

7 AIR POLLUTION AND TRAFFIC NOISE REDUCTION POLICY

7.1 OUTCOMES

- 1) Reduced air pollutants caused by traffic
- 2) Reduced traffic noise

7.2 STRATEGIES

(1) Establishment of Environmental Management Scheme

Environmental pollution could be avoided by continuous environmental management, implementing pollution control programs that are evaluated and, if necessary, upgraded on a project cycle basis. This requires an environmental management scheme which consists of environmental monitoring for evaluation and environmental impact simulation based on regularly updated emission source inventory for planning. And to establish and develop the scheme, capacity building for technical staffs and reinforcement of institution/capacity for policy makers in the scheme should be undertaken.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
EU		EURO 2				EURO 3				EURO 4						
Singapore		EURO 1				EURO 2										
Malaysia		EURO 1				EURO 2		EURO 3(planned)								
Thailand					EURO 1	EURO 2		EURO 3(planned)								
Korea						EURO 2		EURO 3								
India						EURO 1				EURO 2						
Philippines										EURO 1						
Vietnam					EURO 1											
China						EURO 1				EURO 2(planned)						
Indonesia										EURO 2 (?)						

Note: Implementation schedule of emission controls for Heavy-duty Diesel Vehicles
 Source: K. Minato "The Global Initiative on Transport Emissions", 2001 World Bank

Figure 7.1 Automotive Emission Control in East Asia and Europe¹⁶

(2) Implementation and Enhancement of Air Pollutant/Noise Emission Standards

Implementation and enhancement of emission standards are fundamental for vehicle emission reduction. These actions could reduce emission from new vehicles, which tend to increase their share in total every year, and the average emission factor would decrease as the result. Therefore, the standards should be implemented and enhanced immediately. Considering emission control technology of local vehicle

¹⁶ Refer to Technical Report Volume 8: Environmental Improvement.

manufacturers, EURO 2/3¹⁷ could be enforced without economic impacts on the automotive industry if fuel properties attain required standard in the whole of Indonesia, i.e., emission control highly depends on fuel quality.

(3) Enhancement of Vehicle Inspection and Maintenance Program

Reduction of air pollutants from vehicles is a primary measure to deal with air pollution problem caused by automobiles. Traffic noise can also be reduced by proper maintenance of vehicles. Vehicle inspection at vehicle inspection stations, however, is not effective because users adjust emission and noise prior to inspection. Thus, on-road testing is recommended to check actual air pollutants emitted by vehicles as well as traffic noise made by vehicles.

(4) Low Sulfur Diesel Program

In order to reduce PM10 emission, a predominant air pollution factor, and to ensure compatibility with advanced diesel emission control systems such as trap oxidizers and oxidation catalysts, sulfur content in diesel should be kept at a low level. EURO 3, the heavy-duty vehicle emission standard enforced from 2001 in EU, requires that sulfur in diesel be less than 0.05% (500ppm). If EURO 3 is enforced three years after 2005 when EURO 2 is planned to start, current high sulfur concentration should be reduced to the standard level by 2008 in the whole of Indonesia. Low sulfur diesel program is considered to follow a similar path to leaded gasoline's phase-out program, which is a gradual and evolutionary approach to spread throughout Indonesia, and it would take a few years to complete. Therefore, diesel engine manufacturers and Indonesia's oil sector should agree to limit sulfur in diesel at allowable level immediately and the oil sector should undertake an investigation for refinery facility development.

The costs of reducing the sulfur content of diesel to 0.05% are considered moderate and the estimated cost-effectiveness is attractive compared with other diesel control measures. However, the costs can be quite large, requiring substantial upfront investment.

(5) Promotion of Biodiesel

A variety of vegetable oils considered as possible substitutes for diesel fuel can be produced from rapeseed, sunflower, sesame, cotton, peanut, soybean, coconut, and oil palm. Those vegetable oils have been promoted as possible replacement for diesel fuel because of their good ignition quality and less air pollutants emission. Moreover, due to recent increasing attention to the greenhouse effect, use of

¹⁷ EURO 2 and 3 are common names of European Directive of Automotive Emission Standard, 91/542/EEC(A).

vegetable oils have drawn more attention for reducing the emission of CO₂ that would otherwise be produced from the combustion of diesel oil as fossil oil although fuel economy is not improved. Indonesia ranks second among palm-oil-producing countries and has rich raw material of biodiesel. However, palm oil is used for higher value-added products, namely cooking oil and cosmetics, and it is impossible to promote biodiesel nationally unless its material cost is saved or it is subsidized to be competitive in price with fossil diesel oil. Therefore, biodiesel should be supplied in limited area and for limited vehicle type, such as heavy-duty diesel bus in highly polluted area.

(6) Promotion of Natural Gas Vehicle

Promotion of natural gas vehicle could reduce air pollutants like PM₁₀ significantly. Although natural gas vehicle requires its own engine configuration while biodiesel does not, gasoline vehicle has the same fuel combustion mode and it can be converted to dedicated type while diesel vehicle can be converted to dual fuel type (uses diesel and natural gas at the same time), by attaching additional equipment such as storage tank. And natural gas vehicle promotion also premises sufficient refueling stations, specially trained staff and equipped garages as its infrastructure. Thus its promotion should be started with taxis, which run for longer distance in the center of Jakarta where infrastructure investment is intensive, and then buses on the next step.

(7) Environment-Friendly Driving Behavior

One of the major causes of air and noise pollution from road transport is some arrogant drivers who are unaware of the environmental impacts of their driving behavior. An educational approach utilizing mass media and mandatory training program would be very effective to remind drivers of the impact of their behavior on the environment. Currently, taking an authorized driving course is a requirement for driving license, but it is not required when drivers renew their license. But driving behavior tends to get worse with the passing of time after a license is acquired, so that a reminder would be effective to curb bad driving manner early. And through training, it is achievable to make the drivers more environmentally conscious.

7.3 RELATION WITH OTHER POLICIES

(1) Public Transportation Use Promotion Policy

Promotion of public transportation use would lead to reduction of automobile use. Therefore, air pollution and traffic noise problem can be alleviated through the policy.

(2) Traffic Congestion Alleviation Policy

Alleviation of traffic congestion would also contribute to reduction of air pollutants.

7.4 PERFORMANCE GOAL

Air Pollution and Traffic Noise Reduction Policy

Performance Measures	Condition in 2002	Target in 2010	Target in 2020
PM10 Emission per capita (g/day)	0.27	0.25	0.22
CO2 Emission per capita (kg/day)	0.66	0.73	1.00
Energy Consumption per capita (mil. J/day)	9	10	14
Road length with PM10 is not allowable range of environmental standard (km)	4,926	5,500	6,000
Road length with traffic noise is not allowable range of environmental standard (km)	3,751	4,400	5,000

8 SAFETY AND SECURITY IMPROVEMENT POLICY

8.1 OUTCOMES

- 1) Reduced number of railway accidents
- 2) Reduced number of fatalities and injuries on traffic accidents
- 3) Reduced number of crimes and violence in transportation

8.2 STRATEGIES

(1) Education on Traffic Safety

Most of traffic accidents are attributable to human errors, in fact, 73% of traffic accidents on ordinary roads are caused by carelessness and violation of traffic rules. Traffic safety education programs for both drivers and pupils at schools are effective measures to improve traffic safety. Creation of video is an effective education program.

(2) Inspection of Private Vehicles

Sixteen percent (16%) of traffic accidents were caused by failure of vehicle machines due to lack of maintenance. Vehicle inspection thus should be expanded to private vehicles to reduce traffic accidents due to mechanical failure.

(3) Proper Maintenance of Roads

Proper maintenance of roads would lead to not merely smooth running of vehicles on the roads but also reducing traffic accidents. Currently, some 9% of traffic accidents have been occurred due to potholes and damage of the roads.

(4) Rehabilitation and Installation of Traffic Signal System

A considerable number of traffic lights are out of order and need repair work in order to function properly. In addition, further installation of traffic signals should be undertaken, in particular, in Bodetabek area, where the number of traffic signals already installed is very limited. More road sections should also be signalized for the safety of crossing pedestrians.

(5) Rehabilitation of Railway Signal System

Railway signals have been damaged and do not work properly at present. Due to improper railway signal systems, train drivers are forced to drive manually and this has resulted in an alarming number of collision accidents. Rehabilitation of railway signals is a task urgently needed to improve railway safety.

(6) Grade Separation between Railway and Road and Provision of Railway Crossing

When railway service is improved and frequency increases, it is anticipated to cause division of community along the railway line and more railway accidents. Sufficient number of flyovers and underpasses as well as railway crossing thus should be constructed in accordance with railway system development. Railway tracks in urban area shall be elevated in the long run.

(7) Analysis on Causes of Traffic Accidents

Traffic accidents record reporting system should be developed and accident database should be established as a part of urban transportation database system for analyses on causes of traffic accidents.

(8) Improvement of Security

Immediate action should be taken to protect passengers from robbers and pickpockets by allocating security guards at railway stations, bus terminals and bus shelters.

8.3 RELATION WITH OTHER POLICIES

Public Transportation Use Promotion Policy

Improvement of safety and security of public transportation lead to promotion of public transportation use.

8.4 PERFORMANCE GOAL

Safety and Security Improvement Policy

Performance Measures	Condition in 2002	Target in 2010	Target in 2020
Number of injuries in traffic accidents	913 (in 2000)	650	450
Number of fatalities in traffic accidents	585 (in 2000)	440	290
Number of train accidents	60	45	30

9 IMPLEMENTATION PROGRAM BY TRANSPORTATION POLICY

9.1 PROJECTS AND PROGRAMS FOR POLICY 1: PROMOTION OF PUBLIC TRANSPORTATION USE

Projects and programs for promoting public transportation use are composed of not merely railway system development and bus transportation improvement but also road network development for public transportation and supporting measures in traffic control and urban planning.

To formulate efficient and convenient public transportation network, development of three east-west corridors and four north-south corridors has been proposed. These public transportation corridors will be developed in combination of busway, the existing railway system and new MRT system. The public transportation network will form a grid pattern in the urbanized area by connecting all these corridors thus people can reach their destinations using the system. It requires provision of well designed interchange facilities between different corridors.

The location of each corridor is depicted in the figure below.

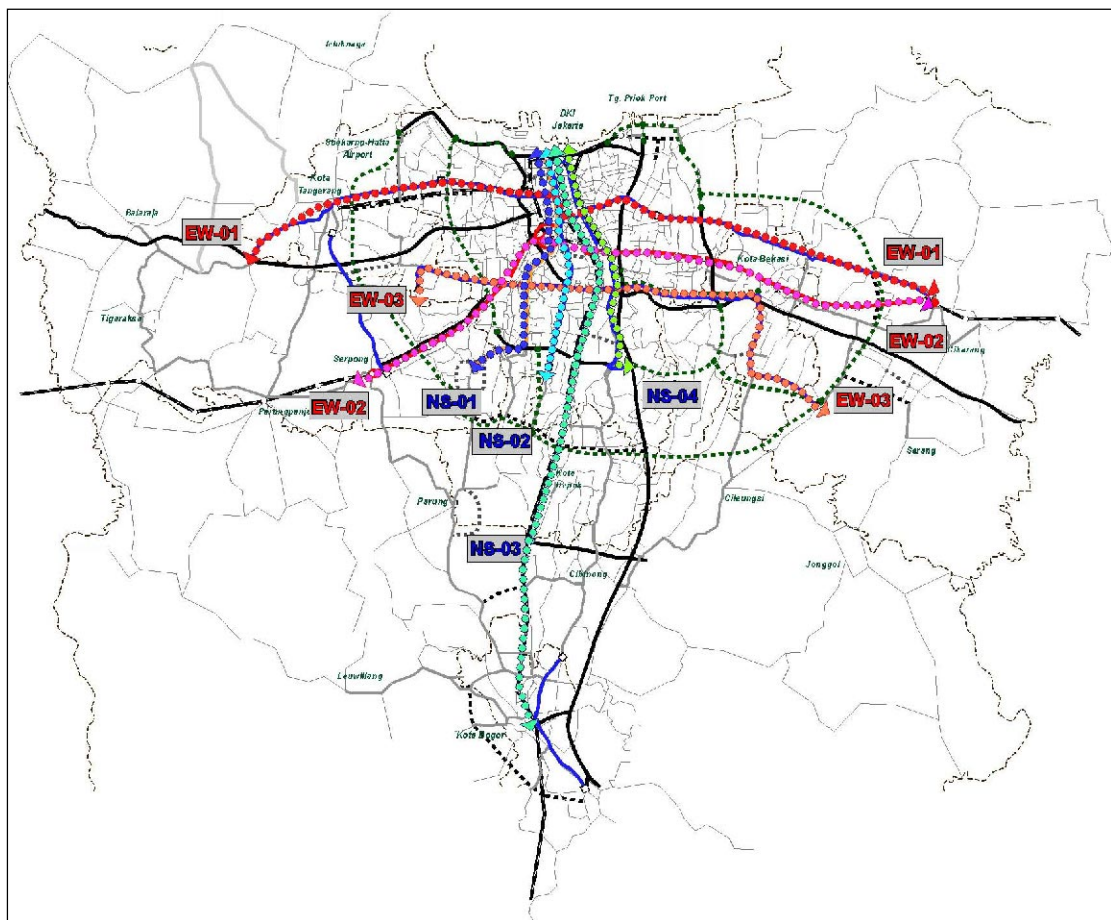


Figure 9.1 Location of SITRAMP Development Corridor

(1) East-west public transportation corridor No. 1 (EW01)

EW01 aims at providing a mass transit service between Tangerang Barat and Cikarang. In the short term, the route between Pulogadung and Kalideres (PB04) will be developed then it will be extended to both Tangerang Barat and Cikarang (PB05). In the long run, the busway system could be converted into MRT system (PR06) utilizing the existing Tangerang railway line.

(2) East-west public transportation corridor No. 2 (EW02)

EW02 will be developed to connect Serpong and Cikarang by construction of short-cut between the Serpong line and the Western line at Palmerah – Karet section. The double-double tracking of the Bakasi line is being undertaken thus double tracking of the Serpong line is recommended to be implemented in the short-term period.

(3) East-west public transportation corridor No. 3 (EW03)

EW03 will provide another access by busway system to Jakarta from Ciledug in Kota Tangerang as well as from Siliwangi in Kabupaten Bekasi. The suspended toll road Bekasi – Cawang - Kampung Melayu could be regarded as an alternative for busway alignment for the section between Cawang and Kota Bekasi but if it cannot be utilized by institutional and financial reasons, road widening of the existing Kalimalang road will be required. In the long term, the busway could be converted into MRT system since the passenger demand on the corridor in 2020 would exceed more than 120,000 passengers per direction per day.

(4) North-south public transportation corridor No. 1 (NS01)

A part of NS01, Blok M – Kota, has been served by busway system since January 2004. It is proposed to extend to Lebak Bulus intercity bus terminal located in the southern west part of DKI Jakarta. On the other hand, the MRT development plan has already been prepared between Fatamawati – Kota. It is therefore recommended to replace the busway system with the MRT system, which provides higher passenger capacity and higher speed, by stage.

(5) North-south public transportation corridor No. 2 (NS02)

NS02 is another busway corridor (PB03) to complement the NS01 corridor starting from Ragunan in the south of DKI Jakarta and merges with NS01 at Hotel Indonesia roundabout.

(6) North-south public transportation corridor No. 3 (NS03)

NS03 is the Bogor line and the Central line of the Jabotabek railway. This corridor serves the passenger travel demand between Jakarta and Bogor/Depok.

(7) North-south public transportation corridor No.4 (NS04)

NS04 will be served by the busway system PB03, which plies Jl. Bogor Raya, Jl. Otista, Jl. Matraman, Jl. Kramat Raya, Jl. Gunung Sahari and Jl. Mangga Dua. PB03 is connected with other busway PB01 and PB02 at Kota. NS04 runs in parallel to NS01 in the northern part of CBD. In the long term, the Eastern line of Jabotabek railway is expected to play a main role for passenger movements.

East-West Public Transportation Corridor No.1 (EW01)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PB04	Busway System (4) Kalideres – Pulogadung	Yes				25.5	98.5	
R10	Road widening for the Trunk Bus Perintis - Bekasi Raya	Begin	Yes			2.3	75	
R11	Road Widening for the Trunk Bus Bekasi Raya – Cikarang			Yes		21.2	500	
R15	Road widening for the Trunk Bus Daan Mogot (1)		Yes			5.6	192	
R16	Road widening for the Trunk Bus Daan Mogot (2)		Begin	Yes		9.3	543	
PR19a	Station Square Development at 1 station (Tangerang) on the Tangerang Line			Yes		-	2	1 station
R20a	Access Road to Pesing, Kembangan, Bojong Indah, Rawa Buaya, Kalideres, Poris, Batu Ceper and Tangerang Railway Stations on the Tangerang Line	Begin	Continue	Yes		-	274	8 stations
R28	Road widening for the Trunk Bus (West side of Pulogadung)	Yes				0.9	149	Cost in Oct. 2003 due to Pre F/S
PB05	Busway System (5) Extension of Kalideres - Pulogadung to Tangerang Barat (Kab Tangerang) and Bekasi/Cikarang (Kota and Kab Bekasi)		Begin	Yes		46.5	93	Subject to Busway System (4) Kalideres – Pulogadung
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Convert after 2020</div>								
PR06	MRT Balaraja – Cikarang				Yes	78.2	14,009	
PR03	Tangerang Line Short Cut				Yes	1.3	330	Including (New) Roxy Station Development
PR07	Tangerang - Cengkareng Connection				Yes	5.0	-	

Note: Cost Estimate was made on the price in January 2003. However, the cost of projects for pre-Feasibility Studies was revised based on the prices in October 2003.

East-West Public Transportation Corridor No.2 (EW02)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PR01	Bekasi Line Double Double Tracking and Electrification	Begin	Yes			35.0	7,986	
PR08	Serpong Line Double Tracking Between Serpong – Tanah Abang	Begin	Yes			23.4	1,720	Incl. 5 new stations
PR02	Serpong Line Short Cut Between Palmerah – Karet		Yes			5.2	1,528	Incl. 1 new station
PR19b	Station Square Development at 8 stations (Jatinegara, Klender, Klender Baru, Cakung, Kranji, Bekasi, Tambun and Cikarang) on the Bekasi Line			Yes		-	128	8 stations
PR18a	Provision of 2 New Stations (Matraman St. and Bekasi Timur St.) on the Bekasi Line	Begin	Yes			-	130	2 stations
R20b	Access Road to Tanah Abang, Palmerah, Kebayoran, Bintaro, Pondok Ranji, Jurang Manggu, Sudimara, Ciater, Rawa Buntu, Serpong, Cisauk and Cicayur Railway Stations on the Serpong Line	Begin	Continue	Yes		-	663	13 stations
R20c	Access Road to Klender, Buaran, Klender Baru, Cakung, Kranji, Bekasi, Tambun, Cibitung and Cikarang Railway Stations on the Bekasi Line	Begin	Continue	Yes		-	442	9 stations
PR22a	Addition of Signaling Facility and Improvement/Addition of Substations on the Bekasi Line	Yes				-	444	For 4-Minute Headway Operation
PR22b	Addition of Signaling Facility and Improvement/Addition of Substations on the Serpong Line	Yes				-	303	For 4-Minute Headway Operation

East-West Public Transportation Corridor No.3 (EW03)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
R14	Road widening for the Trunk Bus Ciledug Raya	Begin	Yes			11.3	366	
PB06	Busway System (6) Ciledug Raya		Yes			51.0	113	
R25	Road widening for the Trunk Bus Siliwangi	Begin	Yes			4.6	105	
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PR11	MRT Ciledug – Bekasi				Yes	45.7	11,766	

North-South Public Transportation Corridor No.1 (NS01)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
R24	Road widening for the Trunk Bus (Fatmawati)	Yes				4.5	711	
PB01	Busway System (1) Kota - Lebak Bulus (Extension of Kota - Blok M)	Yes				21.0	61	Replaced by MRT in the future
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Phased Conversion</div>								
PR12	Jakarta MRT Kota – Ciputat	Begin	Continue	Yes		24.7	10,670	

North-South Public Transportation Corridor No.2 (NS02)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PB02	Busway System (2) Kota - Ragunan	Yes				17.5	151,8	

North-South Public Transportation Corridor No.3 (Bogor Line & Central Line) (NS03)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PR10	New Jakarta Kota Station Development				Yes	2	1,682	
PR16a	Improvement of Station Facility at Bogor, Cilebut, Bojong Gede, Citayam, Depok, Pasar Minggu and Cawang stations on the Bogor Line	Yes				-	87	7 stations
PR22c	Addition of Signaling Facility and Improvement/Addition of Substations on the Bogor Line		Yes			-	705	For 4-Minute Headway Operation
PR17	Purchase of Electric Train Cars for the Bogor Line	Begin	Yes			-	2,804	309 trains
PR18b	Development of a New Station between Bogor and Cilebut on the Bogor line	Begin	Yes			-	62	1 station
PR19c	Station Square Development on the Bogor Line and the Central Lines at Bogor, Cilebut, Bojong Gede, Citayam, Depok, Depok Baru, Pondok Cina, Lenteng Agung, Pasar Minggu, Duren Kalibata, Tebet, Manggarai and Jakarta Kota stations			Yes		-	860	13 stations
R20d	Access Road Development to Bogor, Cilebut, Bojong Gede, Citayam, Depok, Depok Baru, Pondok Cina, Universitas Indonesia, Universitas Pancasila, Lenteng Agung, Tanjung Barat, Pasar Minggu, Pasar Minggu Baru, Duren Kalibata, Cawang, Manggarai, Juanda, Sawah Besar, Mangga Besar, Jakarta Kota Railway Stations on the Bogor and Central Lines	Begin	Continue	Yes		-	1,488	20 stations

North-South Public Transportation Corridor No.4 (NS04)								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
R12	Road widening for the Trunk Bus Bogor Raya (1)	Yes				6.5	400,7	Costs in Oct. 2003 due to Pre F/S
PB03	Busway System (3) Kota - Kampung Rambutan	Yes				24	89	

Circular Public Transportation Service in CBD								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PR04	West Line Double Double Tracking (Karet - Manggarai)				Yes	4.3	1068	
PR05	Manggarai - Pondok Jati Short Cut				Yes	2.0	404	
PR09	East Line Track Elevation				Yes	5.4	943	
PR16b	Improvement of Station Facility of Rajawali, Gang Sentiong and Kramat Station on the Eastern Line	Yes				-	6	3 stations
PR22d	Addition of Signaling Facility and Improvement/Addition of Substations on the Eastern and Western Lines				Yes	-	413	For 4-Minute Headway Operation
PR19d	Station Square Development on the East / West Line at Sudirman and Pasar Senen Stations			Yes			52	2 stations
PR19e	Station Square Development on the Serpong Line at Tanah Abang Stations			Yes			24	1 stations
R20e	Access Road to Kampung Bandan, Angke, Karet, Rasuna Said, Mampang, Duri, Rajawali, Pasar Senen, Kramat, Pondok Jati, Jatinegara, and New Jakarta Kota Railway Stations on the East and West Lines	Begin	Continue	Yes		-	468	12 stations

Public Transportation Enhancement in Sub Centers of Bodetabek								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
R17	Road Widening for the Trunk Bus Serpong Raya		Yes			9.3	318	
PB07	Busway System (7) Jl Raya Serpong (Kota and Kab Tangerang)		Yes			18.5	26	
R13	Road Widening for the Trunk Bus Bogor Raya (2)		Yes			17.6	736	
PB08	Busway System (8) Jl Raya Bogor (Kota and Kab Bogor)		Yes			14.5	20	

Public Transportation Enhancement in Bodetabek								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PR13	Outer Ring Railway				Yes	-	-	

Other Measures to Promote Public Transportation Use								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
I03	Privatization of PT. KA and Establishment of Jabodetabek Metro Railway Corporation		Yes			-	-	
I04	Rationalization of Perum PPD		Yes			-	-	

Common Public Transportation Improvement Program								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
PR14	Development of Railway Spare Parts Factory for Jabotabek Railway	Begin	Yes			-	303	
PR15	Training Program for Railway Electrical, Signaling and Telecommunication System	Yes				-	240	
PB09	Reform Bus Licensing Scheme	Begin				-	-	
PB10	Enhancement of Bus Feeder Services to Railway Stations		Yes			-	-	
PB11	Bus Route Restructuring (Separation of trunk bus routes and feeder bus routes)	Yes				-	-	
PB12	Intermodal Facility Development with Barrier-Free Facilities		Yes			-	-	
PB13	Bus Terminal Development	Begin	Continue	Yes		27 places	86	
R18	Widening of the Existing Roads to accommodate Bus Lanes	Begin	Yes			56.5	1,663	
R19(1)	Arterial Road Development for Regional Development and Enhancement of Bus Service Coverage (Widening)	Begin	Continue	Yes		228.3	5,454	
R19(2)	Arterial Road Development for Regional Development and Enhancement of Bus Service Coverage (New Road)	Begin	Continue	Yes		76.2	2,597	
R19(3)	2-lane Standardization for Regional Development	Begin	Continue	Yes		34.3	786	
C04	Bus Priority Measures in Jakarta	Begin	Yes			-	-	
C06	Management of Public Transportation in Bodetabek	Yes				-	-	
UP01	Provision of High Floor Area Ratio for the Surrounding Areas of Railway Stations and Major Transit Interchanges	Begin	Yes			-	-	

9.2 PROJECTS AND PROGRAMS FOR POLICY 2: ALLEVIATION OF TRAFFIC CONGESTION

Alleviation of traffic congestion would be achieved by increasing road network capacity and traffic control and management for supply side. Measures to manage transportation demand such as traffic restraint and change of urban structure are also included.

Road Network Development								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
R01	Jakarta Outer Ring Road	Yes				36.5	7,035	
R02a	Jatiasih – 2 nd JORR			Yes		3.7	223	
R02b	2 nd JORR – Cikampek Toll Road				Yes	7.3	273	
R03	Tg. Priok Access from JORR	Yes				12.1	3,784	
R04	Tanjung Priok – Cikarang Toll Road				Yes	28.0	2,511	8 km included in R05
R05	2 nd JORR (Outer Outer Ring Road)	Begin	Continue	Yes		108.2	7,057	Cost in Oct. 2003 due to Pre F/S
R06	Extension of Serpong Toll Road to Intraurban Toll Road				Yes	7.5	2,015	
R07	Extension of Serpong Toll Road to Tigaraksa				Yes	32.5	848	
R08a	Depok – Antasari Toll Road (JORR – 2 nd JORR)			Yes		2.8	1,433	
R08b	Depok – Antasari Toll Road (2 nd JORR – Citayam)				Yes	3.1	956	
R09	Kalimalang Toll Road		Yes			13.9	2,066	
R21	City Bypass Development	Begin	Continue	Continue	Yes	10.0	293	
R22	Flyovers/Underpasses at bottleneck intersections	Begin	Continue	Yes		60 places	3,565	
R23	Road Maintenance	Begin	Continue	Continue	Yes	-	13,220	
R26	Baralaja – Teluknaga Toll Road				Yes	35.0	1,808	
R27	Cengkareng Access Improvement	Begin	Yes			4.0	402	
F02	Introduction Road Fund	Yes						

Improvement of Traffic Control System and Demand Management								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
C01	Traffic Demand Management (Area Pricing etc.) in DKI Jakarta	Begin	Continue	Yes		-	700	Provision of better level of public transport service such as Busway or Jakarta MRT
C02	Intensive Improvement at Bottleneck Sections in Jakarta	Yes				-	34	Clearing of obstacles and illegal occupants
C03	Unification and Upgrading of Area Traffic Control (ATC) System in Jakarta		Yes			-	210	
C05	Traffic Information System for Surface Road	Yes				-	58	
C07	Traffic Management at Pasar in Bodetabek	Yes				-	12	
C08	Traffic Engineering (Geometric) Improvement in Bodetabek	Yes				-	22	
C09	Toll Road Traffic Information System	Yes				-	872	
C10	Electric Toll Collection (ETC)	Yes				-	610	
Measures in Urban Planning								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
UP02	Incentives for Sub-center Developments		Begin			-	-	
UP03	Strengthen Development Control	Begin				-	-	
Pricing Policies for Traffic Restraint								
Project Code	Project/ Program	Timing				Length (Km)	Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020			
F04	Gradual Increase of Gasoline Tax	Begin				-	-	

9.3 PROJECTS AND PROGRAMS FOR POLICY 3: AIR POLLUTION AND TRAFFIC NOISE REDUCTION

Reduction of air pollutants and traffic noises would be brought about by promotion of public transportation as well as alleviation of traffic congestion. Projects and programs in environmental betterment include enhancement of vehicle inspection and introduction of environment-friendly fuels.

Environmental Betterment							
Project Code	Project/ Program	Timing				Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020		
E01	Enhancement of Vehicle Inspection and Maintenance Program		Yes			14	
E02	Promotion of Low Sulfur Diesel			Yes		1,900	
E03	Promotion of Bi-fuel		Yes			150	
E04	Driver Education Program on Driving Manner	Yes				10	To be coordinated with traffic safety program for drivers
E05	Promotion of Natural Gas Vehicle	Yes				-	

9.4 PROJECTS AND PROGRAMS FOR POLICY 4: SAFETY AND SECURITY IMPROVEMENT

Projects and programs for improvement of transportation safety and security include traffic safety education program, rehabilitation of signal system for road and railway, and proper maintenance of road network.

Improvement of Transportation Safety and Security							
Project Code	Project/ Program	Timing				Project Cost (Rp. Bil.)	Note
		Within 4 Years	Next 7 Years	Up to 2020	After 2020		
S01	Traffic Safety Education Program at Schools	Yes				-	
S02	Traffic Safety Education Program for Drivers	Yes				-	
PR20	Train Radio System			Yes		491	
PR21	Rehabilitation of Signaling/ Telecommunication Facilities	Begin	Yes			178	
PR23	Automatic Train Stop (ATS) System			Yes		249	
C11	Repair and Installation of Traffic Signals	Begin				245	
S03	Allocation of security guards at railway stations, bus terminals, and bus shelters	Yes				-	
S04	Establishment of Traffic Accident Database System	Yes				-	

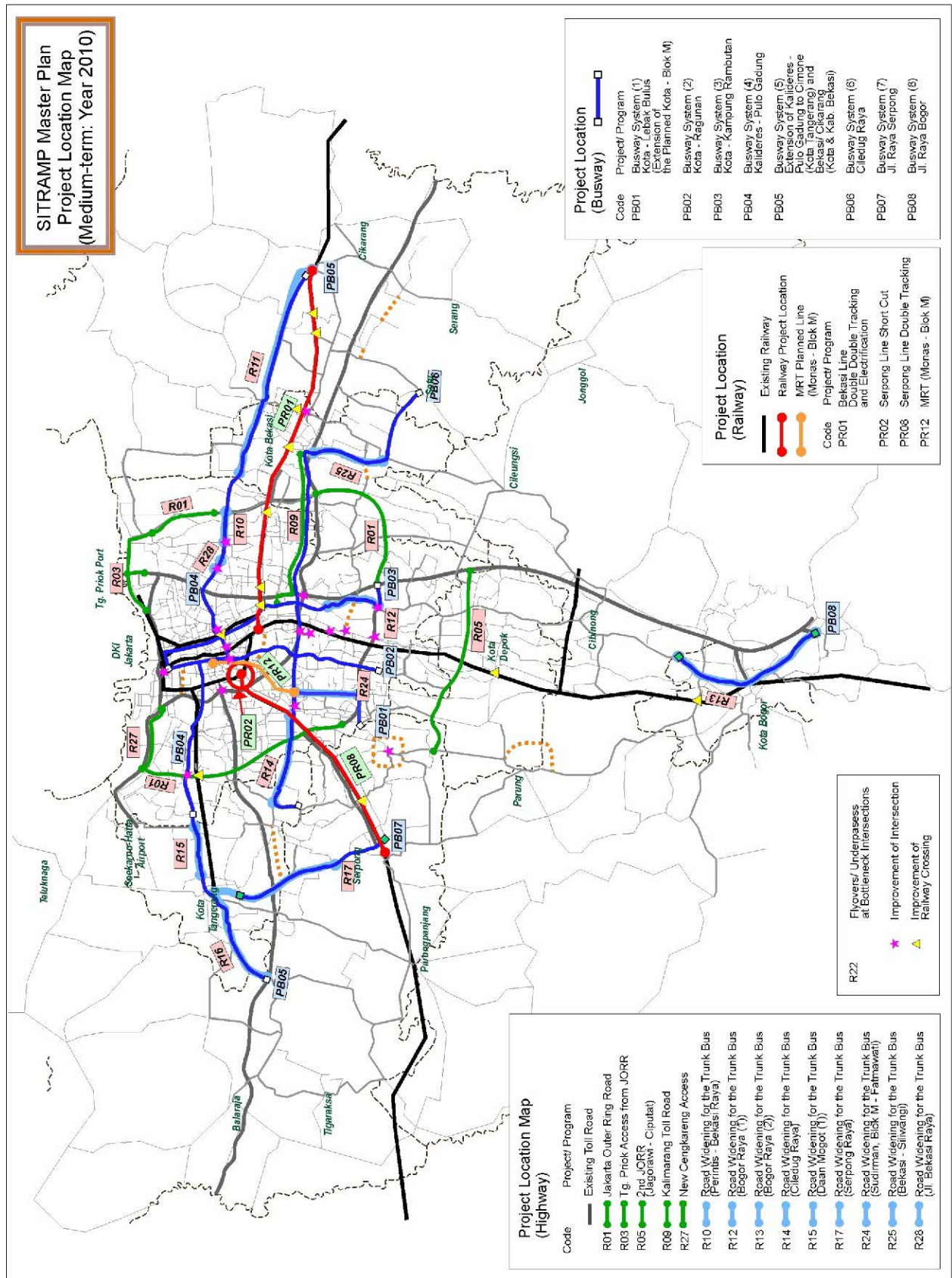


Figure 9.3 Project Location Map (2010)

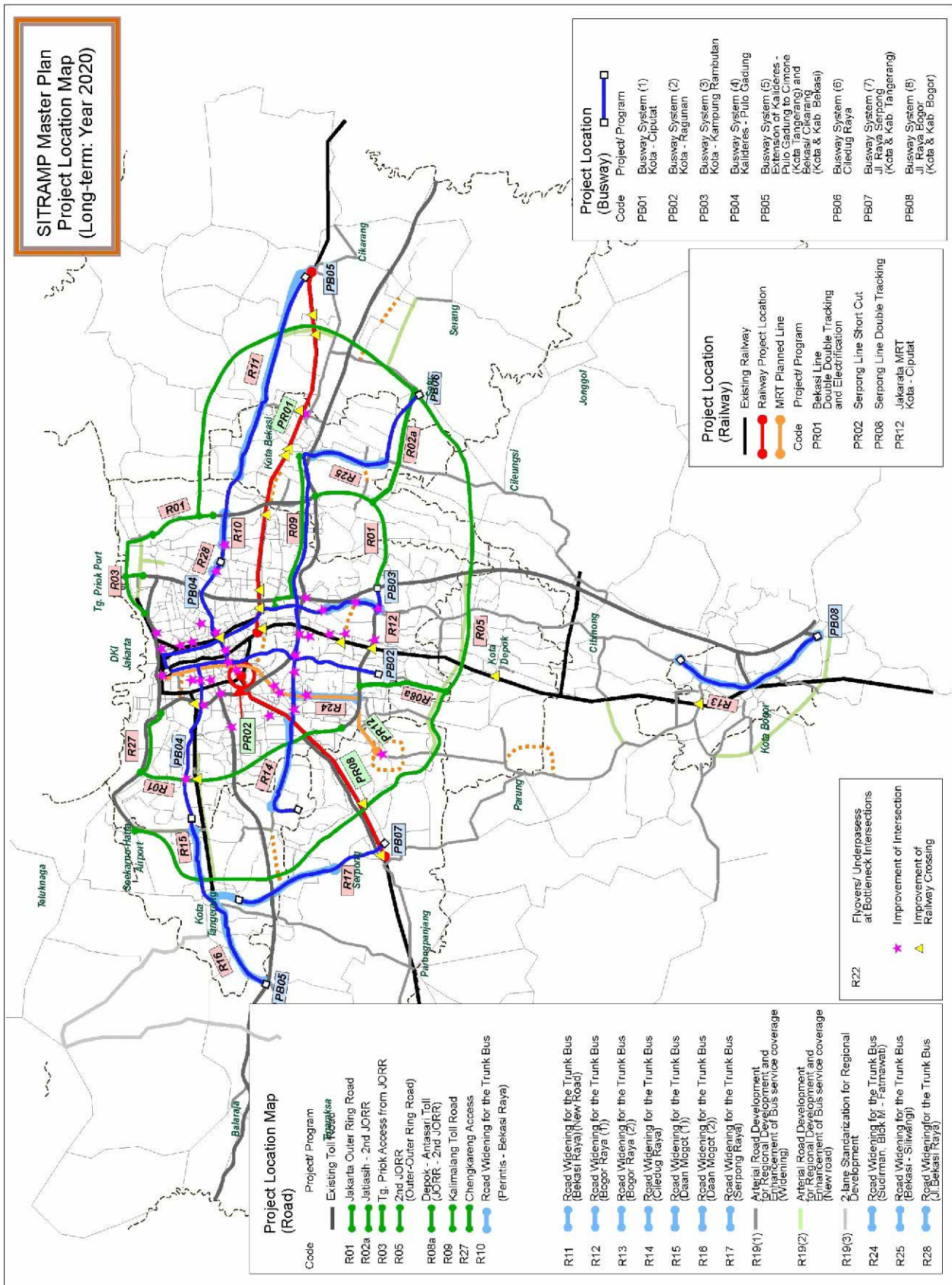


Figure 9.4 Project Location Map (2020)