

APPENDIX 5

ROAD AND TRANSPORT

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CHAPTER 1 SITUATIONS OF ROADS AND OTHER TRANSPORT FACILITIES BEFORE DISASTER

1.1 PUBLIC TRANSPORT IN KOTA BANDA ACEH

In Kota Banda Aceh, road transport is most common means of transport. The public transport is served by both Kota Banda Aceh and by private firms as described below.

(1) Bus Service in Banda Aceh City

There are two types of bus services in Kota Banda Aceh. One is by Damri (National bus, about 50 seats capacity) and the other is Labi-labi (Private small bus, 10 seats capacity). Before disaster 20 Damri buses were operated along 10 routes and about 1,300 of Labi-labi along 8 routes before tsunami. Both bus systems start from the PMABS bus terminal located near to the Grand Mosque.

The operation time of Damri is 7:00-17:00 and its fare is Rp.500 flat, while those of Labi-labi are 6:00-21:00 and Rp.1,000-2,000, respectively.

Table 1.1 Bus Services in Kota Banda Aceh

(1) Damri

seq.	Destination	Operation after Disaster(As of May 2005)
1	Darussalam	Operating
2	Batoh	Operating
3	Mata Ie	Operating
4	Lampeunerut	Operating
5	Kr.Raya	Not operating
6	Ulee Kareeng	Not operating
7	Jantho	Not operating
8	Lho'nga	Not operating
9	Blang Bintang	Not operating
10	Ulee Lheue-Lamjame	Not operating

Source: JICA Study team, as of May 2005

(2) Labi-labi

seq.	Route No.	Destination	Operation after Disaster (As of May 2005)
1	01	Sibreh	Operating
2		Montasik	Operating
3		Seulimum	Operating
4		Jantho	Operating
5		Samahani	Operating
6		Lambaro-Blang Bintang	Operating
7	02	Darussalam	Operating
8		Lampineung	Operating
9		Kr. Cut	Operating
10		Kr.Raya	Operating
11	03	Keutapang	Operating
12		Mata Ie	Operating
13	04	Stui-Lamteumen	Operating

14		Lamlom-Lho'nga	Operating
15	05	Ulee Lheue	Not operating
16	06	Ulee Kareeng	Operating
17		Ulee Kareeng-Lam Ateuk	Operating
18	07	Lampeunerut	Operating
19	08	Lambaro	Operating

(2) Intercity bus services

The inter city bus services are available by L300 (van type, 9seats capacity) from the PMABS and MINIBUS terminal, by Biuren Express (microbus type, 20 seats capacity) from the PEUNITI terminal, and by a large buses (40 seats capacity) from SETUI terminal are operating as the intercity buses.

Table 1.2 Route Information (Intercity Bus)

(a) PMABS terminal (L300 type bus)

Company	Destination	Operation	Fare (Rp)
Independent	Calang	1 round /day /bus × 1 bus/destination	70,000-80,000
	Lamno		20,000
	Lhong		10,000-15,000

(b) MINIBUS terminal (L300 type bus)

Company	Destination	Operation	Fare (Rp)
Bintang Lestari	Meulaboh Blang Pidie Alue Bilie Manggeng Tapak Tuan Kota Fajar Bakongan Sulussalam Singkil	1 round /day /bus X 4 buses/destination	100,000-160,000
Mandala	Medan Meulaboh Blang Pidie Tapak Tuan Kota Fajar Singkil	1 round /day /bus X 3-4buses/destination	100,000-150,000

(c) SETUI terminal (Large bus)

Company	Destination	Operation	Fare (Rp)
Pelangi	Medan	1 round/day x 8buses	70,000-100,000
Kurnia		1 round/day x 21buses	70,000-100,000
Pmtoh		1 round/day x 4buses	60,000-70,000

(d) PEUNITI terminal (Biuren express)

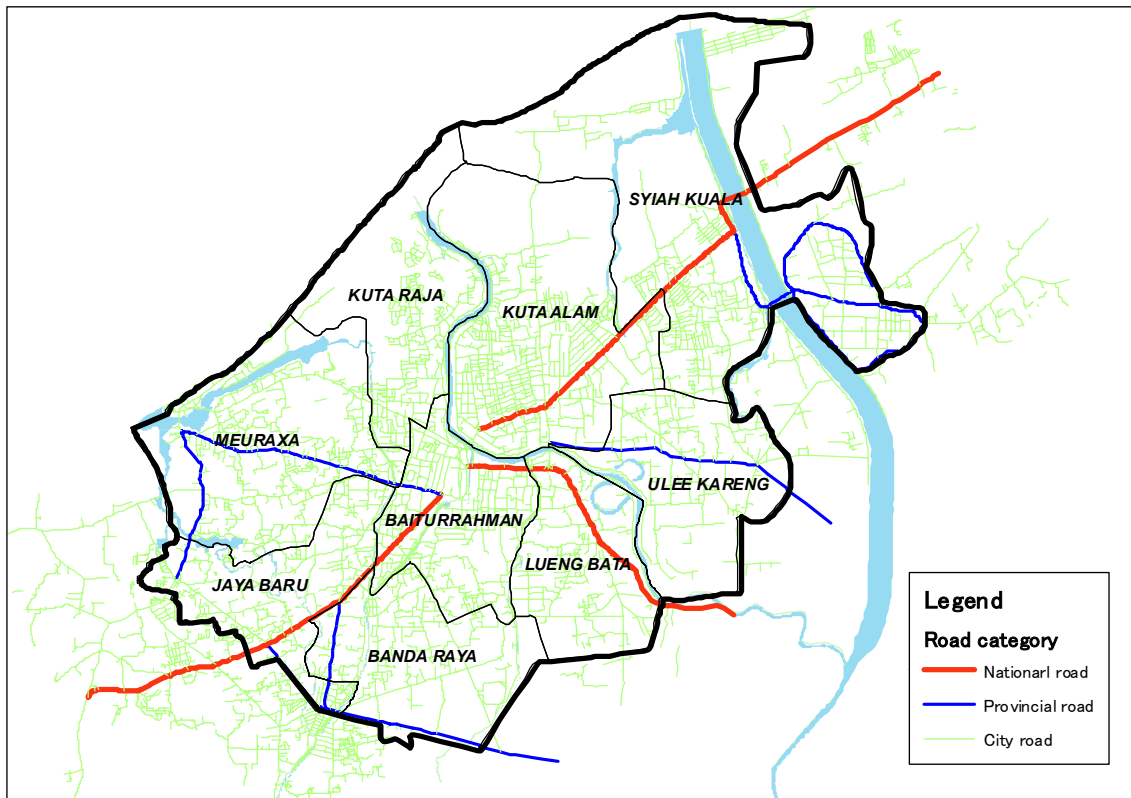
Company	Destination	Operation	Fare (Rp)
Cendrawasih Bus	Biuren	1 round /day x 5buses	10,000-30,000

Source: JICA Study team, as of May 2005

1.2 ROADS

1.2.1 Road Classification by Administrative Category

Before disaster, total length of the road network in Banda Aceh City was about 495km, consisting of the national roads of 12.7 km, the province roads of 22.4km and the city roads of 460 km. Figure 1.1 shows the road network before disaster.



Source: JICA Study team

Figure 1.1 Roads by Categories

1.2.2 Road Classification by Function

On the other hand from viewpoint of functions of roads the roads could be classified into (1) main arterial road (18km), arterial road (29km), sub-arterial road (30km) and access road (418km). The characteristics of the respective category are as summarized below.

(1) Main arterial road

It connects Kota Banda Aceh with other major cities/towns outside its boundaries and has major role to handle intercity traffics. The numbers of lane are 4 or more.

(2) Arterial road

It links one center to another within Kota Banda Aceh and has the numbers of lane of 2 or 4.

(3) Sub-arterial road (collector road)

It has a role to complement the arterial roads and has the numbers of lane of 2 or 4.

(4) Access road (street)

Access road is defined that is to handle the traffics of going in and out from the buildings.

Table 1.3 and Figure 1.2 present the road classification by the above definition.

Table 1.3 Road Lengths by Road Classification

	Main arterial road (km)				Arterial road (km)				Collector road (km)				Street (km)			
	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %
MEURAXA	0.0	0.0	0.0	-	7.6	0.5	8.0	5.9	0.0	0.0	0.0	-	1.2	55.3	56.5	97.9
JAYA BARU	3.5	0.0	3.5	0.0	1.5	0.7	2.1	31.0	0.5	0.0	0.5	0.0	13.3	27.3	40.6	67.3
BANDA RAYA	2.1	0.0	2.1	0.0	2.6	0.0	2.6	0.0	4.1	0.0	4.1	0.0	32.3	0.0	32.3	0.0
BAITURRAHMAN	3.3	0.0	3.3	0.0	1.9	0.0	1.9	0.0	5.2	1.0	6.2	16.2	43.9	3.3	47.2	7.0
LUENG BATA	2.8	0.0	2.8	0.0	0.3	0.0	0.3	0.0	3.9	0.0	3.9	0.0	28.7	0.0	28.7	0.0
KUTA ALAM	3.6	0.0	3.6	0.0	5.4	0.0	5.4	0.0	6.5	1.1	7.6	14.2	45.5	25.0	70.5	35.4
KUTA RAJA	0.0	0.0	0.0	-	0.6	0.0	0.6	0.0	0.7	0.0	0.7	0.0	5.7	33.7	39.4	85.5
SYIAH KUALA	2.2	0.0	2.2	0.0	4.3	0.0	4.3	0.0	4.0	0.0	4.0	0.0	50.4	24.4	74.8	32.6
ULEE KARENG	0.0	0.0	0.0	-	3.7	0.0	3.7	0.0	3.1	0.0	3.1	0.0	28.0	0.0	28.0	0.0
TOTAL	17.6	0.0	17.6	0.0	27.7	1.1	28.8	3.9	27.9	2.1	29.9	7.0	249.1	169.0	418.1	40.4

Source: JICA Study team



(Source: JICA Study team)

Figure 1.2 Classification of Roads

1.2.3 Roads Classification by Width

In order to facilitate future road development, existing roads are mapped out by their width as shown in Figure 1.3, 1.4 and Table 1.4.

Table 1.4 Road Lengths by Road Width

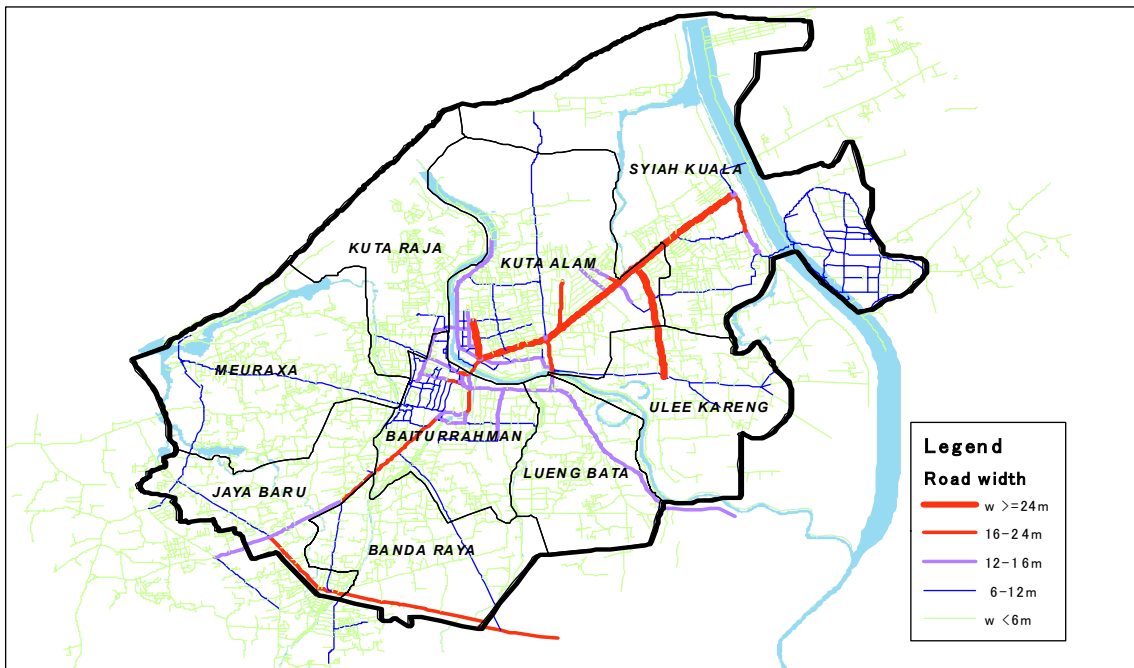
UNIT=km

	w>=24m	18-24m	12-18m	6-12m	w<6m	Total
MEURAXA	0.0	0.0	0.0	5.4	59.1	64.5
JAYA BARU	0.0	2.0	1.5	2.9	40.3	46.8
BANDA RAYA	0.0	2.1	0.0	3.7	35.3	41.1
BAITURRAHMAN	0.0	2.0	4.8	11.5	40.2	58.5
LUENG BATA	0.0	0.1	3.1	0.0	32.6	35.7
KUTA ALAM	4.9	1.7	5.9	10.6	64.0	87.1
KUTA RAJA	0.0	0.0	0.7	1.5	38.5	40.6
SYIAH KUALA	1.3	0.6	0.5	19.4	63.6	85.3
ULEE KARENG	0.9	0.0	0.0	3.6	30.3	34.7
TOTAL	7.0	8.6	16.5	58.5	403.9	494.5

UNIT=%

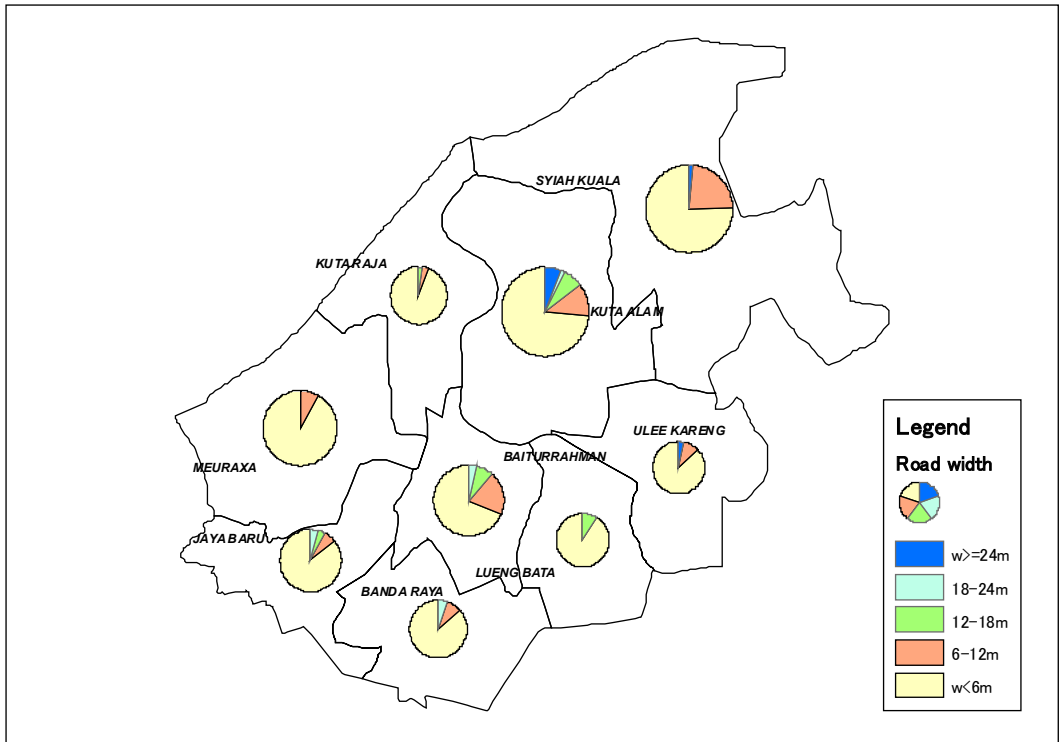
	w>=24m	18-24m	12-18m	6-12m	w<6m	Total
MEURAXA	0.0	0.0	0.0	8.4	91.6	100.0
JAYA BARU	0.0	4.3	3.3	6.2	86.2	100.0
BANDA RAYA	0.0	5.1	0.1	8.9	85.9	100.0
BAITURRAHMAN	0.0	3.5	8.3	19.6	68.6	100.0
LUENG BATA	0.0	0.2	8.6	0.0	91.2	100.0
KUTA ALAM	5.6	2.0	6.8	12.2	73.4	100.0
KUTA RAJA	0.0	0.0	1.7	3.6	94.7	100.0
SYIAH KUALA	1.5	0.8	0.6	22.7	74.4	100.0
ULEE KARENG	2.5	0.1	0.0	10.3	87.1	100.0
TOTAL	1.5	1.7	3.3	11.8	81.7	100.0

Source: JICA Study team



Source: JICA Study team

Figure 1.3 Roads by Width



Source: JICA Study team

Figure 1.4 Road Length by Road Width

1.2.4 Road Classification by Numbers of Lane

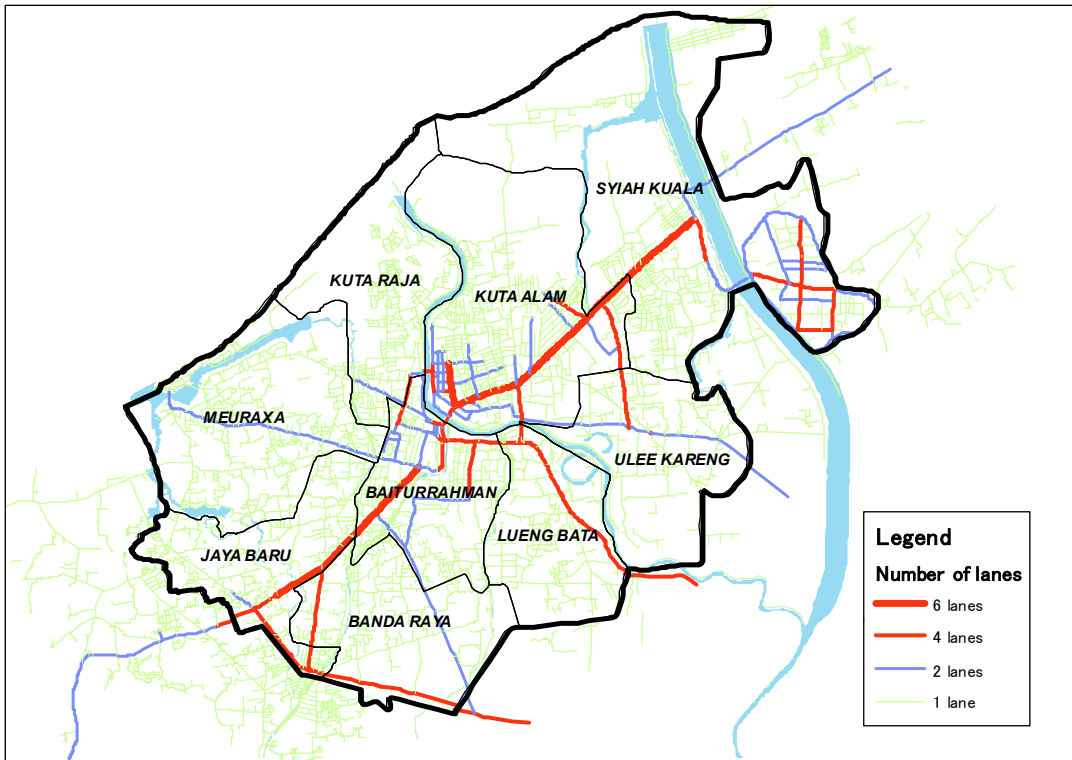
Road classification by the numbers of lane is Table 1.5 and Figure 1.5 and 1.6.

Table 1.5 Road Lengths by Lanes

UNIT=km					
	6 lanes	4 lanes	2 lanes	1 lane	Total
MEURAXA	0.0	0.0	3.4	61.1	64.5
JAYA BARU	1.4	2.6	0.4	42.4	46.8
BANDA RAYA	0.1	3.1	2.6	35.3	41.1
BAITURRAHMAN	1.3	3.1	7.2	46.9	58.5
LUENG BATA	0.0	3.1	0.0	32.6	35.7
KUTA ALAM	3.9	2.9	11.0	69.3	87.1
KUTA RAJA	0.0	0.5	0.8	39.4	40.6
SYIAH KUALA	1.3	4.6	10.1	69.4	85.3
ULEE KARENG	0.0	1.0	2.7	31.1	34.7
TOTAL	8.0	20.8	38.2	427.5	494.5

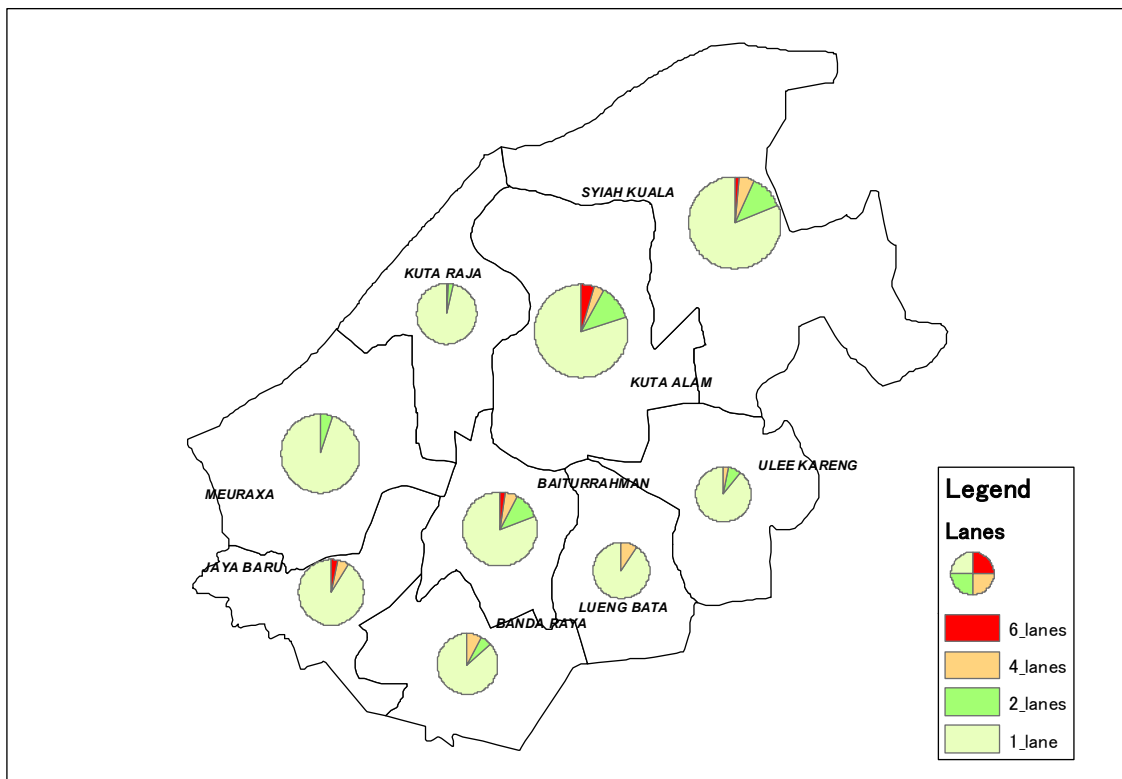
UNIT=%					
	6 lanes	4 lanes	2 lanes	1 lane	Total
MEURAXA	0.0	0.0	5.3	94.7	100.0
JAYA BARU	2.9	5.5	1.0	90.6	100.0
BANDA RAYA	0.3	7.5	6.3	85.9	100.0
BAITURRAHMAN	2.3	5.2	12.3	80.2	100.0
LUENG BATA	0.0	8.8	0.0	91.2	100.0
KUTA ALAM	4.5	3.3	12.7	79.5	100.0
KUTA RAJA	0.0	1.1	1.9	97.0	100.0
SYIAH KUALA	1.5	5.4	11.8	81.3	100.0
ULEE KARENG	0.0	2.8	7.8	89.4	100.0
TOTAL	1.6	4.2	7.7	86.5	100.0

Source: JICA Study team



Source: JICA Study team

Figure 1.5 Road Classification by Numbers of Lanes



Source: JICA Study team

Figure 1.6 Road Length by Lanes

1.2.5 Road Traffic Volume

Aceh city office conducted the traffic counts on the some intersections on the arterial roads before tsunami, but it was not enough to grasp the whole situation of traffics. Apparently morning peak is 7:30-8:30, and afternoon peak is 14:00-16:00.

In order to estimate the traffics in Banda Aceh City, the cumulative number of the driver's license from 1992 to 2004 that were issued by traffic police in Banda Aceh is used. (Table 1.6)

Motor cycle traffics account for about 50%, public transportation traffics account for 25% and car traffics account for the rest of the whole traffics in Banda Aceh City. Rate of truck traffics is very small.

Table 1.6 Cumulative Number of Driver's License in Banda Aceh

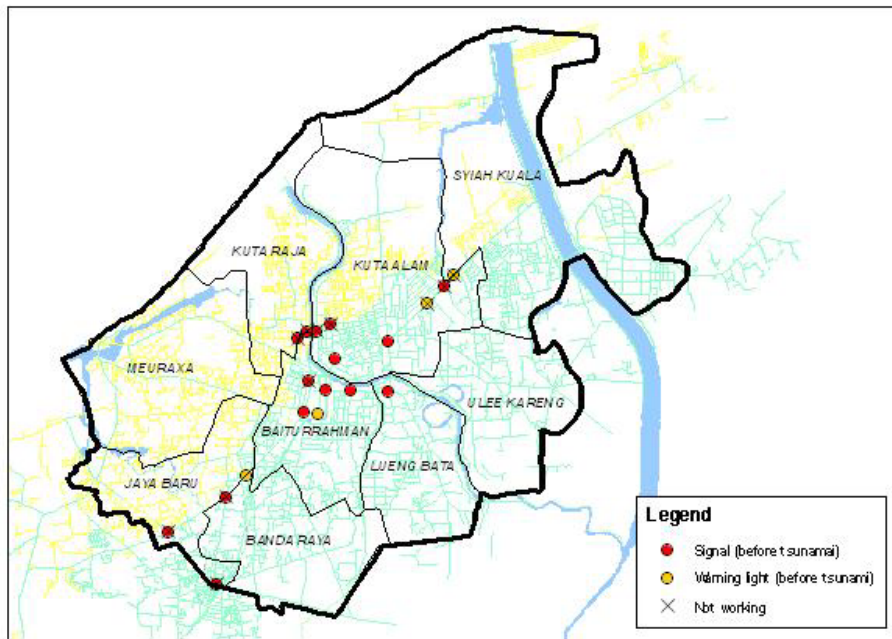
License type	Car type	Total of licenses issued	Proportion
A	Private car	61,637	22.6%
C	Private motor cycle	134,987	49.5%
B _{IP} /B _{IIP}	Private truck	11,223	4.1%
B _{IU} /B _{IUIU}	Public transportation (Various buses, taxi)	64,662	23.7%
AKHS	Becak (motored tricycle)	368	0.1%

Source: Traffic police in Banda Aceh

1.3 ROAD TRAFFIC FACILITIES

1.3.1 Traffic Control Facilities

There were 15 signals and 4 warning lights in Banda Aceh City as shown in Figure 1.7.



Source: JICA Study team

Figure 1.7 Road Signals

1.3.2 Bus and Truck Terminals

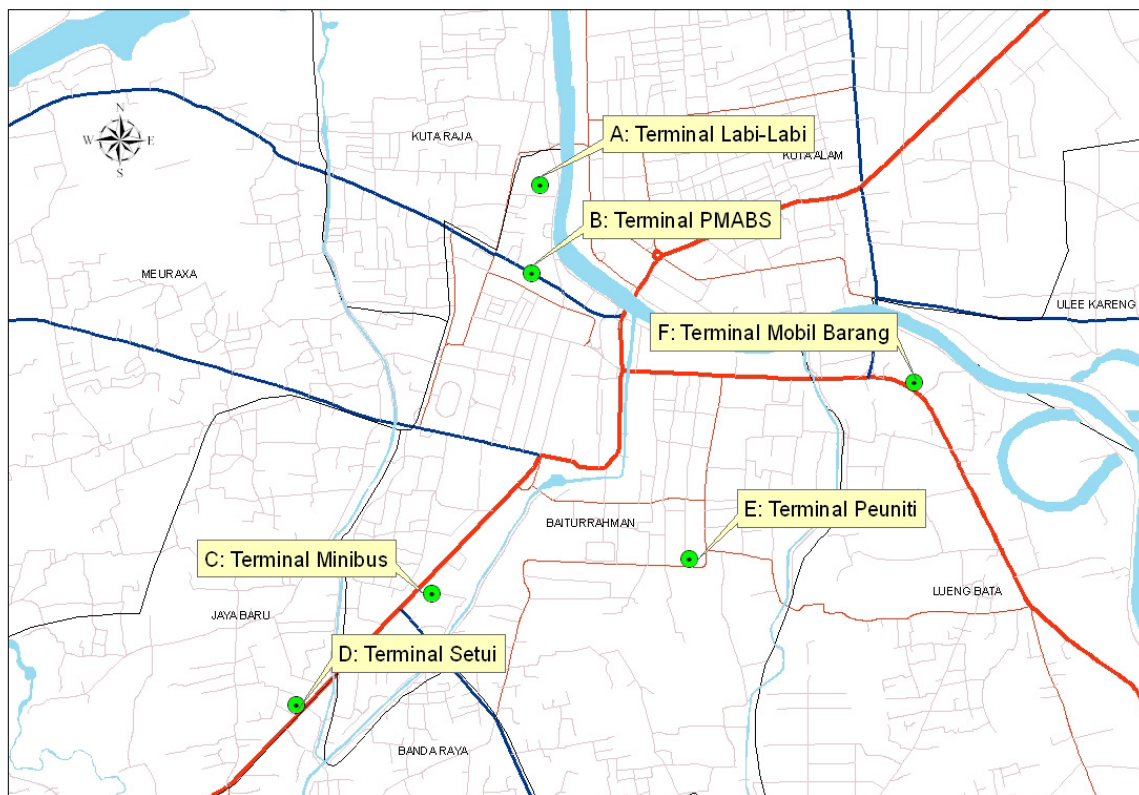
There are 5 bus terminals and 1 truck terminal in Banda Aceh City. Both the Labi-labi and the PMABS terminals are located in the downtown, and Minibus and Setui terminals are located along the national road to Meulaboh, while truck terminal is located along the national road to Medan.

Since a large number of buses are used to park on the roads in the vicinity of the PMABS terminal, they sometimes interfere with traffic flows.

Table 1.7 Characteristics of Bus and Truck Terminals

Name of terminals	Condition	Vehicle type	Remarks
A: LABI-LABI	bad	-	Collapsed and not usable.
B: PMABS	-	Damri, Labi-labi, L300	There is a small terminal behind the PMABS building, and L300s use it mainly.
C: MINIBUS	-	L300	Toilet and coffee shop are available.
D: SETUI	-	Intercity bus	Toilet, coffee shop and small mosque are available.
E: PEUNITI	-	Bireun Expres	This is used only morning and evening.
F: MOBIL BARANG	-	Truck	Toilet and coffee shop are available.

Source: The JICA Study Team



Source: JICA Study team

Figure 1.8 Location of Bus and Truck Terminals

1.3.3 Parking Lot

There are not sufficient parking lots in Banda Aceh City, in particular in the central area. It is commonly that a large number of cars park road side, resulting in hampering traffic flow and causing traffic jam.

1.4 FERRY SERVICES

There is ferry services between Kota Banda Aceh and Sabang Island, two (2) round trip services in a day. In Kota Banda Aceh a ferry terminal was existed at Ulee Lheue as seen in Figure. 1.10.



Source: JICA Study team

* Pre-tsunami road networks are drawn on the IKONOS post tsunami image.

Figure 1.9 Location of Ulee Lheue Ferry Terminal



Source: JICA Study team

Figure 1.10 Temporary Ulee Lheue Ferry Terminal

The capacity of each ferry is 200 and 300 people, and the average number of passengers is about 50-100 people.

CHAPTER 2 DISASTER DAMAGES ON ROADS AND OTHER TRANSPORT FACILITIES

2.1 DAMAGES ON ROADS

2.1.1 Damages on Roads

Damage on existing roads was assessed based on IKNOS satellite images taken before and after disaster, and its assessment is addressed in two different ways: One is damage assessment in view of administrative category such as the national, provincial and city roads and the other is in terms of functional classification such as main arterial road, arterial road, collector road and street.

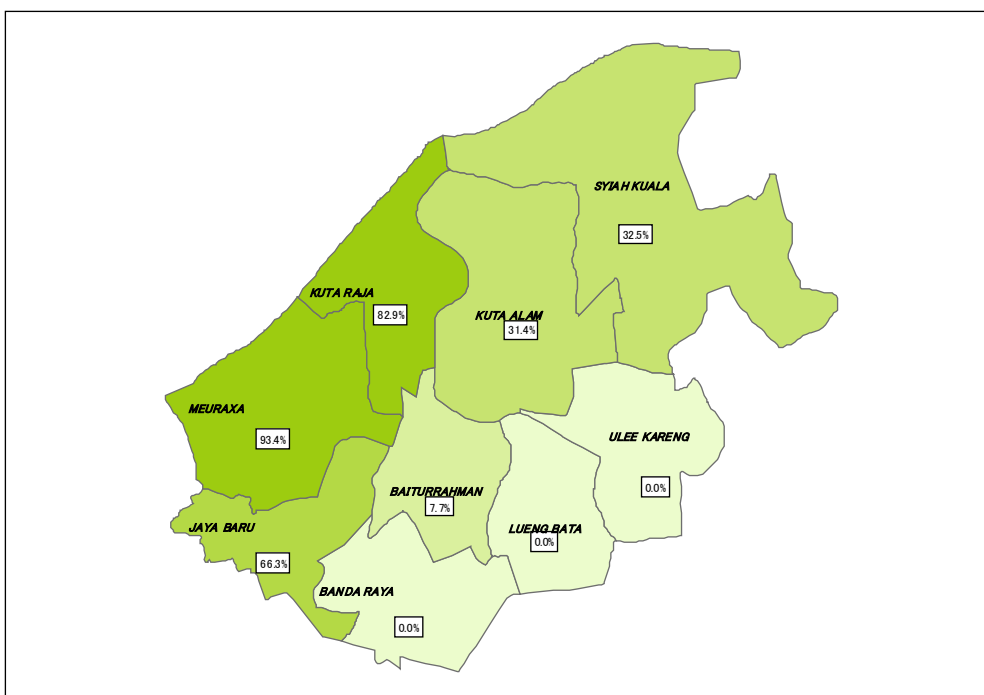
(1) Damage assessment on national, provincial and city roads

The result of the assessment is as shown in Table 2.1. There was fortunately no damages on the national and roads, while approximately 38% of the city roads are damaged to various degrees. Among 9 Kecamatan damages are serious in Meuraxa (93%), Kuta Raja (83.5) and Jaya Baru (66%). Aerial distribution of damages on the city roads is shown in Figure. 2.1.

Table 2.1 Road Lengths by Administrative Road Category and Their Damages

	National roads (km)				Provincial roads (km)				City roads (km)				Total (km)			
	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %
MEURAXA	0.0	0.0	0.0	-	4.8	0.0	4.8	0.0	4.0	55.8	59.7	93.4	8.7	55.8	64.5	86.4
JAYA BARU	2.1	0.0	2.1	0.0	2.5	0.0	2.5	0.0	14.3	28.0	42.3	66.3	18.8	28.0	46.8	59.8
BANDA RAYA	0.1	0.0	0.1	0.0	3.1	0.0	3.1	0.0	37.9	0.0	37.9	0.0	41.1	0.0	41.1	0.0
BAITURRAHMAN	2.2	0.0	2.2	0.0	0.6	0.0	0.6	0.0	51.5	4.3	55.7	7.7	54.3	4.3	58.5	7.3
LUENG BATA	2.8	0.0	2.8	0.0	0.0	0.0	0.0	-	32.9	0.0	32.9	0.0	35.7	0.0	35.7	0.0
KUTA ALAM	3.3	0.0	3.3	0.0	0.7	0.0	0.7	0.0	57.0	26.1	83.1	31.4	61.0	26.1	87.1	29.9
KUTA RAJA	0.0	0.0	0.0	-	0.0	0.0	0.0	-	6.9	33.7	40.6	82.9	6.9	33.7	40.6	82.9
SYIAH KUALA	2.2	0.0	2.2	0.0	8.0	0.0	8.0	0.0	50.7	24.4	75.1	32.5	60.9	24.4	85.3	28.6
ULEE KARENG	0.0	0.0	0.0	-	2.7	0.0	2.7	0.0	32.0	0.0	32.0	0.0	34.7	0.0	34.7	0.0
TOTAL	12.7	0.0	12.7	0.0	22.4	0.0	22.4	0.0	287.1	172.2	459.4	37.5	322.2	172.2	494.5	34.8

Source: JICA Study team



JICA Study team

Figure 2.1 Aerial Distribution of Damages on City Roads

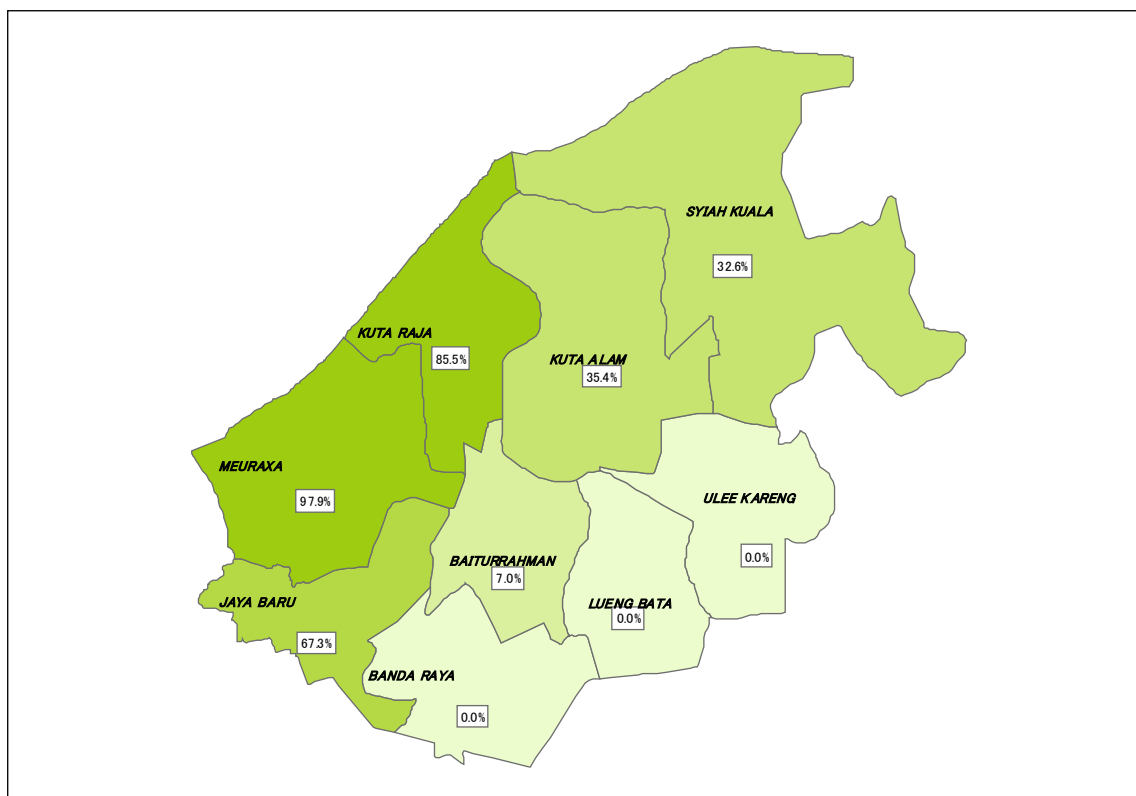
(2) Assessment in view of main arterial, arterial, and collector roads and street

There is no damage on main arterial road, while damages are observed on arterial, collector and street at rates of 4, 7 and 40% respectively. Breakdown of the damages among 9 Kecamatan is as shown in Table 2.2 and illustrated in Figure. 2.2.

Table 2.2 Damages on Roads (2)

	Main arterial road (km)				Arterial road (km)				Collector road (km)				Street (km)			
	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %	No damaged	Damaged	Total	Damage %
MEURAXA	0.0	0.0	0.0	-	7.6	0.5	8.0	5.9	0.0	0.0	0.0	-	1.2	55.3	56.5	97.9
JAYA BARU	3.5	0.0	3.5	0.0	1.5	0.7	2.1	31.0	0.5	0.0	0.5	0.0	13.3	27.3	40.6	67.3
BANDA RAYA	2.1	0.0	2.1	0.0	2.6	0.0	2.6	0.0	4.1	0.0	4.1	0.0	32.3	0.0	32.3	0.0
BAITURRAHMAN	3.3	0.0	3.3	0.0	1.9	0.0	1.9	0.0	5.2	1.0	6.2	16.2	43.9	3.3	47.2	7.0
LUENG BATA	2.8	0.0	2.8	0.0	0.3	0.0	0.3	0.0	3.9	0.0	3.9	0.0	28.7	0.0	28.7	0.0
KUTA ALAM	3.6	0.0	3.6	0.0	5.4	0.0	5.4	0.0	6.5	1.1	7.6	14.2	45.5	25.0	70.5	35.4
KUTA RAJA	0.0	0.0	0.0	-	0.6	0.0	0.6	0.0	0.7	0.0	0.7	0.0	5.7	33.7	39.4	85.5
SYIAH KUALA	2.2	0.0	2.2	0.0	4.3	0.0	4.3	0.0	4.0	0.0	4.0	0.0	50.4	24.4	74.8	32.6
ULEE KARENG	0.0	0.0	0.0	-	3.7	0.0	3.7	0.0	3.1	0.0	3.1	0.0	28.0	0.0	28.0	0.0
TOTAL	17.6	0.0	17.6	0.0	27.7	1.1	28.8	3.9	27.9	2.1	29.9	7.0	249.1	169.0	418.1	40.4

Source: JICA Study team



Source: JICA Study team

Figure 2.2 Damage Ratio on Streets

All most all the street in both Meuraxa and Kuta Raja Kecmatan were damaged.

2.2 DAMAGES ON BRIDGES

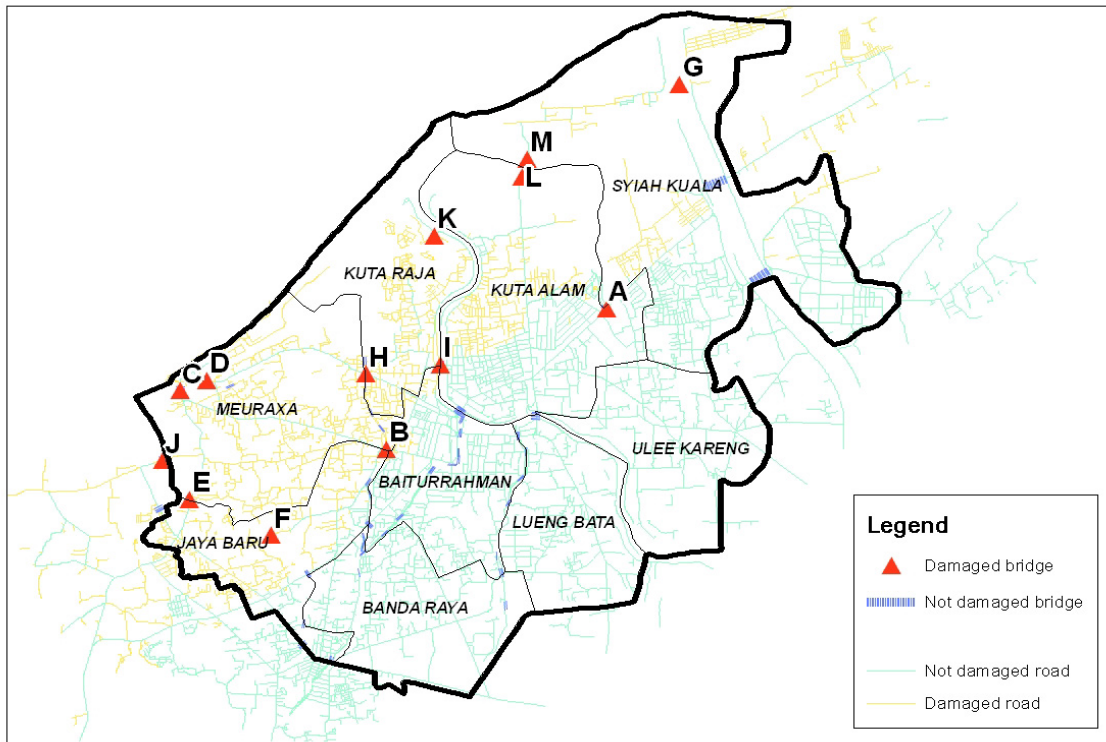
13 bridges are damaged in Banda Aceh City to various degrees as shown in Table 2.3. The location of such damages bridges are as seen in Figure. 2.3.

Table 2.3 Details of Damaged Bridges

No	Bridge Names	River/Path	Location/Road	Desa	Type	Long (m)	Wide (m)	Condition
A	Lamprit	Kr. Titi Panjang	○H.M. Daud Beureuh St.	Bandar Baru	Concrete	31	17	△
B	Punge I	Kr. Doy	○Slt. Iskandar Muda St.	Punge Jurong	Concrete	15	10	x→△fixed
C	Laguna I	Muara (Estuary)	○Slt. Iskandar Muda St.	Ulee Lheue	Concrete	64	7.5	△
D	Laguna II	Muara (Estuary)	○Rama Setia St.	Ulee Lheue	Concrete	40	6	x
E	Lamjame	Kr. Lamjame	○Soekarno-Hatta St.	Lamjame	Concrete	33	4	▲
F	Bitai	Kr. Neng	●Surin-Bitai St.	Bitai	Concrete →wood	8	5.5	x→▲fixed
G	Aleu Naga	Kr. Cut	●Alue Naga St.	Alue Naga	Concrete	325	2.5	x
H	Titi Tungkat	Kr. Doy	○Rama Setia St.	Lampaseh	Concrete	16	10	▲
I	Peunavong	Kr. Aceh	○Supratman St.	Peunavong	Concrete	102	17	△
J	Lamteh (Ulee Lheue)	Kr. Lamteh	●Lamteh St.	Gampong Blang	Concrete	40	4	x
K	TPA Kp. Jawa	Kp. Jawa Path	●TPA St.	Kampong Jawa	Concrete	20	7	△
L	Syiah Kuala I	Syiah Kuala Path	○Syiah Kuala St.	Lambaro Skep	Concrete	11	11	▲
M	Syiah Kuala II	Syiah Kuala Path	○Syiah Kuala St.	Deah Raya	Concrete	32	10	▲

Location/Road : ○: This road is specified as the (main) arterial road. ●: Others
Condition : △: Slightly damaged, ▲: Heavily damaged, x: Broken/fallen

Source: JICA Study team



Source: JICA Study team

Figure 2.3 Location of Damaged Bridges

Plunge I bridge on the Doy River and on the Sltn. Iskandar Muda street fallen down. In order to ensure traffic within the city, a temporarily bridge has been installed.

Laguna II bridge <D> on the Doy River and on Rama Setia street also fallen down. The road is still impassable as of July 2005.

Titi Tungkat bridge <H> on the same street and the same river was heavily damaged though it is passable.

Aleu Naga pedestrian bridge on Aceh floodway and Lamtech bridge on Kr. Lamtech also fallen down and they are still impassable.

2.3 DAMAGES ON ROAD TRAFFIC FACILITIES

2.3.1 Traffic Signs and Road Marking

469 of traffic signs and about 12km of road marking were set up in the Banda Aceh City, but 225 of traffic signs and about 6km of road marking were damaged by the disaster.

2.3.2 Bus and Truck Terminals

Labi-labi terminal was destroyed and now many of Labi-labi park on the nearby road in the vicinity of the PMABS. Also Damri and L300 park in front of the PMABS building and behind the PMABS building respectively.

2.3.3 Traffic Control Facilities

Out of 15 signals and 4 warning lights existing, 9 signals and 2 warning lights are out of order after disaster. The location of such signals and warning lights is shown in Figure. 1.7.

2.4 DAMAGES ON FERRY TERMINAL

The ferry terminal was completely destroyed including a new terminal building in progress. The land around the ferry site also subsided, and thus it is not possible to access to the original ferry site. The ferry services are however resumed by means of constructing temporary jetty as shown in Figure. 1.10.

CHAPTER 3 APPROACH TO REHABILITATION AND RECONSTRUCTION PLAN

3.1 MISSION, STRATEGY AND GOAL

Mission:

- To re-build efficient and effective transportation array within and to and from outside Kota Banda Aceh
- To restore main arterial and arterial roads promptly as possible to accelerate rehabilitation and reconstruction activities as a whole
- To be aligned systematically in conformity with the proposed urban development of Kota Banda Aceh and be effective in view of evacuation/relief against future possible disaster

Strategies:

- To rehabilitate ferry terminal to sustain to enhance economic development activities in harmony of Kota Banda Aceh and remote islands
- To employ local technology as much as possible in order to save rehabilitation and reconstruction cost
- To deploy priority implementation approach in order to minimize concentration of investment in short period

Goals:

- To rehabilitate substantial portion of main arterial and arterial roads within a rehabilitation period, by 2007
- To rehabilitate damaged bridge also until 2007
- To also restore substantial portion of collector and street until 2007
- To reconstruct Ulee Lheue ferry terminal by 2009
- To restore Labi Labi bus terminal and road traffic signal and warning lights by 2007

3.2 EXISTING PLANS

3.2.1 Blueprint

Soon after the disaster the BAPPENAS published so called “Blueprint”. This elaborated how to address the rehabilitation and reconstruction of the entire damaged areas. Particularly for Kota Banda Aceh, the Blueprint list up a large number of the rehabilitation projects to be completed by 2006. It also estimates the rehabilitation, amounting to Rp. 48,440 million only for road and traffic sector.

The Blueprint includes reconstruction of the Ulee Lheue ferry port, improvement of the St.Iskandar Muda airport, and reconstruction of the city roads to be completed by the end of 2009. The reconstruction cost for such is estimated at Rp. 571,244 million. (see Table 3.1)

Table 3.1 Outline of Blueprint (for transport sector in Banda Aceh City) (Unit: 1,000Rp)

Activity	Rehabilitation plan	Reconstruction plan	
Reconstruction/ Replacement of Ulee Lheue Ferry Harbor			52,000,000
		a. Renovation of standard facility	
		-Quay of quick boat pontoon 150GT	2,500,000
		-Construction of movable bridge	160 M2 2,100,000
		-Control room	16 M2 175,000
		-Cleaning /dredging of harbor pool	450,000 M3 13,500,000
		-Cleaning of harbor entry channel	250,000 M3 7,500,000
		-Break water	500 M 8,000,000
		-Fender	9 Units 270,000
		-Frontal frame	3 Units 225,000
		-Dolphin	5 Pieces 3,750,000
		b. Development of land facility	
		-Gangway	300 M 600,000
		-Terminal building	500 M2 1,125,000
		-Retaining wall/ revetment	400 M 9,635,000
		-Parking lot	4,000M2 1,200,000
		-Genset & genset house	1 Unit 200,000
		-Fence	1,200 M 420,000
		c. Facility of signal light safety	2 Pieces 800,000
	St.Iskandar Muda Airport		
		Development of entrance	1package 17,133,153
		Continue of terminal development of Phase II	1package 20,000,000
		Disclosure of previous terminal building	1 package 75,000
		Supplying of X-ray and compayer	1 package 12,900,000
		Fencing of airport location, making of gate and billboard	1 package 732,500
		Supplying of connecting tunnel and AC	1 package 21,500,000
		Completion of interior building	1 package 6,695,700
		Completion of additional building of DOM	1 package 5,500,000
		Widening of the right wing apron	1 package 56,595,000
		Development of new VIP building	1 package 3,000,000
		Development of previous VIP building	1 package 60,000
		Development of tower	1 package 1,500,000
		Development of technique facilities and etc.	1 package 22,499,000
		Development of cargo terminal	1 package 13,680,000
		Development of left wing cargo	1 package 56,595,000
		Extension of runway-17	1 package 113,728,000
	Support of runway	1 package 75,583,000	
	Cargo terminal apron	1 package 14,717,000	
	Supplying and installation of outer marker (ILS)	1 package 2,000,000	
	Supplying and installation of MSSR (radar)	1 package 30,000,000	
Road of Regency/City	48,440,000		44,750,000
TRANSPORTATION SECTOR TOTAL	48,440,000		571,243,853

Source: Blueprint, by BAPPENAS

3.2.2 Rehabilitation and Reconstruction Plan by PU Dinas

PU DINAS also estimated rehabilitation and reconstruction requirement. It basically consists of the rehabilitation of streets over 223km and the reconstruction of streets for a length of 106 km. The required total cost is estimated at Rp. 139,840 million as given in Table 3.2.

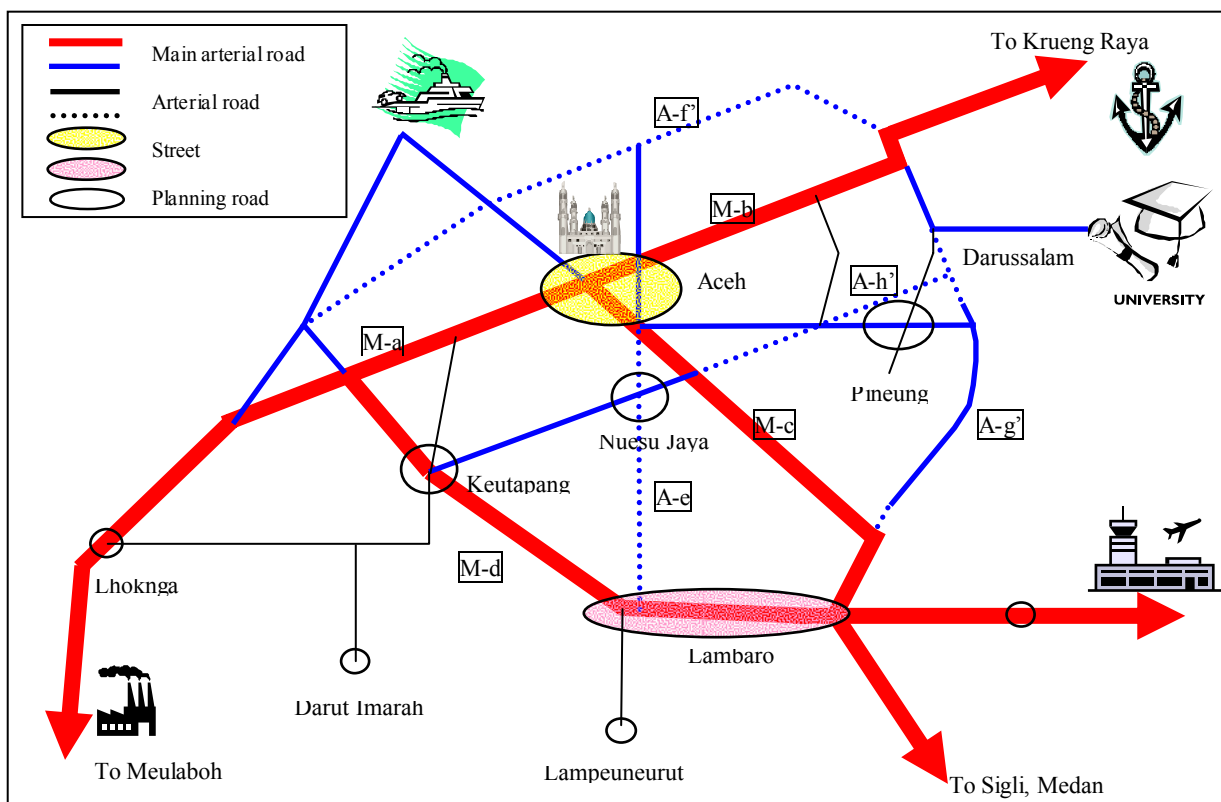
Table 3.2 Proposal from Banda Aceh City Office

Item	Rehabilitation plan	Reconstruction plan	Total
Number of roads (links)	346	126	472
Total of road lengths (km)	223.03	105.53	328.56
Total of estimation (1000Rp)	60,447,600	78,392,700	138,840,300

Source: USULAN PROGRAM, by DINAS PRASARANA JALAN DAN SUMBER DAYA AIR, KOTA BANDA ACEH

3.3 PROPOSED ROAD FRAMEWORK

One of the missions of road and transport sector is to create a systematic and rational road framework within Kota Banda Aceh in conformity with future urban development of Kota Banda Aceh after disaster. In Chapter 4 of the Main Report, great efforts are made to layout most adaptable spatial plan for Kota Banda Aceh. This spatial plan is fundamental for planning of road framework plan and is illustrated in Figure. 3.1.

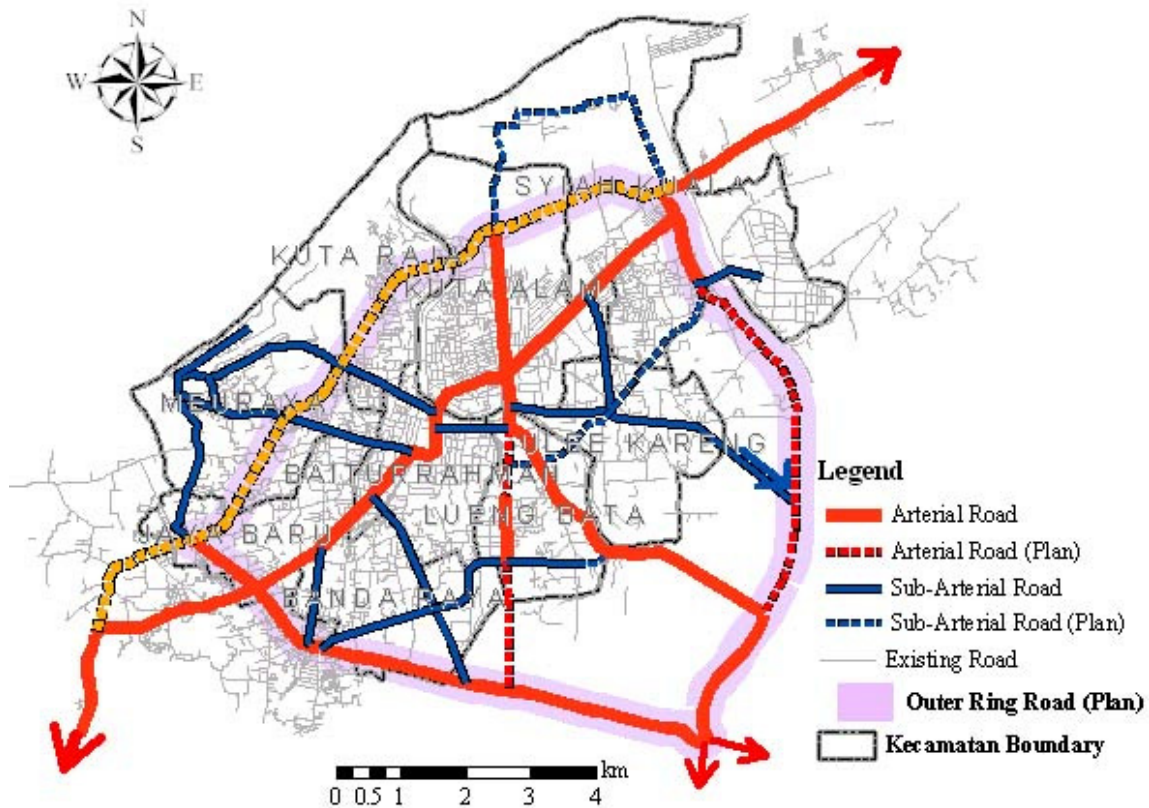


Source: JICA Study team

Figure 3.1 Simplified Proposed Spatial Plan

Also it is one of the important elements to create Kota Band Aceh with preparedness against future potential disaster like experienced in 2004. In Chapter 4 of the main report Disaster Preparedness is studied and various measures are proposed including layout of relief and escape roads in case of emergency.

In due consideration of all such factors, future road framework is established as illustrated in Figure. 3.2.



Source: JICA Study Team

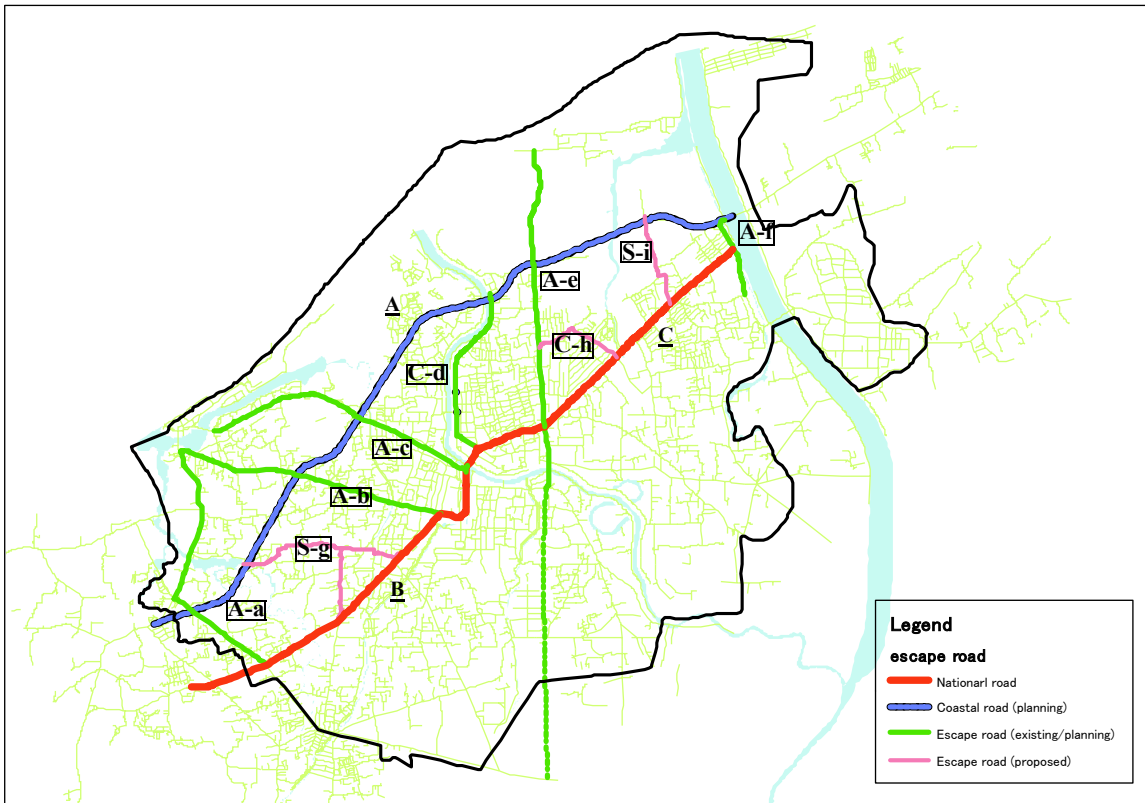
Figure 3.2 Future Road Framework

Policy of the future road framework is as described below:

- (1) Three national roads, J. T. Umar (Id: M-a), Jl. H. M. Daud Beureueh (M-b) and Jl. TGK. Imum Lueng Bata (M-c) act as main arterial rod. The first lies between Pasar Aceh and Meulaboh, the second between between Pasar Aceh and Krueng Raya port, and the third between Pasar Aceh and Medan).
- (2) Coastal road <A-f> runs along the fringe of the existing residential area. This alignment is determined through a number of discussions with the authorities concerned.
- (3) Ring road is defined as portion of main arterial road which encircles Kota Banda Aceh through Jl. TGK. Imum Lueng Bata <M-c>, Jl. Soekarno Hatta <M-d>, coastal road

<A-f> and existing roads <A-g>. The functions of ring road are to connect among the new sub-centers and existing city centers, to bypass the traffic without passing through the existing city center and to be form part of relief and escape roads.

- (4) In spatial plan, it is contemplated to shift the barycenter of the city from the present Grand Mosque area to the southern part of the city. This concept is introduced taking into account of difficulty in further development around the Grand Mosque area. There are such facilities as public facilities and soccer stadium and shopping access road in Keutapang along Jl. Soekarno Hatta <M-d>. The road <M-d> is defined as main arterial road.
- (5) The extension of Jl. Syiah Kuala <A-e> is in place from the central area to the Jl. Soekarno Hatta <M-d>, and has the functions of frame road between north and south parts. The road <A-e> is defined as arterial road.
- (6) There exists no road between the new sub-centers in the southern area. New east-west road <A-h'> is planned. This road is defined as arterial road.
- (7) Escape roads are planned with the following policies so that the citizens can escape promptly and safely and will access to the escape facilities (escape building, mosque, school, and communal facilities, etc.). (Figure 3.3)
 - Escape roads are basically selected from the roads which run with a perpendicular direction from the coastline. Roads connecting between the road <A> and the national roads (T. Umar , H.M. Daud Beureueh <C>) are selected. This distance between A and C-B is about 1.5 km on average.
 - Among the arterial roads the following are designated to be escape roads: Jl. TGK. ABD Rahman Meunasah Mencab <A-a>, Jl. Iskandar Muda <A-b>, Jl. Habib Abdurrahman <A-c>, Jl. Syiah Kuala <A-e>, Jl. TGK. Hasan Krueng Kalee <C-d>.
 - One collector road <C-h> and two streets <S-g><S-i> are selected to supplement above escape roads.
 - Escape roads should have the width of 6 meter or more so that two cars can pass each other.



Source: JICA Study team

Figure 3.3 Escape Road