4.4 EXISTING CONDITION OF SERPONG LINE RAILWAY FACILITIES

4.4.1 Existing Track Condition

The previous Single Track Improvement on the Serpong Line Jabotabek Railway Project started from 1988 principally developed the current railway track structure on the corridor. The regular maintenance works have been done by PT. KA after the project.

The existing single track is now made up of UIC R54 Rail laid on pre-stressed concrete (PC) sleeper. The track panel modules are categorized as short welded rail (SWR) of 100 m length in each module. Mechanical joint with fishplate is connecting two track panels. Wooden sleepers are used at the locations of mechanical joint.

The track structure is constructed on geotextile sheet. The geotextile separates the ground soil with the sub-ballast layer or sand layer. The sand layer, which is under the sub-ballast layer, indicates the locations where new sub-grade was constructed replacing the former one. While at other places where the former sub-grade was not replaced but rehabilitated, the sand layer was not used.

4.4.2 Existing Track Alignment

The existing radii of curves on the main line vary from 304 m to 2,580 m. Reversible curves (S curves) comprise a straight section that is not less than 20 m. The shortest straight section in S curve, i.e. 24 m, is located at km 29+550 approaching the Serpong station.

A compound curve exists near Pondok Betung station. Two curves of 600 m radius and 340 m radius are connected by a 15 m transition curve.

No longitudinal gradient of existing single line railway of the Serpong Line exceeds $12\,^{0}/_{00}$. Almost all the slopes are less than $10\,^{0}/_{00}$. It indicates that the terrain is categorized as a plain area. About $11^{0}/_{00}$ of slopes are observed between Kebayoran and Pondok Betung, between Pondok Betung and Pondok Ranji, and between Sudimara and Rawabuntu.

At Tanah Abang - Serpong line, the existing stations, except Rawabuntu, facilitate the passing-over and crossing operations between trains. Facilities for EC (Electric Car) trains, however, are not provided at all of the lines in stations. Line III of Kebayoran station, Line III of the Sudimara station, and Lines III and IV of Serpong station are the lines without Overhead Catenary System facilities. These lines are used for non-electrified cars.

The existing and proposed bridges, existing level crossings, extension level crossing and drainages are shown in Tables 4.4.1 – 4.4.5.

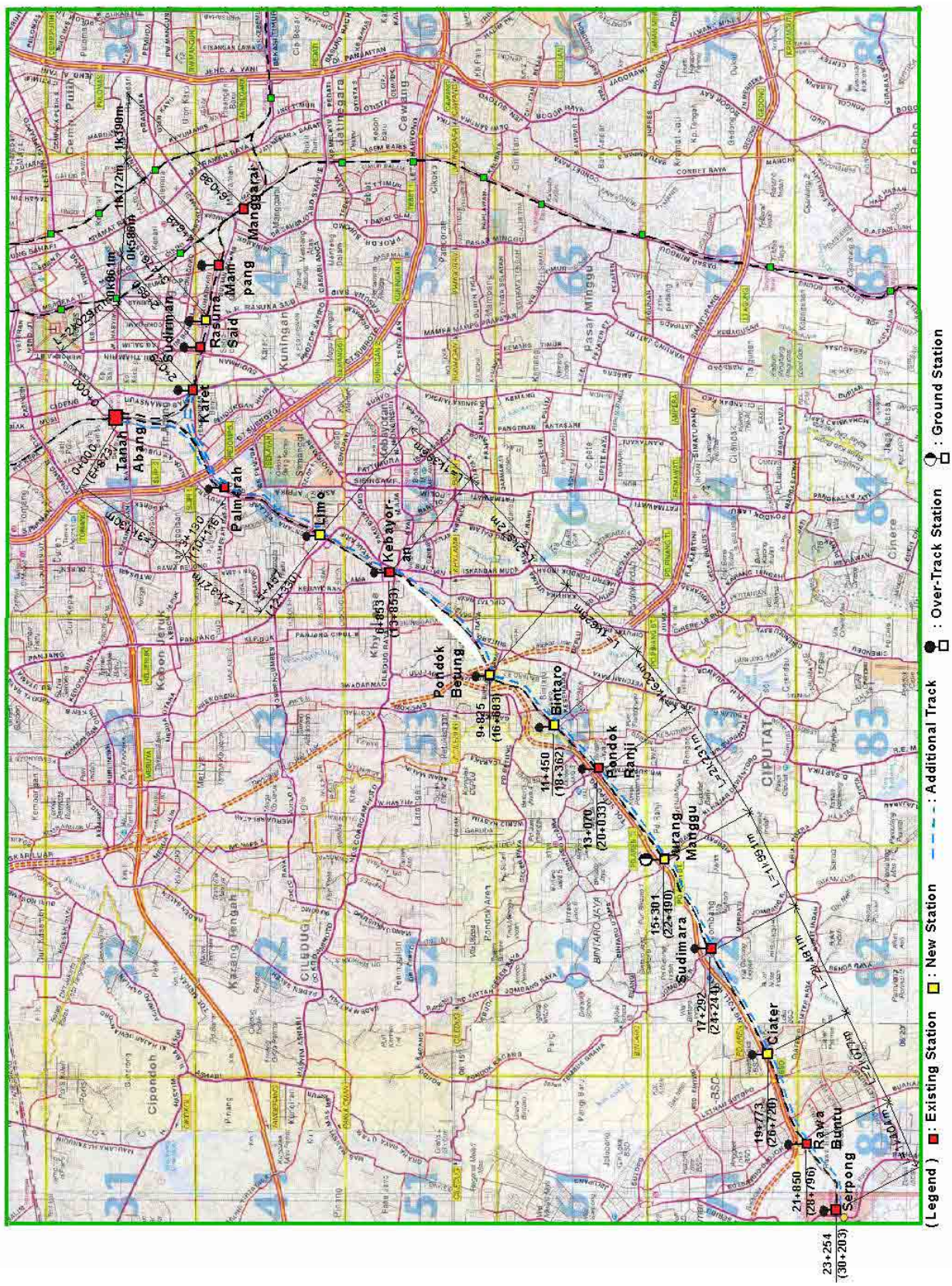

Figure 4.4.1 Double Track on Serpong Line and Improvement Facilities on Western Line

Table 4.4.1 Existing & Proposed Bridges on the Serpong Line (L>2.0m)

No.	Type	Bridge No. (BH)	Survey Kilo. Post (km)	Existing Structure		Proposed Structure	
				Length of Span (m)	Type Of Structure	Length of Span (m)	Type Of Structure
1	**(C)**	BH-27	8k 285m	4 x 4.4m	Concrete	1 x 43.6m	Steel Truss Beam
2	**(A)**	BH-28	8k 507m	2.0m	Concrete	2.0m	Concrete
3	**(B)**	BH-38	10k 842m	1 x 11.48m	Steel Beam	1 x 21.2m	Steel Beam In Cast Concrete
4	**(A)**	BH-42	13k 238m	2.0m	Concrete	2.0m	Concrete
5	**(A)**	BH-46	14k 591m	3.50m	Concrete	4.0m	Concrete
6	**(A)**	BH-49	15k 898m	3.99m	Concrete	4.0m	Concrete
7	**(C)**	BH-51	16k 343m	6.6m + 16.0m +6.6m	Steel Beam	10.0m+15.0 m+10.0m	Steel Beam In Cast Concrete
8	**(A)**	BH-54	17k 143m	3.07m	Concrete	3.5m	Concrete
9	**(A)**	BH-55	17k 609m	2.38m	Concrete	2.5m	Concrete
10	**(B)**	BH-59	18k 554m	17.08m	Steel Beam	18.0m	Steel Beam
11	**(B)**	BH-59A	19k 170m	22.43m	Steel Beam	23.0m	Steel Beam
12	**(A)**	BH-69	20k 630m	3.71m	Concrete	4.0m	Concrete
13	**(A)**	BH-72	21k 156m	4.34m	Concrete	5.0m	Concrete
14	**(A)**	BH-73	21k 231m	4.09m	Concrete	5.0m	Concrete
15	**(A)**	BH-75	21k 356m	5.21m	Concrete	6.0m	Concrete
16	**(B)**	BH-76	21k 886m	6.6m + 8.7m +6.6m	Steel Beam	1 x 21.0m	Steel Beam In Cast Concrete
17	**(B)**	BH-77	22k 092m	20.49m	Concrete	1 x 21.0m	Steel Beam In Cast Concrete
18	**(A)**	BH-79	22k 292m	3.00m	Concrete	3.0m	
19	**(B)**	BH-81	22k 470m	18.93m	Concrete	1 x 21.2m	Steel Beam In Cast Concrete
20	**(A)**	BH-85	23k 160m	2.00m	Concrete	2.0m	Concrete
21	**(A)**	BH-87	23k 663m	2.50m	Concrete	2.5m	Concrete
22	**(A)**	BH-96	24k 762m	3.45m	Concrete	3.5m	Concrete
23	**(A)**	BH-98	24k 851m	5.88m	Concrete	6.0m	Concrete
24	**(B)**	BH-99	24k 995m	1x 8.72m	Steel Beam	1 x 10.6m	Steel Beam In Cast Concrete
25	**(D)**	BH-102	25k 998m	8.72m+31m+8. 72m	Concrete + Steel Truss Beam	10.0m+31.0 m+1x10.0m	Steel Beam In Cast Concrete and Prestressed Concrete Beam
26	**(C)**	BH-105	26k 559m	10.0m+1x10.0 m+6.37m	Concrete	10.0m+10.0 m+6.37m	Steel Beam In Cast Concrete
27	**(A)**	BH-106	26k 749m	7.68m	Concrete	8.0m	Concrete
28	**(B)**	BH-107	27k 049m	12.10m	Concrete	13.0m	Concrete
29	**(B)**	BH-112	28k 023m	18.01m	Concrete	20.0m	Concrete
30	**(C)**	BH-113	28k 099m	10.0m+10.0m+ 9.0m	Concrete	10.0m+10.0 m+9.0m	Steel Beam In Cast Concrete
31	**(A)**	BH-114	28k 377m	2.60m	Concrete	3.0m	Concrete
32	**(D)**	BH-119	29k 352m	16.0m+1x21.0 m + 16.0m	Steel Truss Beam	16.0m+21.0 m+16.0m	Steel Beam In Cast Concrete

Note Type **(A);** RC Bridge (L=2m – 10m) 17 Bridges
Type **(B);** RC Bridge (L=10m – 25m) 9 Bridges
Type **(C);** PC Bridge (L=25m – 50m) 4 Bridges
Type **(D);** Steel Bridge (L=50m – 100m) 2 Bridges

Table 4.4.2 Existing Bridges on the Western Line

Bridge No. (BH)	Name of Street	Survey Kilo. Post (km)	Existing Bridge	
			Length of Span (m)	Type Of Bridge
Flyover	Jl. Jendo Sudirman	2k 728m	35.9m	-
BH-5	-	3k 291m	1 x 6.0m	CB
Flyover	Jl. Hos Cosroaminoto	3k 317m	17.9m	-
BH-8	-	5k 113m	1 x 6.0m	CB
BH-28	-	5k 723m	2 x 5.5m + 1 x 6.0m	CB

Table 4.4.3 Existing Level Crossings and Extension Level Crossings on the Serpong Line

LC-No.	Name of Street	Survey Kilo Post (KM)	Road Width (m)	Length (m)	Square meter (m2)
(Illegal)	Jl. Inspeksi	8k 256m	4.0	6.5	26.0
(Illegal)	Jl. Jati Petambuaran I	8k 310m	6.0	6.5	39.0
LC-39	Jl. Lembaga	8k 912m	10.0	6.5	65.0
LC-39A	Jl. Arteri to Pejompongan	9k 444m	10.1	6.5	65.7
LC	Jl. Arteri to Pejompongan	9k 464m	6.2	6.5	40.3
LC-41	Jl. Palmerah Selatan	10k 315m	6.7	6.5	43.6
LC-45A	Jl. Permata Hijau	12k 023m	13.6	6.5	88.4
LC-46	Jl. Juani	12k 689m	4.7	6.5	30.6
LC-50	Jl. Kramat	13k 683m	10.2	6.5	66.3
LC-52	Jl. Kebayoran Lama	14k 256m	14.6	6.5	94.9
(Illegal)	Jl. Bendi Raya	15k 413m	6.5	6.5	42.3
(Illegal)	Jl. Pemakaman Tanah Kusir	15k 935m	3.1	6.5	20.2
LC-57A	Jl. Bintaro Permai	16k 940m	7.3	6.5	47.5
LC-58A	Jl. Bintaro Puspita Raya	18k 143m	11.1	6.5	72.2
LC-64	Jl. Pondok Ranji	19k 872m	6.1	6.5	39.7
LC-65	-	21k 555m	2.9	6.5	18.9
LC-71	-	22k 693m	1.0	6.5	6.5
LC-75	-	24k 396m	7.1	6.5	46.2
LC-82	Jl. Jombang	27k 496m	4.2	6.5	27.3
LC-90	Jl. Serpong	30k 362m	7.8	6.5	50.7
	Total				**931.3**

Table 4.4.4 Existing Level Crossings on the Western Line

No	Name of Street	Kilo Post (km)	EXISTING CONDITION	
			Road Width (m)	Road Pavement
1.	-	0k314m	5.0	Asphalt
2	-	0k476m	7.0	Asphalt
3	-	0k528m	8.0	Asphalt
4	Jl K.H.Mas Mansyur	1k886m	28.0	Asphalt
5	Jl Madiun	3k996m	19.0	Rubber
6	Jl Guntur	4k 528m	12.0	Concrete
7	Jl Menteng Sukabumi	4k .813m	21.0	Asphalt

Table 4.4.5 Existing Cross Drains on the Western Line

Drainage No.	Kilo Post (km)	Structure	
		Type of Structure	Span or Diameter
2	2k 668m	Concrete Culvert	3 x 0.30m
2A	2k 718m	Viaduct	-
3	2k 820m	Concrete Culvert	3 x 0.30m
3A	3k 018m	Viaduct	-
4	3k 034m	Concrete Culvert	3 x 0.30m
6	3k 697m	Concrete Culvert	3 x 0.30m
7	4k .211m	Concrete Culvert	3 x 0.30m

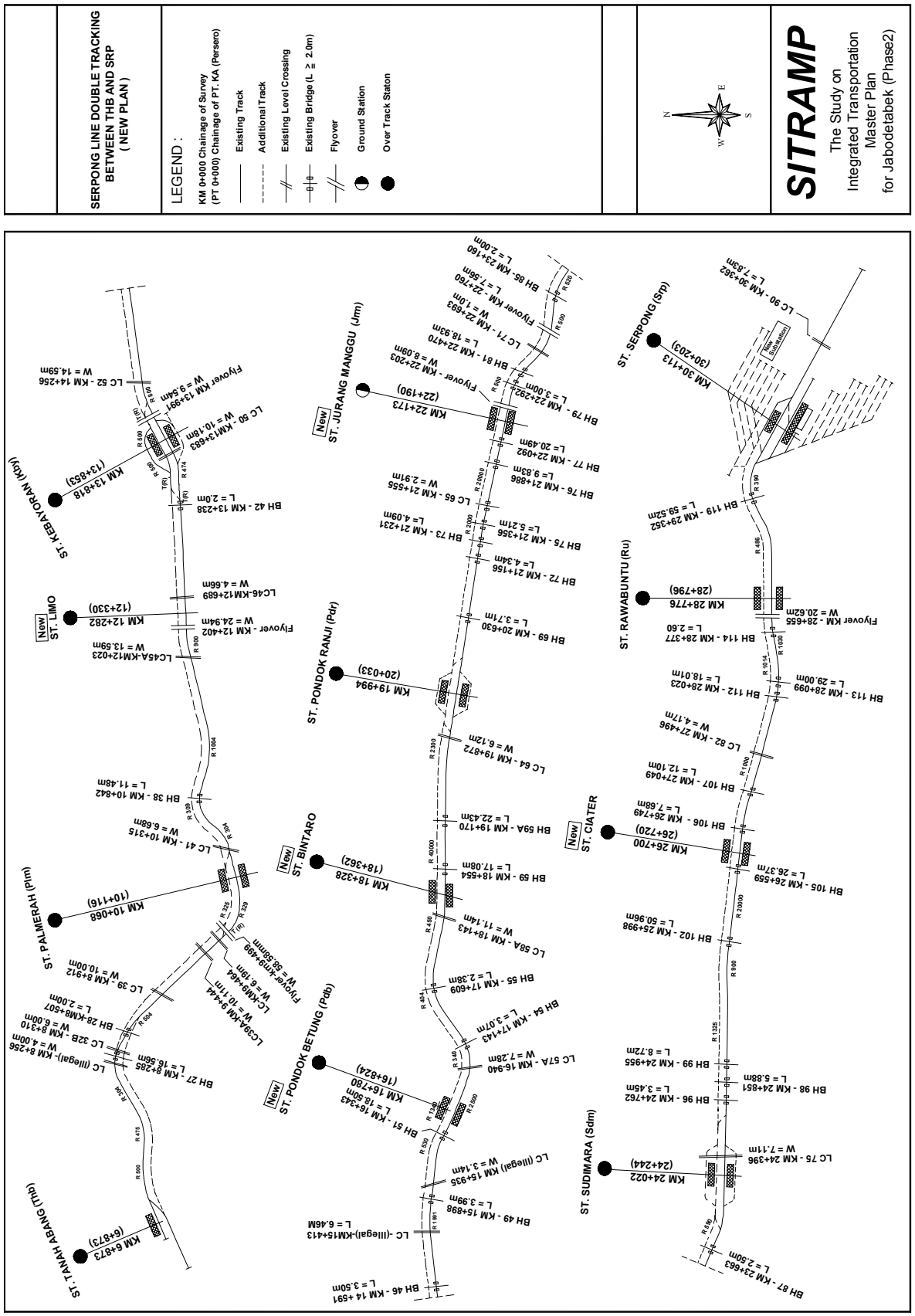

Figure 4.4.2 Serpong Line Double Tracking Between Tanah Abang and Serpong

4.5 STATION BUILDING

4.5.1 Conditions of the Existing Stations and Proposal of New Stations

At present there are seven existing stations between Tanah Abang – Serpong (Serpong Line): (1) Tanah Abang Station, (2) Palmerah Station, (3) Kebayoran Station, (4) Pondok Ranji Station, (5) Sudimara Station, (6) Rawa Buntu Station and (7) Serpong Station. Between Tanah Abang – Manggarai (Western Line) there are (1) Tanah Abang Station, (2) Karet Station, (3) Sudirman (former Dukuh Atas) Station, (4) Mampang Station and (5) Manggarai Station.

In line with modernization of the Serpong Line, it is proposed to add five new stations, taking into account the present interval of the railway stations, availability of the access roads, and the development plans of the real estate developers. The five new stations are (1) Limo Station, (2) Pondok Betung Station, (3) Bintaro Station, (4) Jurang Manggu Station, and (5) Ciater Station. For the Western Line, it is proposed to add one new station, Rasuna Said Station, to make transfer from Jl. Rasuna Said, one of the major arterial streets in CBD, easier.

Situation of the existing stations is listed in Table 4.5.1.

Table 4.5.1 Situation of Existing Stations (1/2)

No.	Station Name	Building & Station Area Condition	Circulation & Transportation Network
1	Karet*	-A small stopping station with ticketing booth, station master office, and platform	-Station Karet is located between Tanah Abang Station and Sudirman Station, and is near level crossing with arterial road Jl. KH. Mas Mansyur; Traffic is always busy because there is access to the trade centre Pasar Tanah Abang and the central business district of Jakarta from this area. -There are various modes of transportation such as taxi, metro-mini, mikrolet, ojek and bajaj.
2	Sudirman*	-An over-track stopping station equipped with ticketing booth, station master office and platforms with connecting bridge	-Station Sudirman is located near Dukuh Atas Flyover and Jl.Sudirman; the continuous traffic activity is attributed to its location, which is at the heart of the central business district of Jakarta. -There are various modes of transportation such as taxi, metro-mini, bus and ojek.
3	Mampang*	-A small station consisting of ticketing booth, station master office, and platform	-Station Mampang is located beside Jl. Latuharhari and between two level crossing. -There are various modes of transportation such as metro-mini, mikrolet, ojek and bajaj.
4	Palmerah	-The crossing track station is housed in an old building that has now undergone some renovation. -There are two main structures found: a station building and a shunting room -The station area is small and does not have space for a station square.	-The station is located between arterial road (Jl. Gelora 1) and a road which is one of an alternative road for southbound traffic -There are various modes of transportation such as taxi metro-mini, mikrolet, ojek and bajaj. -Sometimes traffic jam occurs in the morning and afternoon.
5	Kebayoran	-There is an old building that has been renovated and more buildings have been added. -There is wide space available but does not satisfy conditions for a station square because of its proximity to market.	-The station is located near access ways -There are various modes of transportation such as taxi, metromini, mikrolet, ojek and bajaj. -Entrance to station is very crowded because of traffic and market activities. -It is near level crossing.

Table 4.5.1 Situation of Existing Stations (2/2)

No.	Station Name	Building & Station Area Condition	Circulation & Transportation Network
6	Pondok Ranji	-The station building has been renovated and it has a shunting room. -The station square is spacious and with some shops.	-The location is near a high traffic density road (Jl.WR.Supratman) and Bintaro Jaya estate. -There are various modes of transportation such as mikrolet, ojek and bajaj. -Entrance to station is very crowded owing to traffic and market activities. -It is near level crossing and parallel with Bintaro-Jakarta Toll Road.
7	Sudimara	-Building is old but renovation has been done and more buildings are added. -Have a wide land and station square. -The condition inside of station is dirty, and there are many vendors on the platform.	-The location is near a high traffic density road (Jl. Jombang Raya) and surrounded by some estates and residential areas. -There are various modes of transportation such as taxi, mikrolet and ojek. -Entrance to the station is very crowded owing to traffic and market activities. - It is near level crossing.
8	Rawa Buntu	-Building is old but has already undergone renovation and more buildings are added. -Have a wide land and station square.	-The location is near access ways of Buaran-Rawa Buntu, Bumi Serpong Damai Estate and Serpong-Jakarta Toll Road. -There are various modes of transportation such as mikrolet and ojek. -Entrance to the station is sort of hidden from view because of the flyover and the way to the entrance is damaged
9	Serpong	-Building is old but renovation has been done and more buildings are added. Have a wide land and station square. -Land on the station property is already developed for housing, shopping complex, etc.	-The location is near Jl. Serpong Raya and market. -Near level crossing of high traffic density and often congested. -There are various modes of transportation such as mikrobus, mikrolet and ojek. -Entrance to station is accessible.

*) Western Line

4.6 SIGNALING AND TELECOMMUNICATION

4.6.1 Condition of Existing Signaling and Telecommunication System

The current signaling system of SSI (Solid State Interlocking) of the Serpong Line (single track operation) has been operated and controlled from a station since the CTC was installed after the completion of the TOCS (Train Operation Control System) project which covers the loop line

area in the middle of 1999. The existing route between Tanah Abang and Serpong was equipped throughout with color light signals and power-operated point machines.

The Serpong Line takes its origin at the main Tanah Abang station, which provides a connection with the Western Line, Tanah Abang and Serpong. As trains have to circulate in both directions with the same headway on a single track, each section of single track between terminal stations (Tanah Abang and Serpong) and the next crossing station or between two successive crossing stations can only be run by one train in a given direction. The description of the existing signaling and telecommunication system of the Serpong Line is provided in Table 4.6.1 below:

Table 4.6.1 Condition of Existing Signaling and Telecommunication System(1/2)

No.	Items	Description
1	Basic Signaling System for the Serpong line	❖ The line operation is placed under the control of a line traffic controller in Manggarai. ❖ The line traffic controller keeps contact with each station operator through the telecommunication system. ❖ The line traffic controller is provided with panel controller from which he can control and monitor the complete line. ❖ Each station operator is provided with panel controller from which he can control and monitor the crossing station.
2	Interlocking Equipment	This is the vital part and it interfaces with the trackside equipment with safety relays or solid-state components and with the fail-safe principle. The controlling elements of the electronic interlocking are three multiprocessor configured as interlocking modules as follows: 1. The interlocking modules are responsible for the safe execution of all interlocking logic and issue of the correct instructions (telegrams) to line side equipment. 2. The interlocking modules are responsible for the control of the timing of all communications within the system and management of redundancy system. 3. The interlocking modules have the capability to continue to work as a duplicated system on failure of the first modules.
3	Equipment for Control and Monitoring	Control and Display panel or Visual display unit with control
4	Signals	❖ Display of information to the train drivers: -Signal with colored light units: 1. Speed limit markers 2. Shunting limit markers 3. Miscellaneous boards or marker ❖ Signals are installed on mast, fitted with rungs to enable access to the light boxes. ❖ For main signal, an approximate height of 3.660 m between the rail rolling surface and the centerline of the first light unit. For a shunting signal, an approximate height of 2.929 m or 3.50 m between the rail rolling surface and the centerline of the first light unit.

Table 4.6.1 Condition of Existing Signaling and Telecommunication System(2/2)

5	Visibility	❖ Main Signal (red, yellow, green) : 600m ❖ Shunting Signal : 200m ❖ Emergency : 100m ❖ Variable speed limit indicator : 350m ❖ Speed limit sign : 200m
	Point Machines	❖ Trailable type with internal locking ❖ Power supply voltage: 3-phases, 380 VAC/50Hz. ❖ A minimum throwing force of 350 Kg.f ❖ A minimum retention force of 700 Kg.f
7	Track Circuit (TC)	❖ High Voltage Impulse type with insulating mechanical joint ❖ The minimum length of 20 m.
8	Panel Controller in station	❖ 2 IBM PC Compatible CPU (Redundancy) ❖ Main Processor 486 DX2 33 MHz. ❖ 16 Mb of RAM ❖ Hard Disk of 120 Mb ❖ 3 ½" Disk Drive ❖ Communication managed by a separate processor board ❖ Passive bus to facilitate connective and scheduled maintenance. ❖ 1 keyboard & 1 track ball 1 20' SVGA Color Monitor (VDU)
9	Panel Controller in CTC	❖ 1 IBM PC Compatible CPU (Redundancy) ❖ Main Processor 486 DX2 33 MHz. ❖ 16 Mb of RAM ❖ Hard Disk of 120 Mb ❖ 3 ½" Disk Drive ❖ Communication managed by a separate processor board ❖ Passive bus to facilitate connective and scheduled maintenance. ❖ 1 keyboard & 1 track ball ❖ 1 20' SVGA Color Monitor (VDU)
10	LVP (Signal Cabin)	There are five units of LVP (Equipment Room): 1. Serpong Station (23k139) 2. Sudimara Station (17k229) 3. Pondok Ranji Station (13k016) 4. Kebayoran station (6k800) 5. Palmerah station (3k062)
11	Power Supply	Signaling installations inside low voltage premise (LVP) was supplied from a 220-380 VAC/50 Hz three-phase feeder coming from the utility substation. The diesel generator set was provided in each low voltage premise as a reserve in case of PLN power failure. A master power supply cabinet consists of: ❖ Power supply of the track circuit ❖ DC power supply (One transformer-rectifier set with storage battery) ❖ Power supply of point motors ❖ Power supply of signal lights and indicator ❖ Power supply of control display panel
12	Telecommunication	❖ The transmission support consisting of: - 28 Pairs telephone cable, connecting in serial all low voltage premises from Tanah Abang - 8 Pairs telephone cable, connecting each Rectifier Substation (RSS) to the nearest low voltage premise - 12 Optic fiber cable linking the CTS to the Signal Boxes

4.6.2 Existing Condition of Substations and Catenary

The Power Supply network to support railway operation on the Serpong line needs a Traction network, transforming from PLN the 20 kV power network into 1500 V DC.

The first stage encompasses the entire length of the layout which was fitted only with a single track during the rehabilitation phase, hereinafter called Single Track Improvement (STI).

(1) Characteristics of Rectifier Substation

- No Load Voltage : 1,680 V
- Voltage/Current : 30 V/KA
- Nominal Power : 3000 KW
- Internal resistance : 30 mΩ

Four Rectifier Substations have been realized in rehabilitation phase (i.e., Karet, Limo, Jurang Mangu and Serpong). Each Rectifier Substation delivers 1500 V DC traction power through a transformer rectifier set with 3000 KW rated power.

The two end substations generate through a 20/6 kV transformer, the 6 kV power supplying the utilities substations (USS) to be installed near the passenger stations: Palmerah – Limo – Kebayoran – Pondok Betung – Bintaro - Pondok Ranji – Jurang Mangu – Sudimara – Ciater – Rawa Buntu – Serpong.

Each USS will also be completed with equipment that transform the 6 kV network into 220 V/380 V and will distribute the power required for operation of the stationary installations (lighting, control and monitoring circuit, signaling, telecommunication, etc).

Table 4.6.2 Existing Rectifier Substation

No.	RSS	Capacity (KW)	Output Voltage (V)	PLN Connection (KVA)
1	KARET	3,000	1,500	4,500
2	LIMO	3,000	1,500	4,000
3	JURANG MANGU	3,000	1,500	4,000
4	SERPONG	3,000	1,500	2,425

(2) UTILITY SUBSTATION CHARACTERISTICS

- Input Voltage : 6 kV AC
- Output Voltage : 220 / 380 VAC
- Power : 100 KVA

Seven Utility Substations have already been installed during rehabilitation phase (i.e., Palmerah, Limo, Kebayoran, Pondok Ranji, Jurang Mangu, Sudimara, Serpong).

Table 4.6.3 Existing Utility Substation

No.	USS	Capacity (KW)	Output Voltage (V)	Utility PLN Connection (KVA)
1	PALMERAH	100	220 / 380	-
2	LIMO	100	220 / 380	-
3	KEBAYORAN LAMA	100	220 / 380	-
4	PONDOK RANJI	100	220 / 380	-
5	JURANG MANGU	100	220 / 380	-
6	SUDIMARA	100	220 / 380	-
7	SERPONG	100	220 / 380	-

(3) Overhead Catenaries

Characteristics of catenary system of the Serpong Line are as follows:

- 1 Messenger Wire 116.24 Sq. mm (Conductibility 72%) = 84 Sq mm
- 2 Contact Wires 107 Sq mm (Conductibility 98%) = 210 Sq mm
- 1 Feeder 261.54 Sq. mm (Conductibility 98%) = 256 Sq mm

Table 4.6.4 Characteristics of the Existing Catenary

Characteristic of Conductor	Messenger (Bronze 72%)	Contact Wire Hard Drawn Cu	Feeder Hard Cooper
Section	116.24 Sq mm	107 Sq mm	261.54 Sq mm
Diameter	14 mm	12,24	21 mm
Composition	37 Strands 2 mm	Grooved	37 Strands 2 mm
Meter Weight	108 kg/m	0.952 Kg/m	2,375 Kg/m
Minimum Breaking Load	6720 daN	3720 daN	9100 daN
Electrical Expansion coefficient γ	17×10^{-6}	17×10^{-6}	17×10^{-6}
Elongation Coefficient λ	118×10^{-6}	91×10^{-6}	118×10^{-6}
Mechanical Tension at + 30 ^{o} C	1650 daN	1100 daN	
Safety Coefficient	> 3	>2,2	>3

4.7 EXISTING CONDITIONS OF ACCESS ROADS TO RAILWAY STATIONS AND STATION SQUARES ON THE CORRIDOR

4.7.1 Access Roads and Station Squares

Table 4.7.1 Existing Conditions of Access Roads and Station Squares

Line	No.	Station	Access Roads	Station Squares
Serpong Line	1	Tanah Abang	There are problems on alignment and traffic management on access road in the south, though 4-lane road is provided in front of the rail station. These have resulted in traffic disorder.	There is no station square and road sides are used by Angkot for boarding and alighting of passengers.
	2	Palmerah	Three-lane road with a one-way regulation is provided on both sides of the station.	There is no station square and road side is used for boarding and alighting by Angkot and buses.
	3	Limo New Station	Three-lane road with a one-way regulation is provided on both sides of the station.	There is no square due to new station.
	4	Kebayoran Lama	Roads are provided on both sides of the station. Many markets are concentrating at the west side of the station. A one-way, two-lane road is provided along the station but the width is narrow and the road is always congested.	There is no station square and road side is used for boarding and alighting by Angkot and buses.
	5	Pondok Betung New Station	The railway station is connected by a narrow two-lane road.	There is no square due to new station.
	6	Bintaro New Station	Comparatively wide two-lane road is provided. Traffic is not much.	There is no square due to new station.
	7	Pondok Ranji	Two-lane road is provided crossing the railway. Road width is narrow at the south side.	There is a square with around 2,000 m2.
	8	Jurang Manggu New Station	Two-lane road is provided crossing the railway. Traffic is not much.	There is no square due to new station.
	9	Sudimara	Narrow two-lane road is provided crossing the railway but it is very inconvenient due to crank-type connection.	There is a square with around 3,000 m2.
	10	Ciater New Station	Two-lane road is provided crossing the railway.	There is no square due to new station.
	11	Rawabuntu	Narrow road with 2-3m width and unpaved is connected to the railway station.	There is a square with 800 m2 but all users have to cross the railway.
	12	Serpong	Narrow road is connected to the railway station from two-lane road crossing the railway.	There is a rather large square with 4,000 m2.
West Line	13	Karet	Six-lane road is provided at the south side of the railway station.	There is no square.
	14	Sudirman	Arterial road, Jl. Sudirman, is crossing the railway.	There is no square.
	15	Rasuna Said New Station	Arterial road, Jl. Rasuna Said, is crossing the railway.	There is no square due to new station.
	16	Mampang	Six-lane road is provided at the south side of the railway station and a two-lane district road is provided at the north side.	There is no square.

4.7.2 Current Bus Services on the Corridors

(1) Serpong Line

1) Current Bus Route

Bus service routes are illustrated in Figures 4.7.1 to 4.7.10 and characteristics of each bus service are described as follows:

a. Patas AC and Patas

Although the east-side stations of Kebayoran station has some Patas AC and Patas bus routes, no route can be seen at the west-side stations of Kebayoran station.

b. Regular Bus

Regular bus routes have a similar pattern to those of Patas AC and Patas. However, some regular bus routes are serving Serpong Station.

c. Medium Bus

Medium bus routes are serving to the west beyond Kebayoran station and reaching Pondok Ranki station. There is, however, no route in the west-side of Pondok Ranji station.

d. Small Bus

Small bus routes cover almost all of the existing rail stations on the Serpong Line up to Parung Panjang station.

2) General View

It is obvious that the bus routes by type are sharing their roles depending on the size of buses, passenger demand and road conditions. Large buses like Patas AC and Pata are covering the area near the center of DKI Jakarta because it has high passenger demand and comparatively wide roads, which enable large buses to operate.

On the other hand, most roads along the Serpong Railway Line are two lanes and narrow for large buses to pass through. Main railway stations on the Serpong Line are served by small buses like Angkot and Mikrolet due to these road conditions. In other words, passenger transportation to the railway station has some limitations in carrying capacity due to the narrow width of access roads at present.

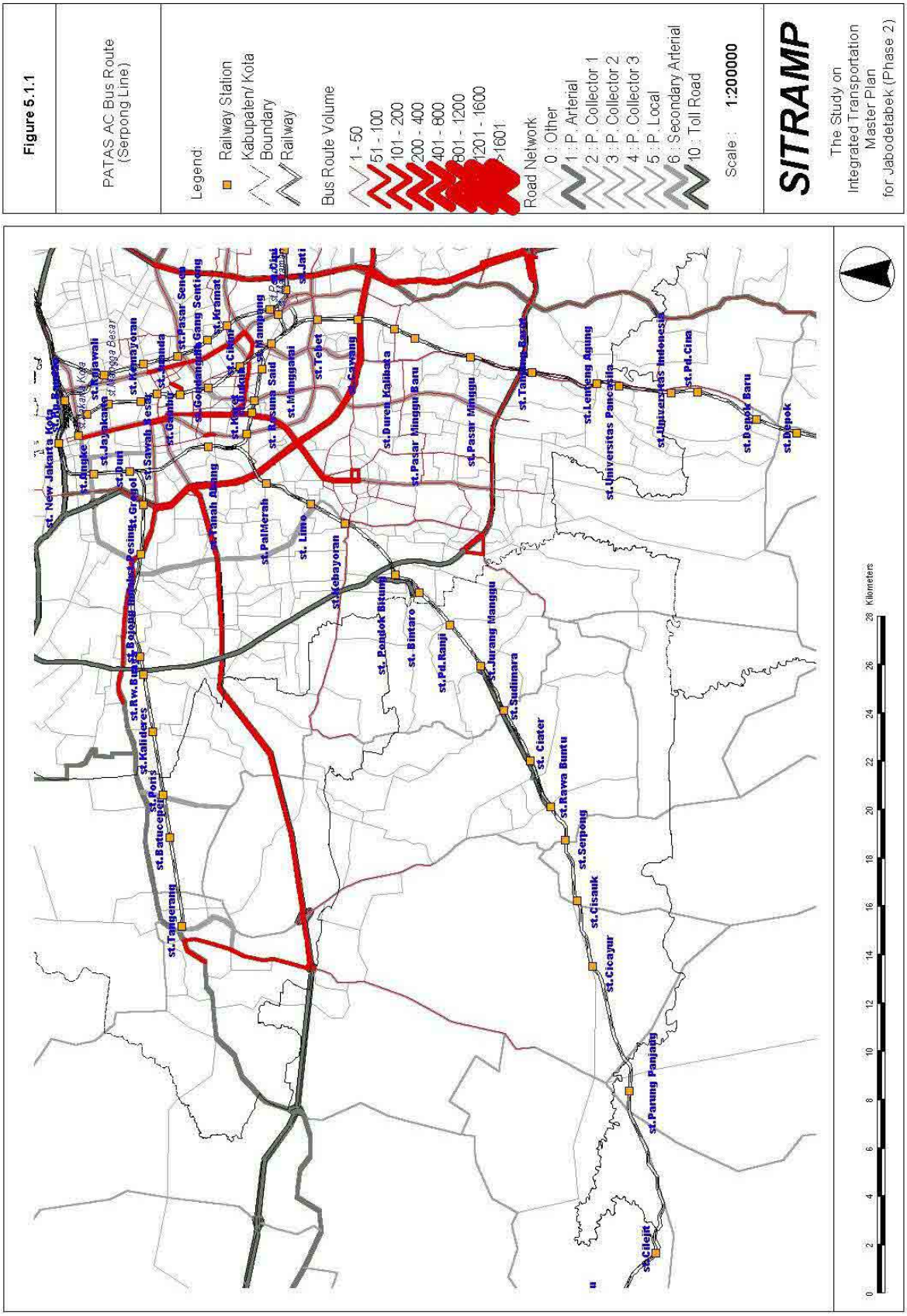

Figure 4.7.1 Patas AC Route (Serpong Line)

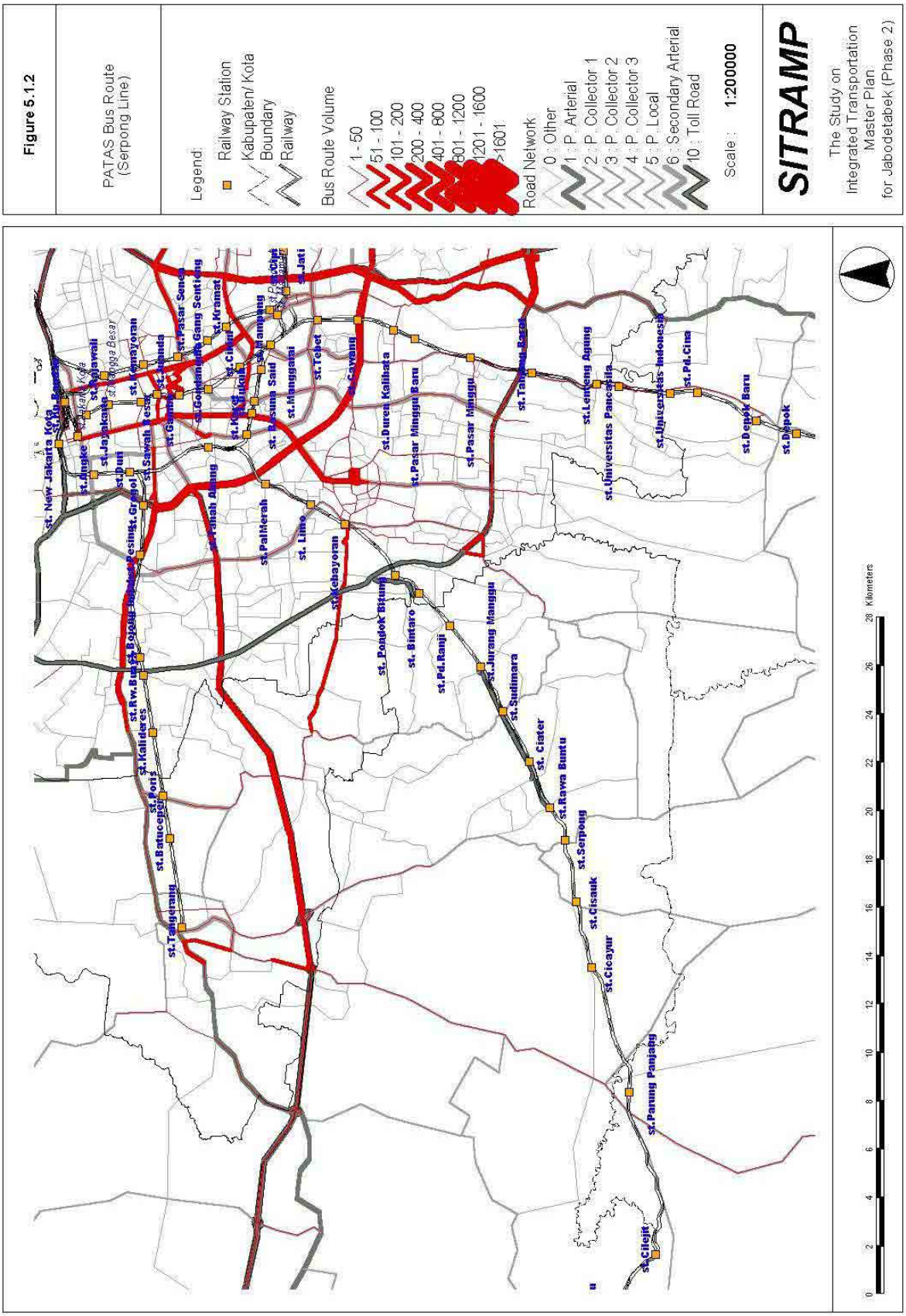

Figure 4.7.2 Patas Route (Serpong Line)

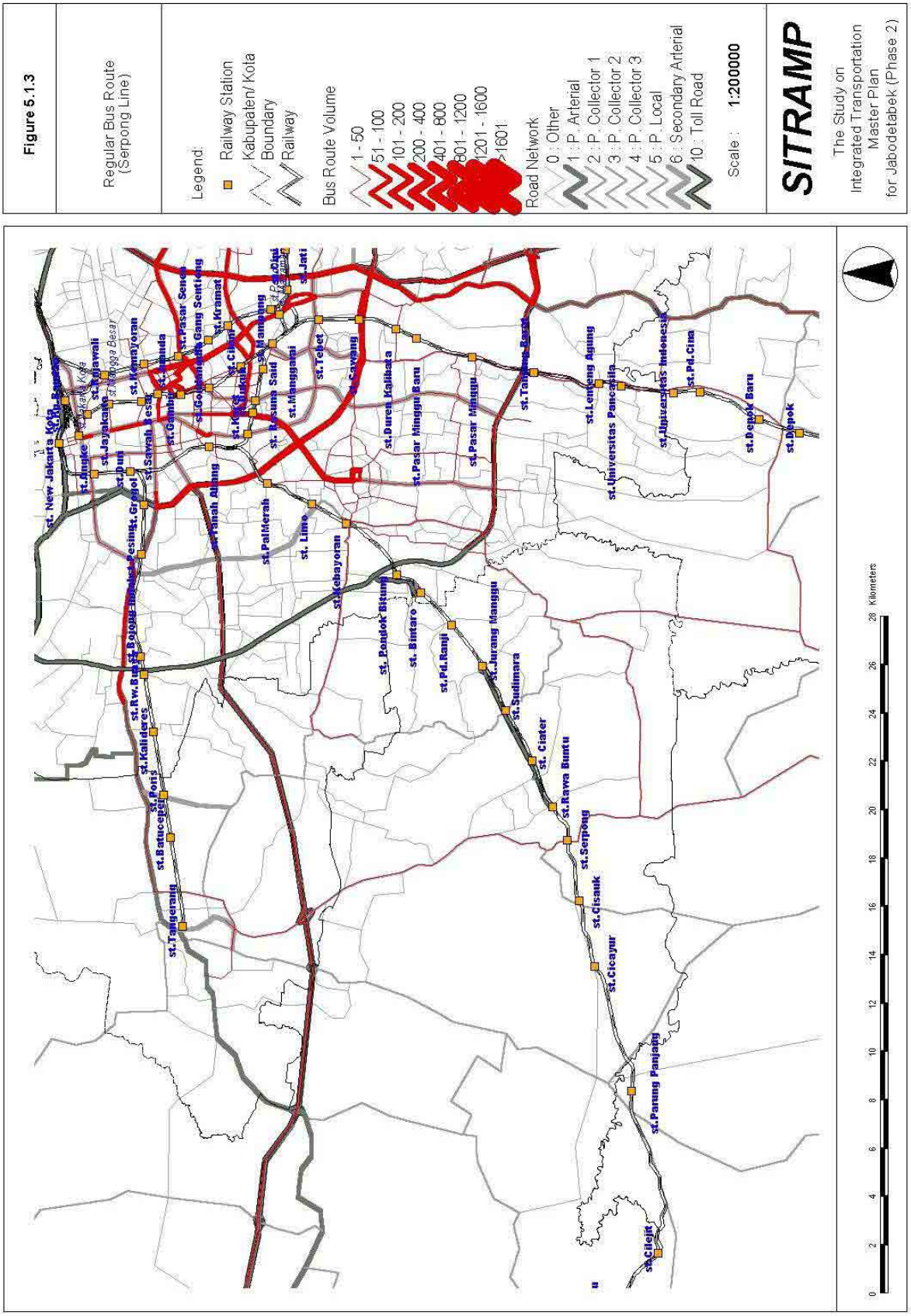

Figure 4.7.3 Regular Bus Route (Serpong Line)

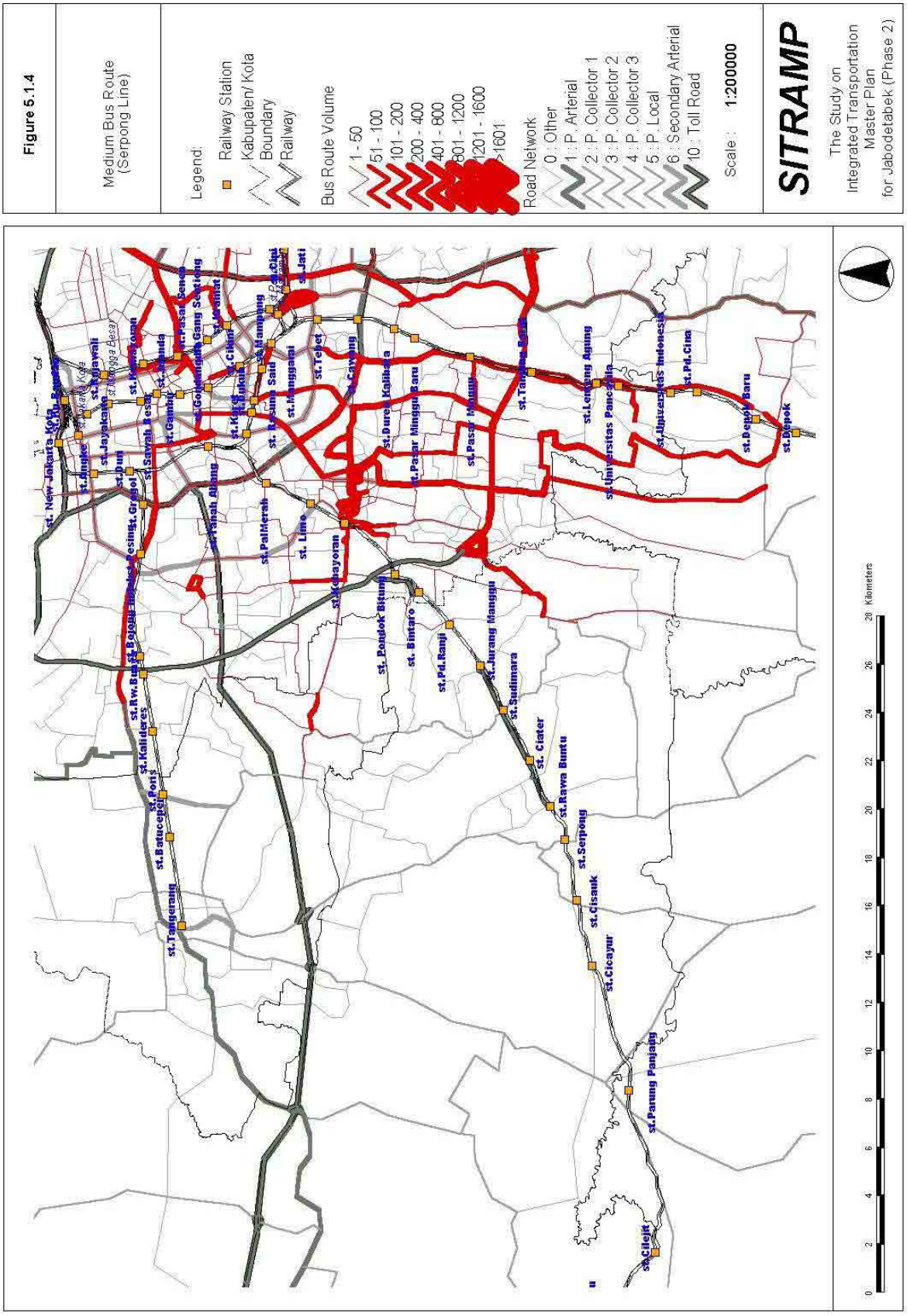

Figure 4.7.4 Medium Bus Route (Serpong Line)