

Sustainability Assessment of Urban Transport System in Greater Jakarta



Ir. Resdiansyah., ST., MT., Ph.D., IPM

**Director of Center for Urban Studies, Universitas Pembangunan Jaya
Vice President Intelligent Transportation System Indonesia**

2021

TABLE OF CONTENTS

Table of contents	ii
List of Table	iii
Table of Figures	iv
Executive Summary	1
Chapter One Introduction	5
1.1 Geographical Condition	5
1.2 Demographic	9
1.3 Economy	10
1.4 Governance and Cooperation	12
Chapter Two Current State of Urban Transport Systems and Services	14
2.1 Introduction	14
2.2 Traffic and Private Vehicle Ownership	19
2.3 Land Use	21
2.4 Main Network and Systems	24
2.5 Key Connections	35
2.6 Public Transportation	36
2.6.1 Commuter Train (KRL)	38
2.6.2 Bus Rapid Transit (Transjakarta)	40
2.6.3 Mass Rapid Transit (MRT)	51
2.6.4 Light rail Transit (LRT)	60
2.6.5 Integration Transportation System (Jak Lingko Payment Integration)	65
2.7 Commuter Travel in JMA	66
2.8 Urban Transport Policies in GJMA	71
2.9 On Going Project in GJMA	76
2.10 Current Situation and Impacts due to Spread of COVID-19 on Urban Mobility	82
Chapter Three Data Collection Approach for SUTI	87
3.1 Introduction	87
3.2 Data Collection	88
Chapter Four Data for SUTI	93
4.1 Sustainable Urban Transportation Index	93
4.2 Data collection for each SUTI indicators in Jakarta Metropolitan Area (Greater Jakarta)	94
Chapter Five SUTI Data Analysis	117
5.1 Analysis of Data (Input Data in Excel sheet and results)	117
5.2 Spider diagram (interpretation of result, observation, etc)	133
5.3 Interpretation of value, index number, observation of SUTI	133
Chapter Six Impacts of COVID-19 on Urban Mobility	135
6.1 Public Transportation Situation Before COVID-19 and Current Situation	135
6.2 Public Transportation Daily Passenger	140
6.3 Impact of Mobility Restrictions in Greater Jakarta – JMA	143
6.4 City Perspective dan Strategies on Post COVID-19 Mobility	158

Chapter Seven Concluding Remarks and Recommendation to Improve Sustainability of Urban Mobility	164
7.1 Viewpoint on SUTI Assessment and Results	164
7.2 Views on the Transportation Policy and Regulation	165
7.3 Views on the Decarbonization of Public Transport	166
7.4 Addressing the Needs of Differently Abled and Aged Users	173
References	177

Disclaimer:

The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations Economic and Social Commission of Asia and the Pacific (ESCAP). The designation employed and the presentation of the material in the report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The views expressed, analysis, conclusions and recommendations are those of the authors, and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations. Mention of firm names and commercial products does not imply the endorsement of the United Nations ESCAP.

This report has been issued without formal editing

LIST OF TABLE

Table 1.1	Table Population of Greater Jakarta Metropolitan Area in 2020	9
Table 2.1	List of Operated Toll Road Sections in JABODETABEK	26
Table 2.2	Existing BRT (Transjakarta) Main Corridor	45
Table 2.3	Number of Transjakarta Bus by Name of Company and Type of Fuel	48
Table 3.1	The ten SUTI indicators	87
Table 3.2	Ten indicators of Sustainable Urban Transport Indeks	91
Table 4.1.	Ten indicators for Sustainable Urban Transport Index	94
Table 4.2	Indicator 1: Extent to which transport plans cover public transport, intermodal facilities and infrastructure for active modes	95
Table 4.3	Standard of Pedestrian Path LOS in Ministry of Public Works Regulation No: 03/PRT/M/2014	97
Table 5.1	Indicator 1 for Greater Jakarta	117
Table 5.2	Summary of Indicator 1 for Greater Jakarta	118
Table 5.3	Explanation of Indicator 1 for Greater Jakarta	118
Table 5.4	Cycling and Walking in Jakarta	121
Table 5.5	Selected Cluster Data within 500m Buffer Zone of Commuting Trips (BRT)	122
Table 5.6	Selected Station Data within 500m Buffer Zone of Commuting Trips (KLR-Commuter)	123
Table 5.7	Percent of operational costs recovered by fares (all values in million US \$)	130
Table 5.8	Percent of transport investment spending; running five-year average	130
Table 5.9	Air Quality - Micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)	131
Table 5.10	Emission	131
Table 5.11	SUTI Result	132
Table 6.1	Data of Passenger in Public Transportation (Transport Control During Eid Festival)	153
Table 6.2	Impact of Change in MRT Operation Hours on Potential Farebox Revenue Loss	157
Table 6.3	Aggregated Potential Farebox Revenue Losses Due to COVID-19 Mobility Restriction	157
Table 7.1	Useful References and Persons, eExperts and Officials Met	175

TABLE OF FIGURES

Figure 1.1	Greater Jakarta Metropolitan Area (GJMA)	6
Figure 1.2	Detail Jakarta Metropolitan Area (Greater of Jakarta)	7
Figure 1.3	Illustration of the Development of Built-up Areas in Metropolitan	8
Figure 1.4	Share of Each Kota and Kabupaten in Greater Jakarta Metropolitan Area (2017)	11
Figure 2.1	The Greater Jakarta Area Commuters Travelling	15
Figure 2.2	Masterplan Greater Jakarta Metropolitan Area 2018-2029	16
Figure 2.3	Roadmap Towards 60 Percent of Public Transportation in Greater Jakarta	18
Figure 2.4	Anticipated Serious Traffic Congestion	19
Figure 2.5	Registered Private Vehicle in Greater Jakarta Metropolitan Area	20
Figure 2.6	Land-use Change in GJMA during Year 2000 –2017	21
Figure 2.7	GJMA Land-use Comparison Year 2017 and 2035	22
Figure 2.8	Land Used Greater Jakarta Metropolitan Area (GJMA) 2000-2015	23
Figure 2.9	Physical Development Pattern of GJMA Year 2000, 2006, and 2015	23
Figure 2.10	Comparative land use maps of Greater Jakarta, Indonesia (a) 2009 original, (b) 2030 original, (c) 2009 derived, and (d) 2030 derived	24
Figure 2.11	Highway Network Development in the GJMA	27
Figure 2.12	Historical Road Network in the GJMA	28
Figure 2.13	Railway Networking for Public Transportation in GJMA	29
Figure 2.14	Toll Highway Networking GJMA	29
Figure 2.15	Jakarta Inner-City Elevated Toll Road	30
Figure 2.16	Cross-section Jakarta Inner-City Elevated Toll Road	30
Figure 2.17	Road Network Map for Greater Jakarta Metropolitan Area	31
Figure 2.18	Rail Based Road Network Map for Greater Jakarta Metropolitan Area	31
Figure 2.19	2020 Road Network by JUTPI Revised Master Plan	32
Figure 2.20	2020 Public Transport Network by JUTPI Revised Master Plan	33
Figure 2.21	Jakarta-Cikampek Elevated Toll Road	34
Figure 2.22	KRL Situation in 2005 and 2020 After Total KRL Reform	39
Figure 2.23	BRT network Plan 2014-2030 in Greater Jakarta Metropolitan Area	40
Figure 2.24	BRT network Plan 2020 in Greater Jakarta Metropolitan	41
Figure 2.25	Transjakarta BRT Integration Map 2020	42
Figure 2.26	BRT Services with AC	43
Figure 2.27	Pedestrian Crossing Facilities at BRT Station	44
Figure 2.28	Number of Transjakarta Pasenger 2004-2018	46
Figure 2.29	Illustration of BRT and MRT Integration Infrastructure (ASEAN-CSW MRT Station)	50
Figure 2.30	Illustration of MRT Infrastructure	52
Figure 2.31	MRT Network Map- Phase 1 and 2	54

Figure 2.32	Integration MRT Network with Other Ring Rail Network to Accommodate Sub-Urban Area	55
Figure 2.33	New Culture in Transportation	57
Figure 2.34	Friendly City in MRT Surrounding Area	57
Figure 2.35	MRT Jakarta Network	58
Figure 2.36	TOD Area along MRT Lines	60
Figure 2.37	LRT Station Velodrome-Kelapa Gading	61
Figure 2.38	LRT Corridor Plan	62
Figure 2.39	Work on the Jabodebek Light Rail Transit (LRT) project in Cawang-Dukuh Atas	64
Figure 2.40	The Proposed Greater Jakarta Light Rail Transit Alignment	64
Figure 2.41	Person Trip Distribution in JMA	68
Figure 2.42	Commuter Travel Distance in JMA (comparison 2014 vs 2019)	69
Figure 2.43	Commuter Travel Time in 10 Cities In JABODETABEK (comparison 2014 vs 2019)	70
Figure 2.44	Indonesia Emission prediction in 2005-2030	71
Figure 2.45	Five Pillars of Urban Transportation Policy	74
Figure 2.46	Phase 2A of MRT Jakarta (Bundaran HI – Kota)	78
Figure 2.47	U-Shaped Girder Construction- Phase 1 LRT Jabodetabek	79
Figure 2.48	Long Span Arch Bridge Construction- Phase 1 LRT Jabodetabek	79
Figure 2.49	Lifting of the First Train (trainset)- Phase 1 LRT Jabodetabek	80
Figure 2.50	Construction Progress of Six Inner-City Toll Roads	81
Figure 2.51	Road Network of Six Inner-City Toll Roads	82
Figure 2.52	Daily fraction of users staying at home	84
Figure 2.53	Infographic of KRL during Covid-19 Pandemi	85
Figure 2.54	Before and After Pandemi (Sudirman Street Jakarta)	86
Figure 2.55	PM ₂₅ Measurement Before and After Pandemi in Greater Jakarta	86
Figure 3.1	Meeting with Director of Traffic, Greater Jakarta Transport Authority (BPTJ)	89
Figure 3.2	Meeting with City Transport Authority in Jabodetabek	90
Figure 4.1	Pedestrian Revitalisation in Jakarta	98
Figure 4.2	Pedestrian Facilities at Thamrin Street Jakarta	99
Figure 4.3	Sample cross section from the guideline incorporating dedicated space for walking, cycling, and public transport in Greater Jakarta	100
Figure 4.4	Transit Mode Share in Greater Jakarta	101
Figure 4.5	Jabodetabek Commuters' Travel Distances	102
Figure 4.6	Bicycle and Walking Network in Jakarta	103
Figure 4.7	Cycling Network in Jakarta	104
Figure 4.8	Integrated Cycling Network with Public Transport in Jakarta	105
Figure 4.9	Cycling Network Plan 2019-2030	106
Figure 4.10	Transit station's service area with walking radius	106
Figure 4.11	Transit station's service area with cycling radius	107
Figure 4.12	Smart Pedestrian Hub Competition, DKI Jakarta 2021	108
Figure 4.13	Modal Share in JABODETABEK	109

Figure 4.14	Modal Share in JABODETABEK (Excluding NMT)	110
Figure 4.15	TransJakarta BRT network	112
Figure 4.16	TransJakarta Daily Passenger Demand by Shelter	113
Figure 4.17	Commuter Line (KRL) Network	113
Figure 4.18	Desire Line by Railway Station on Commuterline	114
Figure 4.19	Daily Bandwidth on Commuterline	115
Figure 4.20	Non-Overlapping Service Area of KRL Stations (4km)	116
Figure 4.21	Total Population per Kelurahan (District)	116
Figure 6.1	Decrease in the Number of Passengers due to Covid-19	136
Figure 6.2	Sosial Distancing in BRT Transjakarta	137
Figure 6.3	Sosial Distancing in KRL Commuterline	138
Figure 6.4	Quiet Streets in the Beginning of Pandemic in Jakarta	139
Figure 6.5	Clean the MRT	139
Figure 6.6	Physical distancing COVID-19 in public transportation Indonesia 2020	140
Figure 6.7	Number of Passenger in Top 11 BRT Corridor	141
Figure 6.8	Number of Routes/Corridors According to Services	142
Figure 6.9	Activity at Home During PSBB and PPKM	149
Figure 6.10	Activity of Outside of Home During PSBB and PPKM	150
Figure 6.11	Activity of Outside of Home (Others)	151
Figure 6.12	Change in Mobility Level	152
Figure 6.13	Public Transport Passenger Data- All Modes Of Transportation	154
Figure 6.14	Technology Driven Micro Systems	160
Figure 6.15	Mass Vaccination Program at Station	160
Figure 7.1	Area of Improvement in Greater Jakarta SUTI	164
Figure 7.2	Energy Consumption and Renewable Energy Share in the Transportation	166
Figure 7.3	The Pillars of Decarbonization	168
Figure 7.4	Decarbonization in Transport Sector	169
Figure 7.5	Electric buses Dominate Transjakarta's Fleet starting 2025	170
Figure 7.6	Transjakarta Electric Vehicle	170
Figure 7.7	Four Categories Root Causes in Gender Inequality in Public Transportation	171
Figure 7.8	Gender Insecurity in Public Transportation in Greater Jakarta	173
Figure 7.9	Lower Deck BRT (Transjakarta)	174
Figure 7.10	Disable Facility in LRT Jakarta	174
Figure 7.11	Disable and Eledery People Facility and Signage in Greater Jakarta	175

Executive Summary

UNESCAP has developed The Sustainable Urban Transport Index (SUTI) to help summarize, track and compare the performance of Asian cities in regards to sustainable urban transport and the related Sustainable Development Goals (SDGs), more specifically target 11.2. The objective of SUTI is to evaluate the status of the urban transportation system in cities. SUTI is a quantitative tool for member states and cities to compare their performance on sustainable urban transport systems and policies with peers. It can help to identify additional policies and strategies required to improve the urban transportation systems and services. It includes ten indicators for the System, Economic, Environmental, and Social domains. SUTI also assesses the progress of transport contribution towards the achievement of SDGs. Jakarta, especially Jabodetabek (Greater Jakarta), is an urban agglomeration area in Indonesia which is growing rapidly and has many problems in the transportation sector. Sustainable transportation is part of the government's program to ensure the smooth running of urban transportation. For this reason, it is necessary to measure the sustainability of transportation in Greater Jakarta through SUTI. Data collection to develop SUTI in Greater Jakarta includes field data collection, data collection from the appropriate authority, and reviewing various relevant sources. Due to the Covid-19 situation, all data collection was from secondary data based on relevant parties in Indonesia.

On the other hand, consultation meetings (online) with GJTA, Ministry of Transportation Indonesia, Directorate of Land Transportation, Directorate of Traffic, Ministry of Work, Toll Road Authority, Police Traffic Department, Environmental Division, and relevant stakeholders organized during data collection and analysis. Implemented in Jakarta in 2017, and upon learning the successful prospect of the project, the SUTI project is to continue in 2021 to see its improvement and development in sustainable transportation. The ten indicators and methodology to model the SUTI for cities in Indonesia are very useful for the city policymakers in improving their urban transport system. This index can be used by Greater Jakarta Transport Authority to rate their city performance annually. Besides, collecting the data itself in a pandemic

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_51

