

10. HOW TO MAKE IT HAPPEN

10.1 Paying for Better Transportation

(1) Principle of Cost Burden

The financing plan is formulated so as to promote the restructuring and reforming programs of facility and infrastructure. To fill the gap between the current level of revenue and the required cost for development, additional financial sources should be sought as follows.

1) Increase of Revenue for Transportation Sector

Increase of revenue for transportation sector such as an increase of rate for gasoline tax and road pricing are just some of the possibilities. These revenues should be earmarked for stable development of transportation systems.

2) Reduction of Subsidy for Public Transportation

Public transportation fare for economy class is currently set at low level taking in consideration the affordability of the low-income people. Provision of affordable means of transportation for the poor could be achieved through a direct way of delivering subsidy to the target group. It will reduce expenditure of the governments by not providing the subsidy to the people who can afford to pay higher transportation fare. Also, in the long run, the amount of subsidy is expected to naturally decrease as people's income improves.

3) Inclusion of Private Sector in Transportation System Development

Regulations on private investment in transportation sector should be reviewed and modified to provide sound investment environment for the private sector in transportation business. This includes toll rate setting mechanism and provision of development rights. The role and responsibility sharing system between the public and private sectors should be clearly determined.

4) Integrated Transportation System Development with Urban Development

Transportation system development would bring about direct and indirect benefits to the society. Indirect benefits such as increase in land value along the transportation corridor, however, cannot be absorbed by the transportation system development project. The following concepts therefore attempt to internalize the development benefits of transportation system. Provision of the land development rights to private investors in the surrounding area of railway stations or interchanges of toll roads will make it possible to internalize the development benefits of transportation system development. This, however, should be done in a manner well-planned and controlled in consistency with the land use plan.

(2) Master Plan Cost

Table 10.1 summarizes fund requirement for the Master Plan, which includes capital investment costs and O&M costs during the period from 2004 to 2020. A total of Rp. 91,270 billion is required for the period in market prices of January 2003 excluding inflation, of which Rp. 76,150 billion and Rp. 15,120 billion are required for investment and for operation and maintenance, respectively. In terms of the GRDP share, it requires the government to allocate 0.8% of the GRDP of the Jabodetabek region for the implementation of the Master Plan throughout the period from 2004 to 2020.

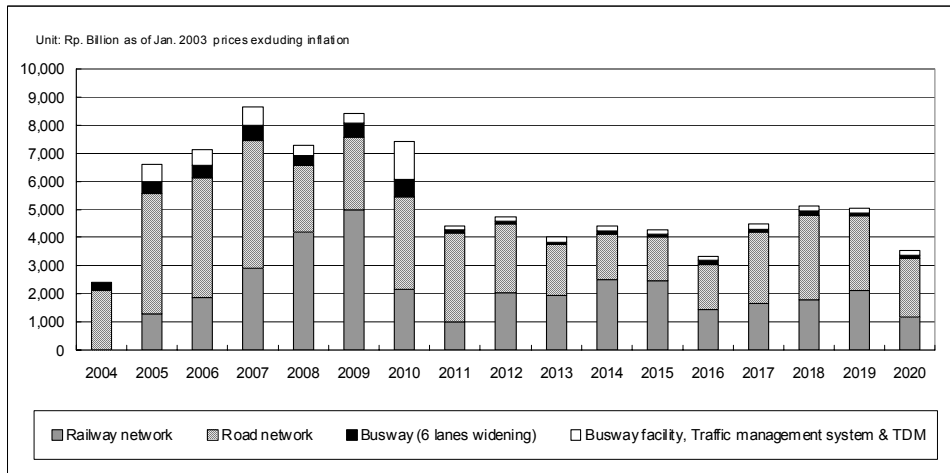
The cost for the railway and the road network development accounts for 94% of the total cost. The rest amounting to Rp. 5,570 billion is required for the development of the busway facilities, the traffic control system and the traffic demand management (TDM) system.

From the viewpoint of the timing of cost distribution, 27%, 25% and 48% of the total cost need to be allocated in the short-term period until 2007, the intermediate period (2008-2010) and the long-term period (2011-2020), respectively (Figure 10.1).

Table 10.1 Master Plan Cost (2004-2020)

	Investment cost	Operation & maintenance cost	Total	Share
Railway Network Development	29,390	6,140	35,530	39%
Road Network Development	39,510	6,360	45,870	55%
Busway (Widening)	4,090	210	4,300	
Other Traffic Facilities /TDM ¹⁾	3,160	2,410	5,570	6%
Total of MP Cost	76,150	15,120	91,270	100%

Note: 1) The cost for busway facilities, traffic management and TDM is included.
The cost is estimated at January 2003 market prices and price escalation is not included.



Source: SITRAMP Estimate

Figure 10.1 Annual Allocation of Master Plan Cost (2004-2020)

(3) Master Plan Implementation and Private Initiative Development

Taking into consideration the private involvement and revenue, the cost burden by the public sector is estimated by sub-sector as shown in Table 10.2. Total master plan cost amounts to Rp. 91,270 billion, of which Rp. 24,090 billion or 26% of the total cost could be reduced from the public cost burden due to private initiative development. Consequently, the funding requirement of the public sector for the implementation of the Master Plan is estimated at Rp. 67,180 billion at January 2003 market prices excluding inflation for the period 2004-2020.

Table 10.2 Master Plan Cost and Private Initiative Development (2004-2020)

	MP Cost	Private Initiative Development	Net Public Cost Burden
Railway Network Development	35,530	16,250 1)	19,280
Road Network Development	45,870	6,920 2)	38,950
Busway (Widening)	4,300	0	4,300
Busway Facility	920	920 3)	0
Traffic Management System	2,980	0	2,980
TDM	1,670	0	1,670
Total	91,270	24,090	67,180
%	100%	26%	74%

Source: SITRAMP Estimate

Note: 1) The operation service of Jabotabek railway and JKT MRT will be provided by PT.KA and by a new enterprise, respectively.

Note: 2) Private initiative development will be introduced for 2nd JORR (Section1~14), Jatiasi Toll (R02a) and Depok - Antasari Toll (R08a).

Note: 3) Concession revenue of busway operation will recover the cost for busway facility development such as bus stops and bus location system.

(4) Public Sector Cost for Transportation

Besides the cost for the master plan amounting to Rp. 67,180 billion, the central and the local governments are required to share the maintenance cost for the existing roads, which is estimated to be Rp. 13,220 billion for the period from 2004 to 2020. As shown in Table 10.3, the total public cost for urban transportation sector in the Jabodetabek region is Rp. 80,400 billion, which accounts for 0.72% of the GRDP throughout the master plan period.

Table 10.3 Public Cost for Transportation Sector 2004 – 2020

Unit: Rp. billion	
	Cost (2004 – 2020)
Master Plan Cost (Public Burden)	67,180
Maintenance Cost for Existing Roads	
Central Government	2,600
West Java Provincial Government	520
Banten Provincial Government	150
DKI Jakarta	6,060
Kota Bekasi	570
Kota Bogor	380
Kota Depok	210
Kabupaten Bekasi	860
Kabupaten Bogor	860
Kota Tangerang	360
Kabupaten Tangerang	650
Total of maintenance cost of existing roads	13,220
Total Public Cost for Transportation Sector	80,400

Source: SITRAMP Estimate

Note: The operation and maintenance cost of the existing Jabotabek railway is not included in the figure, as it is the cost for PT. KA.

(5) Funding Capability of Government Budget

The future funding capability of the central and local governments for transportation sector is estimated throughout the master plan period, from 2004 to 2020, and this is shown in Table 10.4. Total amount is estimated at Rp. 49,000 billion, accounting for 0.44% of the GRDP of the Jabodetabek region during the period, which does not meet the fund requirements of the public burden of Rp. 80,400 billion as proved in Table 10.4. The cumulative deficits of the fund will be Rp. 31,400 billion in 2020 excluding price escalation. Therefore, it is necessary to seek additional funding source.

Table 10.4 Funding Capability of Government and Deficit for Transport Sector Development, 2004 – 2020

	(Rp. billion)	Assumptions
Funding Capability of Governments		
1) Central government	21,400	0.08% of GRDP in 2002
2) Local governments	27,600	0.20% of GRDP in 2007-2020
Total	49,000	0.25% of GRDP in 2004-2020
Public Fund Requirement		
1) Net Public Cost Burden of MP	67,180	See Table 10.2
2) Maintenance Cost of Existing Roads	13,220	See Table 10.3
Total	80,400	0.72% of GRDP
Deficit	31,400	

Source: SITRAMP Estimate

(6) Additional Revenue Sources

Additional budgets could be available from such sources as increase in fuel tax rate, revenue from TDM and new taxation on the properties. Additional revenues from three kinds of sources are estimated at Rp. 33,010 billion for the master plan period.

Table 10.5 Additional Revenue 2004 – 2020

Unit: Rp.billion	
Additional Revenue (2004 – 2020)	
Revenue from Increase of Fuel Tax Rate	14,000
Revenue of TDM	15,100
Revenue of Urban Development Tax	3,910
Total Additional Revenue	33,010

Source: SITRAMP Estimate

(7) Balance between Budget and Expenditure

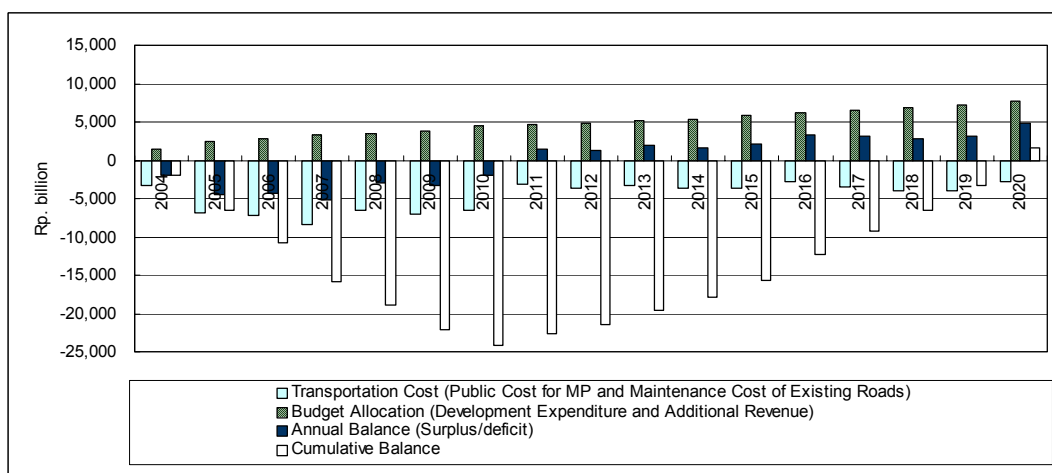
The potential budget has been examined for the implementation of the Master Plan and the maintenance of the existing road. SITRAMP proposes that the government allocate additional expenditure for the transportation sector development in the Jabodetabek region. Additional budgets could be found from such interventions as increase of fuel tax, TDM revenue and urban-development tax and these revenues should be earmarked for transportation expenditure. As proven in Table 10.6, the cumulative deficit turns to surplus of Rp. 1,610 billion in 2020, if the government could generate additional funding sources.

Table 10.6 Cost Burden by Public Sector 2004 – 2020

Unit: Rp. billion	
I. Required Funds	
1. Master Plan Cost	91,270
2. Reduction in Public Cost Burden of Master Plan due to Private Initiative Development	- 24,090
3. Net Public Burden for Master Plan	67,180
4. Maintenance Cost of Existing Roads	13,220
Total Public Cost for Transportation	80,400
II. Funding Sources	
1. Development Budget Allocation for Transportation	49,000
2. Revenue from Additional Revenue Sources (Fuel Tax, TDM & Urban Development Tax)	33,010
Total Funds	82,010
III. Balance (Surplus)	1,610

Source: SITRAMP Estimate

Regarding the annual balance of the fund, however, the shortage of the fund is obvious during the short-term development period, which is estimated at nearly Rp. 5,000 billion every year from 2005 to 2007 as shown in Figure 10.2. From 2008 the annual deficit will start to decrease and will turn to surplus from 2011. In the initial stage of the master plan, therefore, the external financial resources such as soft loan of ODA should be sought to fulfill the shortage of the budget.



Source: SITRAMP

Figure 10.2 Annual Funding Balance, 2004 – 2020

10.2 Establishment of Jabodetabek Transportation Authority and Master Plan Implementation

The Study examines the financial plan of the Master Plan under the assumptions that the JTA will be established by 2007 in a form and with responsibilities as proposed below.

(1) Establishment of Jabodetabek Transportation Authority

The inevitable and foremost imperative institutional issue in the transportation sector is insignificant coordination and communications among central ministries, Kimpraswil, Ministry of Communication and Bappenas, and local government agencies.

Not only vertical discrepancy but also a lack of consensus on regional planning across each local government's jurisdiction makes it more difficult to formulate an integrated transportation system development plan in the region.

BKSP should be the main player to coordinate among local administrations; however, insufficient resources and overlapping responsibilities with central and provincial agencies make it difficult for BKSP to perform its duties with proficiency. Taking into account its current legal ground and functions, a legally and administratively independent and more flexible new institution should be considered.

Establishment of a new agency, Jabodetabek Transportation Authority, is strongly recommended to make consistent a metropolitan-wide transportation system development plan and to manage transportation demand in the region. However, if it needs time to establish such a new agency, a planning commission is to be established to pursue the tasks in short term.

The Study Team recommends to establish a transportation authority for the region in early stage of the master plan period and to envisage the next step to be an establishment of an urban development authority.

(a) Jabodetabek Transportation Planning Commission

The Jabodetabek Transportation Planning Commission is set up under the direction of the central ministries, consisting of transport-related personnel from sub-national governments. This executive body shall consist of heads of respective provincial and local governments, as well as representatives from the ministries, such as Kimpraswil, MoC, MoHA and Bappenas.

Its main functions are to: 1) coordinate respective transportation planning at local governments into an incorporated regional transportation plan, 2) conduct research and survey for transportation planning, 3) coordinate studies in the region to be utilized for an integrated transportation planning, and 4) manage the data collected through the Study particularly the surveys to be used for academic research, planning purpose, and so on.

A permanent secretariat is established to support the commission and carry out daily operations. Funding for the commission and secretariat shall in the form of contribution by the commission members.

(b) Jabodetabek Transportation Authority

The Jabodetabek Transportation Authority (JTA) is established as an independent public corporation, which has main accountability to the public, not only to the central or sub-national governments. The authority would be endorsed by either presidential decree or government law to stand as an independent public corporation.

It oversees all land transportation issues and has main responsibilities to: 1) formulate regional transportation policy, 2) formulate integrated transportation planning, including road network development, railway (MRT, LRT and subway) development, traffic management and public transportation system management, 3) implement the integrated transportation planning and programs, 4) issue licenses and control public transportation with bus route license, public transport business license, bus terminal development permission, and so on, 5) regulate public

transport services, such as trunk bus, MRT, LRT and so on, 6) support development of inter-Kota or inter-Kabupaten highway network, and 7) carry out traffic management measures, such as road pricing, park and ride, and park and bus ride.

The Authority would be operated by the revenue from road pricing and surcharge on fuel tax and financial contribution or subsidy from DKI Jakarta and the relevant local governments. As an independent corporation, however, its primary task is to be financially sovereign and it should be underlined that a disclosure of financial status is one of the most important aspects to secure its position as a public corporation offering public services to users in the region. As a public corporation, it could also raise fund from the capital market by issuing corporate bond.

(2) Undertakings by JTA

a) TDM

TDM will be adopted against the vehicles currently running on the congested streets in the central area of DKI Jakarta. A considerable number of vehicles, however, come from the outside of DKI Jakarta. In this context, implementation and management of TDM should be undertaken by the JTA after 2007 when it is planned to shift to area-pricing from road pricing.

b) MRT

MRT is expected to be a key public transportation system in Jabodetabek and substantial patronage would be obtained from the outside of Jakarta. In addition, the route is proposed to extend beyond the boundary of DKI Jakarta. Considering these circumstances, the infrastructure construction work will be the responsibility of the JTA and a new public or private enterprise will undertake the operation and management of MRT. The JTA will share the cost for the infrastructure development of MRT, while the cost for rolling stock and operation and maintenance cost are the expenditure for the enterprise.

c) Busway

Usually, road widening and the other related facility-development will be implemented under the responsibilities of the central and local governments. Thus consistent implementation of the project beyond the administration boundary is required. Therefore, the JTA will undertake management of infrastructure development for trunk bus system including necessary widening of arterial roads on which busway is provided after 2007. Actual road maintenance work of the road sections of busway will be undertaken by the local government, though necessary expenses may be appropriated by the JTA. Trunk bus operation services will be provided by private bus companies.

d) 2nd JORR, Jatiasi Toll Road and Depok-Antasari Toll Road

The 2nd JORR will connect many sub-centers such as Kota Bekasi, Kota Depok and Kota Tangerang in order to support regional development and to increase the mobility in the region. This project has much to do with all local governments in Jabodetabek. Therefore, it is preferable for the JTA to take comprehensive planning coordination and implementation including private-sector participation. Jatiasi toll road composes part of Cikarang-Jatiasi toll road, which is expected to function as an alternative route of Cikampek toll road. On the other hand, Antasari toll road connects between the south of Jakarta and north of Depok. As both toll roads pass through the current administrative boundaries, forming part of high mobility highway network, it is also preferable for JTA will undertake the projects.

e) Area Traffic Control (ATC) System

Traffic management including ATC (area traffic control) and traffic information system comprises an important component to alleviate traffic congestion and fully maximize the capacity of roads and related facilities. In addition, at least DKI Jakarta and the surrounding three Kotas are closely related to the implementation of this project. In this view, the JTA will undertake management of the control system.

(3) Funding Requirement and Balance of Funds by Implementing Body

The requirement of the public burden of the Master Plan at Rp. 67,180 billion is distributed to the implementing bodies as shown in Table 10.7. The requirement of the central government is huge, amounting to Rp. 37,850 billion or 56% of the total of the MP cost, while the burden of the JTA will be Rp. 15,230 billion or 23% of the total.

The total transportation development and O&M cost of Rp. 80,400 billion is shared by the governments as shown in Table 10.8. Taking into account of the possible budget allocation of the development expenditures, the balance of fund of each government is estimated for the master plan period. The deficit of the fund is huge for the central government and the JTA amounting to Rp. 19,050 billion and Rp. 15,230 billion, respectively.

Table 10.7 Public Cost Burden of Master Plan: 2004 – 2020

Unit: Rp. billion

	MP Cost			Private initiative & revenue	Net public burden	Remarks
	Road network ¹⁾	Railway network	Busway, traffic management & TDM			
Central Government	24,530				24,530	
		24,120		13,380 ²⁾	10,740	Jabotabek RWY
Sub-total of Central government	24,530	24,120	2,580 ³⁾	13,380	37,850	³⁾ Traffic management
West Java Provincial Government	1,550				1,550	
Banten Provincial Government	680				680	
DKI JKT	4,650		35 ³⁾ 555 ⁴⁾ 150 ⁵⁾	555 ⁴⁾	4,835	⁴⁾ Busway facility ⁵⁾ TDM (2005~6)
Kota Bekasi	470		5 ³⁾		475	
Kota Bogor	1,220		5 ³⁾		1,225	
Kota Depok	1,200		5 ³⁾		1,205	
Kabupaten Bekasi	670		5 ³⁾		675	
Kabupaten Bogor	600		5 ³⁾		605	
Kota Tangerang	320		5 ³⁾ 15 ⁴⁾	15 ⁴⁾	325	⁴⁾ Busway facility
Kabupaten Tangerang	2,520		5 ³⁾		2,525	
Jabodetabek Transportation Authority	11,760			6,920 ⁶⁾	4,840	²⁾ JORR, Jatiasi Toll, Depok - Antasari Toll & widening for busway (2007~)
		11,410		2,870 ⁷⁾	8,540	JKT MRT
			350 ⁴⁾	350 ⁴⁾	0	⁴⁾ Busway facility
			330		330	³⁾ Traffic management
			1,520 ⁵⁾		1,520	⁵⁾ TDM
Sub-total of JTA	11,760	11,410	2,200	10,140	15,230	
Total	50,170	35,530	5,570	24,090	67,180	
		91,270				

Source: SITRAMP

Note: 1) The cost for road network and 6-lane widening for busway is included.

2) Jabotabek Railway operation including procurement of rolling stock by PT. KA

3) Traffic management

4) Busway facility development and concession revenue from busway operation companies

5) DKI JKT is responsible for TDM in 2005 and 2006. After 2007 the JTA will take care of it.

6) Private initiative development for 2nd JORR (Section 1~14), Jatiasi Toll and Depok-Antasari Toll

7) JKT MRT operation including procurement of rolling stock by a new enterprise

Table10.8 Funding Requirements for Transportation Sector and Balance of Fund 2004 – 2020

Unit: Rp. billion

	Net burden of government for Master Plan implementation	Maintenance cost of existing roads	Total transportation cost	Allocation from development expenditure budget	Balance of fund (Surplus/ deficit)
Central Government	37,850	2,600	40,450	21,400	-19,050
West Java & Banten Provincial Governments	2,230	670	2,900	3,700	800
DKI JKT	4,835	6,060	10,895	14,400	3,505
Kota Bekasi	475	570	1,045		
Kota Bogor	1,225	380	1,605		
Kota Depok	1,205	210	1,415		
Kabupaten Bekasi	675	860	1,535	9,500	-1,425
Kabupaten Bogor	605	860	1,465		
Kota Tangerang	325	360	685		
Kabupaten Tangerang	2,525	650	3,175		
Sub-total (Bodetabek)	7,035	3,890	10,925	9,500	-1,425
Jabodetabek Transportation Authority	15,230	-	15,230	0	-15,230
Total	67,180	13,220	80,400	49,000	-31,400

Source: SITRAMP Estimate

(4) Balance between Budget and Expenditure

Although the cumulative deficit turns to surplus of Pp. 1,610 billion in 2020, if the government could generate additional funding sources, the balance of the central government still remains deficit and inter-governmental transfer scheme of the fund such as some contribution of local governments is necessary to be considered.

Table10.9 Cost Burden by Public Sector 2004 – 2020

Unit: Rp. billion

	Balance of fund (Minus: deficit)	Additional revenue				Net balance
		Fuel tax	TDM revenue	Urban development tax	Total	
Central Government	-19,050	7,000		430	7,430	-11,620
West Java & Banten Provincial Government	800	700		200	900	1,700
DKI Jakarta	3,505	700	900	2,480	4,080	7,585
Kota/ Kabupaten in Bodetabek region	-1,425	1,400		800	2,200	775
Jabodetabek Transportation Authority	-15,230	4,200	14,200		18,400	3,170
Total	-31,400	14,000	15,100	3,910	33,010	1,610

Source: SITRAMP Estimate

10.3 Public Transportation Enterprises Reform

Public transportation enterprises, namely, Perum PPD, a state-owned bus company and PT. KA, a state-owned railway company, should be rationalized. Although privatization is yet to be discussed further, the rationalization and efficiency of these companies are the conditions for the private-sector participation.

10.4 Capacity Building for Officials in Local Government

Training courses provided by relevant ministries will be restructured and incorporated in an integrated transport planning program to deliver broad training courses under one structured and stepwise program. The goal of the program is to deliver administrative, institutional and technical knowledge and skills, such as transport planning, capital management, project management,

OMR (Operation, Maintenance, and Rehabilitation) management, and so on, in order for public servants of local governments to administer transport programs proficiently.

It also aims at consolidating the limited but rather scattered resources among ministries and local governments to effectively utilize to bring out maximum outcomes. An integrated transport planning program, which is not divided vertically by line ministry, but is programmed to train local staff in horizontal structure, is proposed.

10.5 Public Involvement in Transportation System Development

With reference to this master planning study, the understanding of the citizen on the master plan is essential to successfully implement the projects and programs proposed in the master plan. Prior to the implementation of the projects and programs, dissemination of the plan and getting feedback from the general public is an important process to make it happen.

- For local government, actual practices of public involvement at local transportation planning level are most useful. Meanwhile, legalization of public involvement procedure should be considered.
- For the master plan, monitoring mechanism by the public should be taken into account as well as information dissemination and feedback from the public.

10.6 Monitoring on Master Plan Implementation

(1) Importance of Monitoring Master Plan Implementation

During the master plan period, monitoring on progress of the projects and the programs are essential to achieve the objective of the master plan. The projects and programs should be evaluated in the degree of achievement. The contents and schedule of the master plan components should also be periodically reviewed to accommodate changing social and economic environments.

Implementation schedule for the Master Plan up to 2020 has been established taking budgetary constraints of relevant governments into account; however, transportation system development projects, which can be financed under private initiative scheme, could be implemented before 2020 if the economic and financial conditions are met.

In this master plan, it is recommended to develop busway system as a part of trunk public transportation system in short-term to complement rail-based system. In the future, if passenger demands increase on the busway corridors and/or ability to pay increase in accordance with increase in real household income due to economic development, then busway can be converted to higher standard of public transportation such as LRT or MRT. Thus it is of great importance to monitor increase in real household income as well as busway passenger demand for determining the time to upgrade the public transportation system. It should be noted that the implementation schedule of projects/ programs be reviewed and adjusted if necessary through monitoring on social-economic changes. For instance, if regional economy would develop more rapidly than expected in this plan and probably tax revenue would also increase, more infrastructures could be developed from possible alternatives of transportation system presented in Figure 10.3.

(2) Database System Development

The database system is essential for the monitoring and evaluation to produce effective outputs. The database should be useful in checking the progress of project implementation and the achievement level of expected benefits / effects of the project.

Accordingly, three types of monitoring indicators are necessary, namely, "Input Index", "Output Index" and "Outcome Index". The former index indicates achievement or progress of the projects in terms of scheduling, financing, and budgeting. While the latter index indicates benefits derived / realized by the projects in terms of degree of achievement toward the target. In the future, the system will be connected between the different implementation organizations through the Internet.

The database system should be designed to be useful for the whole project-cycle, that is, “Plan”, “Do”, and “See”. The system will be used as a supporting system for planning in the “Plan” stage, as a project implementation monitoring system in “Do” stage, and as a project evaluation system in “See” stage. It is highly recommended to establish such a database system in an organization being in charge of the project monitoring activities.

The urban transportation database system includes the following data pertaining to not merely transportation but also social and economic indicators, land use, and environmental data.

1) Transportation	<ul style="list-style-type: none"> - Person trip data (obtained from Home Visit Survey) - Trip OD matrices (manipulated from PT data) - Road network (toll road network, arterial and collector roads) - Transit network (bus route, railway network and operation)
2) Socio-Economic	<ul style="list-style-type: none"> - Population - Employment (number of employees at residence/work place) - Education(number of students at residence/school place)
3) Land Use	<ul style="list-style-type: none"> - Existing land use
4) Environment	<ul style="list-style-type: none"> - Air pollution - Traffic noise

The data are consolidated in the format of database, which can be handled with popular commercial database software. Some of them, which have relation with geographical feature such as zones, arcs, or points, are contained in the GIS system. Therefore the data can be utilized with personal computers, although it requires sufficient space for data storage.

For maintaining and updating the data, the urban transportation database center should be established. Since the data will be utilized for monitoring the master plan implementation, the database center should ideally be a part of the proposed Jabodetabek Transportation Authority. Before establishing such an institution, the database center could tentatively be developed in Bappenas for managing update of the data.

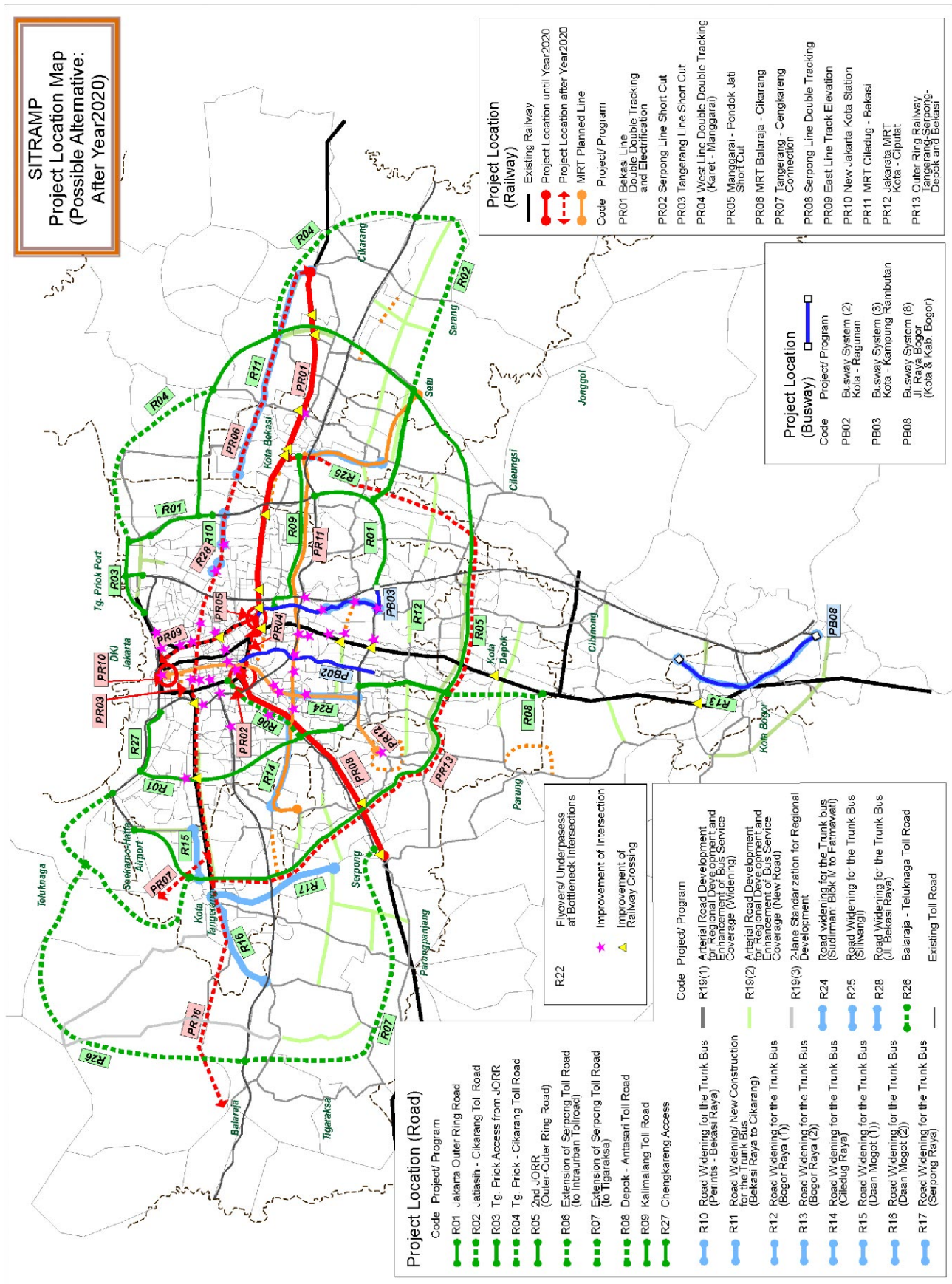


Figure 10.3 Possible Alternatives of Trunk Transportation System

11. TOWARD MASTER PLAN IMPLEMENTATION

11.1 Directions for Master Plan Implementation

(1) Promotion of Public Transportation

In the short term and intermediate term, the public transportation network should be formulated by combining the maximum use of the existing railway network and busway system which would complement the railway network. In the long run, a rail-based transportation system is definitely needed to provide a higher level of services as well as a higher passenger capacity. Introduction of busway ensures the space for future public transportation system development with higher level of services. Improvement of public transportation services alone cannot suppress the deeply rooted preference to use private modes of transportation; consequently, traffic restraint scheme should be employed in the congested area in the central part of the region where traffic congestion is often observed. Another important measure is to foster sub-centers in Bodetabek and to distribute urban functions, which currently concentrate in DKI Jakarta. By creating an alternative urban structure, traffic congestion problem would be alleviated to some extent.

(2) Road Network Development

Although promotion of public transportation is the most important policy to alleviate transportation problem in the master plan, road network has not been well developed and the capacity is significantly small in Bodetabek. In particular, progress of road network development has not caught up with the expansion of urbanized area therefore road network development is also important in Bodetabek.

(3) Institutional Arrangement

The Study indicates how to solve the transportation problems in the Jabodetabek region by explaining not only how the physical development of the transportation network should evolve but also how to ensure the required funds including sharing of costs by the citizens, regulatory reform, institutional rearrangement, and consensus building among the stakeholders. It also indicates what should be done now to make the master plan materialize.

(4) Fund Raising for Transportation System Development

The shortage of funds is expected for implementing the projects and programs proposed in the master plan, if allocation of funds in the central and local government is assumed to be at the same level of expenditure for transportation at present. It implies that the funds are very limited, not even enough to cover the maintenance costs of the existing facilities, and very possibly just a small amount could go to development of new transportation facilities. Funds for transportation system development and maintenance should be augmented through increase of fuel tax rate, charges of road pricing, new urban development tax and others.

(5) Promotion of Private Sector Participation

Furthermore, to make up for the shortage of development funds of the public sector, active private-sector participation in provision of transportation services should be encouraged. In this case, based on the user-pay-principle, transportation fare should be charged on the users who get benefits from the services. To promote private-sector participation in the transportation business, it is urged that business laws and regulations should be amended to create a more attractive environment and to reduce uncertainties for investment.

(6) Public Involvement

The cooperation of the citizens, particularly in bearing the burden of increasing taxes, is indispensable for implementation of the master plan. Of course, it goes without saying that they have to be well-informed about the plan. This can be accomplished through such occasions as public hearings and stakeholder meetings, and their opinions should be incorporated in the plan; the effects of the project implementation should also be monitored. It is important that there be

accountability by the government. Transparency is of significance to gaining public acceptance and cooperation; thus an information dissemination mechanism should be urgently established. The Study recommends, as a part of the master plan, to develop an urban transportation database system and a transportation performance monitoring system.

11.2 Next steps to be taken

To materialize the transportation master plan, as a first step, the following should be implemented in short term.

(1) Legal Framework of Jabodetabek Transportation Master Plan

Legal framework is needed to materialize the master plan by relevant government agencies, thus it is recommended to draft a new law, or at least a presidential decree, on the transportation master plan for Jabodetabek.

(2) Establishment of Jabodetabek Transportation Planning Committee

Since it seems difficult to establish a new transportation authority in a short term, a Jabodetabek transportation planning commission should be established for examining structure of the organization, functions, role sharing with the existing government agencies and for preparation of the authority to pursue the tasks in short term.

(3) Detailed Transportation Master Plan for DKI Jakarta and Local Governments in the Bodetabek Area

The SITRAMP transportation master plan provides the trunk transportation system development plan in the Jabodetabek region. DKI Jakarta and the local governments in the region should develop sub-regional transportation master plan and should obtain legal basis for implementing the local transportation plan, which should be consistent with metropolitan-wide master plan. Furthermore lower-level transportation network should be added according to local needs of each local government

(4) Ensuring Funds for Transportation System Development

Even taking private sector participation into account, financial burden of public sector was estimated at Rp. 80,400 billion in the 14-year master plan period from 2004 to 2020. About Rp. 33,010 billion would be required in addition to the current level budget for transportation sector. Relevant laws should be drafted regarding road pricing, increase in fuel tax rate and introduction of urban development tax to complement the shortage of development funds. Moreover since all relevant agencies have not agreed on the concept of earmarking of transportation-related taxes to the transportation sector, discussion should be continued on the issue. Further discussion is necessary among relevant agencies with regard to possibility on application of CDM (Clean Development Mechanism) for developing a rail-based transportation system which needs a huge amount of fund.

(5) Appropriate Formulation of Private-Public Partnership and Cooperation among Public Sectors

Participation of private sector in transportation system development and operation is of great importance in reducing financial burden of public sector as well as in introducing a more efficient management practice of private sector as previously described. More concrete and detailed analyses should be conducted on cost sharing between public and private sectors, and incentives for private sector participation (such as provision of development right and guarantee by government and so on.)

(6) Post Evaluation of the Projects

In the final stage of master plan study, busway operation was initiated in January 2004 and enforcement of the 3-in-1 traffic restraint policy was also made stricter compared to the previous days. It is definitely important to execute post evaluation study to understand responses of the

citizens and impacts on traffic as well as on economic activities on the corridor. Then it should be fed back to the next stage and the plan should be modified and improved into a more efficient and convenient system; as a consequence, it leads to a transportation policy which could obtain consensus from the public.

12. OVERVIEW OF PRE-FEASIBILITY STUDIES

Four projects from the components in the SITRAMP transportation master plan have been selected for pre-feasibility study; namely, 1) Busway extension project in the short term, 2) Traffic Demand Management (TDM) in the CBD of Jakarta, 3) Railway Serpong line double tracking, access improvement and integrated land development, and 4) 2nd JORR (Outer-Outer Ring Road) Project.

The first two projects, the busway extension and TDM, were selected because these two projects were proposed to be implemented in the short-term for promoting public transportation use as well as alleviating traffic congestion. On the other hand, the pre-feasibility studies for the latter two projects, the Serpong railway line double tracking and the 2nd JORR project, put more focus on implementation mechanism.

The pre-feasibility studies have examined technical, environmental, economic and financial aspects of the projects. It has also clarified the responsibility of relevant agencies and has suggested possible role sharing between public and private sectors.

13. BUSWAY EXTENSION PROJECT

13.1 Objective and Background

Any conspicuous improvement on relieving traffic congestion has not been seen in Jabodetabek, while measures to enhance public transportation have been examined for a long time. SITRAMP proposed introduction of busway on major arterial roads in order to challenge traffic woes. DKI Jakarta also has a plan of busway and this was opened to service between Kota and Blok M on 15th January 2004. The pre-feasibility study examined viability and implementation plan of four busway-routes on the major arterial roads for a short-term plan in order to establish a busway network, including extension of DKI Jakarta's busway.

13.2 Busway Route

Figure 13.1 shows the busway routes for the short-term plan analyzed in the study. Exclusive bus lanes are planned at an innermost lane on the wide roads and mingled operation with ordinary vehicle traffic is planned on some limited roads having narrow width if there is no other way, while immediate widening is required.

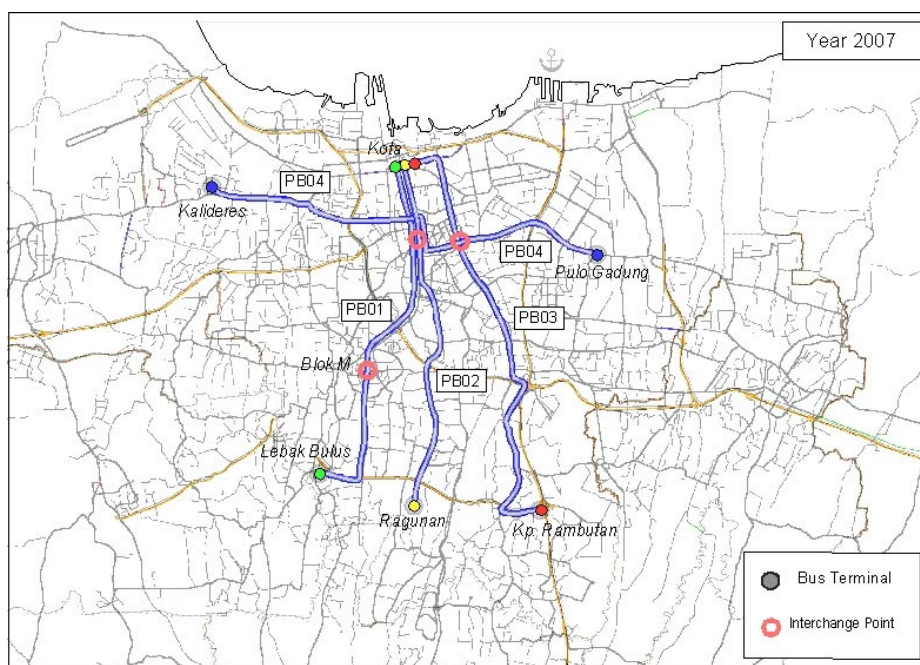


Figure 13.1 Planned Busway Route for Short Term

13.3 Bus Passenger Demand

The number of passengers forecasted by route in 2007 and 2010 is shown in Table 13.1.

Table 13.1 Passenger Demand on Busway

Unit: Pax/day

Route	Direction	Number of Passengers			
		Daily		Peak 1 Hour	
		2007	2010	2007	2010
PB01	North Bound	19,900	32,600	1,990	3,260
	South Bound	23,600	40,800	2,360	4,080
PB02	North Bound	8,900	44,300	890	4,430
	South Bound	7,300	36,400	730	3,640
PB03	North Bound	22,800	50,200	2,280	5,020
	South Bound	23,900	41,800	2,390	4,180
PB04	East Bound	35,000	54,600	3,500	5,460
	West Bound	38,400	55,600	3,840	5,560

Source: SITRAMP

13.4 Bus Operation Plan

Operation plan by route is shown in Table 13.2. Single and articulated buses are used for the operation respectively according to the passenger demand.

Table 13.2 Number of Buses Operated by Section (2007)

Unit: Buses / hour/direction

Section		Bus Type	PB01	PB02	PB03	PB04	Total (Buses/Hour)
PB01	Kota - Harmoni	Articulated	16	6	-	-	22
	Harmoni - Kebon Sirih		16	6	-	27	49
	Kebon Sirih - H.I.		16	6	-	-	22
	H.I. - Blok M		16	-	-	-	16
	Blok M - Lebak Bulus		16	-	-	-	16
PB02	Kota - Kp. Tendea	Articulated	-	6	-	-	6
	Kp. Tendea - Ragunan		-	4	-	-	4
PB03	Kota - Senen	Single	-	-	15	-	15
	Senen - Kp. Rambutan		-	-	30	-	30
PB04	Kalideres - Pulogadung	Articulated	-	-	-	27	27

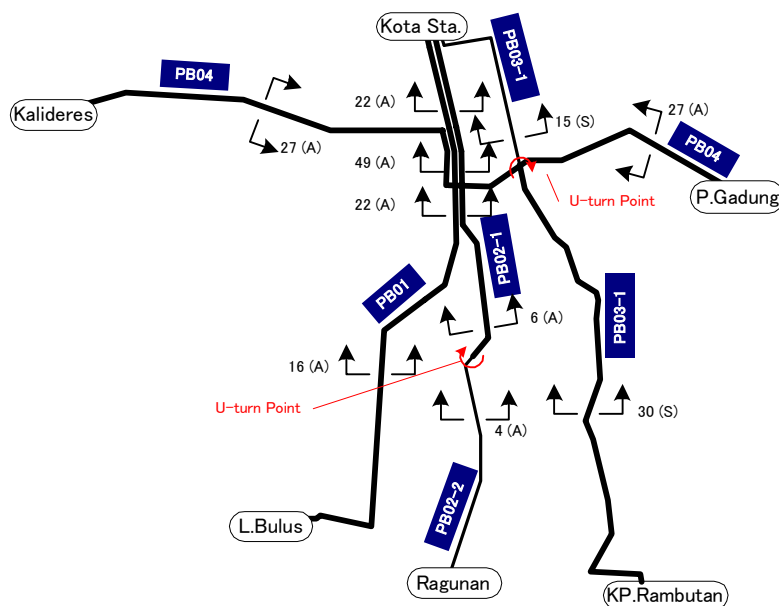
Source: SITRAMP Estimates

This operation plan is interpreted into the following operation frequencies between origin and destination by route.

Table 13.3 Bus Operation by Route

Route	Origin - Destination	Frequency (buses/peak hour/direction)	Type of Bus
PB01	Kota - Lebak Bulus	16	Articulated
PB02	Kota - Ragunan	6	Articulated
	Kota - Tendea	4	
PB03	Kota - Rambutan	15	Single
	Senen - Rambutan	30	
PB04	Kalideres - Pulogadung	27	Articulated

The bus frequency in peak hour by major section is shown in Figure 13.2.



Note: (S, A) indicates single and articulated type of bus

Figure 13.2 Bus Operation Concept

13.5 Traffic Management Plan

(1) Safety Measures

As the busway is operated on the exclusive lanes, it is necessary to take necessary measures for safe and smooth traffic management at signalized intersections and other places allowing the following traffic movements:

- Left-turn movement by buses operated on exclusive lanes
- Right-turn movement by general vehicular traffic
- U-turn movement by general vehicular traffic

(2) Measures for Smooth Operation

As smooth operation is a key to success for busway, the following measures have to be taken in order to ensure the smooth operation.

- Installation of bus-priority signals
- Introduction of bus location system

(3) Measures for Alleviation of Traffic Congestion

Introduction of busway eventually reduces the road capacity for general traffic and causes further traffic congestion because private cars users would not shift to public transportation immediately. For a short-term solution, it is recommended to reduce the width of the middle separator where possible and add one lane for general traffic or to reduce lane width to maintain the same number of lanes for private passenger cars.

(4) Safety Measures for Pedestrian

It is necessary to install pedestrian bridges or pedestrian signals for pedestrian crossing at bus-shelters on the median strips, when signalized intersections are far from the bus shelters.

13.6 Project Cost

Project cost, which is composed of road widening, earthworks, pedestrian bridges, bus-shelters, ticketing machines and traffic signals, is tabulated in Table 13.4. One of the features is high land acquisition cost accounting for around as much as 70% of the total cost.

Table 13.4 Project Cost for Busway Plan (2004-2007)

	Investment Cost (Rp. Billion)
Land & compensation	1,174
Construction cost	
Civil works for widening	190
Bus shelter	92
Ticketing machine	146
Bus location system/Traffic signal	58
Total construction cost	486
Total investment cost	1,660

Source: SITRAMP

Unit operating cost per bus-km reaches around Rp. 20,000 /bus/km including infrastructure improvement cost, related facility development cost, bus-coach procurement cost, operation and maintenance of busway system and interest accruing from borrowing for a short term. Table 13.5 shows the bus operating cost by composition.

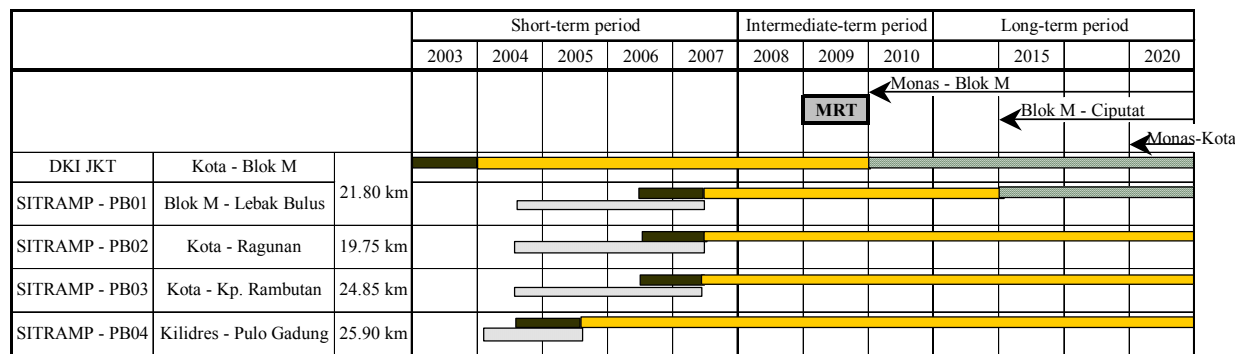
Table 13.5 Bus Unit Operating Cost

	Bus operation cost per km
Land & compensation	25%
Infrastructure facility	9%
Bus procurement cost	6%
Bus operation cost (Fuel, parts, crew fee, etc.)	21%
Interest	39%
Total	Rp.20,400

Note: Interest cost is estimated based on annual deficit of cash-flow and interest rate at 12%.

13.7 Implementation of Busway Extension and Operation

The project implementation and operation of four routes is scheduled as follows.



: Resettlement and Widening for BRT
 : Construction of Busway Facility
 : Operation of BRT
 : Replacement of BRT with MRT

Figure 13.3 Schedule of Project Implementation and Busway Operation

Busway of DKI Jakarta started operation from the middle of January in 2004. The implementation of PB04 (Kalideres - Pulogadung) will need to be followed. Until year 2007, target year of short-term period, four extensions are scheduled to start operation. It is assumed in the operation schedule that Monas – Blok M will be replaced with MRT system until the end of the intermediate-term period of SITRAMP, when sufficient passenger demand generate for MRT operation. As for the rest of the route of PB01: from Blok M to Lebak Bulus, SITRAMP proposes the conversion to MRT system within the Master Plan Period.

13.8 Economic Evaluation

The Net Present Value (NPV) discounted by 12% is estimated at Rp. 1,153 billion and the Economic Internal Rate of Return (EIRR) is 31.9%, which is sufficiently high to show the viability of the implementation of the project from a viewpoint of national economy.

Table 13.6 Evaluation Index of Economic Analysis of Busway Extension

Present Value discounted by 12% (Rp. billion)			EIRR (%)
Costs	Benefits	Net Present Value	
785	1,938	1,153	31.9%

13.9 Financial Viability Analysis

(1) Cost Composition and Responsibility

The costs for busway development consists of mainly three items; 1) basic infrastructure development cost such as road widening, installation of traffic signals and maintenance, 2) Intermediate facility development cost such as bus-shelters and bus location system, 3) direct operation-related cost such as bus coaches and repair and maintenance works. As for a tariff system, both types, flat tariff and zone system, may be considered. The results of financial

viability analysis based on the above conditions are tabulated in Table 13.7.

Table 13.7 Results of Financial Viability Analysis

Tariff System	Cost Burden by Bus Operator				
Flat tariff at Rp. 3,300 until 2009; and Distance proportional tariff after 2010 (Flag fall: Rp.1,000 and Distance portion: Rp.200 /km)	Land and Compensation	Infrastructure Facility	Bus Shelter, Bus Location System	Bus Purchase and Operation Cost of bus	FIRR
		○	○	○	○
		○	○	○	39.4%
Decrease of Revenue by 20%	○	○	○	○	4.3%
		○	○	○	28.1%

Source: SITRAMP

(2) Policy on Financial Burden

Analysis on financial viability revealed that it is possible for bus operators to shoulder even all the investment costs excluding land cost. In other words, given the conditions that public investment covers the cost of infrastructure development, concessionaires can collect their investment from the revenue accruing from bus operation.

13.10 Issues for Further Development of Busway System

(1) Operation Body

The implementation body of the current bus operation between Blok M and Kota is DKI Jakarta, which purchased special bus coaches and obtained personnel from the bus company managed by DKI Jakarta and several private companies. However, it is more efficient that concession for bus operation would be given to private bus companies through bidding when busway routes are added.

In the intermediate and long term, it was recommended to extend busway to the outside of DKI Jakarta in the SITRAMP master plan. In such a circumstance, the bus operation is better managed under an organization which can deal with region-wide transportation administration such as Jabodetabek Transportation Authority.

(2) Monitoring and Improvement of Busway Extension Plan

Since busway operation has been initiated between Blok M and Kota, monitoring on the current operation is of great importance for the following extension of the busway project. Review of the system performance, passenger demand and opinions from the users should be taken into consideration for planning of the busway extension projects.

(3) Express Bus Services from Suburban Areas

In the short term when the other busway routes are not yet developed, bus services for trips departed from outside of the busway corridor are needed to attract people in suburban areas. If special bus coaches designated for the operation on the busway are available, express bus services from Kota Bekasi, Kota Tangerang and Kota Depok would attract commuters to Jakarta CBD. In this case, coordination with the surrounding local governments is required and preferential treatment such as HOV lane on the toll roads should also be taken into consideration.

(4) Grade Separation at Interchanges and Roundabouts

Interchanges, roundabouts and U-turn points would be bottleneck for bus operation due to conflict with general traffic. In the short term, it is proposed to install bus priority signals at these places; however, in the long run grade separation should be taken into consideration to maintain smooth bus operation on the busway.