



**A Socio-Economic Study
on the Integration of Environmentally Friendly
Mass Public Transportation
in Jakarta, Bogor, Depok, Tangerang, and Bekasi Region
(Jabodetabek)**



**Coordinating Ministry for Maritime and Investment Affairs
of the Republic of Indonesia
and
United Nations Office for Project Services (UNOPS)**

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RESEARCH TEAM

Coordinating Ministry for Maritime and Investment Affairs of the Republic of Indonesia

1. Dr. Ir. Rahman Hidayat, M.Eng.
2. Ir. Velly Asvaliantina, M.Eng.Sc.
3. Hafil Gusni Santana Aji, S.T., M.Sc.
4. Akhmad Fikri Maulana, S.T.
5. Qonitah Rafiusrani, S.PWK

United Nations Office for Project Services

1. Dr. Eric Alexander Sugandi, S.Sos., M.E., M.A., Ph.D.
2. Achmed Shahram Edianto, S.ST., M.T., Ph.D.

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FOREWORD
COORDINATING MINISTRY FOR MARITIME AND INVESTMENT AFFAIRS
OF THE REPUBLIC OF INDONESIA

The government strives to create policies to answer challenges in the transportation sector, especially in the Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) areas. Public transportation in Jabodetabek has a crucial role in overcoming the issue of congestion and air pollution. The large number of private two-wheeled and four-wheeled motor vehicles and the minimal use of public transportation are the main challenges in the development and integration of public transportation.

This study not only provides an in-depth overview of the social and economic aspects of transportation in Jabodetabek but also offers comprehensive solutions to reduce congestion, pollution, and related economic losses. The findings obtained can be an important basis for central and regional governments to formulate more effective policies for the development of public transportation.

I hope that the results of this study will enrich the transportation policy literature in Indonesia, as well as serve as a guide for all stakeholders in accelerating the strengthening of a modern, efficient, and sustainable public transportation system. By implementing the right policies, we are confident that a transportation system will be created that not only supports people's mobility but also contributes to economic growth and environmental conservation.

Rachmat Kaimuddin

Deputy for Transportation and Infrastructure
Coordinating Ministry for Maritime and Investment Affairs
of the Republic of Indonesia

FOREWORD
SOUTHEAST ASIA ENERGY TRANSITION PARTNERSHIP
UNITED NATIONS OFFICE FOR PROJECT SERVICES

On behalf of the Southeast Asia Energy Transition Partnership (ETP), it is my pleasure to pen a few words for the ‘A Socio-Economic Study on the Integration of Environmentally Friendly Mass Public Transportation in Jakarta, Bogor, Depok, Tangerang, and Bekasi Region (Jabodetabek)’ study, conducted in collaboration with the Coordinating Ministry for Maritime and Investment Affairs of the Republic of Indonesia. This joint effort underscores ETP’s commitment to supporting the energy and transport transition in Indonesia, focusing on environmentally friendly solutions in the Jabodetabek region.

ETP is a program of the United Nations Office for Project Services (UNOPS), working to facilitate sustainable energy transition in Southeast Asia in line with the Sustainable Development Goals (SDGs). The findings and recommendations of this study align with SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action) by addressing the urgent need to reduce reliance on fossil fuel used in mass public transportation systems, enhancing economic resilience, and combating environmental degradation.

This study emphasizes the significance of integrating renewable energy-powered public transport in one of Southeast Asia's most densely populated regions. The study highlights the social and economic benefits that are a result of such integration, contributing to a cleaner, more efficient transport network that directly supports the Government of Indonesia's climate and energy targets.

As ETP continues to support the Government of Indonesia in meeting the Just Energy Transition goals, we hope to deepen our collaboration in the future, ensuring a successful transition to a low-carbon, sustainable economy.

Philip Timothy Rose

Director of ETP UNOPS

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16. Dr. Raphaella Dewantari Dwianto, Teaching Staff, Faculty of Social and Political Sciences, University of Indonesia
17. Dr. Muhammad Halley Yudhistira, Chair of the Urban Economics and Transportation Research Cluster, Faculty of Economics and Business, University of Indonesia

EXECUTIVE SUMMARY

The rapid increase in the number of motor vehicles in the Jakarta, Bogor, Tangerang, and Bekasi (Jabodetabek) region has resulted in various economic, social, and environmental losses caused by traffic congestion and environmental pollution from motor vehicles, especially private motor vehicles. One solution to reduce such losses is to encourage the use of environmentally friendly mass public transportation by accelerating and strengthening the integration of an environmentally friendly mass public transportation system in Jabodetabek.

In line with the objective to accelerate and strengthen the integration of the mass public transportation system in Jabodetabek, the Coordinating Ministry for Maritime Affairs and Investment Affair of the Republic of Indonesia has collaborated with the United Nations Office for Project Services (UNOPS) to conduct a social and economic study on the integration of an environmentally friendly mass public transportation system in Jabodetabek.

The following are some key findings from this study.

First, the integration of an environmentally friendly mass public transportation system in Jabodetabek will stimulate economic growth, reduce the use of fossil fuels (especially fuel oil), and reduce environmental pollution in this region.

Second, various efforts to increase the number of mass public transportation vehicles, enhance the quantity and quality of physical facilities for mass public transportation, and improve the quality of mass public transportation services can indeed increase the number of mass public transportation users in Jabodetabek. However, these efforts are insufficient to encourage more private vehicle users in Jabodetabek to switch to mass public transportation. Most Jabodetabek commuters still use private vehicles and have no desire to switch to mass public transportation.

Third, various efforts are needed to encourage private vehicle users to switch to mass public transportation, including policies that restrict the use of motor vehicles – e.g., expansion of odd-even license plate zones, emissions tests to limit the number of motor vehicles allowed on public roads, increased parking rates, and stricter penalties for traffic violators.

Fourth, the integration of an environmentally friendly mass public transportation system in Jabodetabek aims to encourage commuters to use electric-powered mass public transportation.

Fifth, the development of public transportation routes, whether road and rail-based, must be directed at reaching commuter residential areas rather than being limited to transportation nodes. Road-based routes are cheaper and faster to build than rail-based routes, hence they are more suitable for DKI Jakarta. Meanwhile, railway-based routes have enormous potential for further development in Bogor, Tangerang, and Bekasi (Bodetabek) because of the large number of commuters who live in this area.

This study also recommends several short-term, medium-term, and long-term policies to strengthen the integration of environmentally friendly mass public transportation systems in Jabodetabek.

TABLE OF CONTENTS

Foreword from Coordinating Ministry for Maritime and Investment Affairs of the Republic of Indonesia	... i
Foreword from Southeast Asia Energy Transition Partnership, United Nations Office for Project Services	... ii
Acknowledgements	... iii
Executive Summary	... iv
Table of Contents	... v
List of Abbreviations	... vi
List of Tables and Figures	... vii
1. Introduction	... 1
1.1. Background	... 1
1.2. Study Objectives and Benefits	... 4
1.3. Research Questions	... 4
1.4. Methodology	... 4
2. Mass Public Transportation System in Jabodetabek	... 5
2.1. Development of Mass Public Transportation System in Jabodetabek	... 5
2.2. Mass Public Transportation Vehicles and Facilities in Jabodetabek	... 7
3. Commuters and Use of Mass Public Transportation in Jabodetabek	... 10
3.1. Characteristics of Commuters in Jabodetabek	... 10
3.2. Patterns and Modes of Commuter Movements in Jabodetabek	... 14
3.3. Jabodetabek Commuters' Perceptions and Preferences on Mass Public Transportation	... 20
4. Aspects of Environmentally Friendly Mass Public Transportation Integration in Jabodetabek	... 23
4.1. Regulatory Integration and Policy Coordination	... 23
4.2. Physical Integration of Mass Public Transportation Modes	... 25
4.3. Fares and Payment System Integration	... 31
4.4. Integration of Information Systems	... 35
5. Impact of Mass Public Transportation System Integration in Jabodetabek	... 36
5.1. The Role of the Transportation Sector in the Economy of Jabodetabek	... 36
5.2. Economic Impact of Mass Public Transportation System Integration in Jabodetabek	... 38
5.3. Environmental Impact of Mass Public Transportation System Integration in Jabodetabek	... 41
6. Concluding Remarks	... 43
6.1. Conclusions	... 43
6.2. Policy Recommendations	... 43
6.3. Limitations of the Study	... 44
References	... 48

LIST OF ABBREVIATIONS

APBD	Regional Budget (<i>Anggaran Pendapatan dan Belanja Daerah</i>)
APBN	State Budget (<i>Anggaran Pendapatan dan Belanja Nasional</i>)
Bappenas	Ministry of National Development Planning/National Development Planning Agency (<i>Badan Perencanaan Pembangunan Nasional</i>)
BPS	National Statistics Agency (<i>Badan Pusat Statistik</i>)
BPTJ	Jakarta Transportation Management Agency (<i>Badan Pengelola Transportasi Jakarta</i>)
BRT	Bus Rapid Transit
BTS	Base Transceiver Station
DKI	Special Capital Region (<i>Daerah Khusus Ibukota</i>)
GDP	Gross Domestic Product
GRDP	Gross Regional Domestic Product
IDR	Indonesian Rupiah
IKN	Ibu Kota Nusantara
IO	Input Output
Jabodetabek	Jakarta Bogor Depok Tangerang Bekasi
JAC	Jabodetabek Airport Connection
JRC	Jabodetabek Residence Connection
KAI	Kereta Api Indonesia
Kemenko Marves	Coordinating Ministry for Maritime Affairs and Investment (<i>Kementerian Koordinator Bidang Kemaritiman dan Investasi</i>)
Keppres	Presidential Decree (<i>Keputusan Presiden</i>)
KRL	Electric Train (<i>Kereta Rel Listrik</i>)
LRT	Light Rapid Transit
MRT	Mass Rapid Transit
Perpres	Presidential Regulation (<i>Peraturan Presiden</i>)
PP	Government Regulation (<i>Peraturan Pemerintah</i>)
PPP	Public-Private Partnership
PSO	Public Service Obligation
RITJ	Jabodetabek Transportation Master Plan (<i>Rencana Induk Transportasi Jabodetabek</i>)
Sistranas	National Transportation System (<i>Sistem Transportasi Nasional</i>)
TOD	Transit Oriented Development
UNOPS	United Nations Office for Project Services

LIST OF TABLES AND FIGURES

LIST OF TABLES

Table 1-1. Several key indicators of regencies, municipalities, and administrative cities in Jabodetabek	... 2
Table 1-2. Number of motor vehicles in Jabodetabek, 2023 (units)	... 2
Table 1-3. Number of motor vehicles in Jabodetabek, 2020-2023 (units)	... 3
Table 2-1. Transportation management targets for Jabodetabek in RITJ 2018-2029 and achievements as of November 2023	... 6
Table 2-2. Mass public transportation modes in Jabodetabek (2023)	... 7
Table 3. Commuter directions in Jabodetabek from residence to main place of activity (% of total number of commuters, 2023)	... 15
Table 4-1. Total number of transportation nodes and integrated nodes in Jabodetabek (2023)	... 26
Table 4-2. Transit Oriented Development (TOD) areas in Jabodetabek based on RITJ 2018-2029	... 27
Table 4-3. Estimated cost requirements for expanding mass public transportation routes in Jabodetabek 2024–2026	... 28
Table 4-4. Fares for TransJakarta Services (as mid-2024)	... 32
Table 4-5. Fares for KRL Commuter Line Jabodetabek, LRT Jakarta, and LRT Jabodebek	... 32
Table 4-6. Several electronic payment methods for mass public transportation in Jabodetabek (as of mid-2024)	... 34
Table 5-1. Growth rate and contribution of the transportation and warehousing sector to Jabodetabek GRDP (2019-2023)	... 37
Table 5-2. Land transportation sector contribution to intermediate input demand and final demand in DKI Jakarta (2019-2023)	... 40
Table 5-3. Backward linkages, forward linkages, output multipliers, value-added multipliers, and income multipliers of land public transportation in DKI Jakarta	... 40
Table 5-4. Implementation targets for the strengthening of mass public transportation and pedestrian modes in DKI Jakarta by 2030 and estimated potential fuel savings	... 41
Table 6. Short-term, medium-term, and long-term policy recommendations to strengthen mass public transportation integration in Jabodetabek	... 45

LIST OF FIGURES

Figure 2-1. Jabodetabek integrated mass public transportation route map (as of mid-2024)	... 8
Figure 2-2. Number of KRL Commuter Line Jabodetabek passengers (million people)	... 9
Figure 2-3. Number of TransJakarta passengers (million people)	... 9
Figure 2-4. Number of MRT Jakarta passengers (million people)	... 9
Figure 2-5. Number of LRT Jakarta and LRT Jabodebek passengers (million people)	... 9
Figure 3-1. Population of Jabodetabek commuters aged 5 years old or older (2023)	... 10
Figure 3-2. Commuters in Jabodetabek based on location of residence (2023)	... 10
Figure 3-3. Commuters in Jabodetabek based on main activity (2023)	... 11
Figure 3-4. Commuters in Jabodetabek based on age group and gender (million people, 2023)	... 11
Figure 3-5. Commuters in Jabodetabek based on their highest level of education (2023)	... 12
Figure 3-6. Commuters in Jabodetabek based on cell phone use and internet use via cell phone (2023)	... 12
Figure 3-7. Working commuters in Jabodetabek based on main employment status (2023)	... 13
Figure 3-8. Working commuters in Jabodetabek based on average income per month (2023)	... 13
Figure 3-9. Commuters in Jabodetabek based on round trip cost in a day (2023)	... 13
Figure 3-10. Number of working commuters in Jabodetabek based on round trip cost per day and average income per month (2023)	... 13
Figure 3-11. Commuters in Jabodetabek based on the number of travel days in a week (2023)	... 16
Figure 3-12. Commuters in Jabodetabek based on place of residence and kilometers traveled to their main place of activity (2023)	... 16
Figure 3-13. Commuters in Jabodetabek based on the number of modes of transportation used to travel to their main place of activity (2023)	... 16
Figure 3-14. Commuters in Jabodetabek based on the number of minutes of travel from their place of residence to their main place of activity (2023)	... 16
Figure 3-15. Commuters in Jabodetabek based on departure time from home (2023)	... 17
Figure 3-16. Commuters in Jabodetabek based on arrival time at home (2023)	... 17
Figure 3-17. Commuters in Jabodetabek based on the primary mode of transportation to their main place of activity (2023)	... 18
Figure 3-18. Commuters in Jabodetabek based on the primary mode of transportation to go home from their main place of activity (2023)	... 18

Figure 3-19. Proportion of the primary mode of transportation used by commuters in Jabodetabek based on the distance traveled from home to their main place of activity (2023)	... 19
Figure 3-20. Proportion of the primary mode of transportation used by commuters in Jabodetabek based on the distance to go home from their main place of activity (2023)	... 19
Figure 3-21. Working commuters in Jabodetabek based on the primary mode of transportation to go to their main place of activity and average monthly income (2023)	... 19
Figure 3-22. Working commuters in Jabodetabek based on the primary mode of transportation to go home from their main place of activity and average monthly income (2023)	... 19
Figure 3-23. Commuters in Jabodetabek who do not use public transportation for commuting based on willingness to switch to public transportation (2023)	... 20
Figure 3-24. Commuters in Jabodetabek who do not use public transportation for commuting based on willingness to switch to public transportation (2019)	... 20
Figure 3-25. Main reasons of commuters in Jabodetabek who do not use public transportation for commuting not switching to public transportation (2023)	... 21
Figure 3-26. Main reasons of commuters in Jabodetabek who do not use public transportation for commuting not switching to public transportation (2019)	... 21
Figure 3-27. Commuters in Jabodetabek who do not use public transportation based on preference on the use of electric/hybrid motor vehicle (2023)	... 22
Figure 3-28. Commuters in Jabodetabek based on negative experience while commuting (million people, 2023)	... 22
Figure 4-1. Subsidized and non-subsidized revenue of PT KAI Commuter (IDR billion)	... 33
Figure 4-2. Subsidized and non-subsidized revenue of PT TransJakarta (IDR billion)	... 33
Figure 4-3. Subsidized and non-subsidized revenue of PT MRT Jakarta (IDR billion)	... 33
Figure 4-4. Subsidized and non-subsidized revenue of PT LRT Jakarta (IDR billion)	... 33
Figure 5-1. The proportion of contributions from major economic sectors to the real GRDP of Jabodetabek (2023)	... 36
Figure 5-2. Transportation and warehousing sector growth rates and contribution to Jabodetabek GRDP (2019-2023)	... 36
Figure 5-3. Contributions of main economic sectors to real GRDP of cities, regencies, and administrative cities in Jabodetabek in 2023 (IDR quadrillion)	... 37

1. Introduction

1.1. Background

The Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) region is the largest metropolitan area in Indonesia¹, covering nearly 7,000 km of land². Special Capital Region (DKI) Jakarta, which consists of five administrative cities (South Jakarta, East Jakarta, Central Jakarta, West Jakarta, and North Jakarta) and one administrative regency (Kepulauan Seribu), is the economic center of Jabodetabek and has the largest population in this region (Table 1 -1). DKI Jakarta is the largest contributor to Indonesia's Gross Domestic Product (GDP), accounting for 16.8% of the national GDP in 2023.

Although Indonesia's national capital will move from DKI Jakarta to Ibu Kota Nusantara (IKN), East Kalimantan, Jakarta will still play an important role in the Indonesian economy. Law No. 2 of 2024 on the Special Region (DK) of Jakarta provides clarity on the status of Jakarta as a Special Region after the relocation of the country's capital². While the DK Jakarta Law has been passed, the relocation of the country's capital to IKN still awaits the issuance of a Presidential Decree (*Keputusan Presiden / Keppres*) to further regulate the move³.

The population of Jabodetabek continues to increase due to organic population growth and incoming migration into this region. The National Statistics Agency (BPS) estimates that the population in Jabodetabek reached 32.6 million people in 2023, amounting to 11.7% of Indonesia's total population. The average population growth rate in Jabodetabek was 1.4% per year between 2020-2023, higher than the national average population growth rate of 1.04% during the same period.

The population increase in Jabodetabek is also driving the continued growth in the number of motor vehicles. According to data collected by BPS from the Metro Jaya Regional Police, the West Java Provincial Revenue Agency, and the Banten Provincial Revenue Agency, the number of motor vehicles in Jabodetabek reached 33.1 million in 2023 (Table 1-2). A total of 22.9 million or 69.2% of the number of motor vehicles in Jabodetabek in 2023 were in DKI Jakarta. Based on the type of vehicle, as many as 26.4 million or 79.7% of the total number of motor vehicles in Jabodetabek were motorcycles, 5.5 million (16.8%) were passenger cars, 1.1 million (3.4%) were trucks, and 52,209 (0.2%) were buses. Table 1-3 shows the number of motor vehicles in Jabodetabek between 2020 – 2023.

¹Bahl (2013) defines “metropolitan” as the built-up areas encompassed by large cities, including their suburban areas.

² <https://www.menpan.go.id/site/berita-terkini/berita-daerah/pemerintah-sahkan-undang-undang-daerah-khusus-jakarta>

³ <https://www.rri.co.id/nasional/764086/jakarta-masih-ibu-kota-sampai-ada-keppres-pemindahan-ikn>

Table 1-1. Several key indicators of regencies, municipalities, and administrative cities in Jabodetabek

Region	Land area (km ²)	Population (million, 2023)	Current price GRDP (IDR trillion, 2023)	Current price per capita income (IDR million, 2023)	Average economic growth rate (% , 2019-2023)
South Jakarta Adm. City	144.9	2.2	792.6	354.5	3.9
East Jakarta Adm. City	185.5	3.1	592.2	192.3	3.1
Central Jakarta Adm. City	47.6	1.1	860.1	819.6	3.6
West Jakarta Adm. City	125.0	2.5	585.5	237.0	4.0
North Jakarta Adm. City	147.2	1.8	631.4	349.0	2.7
Kep.Seribu Adm. Regency	10.7	0.0	8.2	288.0	-3.4
Bogor Regency	2,991.8	5.6	289.1	51.4	3.6
Bogor City	111.3	1.1	57.0	53.2	4.1
Depok City	199.9	2.6	87.6	40.8	3.8
Tangerang Regency	1,027.8	3.4	173.3	51.5	3.4
Tangerang City	178.4	2.0	206.6	105.9	2.4
South Tangerang City	164.9	1.4	104.4	75.0	4.5
Bekasi Regency	1,251.1	3.2	393.8	121.7	3.0
Bekasi City	213.0	2.6	119.0	45.3	3.3
JABODETABEK	6,799.1	32,6	4,900.8	150,5	3,4

Source: National Statistics Agency

Table 1-2. Number of motor vehicles in Jabodetabek, 2023 (units)

Region	Motorcycles	Passenger cars	Trucks	Buses	TOTAL
DKI Jakarta	18,229,176	3,836,691	802,601	38,612	22,907,080
Bogor Regency	1,433,350	184,107	48,429	973	1,666,859
Bogor City	362,278	93,048	11,772	621	467,719
Depok City	926,839	192,821	19,245	698	1,139,603
Tangerang Regency	1,306,093	217,751	57,595	1,736	1,583,175
Tangerang City	1,029,881	238,480	48,534	2,275	1,319,170
South Tangerang City	712,142	261,807	31,215	1,648	1,006,812
Bekasi Regency	1,227,730	222,775	59,726	3,315	1,513,546
Bekasi City	1,147,706	300,651	51,445	2,331	1,502,133
JABODETABEK	26,375,195	5,548,131	1,130,562	52,209	33,106,097

Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

Table 1-3. Number of motor vehicles in Jabodetabek, 2020-2023 (units)

	2020	2021	2022	2023
Motorcycles	24,263,727	24,458,027	24,966,891	26,375,195
Passenger cars	5,672,756	5,694,336	5,832,559	5,548,131
Trucks	1,086,371	1,095,113	1,163,674	1,130,562
Buses	353,175	356,547	357,959	52,209
TOTAL	31,376,029	31,604,023	32,321,083	33,106,097

Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

The continuous rise in the number of motor vehicles worsens traffic congestion and air pollution in Jabodetabek. Various studies have provided different estimates of the value of economic losses caused by traffic congestion in Jabodetabek, primarily due to differences in the estimation methods used. In 2017, the Ministry of National Development Planning/National Development Planning Agency (*Badan Perencanaan Pembangunan Nasional / Bappenas*) estimated that traffic congestion in DKI Jakarta resulted in economic losses of IDR 67.5 trillion per year⁴. A World Bank study in 2019 estimated that economic losses from traffic congestion reached USD 2.6 billion (approximately IDR 36.8 trillion) per year in DKI Jakarta and almost reached USD 3 billion (approximately IDR 42.4 trillion) for Jabodetabek as a whole (World Bank, 2019). Resdiansyah (2021) estimates that economic losses from traffic congestion in Jabodetabek in 2018 reached IDR 133 trillion or 5.3% of the region's GRDP. In 2023, the Ministry of Transportation estimated that losses from traffic congestion in DKI Jakarta will reach around IDR 100 trillion per year⁵.

The Central Government and Regional Governments in Jabodetabek continue to accelerate and strengthen the integration of a mass public transportation system to reduce economic losses caused by traffic congestion and air pollution. As a key stakeholder in the development of environmentally friendly mass public transportation systems in Indonesia, the Coordinating Ministry for Maritime Affairs and Investment (*Kementerian Koordinator Bidang Kemaritiman dan Investasi / Kemenko Marves*) coordinates various activities of Central Government ministries and/or institutions, all Regional Governments in Jabodetabek, business entities, and other stakeholders involved in the implementation of the transportation system in Jabodetabek.

To accelerate and strengthen the integration of the mass public transportation system in Jabodetabek, Kemenko Marves has collaborated with the United Nations Office for Project Services (UNOPS) to conduct a socio-economic study of the integration of an environmentally friendly mass public transportation system in this region. The study was conducted by

⁴ <https://ekonomi.kompas.com/read/2017/10/06/054007626/bappenas-kerugian-akibat-macet-jakarta-rp-67-triliun-per-tahun>

⁵ <https://ekbis.sindonews.com/read/1238603/34/kerugian-akibat-macet-jakarta-tembus-rp100-triliun-per-tahun-begini-pesan-menhub-1698642642>

investigating the current conditions on the demand side and supply side of mass public transportation in Jabodetabek, analyzing the gap between demand and supply of the existing mass public transportation, and providing policy recommendations for the integration of the environmentally friendly mass public transportation system in Jabodetabek.

1.2. Study Objective and Benefits

The main objective of this study is to investigate aspects of the development and integration of environmentally friendly mass public transportation systems in Jabodetabek, namely: (i) the availability of the mass public transportation system, the use of mass public transportation, and the gap between the supply and demand for mass public transportation in this region; (ii) factors that influence the decisions of commuters in choosing modes of transportation for their daily commute to and from their primary places of activity; (iii) the current state of mass public transportation system integration; (iv) challenges faced in the development and integration of an environmentally friendly mass public transportation system, along with various alternative solutions; and (v) the social, economic and environmental impacts of the development and integration of environmentally friendly mass public transportation system in this region.

There are two main contributions from this study. *First*, this study will enrich the literature related to the integration of mass public transportation systems in Jabodetabek, especially the environmentally friendly mass public transportation system. *Second*, the findings and recommendations from this study can be used as a basis for policy considerations by the Central Government and Regional Governments in Jabodetabek in the development and integration of an environmentally friendly mass public transportation system.

1.3. Research Questions

This study seeks to answer five research questions:

- (i) Is there a significant gap between the demand and supply of mass public transportation in Jabodetabek?
- (ii) What factors influence commuters in Jabodetabek in choosing their mode of transportation to their primary places of activity?
- (iii) What is the current state of mass public transportation system integration in Jabodetabek?
- (iv) What challenges are faced in developing and integrating an environmentally friendly mass public transportation system in Jabodetabek?
- (v) What are the social, economic, and environmental impacts of developing and integrating an environmentally friendly mass public transportation system in Jabodetabek?

1.4. Methodology

This study utilized a combination of qualitative and quantitative methods. The qualitative method was conducted through literature reviews, focus group discussions, in-depth interviews, and anecdotal observations. The quantitative method was conducted through descriptive analysis of quantitative data and Input-Output Table analysis.

2. Mass Public Transportation System in Jabodetabek

2.1. Development of Mass Public Transportation System in Jabodetabek

Presidential Regulation (*Peraturan Presiden / Perpres*) No. 55 of 2018 on the Jabodetabek Transportation Master Plan (*Rencana Induk Transportasi Jabodetabek / RITJ*) serves as the primary reference for the Central Government and Regional Governments in Jabodetabek when developing transportation systems in this region, including mass public transportation systems. According to this regulation, the RITJ is divided into three phases: (i) 2018-2019 (Phase I); (ii) 2020-2024 (Phase II); and (iii) 2025-2029 (Phase III).

Presidential Regulation No. 55 of 2018 stipulates nine pillars for transportation development policy in Jabodetabek, as follows:

1. Improvement of the safety and security of urban transportation;
2. Development of the urban transportation infrastructure network;
3. Development of a road-based urban transportation system;
4. Development of a rail-based urban transportation system;
5. Development of integrated transportation;
6. Improvement of traffic performance;
7. Development of an urban transportation funding system;
8. Development of integrated urban transportation and spatial planning;
9. Development of environmentally friendly urban transportation.

Presidential Regulation No. 5 of 2018 sets the following targets for organizing transportation in Jabodetabek based on the RITJ for the 2018-2029:

1. The movement of people using urban public transportation must reach 60% of the total movement of people;
2. The average travel time in urban public transportation is one hour and thirty minutes during peak hours from origin to destination;
3. The average speed of urban public transportation vehicles at peak hours across the road network should be at least 30 kilometers/hour;
4. Urban public transportation service coverage should reach 80% of road length;
5. Walking access to public transportation should be no more than 500 meters;
6. Each region must have a local service network/feeder network that is integrated with the main network (trunk) through one urban transportation node;
7. Urban transportation nodes must have pedestrian facilities and park-and-ride parking facilities, with a transfer distance of no more than 500 meters between modes;
8. The number of transfers in a single trip should be limited to a maximum of three.

By the time this study was prepared (mid-2024), the Central Government, Regional Governments, and state-owned enterprises and private businesses have constructed or are currently constructing

various mass transportation facilities and infrastructure in Jabodetabek based on the RITJ 2018-2029. For example, DKI Jakarta has ten park-and-ride locations, namely:⁶ (i) IRTI Monas Parking Lot; (ii) Blok M Parking Area; (iii) Samsat Parking Lot; (iv) Mayestik Market Area; (v) Kalideres Park and Ride; (vi) Menteng Park Parking Building; (vii) Pasar Baru Palace Parking Building; (viii) Lebak Bulus Park and Ride; (ix) Kampung Rambutan Terminal Park and Ride ; and (x) Taman Ismail Parking Lot. PT MRT Jakarta is also preparing to build five Transit Oriented Development (TOD) areas in DKI Jakarta, namely in Lebak Bulus, Fatmawati, Blok M and Sisingamangaraja, Istora and Dukuh Atas⁷.

As of the end of November 2023, BPS collected indicators of public transportation use (Table 2-1) that show four targets in the RITJ have been achieved, namely: (a) the average travel time in public transportation; (b) walking access to public transportation; (c) pedestrian facilities and park-and-ride facilities for changing transportation modes; and (d) the number of modal transfers in a single trip. However, four indicators are still below the RITJ target, namely: (i) the level of public transportation usage by Jabodetabek commuters; (ii) the average speed of urban public transportation during peak hours; (iii) the ratio of public transportation service coverage to road length; and (iv) local service networks/feeder networks that are integrated with the main network.

Table 2-1. Transportation management targets for Jabodetabek in RITJ 2018-2029 and achievements as of November 2023

Targets in RITJ 2018–2029	Target in 2029	Achievement rate (as of November 2023)
1. The movement of people using public transportation must reach 60% of the total movement of people	60%	20.7%
2. The average travel time on public transportation is 1 hour 30 minutes	< 90 minutes	41 minutes
3. The average speed of urban public transportation vehicles at peak hours should be at least 30 km/hour	30 km/hour	23.6 km/hour
4. Urban public transportation service coverage should reach 80% of the road length	80%	54.3%
5. Walking access to public transportation should be no more than 500 meters	500 meters	250 meters
6. Each region must have a local service network / feeder network that is integrated with the main network through one urban transportation node	100% nodes	94% nodes
7. Urban transportation nodes must have pedestrian facilities and parking facilities (park-and-ride) for changing transportation modes, with a transfer distance between modes of no more than 500 meters	< 500 meters	125 meters
8. The number of transfers in a single trip should be limited to a maximum of three.	3 times	1.1 times

Source: BPTJ

⁶ <https://dishub.jakarta.go.id/2023/10/09/layanan-transportasi-publik-murah-meriah-di-jakarta/>

⁷ <https://jakartamrt.co.id/id/kawasan-berorientasi-transit-tod>

2.2. Mass Public Transportation Vehicles and Facilities in Jabodetabek

As of mid-2024, Jabodetabek has several types of public transportation and mass public transportation facilities, both rail and road-based (Table 2-2). That said, the supply of mass public transport services has yet to meet the rapidly growing demand in Jabodetabek. Figure 2-1 shows the map of the integrated public mass transportation system routes in Jabodetabek.

KRL Commuter has five lines that are already operating in Jabodetabek, namely: (a) The Bogor Line (comprising two routes: Jakarta Kota Station – Bogor Station and Jakarta Kota Station – Nambo Station); (b) The Rangkasbitung Line (Tanah Abang Station – Rangkasbitung); (c) The Tangerang Line (Tangerang Station – Duri Station); (d) The Cikarang Line (comprising three routes: Jatinegara Station – Cikarang Station, Tanah Abang Station – Jatinegara Station, and the Cikarang ring road); and (e) The Tanjung Priok Line (Tanjung Priok Station – Jakarta Kota Station).

PT TransJakarta operates the Bus Rapid Transit (BRT) and non-BRT services (including feeder vehicles, Royaltrans buses, and special service buses). The TransJakarta BRT operates in the following fourteen main corridors: (i) Corridor 1 (Blok M – Kota); (ii) Corridor 2 (Pulo Gadung – National Monument); (iii) Corridor 3 (Kalideres – National Monument via Veteran); (iv) Corridor 4 (Pulo Gadung – Galunggung); (v) Corridor 5 (Kampung Melayu – Ancol); (vi) Corridor 6 (Ragunan – Galunggung); (vii) Corridor 7 (Kampung Melayu – Kampung Rambutan); (viii) Corridor 8 (Lebak Bulus – Pasar Baru); (ix) Corridor 9 (Pinang Ranti – Pluit); (x) Corridor 10 (Tanjung Priok – PGC); (xi) Corridor 11 (Pulo Gebang – Kampung Melayu); (xii) Corridor 12 (Pluit – Tanjung Priok); (xiii) Corridor 13 (Ciledug – Tegal Mampang); and (xiv) Corridor 14 (Jakarta International Stadium – Senen). Each corridor has its own routes.

The Jabodebek LRT operates two lines, namely the Cibubur Line (Dukuh Atas Station – Harjamukti Station) and the Bekasi Line (Dukuh Atas Station – Jatimulya Station). The Jakarta LRT currently operates a single route (Pegangsaan Dua Station – Velodrome Station).

Table 2-2. Mass public transportation modes in Jabodetabek (2023)

No.	Public transportation mode	No. of corridors (unit)	Route length (km)	No. of nodes (unit)
1	KRL Commuter Line	5	232	81
2	MRT Jakarta	1	16	13
3	LRT Jabodebek	2	43	18
4	LRT Jakarta	1	6	6
5	BRT TransJakarta	14	1,401	252
6	TransJakarta Feeder	64	1,371	5,872
7	TransJabodetabek	106	4,632	62
8	Jabodetabek Residence Connection (JRC)	59	2,236	89
9	Jabodetabek Airport Connection (JAC)	53	2,577	53

Source: BPTJ, PT TransJakarta

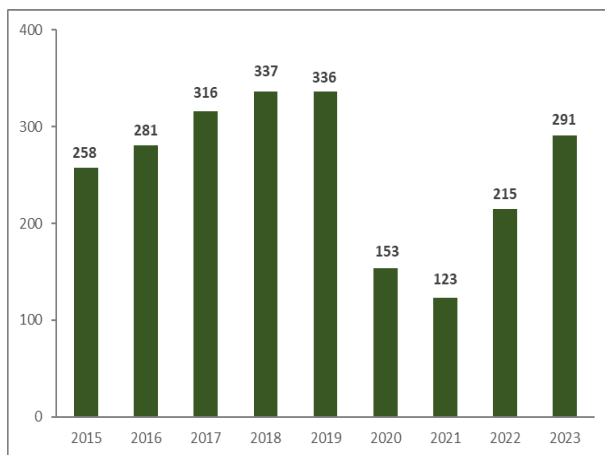
Figure 2-1. Jabodetabek integrated mass public transportation route map (as of mid-2024)



Source: PT TransJakarta

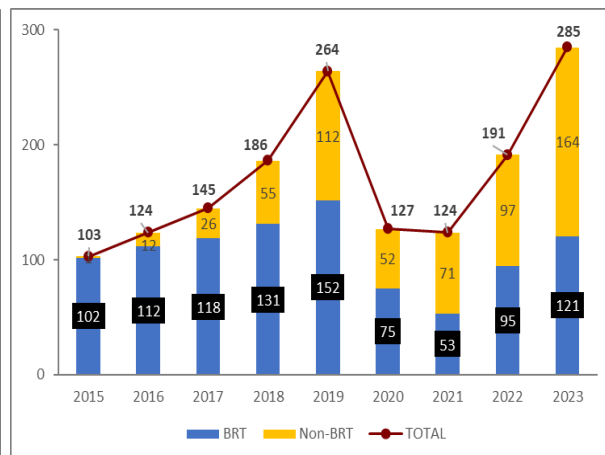
As shown in Figures 2-2 to 2-5, the KRL Commuter Line had the highest number of passengers in 2023 (290.9 million passengers per year or 796,961 passengers per day), followed by TransJakarta's BRT and non-BRT vehicles (284.9 million passengers per year or 780,521 passengers per day), MRT Jakarta (33.5 million passengers per year or 91,771 passengers per day), LRT Jabodebek (4.6 million passengers per year or 29,965 passengers per day), and LRT Jakarta (1.04 million passengers per year or 2,842 passengers per day). The number of passengers using the KRL Commuter Line and TransJakarta's BRT and non-BRT vehicles had declined in 2020 and 2021 due to the COVID-19 pandemic and large-scale social restrictions, but gradually increased in 2022 and 2023.

Figure 2-2. Number of KRL Commuter Line Jabodetabek passengers (million people)



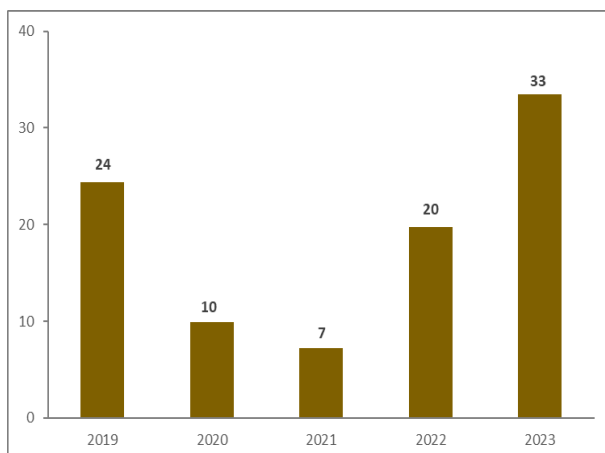
Source: National Statistics Agency, PT KAI Commuter

Figure 2-3. Number of TransJakarta passengers (million people)



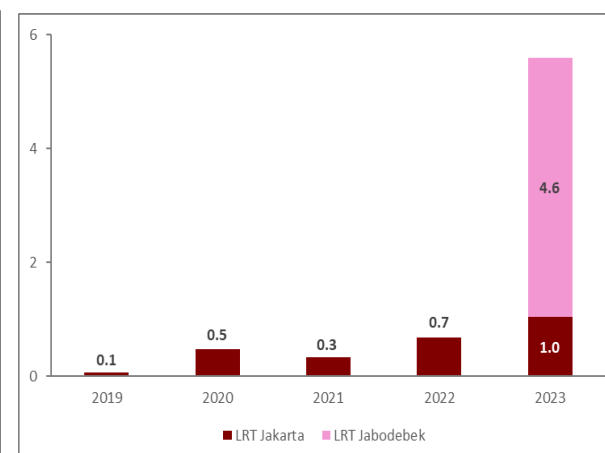
Source: National Statistics Agency, PT TransJakarta

Figure 2-4. Number of MRT Jakarta passengers (million people)



Source: National Statistics Agency, PT MRT Jakarta

Figure 2-5. Number of LRT Jakarta and LRT Jabodebek passengers (million people)



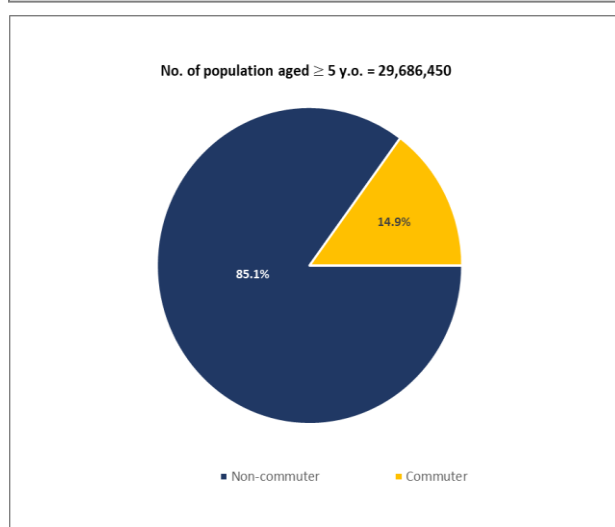
Source: National Statistics Agency, PT LRT Jakarta, PT LRT Jabodebek

3. Commuters and Use of Mass Public Transportation in Jabodetabek

3.1. Characteristics of Commuters in Jabodetabek

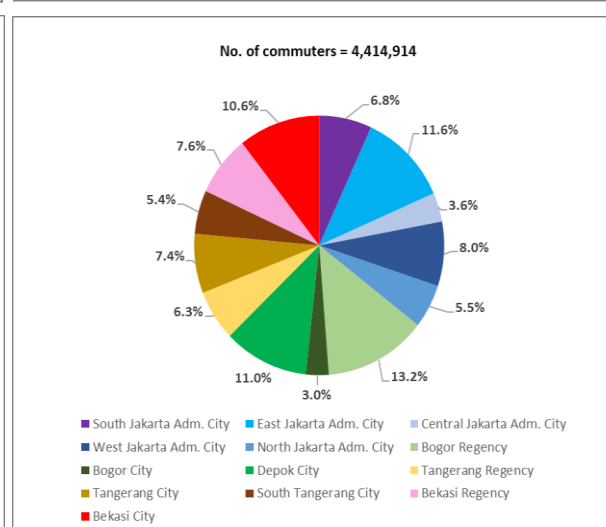
The 2023 Jabodetabek Commuter Survey conducted by BPS reveals that the number of commuters reached 4.4 million or 14.9% of the population aged five years or older in Jabodetabek⁸ in 2023 (Figure 3-1). The term “commuter” in the BPS survey refers to commuters aged five years or older. The three regions with the highest number of commuters in Jabodetabek were Bogor Regency (13.2% of the number of commuters in Jabodetabek), East Jakarta Administrative City (11.6%), and Depok City (11.0%). However, if all administrative cities in DK Jakarta are included in the calculation, 35.5% of Jabodetabek commuters lived in this special region (Figure 3-2). Based on their main activities, 81.9% of Jabodetabek commuters work, while 18.1% attend school, university, or courses (Figure 3-3).

Figure 3-1. Population of Jabodetabek commuters aged 5 years old or older (2023)



Source: National Statistics Agency

Figure 3-2. Commuters in Jabodetabek based on location of residence (2023)



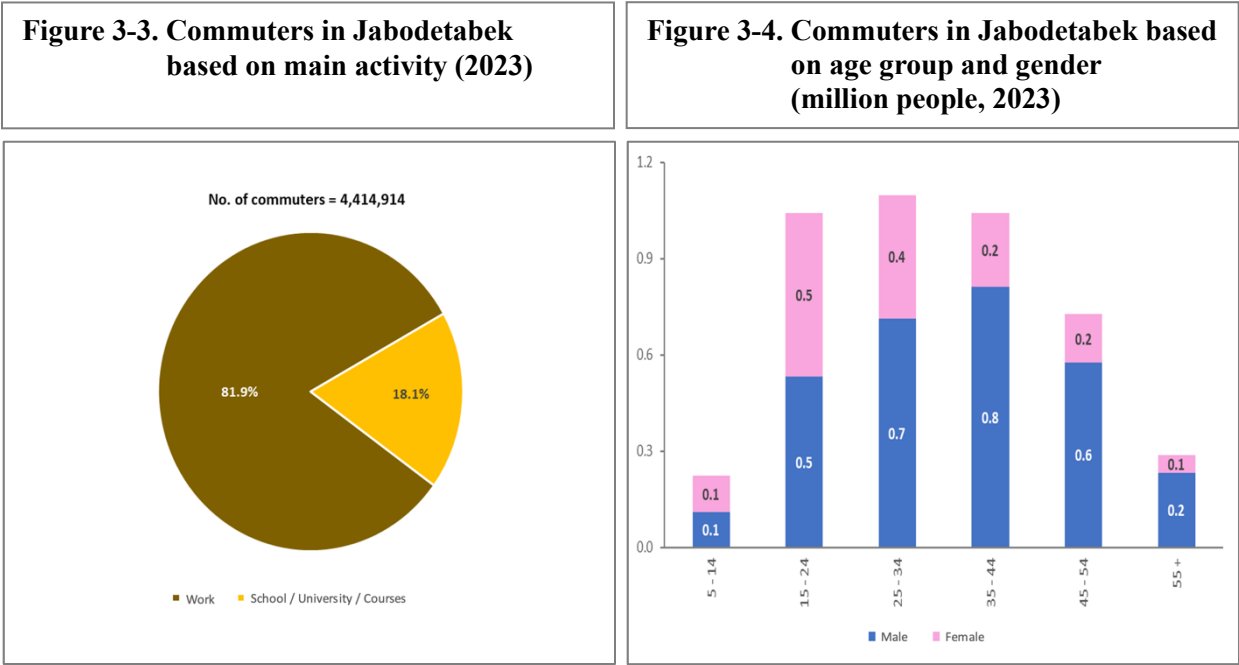
Source: National Statistics Agency

Based on gender composition, 67.3% of Jabodetabek commuters were male, while 32.7% were female. In terms of age composition, the 25-34 year age group has the highest proportion of Jabodetabek commuters (24.9% of the total number of commuters), followed by the 35-44 year age group (23.6%) and the 15-24 year age group (23.6%). Figure 3-4 shows that the proportion of

⁸ In the 2023 BPS Commuter Survey, Jabodetabek includes the South Jakarta Administrative City, East Jakarta Administrative City, Central Jakarta Administrative City, West Jakarta Administrative City, North Jakarta Administrative City, Bogor Regency, Bogor City, Depok City, Tangerang Regency, Tangerang City, South Tangerang City, Bekasi City, and Bekasi Regency. Although part of DKI Jakarta, Kepulauan Seribu Administrative Regency is not included in this BPS survey.

female commuters decreases as the age group increases. This is due to a decrease in the proportion of women engaging in activities outside the home as they age compared to men (for example due to household responsibilities after marriage).

The majority of Jabodetabek commuters have the highest education level of senior high school (SMA), Madrasah Aliyah (MA), or equivalent (48.8% of the total number of commuters), followed by bachelor’s degree (S1) or diploma IV (Figure 3-5). Almost all Jabodetabek commuters use digital technology. Figure 3-6 shows that 97.4% of all Jabodetabek commuters use cell phones, consisting of those who use cell phones to access the internet (62.3%) and those who could use cell phones but do not access the internet (35.1%). The large proportion of commuters who can use digital technology enables the government and public transportation operators to implement various digital applications that assist commuters in their travels.

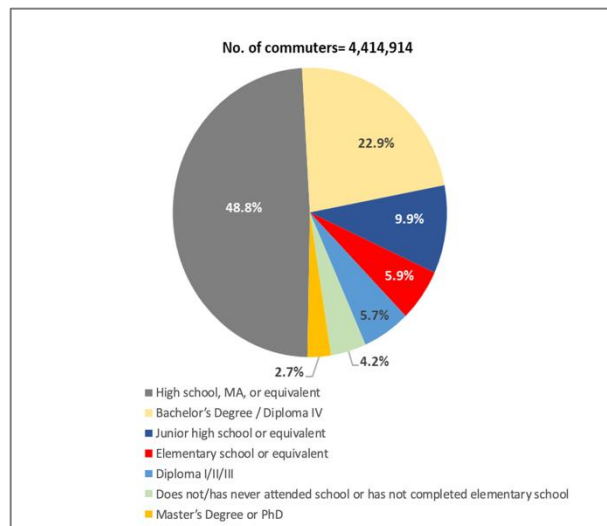


Source: National Statistics Agency

Source: National Statistics Agency

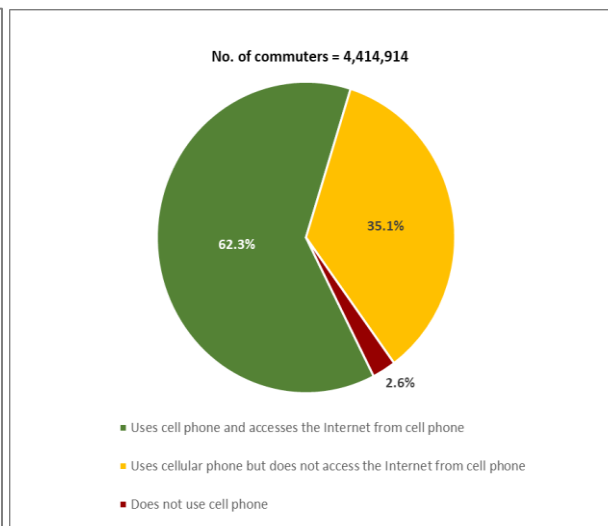
The majority of working Jabodetabek commuters were laborers, employees, or private sector employees (81.0%), followed by government employees (7.1%), and self-employed entrepreneurs (6.7%) (Figure 3-7). Since the group of government employee commuters has quite large, this group can be targeted for government policy pilot projects in the field of public transportation (for example, providing subsidies for the purchase and/or use of electric or hybrid vehicles) before this policy is widely implemented among other commuter groups.

Figure 3-5. Commuters in Jabodetabek based on their highest level of education (2023)



Source: National Statistics Agency

Figure 3-6. Commuters in Jabodetabek based on cell phone use and internet use via cell phone (2023)



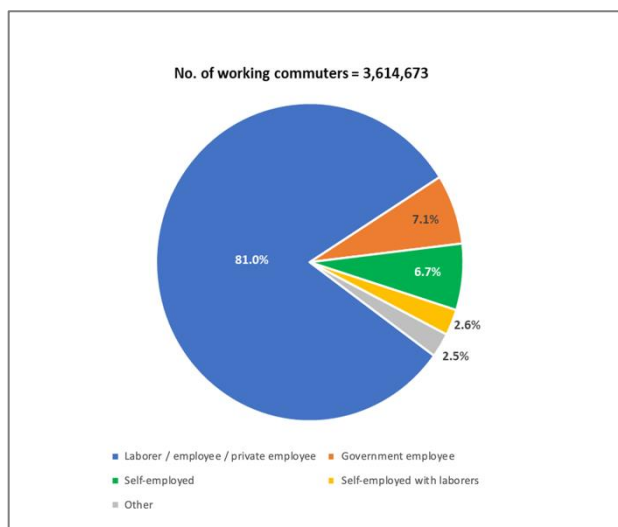
Source: National Statistics Agency

As many as 50.7% of working Jabodetabek commuters earned an average monthly income of IDR 5,000,000 or more (Figure 3-8). This figure is above the 2023 minimum wage in DKI Jakarta (IDR 4,901,798 per month), Bogor Regency (IDR 4,520,212), Bogor City (IDR 4,639,429), Depok City (IDR 4,694,493), Tangerang Regency (IDR 4,527,688), Tangerang City (IDR 4,584,519), and South Tangerang City (IDR 4,551,451), but below the 2023 minimum wage in Bekasi Regency (IDR 5,137,575) and Bekasi City (IDR 5,158,248)⁹. Since 49.3% of Jabodetabek commuters earn below IDR 5,000,000 per month, the increase in transportation costs will significantly erode the purchasing power of this commuter group.

Based on daily transportation costs, 28.6% of Jabodetabek commuters spent at least IDR 25,000 per day for transportation costs, 27.3% spent between IDR 15,000 and less than IDR 25,000, 21.3% spent between IDR 10,000 and less than IDR 15,000, and the remaining 22.9% spent below IDR 10,000 (Figure 3-9). Among the working commuter group, 43.6% of commuters earning IDR 5,000,000 or more per month spent at least IDR 25,000 per day on transportation (Figure 3-10). This could indicate that commuters in the middle and upper-income classes tend to use private vehicles, thus incurring higher transportation costs compared to lower-income commuter groups.

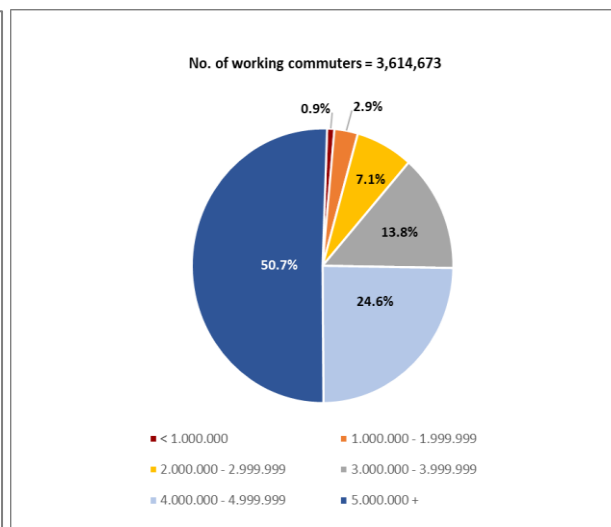
⁹ <https://bisnis.tempo.co/read/1740386/daftar-umr-jakarta-bogor-depok-tangerang-dan-bekasi-2023>

Figure 3-7. Working commuters in Jabodetabek based on main employment status (2023)



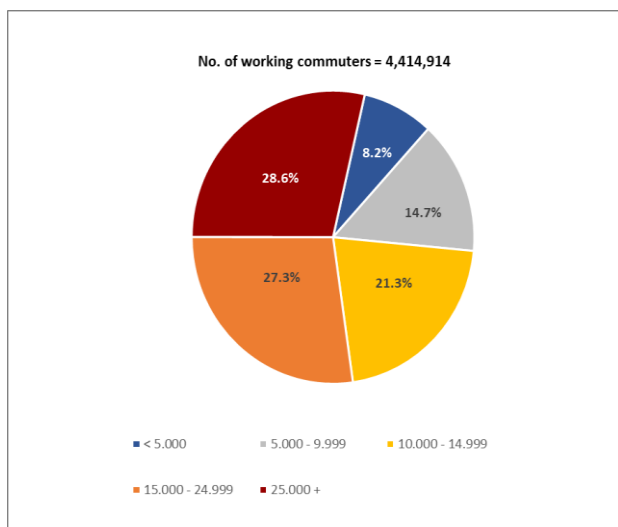
Source: National Statistics Agency

Figure 3-8. Working commuters in Jabodetabek based on average income per month (2023)



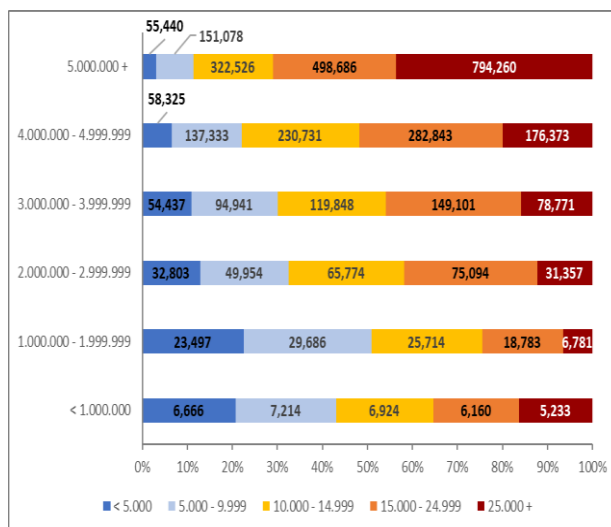
Source: National Statistics Agency

Figure 3-9. Commuters in Jabodetabek based on round trip cost per day (2023)



Source: National Statistics Agency

Figure 3-10. Number of working commuters in Jabodetabek based on round trip cost per day and average income per month (2023)



Source: National Statistics Agency

3.2. Patterns and Modes of Commuter Movements in Jabodetabek

Based on commute direction, the largest proportion of commuter movement in Jabodetabek is from their place of residence to their main place of activity within the city or regency where they reside (marked in blue cells in Table 3-1). As many as 31.7% of Jabodetabek commuters who lived in DK Jakarta traveled within this region.

As many as 50.5% of Jabodetabek commuters traveled five days a week, in line with the main activities of commuters who generally worked or studied five days a week. As many as 37.1% of Jabodetabek commuters traveled six times a week. In addition to working five days a week, those in this group also engaged in other activities besides their main activity, e.g., shopping or recreation (Figure 3-11).

Based on kilometers (km) distance traveled from their residence to the main place of activity, as many as 80.3% of Jabodetabek commuters traveled less than 30 km, consisting of those who traveled less than 10 km (29.8% of the total number of commuters), those who traveled 10 km to less than 20 km (30.3%), and those who traveled 20 km to 30 km (20.2%) (Figure 3-12). If we only take into account the population of commuters who lived within DK Jakarta, 38.1% of commuters who lived in this area traveled less than 10 km, 37.4% traveled between 10 km to less than 20 km, and 16.9% traveled between 20 km to less than 30 km (BPS, 2024). The Kemenko Marves-UNOPS study classifies commuter trips of up to 10 km as short-distance, trips between 10 km to less than 30 km as medium distance, and trips equal to or more than 30 km as long distance. Based on this classification, Jabodetabek commuter trips were mostly short and medium distances.

The 2023 Commuter Statistics Survey defines “mode of transportation” as the means of transportation commonly used by commuters to go to or return from their main places of activity. If a commuter uses more than one mode of transportation, the primary mode of transportation recorded is the one used for the furthest distance. If a commuter uses several modes of transportation over the same distance, the primary mode of transportation is the one that takes the longest to travel. This BPS survey classifies the activity of walking from the residence to the main place of activity as "not using a mode of transportation". As many as 86.4% of Jabodetabek commuters used one type of primary mode of transportation from their place of residence to their main place of activity (Figure 3-13).

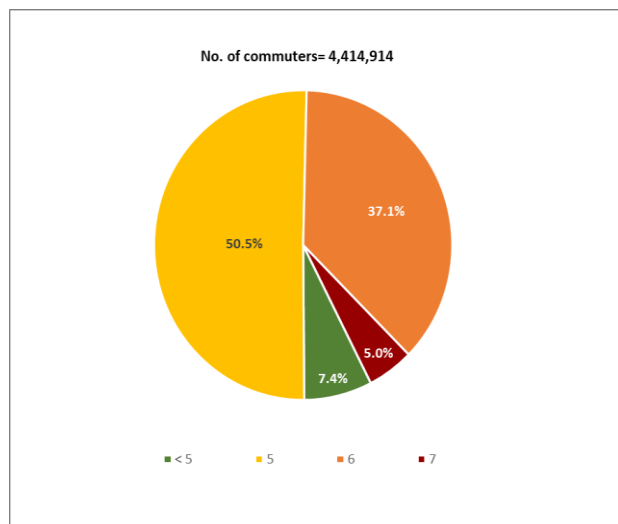
Based on the travel time required, 25.8% of Jabodetabek commuters took less than 30 minutes, 38.7% took between 30 minutes to 1 hour, and the remaining 35.5% took more than 1 hour (Figure 3- 14).

Table 3. Commuter directions in Jabodetabek from residence to main place of activity (% of total number of commuters, 2023)

Residence of location	South Jakarta Adm. City	East Jakarta Adm. City	Central Jakarta Adm. City	West Jakarta Adm. City	North Jakarta Adm. City	Bogor Regency	Bogor City	Depok City	Tangerang Regency	Tangerang City	South Tangerang City	Bekasi Regency	Bekasi City	Luar Jabodetabek	Jumlah
South Jakarta Adm. City	5.61	0.31	0.48	0.32	0.09	0.03	0.01	0.18	0.03	0.04	0.18	0.02	0.02	0.00	7.34
East Jakarta Adm. City	0.90	6.87	0.63	0.20	0.36	0.04	0.02	0.26	0.02	0.02	0.02	0.13	0.30	0.03	9.81
Central Jakarta Adm. City	0.24	0.15	2.39	0.20	0.25	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.02	0.00	3.31
West Jakarta Adm. City	0.41	0.08	0.49	5.79	0.48	0.00	0.00	0.02	0.10	0.32	0.10	0.02	0.01	0.00	7.82
North Jakarta Adm. City	0.17	0.27	0.45	0.32	4.19	0.00	0.01	0.01	0.01	0.03	0.01	0.02	0.05	0.01	5.57
Bogor Regency	0.37	0.24	0.29	0.10	0.09	13.20	0.81	0.53	0.16	0.02	0.30	0.13	0.19	0.13	16.54
Bogor City	0.10	0.03	0.04	0.02	0.01	0.46	2.42	0.05	0.01	0.01	0.01	0.00	0.00	0.01	3.17
Depok City	1.19	0.35	0.39	0.13	0.08	0.24	0.03	4.07	0.01	0.03	0.27	0.03	0.05	0.01	6.85
Tangerang Regency	0.10	0.01	0.13	0.17	0.06	0.04	0.00	0.01	8.78	0.93	0.13	0.00	0.00	0.03	10.38
Tangerang City	0.35	0.02	0.18	0.49	0.07	0.00	0.00	0.03	0.37	4.38	0.35	0.00	0.01	0.01	6.26
South Tangerang City	0.60	0.05	0.18	0.15	0.04	0.04	0.00	0.06	0.10	0.13	3.33	0.00	0.01	0.00	4.70
Bekasi Regency	0.20	0.20	0.15	0.04	0.23	0.08	0.03	0.01	0.00	0.00	0.00	8.11	0.82	0.14	10.02
Bekasi City	0.43	0.71	0.31	0.12	0.25	0.13	0.00	0.07	0.01	0.03	0.02	0.52	5.55	0.07	8.23
Jabodetabek	10.67	9.28	6.10	8.05	6.20	14.27	3.33	5.32	9.61	5.95	4.73	8.99	7.04	0.45	100.00

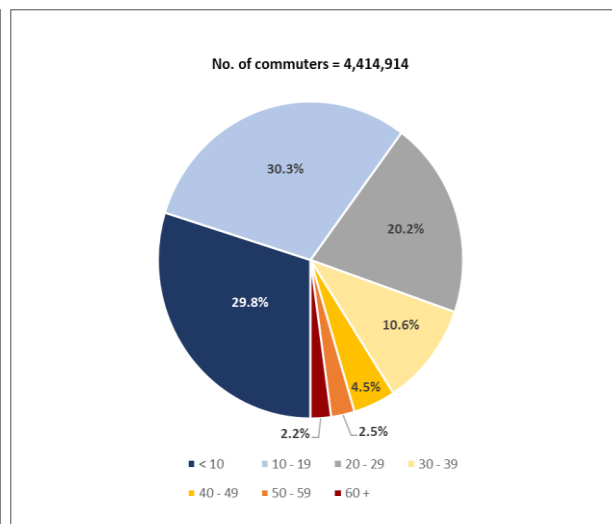
Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

Figure 3-11. Commuters in Jabodetabek based on the number of travel days in a week (2023)



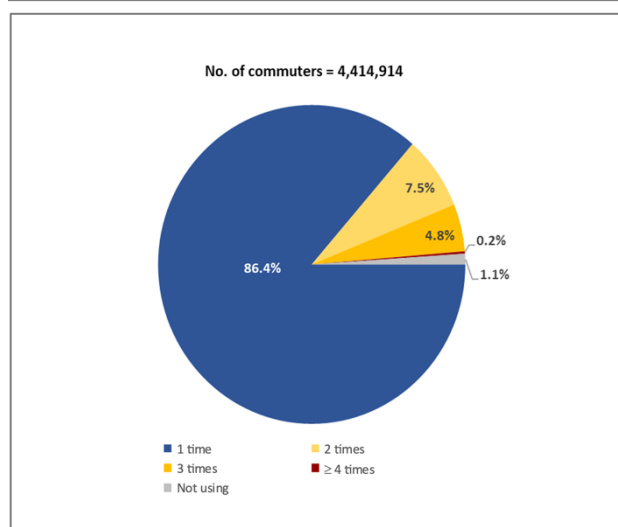
Source: National Statistics Agency

Figure 3-12. Commuters in Jabodetabek based on place of residence and kilometers traveled to their main place of activity (2023)



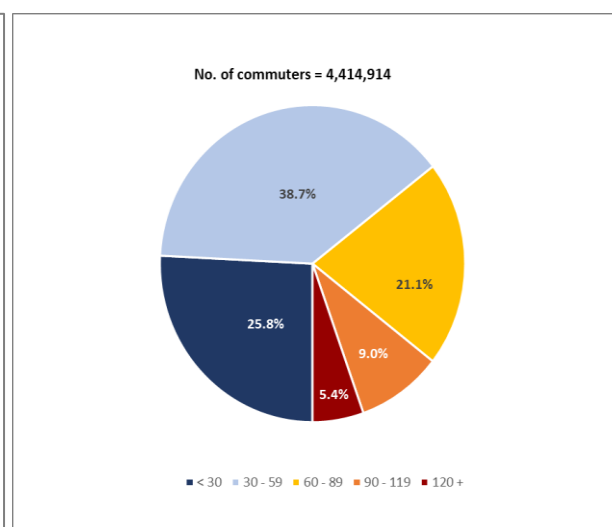
Source: National Statistics Agency

Figure 3-13. Commuters in Jabodetabek based on the number of modes of transportation used to travel to their main place of activity (2023)



Source: National Statistics Agency

Figure 3-14. Commuters in Jabodetabek based on the number of minutes of travel from their place of residence to their main place of activity (2023)

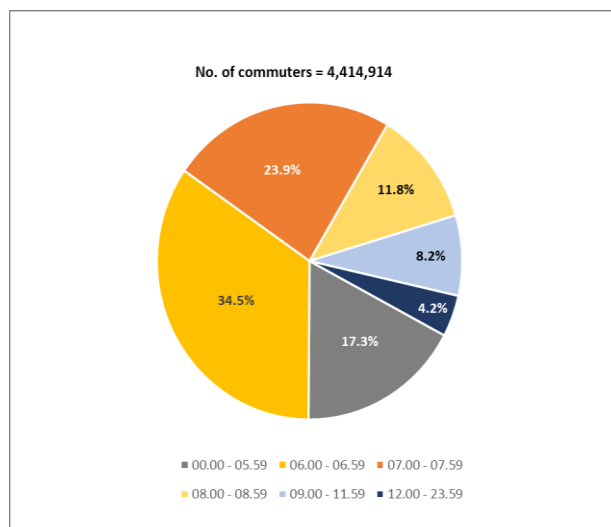


Source: National Statistics Agency

Based on the departure time from their residence, as many as 70.2% of Jabodetabek commuters depart between 06:00 – 08:59 (Figure 3-15). According to the Metro Jaya Regional Police, traffic congestion in DK Jakarta in the morning is concentrated between 06:00 – 09:00, with the highest congestion level occurring between 07:00 – 08:00¹⁰. Data from the Tomtom Traffic Index also shows that traffic congestion in DK Jakarta in the morning is concentrated between 06:00 – 08:00, especially on Mondays. Meanwhile, traffic congestion in the afternoon is concentrated between 17:00 – 19:00, with the worst congestion level on Fridays between 17:00 – 18:00¹¹. Based on the arrival time at their residence, 52.2% of Jabodetabek commuters arrived home between 17:00 – 20:00 (Figure 3-16).

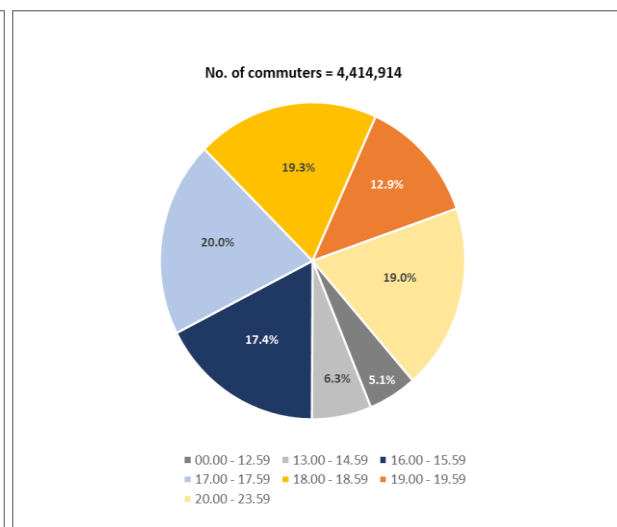
Private vehicles remain the most widely used mode of transportation by commuters in Jabodetabek, particularly motorcycles, followed by cars (see again Table 1-3). As many as 79.0% of Jabodetabek commuters used private vehicles as the primary mode of transportation to their main place of activity, while 19.5% used public transportation, and the remaining 1.5% either walked or used other modes of transportation (Figure 3-17). Meanwhile, 77.9% of Jabodetabek commuters used private vehicles to return home from their main activity locations, 20.4% used public transportation, and the remaining 1.7% either walked or used other modes of transportation (Figure 3-18).

Figure 3-15. Commuters in Jabodetabek based on departure time from home (2023)



Source: National Statistics Agency

Figure 3-16. Commuters in Jabodetabek based on arrival time at home (2023)

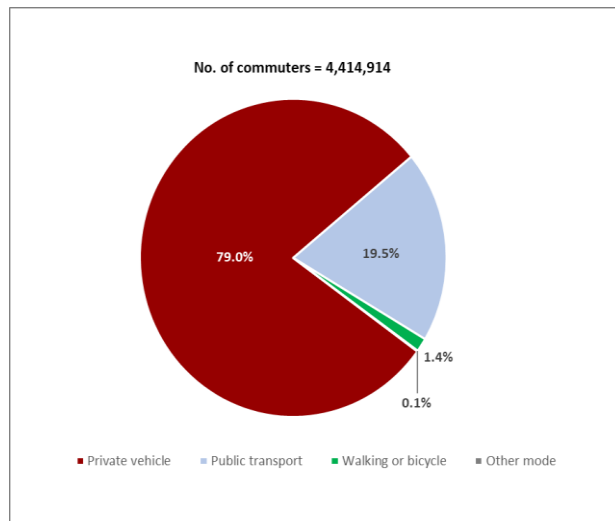


Source: National Statistics Agency

¹⁰ <https://www.kompas.id/baca/metro/2023/05/07/formula-jam-masuk-kerja-mengurai-kemacetan-jakarta>

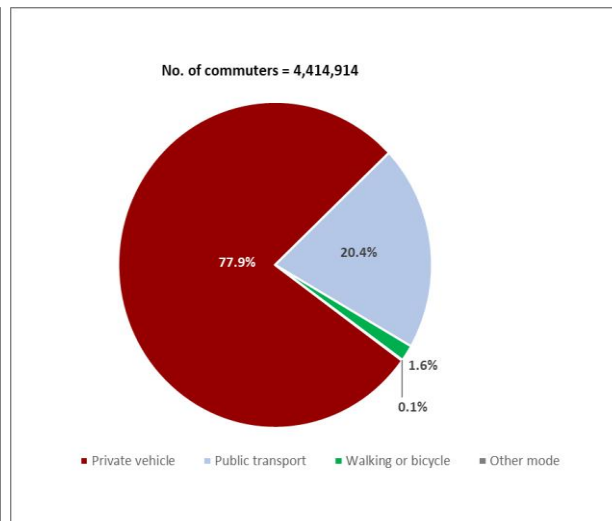
¹¹ <https://www.tomtom.com/traffic-index/jakarta-traffic/> Data accessed on 6 April 2024, at 15:25 Western Indonesia Time (WIB).

Figure 3-17. Commuters in Jabodetabek based on the primary mode of transportation to their main place of activity (2023)



Source: National Statistics Agency

Figure 3-18. Commuters in Jabodetabek based on the primary mode of transportation to go home from their main place of activity (2023)

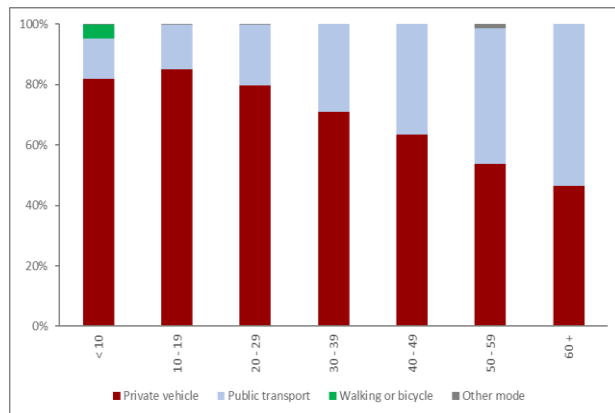


Source: National Statistics Agency

Figures 3-19 and 3-20 show that the farther a commuter travels to go to or return from their main place of activity, the higher the tendency of commuters in Jabodetabek to use public transportation. Long-distance journeys require greater physical and mental endurance and effort when taking a private vehicle compared to using public transportation (for example commuter trains). However, if the travel distance is short or medium, commuters tend to find it more practical (since they don't need to switch modes of transportation), faster, and/or are more comfortable using private vehicles rather than public transportation. As most commuters in Jabodetabek travel short or medium distances, the number of commuters who used private vehicles was significantly larger than commuters who used public transportation.

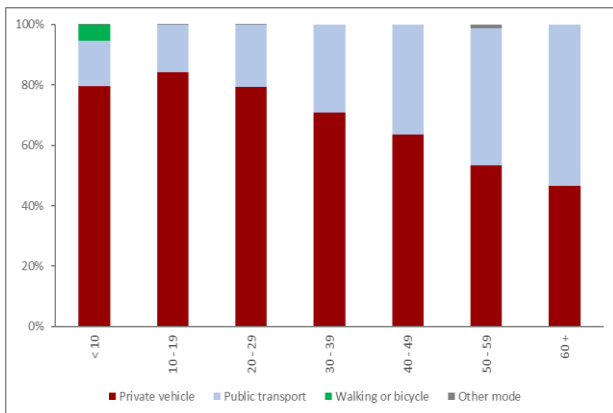
Income is one of the factors that influence working commuters in Jabodetabek when choosing a mode of transportation. The higher the average monthly income, the more likely Jabodetabek commuters are to use private vehicles rather than public transportation, both for going to and returning from their main place of activity (Figures 3-21 and 3-22). Higher income allows a commuter to purchase private vehicles. Although purchasing private vehicles is currently relatively easy due to lenient financing requirements from various financing companies, individuals still need a certain income to cover purchase and maintenance costs.

Figure 3-19. Proportion of the primary mode of transportation used by commuters in Jabodetabek based on the distance traveled from home to their main place of activity (2023)



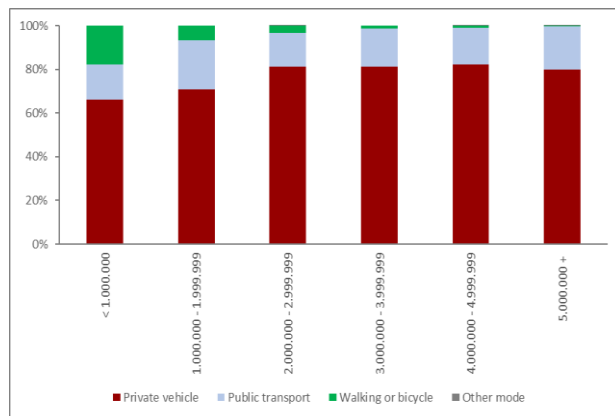
Source: National Statistics Agency

Figure 3-20. Proportion of the primary mode of transportation used by commuters in Jabodetabek based on the distance to go home from their main place of activity (2023)



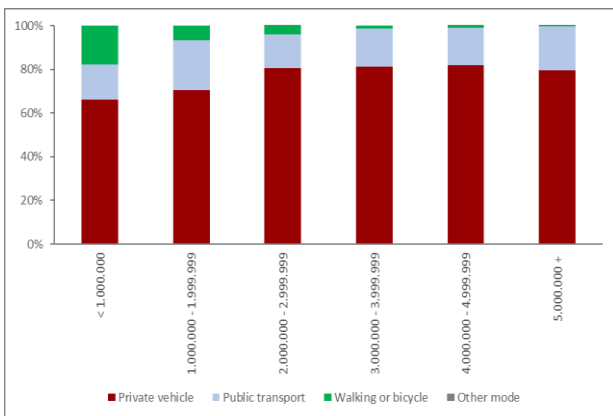
Source: National Statistics Agency

Figure 3-21. Working commuters in Jabodetabek based on the primary mode of transportation to go to their main place of activity and average income per month (2023)



Source: National Statistics Agency

Figure 3-22. Working commuters in Jabodetabek based on the primary mode of transportation to go home from their main place of activity and average monthly income (2023)



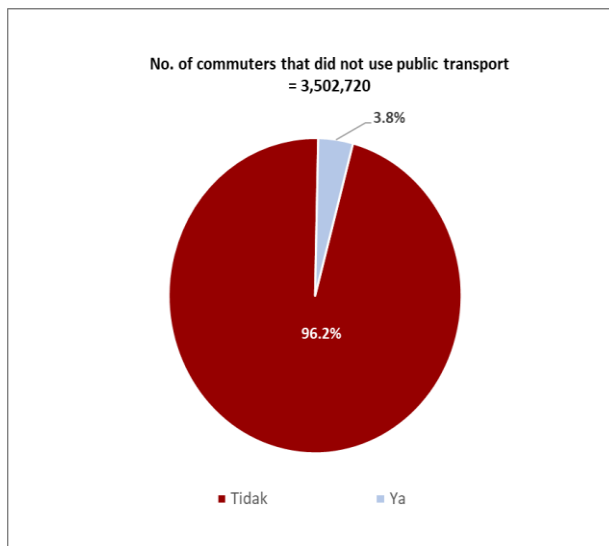
Source: National Statistics Agency

3.3. Jabodetabek Commuters' Perceptions and Preferences on Mass Public Transportation

BPS has conducted Jabodetabek commuter surveys in 2011, 2014, 2019 and 2023. The results of these surveys can be used to compare travel patterns, as well as commuters' preferences and perceptions regarding the modes of transportation they use across different survey years. It is important to note that the population in each survey year is not the same, both in terms of numbers and the individuals within the population. Some members may have entered or exited the population in more recent surveys compared to earlier surveys. Therefore, we cannot interpret differences in commuter preferences and perceptions from survey results of different years as changes in the preferences and/or perceptions of the same commuter population.

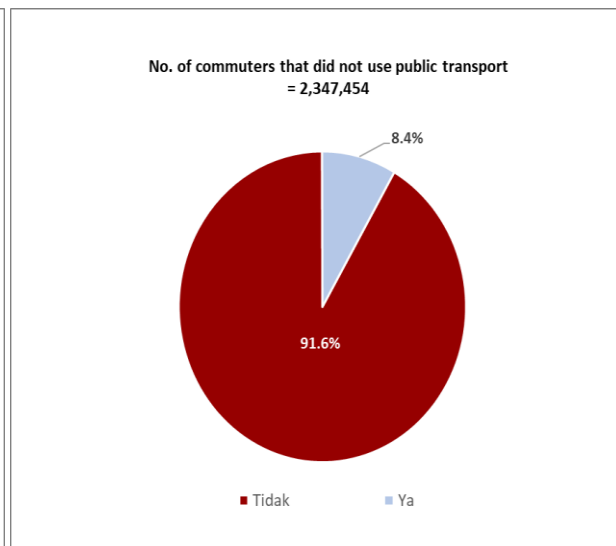
The BPS survey in 2023 shows that around 3.5 million commuters (79.3% of the 4.4 million commuters in Jabodetabek) stated that they did not use public transportation for round trips. As many as 96.2% of Jabodetabek commuters who did not use public transportation for round trips stated that they had no desire to switch to public transportation (Figure 3-23). The proportion of Jabodetabek commuters who did not use public transportation and did not want to switch to public transportation in the BPS survey in 2023 is higher than in the BPS survey in 2019 (91.6%) (Figure 3-24).

Figure 3-23. Commuters in Jabodetabek who do not use public transportation for commuting based on willingness to switch to public transportation (2023)



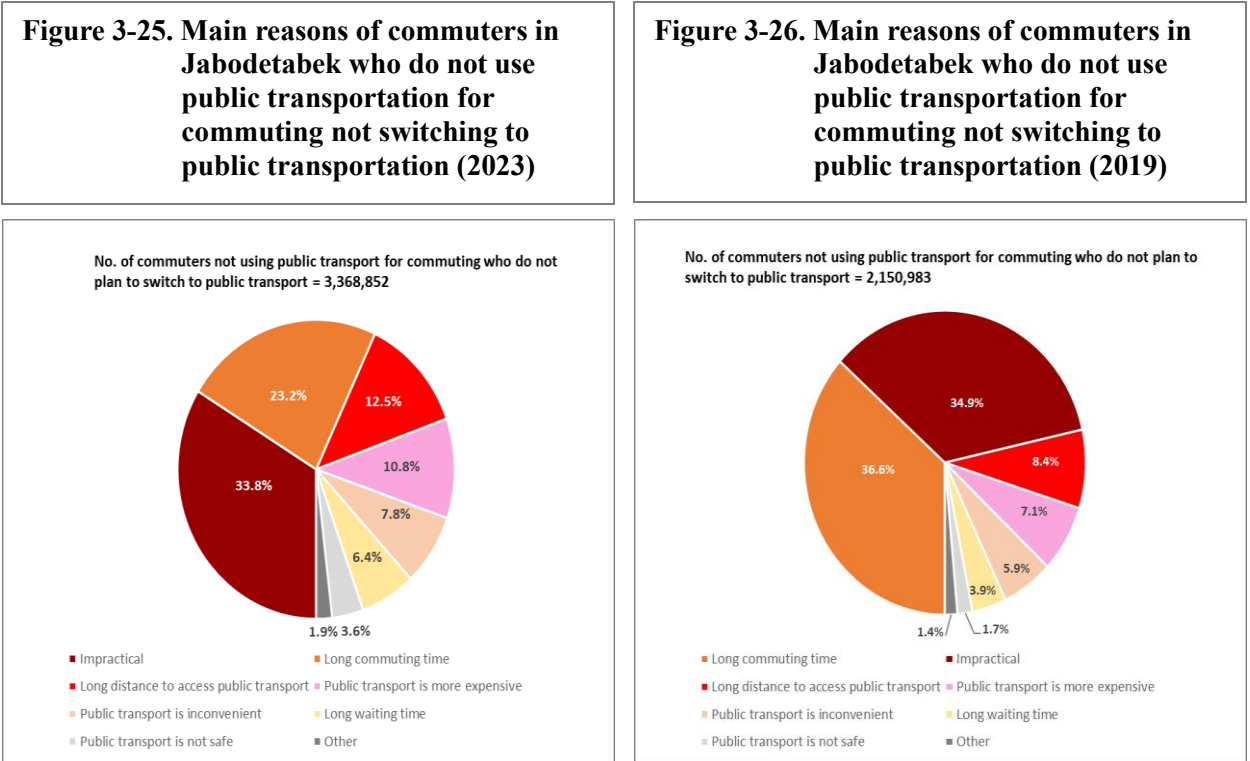
Source: National Statistics Agency

Figure 3-24. Commuters in Jabodetabek who do not use public transportation for commuting based on willingness to switch to public transportation (2019)



Source: National Statistics Agency

Both the 2023 and 2019 survey results show three main reasons why Jabodetabek commuters who did not use public transportation did not want to switch to using public transportation: (1) using public transportation is impractical¹²; (2) long travel times with public transportation; and (3) the distance to access public transportation. In the 2023 survey, the impracticality of using public transportation was ranked as the main reason by respondents (33.8%), followed by long travel times (23.2%), and the long distance to access public transportation (12.5 %) (Figure 3-25). In the 2019 survey, the number one reason for respondents was long travel times (36.6%), followed by the impracticality of using public transportation (34.9%), and the long distance to access public transportation (8.4%).



Source: National Statistics Agency

Source: National Statistics Agency

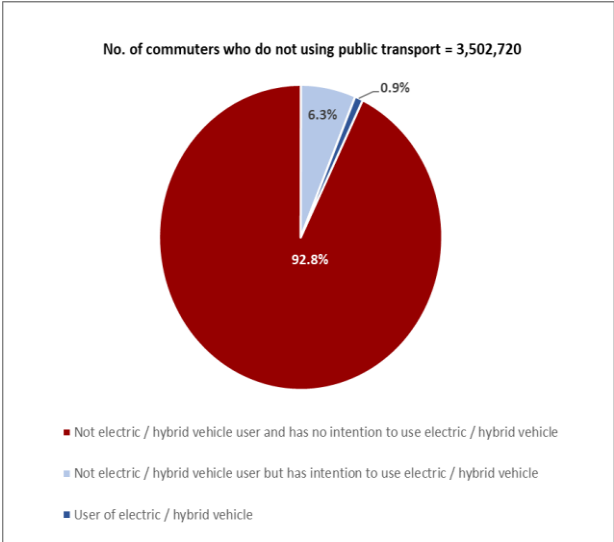
The BPS survey in 2023 also recorded the preferences of commuters who do not use public transportation regarding the use of electric and/or hybrid motor vehicles. As many as 92.8% of this commuter group stated that they did not want to switch to using electric or hybrid vehicles, 6.3% wanted to switch to electric or hybrid vehicles, and 0.9% had already used electric or hybrid vehicles (Figure 3-27). This survey did not further inquire about the reasons respondents expressed unwillingness to switch to electric or hybrid motor vehicles. However, based on the results of interviews conducted by the Kemenko Marves – UNOPS team with several transportation business experts and practitioners, there are several reasons that might cause Jabodetabek to be reluctant to

¹² One of the impracticalities of using public transportation is the need to change modes of transportation during the journey from the departure point to the final destination.

switch to electric or hybrid motor vehicles, including: (1) the high cost of electric vehicles, especially due to the high price of electric batteries; (2) the number of public electric vehicle charging stations is still limited, especially outside DK Jakarta; (3) there is still a limited number of workshops for the maintenance and repair of electric or hybrid motor vehicles; and (4) the perception that electric vehicles are unsafe (flammable).

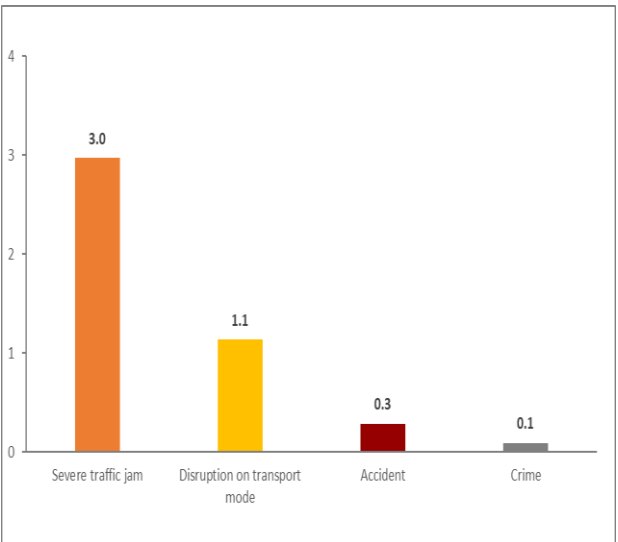
The BPS survey in 2023 also reveals commuters’ bad experiences while commuting in Jabodetabek. The most commonly experienced negative experience among commuters is severe traffic congestion (3.0 million people), followed by disruption to transportation modes (1.1 million people), and traffic accidents (0.3 million people) (Figure 3-28).

Figure 3-27. Commuters in Jabodetabek who do not use public transportation based on preference on the use of electric/hybrid motor vehicles (2023)



Source: National Statistics Agency

Figure 3-28. Commuters in Jabodetabek based on negative experience while commuting (million people, 2023)



Source: National Statistics Agency

4. Aspects of Environmental-Friendly Mass Transportation Integration in Jabodetabek

The integration of environmentally friendly public transportation in Jabodetabek includes four interrelated aspects: (i) regulatory integration and coordination between government agencies and other stakeholders; (ii) physical integration of public transportation modes; (iii) integration of tariffs and payment systems; and (iv) integration of information systems.

4.1. Regulatory Integration and Policy Coordination

Inconsistencies between various laws and regulations and the lack of coordination between government institutions are the two main issues in the integration and implementation of regulations regarding the mass transportation system in Jabodetabek.

There are various laws and regulations at the national and regional levels related to the development of the transportation system in Jabodetabek. Legislation at the national level related to the development of the transportation system in Jabodetabek includes Government Regulation (*Peraturan Pemerintah / PP*) No. 26 of 2008 on National Regional Spatial Planning in conjunction with PP No. 13 of 2017 on Amendments to PP No. 26 of 2008, Presidential Regulation (*Perpres*) No. 103 of 2015 on the Jakarta, Bogor, Depok, Tangerang and Bekasi Transportation Management Agency (*Badan Pengelola Transportasi Jakarta / BPTJ*), Presidential Regulation No. 55 of 2018 on the Jabodetabek Transportation Master Plan 2018-2029, and Minister of Transportation Regulation No. 172 of 2015 on Guidelines for Preparing the Jakarta, Bogor, Depok, Tangerang and Bekasi Transportation Master Plan (*RITJ*). Regional regulations related to the development of the transportation system in Jabodetabek include Regional Regulations on the Regional Budget (*APBD*) and Regional Regulations on Regional Spatial Planning in DKI Jakarta and in each City or Regency in Bodetabek.

Although there is already a Jabodetabek Transportation Master Plan based on Presidential Regulation No. 55 of 2018, various regional regulations on transportation made by Regional Governments in Jabodetabek have not been fully integrated and synchronized. For example, the routes for public transportation are determined by the Department of Transportation in each region, thus, transportation routes that cross several cities and/or regencies must obtain permission from each Department of Transportation from that city and/or regency. This process takes longer and incurs higher costs compared to if there were a single authority in Jabodetabek that could handle these permits. Another example is that the DKI Jakarta Provincial Government must first obtain permission from the DKI Jakarta Regional House of Representatives to provide subsidies to Regional Governments in Bodetabek to build facilities and infrastructure to support the integration of mass transportation systems across Jabodetabek.

Based on Presidential Regulation No. 103 of 2015, the Central Government established the Jakarta, Bogor, Depok, Tangerang, and Bekasi Transportation Management Agency (*BPTJ*) with the aim of developing, managing, and improving integrated transportation services in Jabodetabek by implementing good organizational governance. *BPTJ* is a special organizational unit under the Ministry of Transportation. As a unit with a lower position and relatively limited authority

compared to a Directorate General, BPTJ cannot make regulations that are binding on the Department of Transportation and public transportation companies in Jabodetabek. BPTJ has also been criticized for being perceived as incapable of coordinating with the Regional Governments in Jabodetabek in carrying out its duties, resulting in each Regional Government designing public transportation systems that often differ from the designs created by BPTJ^{13,14}.

The ratification of Law No. 2 of 2024 on the Special Region of Jakarta will accelerate the integration and synchronization of regulations and policies related to the mass transportation system in Jabodetabek. Article 51 Law No. 2 of 2024 states the establishment of an Agglomeration Area aims to synchronize development in DK Jakarta with the surrounding areas. This agglomeration area covers at least DK Jakarta, Bogor Regency, Tangerang Regency, Bekasi Regency, Cianjur Regency, Bogor City, Depok City, Tangerang City, South Tangerang City and Bekasi City. Article 55 of this Law mandates the establishment of an Agglomeration Area Council with the following two tasks: (i) coordinating the implementation of spatial planning for national strategic areas in the Agglomeration Area and the master plan document for the development of the Agglomeration Area; and (ii) coordinating, monitoring and evaluating the implementation of programs and activities in the master plan by ministries/agencies and Regional Governments.

Kemenko Marves can form an ad hoc team to expedite the process of integrating and synchronizing mass transportation regulations in Jabodetabek. This team is tasked with identifying and mapping laws and regulations at the central and regional levels that are incompatible with each other as well as providing recommendations to the Kemenko Marves regarding steps that must be taken to address regulations that are not synchronized. Based on the team's recommendations, Kemenko Marves can instruct ministries and/or institutions within its scope of coordination to revise, revoke, or replace regulations that are not in sync. Kemenko Marves can provide input to other coordinating ministries and Regional Governments in Jabodetabek regarding asynchronous regulations made by these parties.

To facilitate policy coordination between Kemenko Marves, the Ministry of Transportation, and Regional Governments in Jabodetabek, each government agency can form a desk or responsible party to coordinate with each other technically and exchange information regularly (for example weekly or monthly).

¹³ <https://berkas.dpr.go.id/akd/dokumen/K5-23-713d8f95c780c99db73bc95525e44da1.pdf>

¹⁴ <https://www.alinea.id/nasional/organda-tolak-pembentukan-badan-otoritas-transportasi-jabodetabek-b1XcB9hZB>

4.2. Physical Integration of Mass Public Transportation Modes

Before discussing the aspects of physical integration of mass public transportation modes in Jabodetabek, it is necessary to first convey several concepts and definitions related to the transportation system according to Minister of Transportation Regulation No. 49 of 2005 on the National Transportation System (*Sistem Transportasi Nasional / Sistranas*) and Minister of Transportation Regulation No. 172 of 2015 on Guidelines for Preparing the RITJ as follows:

- 1) "Transportation services" are services offered by transportation service providers to meet the needs of transportation service users.
- 2) "Transportation service network" is an arrangement of transportation service routes that form a cohesive relationship;
- 3) "Traffic space" is a space that facilitates transportation means and is equipped with facilities to support safety and smooth transportation.
- 4) "Road network" encompasses all roads intended for public traffic and interconnected, linking various places to form one system;
- 5) "Transportation node" is a place that functions for the activities of picking up and dropping off passengers, unloading and loading goods, arranging travel, serving as a point for intramodal and intermodal transfers;
- 6) "Infrastructure network" is a series of nodes connected by traffic space to form a single unit;
- 7) "Intermodal transportation" is the transportation of passengers and/or goods that utilizes more than one mode of transportation in one continuous journey.

The RITJ 2018-2029 states that transportation nodes that function as intermodal and intramodal passenger transfer points can include main nodes (interchange), medium nodes (terminal), and small nodes (bus stops). A "main node" is a node with a high intensity of passenger mobility activities and/or serves as a center for national and regional activities as a transfer point between two or more modes of transportation. A "medium node" is a node with moderate intensity of passenger mobility activities or serves as a center for local activities as a transfer point for one mode of transportation. A "small node" is a node with a low intensity of passenger mobility activities or serves as a center for local activities as a stop for public motor vehicles to drop off and/or pick up passengers reaching their final destination.

The RITJ 2018-2029 states that the Transportation Service Network System includes plans for the construction, development, and operation of a transportation service network consisting of a main network (trunk), branch network (feeder), and twig network. The "main network" is a network that connects the main node to other main nodes. The "branch network" is a network that connects main nodes with medium nodes or connects medium nodes to other medium nodes. The "twig network" is a network that connects medium nodes to small nodes or connects small nodes to other small nodes.

Next, this study will discuss the current conditions of connectivity and integration of the main urban public transportation nodes in Jabodetabek. BPTJ defines the connectivity ratio of road-based urban public transportation in Jabodetabek as the percentage comparison between the length of urban public transportation routes in Jabodetabek and the length of roads in Jabodetabek. Meanwhile, the connectivity ratio of rail-based public transportation in Jabodetabek is defined as the comparison between the length of the urban railway tracks in Jabodetabek and the land area of Jabodetabek.

Based on BPTJ calculations, the connectivity ratio for road-based urban public transportation in Jabodetabek stands at 73.5%, while the connectivity ratio for rail-based urban public transportation is 0.0492% as of the end of 2023. By the end of 2023, the main nodes in Jabodetabek that have been integrated with feeder nodes reached 55.63% of the total number of main nodes. There is a significant gap between the percentage of integrated main nodes in DKI Jakarta (69.32% of the total number of main nodes) and in other areas in Jabodetabek, especially Bogor Raya (including Bogor City and Bogor Regency), which only has an integrated main node proportion of 14.29% (Table 4-1).

Table 4-1. Total number of transportation nodes and integrated nodes in Jabodetabek (2023)

Location of main nodes	Number of main nodes	Number of integrated main nodes	Proportion of integrated main nodes (%)
DKI Jakarta	88	61	69.32
Bekasi Raya	16	8	50.00
Kota Depok	6	3	50.00
Bogor Raya	21	3	14.29
Tangerang Raya	20	9	45.00
TOTAL	151	84	55.63

Source: BPTJ (2024)

The RITJ 2018-2029 also establishes 54 transit-oriented development (TOD) areas, which consist of two types of TODs, namely TOD with a city typology and TOD with a sub-city or neighborhood typology (Table 4-2). Article 1 Number 7 of the Minister of Agrarian Affairs and Spatial Planning / Head of the National Land Agency Regulation No. 16 of 2017 on Guidelines for Transit-Oriented Area Development defines TOD development as a concept for developing areas within and around transit nodes that adds value by focusing on the integration of mass public transportation networks and between mass public transportation networks and non-motorized transportation networks, and the reduction of motor vehicle usage while promoting the development of mixed-use and dense areas with moderate to high space utilization.

Table 4-2. Transit Oriented Development (TOD) areas in Jabodetabek based on RITJ 2018-2029

City-scale TODs	Sub-city or Community-scale TODs
Jakarta 1) TOD Kampung Rambutan 2) TOD Blok M 3) TOD Lebak Bulus 4) TOD Dukuh Atas 5) TOD Tanjung Priok 6) TOD Grogol 7) TOD Rawa Buaya 8) TOD Jakarta Kota 9) TOD Cawang-Cikoko 10) TOD Pasar Senen 11) TOD Tanah Abang Depok City 1) TOD Depok Baru 2) TOD Cinere Bekasi City 1) TOD Stasiun Bekasi Timur 2) TOD Stasiun Bekasi Bekasi Regency TOD Cikarang-Jababeka Bogor City 1) TOD Baranangsiang 2) TOD Stasiun Bogor-Paledang Bogor Regency TOD Cibinong Tangerang City TOD Poris Plawad-Tangerang Tangerang Regency 1) TOD Balaraja 2) TOD Tigaraksa Tangerang Selatan City 1) TOD Jurangmangu-Ciputat 2) TOD Rawa Buntu	Jakarta 1) TOD Stasiun Tanjung Barat 2) TOD Stasiun Juanda 3) TOD Harmoni 4) TOD Mangga Dua 5) TOD Manggarai 6) TOD Cibubur 7) TOD Pancoran Depok City 1) TOD Stasiun Pondok Cina 2) TOD Jatijajar 3) TOD Citayam Bekasi City TOD di beberapa stasiun LRT Bekasi Regency 1) TOD Stasiun Cikarang 2) TOD Cikarang Selatan 3) TOD Tambun Bogor City 1) TOD Sukaesmi 2) TOD Tanah Baru 3) TOD Bubulak 4) TOD Kertamaya 5) TOD Mulyaharja Bogor Regency 1) TOD Bojonggede 2) TOD Gunung Putri Tangerang City 1) TOD Stasiun Tangerang 2) TOD Ciledug 3) TOD Palem Semi Tangerang Regency 1) TOD Cisauk 2) TOD Cikoya Tangerang Selatan City 1) TOD Pondok Cabe 2) TOD Sudimara 3) TOD Pondok Ranji 4) TOD Serpong

Source: Presidential Regulation No. 55 of 2018 on the Jabodetabek Transportation Master Plan 2018-2029.

The Central Government and Regional Governments in Jabodetabek continuously strive to expand and strengthen the mass public transportation network system in Jabodetabek to further attract private vehicle users to switch to mass public transportation. According to calculations by Kemenko Marves – UNOPS, the planned expansion and development of mass transportation routes in Jabodetabek from 2024-2026 will cost around IDR 5 trillion cumulatively, or IDR 1.7 trillion per year (Table 4-3).

Table 4-3. Estimated cost requirements for expanding mass public transportation routes in Jabodetabek 2024–2026

	No. of points of origin / routes	No. of operating buses (units/day)	Capacity (passengers / day)	Estimated cumulated costs (IDR billion)
Extension of BRT TransJakarta routes	5	120	~57,000	1,125
Opening of new routes for non-BRT TransJakarta feeders	15	180	~56,000	1,875
Adding routes for TransJabodetabek Premium	8	24	~2,000	156
Adding routes for Jabodetabek Residence Connexion (JRC)	134	266	~6,000	597
Adding routes for LRT feeders	18	285	~34,000	945
Adding routes for Bodetabek feeders	13	157	~27,000	251
Total number of routes added	193	1,032	~182,000	4,950

Source: Kemenko Marves – UNOPS, Ministry of Transportation, BPTJ, TransJakarta

In the Jabodetabek mass transportation route expansion plan for 2024-2026, the operational routes of PT TransJakarta in Jabodetabek will include the following developments ¹⁵:

- 1) Extension of five BRT operational routes from DKI Jakarta to Bodetabek: (i) Route E2 (Medan Satria – Monas); (ii) Route E3 (Poris Plawad – Monas); (iii) Route E7 (Jatijajar - Kampung Melayu); (iv) Route E8 (Pondok Cabe - Pasar Baru); and (v) Route E13 (North Serpong - Tegal Mampang).

¹⁵ PT TransJakarta presentation at Kemenko Marves, 10 June 2024.

2) Opening of 15 new non-BRT feeder routes: (i) Rajeg – Tomang; (ii) Balaraja – Petamburan; (iii) Binong – Grogol; (iv) Panongan – Grogol; (v) West Pamulang - Lebak Bulus; (vi) Jatisampurna - Simpang Cawang; (vii) Tourist City – Cawang; (viii) Tourist City – Cawang; (ix) Mustika Jaya – Cawang; (x) South Cikarang – Cawang; (xi) South Cikarang - Pulo Gebang; (xii) Cibitung – Cawang; (xiii) East Bekasi - Pulo Gadung; (xiv) Babelan - Pulo Gadung; and (xv) North Bekasi - Pulo Gadung.

To extend these five BRT corridors, PT TransJakarta needs to build new infrastructure, including adding 95.4 km of BRT lines and constructing 47 new bus stops. In addition, PT TransJakarta needs to increase the number of operational buses by 300 units, consisting of 120 buses for the extension of the five BRT routes and 180 buses for new non-BRT feeder routes¹⁶.

Next, this study will discuss the challenges faced in the physical integration of mass public transportation in Jabodetabek and policy recommendations to address these issues. This study identified three problems in the physical integration of mass public transportation in Jabodetabek, namely: (1) problems related to public transportation services; (2) meeting financing needs for the provision of mass public transportation facilities and their supporting infrastructure; and (3) disparities in the quantity and quality of mass transportation systems between DKI Jakarta and Level II Regions in Bodetabek.

In terms of issues related to mass public transportation services, the results of the 2023 and 2019 Jabotetabek Commuter Survey indicate that impracticality of use, long travel times, and obstacles to commuters' access to public transportation are the three reasons that discourage non-public transportation users from using public transportation.

Concerning the problems of impracticality and long travel times with mass public transportation, this study recommends the construction of a circular BRT transportation network (loop) that connects the five Administrative Cities in DKI Jakarta in a clockwise and counterclockwise direction, with more stops (for example, with a distance of about one kilometer between stops). The BRT loop should ideally be constructed above ground (elevated) to keep it free from private vehicles. This loop-shaped BRT facility is expected to make public transportation commutes more practical by minimizing need to change travel modes frequently and speeding up commutes as the BRT operates on lanes that are free from private vehicles.

Meanwhile, increasing the number of feeder vehicles to main transportation nodes and increasing the number of stops for feeders are expected to address obstacles to commuters' access to mass public transportation. This study also recommends the construction of ramps at bus stops and stations that do not yet have them to make it easier for disabled and/or elderly commuters to access mass public transportation.

¹⁶ *Ibid.*

The next issue is the finances required for the provision of public transportation facilities and supporting infrastructure. Most of these financing needs can be met using conventional financing sources such as the state budget (APBN), regional budgets (APBD), direct investment by private investors, and bank loans. One potential source of conventional financing for Regional Governments is revenues from motor vehicle taxes. Based on calculations by the Ministry of Transportation, Jabodetabek has the potential to generate IDR 34.47 trillion per year¹⁷ in motor vehicle tax revenue.

Although conventional financing sources can be used to meet the financing needs for the provision of public transportation facilities and infrastructure in Jabodetabek, this study recommends that the Central Government and Regional Governments in Jabodetabek explore the possibility of utilizing alternative sources of financing such as public-private partnerships (PPP), including PPPs that use blended financing structures, and issuing regional and/or corporate bonds. For example, the development of a TOD area can be financed using a PPP scheme between the Central Government and/or Regional Government and private business entities. Another example is a PPP scheme with a blended structure that can be offered to environmentally-conscious investors to finance the construction of environmentally friendly stations or bus stops powered by solar panels for self-sufficient electricity needs.

The third issue is the significant disparity between the quantity and quality of mass public transportation systems in DKI Jakarta and Bodetabek. Although these differences cannot be completely eliminated, it is necessary to set a uniform minimum standard for public transportation services that needs to be established for all of Jabodetabek. For example, Regional Governments in Jabodetabek need to determine uniform standards for public vehicles, safety standards that public transportation drivers must adhere to (such as maximum speed limits), safety standards for public transportation users (such as protection for female commuters from the risk of sexual harassment on public transportation), and accessibility standards for disabled and/or elderly commuters using public transportation.

¹⁷ *Ibid.*

4.3. Fares and Payment System Integration

Each mass public transportation service provider (operator) in Jabodetabek has a different fare-setting mechanism. In general, passenger fares in Jabodetabek are divided into subsidized and non-subsidized public transportation fares. Subsidized public transportation operators receive fare subsidies from the Central Government or Regional Government, which are public service obligation (PSO) funds allocated in the APBN or APBD. Government-owned or region-owned public transportation operators charge subsidized fares for economy class, while privately owned public transportation operators have the freedom to set their fares but cannot exceed the maximum fare limit set by the Regional Government. Specifically for rail-based transportation, the fares are set through a Decree from the Minister of Transportation.

Fares in cities or regencies in Bodetabek are set through Regional Regulations or Mayoral/Regent Decrees. For DKI Jakarta, the fare-setting mechanism for public transportation is regulated in Articles 135, 136, and 137 of DKI Jakarta Regional Regulation No. 5 of 2014 on Transportation. Based on this Regional Regulation, passenger fares for using public motor vehicles are categorized into in-route and out-of-route fares. Furthermore, in-route public transportation fares are divided into subsidized and non-subsidized fares. Subsidized public transportation fares in DKI Jakarta are determined by the Governor of DKI Jakarta based on a proposal from the Jakarta City Transportation Council, while non-subsidized public transportation fares are set by transportation service providers after obtaining approval from the Governor of Jakarta. The Provincial Governor can issue a Governor's Regulation or Governor's Decree to determine fares for public transportation owned by Jakarta's region-owned enterprises.

PT TransJakarta applies several fare categories for its public transportation services (Table 4-4). The regular fare of IDR 3,500 is valid from 7:00 AM to 5:00 AM, and economical fares apply from 5:00 AM to 7:00 AM. There are also other fares, such as free fares for Mikrotrans; IDR 20,000 for Royal Trans; and IDR 5,000 for the TransJakarta Integrated Fare, which is valid for three hours.

Table 4-5 shows the fare amounts for the KRL Commuter Line, LRT Jakarta, and LRT Jabodebek as of mid-2024. The Jabodetabek Commuter Line KRL fare, which is currently in effect, is determined based on the Decree of the Minister of Transportation No. KM 354 of 2020 in conjunction with Ministerial Decree No. KM 1999 2022. Based on this Ministerial Decree, the Jabodetabek Commuter Line KRL fare is set at IDR 3,000 for the first 1–25 km and IDR 1,000 for each subsequent 10 km traveled. The Jakarta LRT sets a flat fare of IDR 5,000 per trip regardless of distance. Jabodebek LRT sets a fare of IDR 5,000 for the first 1 km and IDR 700 for each additional kilometer, with a maximum fare of IDR 10,000 during off-peak hours and IDR 20,000 during peak hours.

Several public transportation operator in Jabodetabek have implemented joint fares for several integrated lines or routes. For example, PT TransJakarta, PT MRT Jakarta, and PT LRT Jakarta set a maximum price for the Integrated Multimodal Fare at IDR 10,000, which applies to the use of MRT Jakarta, Transjakarta, and LRT Jakarta transportation modes within a three-hour period.

The results of the BPTJ study show that the ideal fare of IDR 40,000 for a single trip from the initial departure point to the final destination can encourage Jabodetabek commuters who currently use private vehicles (especially motorcycles) to switch to mass public transportation¹⁸.

Table 4-4. Fares for TransJakarta Services (as of mid-2024)

Type of service	Fare (IDR)	Note	Effective from	Legal basis
Reguler	3,500	Valid from 7:00 AM to 5:00 AM	2006	-
Economic	2,000	Valid from 05:00 AM to 07:00 AM	2006	-
Royaltrans	20,000	Only valid for Royaltrans	10/2018	-
Mikrotrans	0	Only valid for Mikrotrans	2018	-
Integrated TransJakarta	Max 5,000 Max 10,000	Only valid for Transjakarta within a period of three hours	09/2018	Governor Regulation No. 97 of 2018
Integrated Multimodes		Valid for MRT Jakarta, Transjakarta, and LRT Jakarta within a period of three hours	10/2022	Governor Decree No. 733 of 2022

Source: PT TransJakarta

Table 4-5. Fares for KRL Commuter Line Jabodetabek, LRT Jakarta, and LRT Jabodebek

Service type	Distance	Fare per person (Rupiah)
KRL Jabodetabek	1 - 25 first km	3,000
	Each subsequent 10 km	1,000
LRT Jakarta	1 trip (regardless of distance)	5,000
LRT Jabodebek	1 first km	5,000
	Each additional kilometer	700
	Maximum fare during off-peak hours	10,000
	Maximum fare during peak hours	20,000

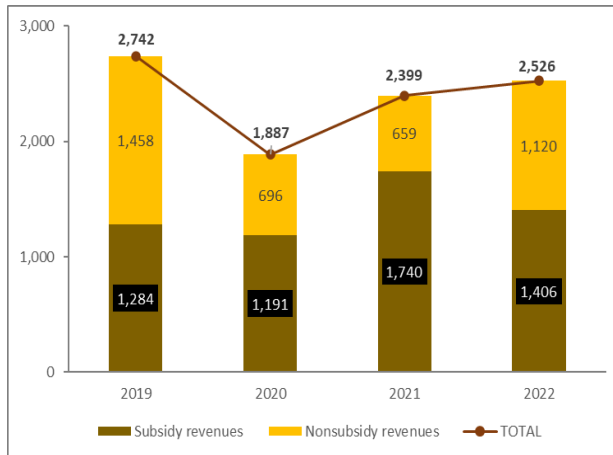
Source: BPTJ, PT KAI Commuter, PT LRT Jakarta, PT LRT Jabodebek

Government subsidies play a vital role in keeping mass public transportation fares affordable for commuters in Jabodetabek. These subsidies are also necessary to improve the quality of public transportation services. Figures 4-1, 4-2, 4-3, and 4-4 show that revenues from government subsidies have a more significant contribution than non-subsidy revenues at PT TransJakarta, PT KAI Commuter, PT MRT Jakarta, and PT LRT Jakarta between 2019-2022. Government subsidies

¹⁸ The results of the BPTJ study on the ideal fares for mass public transportation in Jabodetabek, as presented at a limited meeting at the Kemenko Marves office on June 10, 2024.

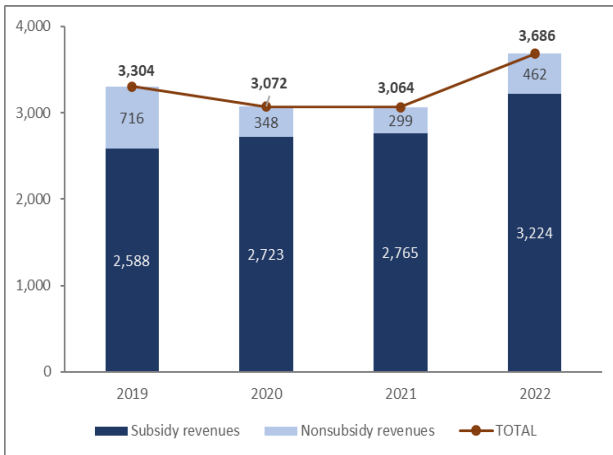
to public transportation operators in Jabodetabek represent a form of public service obligation (PSO) from the government in providing public goods for the benefit of the community.

Figure 4-1. Subsidized and non-subsidized revenue of PT KAI Commuter* (IDR billion)



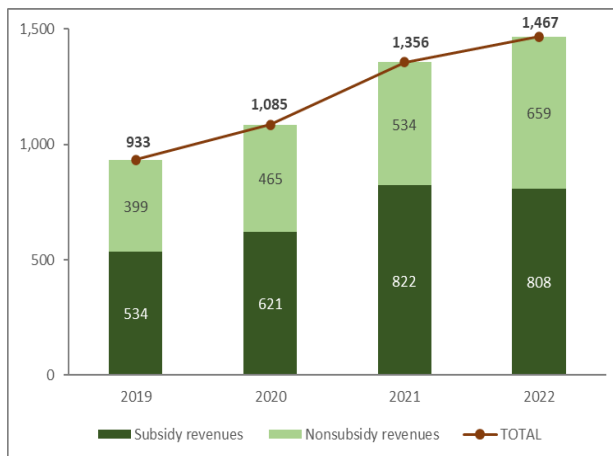
*revenues from Jabodetabek and non-Jabodetabek routes
Source: PT KAI Commuter

Figure 4-2. Subsidized and non-subsidized revenue of PT TransJakarta (IDR billion)



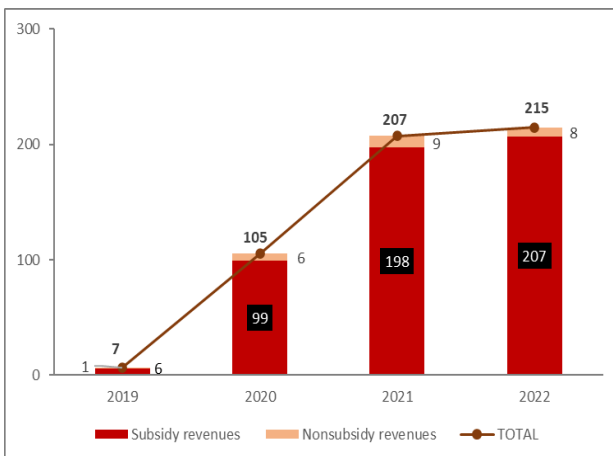
Source: PT TransJakarta

Figure 4-3. Subsidized and non-subsidized revenue of PT MRT Jakarta (IDR billion)



Source: PT MRT Jakarta

Figure 4-4. Subsidized and non-subsidized revenue of PT LRT Jakarta (IDR billion)



Source: PT LRT Jakarta

The mass public transportation payment system in Jabodetabek is already well integrated. Mass transportation operators in Jabodetabek encourage the use of electronic payment methods, such as electronic money (e-money) or Quick Response (QR) code-based electronic payments. Several types of electronic payment methods from various banks and non-bank financial institutions can be used to pay for different types of mass public transportation in Jabodetabek (Table 4-6).

Since nearly all Jabodetabek commuters have digital skills – at least in terms of using cell phones and accessing the internet via cell phones (as shown by the results of the 2023 Jabodetabek Commuter Survey) – the development and implementation of financial technology for mass public transportation payment systems in Jabodetabek can be accomplished quite easily.

Table 4-6. Several electronic payment methods for mass public transportation in Jabodetabek (as of mid-2024)

	TransJakarta	KRL Jabodetabek	LRT Jakarta	MRT Jakarta	LRT Jabodebek
Kartu Multi Trip KAI Commuter	✓	✓	✓	✓	✓
BRI Brizzi	✓	✓	✓	✓	✓
Mandiri e-Money	✓	✓	✓	✓	✓
BCA Flazz	✓	✓	✓	✓	✓
BNI TapCash	✓	✓	✓	✓	✓
Bank DKI JakCard	✓	✓	✓	✓	✓
BTN Blink	✓	✓	X	✓	✓
Kartu JakLingko	✓	✓	✓	✓	X
Mandiri e-Money JakLingko	✓	✓	✓	✓	X
BCA Flazz JakLingko	✓	✓	✓	✓	X
BNI TapCash JakLingko	✓	✓	✓	✓	X
JakLingko Apps	✓	✓	✓	✓	X
Bank Mega MegaCash	✓	✓	✓	X	X
Dana	✓	✓	X	X	✓
GoPay	✓	✓	X	X	✓
OVO	✓	✓	X	X	✓
KAIPay	X	✓	X	X	✓
LinkAja	X	X	✓	X	✓
AstraPay	✓	X	X	✓	X
i.Saku	X	X	X	✓	X
BCA digital blu	X	X	X	✓	X

✓ = can be used for payment X = cannot be used for payment

Source: PT TransJakarta, PT KAI Commuter, PT MRT Jakarta, PT LRT Jakarta, PT LRT Jabodebek

4.4. Integration of Information Systems

Mass public transportation operators in Jabodetabek each have their own information systems. As of mid-2024, Jabodetabek does not yet have an integrated mass public transportation information system. An integrated mass public transportation information system will help policymakers in improving public transportation policies, such as determining the number of additional public transportation vehicles needed, identifying transportation nodes that require capacity expansion, and identifying areas that require new transportation nodes.

An integrated information system will also facilitate mass public transportation users in Jabodetabek during their travels. For instance, it would provide information on the arrival times of other modes of public transportation when transferring between modes, delays in a particular mode of public transportation, and travel disruptions related to weather, natural disasters, accidents, or technical issues with the transportation system. While Jabodetabek commuters can currently access travel information via applications such as Google Maps or Moovit, the information provided is still limited to routes and travel schedules.

To integrate mass transportation information systems in Jabodetabek, BPTJ is developing the Satu Matrix System. This system maps the origin-destination of commuters in Jabodetabek in real time using big data collected from commuters' cell phone location, which are detected by base transceiver stations (BTS). Therefore, the Satu Matrix will be able to display various data on the actual movement patterns of Jabodetabek commuters, such as the total number of movements, average daily movements, average peak movement, average busiest day, and average busiest hours. The Satu Matrix System can be further developed to include information about travel conditions that can be communicated to commuters via cell phones and the internet.

5. Impact of Mass Public Transportation System Integration in Jabodetabek

5.1. The Role of the Transportation Sector in the Economy of Jabodetabek

Before discussing the impact of mass public transportation system integration in Jabodetabek, we will first discuss the role of the transportation sector in the Jabodetabek economy. The transportation and warehousing sector contributed 4.4% to Jabodetabek's GRDP in 2023 (Figure 5-1). This sector grew faster than Jabodetabek's overall economic growth over the past five years, except when the government imposed large-scale social restrictions during the COVID-19 pandemic in 2020 (Figure 5-2).

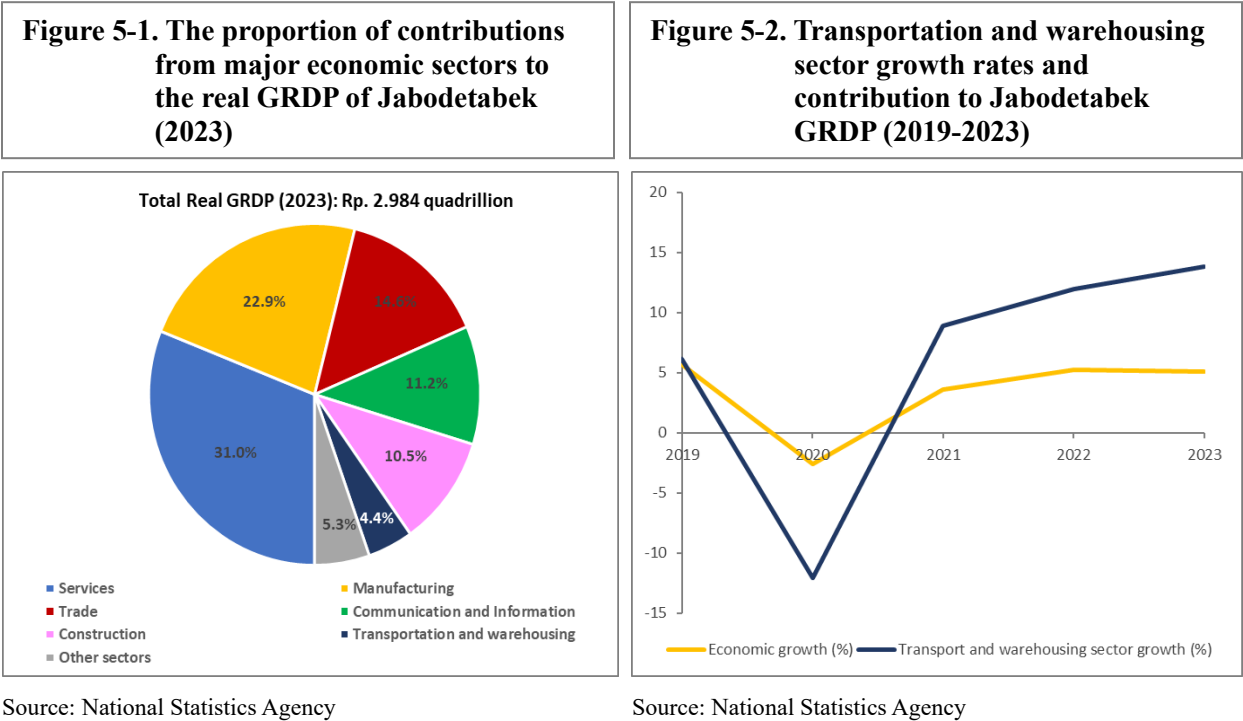
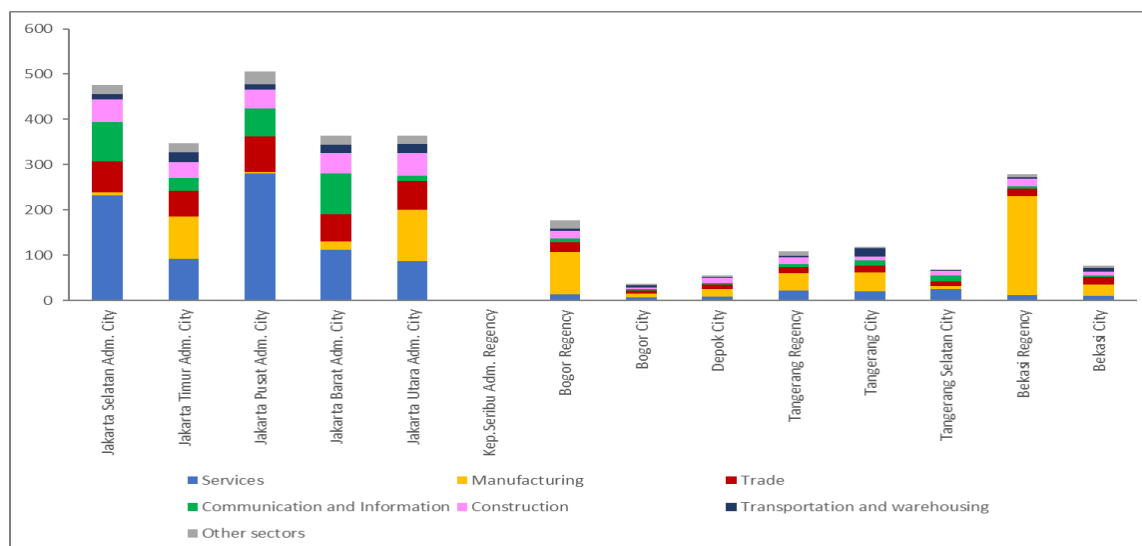


Figure 5-3 shows the GRDP and the contribution of the transportation and warehousing sector to the GRDP in each Level II Region (administrative city, administrative regency, city, and regency) within Jabodetabek. The contribution of the transportation and warehousing sector to GRDP in most Level II Regions in Jabodetabek in the last five years was relatively small, except in Bogor City (12.2%), Tangerang City (11.9%), and Bekasi City (10.0%) (Table 5-1). Although the direct contribution of the transportation and warehousing sector to Jabodetabek's GRDP is relatively small, this sector has an indirect contribution to GRDP through other sectors in the economy.

Figure 5-3. Contributions of main economic sectors to real GRDP of cities, regencies, and administrative cities in Jabodetabek in 2023 (IDR quadrillion)



Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

Table 5-1. Growth rate and contribution of the transportation and warehousing sector to Jabodetabek GRDP (2019-2023)

Region	Average 2019 – 2023			
	Contribution of the transportation and warehousing sector to real GRDP (%)	Growth rate of transportation and warehousing sector (%)	GRDP growth rate (%)	Contribution of the transportation and warehousing sector to economic growth (percentage points)
South Jakarta Adm. City	2.2	8.4	3.9	0.2
East Jakarta Adm. City	5.6	5.0	3.1	0.2
Central Jakarta Adm. City	2.2	8.4	3.6	0.2
West Jakarta Adm. City	5.0	8.2	4.0	0.4
North Jakarta Adm. City	5.0	7.5	2.7	0.4
Kep.Seribu Adm. Regency	0.4	3.8	-3.4	0.0
Bogor Regency	3.4	5.5	3.6	0.2
Bogor City	12.2	5.6	4.1	0.7
Depok City	3.5	4.2	3.8	0.1
Tangerang Regency	3.1	5.6	3.4	0.2
Tangerang City	11.9	5.2	2.4	-0.1
South Tangerang City	3.1	4.9	4.5	0.1
Bekasi Regency	1.1	5.4	3.0	0.1
Bekasi City	10.0	6.9	3.3	0.7
JABODETABEK	4.0	5.8	3.4	0.2

Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

Table 5-1 also shows that the average growth in the transportation and warehousing sector between 2019-2023 surpassed the average economic growth in each Level II Region in Jabodetabek. The transportation and warehousing sector made a positive contribution to economic growth in almost all Level II Regions in Jabodetabek between 2019-2023, except in Tangerang City, which saw a decrease of -0.1 percentage points (ppt). Among Level II Regions in Jabodetabek between 2019-2023, the transportation and warehousing sector provided a relatively large average contribution to economic growth in Bekasi City (0.7 ppt from an average growth rate of 3.3%), Bogor City (0.7 ppt from 4.1%), and North Jakarta Administrative City (0.4 ppt from 2.7%).

5.2. Economic Impact of Mass Public Transportation System Integration in Jabodetabek

The economic impact of mass public transportation integration can be measured using the Input-Output (IO) Table . However, the IO Table analysis in this study can only be conducted for DKI Jakarta because the IO Table is only published for DKI Jakarta and not for all Level II Regions in Jabodetabek as a whole. The IO table used in this study is the 2016 DKI Jakarta IO Table, which covers 52 economic sectors.

This study uses the IO Table to analyze "land transportation," which consists of the land transport subsector and the rail transport subsector, excluding water transportation and air transportation because they are not relevant. It is important to note that these two subsectors encompasses not only passenger transportation but also freight transportation, since the 2016 DKI Jakarta IO Table data does not separate passenger and freight transportation. Nevertheless, this data is useful for illustrating the relationship between the land transportation sector and other sectors in DKI Jakarta.

The IO table illustrates the use of output produced by sectors in an economy as an intermediate input for all sectors in the economy (both for the sectors themselves and other sectors) to meet final demand (consisting of household consumption, consumption of non-profit institutions serving households, government consumption, gross fixed capital investment, changes in inventory, and exports) and imports used to meet intermediate input needs and final demand. In the IO Table, imports are classified as part of supply (supply), not part of final demand. This study uses the IO Table based on producer prices, which serves as the basis for assessment by reflecting the prices of goods and services without trade margins and transportation costs (BPS, 2021).

This study uses several analytical concepts in the IO Table (Miller and Blair, 2009; BPS, 2021), including: (i) backward linkage; (ii) forward linkage; (iii) output multiplier; (iv) gross value-added multiplier; and (v) income multiplier.

Backward linkages measure the degree of a sector's connection to other sectors that provide inputs for that sector ("upstream sectors"). Forward linkages measure the degree of a sector's connection to other sectors that purchase its output ("downstream sectors"). Based on the degrees of backward and forward linkages, sectors in the economy can be classified as follows:

- 1) A sector with both backward and forward linkage values > 1 is classified as "generally dependent" on other sectors, meaning that its output growth depends on demand and supply from other sectors.
- 2) A sector with a backward linkage value ≤ 1 but a forward linkage value > 1 is classified as "dependent on interindustry demand", meaning that its output growth depends on demand from other sectors using its output.
- 3) A sector with a backward linkage value > 1 but a forward linkage value ≤ 1 is classified as "dependent on interindustry supply", meaning that its output growth depends on the output supply from other sectors to use as its input.
- 4) A sector with both backward and forward linkage values ≤ 1 is classified as "generally independent" from other sectors, meaning that its output growth does not depend on demand and supply from other sectors.

A sector is defined as a “key sector” if it is “generally dependent,” as the demand for inputs from that sector drives output growth in sectors that provide input to it, while the increase in outputs from this sector stimulates growth in other sectors that utilize its inputs.

The output multiplier estimates the magnitude of changes in the output across all sectors in the economy due to changes in final demand for a sector’s output. The gross value-added multiplier estimates the magnitude of changes in value-added across all sectors in the economy due to changes in final demand for a sector’s output. The income multiplier estimates changes in household income due to changes in demand for a sector’s output. This study uses trillions of Rupiah (IDR) to estimate changes in output, gross value-added, or household income resulting from changes in final demand of 1 trillion Rupiah for a sector’s output.

Table 5-2 shows that 76% of the rail transport sub-sector’s output is used to meet final demand and the remaining 24% is used as intermediate input for all sectors in the economy. Meanwhile, around 61% of the land transport subsector’s output is used to meet final demand and almost the remaining 39% is used as intermediate input for all sectors in the economy. However, both the rail transport subsector and land transport subsector make a small contribution to overall final demand and overall intermediate demand. Although these two subsectors are not major contributors to output in the economy, they play an important role in facilitating production activities in other sectors.

Table 5-2. Land transportation sector contribution to intermediate input demand and final demand in DKI Jakarta (2019-2023)

Sub-sector	Share of sub-sectoral output used to meet overall intermediate input demand (%)	Share of sub-sectoral output used to meet overall final demand (%)	Contribution of sectoral output to overall demand for intermediate inputs (%)	Contribution of sectoral output to meeting overall final demand (%)
Railway transport	23.98	76.02	0.04	0.08
Land transport	38.71	61.29	2.44	2.15

Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

The rail transport subsector is classified as "dependent on interindustry supply". The output growth of the rail subsector depends on the growth of other sectors that provide input for this subsector's output, but growth of other sectors is not dependent on output growth in the rail transport subsector. Meanwhile, the land transport subsector is classified as "generally dependent on interindustry demand and supply". This means that the output growth in the land transport subsector both influences and is influenced by the growth of other sectors. The land transport subsector is a "key sector" in the economy of DKI Jakarta because it has a degree of backward and forward linkages that are each greater than 1 (Table 5-3).

Table 5-3 shows that an IDR 1 trillion increase in final demand for the output of the rail transport subsector increases overall economic output by IDR 1.7 trillion, gross added value by IDR 0.7 trillion, and household income by IDR 0.6 trillion (*ceteris paribus*). Meanwhile, a IDR 1 trillion increase in final demand for the land transport subsector increases economic output by IDR 1.4 trillion, gross added value by IDR 0.8 trillion, and household income IDR 0.2 trillion (*ceteris paribus*).

Table 5-3. Backward linkages, forward linkages, output multipliers, value-added multipliers, and income multipliers of land public transportation in DKI Jakarta

Sektor	Backward linkage	Forward linkage	Output multiplier	Value-added multiplier	Income multiplier
Railway transport	1.2825	0.7474	1.7280	0.7252	0.5694
Land transport	1.0578	1.2933	1.4274	0.7639	0.2280

Source: National Statistics Agency, Kemenko Marves – UNOPS calculation

The integration of the mass public transportation system in Jabodetabek will increase demand for land transportation services (in terms of increasing demand for road-based public transportation services) and rail transportation services. The results of the IO Table analysis for DKI Jakarta show that increased demand for rail and land transportation will encourage economic growth, increase the economy's gross value-added, and increase household income in DKI Jakarta. Thus, mass transportation system integration in Jabodetabek is expected to have a positive impact on the regional economy.

5.3. Environmental Impact of Mass Transportation System Integration in Jabodetabek

The integration of the mass public transportation system in Jabodetabek aims to develop an environmentally friendly transportation system. Specifically, the DKI Jakarta Provincial Government (DKI Jakarta Department of Environment, 2022) has determined six mitigation actions to achieve low carbon development targets in DKI Jakarta by 2030: (1) energy efficiency in the household, industrial and transportation sectors; (2) utilization of renewable energy in the industrial, commercial and transportation sectors; (3) substitution to low-carbon (clean) energy in the industrial sector; (4) replacing fossil fuels with electric power in the transportation sector; (5) strengthening mass transportation and pedestrian systems; and (6) development and utilization of Solar Photovoltaics (PV) to convert solar energy into electrical energy.

Strengthening mass transportation and pedestrian systems includes the following modes of transportation: (i) integrated highway buses (Bus Rapid Transit / BRT); (ii) integrated motorway (Mass Rapid Transit / MRT) and integrated light rail (Light Rapid Transit / LRT); (iii) electric trains; and (iv) non-motorized vehicles (including walking and cycling). According to calculations by the DKI Jakarta Department of Environment, these mitigation actions are estimated to reduce greenhouse gas emissions in DKI Jakarta by 0.702 million tons of CO₂e by 2030. Table 4-4 shows several targets for implementing mitigation actions through strengthening mass transportation and pedestrian systems, as well as the estimated fuel savings.

Table 5-4. Implementation targets for the strengthening of mass public transportation and pedestrian modes in DKI Jakarta by 2030 and estimated potential fuel savings

Transportation mode	Implementation target 2030 (million passengers / km)	Potential Fuel Savings (kilo ton of oil equivalent, ktoe)
1. Bus rapid transit	2.236	58
2. Mass rapid transit and light rapid transit	5.921	156
3. Electric trains	6.839	180
4. Non-motorized modes (walking and cycling)	1.059	37

Source: DKI Jakarta Department of Environment (2022)

However, not all academics, practitioners, and non-governmental organizations in the transportation sector share the same optimism as the DKI Jakarta Department of Environmental in its estimation of the positive impact of limiting personal vehicle use, switching from fossil fuel-powered vehicles to electric or hybrid vehicles, and/or strengthening system integration of mass public transportation in Jabodetabek on improving environmental quality in DKI Jakarta and Jabodetabek as a whole. During a Focus Group Discussion organized by Kemenko Marves and UNOPS, several academics expressed concern that these steps might not be sufficient to improve the environmental quality in Jabodetabek. For example, many commuters, especially motorcycle commuters, are reluctant to switch to electric vehicles due to their relatively high cost. Moreover, while replacing fossil fuel-powered vehicles with electric-powered vehicles may reduce greenhouse gas emissions, it may not significantly alleviate traffic congestion.

The Resilience Development Initiative and Green Peace (RDI-GP) also expressed similar pessimism. In 2022, RDI-GP conducted a study to project the achievement of the zero-emission target in DKI Jakarta's transportation sector by 2050 based on four scenarios: (1) without intervention; (2) intervention through government programs and policies; (3) electrification and use of renewable energy; and (4) a scenario aimed at achieving zero emissions by 2050. The simulation results from all four scenarios indicate that DKI Jakarta would not achieve its zero emissions target by 2050, even if the government implemented various emission-reduction policies in the transportation sector. RDI-GP estimates that the electrification of private vehicle transportation in DKI Jakarta would not effectively reduce emissions if residents continue to use electricity generated by fossil fuel power plants.

Despite the pessimism expressed by several groups regarding the government's targets, efforts to develop and integrate an environmentally friendly mass public transportation system is still essential to reduce economic losses from traffic congestion and improve environmental quality in Jabodetabek.

6. Concluding Remarks

6.1. Conclusions

Based on the findings and discussions in this study, the following conclusions can be obtained:

First, the integration of an environmentally friendly mass public transportation system in Jabodetabek will encourage economic growth, reduce the use of fossil fuels (especially fuel oil), and reduce environmental pollution in this region.

Second, various efforts to increase the number of mass public transportation vehicles, increase the quantity and quality of physical facilities for mass public transportation, and improve the quality of mass public transportation services can encourage more people to use mass public transportation in Jabodetabek. However, these efforts alone are not enough to persuade more private vehicle users in Jabodetabek to switch to mass public transportation. Most Jabodetabek commuters still prefer to use private vehicles and have no desire to switch to mass public transportation.

Third, various efforts are needed to encourage private vehicles users to switch to mass public transportation, including policies limiting the use of motor vehicles through expanding odd-even license plate zones, emissions tests to limit the number of motor vehicles, increasing parking fees, and stricter penalties for traffic violators.

Fourth, the integration of an environmentally friendly mass public transportation system in Jabodetabek should aim to encourage commuters to use electric-powered mass public transportation.

Fifth, the development of public transportation routes, whether road or rail-based, must focus on reaching commuter residential areas rather than just transportation nodes. Road-based routes are cheaper and faster to construct than rail-based routes, making them more suitable in DKI Jakarta. Meanwhile, railway-based routes hold significant potential for further development in Bodetabek because of the large number of commuters who live in this area.

6.2. Policy Recommendations

This study recommends several short-term (less than one year), medium-term (one year to less than five years), and long-term (five years or more) policies to strengthen the integration of environmentally friendly mass public transportation systems in Jabodetabek. Table 6 summarizes these policy recommendations and the relevant stakeholders.

In addition to the recommended policies, this study also recommends the Central Government and Regional Governments continue providing subsidies for mass public transportation in Jabodetabek to keep public transportation fares affordable for commuters and to improve the quality of public transportation services. Although public transportation operators are striving to increase revenue from non-farebox sources to support farebox revenues, it will take a relatively long time for these operators to become more financially independent. Without sufficient subsidies from the government, public transportation operators may increase ticket prices, which in turn could reduce the number of mass public transportation users.

The government should also maintain subsidies for mass public transportation without discriminating against commuters based on their income levels. The government plans to implement an electronic ticketing policy based on the Population Identification Number (*Nomor Induk Kependudukan* / NIK) of Jabodetabek KRL users, as stated in the draft 2025 State Budget (RAPBN 2025) document¹⁹. A study conducted by the Community Economic Service Institute of the University of Indonesia (*Lembaga Penyelidikan Ekonomi Masyarakat Universitas Indonesia* / LPEM UI) indicates that while the implementation of NIK-based ticketing aims to target subsidies more effectively, it may create a long-term dependency of KRL services on PSO subsidies. This scheme could lead to a decrease in the number of passengers, which will negatively impact PT KAI Commuter's operational income²⁰.

6.3. Limitations of the Study

The limited availability of public data poses a major constraint for this study in conducting a more in-depth analysis of the economic and environmental impacts of integrating mass public transportation systems in Jabodetabek. For example, GDP data based on business sectors is classified into only 17 sectors, whereas this study would be more comprehensive if there was publicly available data on subsectors within these seventeen sectors. Similarly, the existing Input-Output (I-O) Table data is only available for DKI Jakarta, while a comprehensive study requires I-O Tables for all regions in Jabodetabek.

Due to the disparity in the availability of public data between DKI Jakarta and cities/regencies in Bodetabek, this study focuses more on the integration of the environmentally friendly mass transportation system in DKI Jakarta and less about the integration of mass transportation systems in Bodetabek.

¹⁹ <https://www.kompas.id/baca/ekonomi/2024/08/31/subsidi-tarif-krl-berdasarkan-nik-pengguna-transportasi-umum-yang-dianaktirikan>

²⁰ Lembaga Penyelidikan Ekonomi Masyarakat Universitas Indonesia (LPEM UI) (2024). "Subsidi KRL Berbasis NIK: Kebijakan yang Mengabaikan Esensi Transportasi Publik". LPEM UI Special Report, September 2024. <https://lpem.org/subsidi-krl-berbasis-nik-kebijakan-yang-mengabaikan-esensi-transportasi-publik-special-report/>

Table 6. Short-term, medium-term, and long-term policy recommendations to strengthen mass public transportation integration in Jabodetabek

Short-term Policies (less than 1 year)	Medium-term Policies (1 year up to 5 years)	Long-term Policies (5 years or longer)
1. Establish an ad-hoc team across Central Government ministries and institutions, and Regional Governments to synchronize various regulations related to the mass public transportation system in Jabodetabek (Stakeholders: Central Government, Regional Governments) 2. Improve the measurement of the performance of mass public transportation operations in Jabodetabek, including: (i) reviewing and revising targets and key performance indicators (KPI) for mass public transportation in Jabodetabek to better align with the RITJ and the transportation master plan in intersecting cities/regencies; (ii) improving data collection methods for KPI measurement by utilizing more real-time data, which is more accurate and affordable compared to survey data collection; and (iii) identifying alternative indicators that better reflect the performance of mass public transportation services in Jabodetabek. (Stakeholders: Central Government, Regional Governments) 3. Implement regulations to standardize the quality of mass	1. Encourage the electrification of public vehicles in Jabodetabek (Stakeholders: Central Government, Regional Government, mass public transport operators) 2. Provide government subsidies for mass public transportation operators that operate electric vehicles. (Stakeholders: Central Government, Regional Governments, mass public transportation operators) 3. Add park and ride locations in Jabodetabek. (Stakeholders: Regional Governments and/or business entities) 4. Implement emission testing as a requirement for vehicle registration (STNK) renewal. (Stakeholders: Indonesian National Police, Regional Governments) 5. Impose stricter penalties on commuters using private vehicles who violate traffic regulations (e.g., revocation of driving licenses and fines during STNK renewal)	1. Construct elevated BRT corridors that run clockwise and counterclockwise, connecting the five Administrative Cities in DKI Jakarta. (Stakeholders: Central Government, DKI Jakarta Provincial Government, PT TransJakarta, other business entities and/or investors) 2. Develop TOD areas in Jabodetabek by utilizing various financing schemes (e.g., PPP, including PPP with blended financing structures, and the issuance of regional and/or corporate bonds) (Stakeholders: Central Government, Regional Governments, other business entities and/or investors) 3. Construct new commuter train lines with more stations that better reach commuter residences, especially in Bodetabek. (Stakeholders: Ministry of Transportation, PT KAI Commuter, PT LRT Jabodebek, PT LRT Jakarta, PT MRT Jakarta)

public transportation services in Jabodetabek. (Stakeholders: Central Government, Regional Governments) 4. Increase the number of vehicles and fleets for mass public transportation. (Stakeholders: mass public transportation operators, Regional Governments) 5. Develop new and longer dedicated lanes on TransJakarta BRT routes and ensure that existing dedicated lanes remain clear to guarantee punctual BRT services. (Stakeholders: PT TransJakarta, DKI Jakarta Provincial Government, especially the Department of Transportation, Ministry of Transportation, Indonesian National Police) 6. Further develop and implement mobile applications with various features to ease mobility for commuters (e.g., booking and purchasing tickets, tracking public transportation vehicles to provide information on arrival times, and early warnings in the event of natural disasters or accidents). The Ministry of Transportation can utilize cellular data from transportation operators to continually adjust and improve transportation policies in Jabodetabek. (Stakeholders: Central Government, particularly the Ministry of Transportation, mass	(Stakeholder: Indonesian National Police, Regional Governments) 6. Construct environmentally friendly bus stops and stations. (Stakeholders: mass public transportation operators, Regional Governments, and/or business entities) 7. Implement policies that encourage housing developers to build residential areas near train stations. (Stakeholders: Regional Governments, housing development companies) 8. Impose a "congestion impact fee" on owners and/or managers of offices, shopping centers, and other crowd centers. (Stakeholders: Regional Governments; owners and/or managers of offices, shopping centers, and other crowd centers) 9. Implement land value capture as a financing scheme for the transportation infrastructure development in Jabodetabek. (Stakeholders: Regional Governments, mass public transportation operators, and/or business entities)	
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public transportation operators, cell phone operators) 7. Increase parking fees in shopping centers and office areas. (Stakeholders: Regional Governments, owners of shopping centers or office buildings) 8. Expand the odd-even license plate zones in DKI Jakarta. (Stakeholders: DKI Jakarta Provincial Government, Indonesian National Police) 9. Construct new bus stops to facilitate access to mass public transportation. (Stakeholders: Regional Governments, mass public transportation operators, and/or business entities) 10. Construct ramps at bus stops and stations to assist elderly commuters and/or people with disabilities in accessing public transportation. (Stakeholders: Regional Governments, mass public transportation operators, and/or business entities) 11. Intensify public campaigns for the use of environmentally friendly mass public transportation. (Stakeholders: Regional Governments, public transportation operators, and/or business entities)		
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Source: Kemenko Marves – UNOPS analysis

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