass transportation system, must ensure that the fares set are accessible to all levels of society, including those with low incomes, so that no group is marginalized from efficient public transportation accessibility.

Important aspects in implementing PSO in LRT Jabodebek are:

1. **Tariff Subsidy:** To keep LRT Jabodebek rates affordable, the government can provide rate subsidies for certain passengers, especially those in areas with low demand or those who are financially disadvantaged. This subsidy allows LRT Jabodebek to maintain reasonable rates for users while still covering some of the operational costs that are not covered by operating income.
2. **Affordability and Accessibility:** One of the main objectives of PSO is to ensure that transportation facilities, such as LRT Jabodebek, are accessible to all people regardless of their socio-economic conditions. This is very important, because LRT Jabodebek is expected to be a mode of transportation that is not only efficient but also accessible to all people, including those living in areas with lower demand.
3. **Fair Rate Setting:** PSO-based rate policies must consider social justice. For example, rates must be adjusted according to distance or travel zone, and the government can introduce lower rates for certain groups of people, such as students, the elderly, or low-income people. Thus, the rates charged can be fairer and do not burden more vulnerable groups.

4. Financial Sustainability: Although PSO provides subsidies, this must be accompanied by a sustainable business model. The government needs to monitor and evaluate subsidy policies regularly to ensure that the subsidies provided are on target and do not disrupt the operational sustainability of the LRT Jabodebek. Efficient subsidy management will help reduce dependence on subsidies, while maintaining transportation accessibility for all levels of society.

II.2 Conceptual Framework

The conceptual framework is used as an analytical tool to identify and map the problems faced by the LRT Jabodebek. By using the conceptual framework, various aspects that affect the operation of the LRT Jabodebek can be analyzed more systematically and structured. This framework also provides guidance for finding the right solution to overcome existing problems.

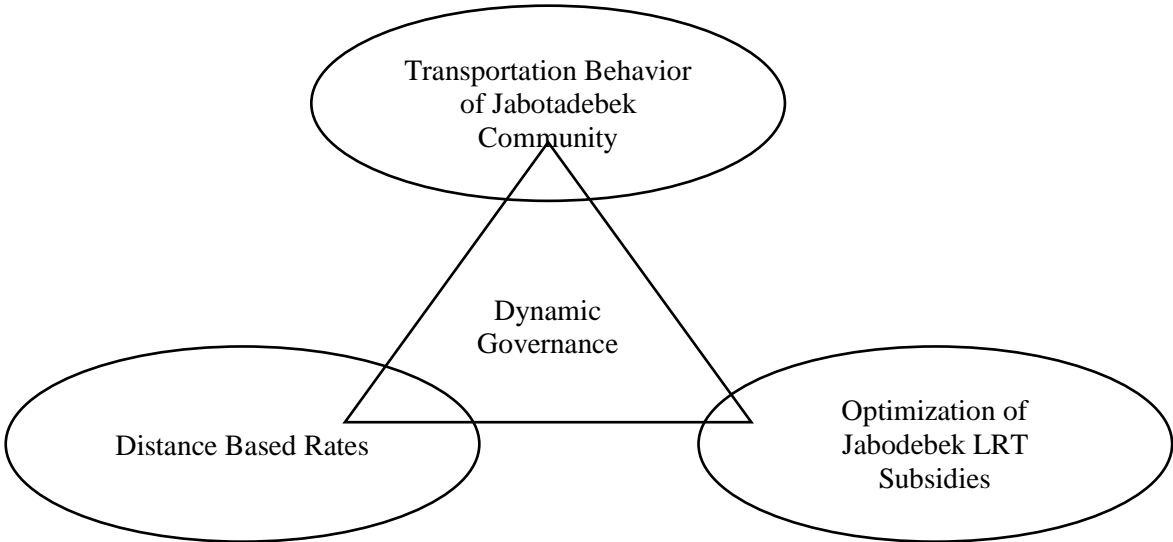


Figure 2.3 Conceptual Framework of the Study

This framework emphasizes the importance of dynamic governance policies in determining distance-based fares to change people's transportation behavior in the Jabodebek area. One of the main objectives of this policy is to increase public interest in using the LRT Jabodebek as a preferred mode of transportation. One of the challenges faced is the low level of demand at intermediate stations that have few passengers. Therefore, understanding the factors that influence passenger behavior is key to designing a fare policy that is not only fair and affordable, but also able to encourage increased demand.

CHAPTER III

RESEARCH METHODOLOGY

III.1 Research Design

The research method we use in analyzing policies to overcome transportation problems in Jabodebek is by using two approaches

1). Quantitative Research: This approach aims to measure phenomena objectively and precisely. Quantitative research uses numerical data and statistical analysis to test hypotheses or measure relationships between certain variables. This approach is widely used to measure consumer behavior, knowledge, opinions, or attitudes (Cooper & Schindler, 2014). The advantage of the quantitative approach is its ability to collect data that can be generalized to a larger population, as well as to identify certain patterns or trends in broader data. In this study, a quantitative approach is used to test the relationship or influence between certain variables that are relevant to the research topic, providing more objective results that can be tested statistically.

2). Literature Research: This approach is used for data collection in this study. Literature research, also known as a literature review, theoretical study, or literary review, refers to a research process that is based on written works, both academic and non-academic (Embun, 2012). Collecting information through literature review and documentation is the main focus in this approach. Literature study techniques are used to dig up information from various sources, such as official government policy documents, company publications, papers, journals, and other sources, including online media.

This literature review process involves not only searching for information, but also careful analysis to ensure that the data collected, the results of the analysis, and the conclusions drawn are relevant and consistent with the research objectives. Literature review requires perseverance and experience to obtain meaningful conclusions. In this study, researchers conducted a search for research journals published through platforms such as ResearchGate and Google Scholar, as well as conducting literature studies from various online media, including news related to public service issues in Jakarta, to obtain an initial picture of the problems of concern in this study.

This analysis aims to provide a deeper understanding of how transportation policies are implemented and how effective they are in addressing transportation problems in Jabodetabek. Thus, this study not

only aims to describe existing policies, but also to provide data-based recommendations that can improve the effectiveness of the LRT Jabodebek policy in the Jabodebek area.

III.2 Data Collection

The object to be studied in this study is the LRT Jabodebek, using primary data and secondary data. This study aims to provide an overview of passenger interest in switching to the LRT Jabodebek, with a focus on collecting and analyzing data related to passenger demand and factors that influence the use of the LRT Jabodebek. The following are the steps taken in collecting primary data:

1. Demand Survey

The demand survey conducted for this study will collect information on the profile of passenger travel along the LRT Jabodebek corridor or route. The focus of this survey is to determine the purpose of travel, frequency of travel, travel time, and the mode of transportation commonly used by passengers. With this information, the study can describe the characteristics of LRT Jabodebek passengers and analyze the potential for shifting modes of transportation from other transportation systems to LRT Jabodebek.

There are 18 stations along the LRT Jabodebek line, consisting of several segments:

- 1). Jatimulya – Cawang Line: On this line, the distance between stations ranges from 1.2 km to 3.9 km. This variation in distance will affect passenger travel patterns, such as travel time and the possibility of changing modes from private vehicles or other public transportation such as buses or KRL.
- 2). Harjamukti – Cawang Line: The distance between stations on this line ranges from 1.6 km to 5.9 km. The longer distance between stations on this line can affect passenger preferences in choosing LRT, as well as its impact on the number of passengers who use this mode of transportation regularly.
- 3). Cawang – Dukuh Atas Line: On this line, the distance between stations is closer, ranging from 0.7 km to 2.2 km. With shorter distances between stations, the LRT Jabodebek on this line has the potential to offer easy access and comfort for passengers who need short-distance travel between points.

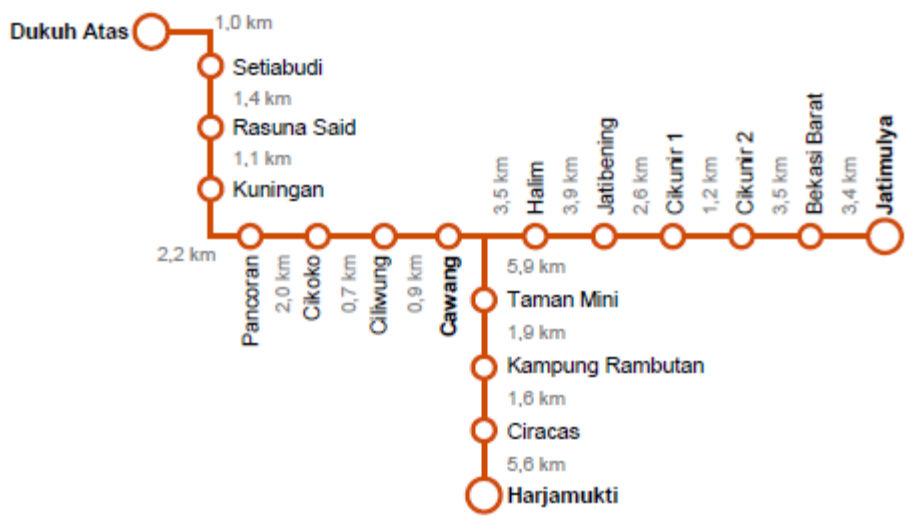


Figure 3.1 LRT Jabodebek Route

Information about the distance between stations is very important in identifying passenger travel patterns and measuring the effectiveness of the LRT Jabodebek as an efficient transportation alternative. Factors such as travel time, ease of access to stations, and transfers between modes of transportation will be the subject of analysis in this study to determine how much public interest there is in switching to the LRT Jabodebek.

The survey conducted at each station will provide a more complete picture of passenger preferences regarding trip frequency, trip purpose, and potential mode shift, as well as help identify factors influencing the adoption of LRT Jabodebek among the public. Thus, the results of this survey will be the basis for planning fare policies, infrastructure improvements, and optimizing LRT Jabodebek operations.

2. Willingness to Pay (WTP) and Ability to Pay (ATP)

The survey method used is state preference to understand the Willingness to Pay (WTP) of potential LRT Jabodebek passengers.

This study will analyze and estimate the WTP (willingness to pay) and ATP (ability to pay) of LRT Jabodebek passengers. This will identify the extent to which passengers are willing to pay the fare charged, as well as whether they have the ability to pay according to the expected fare. This data is important for designing a fare structure that is in accordance with the purchasing power of the community.

3. Market Demand Projection: Based on the data obtained from the survey, researchers will conduct a market demand projection for the LRT Jabodebek. This projection will consider factors such as the number of potential passengers, the rate of adoption of new modes of transportation, and changes in people's travel patterns.

4. Passenger Origin and Destination (OD) Analysis: This study will also conduct an analysis of the origin and destination (OD) of passengers using the LRT Jabodebek, for each existing station. This analysis aims to understand passenger travel patterns, namely where they depart from and their destinations, as well as the potential for switching modes of transportation between LRT Jabodebek and other modes such as buses, KRL, or private transportation. This can provide insight into stations with high demand and the potential for integration between modes of transportation.

5. Peak Hour and Off-Peak Hour Passenger Estimates: This study will analyze and estimate the potential passengers during peak hours and off-peak hours at each LRT Jabodebek station. This data is important for planning operational capacity and schedules, as well as optimizing services to meet passenger needs at various hours.

6. Rate Scheme Impact Analysis: This study will also analyze the impact of various fare scheme options, including progressive and flat fare schemes, on potential passenger numbers. The fare scheme chosen can affect people's interest in using the LRT Jabodebek, so it is important to understand how different fare structures can affect passengers' decisions to switch to this mode of transportation.

III.3 Data Analysis Method

In this study, primary data were obtained through two main methods, namely in-depth interviews and questionnaires designed to provide an overview of how much interest passengers have in switching to the LRT Jabodebek. This study used an online stated preference survey to collect data related to passenger preferences. In the stated preference survey method, respondents are asked to choose between various options provided by the researcher, such as transportation mode or fare options, in an imagined situation. This allows researchers to identify passenger preferences for various factors that influence their decisions in using the LRT Jabodebek. This survey aims to explore the behavior of transportation users in a more realistic scenario, especially regarding the decision to switch from other transportation modes to the LRT Jabodebek.

Secondary data were obtained from PT Kereta Api Indonesia (KAI), which includes official reports and scientific articles relevant to the LRT Jabodebek project. This data also includes an analysis of the potential for LRT Jabodebek passengers, which is used to determine the potential for passenger transfers from other transportation modes to the LRT Jabodebek. This information helps researchers understand the dynamics of passenger transfers and plan appropriate operational capacity and schedules.

In addition, the PwC feasibility study is also used as the main reference for calculating operating costs and distance-based fares. This study provides a strong basis for determining realistic fares and efficient operating strategies. By using this data, the study can identify the financial sustainability of the LRT Jabodebek and formulate a fare policy that can support the overall feasibility of the project.

Overall, this combination of primary and secondary data allows the study to obtain a more comprehensive picture of passenger preferences and the operational potential of the LRT Jabodebek, as well as to design fare policies and operating strategies that are in accordance with market needs and conditions.

In this study, the data analysis techniques used follow several main stages, as explained by Ridder, Miles, Michael Huberman, and Saldaña (2014), which include data reduction, data presentation, and drawing conclusions. The following is a detailed explanation of these stages, as well as the application of data source triangulation and the Paired t-test in the analysis process:

1. Data Reduction

In the data reduction stage, researchers will identify, filter, and simplify information obtained from various data sources. Irrelevant or redundant data will be removed, while data that is important and relevant to the research will be prioritized. In the context of this research, primary data obtained from in-depth interviews and questionnaires, as well as secondary data obtained from PT Kereta Api Indonesia (Persero) and PwC's feasibility study, will be processed and filtered to ensure that only information that is relevant to passenger interests and preferences for the LRT Jabodebek will be analyzed further.

2. Data Presentation

After reduction, relevant data will be presented in a form that is easier to understand, such as tables, graphs, or diagrams. This data presentation aims to organize and systematically compile information

so that it can be analyzed better. For example, the results of a stated preference survey that identifies passenger preferences for various fare scenarios or transportation mode options will be compiled and clearly described to facilitate further analysis.

3. Drawing Conclusions

At this stage, researchers will draw conclusions based on the analysis conducted. The conclusions drawn will include an understanding of the factors that influence passenger interest in switching to the LRT Jabodebek, as well as the effectiveness of the distance-based fare scheme in increasing the use of the LRT Jabodebek. This conclusion will also consider the findings from various data sources that have been presented and analyzed.

4. Data Source Triangulation

To ensure the validity and validity of the data, this study uses data source triangulation. This technique involves comparing and examining data obtained from various sources, such as interviews with informants, stated preference survey results, and secondary data from PT Kereta Api Indonesia (KAI) and PwC's feasibility study. By combining various perspectives and sources of information, triangulation helps improve the accuracy and credibility of the data, ensuring that the results of the study do not rely solely on one source or type of data.

5. Paired t-test

After the data is presented and analyzed, the Paired t-test is used to test whether there is a significant difference between two related data sets. In the context of this study, this test can be used to compare changes in passenger preferences for fares or modes of transportation before and after information about the LRT Jabodebek. For example, this test can evaluate whether there is a significant change in passenger preferences regarding distance-based fares or the effectiveness of the LRT Jabodebek compared to other modes of transportation. The Paired t-test allows researchers to identify whether the changes are statistically significant.

By using data analysis techniques involving data reduction, data presentation, and drawing conclusions, as well as applying data source triangulation and the Paired t-test, this study can obtain more valid and detailed results regarding passenger interests and preferences for the LRT Jabodebek. This approach ensures that the research results are not only accurate but also accountable, providing

a strong basis for policies and strategies that can be applied in the development and operation of the LRT Jabodebek.

In this study, there are three main variables that will be analyzed to answer the problem formulation related to the implementation of the LRT Jabodebek, namely partial fares based on distance, LRT Jabodebek passenger volume, and LRT Jabodebek subsidies. The following is a further explanation of each variable:

a. Partial Rates Based on Distance

Partial rates based on distance refer to fare settings that are adjusted to the distance traveled by passengers. This fare measurement is carried out by comparing the base fare and the distance traveled. Basic fare is a fare calculated based on the basic cost plus profit. The basic cost itself consists of several cost components, namely:

- Capital costs: Costs incurred for infrastructure development, fleet purchases, and other investments.
- Operating costs: Costs incurred to run LRT operations, such as fuel costs, officer salaries, and costs related to daily operations.
- Maintenance costs: Costs incurred to maintain the quality and condition of LRT infrastructure and facilities, including routine maintenance and repairs.

In this context, partial fares based on distance are expected to reflect the real costs that must be borne by operators in providing public transportation services, while still considering the community's ability to pay for the fare. This is important in optimizing the utilization of the LRT Jabodebek and creating an efficient transportation system.

b. LRT Jabodebek Passenger Volume

The LRT Jabodebek passenger volume is one of the important variables that is greatly influenced by fares, travel time, and traffic congestion levels. Based on previous studies, the demand for urban rail transportation is very sensitive to these factors (Q. Wang & Deng, 2019). In this study, a simulation of calculating passenger volume was conducted based on the application of different fares, especially distance-based fares.

Factors such as ticket prices (fares), ease of access to stations, efficient travel time, and integration with other transportation modes (such as KRL, Transjakarta, and the Jakarta-Bandung Fast Train)

will influence passengers' decisions to use the LRT Jabodebek. This study aims to evaluate how distance-based fares can influence passengers' decisions in using the LRT Jabodebek, as well as their impact on overall passenger volume.

c. LRT Jabodebek Subsidy

The LRT Jabodebek subsidy is financial support provided by the government to the LRT Jabodebek operator to maintain operational continuity and ensure that the rates set remain affordable for the community. This subsidy consists of two main components, namely:

Facility subsidy: Subsidy provided to support the procurement and maintenance of transportation facilities, such as trains, station facilities, and other equipment.

Infrastructure subsidy: Subsidy provided for the development and maintenance of infrastructure, such as rails, electrical systems, and other supporting facilities needed for the smooth operation of the LRT Jabodebek (Perhubungan, 2017).

This subsidy is very important to maintain a balance between the sustainability of the LRT Jabodebek operation and ensuring that the fares charged to passengers are not too high, especially for low-income people who depend on public transportation. Subsidies from the government also aim to reduce the burden of operational costs that may not be fully covered by ticket revenues.

The population and sample sizes in this study were adjusted to the locations of the Jabodebek LRT stations to obtain representative and accurate data on passenger interests and preferences for using the LRT Jabodebek. In this case, the researcher selected a minimum of 50 respondents for each station location, which was considered sufficient to provide a representative initial picture of the pattern of utilization and behavior of transportation users.

The selection of population and sample size follows the guidelines commonly used in quantitative research, where adequate population and sample sizes will provide more reliable and valid results. With 17 stations as the focus of the study, the number of 850 respondents will allow researchers to analyze variations in preferences across locations and see how factors such as distance, ease of access, and fares can influence users' decisions to switch to the LRT Jabodebek.

In addition, the large population and sample size also allows researchers to conduct more robust statistical analysis, such as correlation or regression tests, to explore the relationship between the variables studied, such as fares, passenger volume, and subsidies. Thus, the results of the study can

provide more appropriate recommendations for the development of the transportation system in Jakarta.

Route 1 (Cawang - Cibubur)		Route 2 (Cawang - Dukuh Atas)		Route 3 (Cawang - Bekasi)	
Station Name	Number of Questionnaires*	Station Name	Number of Questionnaires*	Station Name	Number of Questionnaires*
TMII Station	50	Cawang Station	50	Jati Bening Baru Station	50
Kp Rambutan Station	50	Ciliwung Station	50	Cikunir 1 Station	50
Ciracas Station	50	Cikoko Station	50	Cikunir 2 Station	50
Harjamukti Station	50	Pancoran Station	50	Bekasi Barat Station	50
		Kuningan Station	50	Jati Mulya Station	50
		Rasuna Said Station	50		
		Setiabudi Station	50		
		Dukuh Atas Station	50		
Total Population and Sample	200		400		250
GRAND TOTAL	850				

Table 3.1 Population and Sample of LRT Jabodebek Station

The sampling technique used in this study is non-probability sampling, where each individual does not have the same chance of being selected as a respondent. This method was chosen because the researcher wanted to obtain a sample that was more focused on a specific population that was relevant to the study. In this case, the judgment sampling technique was applied, which means that the researcher selected a sample based on certain considerations that were considered important for the purpose of the study, such as relevant location and activity criteria.

Judgment sampling was used so that the selected sample included individuals who lived and/or worked around the LRT Jabodebek stations, which were the research locations. This limitation is very important to ensure that the results obtained are more representative of the actual passenger travel patterns. Respondents who live or work in the area around the LRT Jabodebek stations are expected to have direct experience related to their journey from their residence or workplace to the LRT station and vice versa. This experience provides more accurate insight into transportation mode preferences and the possibility of switching to the LRT Jabodebek.

By using this technique, the researcher aims to optimize the relevance of the sample to the research objectives, namely to obtain a more focused and valid picture of passengers' decisions in choosing a mode of transportation and the potential for switching from other public transportation to the LRT

Jabodebek. This sampling technique is expected to provide more detailed and representative data related to the travel patterns and mobility needs of the Jakarta community.

By using the judgment sampling technique and limiting the questionnaire to relevant respondents, this study aims to:

1. Obtain more relevant data on the interests and preferences of passengers in the areas around the LRT Jabodebek stations. This allows researchers to collect more accurate information on the attitudes and needs of the community who are directly affected by the existence of the LRT Jabodebek, as well as to understand how much interest they have in switching to this mode of transportation.
2. Analyze the respondents' journeys from their homes or places of activity to the LRT Jabodebek stations, and vice versa, to understand the factors that drive them to choose a mode of transportation. By analyzing travel patterns, this study can identify the preferences of public transportation users regarding comfort, cost, travel time, and other factors that influence their decisions to choose or not to choose the LRT Jabodebek.
3. Gaining deeper insight into the characteristics of potential users of the LRT Jabodebek, so that it can help design more appropriate policies regarding fares, services, and infrastructure development. This study is expected to provide an understanding of the most potential market segments to use the LRT Jabodebek, so that the government and operators can design appropriate fare policies, improve services, and pay attention to the needs of relevant infrastructure development.
4. Through the use of careful sampling techniques and limitations of this questionnaire, it is hoped that the results of this study can provide more relevant and useful information in designing the development of the LRT Jabodebek and strategies to increase the use of this mode of transportation by the community. By focusing on individuals who live and work around the LRT Jabodebek stations, the results of this study can provide more targeted recommendations on how to increase the use of the LRT Jabodebek, both in terms of fare policies, services, and more efficient and effective infrastructure development.

Through this approach, the study aims to make a significant contribution to the development of transportation policies that can improve the quality and attractiveness of the LRT Jabodebek as the main mode of transportation in the Jakarta area and its surroundings.

CHAPTER IV

RESULT AND DISCUSSION

IV.1. Analysis

With a total of 245 samples, this study aims to collect information on passenger interests and preferences for the use of LRT Jabodebek. Sample selection was carried out by considering certain demographic characteristics, such as age, occupation, income, and mobility habits, which provide a representative picture of the community that has the potential to become LRT Jabodebek users. This approach is important to ensure that the research results can more accurately reflect the needs and preferences of the community, especially those who will use this new mode of transportation.

With this large and diverse sample, this study aims to explore the factors that influence the community's decision to choose LRT Jabodebek as an alternative transportation, as well as to gain insights that can be used in designing policies, tariff strategies, and service development in order to optimally meet user needs.

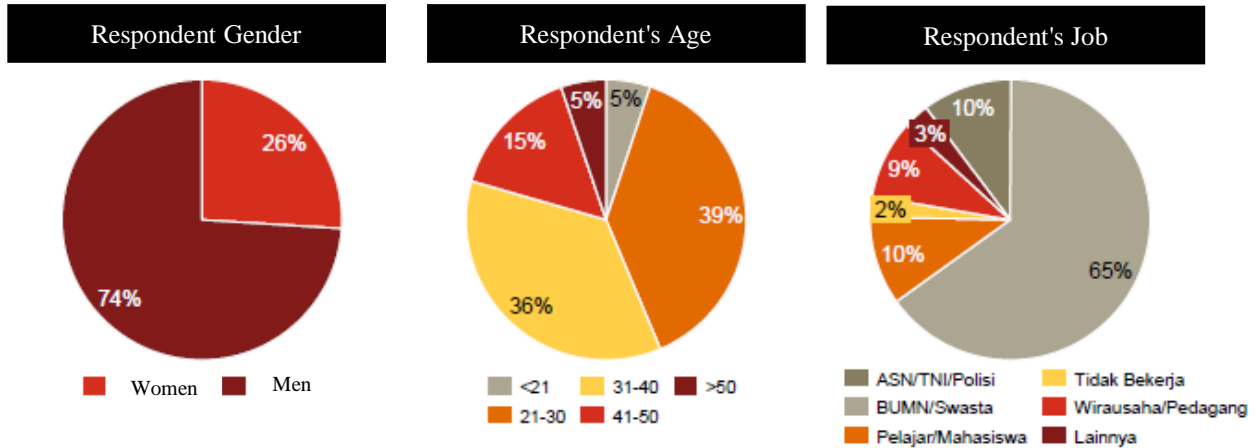


Figure 4.1 Demographic Characteristics of Respondents

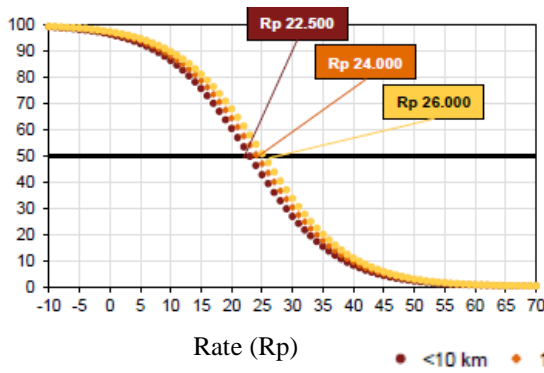
Following are the demographic characteristics of the 245 respondents involved in the survey:

- 1). Gender: The majority of respondents were male, which may reflect trends in public transport use in this area.
- 2). Respondent Age: The dominant respondents are in the 21-30 age group, which is a productive age group and active in daily mobility for work or study activities. This age group may have certain preferences for price, comfort, and travel time. They also tend to be more open to technology and innovation in the transportation system.

3). Respondent's Occupation: The majority of respondents work as employees indicating that most LRT Jabodebek passengers are working people, who may have a fixed schedule, such as regular office hours. This may affect their preferences regarding travel time, comfort, and punctuality of service. They may prioritize ease of access, travel speed, and service reliability to meet their daily mobility needs. In addition, there is a significant proportion of students who will also be greatly affected by the existence of LRT Jabodebek.

Based on the survey results, it was found that the probability of mode shifting for motorcycle, bus, and KRL users was greater than the mode shifting for car users. This shows that most LRT Jabodebek passengers are likely to switch from public transportation modes such as buses or KRL, as well as private vehicles such as motorcycles, which are more affordable and comfortable to use in the Jabodek area. The decision to switch to LRT Jabodebek is greatly influenced by factors such as time efficiency, ease of access, and travel costs.

Probability of Switching – Car Mode



Probability of Switching – Motorcycle Mode

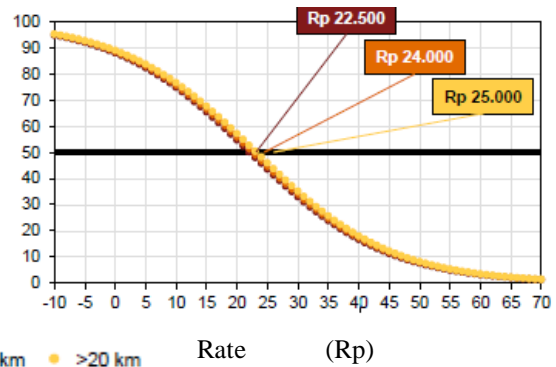
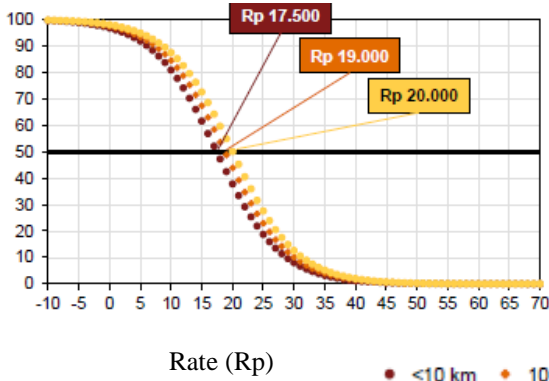


Figure 4.2 Probability of Switching between Cars and Motorcycles

Probability of Switching – Bus Mode



Probability of Changing – Commuter Line Mode

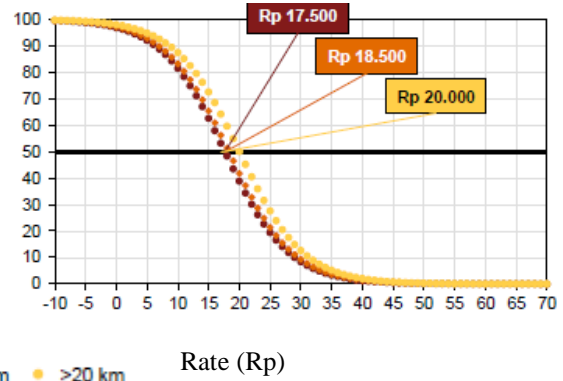


Figure 4.3 Probability of Switching Bus and Commuter Line

No.	Variables	Mark
1	Average income per month	Rp11,649,147
2	% average transportation expenditure per month to income	19.05%
3	Average number of family members in one family	4 Members
4	Family transportation expenses to places of activity (average per month)	Rp3,405,757
5	% of transportation expenditure to the place of activity (average per month against income)	29.24%
6	Ability to Pay	Rp32,438

Table 4.1 ATP Results of Travelers in Jabodebek

Based on the survey results showing that the ability to pay of travelers in the Jabodebek area is estimated to be around Rp 32,000, this provides an overview of the financial limits of most public transportation users in the area in paying for travel costs. To ensure that the LRT Jabodebek fare remains affordable, it is important for the fare policy to consider:

- Community income
- Frequency and intensity of travel
- Total monthly expenses for transportation
- The proposition of transportation expenditure against their income

Taking this into account, the LRT Jabodebek can remain an efficient and affordable option, maintaining a balance between fares and users' ability to pay.

Origin/Destination Station	Bekasi Barat	Cawang	Cikoko	Cikunir 1	Cikunir 2	Cilwung	Ciracas	Dukuh Atas	Cibubur/ Harjamukti	Jati Cempaka/ Jatibening Baru	Bekasi Timur/ Jatimulya	Kp Rambutan	Kuningan	Pancoran	Rasuna Said	Setiabudi	Taman Mini/ TMII	Total
Bekasi Barat	0,00%	0,41%	1,39%	0,08%	0,00%	0,00%	0,08%	4,49%	0,82%	0,08%	0,65%	0,16%	1,06%	0,41%	1,06%	1,06%	0,08%	11,8%
Cawang	0,33%	0,00%	0,00%	0,08%	0,00%	0,00%	0,00%	1,31%	0,16%	0,00%	0,90%	0,08%	0,00%	0,00%	0,16%	0,33%	0,00%	3,3%
Cikoko	1,06%	0,00%	0,00%	0,24%	0,16%	0,00%	0,08%	3,92%	0,82%	0,57%	0,82%	0,08%	1,06%	0,08%	0,24%	0,49%	0,24%	9,9%
Cikunir 1	0,00%	0,08%	0,33%	0,00%	0,00%	0,00%	0,00%	0,41%	0,08%	0,08%	0,00%	0,00%	0,08%	0,08%	0,00%	0,16%	0,08%	1,4%
Cikunir 2	0,00%	0,00%	0,24%	0,00%	0,00%	0,00%	0,08%	0,24%	0,16%	0,00%	0,00%	0,00%	0,00%	0,08%	0,16%	0,00%	0,00%	1,0%
Cilwung	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,33%	0,08%	0,00%	0,08%	0,00%	0,08%	0,00%	0,08%	0,00%	0,08%	0,8%
Ciracas	0,00%	0,00%	0,08%	0,00%	0,08%	0,00%	0,00%	0,57%	1,31%	0,00%	0,08%	0,00%	0,16%	0,24%	0,08%	0,24%	0,16%	3,0%
Dukuh Atas	3,83%	1,14%	2,85%	0,49%	0,24%	0,24%	0,41%	0,00%	1,55%	1,06%	2,20%	0,16%	1,88%	0,82%	0,33%	0,73%	0,92%	18,8%
Cibubur/Harjamukti	0,82%	0,24%	0,98%	0,08%	0,08%	0,08%	1,31%	2,28%	0,00%	0,08%	0,57%	1,39%	1,31%	1,14%	0,49%	0,73%	1,06%	12,6%
Jaticempaka/Jatibening Baru	0,08%	0,00%	0,65%	0,16%	0,00%	0,00%	0,00%	1,14%	0,08%	0,00%	0,08%	0,16%	0,49%	0,24%	0,24%	0,24%	0,16%	3,7%
Bekasi Timur/Jatimulya	0,65%	0,90%	0,82%	0,00%	0,00%	0,08%	0,08%	2,45%	0,57%	0,08%	0,00%	0,08%	0,57%	0,41%	0,33%	0,57%	0,00%	7,6%
Kp Rambutan	0,08%	0,08%	0,08%	0,00%	0,00%	0,00%	0,00%	0,24%	1,31%	0,16%	0,08%	0,00%	0,16%	0,00%	0,00%	0,16%	0,16%	2,5%
Kuningan	0,98%	0,00%	1,06%	0,08%	0,08%	0,08%	0,16%	1,88%	0,98%	0,33%	0,49%	0,08%	0,00%	0,16%	0,00%	0,49%	0,49%	7,3%
Pancoran	0,41%	0,00%	0,08%	0,00%	0,08%	0,00%	0,24%	1,22%	0,90%	0,24%	0,33%	0,00%	0,16%	0,00%	0,65%	0,16%	0,08%	4,6%
Rasuna Said	0,98%	0,08%	0,08%	0,00%	0,16%	0,08%	0,00%	0,33%	0,33%	0,00%	0,16%	0,00%	0,00%	0,24%	0,00%	0,00%	0,00%	2,5%
Setiabudi	0,82%	0,08%	0,49%	0,16%	0,08%	0,00%	0,08%	0,82%	0,57%	0,33%	0,57%	0,16%	0,49%	0,16%	0,00%	0,00%	0,24%	5,0%
Taman Mini/TMII	0,08%	0,00%	0,33%	0,08%	0,00%	0,08%	0,16%	1,22%	1,06%	0,16%	0,00%	0,16%	0,49%	0,08%	0,00%	0,24%	0,00%	4,1%
Total	10,1%	3,0%	9,5%	1,5%	1,0%	0,7%	2,7%	22,8%	10,8%	3,2%	7,0%	2,5%	8,0%	4,1%	3,8%	5,6%	3,8%	100,0%

Information

- : Zone not in demand by passengers
- : Middle zone
- : Passenger favorite zone

Tabel 4.2 Daily Passenger Distribution Estimates

The idea of using distance-based fares in the context of transportation aims to increase passenger volume, especially in less popular areas, by creating a fairer and more balanced fare structure based on the distance traveled by passengers. This will increase the appeal to passengers in areas that are rarely traveled or less popular with transportation services.

1. Single Fare (PM 118 of 2017)

PM 118 of 2017 regulates public transportation fares at Rp12,000, which tends to set a fixed fare for travel from point A to point B without regard to the actual distance traveled. With this single fare system, passengers pay the same amount even though the distance they travel varies. This fixed fare structure is simpler, but can affect the appeal of services in areas with longer or shorter distances.

2. Distance-Based Fares (KM 67 of 2023)

In the distance-based fare system (based on Ministerial Decree KM 67 of 2023), fares are determined based on the distance traveled by passengers, the First 1 Km Rp5,000 and every next 1 Km Rp700. With this system, the further the distance traveled, the higher the fare charged, and vice versa. This aims to create fare equality, where passengers only pay according to the distance they travel.

IV.2. Business Solution

IV.2.1 Paired t-test analysis

Paired t-test is a statistical method used to compare two sets of paired data to determine whether there is a significant difference between two different conditions, either in conditions measured at different times or in two paired measurements. In the context you mentioned, the Paired t-test can be used to compare the average fare between a fixed rate system (for example, a single fare based on PM 118 of 2017) and a rate system based on distance or zone (for example, KM 67 of 2023).

1. Data Preparation

Condition 1: Tariff based on a fixed rate system (PM 118 of 2017).

Condition 2: Tariff based on distance or zone (KM 67 of 2023).

The data used must be a pair of data for each individual or each route, namely the rate in the first condition and the second condition (for example, for each specific travel route or region).

2. Hypothesis

Null Hypothesis (H0): There is no difference in average fare between the fixed fare system and the distance/zone-based fare ($\mu_1 = \mu_2$).

Alternative Hypothesis (H1): There is a difference in average fare between the two systems ($\mu_1 \neq \mu_2$).

3. Calculating the Difference

Calculate the difference between the two rates for each pair of data, namely:

$$d_i = \text{Distance/zone-based fare} - \text{Fixed fare}$$

where d_i is the difference in rate for the i -th data pair.

4. Calculating the t-test Statistic

The formula for the t-statistic for the Paired t-test is:

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

where:

\bar{d} is the average of the differences between the data pairs.

s_d is the standard deviation of the differences.

n is the number of data pairs.

5. Determining the p-value

The p-value is used to determine whether the difference between the two tariff systems is statistically significant. If the p-value is less than the significance level (usually 0.05), then we reject the null hypothesis and conclude that there is a significant difference between the fixed tariff and the tariff based on distance/zone.

Variable	Obs	Mean	Std. Err	Std. Dev	[95% Conf. Interval]	
Distancefare	245	0,8489796	0,022923	0,3588018	0,8038274	0,8941318
Singlefare	245	0,6816327	0,0298225	0,4667965	0,6228902	0,7403751
diff	245	0,1673469	0,0283772	0,4441735	0,1114514	0,2232425

mean (diff)	=	mean (Distancefare – Singlefare)	t = 5,8972
Ho : mean (diff)	=	0	degrees of freedom = 244
Ha : mean (diff)	<	0	Ha : mean (diff) != 0
Pr (T < t)	=	1,0000	Pr (T > t) = 0,0000
			Ha : mean (diff) > 0
			Pr (T > t) = 0,0000

Table 4.3 Paired t test – Fixed Rate and Rate Based on Distance

These results show a very significant finding in the change in passenger interest related to the difference between the fixed fare system and the distance-based fare system.

1) Significant Difference:

- Change in Interest 16.73%: This figure shows that there is a significant increase in the interest of respondents towards the distance-based fare system. Overall, 16.73% more respondents prefer the distance-based fare compared to the fixed fare.

- p-value (0.0000): A very small p-value (much smaller than the significance limit of 0.05) indicates that the difference between the fixed fare and the distance-based fare is not a coincidence, but a statistically significant difference. In other words, the differences found are not just the result of random variation, but reflect real changes in passenger preferences.

2). Passenger Preferences:

Tendency to Choose Distance-Based Rates: The results show that more respondents tend to choose distance-based fares over fixed fares. This could be due to several factors, including:

- Fairness in Payment: Distance-based rates are often perceived as fairer because passengers only pay for the distance they travel. This can be more attractive to passengers traveling short distances, as they will be charged a lower fare compared to the typically higher fixed rates for short distances.
- Perceived Sustainability and Flexibility: Distance-based rates may convey the perception that the rate system is more flexible and can be tailored to different travel needs or circumstances.

3). Policy Implications and Use of Distance-Based Rates:

- With a change in interest of 16.73%, this result provides strong evidence that a distance-based rate system can be more beneficial for both transport operators and passengers, as rates that are more in line with the distance traveled can increase passenger satisfaction and appeal.
- Transport operators may need to consider adopting or introducing a distance-based rate system in areas that have not yet utilized it, to increase passenger numbers and improve the efficiency of the existing fare system.

The results of the Paired t-test show a significant difference in respondents' interest in fixed rates and distance-based rates, indicating that a distance-based rate system is preferred by passengers. The increase in interest of 16.73% indicates that rates that are more proportional to the distance traveled are considered fairer and more attractive. Therefore, a distance-based fare policy can be a good choice to increase passenger satisfaction and improve the appeal of public transportation.

Variable	Obs	Mean	Std. Err	Std. Dev	[95% Conf. Interval]		
Zonafare	245	0,8571429	0,0224018	0,3506434	0,8130173	0,9012684	
Singlefare	245	0,6816327	0,0298225	0,4667965	0,6228902	0,7403751	
diff	245	0,1755102	0,0299026	0,4680491	0,1166101	0,2344103	
mean (diff) = mean (Zonafare – Singlefare)						t = 5,8694	
Ho : mean (diff) = 0						degrees of freedom = 244	
Ha : mean (diff) < 0		Ha : mean (diff) != 0		Ha : mean (diff) > 0			
Pr (T < t) = 1,0000		Pr (T > t) = 0,0000		Pr (T > t) = 0,0000			

Table 4.4 Paired t test – Fixed Rate and Rate Based on Zone

These results show a very significant finding in the change in passenger interest related to the difference between the fixed fare system and the zone-based rate system.

1). Significant Difference:

- **Change in Interest 17.55%:** This figure shows that there is a significant change in the respondents' interest related to the zone-based rate system, with an increase in interest of 17.55%. This means that more respondents prefer zone-based rates compared to fixed rates.
- **p-value (0.0000):** A very small p-value (0.0000) indicates that the difference between fixed rates and zone-based rates is very statistically significant. With a p-value that is much smaller than the significance limit of 0.05, this indicates that the difference found between the two rate systems is not a coincidence, but a real and significant difference.

2). Passenger Preference:

Tendency to Choose Zone-Based Rates: This result shows that passengers are more likely to choose zone-based rates compared to fixed rates. There are several possible reasons for this trend:

- **Flexibility:** Zone-based rates provide greater flexibility as passengers only pay for travel within the zones they pass through. This can be advantageous for passengers who travel within more complex areas or with inter-zone trips.
- **Suitability to Travel Patterns:** Zone-based rates are more suited to diverse travel patterns, especially in large cities or areas with more complex transport networks. Passengers may feel that zone-based fares more accurately reflect the distance or intensity of their trips, which increases the sense of fairness in the fare system.

3). Policy Implications and Use of Distance-Based Rates:

- **Increased Acceptance by Passengers:** With a change in interest of 17.55%, these results indicate that zone-based rates are more accepted and perceived as more attractive by passengers. This could be an indication that flexible and area-based rate systems are more acceptable to the public.
- **Transport Policy and Planning:** Transport operators or policy makers may consider adopting or expanding zone-based rates in a wider area. This can increase passenger satisfaction and attract more public transport users, especially in areas with more frequent cross-zone trips.

The results of the Paired t-test which showed a change in interest of 17.55% indicate that the zone-based rate system is preferred by passengers compared to fixed rates. This increase in interest indicates that zone-based rates are more appropriate for more complex travel patterns and provide more flexibility for passengers. Therefore, the implementation of zone-based rates can be a more profitable and attractive policy for passengers, which in turn can increase the use of public transport.

IV.2.2 Adjustments to Rates

This study aims to analyze the impact of distance-based rates on the volume of LRT Jabodebek passengers and how rate and service factors work together to influence consumer preferences and decisions to use LRT Jabodebek. Fairer and more affordable distance-based rate adjustments can be one of the main factors in attracting more passengers, especially at previously less popular stations or at certain times that are less crowded.

1. Impact of Distance-Based Rates on Passenger Preferences

- **Fair Distance-Based Rates:** Rate adjustments that take into account distance traveled can make fares fairer and more affordable, especially for passengers traveling short distances. Lower fares at less popular stations or at certain times can increase interest and motivate passengers to switch from private transportation to LRT Jabodebek.
- **Impact on Less Popular Stations:** With reduced fares at certain stations that have previously been less popular, passengers who previously preferred to use private vehicles or other transportation may be more interested in using LRT Jabodebek. Lower fares at these stations provide an incentive to use LRT Jabodebek as an alternative transportation.

- **Rate at Specific Times:** Adjusting the rate at specific times, such as during peak hours or off-peak times, can also attract more passengers, especially if the rate charged is more affordable compared to a fixed rate.

2. Service Factors and Service Quality

- **Speed and Comfort:** Although the rate based on distance is higher for long-distance travel, good service such as fast travel time, comfort, and adequate facilities will be attractive factors for passengers to still choose LRT Jabodebek, even though the rate is slightly more expensive. Faster travel time and comfort can be competitive advantages compared to other private or public transportation modes.
- **Facilities and Cleanliness:** Facilities on the train, such as comfortable seats, air conditioning, cleanliness, and security, can increase passenger satisfaction. Passengers who have a pleasant travel experience are more likely to continue using LRT Jabodebek even though the rate is slightly higher, especially when compared to less comfortable transportation alternatives.

3. Effect of Tariff and Service on Consumer Decisions

- **The Role of the Combination of Tariff and Service:** This study can identify how the two factors, tariff and service, interact in influencing consumer decisions. For example, even though distance-based rates are higher on some routes, better services, such as timely arrivals, comfortable travel, and better facilities, can keep passengers choosing LRT Jabodebek.
- **Time and Cost Savings:** One of the reasons consumers choose public transportation such as LRT Jabodebek is time and cost savings. Therefore, the combination of affordable rates and efficient services can create added value for passengers, which in turn can lead them to choose LRT Jabodebek over private vehicles or other modes of transportation.

IV.2.3 Dynamic Governance in Tariff Determination

Based on the results of the Paired t-test, which showed significant differences between distance-based fares, zone-based fares, and fixed fares, there is great potential for the Jabodek LRT to implement or develop a distance-based or zone-based fare system that is more responsive to passenger needs and preferences. The Dynamic Governance approach (thinking ahead, thinking again, thinking across) can provide a basis for making more flexible and adaptive fare decisions, and more in line with developments in socio-economic conditions, demand, and infrastructure.

1. Implementation of Rates Based on Distance and Zone

Based on the findings of the Paired t-test, distance-based and zone-based rates show significant differences compared to fixed rates. Distance-based and zone-based rates offer the potential to improve accessibility and affordability, especially for passengers who travel short distances or use the LRT at certain times.

- **Distance-Based Rates:** Can be set to reflect the distance traveled by passengers. This system allows for fairer fare adjustments and is in accordance with the actual distance traveled, providing benefits for passengers who do not travel long distances.
- **Zone-Based Rates:** Can be adjusted to the level of density or demand in each zone, both those that are in demand and those that are less in demand. With lower fares in less popular zones, LRT Jabodebek can attract more passengers to those zones and distribute passengers evenly.

2. Dynamic Governance for Adaptive Fare Management

The application of Dynamic Governance in the context of LRT Jabodebek rates provides a more responsive approach to changes in community needs and operational conditions. Through the principle of thinking ahead, thinking again, thinking across, fare management can be adjusted to various dynamic factors, such as:

- **Thinking Ahead:** Predicting future socio-economic conditions and changes in passenger demand patterns. For example, if it is predicted that there will be an increase in LRT Jabodebek usage in a particular area, fares can be adjusted to manage passenger volume and ensure operational sustainability.
- **Thinking Again:** Updating fare policies based on evaluation results and feedback. If a distance- or zone-based rate system is not effective in meeting passenger or operator needs, then there needs to be an adjustment in a more appropriate fare policy.
- **Thinking Across:** Considering the influence of other factors that can affect rates, such as government policies, developments in other transportation infrastructure, or social changes that affect people's travel patterns.

3. Tariff Adjustment Based on Developing Conditions

The tariff can be adjusted based on developing conditions, by considering several factors such as:

- **Peak Hour and Off-Peak Hour:** During peak hours, tariffs can be increased to control demand and avoid excessive crowding, while during quiet hours, tariffs can be lowered to increase attractiveness and fill empty capacity.
- **Weekends and National Holidays:** During weekends or holidays, demand can increase, especially on routes connecting tourist attractions or shopping centers. Appropriate tariff adjustments can help manage congestion and increase LRT Jabodebek usage during these periods.
- **Popular and Less Popular Zones:** By implementing zone-based tariffs, LRT Jabodek can lower tariffs in less popular zones to attract more passengers. Conversely, denser zones or zones with high demand can apply higher tariffs to manage passenger volume.
- **Maximum Tariff Limit:** To ensure that tariffs remain affordable, especially for lower-income groups, a maximum tariff limit can be applied that cannot be exceeded. This is to maintain social sustainability and ensure that LRT Jabodebek remains an economical transportation option for all levels of society.

IV.3 Implementation Plan & Justification

Based on the results of the Paired t-test which showed significant differences between various fare systems (distance-based rate, zone-based rate, and fixed rate), LRT Jabodebek can develop or implement a more adaptive fare system by considering various factors such as socio-economic conditions, passenger demand, and infrastructure development. Here are some steps that can be taken to improve the fare system:

1. Passenger-Preferred Zones

Monday – Friday (Peak Hour: 06.00 – 09.00 WIB and 16.00 – 20.00 WIB):

Rate: Rp 5,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 20,000).

Monday – Friday (Off Peak Hour):

Rate: RP 5,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 10,000).

Weekend and National Holidays:

Rate: Rp 5,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 10,000).

Benefits: Higher rates during peak hours and lower fares during off-peak hours or on weekends can help to even out passenger demand, reduce congestion at certain times, and increase capacity and travel comfort.

2. Zones Not Popular with Passengers

Monday – Friday (Peak Hour: 06.00 – 09.00 WIB and 16.00 – 20.00 WIB):

Rate: Rp 3,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 20,000).

Monday – Friday (Off Peak Hour):

Rate: Rp 3,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 10,000).

Weekend and National Holidays:

Rate: Rp 3,000 for the first 1 km, Rp 700 for every next 1 km (maximum rate Rp 10,000).

Benefits: Reducing rates in low-demand zones can help increase passenger volume and optimize LRT Jabodebek operations, reduce dependence on subsidies, and create a fairer rates system for all levels of society.

3. Real-time Monitoring

Objective: Utilizing information technology to monitor LRT Jabodebek operational conditions in real time, such as the number of passengers, peak times, and infrastructure status.

Benefits: With real-time data, rates can be adjusted quickly according to changes in transportation demand. For example, rates can be increased during peak hours or when there is a surge in passengers, and lowered during non-peak times to attract more passengers.

4. Gradual Rate Policy

Objective: Implementing gradual rates based on time (peak vs. non-peak rates) or zones.

Benefits: The gradual rates system provides flexibility in adjusting rates according to operational needs and LRT Jabodebek capacity at a given time, creating a more efficient and fair system.

5. Stakeholder Involvement

Objective: Ensure that the implemented tariff policy is in accordance with the needs of the community and creates a sense of fairness between users and service providers.

Benefits: Inviting stakeholders into the tariff determination process, through open dialogue and surveys, will result in more inclusive and transparent decisions. The government can gather input from the community regarding tariffs that are considered fair and acceptable.

6. Periodic Evaluation

Objective: Conduct periodic evaluations of tariff policies to ensure that the tariffs implemented are still relevant to changes in demand patterns and socio-economic conditions.

Benefits: Regular evaluations help ensure that tariffs continue to reflect the reality on the ground, both from the operator and passenger side. Tariff or policy adjustments can be made based on the evaluation results to improve operational sustainability.

7. Social Justice and Accessibility-Based Tariff Determination

Objective: Adjust tariffs to the principles of social justice and accessibility, ensuring that tariffs are affordable for all levels of society.

Benefits: Tariffs that are fair and accessible to the wider community, especially for vulnerable groups such as students, college students, or workers with low incomes, will improve the fairness and sustainability of the LRT Jabodebek operations.

Implementation: The government can provide fare subsidies or special discounts for certain groups such as students, the elderly, or passengers with limited income.

CHAPTER V

CONCLUSION AND RECOMMENDATION

V.1 Conclusion

Based on the research results, it can be concluded that the public prefers the implementation of a distance or zone-based tariff system compared to the planned fixed tariff. This preference is driven by a greater sense of fairness, because distance or zone-based tariffs reflect the actual distance or area traveled by users, so they are more in line with their travel needs and conditions.

This study also shows that a distance and zone-based tariff system can increase public interest in using the LRT Jabodebek, because it is considered fairer and more flexible. This is also reinforced by the findings of statistical tests that show significant differences in public preference for distance and zone-based tariff systems compared to fixed tariffs. Dynamic Governance as a subsidy policy concept also plays an important role, because it allows flexible adjustments to subsidy policies based on current demand patterns, operational capacity, and socio-economic conditions.

By implementing the dynamic governance concept, the LRT Jabodebek subsidy policy can be more responsive and efficient, ensuring that the subsidies provided are right on target and not excessive, and further optimizing the potential revenue from adjusted tariffs.

V.2 Recommendation

1. Implementation of Distance and Zone-Based Tariff Scheme

As a first step, it is recommended to implement a fairer and more flexible distance or zone-based tariff system. Tariffs can be adjusted based on the distance traveled or zones passed by passengers, both for zones that are in demand and those that are not in demand by passengers. This will increase user satisfaction because the tariffs are more transparent and in accordance with their actual trips.

2. Technology Integration in Tariff Monitoring and Adjustment

LRT Jabodebek must utilize information technology to monitor operational conditions and passenger demand in real-time. With this data, tariffs can be adjusted dynamically based on factors such as peak hours, passenger surges, and changes in operational capacity. This will ensure that the tariffs applied are always relevant to current conditions and can reduce dependence on subsidies.

3. Implementation of Dynamic Governance in Subsidy Policy:

Implementation of dynamic governance in subsidy policy is very important to ensure a policy that is more responsive to changes in community needs and LRT Jabodebek operational capacity. A subsidy policy that is flexibly adjusted based on current needs and conditions will help maximize revenue and reduce waste of resources.

4. Periodic Evaluation of the Tariff System:

To ensure the sustainability and effectiveness of the tariff system, it is necessary to conduct periodic evaluations of the implementation of distance-based or zone-based tariff schemes. This evaluation will help understand the impact of tariff changes on passenger interest, public acceptance, and operational efficiency. Based on the evaluation results, the government and operators can make more appropriate tariff adjustments or subsidy policies.

5. Community Socialization and Involvement:

It is important to involve the public in the process of changing the tariff system through communication forums, surveys, or digital platforms. This will ensure that the tariff policies implemented truly reflect the expectations and needs of the community, and increase user acceptance of the policies taken.

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APPENDICES

The questionnaire that will be displayed is as follows:

No	Type of Questions & Answers	Measurement Scale	Remarks
Part A: Respondent Criteria			
A1	<p>Dimanakah wilayah (kecamatan) tempat tinggal anda saat ini?</p> <p>A. Cipayung, ciracas, duren sawit, jatinegara, kramat jati, makasar (jakarta timur), pasar rebo.</p> <p>B. Menteng, Tanah Abang</p> <p>C. Mampang prapatan, pancoran, setiabudi, tebet</p> <p>D. Cileungsi, gunung putri, jonggol, klapanunggal</p> <p>E. Cimanggis, sukrajaya, tapos</p> <p>F. Bantar gebang, bekasi barat, bekasi selatan, bekasi timur, bekasi utara, jatiasih, jatisampurna, medan satria, mustika jaya, pondok gede, pondok melati, rawalumbu</p> <p>G. Tambun selatan</p> <p>H. Tidak ada dalam pilihan</p>	Choice Scale (One must be selected)	<p>To filter so that the respondents taken are appropriate.</p> <p>If the respondent answers no to this question, then the respondent does not need to continue the questionnaire.</p>
A2	<p>Dimanakah wilayah (kecamatan) tempat aktivitas rutin anda (bekerja, berdagang, sekolah, kuliah, dll)?</p> <p>A. Cipayung, ciracas, duren sawit, jatinegara, kramat jati, makasar (jakarta timur), pasar rebo.</p> <p>B. Menteng, Tanah Abang</p> <p>C. Mampang prapatan, pancoran, setiabudi, tebet</p> <p>D. Cileungsi, gunung putri, jonggol, klapanunggal</p> <p>E. Cimanggis, sukrajaya, tapos</p> <p>F. Bantar gebang, bekasi barat, bekasi selatan, bekasi timur, bekasi utara, jatiasih, jatisampurna, medan satria, mustika jaya, pondok gede, pondok melati, rawalumbu</p> <p>G. Tambun selatan</p> <p>H. Tidak ada dalam pilihan</p>	Choice Scale (One must be selected)	<p>To filter so that the respondents taken are appropriate.</p> <p>If the respondent answers no to this question, then the respondent does not need to continue the questionnaire.</p>

No	Type of Questions & Answers	Measurement Scale	Remarks
A3	<p>Apakah ketika melakukan perjalanan untuk aktivitas rutin, anda melewati wilayah (kecamatan) berikut ini:</p> <p>A. Cipayung, ciracas, duren sawit, jatinegara, kramat jati, makasar (jakarta timur), pasar rebo.</p> <p>B. Menteng, Tanah Abang</p> <p>C. Mampang prapatan, pancoran, setiabudi, tebet</p> <p>D. Cileungsi, gunung putri, jonggol, klapanunggal</p> <p>E. Cimanggis, sukrajaya, tapos</p> <p>F. Bantar gebang, bekasi barat, bekasi selatan, bekasi timur, bekasi utara, jatisih, jatisampurna, medan satria, mustika jaya, pondok gede, pondok melati, rawalumbu</p> <p>G. Tambun selatan</p> <p>H. Tidak ada dalam pilihan</p>	Choice Scale (One must be selected)	To filter so that the respondents taken are appropriate. If the respondent answers no to this question, then the respondent does not need to continue the questionnaire.
A4	<p>Umur:</p> <p>A. 15 s.d. 20</p> <p>B. 21 s.d. 30</p> <p>C. 31 s.d. 60</p> <p>D. > 60</p> <p>E. Tidak ada dalam pilihan</p>	Choice Scale (One must be selected)	To filter so that the respondents taken are appropriate. If the respondent answers no to this question, then the respondent does not need to continue the questionnaire.
Part B: Respondent Profile			
B1	Nama		
B2	Jenis Kelamin	Guttman Scale (Male/Female)	Shunfeng Song, dkk. 2019

No	Type of Questions & Answers	Measurement Scale	Remarks
B3	Pendidikan Formal Terakhir: Tidak tamat SD, SD/Sederajat, SMP/Sederajat, SMA/Sederajat, Diploma, S1, S2/S3		
B4	Pekerjaan: ASN/TNI/Polisi/BUMN, Swasta, Wirausaha/Pedagang, Pelajar/Mahasiswa, Pencari Kerja, Tidak Bekerja		
B5	Jumlah orang dalam keluarga (dalam satuan orang)		
B6	Jumlah sepeda motor yang dimiliki dalam keluarga: <i>(diisi oleh responden dalam bentuk angka)</i>		
B7	Jumlah mobil yang dimiliki dalam keluarga: <i>(diisi oleh responden dalam bentuk angka)</i>		
B8	Jumlah sepeda yang dimiliki dalam keluarga: <i>(diisi oleh responden dalam bentuk angka)</i>		
B9	Total pendapatan keluarga perbulan: ≤ 2.500.000 > 2.500.000 s.d. 5.000.000 > 5.000.000 s.d. 7.500.000 > 7.500.000 s.d. 10.000.000 > 10.000.000 s.d. 15.000.000 > 15.000.000 s.d. 20.000.000 > 20.000.000		
B10	Nominal uang yang anda sisihkan/keluarkan untuk memiliki kendaraan pribadi perbulan: ≤ 2.500.000 > 2.500.000 s.d. 5.000.000 > 5.000.000		
Part C: Travel Characteristics			
C1	Alat transportasi yang digunakan untuk aktivitas/pekerjaan (bekerja,berdagang, sekolah,dll):		

No	Type of Questions & Answers	Measurement Scale	Remarks
	Sepeda motor, mobil, angkutan umum, lainnya.		
C2	Berapa hari dalam seminggu anda melakukan perjalanan dari rumah ke kantor dan sebaliknya menggunakan sepeda motor:		
	<ul style="list-style-type: none"> ➤ Tidak Pernah ➤ 1 hari dalam seminggu ➤ 2 hari dalam seminggu ➤ 3 hari dalam seminggu ➤ 4 hari dalam seminggu ➤ 5 hari dalam seminggu ➤ 6 hari dalam seminggu 7 hari dalam seminggu 		
C3	Berapa hari dalam seminggu anda melakukan perjalanan dari rumah ke kantor dan sebaliknya menggunakan mobil: <ul style="list-style-type: none"> ➤ Tidak Pernah ➤ 1 hari dalam seminggu ➤ 2 hari dalam seminggu ➤ 3 hari dalam seminggu ➤ 4 hari dalam seminggu ➤ 5 hari dalam seminggu ➤ 6 hari dalam seminggu ➤ 7 hari dalam seminggu 		
C4	Berapa hari dalam seminggu anda melakukan perjalanan dari rumah ke kantor dan sebaliknya menggunakan sepeda: <ul style="list-style-type: none"> ➤ Tidak Pernah ➤ 1 hari dalam seminggu ➤ 2 hari dalam seminggu ➤ 3 hari dalam seminggu ➤ 4 hari dalam seminggu ➤ 5 hari dalam seminggu ➤ 6 hari dalam seminggu ➤ 7 hari dalam seminggu 		
C5	Berapa perkiraan waktu tempuh setiap perjalanan dari rumah ke kantor dan sebaliknya secara keseluruhan: <i>(Dalam satuan menit)</i>		

No	Type of Questions & Answers	Measurement Scale	Remarks
C6	Berapa perkiraan jarak tempuh setiap perjalanan dari rumah ke kantor dan sebaliknya secara keseluruhan: <i>(Dalam satuan menit)</i>		
C7	Berapa biaya transportasi yang dikeluarkan dari rumah sampai kantor dan sebaliknya secara keseluruhan: <i>(Dalam satuan rupiah/hari)</i>		
Part D: Community Preferences			
D1	Dengan tarif LRT Jabodebek sebesar Rp12.000, apakah anda bersedia mengganti alat transportasi anda sebelumnya dengan beralih ke LRT Jabodebek. <i>(Jika jawaban D1 adalah “Tidak”, maka dilanjutkan ke D1.1, apabila jawaban D1 adalah “Ya” maka dilanjutkan ke D2)</i>	Guttman Scale (Yes/No)	Tariff based on PM 118 of 2017
D1.1	Alasan anda tidak beralih ke LRT Jabodebek: <ul style="list-style-type: none"> ➤ Tarif tidak sesuai ➤ Lahan parkir tidak tersedia ➤ Akses menuju stasiun membutuhkan waktu/biaya yang lebih banyak. ➤ Lainnya <i>(Seluruh jawaban dilanjutkan ke D2)</i>		
D2	Apabila tarif LRT Jabodebek didesain menggunakan tarif berdasarkan jarak sebagai berikut: 1 Km Pertama : Rp5.000 Setiap 1 Km berikutnya: Rp700 Apakah anda bersedia mengganti alat transportasi anda sebelumnya dengan beralih ke LRT Jabodebek. <i>(Jika jawaban D2 adalah “Tidak”, maka dilanjutkan ke D2.1, apabila</i>	Guttman Scale (Yes/No)	Tariff based on KM 67 in 2023

No	Type of Questions & Answers	Measurement Scale	Remarks
	<i>jawaban D2 adalah “Ya” maka dilanjutkan ke D3)</i>		
D2.1	Alasan anda tidak beralih ke LRT Jabodebek: <ul style="list-style-type: none"> ➤ Tarif tidak sesuai ➤ Lahan parkir tidak tersedia ➤ Akses menuju stasiun membutuhkan waktu/biaya yang lebih banyak. ➤ Lainnya (Seluruh jawaban dilanjutkan ke D3)		
D3	Berapa tarif LRT Jabodebek yang sesuai menurut anda: <ul style="list-style-type: none"> ➤ Rp3.000 – Rp5.000 ➤ >Rp5.000 – Rp10.000 ➤ >Rp10.000 – Rp15.000 ➤ >Rp15.000 		
Part E: LRT Jabodebek Services			
E1	Stasiun LRT Jabodebek terdekat dari tempat tinggal anda: St. Harjamukti, St. Ciracas, St. Kp. Rambutan, St. TMII, St. Jati Mulya, St. Bekasi Barat, St. Cikunir 2, St. Cikunir 1, St. Jati Bening Baru, St. Cawang, St. Ciliwung, St. Cikoko, St. Pancoran, St. Kuningan, St. Rasuna Said, St. Setiabudi, St. Dukuh Atas.		
E2	Moda transportasi apakah yang tersedia dari tempat tinggal anda sampai ke stasiun LRT Jabodebek: <ul style="list-style-type: none"> ➤ Bus ➤ Angkot ➤ Ojeg ➤ Angkutan online (gojek, grab,dll) 		
E3	Stasiun LRT Jabodebek terdekat dari tempat anda beraktivitas (bekerja, berdagang, sekolah,dll): St. Harjamukti, St. Ciracas, St. Kp. Rambutan, St. TMII, St. Jati Mulya, St. Bekasi Barat, St. Cikunir 2, St. Cikunir 1, St. Jati Bening Baru, St. Cawang, St. Ciliwung, St. Cikoko, St. Pancoran,		

No	Type of Questions & Answers	Measurement Scale	Remarks
	St. Kuningan, St. Rasuna Said, St. Setiabudi, St. Dukuh Atas.		
E4	<p>Moda transportasi apakah yang tersedia dari tempat anda beraktivitas sampai ke stasiun LRT Jabodebek:</p> <ul style="list-style-type: none"> ➤ Bus ➤ Angkot ➤ Ojeg <p>Angkutan online (gojek, grab,dll)</p>		
E5	<p>Apa moda transportasi yang anda gunakan jika fasilitas tersedia menuju stasiun LRT Jabodebek terdekat:</p> <ul style="list-style-type: none"> ➤ Jalan Kaki ➤ Sepeda ➤ Kendaraan Pribadi (Mobil/Motor) ➤ Angkutan umum 		