Directorate General of Land Transportation
Ministry of Transportation
The Republic of Indonesia

PROJECT FOR THE STUDY ON JABODETABEK PUBLIC TRANSPORTATION POLICY IMPLIMATATION STRATEGY IN THE REPUBLIC OF INDONESIA (JAPTraPIS)

FINAL REPORT

VOLUME1: Summary

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ABBREVIATIONS

ATC	Area Traffic Control
BAKORLANTAS	Traffic Coordination Body
BAPPEDA	Regional Development Planning Agency
BAPPENAS	National Development Planning Agency
BKSP	Development Cooperation Agency
BLU	Public Service Board
BPPT	Agency for the Assessment and Application of Technology
BPS	Indonesian Central Statistics Bureau
BRT	Bus Rapid Transit
BSTP	Urban Transportation System Development Directorate, MOT
CBD	Central Business District
CMEA	Coordinating Ministry for Economic Affairs
CNG (or BBG)	Compressed Natural Gas
DGLT	Directorate General of Land Transportation
Dishub	Transportation Agency
DKI Jakarta	Jakarta Special Capital Region
EIA	Environmental Impact Assessment
ESDM	Ministry of Energy and Mineral Resources
GDP, GRDP	Gross Domestic Products, Gross Regional Domestic Products
GPRS	General Packet Radio Service
GPS	Global Positioning System
GOI	Government of Indonesia
GOJ	Government of Japan
IMF	International Monetary Fund
IEE	Initial Environmental Evaluation
ITDP	Institute for Transportation & Development Policy
ITS	Intelligent Transport Systems
JABODETABEK	Jakarta, Bogor, Depok, Tangerang, and Bekasi
Jabodetabekpunjur	Jakarta, Bogor, Depok, Tangerang, and Bekasi, Puncak, Cianjur
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JTA	JABODETABEK Transport Authority
JUTPI	Jabodetabek Urban Transportation Policy Integration
LLAJ	Road Transportation and Traffic
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MHA	Ministry of Home Affairs
M/M	Minutes of Meeting
MOE	Ministry of Environment
MOF	Ministry of Finance
MOPW (or PU)	Ministry of Public Works
MOT	Ministry of Transportation
MRT	Mass Rapid Transit
NGO	Non Governmental Organization
OD	Origin and Destination
PPP	Public Private Partnership
RTRW, RTRWN	Spatial Plan, National Spatial Plan

SC	Steering Committee
SEA	Strategic Environmental Assessment
SITRAMP	The Study on Integrated Transportation Master Plan for JABODETABEK
SPM	Minimum Service Standard
TDM	Traffic Demand Management
TOD	Transit Oriented Development
TWG	Technical Working Group
UKP4	Presidential Working Unit for Development Control and Monitoring
UNEP	United Nations Environmental Programme

EXECUTIVE SUMMARY

SCOPE OF THE STUDY

Study Objectives: The overall objective of the study is to review the existing public transportation master plan (2009) and formulate an implementation strategy to improve the city's road-based public transportation system. The specific objectives of the study are:

(1) To formulate an implementation strategy for priority public transportation projects for JABODETABEK up to the year 2014, and

(2) To transfer knowledge and skills to the counterpart personnel during the course of the study to ensure the sustainability of the public transportation strategy.

Study Area: The study area covers the Jakarta metropolitan area, or JABODETABEK, which is comprised of: Jakarta Special Capital Region (DKI Jakarta) and the adjoining local government (5 kota and 3 kabupaten)[1].

Study Process: The study commenced in February 2011 and completed in May 2012. The study was conducted under a multilevel Steering Committee headed by the Director General of Land Transportation of Ministry of Transport and with extensive involvement of the Indonesian counterpart agencies through Technical Working Group meetings, workshops, training program and joint work with the direct counterparts coordinated by the DGLT. As a result, these activities strengthened the Indonesian side's ownership of the study. In addition, the development of a set of updated database contributed to the successful completion of the study.

URBAN TRANSPORT ISSUES

Urban and Transport Situations: The study area – JABODETABEK is the greater capital region of Indonesia with population of 28 million. In order to sustain functions and roles as a capital region, the current transport system of JABODETABEK needs to be upgraded to support varied social and economic activities.

The current transport situation in the study area shows chronic traffic congestions due to delay of transport infrastructure development in comparison to the year-by-year increasing traffic demand. Particularly, the development of key urban transport network such as arterial roads and urban rail is very slow, while increase of car and motorcycle use is significant.

Current Initiatives and Future Prospects: A number of transport master plans formulated by local governments show the absence of consistency between central and local, and have no legal guaranty in its implementation. Therefore, the JUTPI provided the supports to the government in updating and legalizing the urban transport master plan, and establishing the JTA for the implementation of the master plan.

The comprehensive urban transport master plan revised by the JUTPI deployed the intensive public transport system development scenario which network has intensive investment focused on the development of rail and BRT system. This will promote a modal shift from cars and motorcycles to public transport and realize the reduction of loss caused by traffic congestions. In the JUTPI, it is estimated that the modal share of public transport will increase from 27% in 2010 to 34% in 2020. In order to transport this increasing public transport demand efficiently, the role of

[1] "Kota" and "Kabupaten" correspond to "city" and "district", respectively.

road-based public transport including BRT and general buses studied in the JAPTraPIS is very important and its significant development in accordance with the railway system development is necessary.

Table 1 Future Framework of JABODETABEK

Area	Population (million)		Increase 2020/2010
	2010	2020	
DKI Jakarta	9.6	10.1	1.05
BODEATABEK	18.4	21.0	1.14
Total	28.0	31.1	1.11

Source: JUTPI

Table 2 Future Travel Demand of JABODETABEK

Travel Mode	Travel Demand (million trips) 1/		Modal Share (%)	
	2010	2020 2/	2010	2020 2/
Car	10.5	14.2	19.8	24.1
Motorcycle	28.1	24.6	53.0	41.5
Public Transport	14.4	20.4	27.2	34.4
Total	53.0	59.2	100	100

Source: JUTPI

Note: 1/ demand excludes non-motorized trips, 2/ modal share is estimated under the scenario 2 (highway moderate and public transport intensive development)

Development Issues on Road-based Public Transport System: The current busway operation as key system of road-based public transport is partly affected by road traffic conditions and obstructed in its high-speed and punctual operation in some sections. This causes the decrease of operational frequency and long waiting time for passengers. Furthermore, the increase of operational subsidy weight on the public finance of DKI Jakarta government. In this way, the current busway operation needs to be improved to the BRT standard with high-speed and high-frequency operation. Also the extension of the network to the surrounding commutable areas in the study area is desired.

On the other hand, it is pointed out that the issues and problems of general bus services supplementing the key transport system of busway are identified as follows: low operational service level, low quality of bus vehicles by aging and inadequate maintenance, competition between different type of buses, unbalance of demand and supply, lack of law enforcement and so on.

As previously described, in order to meet with the issues of road-based public transport system in the study area, the hierarchical and integrated bus service network is necessary to develop and a comprehensive master plan is needed formulated.

MASTER PLAN AND IMPLEMENTATION STRATEGIES

Overview: The JAPTraPIS formulated the road-based public transport master plan for JABODETABEK. The master plan and implementation strategy targets to the year 2020 with intermediate year of 2014. The structure and main components of the master plan is described as follows and the outline and implementation schedule is summarized in Table 3.

Table 3 JAPTraPIS Master Plan and Implementation Strategy

Components	Implementation Period		Implementing Agency	Cost ($ mil.)
	2012-2014	2015-2020		
1. Integrated PT Network and Services				
A1. Full BRT Routes	15 routes	15 routes	TJ	-
A2. Intermediate Routes	8 route	7 routes	TJ	-
B1. Articulated Bus for full BRT Routes	574 buses	1,107 buses	TJ	563
B2. Single Bus for Intermediate Routes	0 buses	277 buses	TJ	72
2. Infrastructure Development				
A. BRT Corridor Development Projects	Project 1-12	Project 13-31	LG/TJ	284
B. Bus Location System and Control Center	1,100 buses	1,400 buses	TJ	13.8
C. Bus Ticketing System	260 stations	180 stations	TJ	20.5+a
D. Park & Ride Facility	9 locations	10 locations	LG/TJ	n.a.
E. Integrated/Multimodal Terminal	8 locations	12 locations	LG/TJ	n.a.
F. Cycling and Walking Facilities	→	→	LG	n.a.
3. Establishment of TransJabodetabek				
A. Establishment of JTA	2012	-	CG	-
B. Institutional design	2012	-	JTA	-
C. Establishment and operation	2013 →	(operation)	JTA	-
4. Reforming Bus Management System				
A. Minimum Service Standards	2014 →	→	DGLT/JTA/LG	n.a.
B. Rejuvenation of Bus Fleets	2012(amendment)	2019 →	DGLT/JTA/LG	n.a.
C. Restructuring General Bus Licensing	2013(amendment)	2019 →	DGLT/JTA/LG	n.a.
D. Institutional and Capacity Building	2013	-	DGLT/JTA/LG	TA

Source: JAPTraPIS
Note: JTA: JABODETABEK Transportation Agency, TJ: TransJabodetabek (Regional BRT Agency under JTA), CG: Central Government, LG: Local Government. TA: Technical Assistance (funded by Official Development Assistance)

Development Goals and Strategies: The study identified the goals and supporting strategies for the development of road-based public transport system for JABODETABEK. They are as follows:

(1) To make JABODETABEK a prosperous and livable city

(2) To create a highly efficient transport network

(3) To reduce car use through supply and demand measures

(4) To create efficient urban transport systems: including i) efficiency in infrastructure, ii) efficiency in transport management and operation, and iii) efficiency delivers sustainability and equity.

(5) To improve system management supported by a sustainable business model

BRT Operational Design Standards: Determining the elements of what is need to improve and develop BRT as a mass transit mode. A set of planning principles was identified to guide the planning and design process. The main design principles and elements for a BRT were identified and discussed, including: 1) shelter capacity and performance, 2) traffic priority management options and intersection design, 3) busway design and accommodating BRT on standard road lane layouts, 4) BRT stations and passenger infrastructure, 5) control centre and its operation, 6) fare collection and E-ticketing, 7) system branding and image, 8) bus fleet design and 9) bus vehicle emission and fuel propulsion systems.

INTEGRATED PUBLIC TRANSPORT NETWORK AND SERVICES

Service Type: In order to offer seamless travel for passengers and deliver a high level of access, coverage and connectivity, specific service types forming future integrated network including several bus types and supporting mobility are proposed as follows: 1) Full BRT Route, 2) Intermediate Bus Route, 3) area-wide bus route, 4) Neighborhood area service, 5) para-transit service and 6) supporting mobility network/.facilities.

Proposed BRT Network: Development of future BRT network up to 2020 including improvement of the current busway and restructure of the supporting general bus service network are proposed in order to meet the future traffic demand. By 2020, 30 full BRT routes and 15 intermediate bus routes will be developed. Prioritization of the BRT route network implementation is further examined. As a result, in the immediate term up to 2014, an intensive improvement of the existing network and additional routes including the extension on the major corridor to Tangerang and Bekasi are proposed. (Refer to Table 4 and Figure 1 and 2)

The proposed BRT network will transport 2.7 million passengers per day by the proposed 2020 network and 1.4 million passengers per day by the proposed 2014 network. The proposed BRT and railway network will meet with the increasing future traffic demand projected by JUTPI. (Refer to Table 5)

Table 4 Proposed BRT Network by Phase

	No. of routes		Route km		Corridor km	
	2012-2014	2015-2020	2012-2014	2015-2020	2012-2014	2015-2020
Full BRT route	15	15	303	380	227	214
	30		683		429	
Intermediate route	8	7	93	100	93	95
	15		193		188	

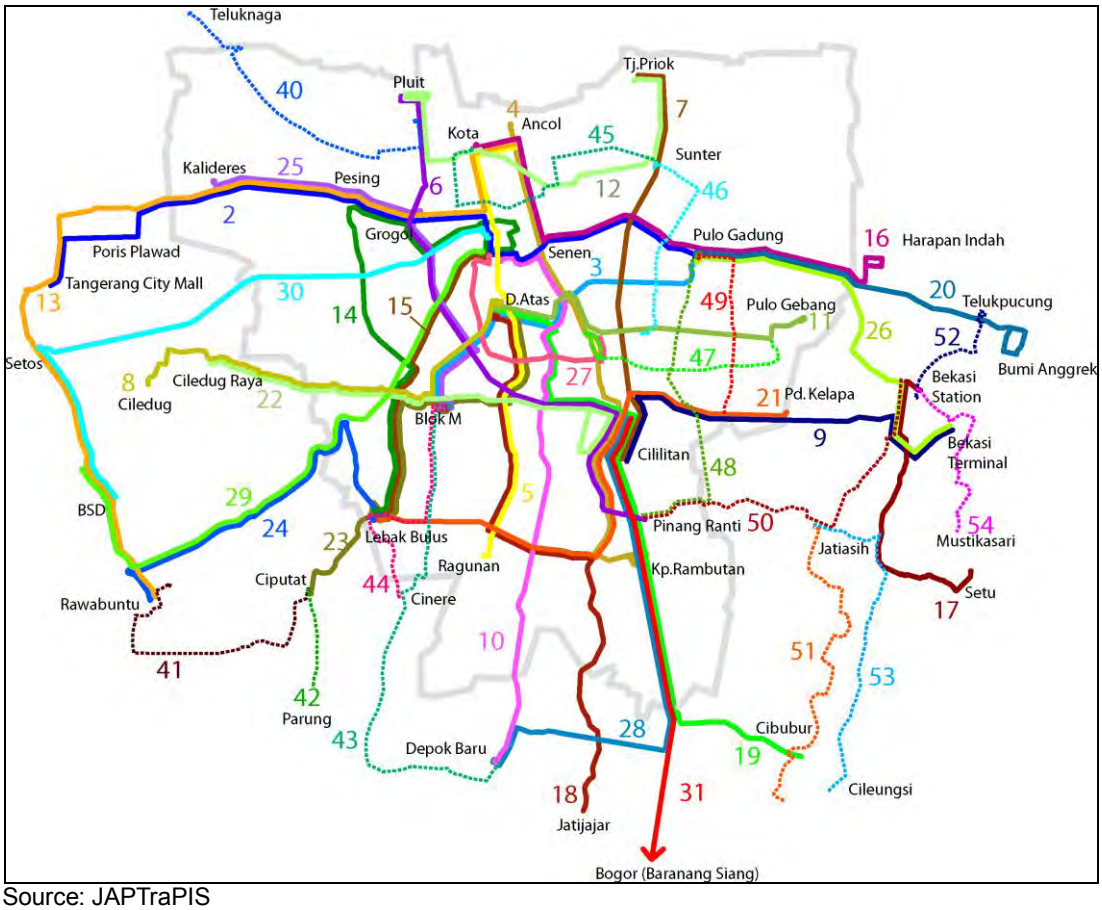
Source: JAPTraPIS

Table 5 Traffic Demand on Future Public Transport Network

Public Transport Mode	Ridership (million pax)	
	2020	2014
Full BRT	2.3 (30 routes)	1.2 (15 routes)
Intermediate BRT	0.4 (15 routes)	0.2 (8 routes)
Jabodetabek Rail	1.2	1.0
MRT	0.9	-

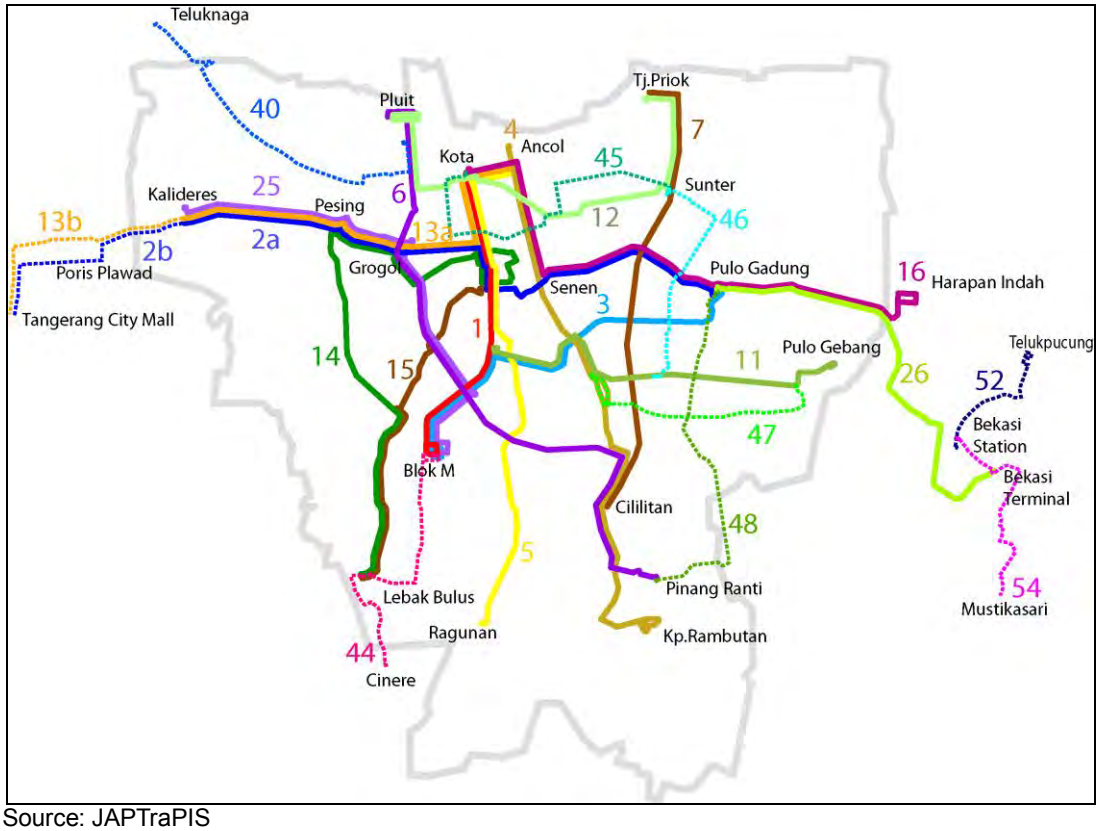
Source: JAPTraPIS

Figure 1 Proposed BRT Network by 2020



Source: JAPTraPIS

Figure 2 Proposed BRT Network by 2014



Source: JAPTraPIS

Traffic Performance of Master Plan Network: Traffic demand of the Jabodetabek will increase from 66 million trips in 2010 to 74 million trips in 2020. If there is no improvement of urban transport network and services by 2020 (Do-Nothing Case), the modal share of public transport will decrease and traffic situations will be aggravated. However, in the case transport network and services of the proposed master plan is implemented properly, modal share of public transport will increased to 34% by 2020 and traffic situation will be improved.(Refer to Table 6)

Table 6 Traffic Performance of Master Plan Network

Indicators		2010 (Existing)	2020 (Do Nothing)	2020 (Master Plan)
Traffic Demand (trips)		66 mil.	74 mil.	74 mil.
Modal Share	Car	20%	28%	24%
	M/C	53%	50%	42%
	Public Transport	27%	22%	34%
Traffic Load	PCU-km	150 mil.	210 mil.	179 mil.
	PCU-hour	10 mil.	27 mil.	15 mil.
Travel Feature	V/C (daily)	0.85	1.15	0.88
	Travel Speed	23.6 kph	15.2 kph	24.0 kph
Public Transport	Pax-km/trip	9.3 km	9.2 km	9.2 km
	Pax-hour/trip	0.41 hr	0.45 hr	0.40 hr

Source: JAPTraPIS

BRT Fleet Development:

The BRT fleet procurement plan in accordance with the implementation of proposed BRT route network is developed. The number of BRT fleets to be procured in each year is estimated in considering the retirement schedule of the existing busway fleets. The procurement plan required $ 635.2 million to procure 1,681 articulated buses and 277 single buses during the period of 2012-2020.(Refer to Table 7)

Table 7 BRT Fleet Procurement Plan

Phase	Articulated Bus		Single Bus	
2012-2014	574	$192.3 mil.	0	-
2015-2020	1,107	$370.8 mil.	277	$72.0 mil.
Total	1,681	$563.1 mil.	277	$72.0 mil.

Source: JAPTraPIS
Note: 1) Bus life time is set for 7 years, 2) assumed fleet capacity of 70 passengers for single bus and 120 passengers for articulated bus, 3) Assumed fleet price of $ 260,000 for single bus and $335,000 for articulated bus.

INFRASTRUCTURE DEVELOPMENT

Overview: In order to develop the proposed road-based public transport network with core network of BRT, the necessary development of related infrastructure up to 2020 is proposed with project scale and implementation schedule. They include the following components:

(1) BRT Corridor Development (31 projects including development of bus lane, shelter and other related facilities with a total cost of $ 284 million)

(2) Control Center and Bus location system (Total cost for 2020 BRT network is $ 13.8 million)

(3) Bus Ticketing System (Total cost for 2020 BRT network is more than $ 20.5 million)

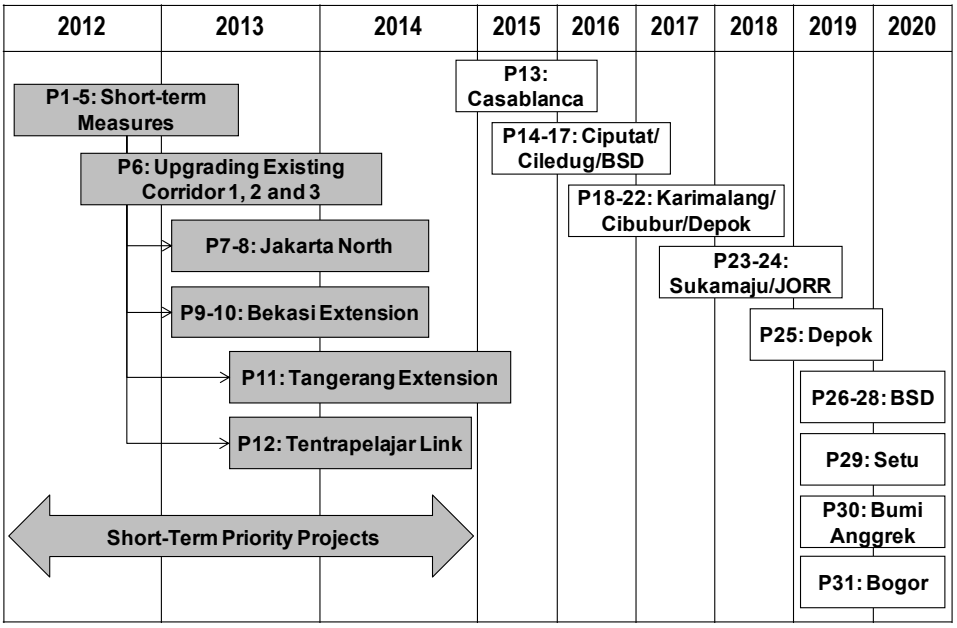
(4) Park & Ride Facility (19 locations)

(5) Integrated/Multimodal Terminal (20 locations)

(6) Cycling and Walking Facilities.

BRT Infrastructure Development: the Proposed 31 projects are prioritized according to a schedule of BRT route implementation (Refer to Figure 3). Specific plan and design for the identified short-term projects (Project 1-6) are further examined (Refer to Table 8).

Table 3 BRT Project Package and Implementation Schedule



Source: JAPTraPIS

Table 8 Short-term BRT Corridor Development Project

	Project / Site	Plan	Related Busway
P1	A. Traffic operation around Monus	Bank Indonesia to Senen two way BRT, Relocate Balaikota shelter	BRT 2, 10, 14
	B. Bank Indonesia shelter modification	Bank Indonesia as major transfer station	Terminus: BRT 10,14,15,27,29 Through: BRT 1,5
	C. Integrate BRT with rail at Gambir	Relocate Gambir 2 shelter	BRT 2, 10, 14
P2	A. New shelter at Pessing	Pessing shelter	Through BRT 2,13,14,25
	B. Dukuh Atas modification	New shelter Dukuh Atas 1 closer to Surdiman station., pedestrian underpath and escalator, Dukuh Atas 2 extension	D.Atas 1: Through BRT 1 D.Atas 2: Terminus BRT 8, 11,18,19,23, Through BRT 3
	C. St.Cawan shelter pedestrian bridge extension	St. Cawan pedestrian improvement	Through BRT 6, 9, 22
P3	A. Mangga dua shelter construction	Busway track, Two new shelters	BRT 5,13,16
	B. Kp.Melayu road redesign	Redesign to dual direction on Jl.Bekasi Barat Raya, Kebon Pala shelter modification as a transfer station	BRT Route 4,11,27 Intermediate 47
	C. Blok M terminal modification	Increase Blok M busway capacity , Blok M pedestrian deck	Terminus: BRT 1,3,25 Intermediate 43,44, Through BRT 8,22,23
P4	Kalideres shelter improvement	Increase boarding space for Transjakarta and Tangerang	Terminus: BRT 25 Through: BRT 2,13
P5	Kp.Melayu shelter modification	Build new shelters to north-south alignment	Terminus: BRT 27, Intermediate 47, Through BRT 4,11
P6	Corridor 1,2&3 upgrading	track, shelter for articulated and bridge	Corridor 1,2&3

Source: JAPTraPIS

INSTITUTIONAL DEVELOPMENT

TransJabodetabek: As a regional BRT agency, it is expected to be established to expedite and improve public bus transport services across the Jabodetabek region. It will be under the structure of the JTA, yet established as autonomous statutory agency to plan, manage and control and deliver services, including intermediate and connected feeder bus routes. TransJabodetabek, as the system manager of the BRT system, functions with the responsibilities to 1) plan the route network and develop services, 2) generate patronage and build revenue, 3) manage system efficiency and costs, 4) ensure financial performance, 5) manage fare collection and policy, 6) manage and enforce bus operator contracts and 7) manage customer service delivery, complaints and mange public relations, marketing and promotion.

Reforming General Bus Management System: In the last decade, general bus services have largely lost their patronage due to poor service quality such as overcrowding, inconsistent service and inconvenient transfers, poor comfort and low security. Some of the poor service quality aspects are attributable to their operation and management system. Public transport service improvement is a pressing issue, yet for a long time being left out by the authorities, bus operators association and bus operators.

Four variable instruments for improving public transport service delivery are as follows:

(1) Standardizing and enforcing minimum service standards

(2) Rejuvenating bus fleets

(3) Restructuring general bus license system

(4) Capacity building of staff at transport agencies, DGLT and the JTA

Some considerable instruments to realize bus fleet rejuvenation are 1) to reform period vehicle inspection along with workshop and automobile mechanic accreditation system, 2) fleet-age restriction measure, 3) financial supports and incentives and improvements to the business model, and 4) strengthening law enforcement.

Typically general bus operators are governed under a license or route permit system; however, this is a poor mechanism for the regulators to control operators as operators carry the business risk. This can work well if the operator has a sound business and a long term perspective for the business, however for struggling operators their survival instinct is a stronger force than the regulations designed to control them, and poor behavior and poor service standards are the result.

A number of approaches in incorporating incumbent operators into the system network, with services designated, as:

- BRT trunk operations being the trunk route operation, with a high level of infrastructure;
- Intermediate bus routes, acting as cross-suburb routes and feeder to the BRT and fully integrated with BRT through fare integration, and connecting to BRT shelter platforms. Intermediate routes always overlap a section of BRT to allow a shelter transfer.
- Area routes operating under local government additional to the BRT network and not fare integrated (but can serve BRT)
- Local feeder and community services also not fare integrated but serving local communities to provide local services and access to the BRT.

EVALUATION OF MASTER PLAN

Impact on Fleet and Operation Subsidy: It is a big challenge to provide BRT service without subsidy. To explore such opportunities and conditions, a comprehensive Bus Operations Model (BOM) was developed. The scenario evaluation reveals that average bus speed is a critical factor in the sustainability of the TransJabodetabek business model. For example, it is suggested to increase speed on the full BRT routes under the year 2014 network from currently 20 kph to over 25 kph. A self-financing system will become more difficult under the year 2020 network, requiring faster operation, i.e. 27 kph, with an increased fare setting at IDR 4,250.

The BRT system including traffic priority should be designed for faster and frequent services. Any loss of system speed will need to be directly compensated by government support (or fares will need to increase).

Impact on Road Space Utilization: The exercises of existing traffic calibration and future traffic assignment have been done under existing and planned networks in the metropolis. In conclusion, the proposed BRT network expansion will not only serve for the public transport demand but also enhance space utilization of both lanes for BRT and cars by adding more BRT patronage.

Environmental Considerations: The most critical environmental impact in urban transport development is the emission of Greenhouse Gas (GHG). According to the study's estimation, a considerable GHG emission volume of over 1Mt CO2-equivalent could be reduced from road-based public transport when implementing the JAPTraPIS master plan projects.

Social Considerations: Although some bus services should be rationalized and restructured, the Jabodetabek bus industry consisting of BRT and other bus services will provide larger employment opportunities in 2020, including drivers, conductors, security guards, fleet maintenance engineers, cleaning crew and so on.

Female and the disabled are regarded vulnerable. Considering the JAPTraPIS interview survey result with them, it is suggested that universal design be introduced at bus facilities to be accessible for all and the standard of security and comfort be maintained in good condition.

External Assistance for Smooth Master Plan Implementation: The study has identified some needs for technical and financial assistance as indicated table below. To maximize synergy effects and timely support the JAPTraPIS master plan, it is recommended to combine them into one project (project loan: $ 188.8 million and technical service: $ 4.0 million). The project will be implemented for five years starting from 2014 while newly established JTA will work as an executing agency.

Table 9 Sub-Components of the BRT System Development

Sub-Component	Estimated Budget	Assistance Need		Organizational Relation with TransJabodetabek
		Technical	Financial	
Control Center and Bus Location System	$ 13.8 Million	✓	✓	Traffic Police for safety and enforcement
BRT Prioritized Traffic Management	(Negligible)	✓		LG Transportation Unit and Traffic Police
Ticketing System	$ 20.5 Million	✓	✓	Participating Bank(s)
BRT Fleet	$ 635.2 Million inclusive of Bodetabek fleet ($ 154.5 Million)		✓	JTA for budgeting
BRT Infrastructure	$ 284 Million			LG Public Works Unit

Source: JAPTraPIS

PRE-FEASIBILITY OF BRT EXTENSION TO TANGERANG CITY

Overview: The JAPTraPIS has developed a comprehensive Full BRT network, supported by 'Intermediate BRT' routes and feeder bus service for JABODETABEK. The high demand corridor from Kalideres to Kota Tangerang has been identified as the corridor for immediate action plan, and selected for the pre-feasibility study (PFS) as a key component of JAPTraPIS Master Plan.

The key objective of the PFS is to prepare an assessment for a stepwise implementation of a BRT system in the corridor as part of JAPTraPIS Action Plan. This involved review of existing work, analysis of JAPTraPIS recent survey data, travel demand forecasts, assessment of route suitability, proposals for station locations & terminal facilities, timing of its integration into the JABODETABEK BRT network, and its operational & financial performance.

Corridor Alignment and Station Locations: The target corridor area is depicted below. The proposed route is 10.6km long with 11 proposed stations, including two existing bus terminals (Kalideres & Poris Plawad), eight new stops/stations and a final station at Tangerang City Mall.

Figure 4 Corridor Alignment and Station Locations

Source: JAPTraPIS

Corridor Demand Analysis and Operational Assessment: The demand estimates under Scenario-1 and assessment of existing infrastructure (availability of ten (10) buses with Kota Tangerang City Council for immediate deployment, available bus lane along Benteng Banten & Banten Betawi, terminal facilities and spare capacity at Poris Plawad Terminal) showed that an 'Intermediate BRT' system may start operation in the corridor, after some preliminary preparation as early as mid-2012.

Financial Assessment and Sustainability: The financial analysis is based on operating cost, includes: all fix costs of operation (identified and detailed on the Kota Tangerang Mass Transit Study), current fuel costs, including all taxes, and future fleet investment costs. Infrastructure costs are NOT included in the financial analysis. The fare is set at a flat rate of IDR 2,500 per trip between Kalideres and Tangerang City Mall. In later years, during integrated operation the fare is assumed to be IDR 500/km. The analysis shows revenue surplus form the opening year operation, and could be as much as US$730 thousand per annum, prior to the requirement of investment cost future bus fleet. The profit is estimated to increase with time as the patronage build up. The financial success of the system is dependent on considerable planning for smooth operation, convenient and safe passenger boarding/ alighting and cross platform transfer at Kalideres.

1 INTRODUCTION

1) Scope of the Study

Objectives: The overall objective of the study is to review the existing public transportation master plan (2009) and formulate an implementation strategy to improve the city's road-based public transportation system. The strategy is to actively encourage and promote modal-shift from cars and motorcycles to the public transportation, and in so doing, ease road traffic congestion, reduce economic losses and improve the environment in the study area.

The specific objectives of the study are:

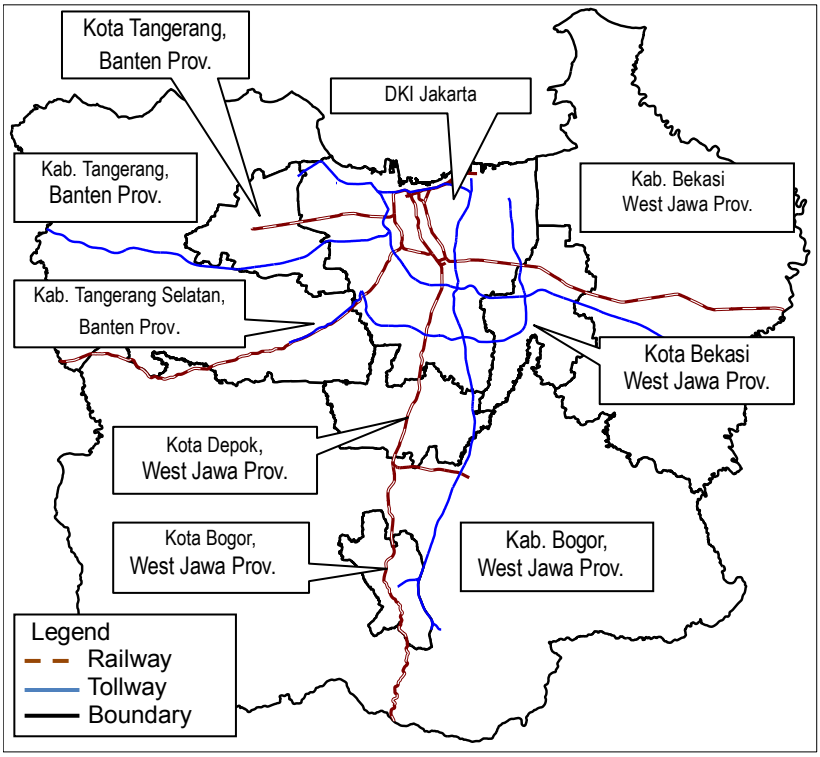
(1) To formulate an implementation strategy for priority public transportation projects for JABODETABEK up to the year 2014, and

(2) To transfer knowledge and skills to the counterpart personnel during the course of the study to ensure the sustainability of the public transportation strategy.

In this study, road-based public transportation was focused as the main point of planning. Development plans for arterial road and railway network are taken from the Master Plan revised by JUTPI.

Study Area: The study area covers the Jakarta metropolitan area, or JABODETABEK, which is comprised of: (i) Jakarta Special Capital Region (DKI Jakarta) and the adjoining local government[1] areas of (ii) Kota Bogor, (iii) Kabupaten Bogor, (iv) Kota Depok, (v) Kota Tangerang, (vi) Kota Tangerang Selatan, (vii) Kabupaten Tangerang, (viii) Kota Bekasi, and (ix) Kabupaten Bekasi (see Figure 1.1).

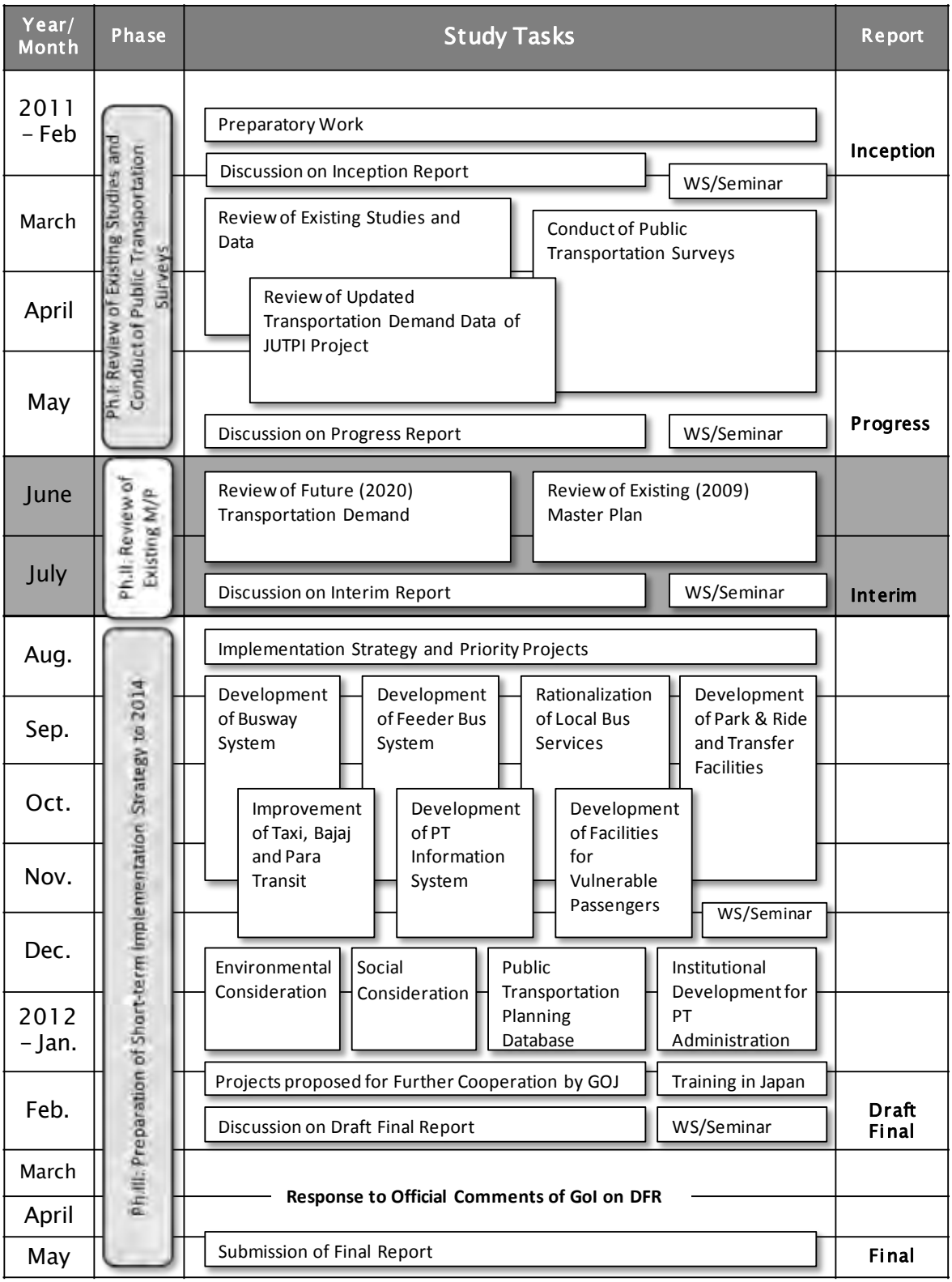
Figure 1.1 Administrative Boundary of the Study Area



[1] "Kota" and "Kabupaten" correspond to "city" and "district", respectively.

Study Framework: The study commenced in February 2011 and ended in May 2012 (see Figure 1.2)

Figure 1.2 Overall Study Tasks and Work Programme

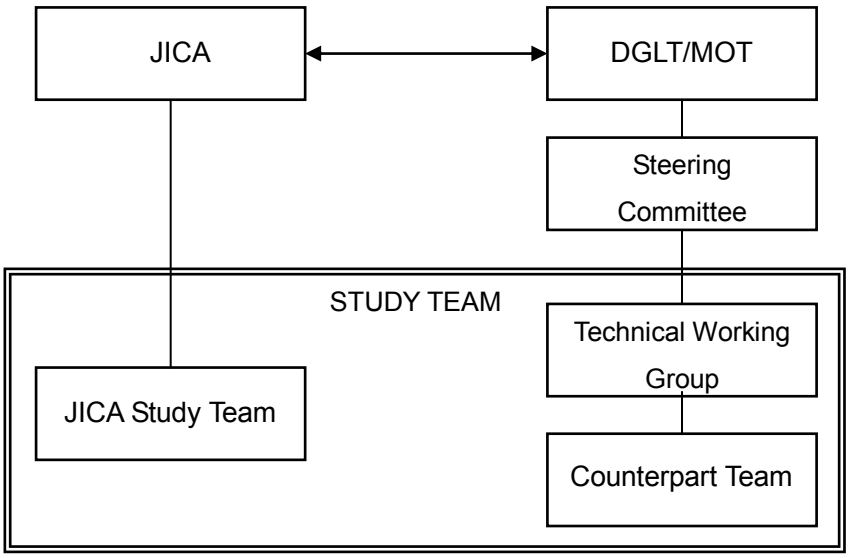


2) Study Organization and Implementation

Study Organization: The study organization has been set up composed of the JICA Study Team on Japan's side and the Steering Committee (SC), Technical Working Group (TWG), and the counterpart (CP) team on Indonesian's (refer toFigure1.3).

Coordination and involvement of the Indonesian side were significant during the course of the study. There were regular discussions with the SC, TWG and CP, while various related agencies were directly involved in the study.

Figure 1.3 Study Organization



Workshops/Seminars: Workshops and seminars were organized on the specific planning issues in order to discuss them in detail with all related persons. Resulting discussions and suggestions were incorporated in the study.

Technology Transfer: Technology transfer in public transport planning was conducted for counterpart team members through on-the-job activities. In addition, the intensive program was conducted in Japan for counterpart members on 5-12 February 2012.

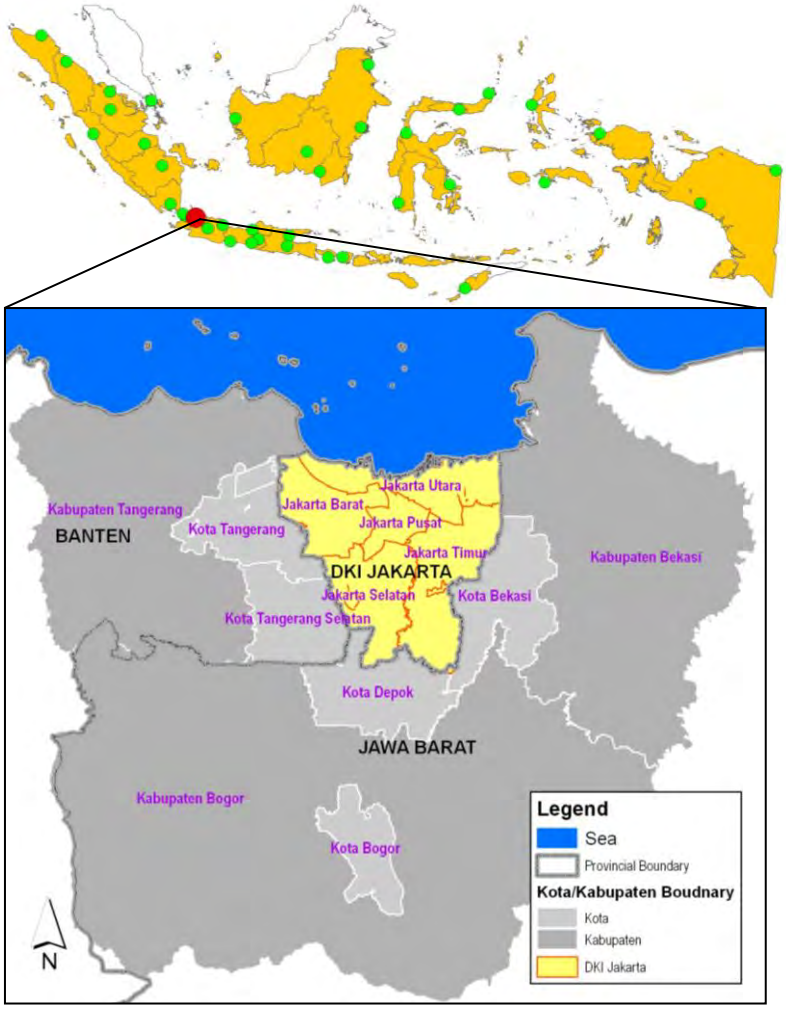
Website and Newsletters: In addition to the above activities, the study team developed a website (http://www.japtrapis.com) to inform the study outline and progress and published two issues of newsletters.

2 URBAN TRANSPORTATION SITUATION IN JABODETABEK

1) Socio-economic and Urban Development Characteristics

Study Area: JABODETABEK area is located in Jawa Island and has the characteristics to be the center of Indonesia in politics, demography and economy. It consists of DKI Jakarta, part of West Jawa Province (Kota Depok, Kota Bogor, Kabupaten Bogor, Kota Bekasi, and Kabupaten Bekasi) and part of Banten Province (Kota Tangerang, Kota Tangerang Selatan, Kabupaten Tangerang). In addition, DKI Jakarta consists of 5 Kota (Jakarta Utara, Jakarta Barat, Jakarta Pusat, Jakarta Timur, and Jakarta Selatan).

Figure 2.1 Location of JABODETABEK Study Area



Source: Study Team

Demography: JABODETABEK population has grown rapidly, in 1990 it was 17 million, increasing to 21 million by 2000, 24 million by 2005, 28 million by 2010. The areas with high population density are spread mainly in the whole of DKI Jakarta and the adjoining Kotas and Kota Bogor. Also population densities have been increasing in Kabupatens in the east and south, outside DKI Jakarta along the major arterial roads.

Economy: JABODETABEK is the country's largest economic growth center where 40% of

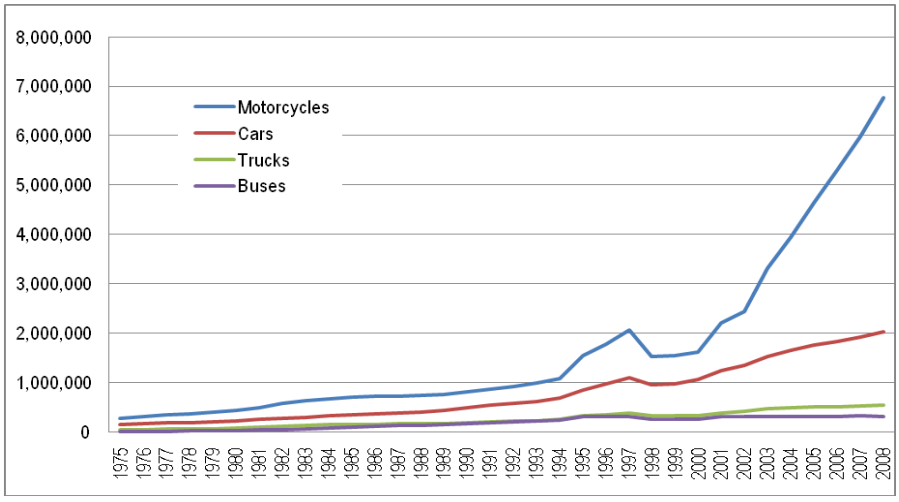
all the foreign investment is concentrated. The Jabodetabek economy accounted for 25% of the national Gross Domestic Products (GDP) in 2008; albeit its population was about 12% of the national total.

Motorization: The growth rate of motorcycle has declined since the economic crisis of 1997 as shown in Figure 2.2. However, subsequently as the economy started to grow, the growth rate of registered motorcycles between 2000 and 2005 is recorded to be 23.5 % per annum. Since 2005 the growth rate has slowed to an average rate of 13.3 % per annum from 2005-2010. In contrast, between 2005 and 2008, the number of buses decreased slightly by about eight thousand.

Poverty: Within JABODETABEK the areas which have relatively high percentage of poor population are resident in Kota Bogor, and Kabupatens of Bogor, Bekasi and Tangerang, generally the rural population.

Urban Development and Planning: The recently developed areas of DKI Jakarta mostly consist of integrated mega complexes of shopping center, apartments and office buildings. These developments are mostly located along the toll roads and arterial roads, and within central Jakarta and in the 'Golden Triangle' of Mega Kuningan. However, sometimes the generated traffic demand exceeds the road capacity of access roads and also access to public transport is limited.

Figure 2.2 Growth of Registered Vehicles in DKI Jakarta, Depok, Tangerang and Bekasi (Excluding Army and Diplomatic)



Source: Study Team

2) Urban Transportation Administration

Traffic and Road Transportation Law: The previous law for traffic and land transportation was ratified in 1992, consisting of 16 chapters and 74 articles; meanwhile the current one was endorsed in 2009, consisting of 22 chapters and 326 articles. The law becomes more comprehensive and encompasses new chapters, i.e. among others, the major additional contents are traffic network and transportation, security and traffic safety, information and communication systems.

Traffic and Transportation Forum: Article 13 in the new traffic and transportation law

indicates the establishment of "forum" for traffic and transportation, and its main tasks are to coordinate among related agencies in planning, analyzing problems and seeking solutions for better traffic and transportation services. Forum will be established in the framework of government structure, i.e. at each level national, provincial and district/ municipality, and each forum is divided not only by the government administrative structure, but also by road classification, which seems to be significantly insufficient and not functional, so to speak. The forum is structured in such system mainly because the institution is deemed from the viewpoint of road administration, instead of considering roads and transport as one of the factors of same area, in urban or rural planning. Besides this fact, the forum is more oriented to be a coordination body for government agencies.

JABODETABEK Transportation Authority (JTA): The primary tasks of the JTA are 1) to formulate short-term action plans based on the transportation master plan, 2) to enhance the services of public transportation and develop necessary infrastructure, 3) to implement traffic demand management, 4) to promote transit oriented development, 5) to budget and execute the planning and monitor their performance. The final draft was submitted to the Secretariat of Cabinet last December. The next step will be a series of discussion to explore and finalize the task descriptions and standard operation procedures. Once the presidential regulation is enacted, the next critical benchmark is to nominate the candidate for the chairperson and deputies of the JTA.

3) Road Network and Traffic Conditions

Road Network: The total length of the roads as of 2009 is over 6,700km in DKI Jakarta, and about 13,700km in the Jabodetabek region. About 50% of the roads are under DKI Jakarta which has only one tenth of area and one third of the population. The toll road network developments are in progress, the radial toll roads to Merak, Serpong, Bogor and Cikampek as well as two ring roads; Jakarta Intra-Urban Toll Road (JIUT) and a part of Jakarta Outer-Ring Road (JORR), almost 137km are in service. JIUT is the inner ring toll road that runs at a 4 to 7km radius from the center of Jakarta city. JORR is also a ring toll road that runs at a 10 to 13 km radius from central Jakarta around the metropolitan area.

Road Volumes: A traffic volume count survey was carried out in 2008 by JICA to update SITRAMP database. Through comparison with previous surveys in 2000, 2002, 2006 and 2007, the rapid increase of motorcycle traffic is evident at all cordons and screenlines.

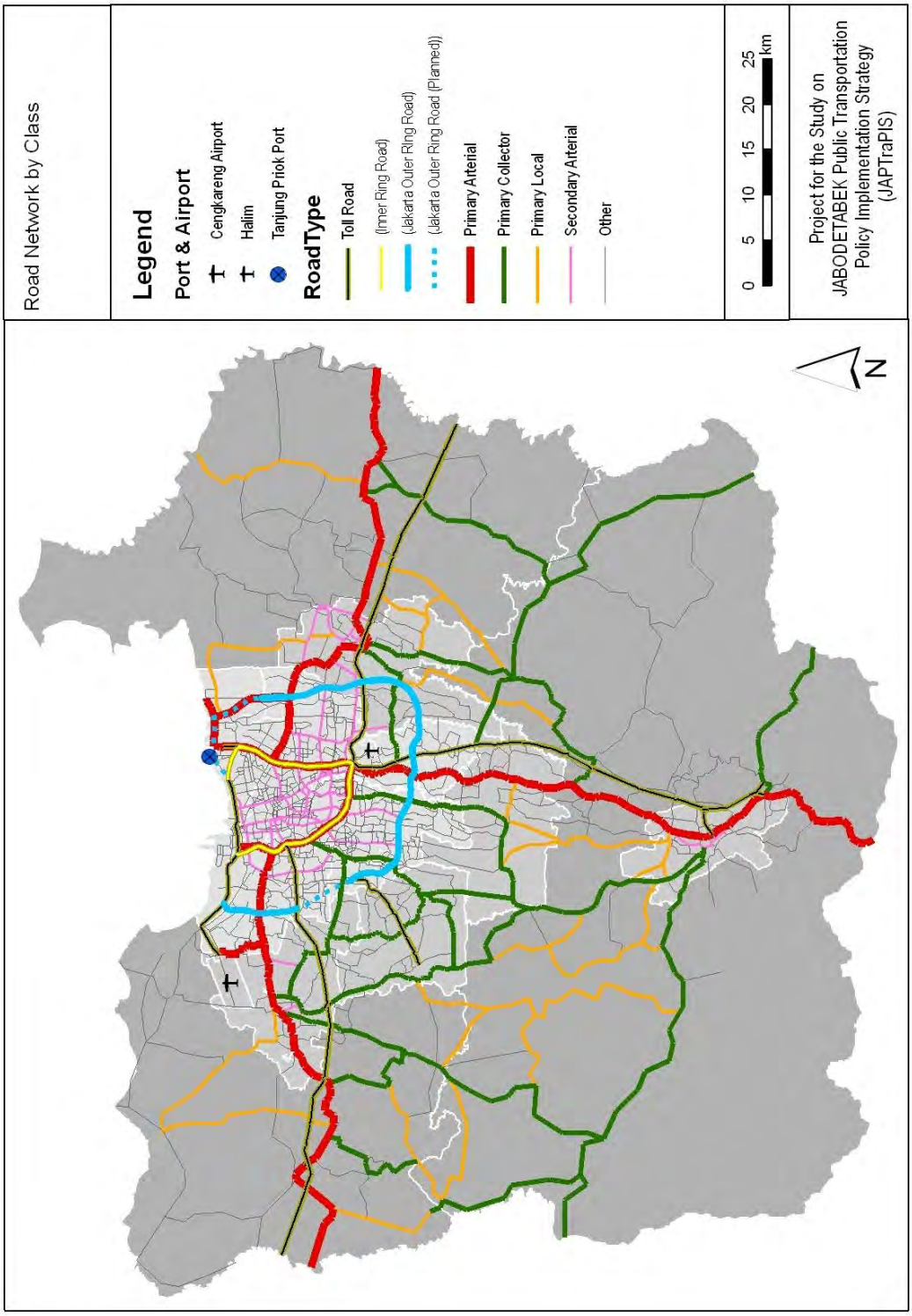
Speed: The average speed in the central business district (CBD) in DKI Jakarta area is mostly less than 20 km/h while the speed drops below 10 km/h in the morning peak hour. In addition, the travel speeds on arterial roads were relatively lower than the CBD and on roads entering the CBD. Also, very low travel speeds were observed around Kota Station, Pasar Senen, Manggarai Station and Hotel Indonesia.

Road network Development: The following road developments have been planned.

- Jakarta Outer-Ring Road (JORR) Plan
- Six Inner Area Toll Road Development Plan
- Four Non-Toll Elevated Road Development Plan in DKI Jakarta
- Arterial Road Development Parallel to Jakarta – Merak Toll Road

- Becakayu Toll Road Development Plan
- Arterial Road Development Plan

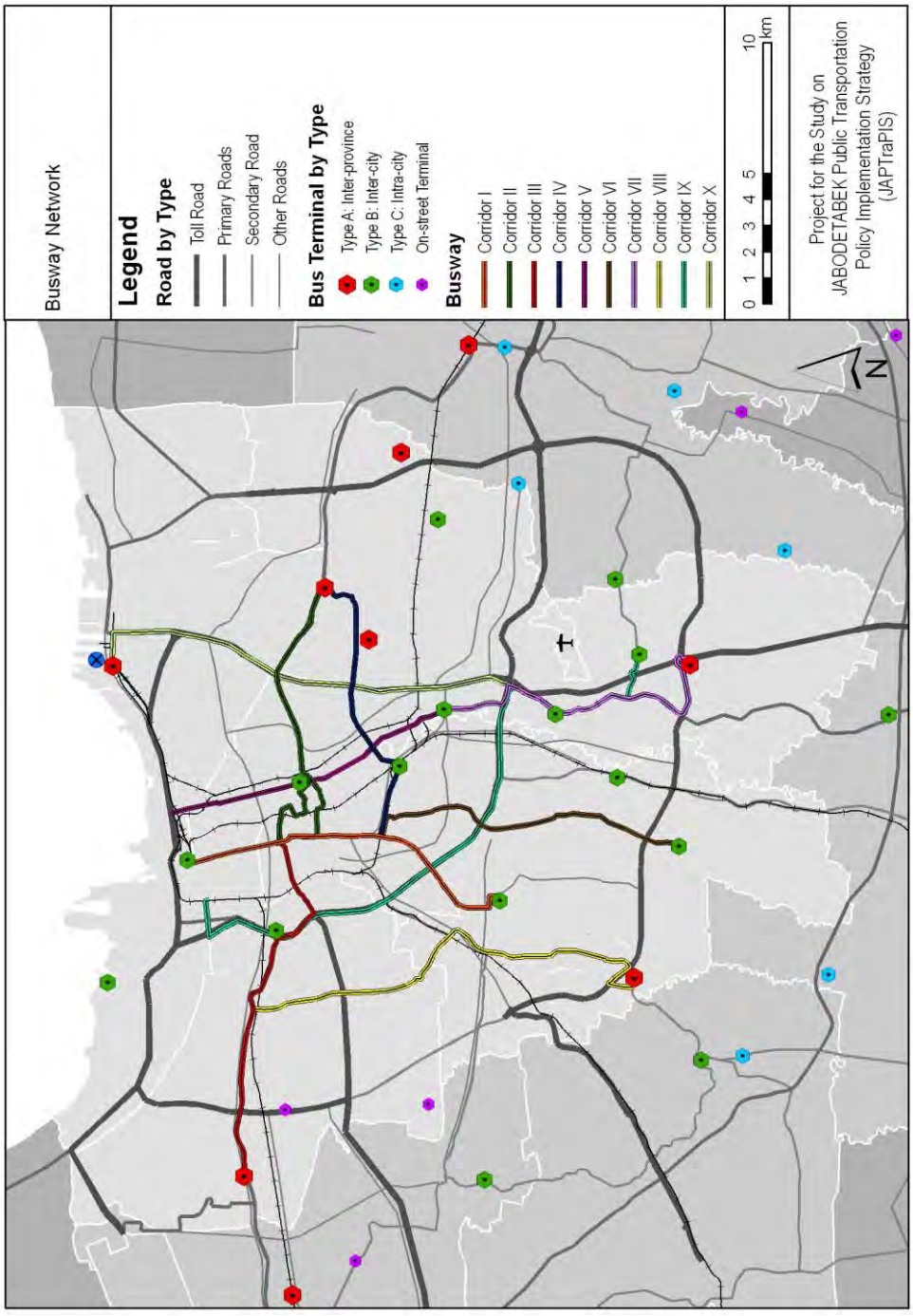
Figure 2.3 Road Netowork by Road Class



Source: Capacity of roads data from JUTPI Road Network for the traffic simulation

Bus Terminal Facilities: There are about 200 stations in Jakarta along the 11 corridors of TransJakarta Busway. The bus stations have elevated platform and are basically on the streets; either in the center of the street or along the sidewalk. In addition, for the TransJakarta Busway and other bus services there are more than thirty bus terminals scattered around DKI Jakarta area. The bus terminals can be classified into four types; Inter-province, Inter-city, intra-city and On-street terminal.

Figure 2.4 Bus Terminals in DKI Jakarta

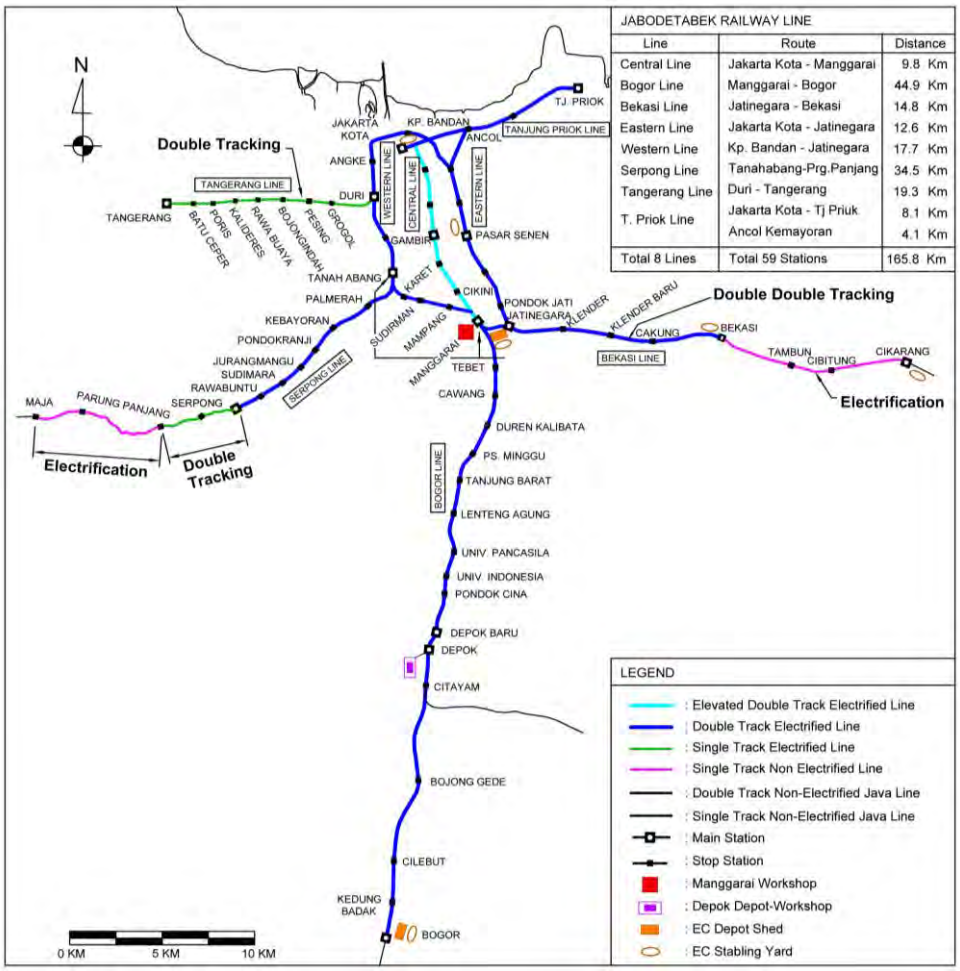


Source: Study Team

4) Railway Network and Services

Existing Railway: In JABODETABEK most of the railway network is electrified and provides services in the DKI Jakarta and surrounding areas. It consists of 8 lines; Central line, Bogor line, Bekasi line, East line, West line, Serpong line, Tangerang line and Tanjung Priok line. Most of the railway lines in JABODETABEK area are double-track. As shown in Figure 2.5, the remaining single-track sections are also planned to be double-track. In addition, some sections are to be electrified.

Figure 2.5 Existing Railway Network and Plan



Source: Preparatory Survey for JABODETABEK Railways Capacity Enhancement Project Interim Report December 2010

MRT: Several Mass Rapid Transit (MRT) corridors are planned. The first priority corridor is Lebak Bulus – Dukuh Atas – Kota corridor; namely, the Jakarta MRT North – South Line. At present preliminary design has been prepared for the section between Lebak Bulus and Dukuh Atas. For the MRT east - west line of JABODETABEK, 5 alternative alignments are proposed. The alignments are 1A, 1B and 2 connect, these run between Balaraja and Cikarang stations along different corridors. The option 3 connects Roxy station with Pondok Kopi station, whereas option 4 connects Balaraja station with Setu station.

5) Road-based Public Transportation Network and services

Overview: In JABODETABEK, there are various types of road-based public transportation systems operated. Currently, there is a Busway network operated by Transjakarta, Trasn Pakuan network in Bogor city, large buses with seating capacity of 50 (maximum 90 including standees) passengers, (Patas AC, Patas Non-AC and Regular), medium buses with seating capacity of 24 (maximum 55) passengers (called Metro Mini, Kopaja, etc.) and small buses (Transit Vans) with capacity of 9-14 passengers (called Microlet, Angkot, etc.). Taxi and Bajaj are providing hired individual transport service. There are also Ojek (motorcycle taxis) providing fast and short-distance service but it is not legally permitted. The operation of Manpowered 3-wheeled vehicle of Becak has been prohibited within DKI Jakarta since 1990, due to slow speed and short trip length, causing congestion.

Transjakarta Busway: Busway system in DKI Jakarta is managed and indirectly operated by BLU Transjakarta, which is an organization under the Transportation Agency of DKI Jakarta Government. The planning, development and implementation of busway network in DKI Jakarta started in early 2000. Corridor 1, between Blok M and Kota was commissioned in 2004. Since then the Busway network has expanded to 11 corridors, with total length of 184km and 208 stations (refer to Table 2.1 and Figure 2.7).

Figure 2.6 Transjakarta

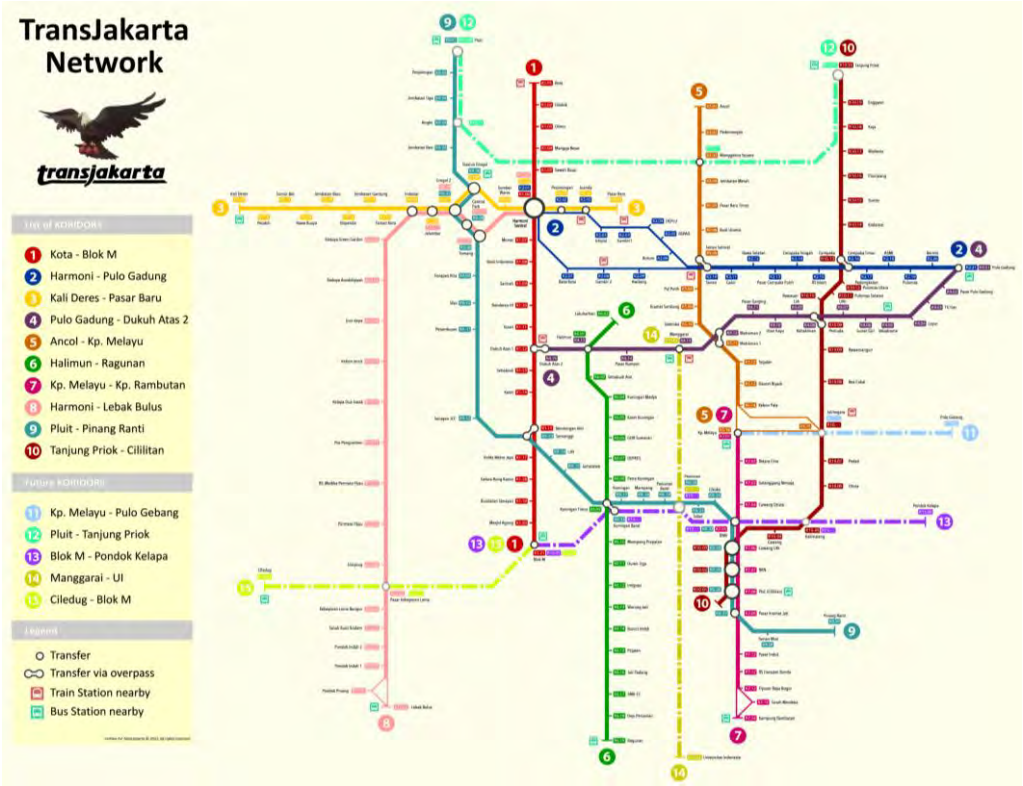
Source: Transjakarta

Table 2.1 Transjakarta Busway Corridor Details

Corridor		Opened	Length (km)	No. of Stops	Travel Time (min.)	Station Interval (km)	Ave. Speed (km/h)
1	Block M – Kota	1-Feb-2004	12.9	20	43	0.68	18
2	Pulo Gadung – Harmoni	15-Jan-2006	14.3	23	48	0.65	18
3	Kalideres – Harmoni	15-Jan-2006	19.0	14	63	1.46	18
4	Pulo Gadung – Dukuh Atas	27-Jan-2007	11.5	15	38	0.82	18
5	Ancol – Kp. Melayu	27-Jan-2007	13.5	15	45	0.96	18
6	Ragunan – Kuningan	27-Jan-2007	13.3	19	44	0.74	18
7	Kp. Rambutan – Kp. Melayu	27-Jan-2007	12.8	14	43	0.98	18
8	Lebak Bulus – Harmoni	21-Jan-2009	26.6	23	89	1.21	18
9	Pluit – Pinang Ranti	31-Dec-2010	28.8	29	96	1.03	18
10	Tanjung Priok – Cililitan PCG	31-Dec-2010	19.4	20	65	1.02	18
11	Kampung Melayu – Pulo Gebang	28-Dec-2011	12.0	16	50	0.75	18
Total Operational Network in 2012		**1-Jan-2012**	**184.1**	**208**	**-**	**0.89**	**-**

Source: Transjakarta

Figure 2.7 Transjakarta Busway Network



Source: Transjakarta

Trans Pakuan: Trans Pakuan is a bus system in Kota Bogor. The Trans Pakuan is operated by obeying a time schedule and stops only at designated shelters. On the other hand they do not have dedicated lanes as Transjakarta. Therefore, the bus of Trans Pakuan is operated on general lane with other vehicles. Trans Pakuan operates three routes as shown in Table 2.2. The Trans Pakuan is used around 3,000 passengers per a day.

Table 2.2 Trans Pakuan Route

Route	Section	Length (km)	Travel Time (min)	Opened	No. of shelters	Operation Hours	Fare (Rp)
Route 1	Bubuluk – Cidangiang	11.5	35	May 2007	39	5:20-21:00	3,000
Route 2	Cidangiang – Harjasari	10	30	July 2009	27	6:00-19:00	3,000
Route 3	Cidangiang - BELLANOVA	5	12	February 2010	2	6:30-21:30	5,000

Source: Trans Pakuan

Figure 2.8 Bus Fleet and Shelter of Trans Pakuan

Source: Study Team

Other Bus Services: Other than the Busway system and Trans Pakuan, other bus services in JABODETABEK area may be divided into three main types, in terms of vehicle size and service characteristics.

- Large bus (50 seats): Patas AC, Patas Non-AC, Regular Bus
- Medium bus (24 seats): Metro Mini, Kopaja, etc.
- Small bus (9-14 seats): Mikrolet, Angkot, etc.

In JABODETABEK, 42,767 buses were operating, of which 2,237 were large buses, 3,207 medium buses and 37,323 small buses. As of 2010, these bus services in JABODETABEK are provided with a total of 1,101 bus routes: comprised of: 455 large bus routes, 118 medium bus routes and 536 small bus routes. Current bus fare in DKI Jakarta is IDR 6,000-12,000 for Patas AC depending on the destination of bus, IDR 2,000-4,000 for Patas Non-AC and regular bus depending on the distance of bus, IDR 2,000 for medium bus, IDR 2,000-3,000 for small bus depending on the area of operation.

Figure 2.9 Large Bus, Medium Bus and Small Bus

Large Bus (Patas)
Source: Study Team

Medium Bus (Kopaja / Metro Mini)

Small Bus (Mikrolet/ Angkot)

Taxi: There are many taxis available and these are widely used in JABODETABEK. Almost all taxis have fare meter and major taxi companies have radio contact for pick-up service. In DKI Jakarta, as of December 2009, there are 24,324 licensed taxis registered by 46 taxi companies, of which 12,015 licenses have renewed and are operational. Large taxi companies which operate more than 1,000 taxis are PT. Blue Bird (1,600) and PT. Express Transindoutama (1,000). Taxi fare is distance based, it starts at IDR6,000 for the first 2km and IDR3,000 per km for the following travel distance.

Bajaj: There are many Bajajs available and these are widely used in DKI Jakarta. In DKI Jakarta, as of December 2009, there are 14,424 licensed Bajaj of which 12,797 Bajaj licenses have been renewed and are operational. There are 600 registered Bajajs with CNG engines. Bajaj fare is decided by negotiation between the driver and the customer. Fare of Bajaj is relatively higher than that of a taxi trip of the same length.

Ojek: Motorcycle taxi is commonly called Ojek. It is a very common, but remains an unlicensed service. They are operational in most areas of JABODETABEK. Generally fare for an Ojek trip is around IDR 10,000.

Figure 2.10 Taxi, Bajaj and Ojek

Taxi

Bajaj

Ojek

Source: Study Team

Problems and Issues: The following problems and issues were identified in the road-based public transportation;

Low service level of public transportation: The level of bus services is low in many aspects. Poor frequency, not punctual, unreliable, non-designated bus stops, unexpected termination of operation, long waiting time, sense of insecurity on board by passengers, poor hygiene condition inside buses – these are just some of its many deficiencies related to bus service, and are being addresses in this study.

Insecurity on public transportation: Although the security situation on buses is better since the SITRAMP time, still many crimes occur on board the buses.

Rejection of students to use buses: Students are sometimes rejected from boarding a bus by bus crew, because their fare is less than half of the normal passenger fare. This unfair treatment is partly caused by bus rental system, as bus drivers should get sufficient fare revenue to cover the rental charges, fuel cost, and other operational expenses, and of-course his own profit. By allowing students the bus driver is reducing his revenue without any compensation.

6) Traffic Management and Safety

Traffic Signal Control: There are about 600 major intersections, of which 287 are signalized in DKI Jakarta. It shows that the level of junction signalization is quite low for such a dense urban area. Three ATC systems (Area Traffic Control system) in DKI Jakarta were supplied by Sainco of Spain, Siemens of Germany, and AWA of Australia. However, coexistence of three distinctly different systems prevents signal integration, results in poor management of traffic flow and is preventing the upgrade to more advanced systems. At present, the ATC system has some problems thus it is not an exaggeration to say that ATC system in DKI Jakarta area is almost defunct. In addition, numbers of signalized junctions in the BOTABEK area are even fewer than DKI Jakarta.

One-way Management: In central DKI Jakarta, several roads are act as one-way road. It increases the road capacity as well as intersection throughput, and also simplifies the turning movements at a junction. On the other hand, the trip length become longer and public transportation users suffer inconvenience due to route diversion and longer walk distances to access the bus services on parallel roads.

Car Pooling (3 in 1) Regulation: Since beginning of 90's, car pooling (locally known as 3 in 1) regulation is in operation in DKI Jakarta. Under this system only high-occupancy vehicles (with three or more occupants) are allowed to use or enter the central arterial road. The system is in operation on Jl. Sudirman, Jl. MH. Thamrin, Jl. JG. Subroto: R.Rasuna Said up to G. Pemuda Intersection; during weekday peak periods (morning peak; 7:00-10:00, evening peak; 16:00-19:00, Mondays to Fridays). Taxis and public buses are exempted from this regulation.

Truck Regulation: Heavy trucks (capacity>5.5 ton) are restricted to enter the central arterial roads (Jl. Sudirman and Jl. Thamrin). The lighter trucks (capacity<5.5 ton), buses and motorcycles are restricted to use left lanes on Jl Sisingamangaraja, Jl. Sudirman and Jl. Thamrin. On Jl. Medan Merdeka Baret, Jl. Majapahit, Jl. Gajah Mada, Jl. Hayam Wuruk, Jl. Pintu Besar Selatan, and Jl. Pintu Bear Utara, trucks are restricted to use only the 1st or 2nd lane from the left side.

Traffic Accident Situation: Traffic accidents are one of the serious social problems in JABODETABEK area. Especially fatalities through road accidents were mostly riders of motorcycles.

Traffic Management Plan: Road Pricing was proposed as one of the priority project by the SITRAMP study. After the SITRAMP proposal, road pricing was also considered by JETRO Project in 2008 (The Study on Jakarta Road Pricing in the Republic of Indonesia).

7) Urban Environment

Air quality: The actual condition of ambient air quality, which was observed in 2007-2008 is given in Table 2.3.

Table 2.3 Observation of Air Condition in Jakarta (Average of the Observed Months)

No	Location	SO_2 (µg/m^3)	CO (µg/m^3)	NO_2 (µg/m^3)	TSP (µg/m^3)
	Quality Standard of DKI Jakarta (24 Hours)	**260.0**	**9,000**	**92.00**	**230**
1	Kuningan	6.6		49.7	142
2	Tebet	7.9		30.7	181
3	Pulogadung	9.2		91.8	276
4	Istiqlal	10.0		23.6	181
5	Ancol	9.7		42.1	291
6	Cilincing	9.1		20.8	378
7	Lubang Buaya	8.3		26.6	128
8	Kahfi	9.1		17.9	106
9	Kalideres	12.5		24.0	168
10	East Jakarta		920		
11	West Jakarta		1,210		
12	Gelora Senayan		1,260		
Average		**9.2**	**1,130**	**36.3**	**206**

Note: HC is not monitored
Source: Environmental Status Report, 2008, BPLHD (Environmental Management Agency), DKI Jakarta

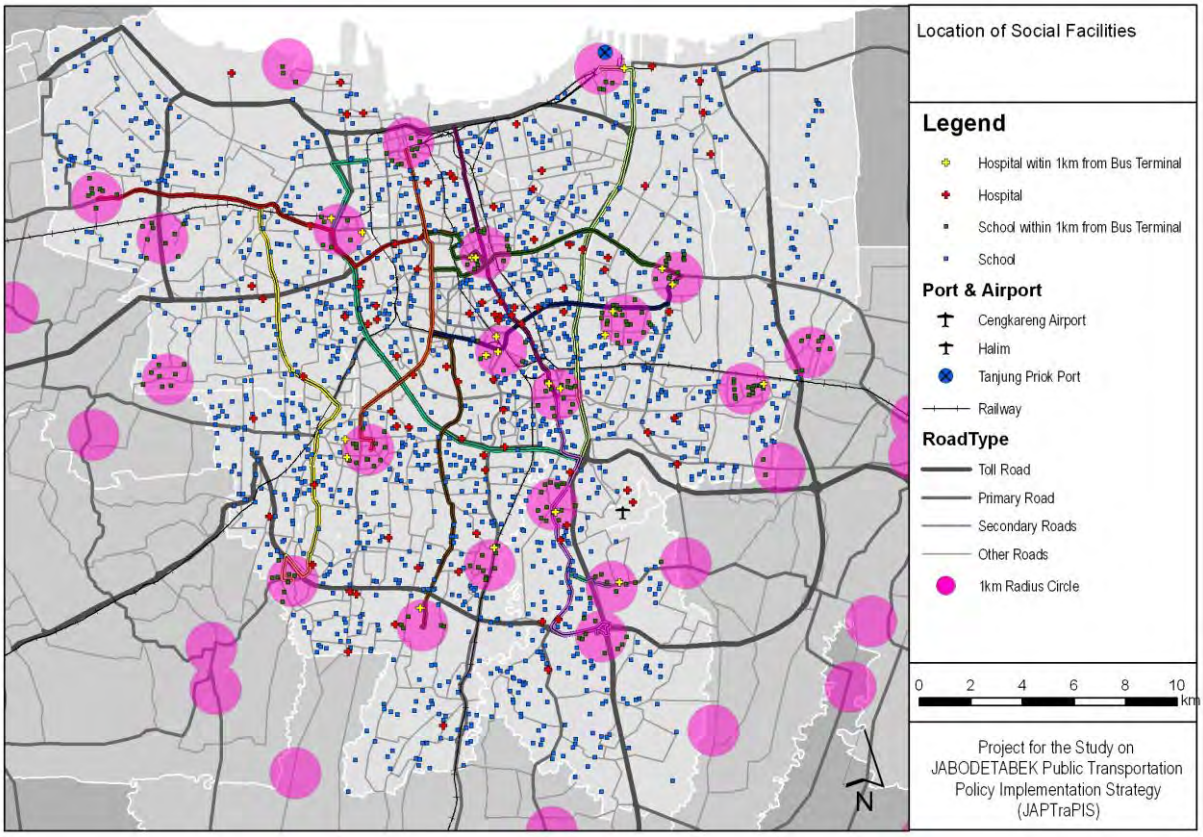
CNG Fuel Introduction: DKI Jakarta has implemented a program of CNG fuel introducing on Busway vehicles, it was announced by the President on May 20, 2006. In addition, related regulations were published on i) the regulation No. 2 in 2005 on air pollution control and ii) Kep. Gubernur No. 141 in 2007 on the type of fuel to be used public transport and local government operated vehicles.

Employment in Public Transportaiton Sector: It is expected that the reorganization of bus operation affects to the employment mostly of bus drivers and conductors. In the process of transport strategy formulation, it would be carefully considered to build a framework of reemployment of these workers. However, in the process of implementation of the project, the indicators relating to the employment should be monitored.

Access to Hospital and School: Figure 2.11 shows the location of social facilities in 2002 and the selected facilities which are located within 1km radius of the existing bus terminals. There are 206 schools and 21 hospitals which fulfill this condition.

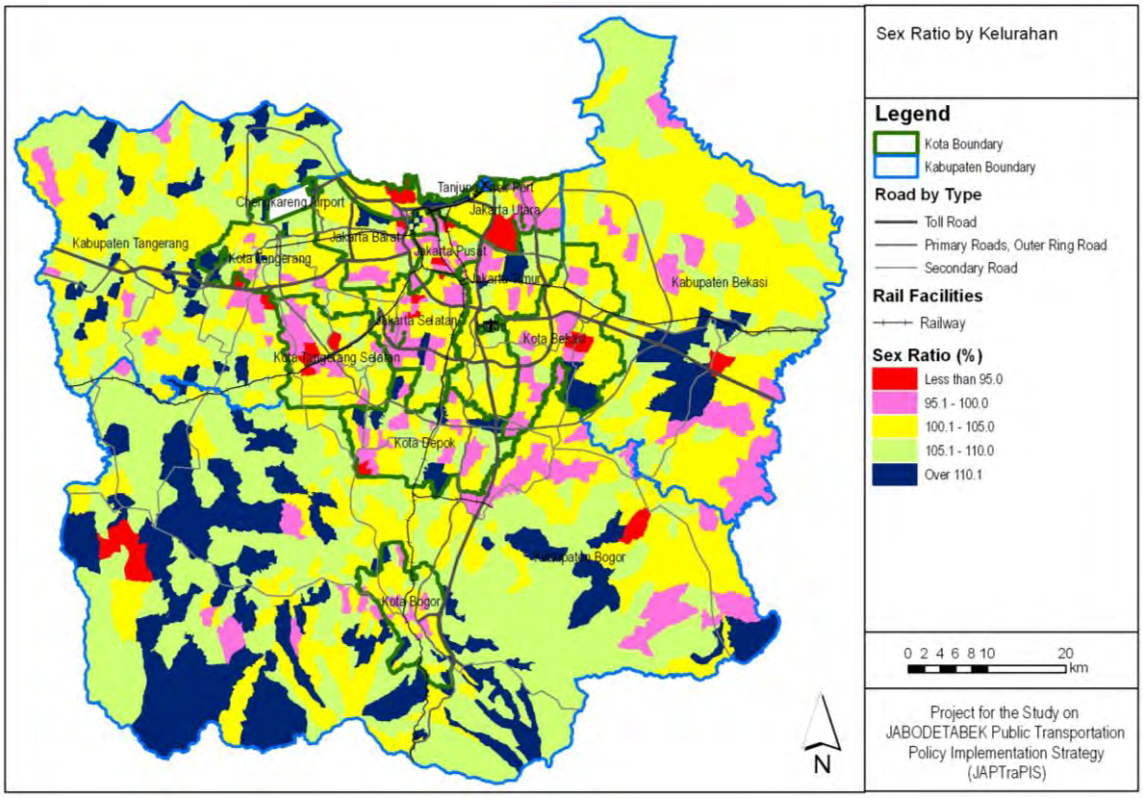
Gender Issue: Figure 2.12 depicts the distribution of gender balance (male/female Ratio as %) by census Kelurahan. The areas with lower male population are mostly scattered around the Kota areas.

Figure 2.11 Social Facilities within 1km Radius of Bus Terminals



Source: SITRAMP GIS Database, 2002

Figure 2.12 Gender Balance by Census Kelurahan



Source: Census 2010, BPS

3 EXISTING PUBLIC TRANSPORT CHARACTERISTICS

1) Introduction

This chapter aims to analyze the recently estimated public transportation demand based on comprehensive urban transport demand data updated by JUTPI in the study area and to show the characteristics of demand and supply side of public transportation based on results of the public transportation surveys that were conducted by JAPTraPIS. The analysis comprises of five main aspects: (i) Characteristics of the JUTPI updated urban transport demand, (ii) Characteristics of public transport usage, (iii) Characteristics of supply of public transportation, (iv) Characteristics of public transportation driver/conductor, and (v) Evaluation of public transportation. These analysis were based on the following surveys.

Commuter Survey: Commuter survey was conducted under the JUTPI during March-May 2010 to understand the characteristics of commuter trips of worker and student in the household as well as to collect the socio-economic information of the household and its members in JABODETABEK.

Person Tracking Survey: To investigate trip generation/attraction and modal choice behavior for all trip purposes in the study area, JUTPI also conducted person tracking survey. This survey is similar to conventional person trip survey, but respondents are requested to carry GPS device sot that the GPS data could be used to verify the paper-based responses.

Public Transportation Surveys: Public transportation surveys were consisted four surveys; (i) Bus vehicle and passenger traffic count survey, (ii) Bus route operation survey, (iii) Public transportation passenger interview survey and (iv) Public transportation operator interview survey.

2) Analysis of Current Travel Demand

Total Travel Demand: The total travel demands are disaggregated by three income groups (Low, Medium & High) and by vehicle type. Similarly the goods movement was provided by two types of trucks (Small and Large). The total demand is summarized in Table 3.1. There are about 53million daily person trips in 2010, of which Motorcycles accounts for close to 53% (28.1million), Car 10.5 million at 20% and all public transport modes 14.4million (27%) of the total. It should be noted that in SITRAMP study it was reported that close to 40% all person trips are by public transport mode.

Total Travel Demand by Area: The dominance of motorcycle trips in all areas, and in most cases the public transport trips exceed car trips, and the difference is greatest in rural areas such as Kabupaten Bogor, Bekasi and Tangerang, indicating high reliance of public transport in the regions.

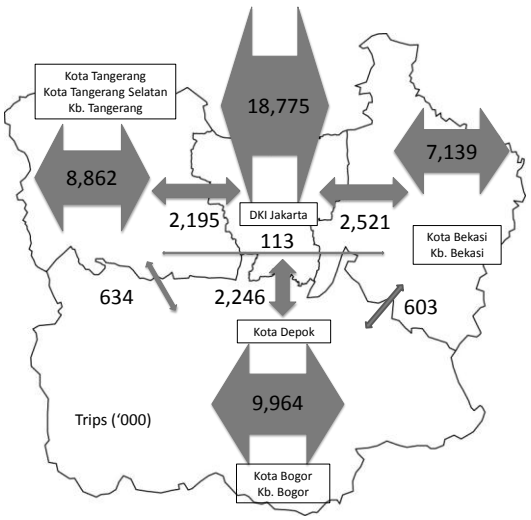
Travel Demand Patterns (Trip Distribution): The highest travel demand is within DKI Jakarta (18.8million (35.2%) trips. In addition there are 7.0million trips to/from DKI Jakarta daily. The next busiest area of travel demand is the southern areas of DKI Jakarta (including Kotas Depok & Bogor and Kabupaten Bogor, accounts for 10 million internal trips about 18.8% of the study area movements.

Table 3.1 Daily Total Travel Demand in the JABODETABEK Area

Mode Description	Sub-Group	Total Trips	Intra-Zonal	Inter-Zonal
Motorcycle Person Trips	Low Income*	8,314,748	3,533,530	4,781,218
	Medium Income*	17,801,390	5,475,141	12,326,249
	High Income*	2,007,651	402,841	1,604,809
	Sub-Total	**28,123,863**	**9,411,513**	**18,712,350**
Car Person Trips	Low Income	1,211,348	511,547	699,801
	Medium Income	7,233,139	2,234,348	4,998,790
	High Income	2,056,607	318,049	1,738,559
	Sub-Total	**10,501,094**	**3,063,945**	**7,437,150**
All Public Transport Person Trips	Low Income	5,323,158	2,299,740	3,023,418
	Medium Income	8,466,125	2,742,389	5,723,736
	High Income	637,535	135,409	502,126
	Sub-Total	**14,426,818**	**5,177,538**	**9,249,280**
Total All Modes Person Trips	Low Income	14,849,254	6,344,818	8,504,437
	Medium Income	33,500,654	10,451,879	23,048,775
	High Income	4,701,793	856,299	3,845,494
	Total	**53,051,776**	**17,652,996**	**35,398,780**
Truck (Vehicle) Trips	Small Trucks	382,736	2,756	379,980
	Large Trucks	76,081	727	75,354
	Total All Trucks	**458,817**	**3,483**	**455,334**

Note: Low Income: Average Household Income < IDR1.5million/month; Medium Income: Average Household Income >=IDR1.5million, and < IDR 6.0 million/month; and High Income: Household Average Income>= IDR6.0million/month; *Source: JUTPI Model Output*

Figure 3.1 Daily Travel Pattern by All Modes of Travel - Trips ('000)



Source: Analysis by JAPTraPIS Study Team, Source Data JUTPI

Mode Choice: Public transport share is below 40% for low & medium income persons, and it decreases to 14% for high income trips mainly because the high income motorcycle trips shift to car. It can be further seen that car mode share increases with increase in income, and increases to more than 5½ times (from 8% to 44%) from low to high income car travelers. Among the low income, motorcycle is the most dominant mode at 56% of all trips are by motorcycle.

3) Characteristics of Existing Public Transportation Usage

Travel Time: Average travel time per trip for each public transport modes in 2010 are presented in Table 3.2. The travel times are calculated from commuter survey and person tracking survey for the commuting purpose and all purposes respectively. The travel times are the sum of in-vehicle travel time and do not include the waiting time or transfer time.

Table 3.2 Average Travel Time per Trip by Public Transport Mode

Public Transport Mode	Average Trip Travel Time (min)	
	Commuting Trip	All Purposes
TransJakarta	40.0	46.5
Large Bus (AC/Patas AC)	55.4	51.4
Large Bus (Patas)	35.1	76.6
Large Bus (regular)	50.2	Data not available
Medium Bus (Metromini, etc.)	29.9	45.9
Small Bus (Angkot, etc.)	25.3	34.3
Train (express)	40.3	53.0
Train (economy AC)	49.2	81.0
Train (economy)	51.5	Data not available

Source: Study Team based on Commuter Survey Data from JUTPI

Fare: The average trip fare for train (express/economy AC) user is the most expensive as it costs. Commuting trip by small bus (e.g. Angkot) appears to be the cheapest one; this reflects that trip by small bus is generally short.

Gender, Age: Ratios of male and female of public transportation users are almost same except taxi and Bajaj. Female rations of Taxi and Bajaj are larger than mail ration. The 30-39 years old group among age groups of public transportation users is substantially high and it amounts to around 30% to 36% except Taxi. Main passenger of Taxi is 40–49 years old group.

Frequency: Rations of daily public transport use by each bus type are around 50%.

Trip Purpose: Ratios of purpose of trip for work are high in each mode except taxi. On the other hand ratios of purpose for private are high in taxi.

4) Characteristics of Supply of Existing Public Transpiration

Travel Speed, Boarding and Alighting Passengers: Average travel speed and average boarding and alighting passengers of each main bus route is presented in Table 3.3. Off peak travel speed is faster than peak travel speed on the whole. Boarding – alighting passenger in morning peak and evening peak is larger than off peak on the whole.

Table 3.3 Average Travel Speed and Average Boarding and Alighting Passengers

No	Type	Route No	Origin	Destination	Average travel speed (km/h)			Average board and alight passengers		
					Morning peak	Off-peak	Evening peak	Morning peak	Off-peak	Evening peak
1	Busway	Corridor 1	Blok M	Kota	16.7	17.4	16.2	208	165	159
			Kota	Blok M	17.2	18.3	18.2	227	173	253
2		Corridor 2	Pulo Gadung	Harmoni	16.0	18.3	16.2	206	155	195
			Harmoni	Pulo Gadung	17.2	14.9	16.6	173	130	201
3		Corridor 3	Kalideres	Harmoni	19.1	20.9	22.3	129	143	137
			Harmoni	Kalideres	18.8	22.6	19.8	191	85	198
4		Corridor 4	Dukuh Atas	Pulo Gadung	18.7	20.9	13.0	199	139	224
			Pulo Gadung	Dukuh Atas	14.3	15.6	14.4	143	70	171
5		Corridor 5	Kp.Melayu	Ancol	19.5	19.4	17.4	215	195	295
			Ancol	Kp. Melayu	16.5	15.2	11.5	155	187	250
6		Corridor 6	Ragunan	Dukuh Atas	21.8	26.7	18.3	215	118	147
			Dukuh Atas	Ragunan	21.7	28.4	21.1	182	128	137
7		Corridor 7	Kp. Rambutan	Kp.Melayu	12.3	16.0	-	130	151	-
			Kp. Melayu	Kp. Rambutan	17.4	17.4	16.9	239	123	193
8		Corridor 8	Lebak Bulus	Harmoni	13.6	18.9	18.9	212	219	217
			Harmoni	Lebak Bulus	21.0	21.3	14.3	186	89	205
9		Corridor 9	Pinang Ranti	Pluit	21.4	26.4	19.8	295	248	349
			Pluit	Pinang Ranti	21.1	17.8	13.4	217	228	446
10		Corridor10	Tj Priok	Cililitan	19.9	21.6	19.5	239	220	265
			Cililitan	Tj. Priok	16.8	18.2	13.2	193	181	344
11	Patas AC	AC07	Kp. Rambutan	Tg. Priok	22.5	22.7	21.5	101	117	161
			Tg. Priok	Kp. Rambutan	22.8	21.7	14.9	95	105	125
12		AC28	Bekasi	Blok M	32.2	20.4	24.1	60	35	58
			Blok M	Bekasi	24.9	28.3	21.0	52	35	65
13	Large Bus AC		Kali Deres / Grogol	Baranangsiang	33.1	33.1	31.4	142	124	129
			Baranangsiang	Kali Deres /Grogol	31.2	36.0	33.8	81	131	86
14	Patas	P7	Pulo Gadung	Grogol	25.6	31.3	26.8	123	95	78
			Grogol	Pulo Gadung	27.1	30.3	19.6	91	76	102
15		P12	Senen	Kali Deres	20.5	20.8	15.2	82	76	72
			Kali Deres	Senen	12.7	16.1	11.7	95	65	111
16		P55	Is Cawang	Grogol	10.9	19.0	7.2	93	65	77
			Grogol	Kp. Melayu	16.2	14.8	11.2	75	85	101
17		P43	Cililitan	Tg. Priok	21.7	21.1	17.2	95	115	127
			Tg. Priok	Cililitan	26.1	25.4	20.7	145	107	154
18		P54	Grogol	Depok	16.4	15.0	12.7	121	133	165
			Depok	Grogol	14.8	14.3	10.6	183	119	175
19	Regular Bus	905	Pulo Gadung	Mangga Dua	16.4	15.0	16.2	189	117	123
			Mangga Dua	Pulo Gadung	16.7	14.2	17.4	137	67	126
20	Medium Bus	P19	Blok M	Tanah Abang	17.7	12.5	24.4	77	47	79
			Tanah Abang	Blok M	14.7	15.2	12.9	62	55	116
21		S75	Blok M	Ps. Minggu	14.5	17.9	10.5	52	45	57
			Ps. Minggu	Blok M	7.9	13.8	10.4	75	33	97

No	Type	Route No	Origin	Destination	Average travel speed (km/h)			Average board and alight passengers		
					Morning peak	Off-peak	Evening peak	Morning peak	Off-peak	Evening peak
22		S69	Ciledug	Blok M	9.5	14.2	16.0	83	49	59
			Blok M	Ciledug	16.5	11.4	10.5	33	35	67
23		T506	PP Kopi	Kp. Melayu	11.7	14.4	9.1	68	67	71
			Kp. Melayu	PP Kopi	22.0	22.0	15.2	35	41	81
24		S62	Manggarai	Tg. Barat	12.7	17.4	10.8	41	45	58
			Tg. Barat	Manggarai	6.5	11.9	11.3	64	37	51
25	Small bus	M01	Senen	Kp. Melayu	22.1	12.3	7.5	18	21	37
			Kp. Melayu	Senen	17.9	15.0	14.5	27	20	29
26		T08	Kp. Rambutan	Cililitan	11.8	10.9	9.7	21	35	30
			Cililitan	Kp. Rambutan	13.3	14.0	8.9	17	20	41
27		B17	Ps Npres Kebayoran	Citraland	15.6	14.9	16.4	37	50	32
			Citraland	Ps Npres Kebayoran	19.9	16.6	18.0	31	32	31
28		T20	Pulo Gadung	Bekasi	22.0	17.5	16.0	12	21	17
			Bekasi	Pulo Gadung	15.5	15.8	15.9	17	13	26
29		B01	Cengkareng	Cikokol	13.1	18.2	15.0	33	29	45
			Cikokol	Cengkareng	18.5	19.3	18.5	29	23	27
30		03	Barangsiang	Laladon	22.5	14.9	19.6	28	28	28
			Laladon	Barangsiang	20.4	16.0	13.3	35	18	27

Source: Bus Route Operation Survey, JAPTraPIS
Highest travel speed among period is highlighted by yellow and largest board and alight passengers among period is highlighted by green.
Corridor 7 in evening peak operate different route, so its travel speed is not written in this table.

5) Characteristics of Existing Public Transportation Driver/Conductor

Age of Each Public Transportation Driver: Ration of 30-39 years group is high and it amounts to 32% to 51%. 40-49 years group is also high (26-41%).

Operation Style of Company/Cooperative: It is often the case that Busway, Patas AC, Patas, Regular bus and taxi are operated by joint venture. On the other hand, Medium bus, Small bus, Bajaj and Ojek are operated by private almost.

Working Hour per Day and Week: Ratio of 7-9 hour working in Buway is almost 100%.On the other hand there are many drivers / conductors who work over 10 hours per day. More than 35% samples of each mode work 7 days a week except Busway and Patas.

6) Evaluation of Public Transportation

Points of evaluation of each public transport service by assess mode to terminal is shown in Table 3.4. Evaluations of each service about busway and taxi are high compared with other mode generally. On the other hand evaluations of each service about Patas and Medium bus, Bajaj are low.

Table 3.4 Evaluation of Each Public Transport Services

	Busway	Patas AC	Patas	Regular bus	Medium bus	Small bus	Taxi	Bajaj	Ojek
Travel speed	3.9	3.4	3.1	3.3	3.1	3.3	4.0	3.3	4.1
Cost / fare	3.9	3.6	3.6	3.5	3.5	3.6	3.7	3.2	3.6
Punctuality	3.7	3.2	2.9	3.0	2.9	3.2	4.0	3.4	4.1
Accessibility	3.8	3.6	3.3	3.3	3.6	3.9	4.0	3.5	4.1
Cleanness in the vehicle	4.0	3.7	2.9	2.8	2.8	3.2	4.2	2.7	3.6
Noise in the vehicle	3.8	3.4	2.7	2.6	2.5	2.9	4.1	2.0	3.3
Safety in the vehicle	4.0	3.8	3.2	3.1	3.1	3.4	4.3	2.9	3.5
Air pollution in the vehicle	3.8	3.3	2.5	2.5	2.4	2.8	4.0	2.2	3.0
Ride comfort	3.9	3.7	2.9	3.0	2.8	3.3	4.4	2.7	3.5
Easy to transfer	3.8	3.8	3.4	3.3	3.5	3.8	4.1	3.3	3.8
Staff behavior(inc driver)	4.0	3.7	3.3	3.3	3.2	3.4	4.2	3.3	3.8
Terminal facilities	3.6	3.2	3.1	3.1	2.9	2.9	3.4	2.9	3.3
Crowdedness in the vehicle	3.0	3.2	2.6	2.9	2.6	3.0	-	-	-
Frequency	3.2	3.3	3.1	3.1	3.2	3.5	-	-	-
Bus stop facilities	3.6	3.1	2.9	3.0	2.9	2.9	-	-	-
No. of bus stop	3.4	3.3	3.1	3.0	3.2	3.4	-	-	-
Information	3.6	3.2	3.1	2.9	3.0	3.0	-	-	-
Average	3.7	3.4	3.1	3.0	3.0	3.3	4.0	3.0	3.6

Source: Public Transport Passengers Interview Survey, JAPTraPIS

Note: average of points 1: very bad, 2: bad, 3: fair, 4: good, 5: very good
The highest point in each mode service is colored red and the lowest point is colored blue

4 REVIEW OF THE EXISTING TRANSPORT MASTER PLAN (PTM)

1) Review of PTM

Overview: The existing transportation master plan, PTM (Pola Transportasi Macro), is prepared by Ministry of Transportation in 2009, and expected to be the guideline for integrated public transportation plan in JABODETABEK. The plan is taken from local transportation master plans such as TATRALOK (Local Transport Administration) and TATRAWIL (Regional Transport Administration) of provincial and city/district governments in JABODETABEK. Subsequently, JUTPI prepared the revised transportation master plan using the updated database. Therefore, the purpose of JAPTraPIS is to review the existing PTM and to add more detailed implementation strategies for the development of road-based public transport system for JABODETABEK up to year 2020 based on the framework of the JUTPI's revised transport master plan.

The Concept of a Road-Based Mass Transport System in JABODETABEK: It relates to the design of a sustainable public transport system specifically being the existing BRT lines, and includes main bus network, park and ride, feeder network, bus operation concept, and institutional aspect.

- Strategies for the Main Bus Network: The PTM in directs the wider regional bus network to be integrated with BRT (Transjakarta) using the concept of dedicated special lane (busway with feeder), particularly for large cities such as Depok, Bogor, Bekasi and Tangerang.
- Strategies for Park and Ride: The PTM supports BRT through providing Park and Ride facilities that can promote public transport by making the connection from home to the bus system, in order to reduce the number of private cars and motorcycles commuters into the inner city.
- Strategies for Feeder Buses: The PTM directs feeder bus concept, which expected to provide ease of accessibility from feeder areas into main corridor (trunk line) and vice versa, optimizing travel time and reducing costs.
- Alternative Bus Operation Concepts: The PTM outlines several options for BRT integration into the surrounding bus network via more integrated system.
- Institutional Aspects: The PTM outlines the necessity of developing cross-jurisdictional coordination between local governments to improve management and integration by establishing an urban transport coordination committee (a Transport Authority).

The Concept of Strategic Transport Policy: There are 8 (eight) points of strategic transport policy prepared by PTM, which among others:

- Spatial Planning Development: The integrated strategic spatial planning to support integrated transportation master plan. It is using the integrated Jabodetabekpunjur Spatial Plan.
- The Public Transport System: The supply-demand approach in managing public transportation system in JABODETABEK, which cover road network, capacity and condition improvements, pedestrian and public transport network development (supply), and Transit Oriented Development (TOD), Transport Demand Management (TDM), and spatial planning control (demand).
- Mass Transit System and Network: Consists of (1) Restructuring and strengthening the

system and physical condition of existing (without adding new infrastructure), (2) Development of new systems and networks, (3) Integration between JABODETABEK bus and railway transport system and network. Those system development will be supported by the adequate improvement of services such as reforming the operation system, terminal function, developing feeder system and inner city bus corridors.

- Policy to Promote the Use of Public Transport: The Providing transfer facilities, land planning and development, and information technology. Transit Oriented Development (TOD) concept is one of the main idea.
- Demand Management Policy: In the form of car pooling (commercial shuttle), road pricing, and parking management.
- Development of Road Network: The four approaches are (1) The roads improvement, (2) Increasing the road capacity, (3) Expansion of economic activity in urban center, and (4) Policy to support road networks.
- Strategies for Managing Public Transport Capacity: Improving railway network capacity and road-based public transport network capacity (BRT and MRT).
- Institutional and Regulatory Policies: Restructuring the orientation of highway-based public transport, overlapping authority, improving private operation, infrastructure and fleet design. The main policy is to establish cross-jurisdiction institution, JABODETABEK Transport Authority (JTA).

2) List of Projects Proposed in PTM

The main plan of PTM proposed projects are summarized in the table below.

Table 4.1 Main Plan Components of the PTM for JABOETABEK

Components	Projects
Road-based Mass Transit System (BRT)	- Trunk line (12 corridors) - Full-BRT line (6 corridors) - Feeder line (10 corridors)
Bus Transport System	- Public bus system - Inner-city bus terminals - Feeder bus system - Related facilities (intermodal, P&R, pedestrian, bicycle) - Inter-city busway
Bus Operation and Management	- Bus fleet control - Bus operation and route management
Railway Transport System	- Development of railway network - Improvement of railway capacity and services
Supporting Strategy	- Supporting policy for public transport (ITS, TDM) - Spatial development (TOD, integrated Dev., etc.)
Road Network Development	- Arterial/collector road - JORR and other toll roads - DKI 6 inner toll roads - Flyover/underpass - Traffic control - Other supporting policies

Source: PTM JABODETABEK

3) Review of the Existing Local Transport Master Plans

The following points are summary of each available local transportation master plan:

- DKI Jakarta: The concept of road based public transport development is BRT with bus priority with the support from LRT and MRT. Existing public bus system will be improved through the route management and bus rationalization. The government plan to develop the mass transport system periodically which started from 2004 up to 2020.
- Tangerang City: Their public transport policies are focused on the rationalization of existing bus route, improvement of public transport regulation, improvement of integrated terminal and supporting facilities. In the near future, they also plan develop dedicated bus lane in mass rapid transport system that can be integrated with BRT in DKI Jakarta.
- Bekasi City: Especially for the development of road based public transport, Bekasi City only provides some strategies including route management, inner-city BRT, as well as attempting the possibility of JABODETABEK Busway operation which connecting Bekasi – DKI Jakarta.
- Bekasi District: There are two main policy concepts of road-based public transport development of Bekasi District, which are (1) the development of Bus Rapid Transit (BRT), and (2) the improvement of public transport services for industrial areas and settlements. The plan of BRT will connect DKI – Bekasi City – Bekasi District.
- Depok City: Depok City focused on the improvement of existing accessibility of public transportation, such as accessibility to terminals, stations, etc. In additions, they also plan to develop mass transport in the form of feeder bus services that connect settlement areas to trunk roads (existing BRT networks) as well as railway stations.
- Bogor District: The main policies of Bogor District transportation development are the road development, improvement of BRT connection, and integration between BRT/railway with feeder system and transit terminals.