

# **CHAPTER 5**

## **PUBLIC TRANSPORT**

## CHAPTER 5 PUBLIC TRANSPORT

### 5.1 EXISTING PUBLIC TRANSPORT SYSTEM

#### 5.1.1 Public Transport System in the Study Area

The current major public transport system is predominantly on land. Such transport includes bus and matatu (which is a minibus), whereas the railway plays a partial role in public transport. In addition, taxis, tuk tuk (motorized 3-wheel taxi) and cycle taxis, are operated in the metropolitan area.

Kenya Bus Service is the main bus operator in the city of Nairobi. Matatus are minibuses with 14-passenger capacity, and they have routes but no designated stops for them. Matatu fares, loading/unloading points, even routes are not fixed as they depend on the passengers' demand or request.

Matatu is very popular among Nairobi citizens due to its flexible operation, as mentioned above. However, matatu is one of the main source of traffic jams and accidents because of the dangerous manner in which its drivers shuttle it.

Until January 2004, the Matatu had a 30% share of total vehicle traffic in Nairobi. However, the share dropped drastically in February 2004. This was due to the strict regulation of matatu operation such as the enforcement of maximum travel speed of 80 km/hr (It is noteworthy that the commuter rail passengers in February 2004 increased as much as three times the number in January 2004.) However, it is expected that the share of matatu traffic would soon recover its previous level because of its high popularity as public transport.

Regarding the public transport network, majority has a radial pattern originating from the centre of the central business district (CBD), except for some bus routes. This causes the accelerated traffic congestion in the CBD and inconvenience to the passengers who have a destination outside the CBD.

### **5.1.2 Public Transport System in the Selected Cities**

The characteristics of public transport in three sub-Saharan African cities, Nairobi (Kenya), Addis Ababa (Ethiopia) and Dar-es-Salaam (Tanzania), are shown in Tables 5.1.1 (1) and (2), and a summary is provided below. The data mainly came from ‘Scoping Study, Urban Mobility in Three Cities’ undertaken by the World Bank in October 2002. Based on the comparison of this data, the advantages and problems/issues of public transport system in Nairobi are assessed.

- Modal share of walk in three cities is high, especially in Addis Ababa. Modal share of public transport in Nairobi and Dar es Salaam is approximately 40% and Addis Ababa’s is much lower than the others cities at 27%.
- Among the three cities, Nairobi has the highest fatality rate per 100,000 populations. This is one of the most serious urban issues in Nairobi.
- The ratio of bus and minibus including matatu in Nairobi and Addis Ababa is 3:7, while the minibus is the major mode of public transport in Dar es Salaam.
- Total public transport seat capacity per 1,000 capita in Nairobi is 169.3. Nairobi is considered as the most convenient city among the three countries in terms of public transport services. Estimated daily revenues earned per vehicle of bus and minibus (matatu) is US\$261 and US\$77, respectively. The highly productive operation results from the longer travel distance of the passengers in Nairobi as compared to the other two cities.
- Most of public transport business in the three cities is privately owned, except for the bus company in Addis Ababa which is owned by a parastatal entity.

**TABLE 5.1-1 (1) PUBLIC TRANSPORT IN THREE CITIES**

Items	Nairobi	Addis Ababa	Dar es Salaam
1 City Statistics			
- Country Population (mil.)	30.74	65.82	34.45
- City Population (mil.)	2.14	2.57	2.20
- Pop. Growth Rate (% per annum)	5.0	3.1	5.0
- Area (sq. km)	696	530	
- National Income per Capita (US\$)	350	100	245
- Car Ownership (per 1,000 pop.)	20	23	26
- Modal Split (%)			
· Walk	47	70	42
· NMT	1	0	8
· Public Transport	42	26	43
· Car	10	4	6
2 Urban Road Conditions			
- Paved Roads (km)	964	40	450
- Unpaved Roads (km)	188	1,000	690
- Total Road Network (km)	1,152	1,040	1,140
- No. of Signalized Junctions (Operational)	3	26	25
3 Road Safety			
- Fatalities per 100,000 pop.	9.7	1.9	5.8
- Fatalities per 100,000 vehs.	57.9	36.0	46.0
- Fatalities per mil. Veh. Km	320.9	141.8	174.0
4 Public Transport			
- Share of Total Trips (%)			
· Big Bus	30	27	2
· Minibus	70	72	98
· Taxi	0	1	0
5 Public Transport Fleet			
- Big Buses in regular daily use:			
· Number	300	415	450
· Seat Capacity	35,000	41,500	690
- Minibuses/Shared Taxis in daily use:			
· Number	12,873	8,847	7,000
· Seat Capacity	327,203	88,470	273,000
- Total public transport seat capacity per 1,000	169.3	50.6	125.5
6 Estimated public transport fleet productivity			
- Daily km. per vehicle			
· Big Bus	240	170	-
· Minibus	200	150	200
- Daily passenger carried per vehicle			
· Big Bus	1,200	1,500	-
· Minibus	300	300	240
- Daily revenues earned per vehicle (US\$)			
· Big Bus	261	129	-
· Minibus	77	35	34

**TABLE 5.1-1 (2) PUBLIC TRANSPORT IN THREE CITIES**

Items	Nairobi	Addis Ababa	Dar es Salaam
7 Public Transport Market			
	<ul style="list-style-type: none"> <li>- Kenya Bus Service (KBS)</li> <li>  · Private</li> <li>  · Conventional bus and Metro Shuttle</li> <li>  · No. of bus fleet</li> <li>  · 300 big buses</li> <li>  · 30 premium minibuses</li> <li>  · Fare system</li> <li>  · Minimum: 0.25 US\$</li> </ul>	<ul style="list-style-type: none"> <li>- Anbessa Bus Enterprise</li> <li>  · Parastatal</li> <li>  · 27% of PT passengers use this bus</li> <li>  · No. of bus fleet</li> <li>  · 415 conventional buses</li> <li>  · No. of bus routes</li> <li>  · 85 conventional bus and 10 express bus routes</li> <li>  · Fare system</li> <li>  · 0 - 9.0km: 0.29 US\$</li> <li>  · 9.0 - 9.9km: 0.40 US\$</li> <li>  · 9.9 - 14.2km: 0.57 US\$</li> </ul>	<ul style="list-style-type: none"> <li>- Dala dalas</li> <li>  · Private</li> <li>  · Most of PT passengers use this</li> <li>  · No. of bus fleet</li> <li>  · About 7,000</li> <li>  · Capacity</li> <li>  · 16 - 36 passengers</li> <li>  · Route Length</li> <li>  · 3 - 30km</li> </ul>
	<ul style="list-style-type: none"> <li>- Matatus</li> <li>  · Private</li> <li>  · 14 seat minibus</li> <li>  · No. of fleet</li> <li>  · About 9,900</li> </ul>	<ul style="list-style-type: none"> <li>- Other Private Operators</li> <li>  · Private</li> <li>  · 73% of PT passengers use this bus</li> <li>  · No. of bus/taxi fleet</li> <li>  · 7,997 buses and about 500 taxis</li> </ul>	

## **5.2 PUBLIC TRANSPORT MODES**

### **5.2.1 Bus and Matatu**

#### **(1) Operational Characteristics and Fares**

Current operational statistics of bus and matatu as of December 2003 are shown in Table 5.2-1. There are 175 routes (50 bus routes and 125 matatu routes) served by 12,376 public transportation mode, i.e. bus and matatu. Of this number, approximately 12,000 are matatus and 78% of them are small, 14-seater matatus, which are the main contributors to traffic congestion in Nairobi. Total daily passengers of bus and matatu are approximately 830,000.

KBS is a private company that had some 266 large buses (61 seated) on fixed routes and time tables in 2003. Most routes they operate on are radial, passing through the city centre. This reduces the need for passenger transfers and provides a competitive advantage over the matatus, which are not permitted to enter the city centre except along main peripheral roads.

Subsequently KBS split into two companies - KBS and Bus Truck Company. KBS now offers two services - express service (new buses) which is for inter city transport, mainly to Western Kenya; and the Metro Shuttle minibus that serves the high/medium income levels in Nairobi. The Bus Truck Company offers city transport, and is now the main competitor of matatus (See Photo 5.1-1 in Appendix 5).

Matatu mostly operates on the same routes as Kenya Bus Service, but without designated timetables. They are of two main types: the 14- and 25-seater vehicles. On some routes such as north-south routes, they compete among themselves (See Photo 5.1-2 in Appendix 5).

There is no fixed fare system for the matatu. Matatu fares mainly depend on the time of the day and the weather conditions. Until recently the fares were usually higher during peak hours, late at night and during bad weather conditions. Nowadays, the fare sometimes is lower during peak hours due to the presence of many competitors. Fares however are still higher late at night and during bad weather.

Matatu largely ignores official bus stops especially during peak hours. They depart from the terminal only when fully occupied and generally drive non-stop to the final destination. In off-peak periods, drivers try to pick up as many passengers as possible on the way, which leads to erratic driving and stopping behaviour. During congested periods, traffic rules are often ignored (e.g. they use the road shoulders or lanes for opposing traffic to by-pass traffic jams).

**TABLE 5.2-1 BUS AND MATATU DAILY OPERATING STATISTICS (AS OF  
DECEMBER 2003)**

Mode		No. of routes	No. of fleet	No. of trips	No. of pass.	% of pass.	Pass/fleet	Pass/trip
Bus	Bus Track	25	266	-	122,479	14.7	460	-
	Met. Shuttle	6	75		8,364	1.0	112	
	City Bus	19	76		14,242	1.7	187	
	Total	50	417		145,085	17.4	348	
Matatu	Small	72	9,362		482,793	58.1	52	
	Big	53	2,597		203,349	24.5	78	
	Total	125	11,959		686,142	82.6	57	
Grand Total		175	12,376	47,338	831,227	100.0	67	18

## (2) Route Structure

Route structures of bus and matatu are shown in Figure 5.2-1 and Figure 5.2-2, respectively.

Buses have radial east-west routes, passing through the city centre. Bus corridors of the east side of the city centre, which consists of Juja Road and Jogoo Road, merge to the west side bus corridor comprising Ngong Road. Some of the routes have origin/destination in the city centre. These routes are connected to Limuru and its adjoining area via Waiyaki Way and Ngong Road.

Matatus have a radial pattern route structure and its origin/destination is in the city centre. Matatu routes have been constituted depending on passenger demand. Most of east-west routes of matatu overlap with bus routes. The roads where many matatu routes pass are Thika Road, Juja Road, Uhuru Highway and Ngong Road.

## (3) Passenger Flow

Daily passenger flow of bus and matatu are shown in Figure 5.2-3 and Figure 5.2-4, respectively. Daily passenger flow of major bus corridors such as Juja Road, Jogoo Road, Waiyaki Way and Ngong Road ranges from 10,000 to 33,500 passengers.

The major matatu corridors are Thika Road, Juja Road, Jogoo Road, Uhuru Highway and Ngong Road. The number of daily passengers travelling through these corridors ranges from 62,000 to 108,000. These roads, which also serve buses, form public transport corridors within the Nairobi Metropolitan Area.

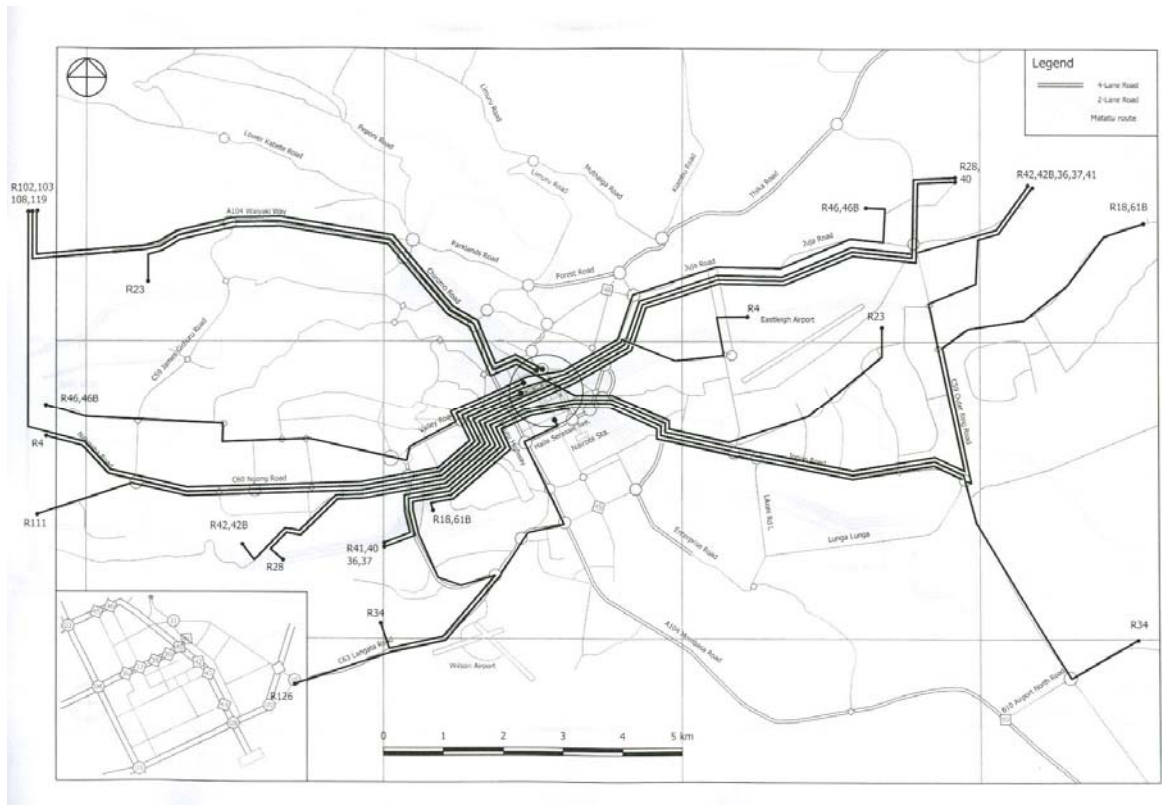


FIGURE 5.2-1 BUS ROUTE STRUCTURE

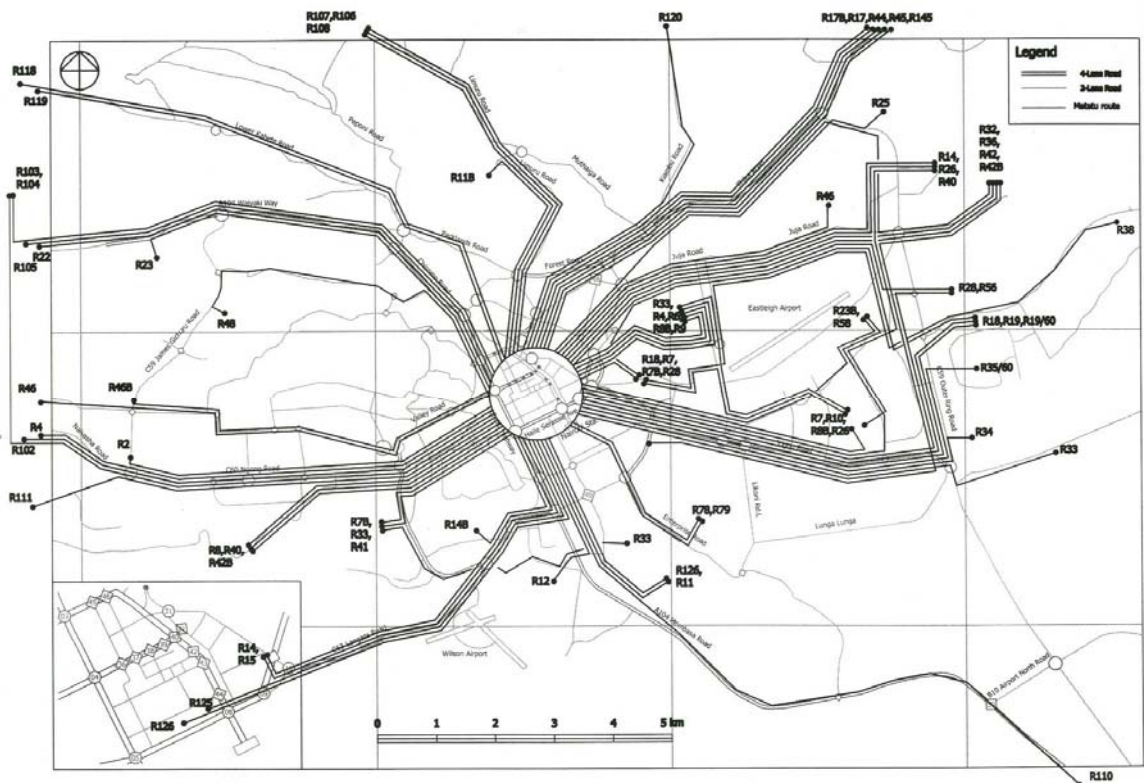


FIGURE 5.2-2 MATATU ROUTE STRUCTURE

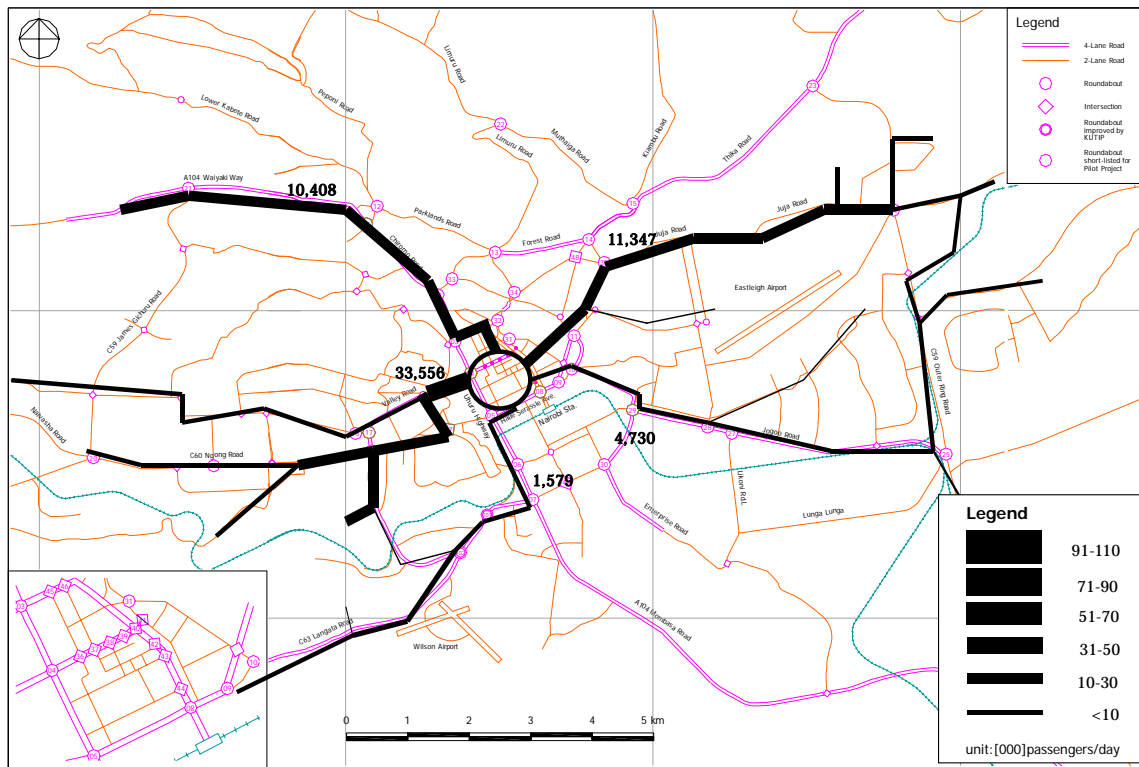


FIGURE 5.2-3 BUS PASSENGER FLOW

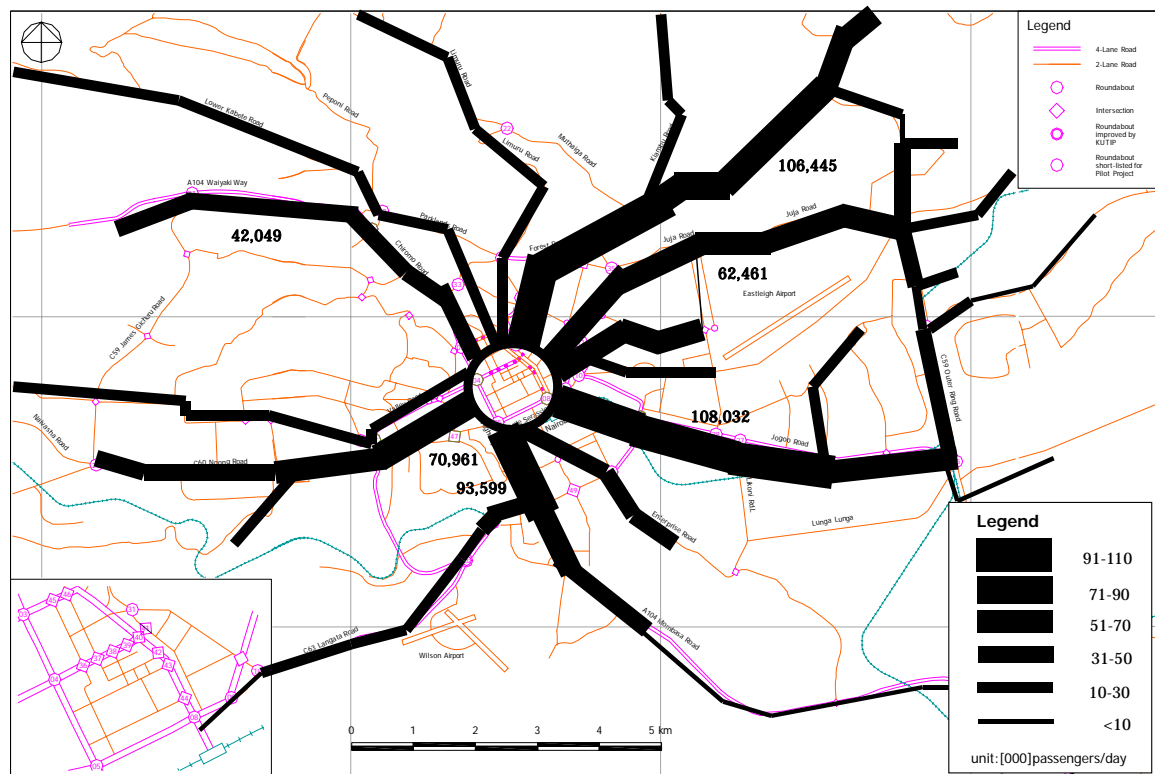


FIGURE 5.2-4 MATATU PASSENGER FLOW



## **5.2.2 Taxi and Other Modes of Transport**

### **(1) Taxi**

Taxis operate in many cities and towns in the Nairobi Metropolitan Area. Nairobi has the biggest share in terms of taxi companies and fleet among these cities/towns in the Nairobi Metropolitan Area. There are no metered taxis in the Metropolitan Area. Basically, the minimum fare of a taxi is approximately Ksh 200.

### **(2) Tuk Tuk**

The tuk tuk, which is a 3-wheel taxi, has its terminal near the intersection of Moi Avenue and Kimathi Lane. This is the only tuk tuk terminal in the Nairobi Metropolitan Area. The advantage of the tuk tuk is the affordable fare for the short distance passengers. However, its main disadvantage compared to taxis is speed and seating capacity. Currently, approximately 40 tuk tuks are operating at a fare of approximately Ksh 100, which is almost half the taxi fare.

### **(3) Cycle Taxi**

Cycle taxis operate in small suburban towns located in relatively flat terrain such as Thika, Tala and Athi River. Drivers of cycle taxis in Thika have organized a driver's association themselves. Operating zones are divided into six (6), and the drivers of each zone have a designated number that is colour-coded. Drivers can wait for passengers at their designated zone. They can take passengers to other zones but cannot pick up passengers at the drop off zone.

Currently, approximately 1,000 cycle taxis are operating under the above system in Thika. The minimum fare of a cycle taxi is only Ksh 10 which does not make good business. Nevertheless, cycle taxi business is one of the limited income resources for the young generation living in the suburbs where economic conditions are often not favourable.

Cycle taxis also operate in Tala, Kangundo and Athi River. About 100 cycle taxis are operating in Tala area which has fairly rough terrains while only 10 cycle taxis are operating from Mombasa Road to town centre.

### 5.2.3 Rail Transport

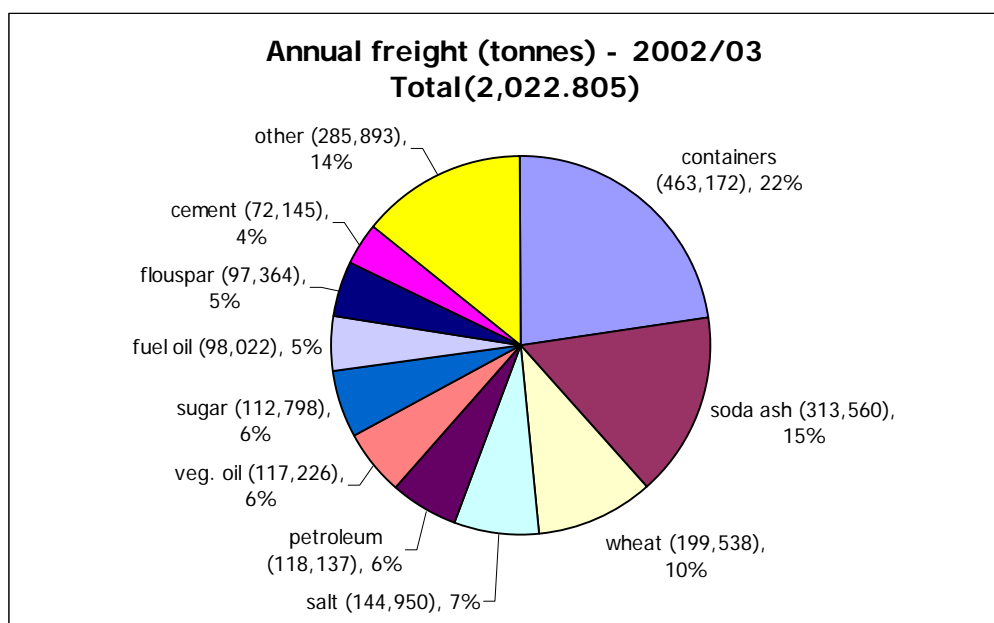
#### (1) Railway System

Railway system in Kenya is operated by the Kenya Railway Corporation (KR). The total operating railway length is 2,735 km and consists of the Main Line and 7 branch lines. Some of the lines connect to Tanzania and Uganda. KR carried 2.2 million tons of freight in 2002/03 fiscal year. Freight transports are composed of containers (22%), soda ash (15%), wheat (10%), salt (7%), petroleum (6%) and vegetable oil (6%). For passenger traffic, 27,000 intercity daily passengers and 350,000 monthly commuters in the Nairobi Metropolitan Area utilized the railway (Table 5.2-2 and Figure 5.2-5).

**TABLE 5.2-2 RAILWAY TRAFFIC, 1997/1998- 2002/2003**

	Unit	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003
<b>Freight</b>								
tonnes	"000"	1620.6	1688	2200	2400	2330	2227	2165
Tonnes-Km	million	1068.2	1111	1492	1557	1603	1538	1571
Revenue	Ksh. Mil	2478	3154	4514	4727	4660	4514	
Revenue per ton-km	cts	232	284	303	332	290	293	
<b>Passenger</b>								
Journeys	"000"	1981	2843	4700	4200	5517	4794	4390
Passenger-km	million	393	432	306	302	216	288	297
Revenue	Kshs. Mil	292	268	288	227	202	147	
Revenue per passenger-km	cts	74.3	62	94	75	94	51	
Total revenue	Kshs. Mil	2770	3422	4802	4954	4862	4662	

Source: Kenya Railway Corporation



**FIGURE 5.2-5 FREIGHT CARRIED IN 2002/03**

**(2) Commuter Service**Commuter rail network

Currently, there are four commuter lines operating in the Nairobi Metropolitan Area from the centre of Nairobi Central Station, as shown in Table 5.2-3 and Figure 5.2-6. These are two lines for Thika and Kahawa (northeast direction from Nairobi), one line for Limuru (northwest direction) and another line for Embakasi (south direction).

Frequency and fare

Basically, daily frequency for each line is one round trip--one trip from the suburban terminal to Nairobi in the morning and another trip from Nairobi to suburban terminal in the evening--except for Embakasi - 2 trips from Embakasi to Nairobi in the evening. Maximum fare is Ksh 20. For example, the fare of matatu during peak hours is Ksh 50 while the commuter train is only Ksh 20. Commuter service is relatively cheap as a mode of public transport even though the distances and travel times are usually longer.

Number of passengers

The average monthly commuter passengers in 2002/03 fiscal year is approximately 350,000 (=16,000 passengers/day). This figure is relatively stable. For 2003/04 fiscal year, the average number of monthly passengers from July 2003 to January 2004 was approximately 250,000. However, this figure suddenly increased up to 900,000 in February 2004, which is almost three times the previous year's average. This was caused by the strict regulation of matatu operation such as maximum travel speed of 80 km/hr applied in February 2004. With the strict implementation of this regulation, many matatu users shifted to railway commuter service. The share of Thika direction was the highest at approximately 74% of total commuter passengers due to the rapid urbanization along the railway corridor.

**TABLE 5.2-3 COMMUTER SERVICE**

Route	Distance from Nairobi (km)	Current rate (Ksh)	No. of coaches	Morning		Evening		Current Matatu Fares (KSh)
				dep	arrival (NRB)	dep (NRB)	arrival	
<b>Thika</b>								
NRB-TKA	56.75	20	20	5:30am	7.45am	5.30pm	7.55pm	60
NRB-RUI	31.63	20						50
NRB-KAA	24.03	20	20	5:45am	6.47am	6.10pm	7.15pm	30
NRB-DDA	12.10	15						20
NRB-UMOJA	-	15						20
NRB-MKR	5.16	15						20
NRB-DON	-	15						20
<b>Embakasi</b>								
NRB-EKV	14.28	15	5	6.30am	7.05am	5.05pm	5.30pm	30
NRB-MKR	5.16	10				6.25pm	6.55pm	20
NRB-DONHM	-	10						20
<b>Limuru</b>								
NRB-LMU	46.86	20	14	5.40am	7.40am	5.40pm	7.45pm	50
NRB-KYU	30.62	20						30
NRB-KBE	9.93	10						20

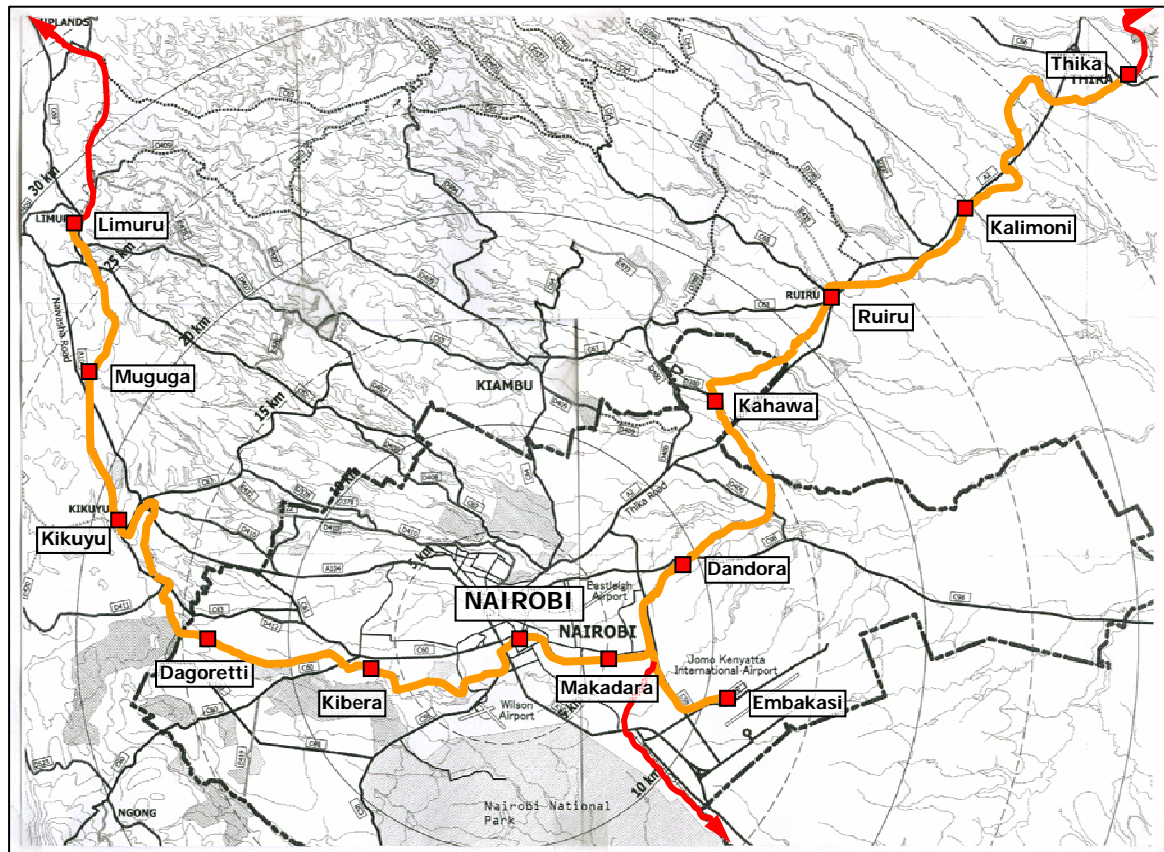


FIGURE 5.2-6 COMMUTER RAIL NETWORK

### 5.3 MODE INTERCHANGE AREA

One of the disadvantages of public transport is the need for passenger to transfer to another mode. The transfer point, located at mode interchange areas such as railway stations and bus terminals, becomes the source of inconvenience due to waiting time and walking distances between the varying modes of transport. Designing efficient interchange areas to facilitate smooth transfer of passengers is one of the biggest challenges directly related to the improvement of the public transport system.

Nairobi Railway Station and Bus Truck terminal in the city centre are the typical mode interchange areas in the Nairobi Metropolitan Area. The Nairobi Railway Station is the central railway station in the capital of Kenya with enough space for the station plaza. However, the station plaza is used predominantly as a matatus terminal. It is not effectively used as a mode interchange area. The Bus Truck terminal in the city center is well developed as a mode interchange area. However, the terminal's narrow entrance and exit points, are usually characterized by heavy traffic congestion. Furthermore, there are also many matatu terminals around this terminal (See Figure 5.3-1).



**FIGURE 5.3-1 BUS TRACK TERMINAL**

#### **5.4 PUBLIC TRANSPORT SYSTEM IN THE FIVE TOWNS**

The Nairobi Metropolitan Area is composed of the Nairobi City and other small towns along the radial trunk roads from the centre of Nairobi. Currently, most of the traffic problems seem to concentrate only within the centre of Nairobi. However, it is expected that transport measures will be established to cope with the future increase of traffic demand in accordance to the future urban growth in these towns.

The selected towns are Thika, Limuru, Ngong, Athi River and Kangundo. The location of these towns is shown in Figure 5.4-1 and the town characteristics and current public transport and traffic management conditions including traffic accidents are given in Table 5.4-1. Brief introduction of each town is discussed below.

##### **(1) Thika**

Thika is located 40 km northeast from Nairobi. The town has been developed as a distribution centre of agricultural goods in the adjoining areas. Rapid urban development can be observed along Thika Road which connects Nairobi and Thika. Thika is an integral town within the commuting area of Nairobi.

The town's relatively flat terrain makes bike taxi popular among the residents. The existing bus/matatu terminal is located in the town centre while the new terminal is proposed near the entrance of the town due to the rapid increase of public transport demand within the town and adjoining areas.

**(2) Limuru**

Limuru is a small town in the hills and is located northwest from Nairobi (approximately 30km). It has bus/matatu terminals and a railway station which is the northwest station of Nairobi railway. The town has a busy market because it serves as the daily life centre of the adjoining areas and many matatus have their origin/destination here. The route structure of public transport, location of matatu stops and the access to the railway station are some of the major challenges related to transport issues in the town.

**(3) Ngong**

Ngong is located 20 km from the Nairobi city centre and has a rich greenery environment surrounding the Ngong Hill. The town has an approximate population of 120,000 due to its close proximity to Nairobi and conducive living environment. The traffic jams at the entrance of the bus /matatu terminal, located along the trunk road, are the main transport issues in this town. Improvement plan of bus/matatu terminal has been proposed by the Kajiado Municipality.

**(4) Athi River**

Athi River is developing largely because of the establishment of the cement factory, which is one of the biggest cement factories in the country. However the size of the urbanized area is still small. There are many commuters to Nairobi because of its relatively close proximity to the city (25 km). Most of the pick up points of passengers are along Mombasa Road, which is one of the National Trunk Roads in the country.

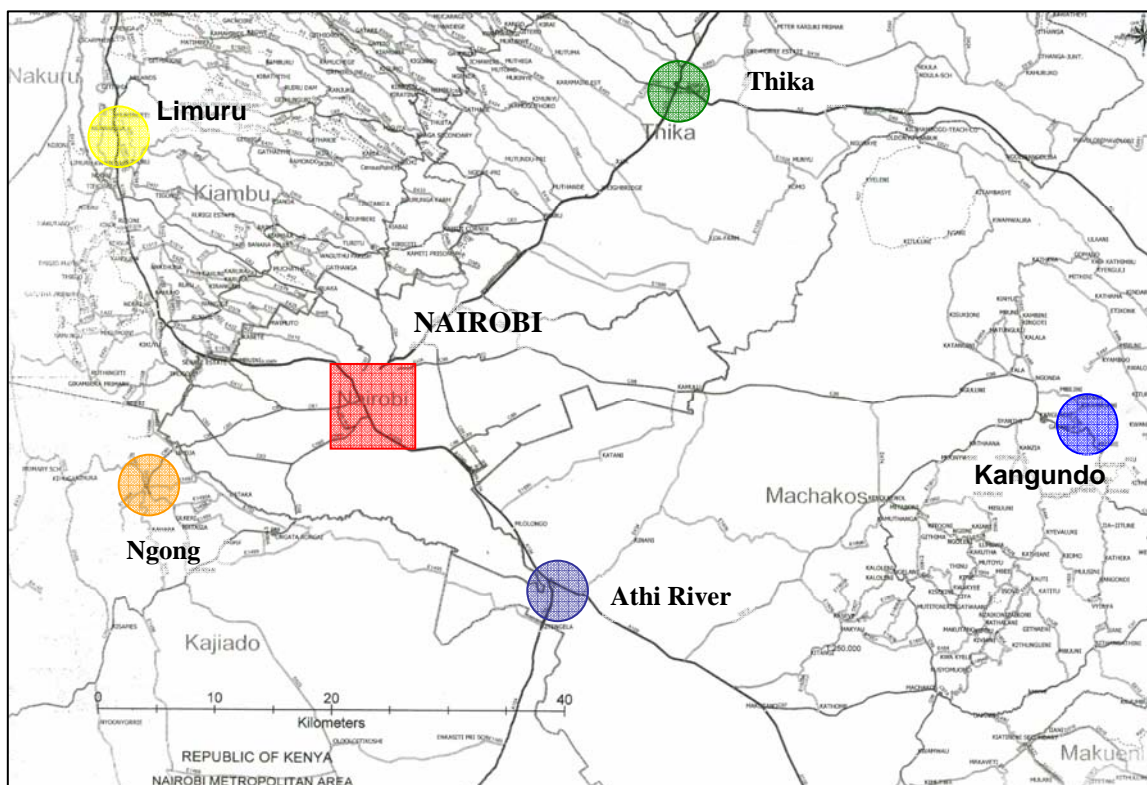
All public transport routes in this town have their origin from the neighbouring towns like Kajiado because of its relatively small size. There is a railway station but no commuter service provided (just for freight).

**(5) Kangundo**

Kangundo is located 60 km east of Nairobi. This town had been developing slowly since the British colonial era. The vehicle traffic volume and number of commuters to Nairobi has increased due to the rapid urbanization in the town and adjoining areas.

The new bus/matatu terminal is already completed but it is not yet in service because the

access road to the terminal is not yet improved. The municipality intends to revitalize the towns and villages by rerouting the public transport after completion of the access road to the terminal.



**FIGURE 5.4-1 LOCATION OF THE FIVE TOWNS IN NAIROBI METROPOLITAN AREA**

**TABLE 5.4-1 PUBLIC TRANSPORT SYSTEM IN THE FIVE TOWNS**

Items	Nairobi M.A.	Nairobi City	Thika	Limuru	Ngong	Athi River (Mavoko)	Kangundo
1 Area (1999, sq. km)	4,477	696	94	115	348	957	178
2 Population (1999)	3,229,624	2,143,254	89,232	65,503	119,339	48,936	91,238
3 Population Density (pop./sq. km)	721.4	3,079.4	949.3	569.6	342.9	51.1	512.6
4 Population Growth Rate (1979 - 1999, % p.a.)	4.4	4.9	3.9	2.5	6.9	6.2	2.4
5 Distance from Nairobi (km)	-	-	44	33	23	29	63
6 Public Transport Modes	Bus						
	Matatu						
	Taxi						
	Tuk tuk						
	Rail					-	(Inter-city)
	Others (Cycle taxi)	-	-		-	-	
7 No. of Public Service Vehicles	-	12,376	1,400	-	-	-	-
8 No. of Bus Routes	-	50		-	1	-	-
9 No. of Matatu Routes	-	125	37	20	2	3 (passing through)	7 (Tala) 4 (Kangindo)
10 Daily PT Passenger	-	847,227	12,400	9,664	-	-	-
11 Bus/Matatu Terminals						-	
12 Railway Station						-	
13 No. of Accidents/month	-	350.5	23.8	5.8	-	11.2	-

## **CHAPTER 6**

# **TRAFFIC MANAGEMENT**



## CHAPTER 6 TRAFFIC MANAGEMENT

### 6.1 EXISTING TRAFFIC CONDITIONS

#### 6.1.1 Traffic Signal Control and Traffic Flow Control

The location of the installed traffic signals in the Nairobi city centre is shown in Figure 6.1-1. Eight (8) out of 18 signals (total) in and around the city centre are not in good condition. Improvement of these eight traffic signals is ongoing including the change of controller. Urgent issues to be resolved as far as the traffic signal installation is concerned are selection of new location and priority of installation based on the analysis of the existing traffic characteristics. The pilot project planning at Westland Roundabout is considered to be a good simulation for this analysis.

A one-way system is introduced into many small roads in the city centre to maximize the limited road space.

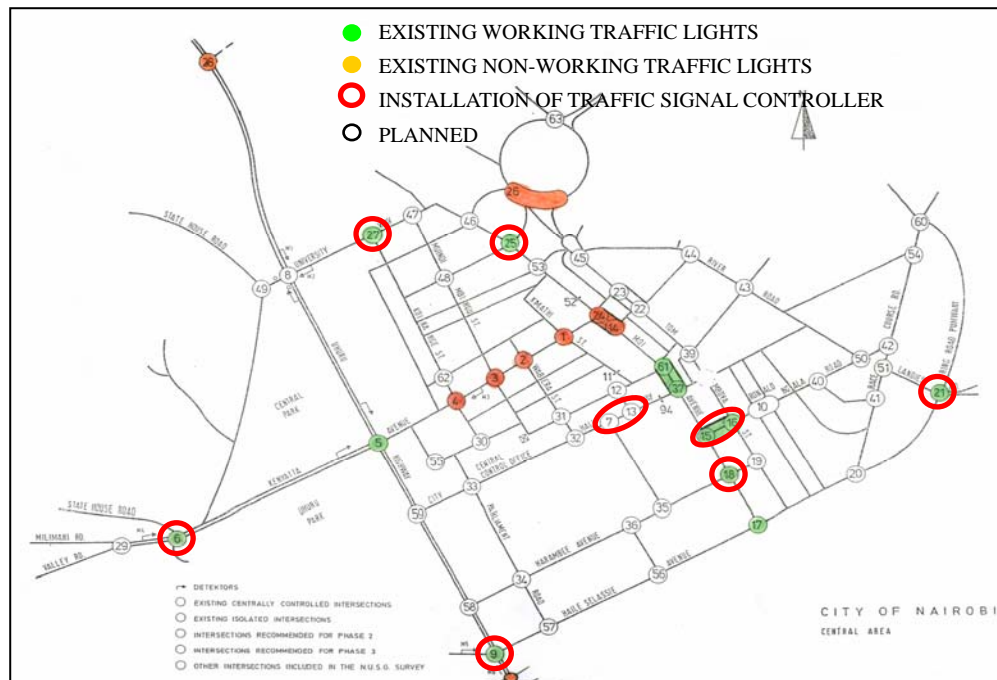


FIGURE 6.1-1 INSTALLED TRAFFIC SIGNALS IN NAIROBI CITY CENTRE

#### 6.1.2 Car Parking Conditions

The distribution of off-road car parking areas is shown in Figure 6.1-2. Road space in the west side of Moi Avenue is mostly used as matatu terminals, while open space in the east side of Moi Avenue is used as off-road and on-road car parking areas. This shows that most of the space in the city centre is utilized as one big car parking area and the roads lose their function as a transport facility (See Photo 6.2-1 in Appendix 6). Most of the on-road car parking space is occupied by the commuters' private cars because the parking fee is collected at a fixed rate of Ksh 70. The collection is based on the number of parking times and not on the parking period.

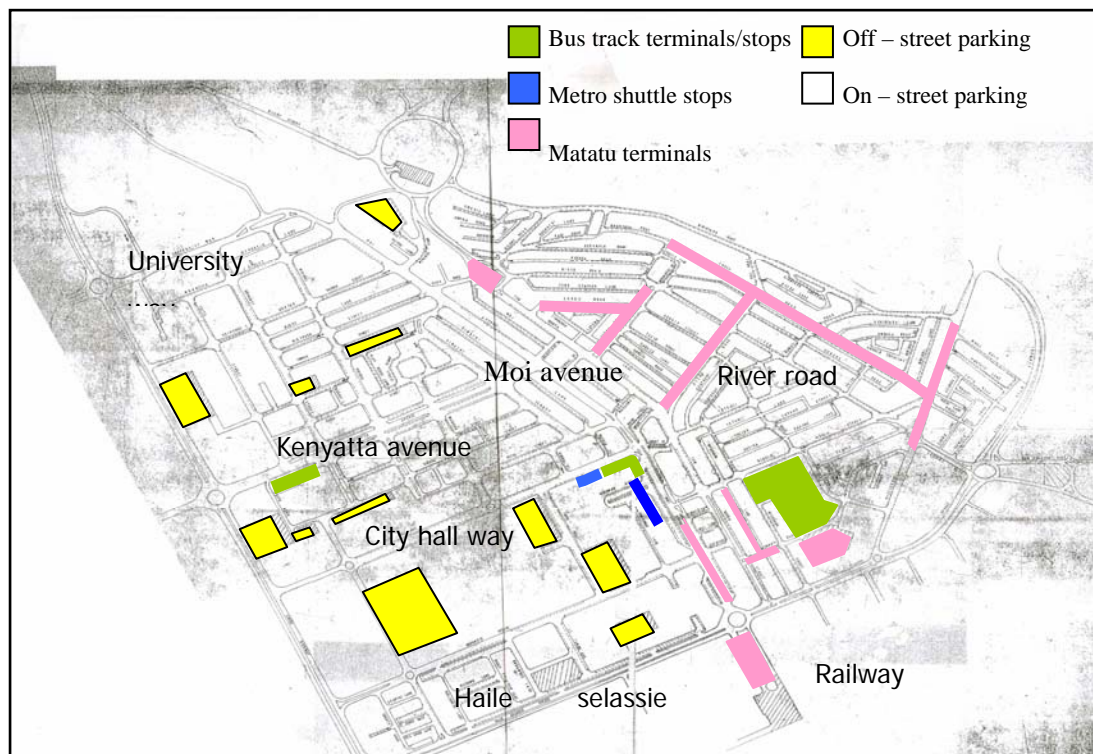


FIGURE 6.1-2 PARKING CONDITIONS IN NAIROBI CBD

6.2 TRAFFIC SAFETY AND ACCIDENT

(1) Trend of Number of Accidents in Nairobi and Traffic Accident Severity

The trend of number of accidents in Nairobi in the last four years (2000–2003) is shown in Figure 6.2-1. The number of accidents decreased from 2000 to 2002. The accident figure, however, in 2003 doubled the reported accident number in 2002. There is no serious difference about fatal and serious injury accidents between 2003 and 2002 figures but slight injury accidents drastically increased in 2003. This shows that the fatality rate decreased but the increase of total number of accidents, caused a negative impact to the urban transport.

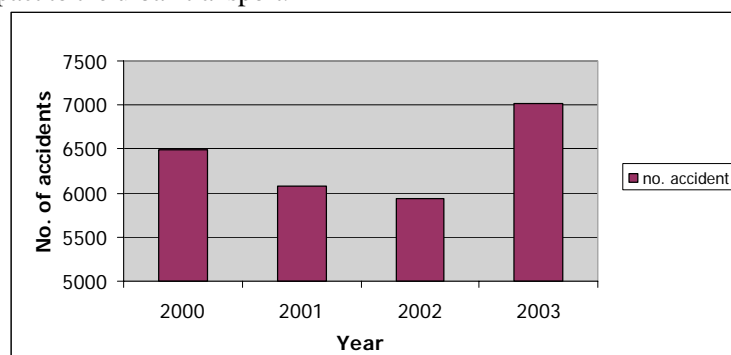


FIGURE 6.2-1 TREND OF NUMBER OF TRAFFIC ACCIDENTS IN NAIROBI

(2) Vehicle Involvement

Figure 6.2-2 shows the types of vehicles involved in the traffic accidents in Nairobi. In 2003, about 1,200 private cars were involved in the majority of these accidents. Matatus have also been involved

in a large number of accidents; however, this trend has shown a decrease in recent years. The rate of traffic accidents involving matatus and buses is still high, considering the registered number of vehicles (matatus and buses).

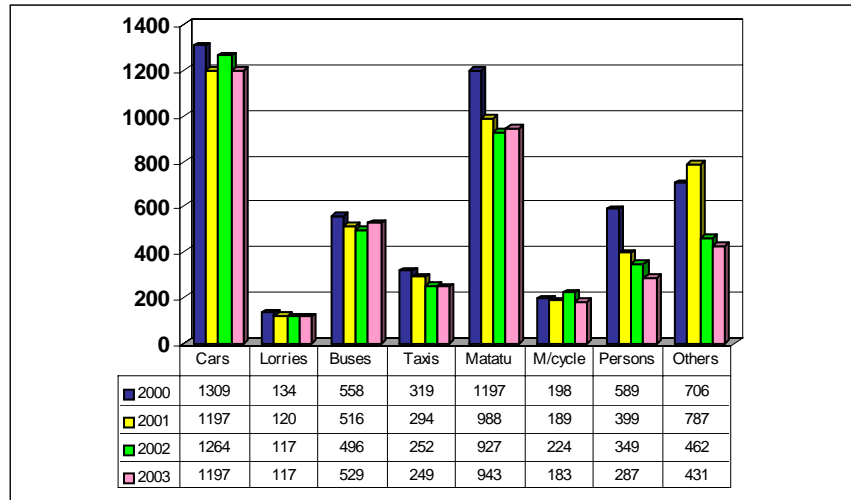


FIGURE 6.2-2 VEHICLE TYPES INVOLVED IN THE ACCIDENTS

(3) Location of Black Spots

Figure 6.2-3 shows the location of black spots (traffic accident prone points) based on the reports by the Nairobi City traffic police. It is obvious that the public transport corridors with large volumes of matatu and bus traffic have many black spots. Ignorance of traffic rules such as speed limit and passenger loading/unloading areas by public transport drivers is one of the major reasons of this tendency.

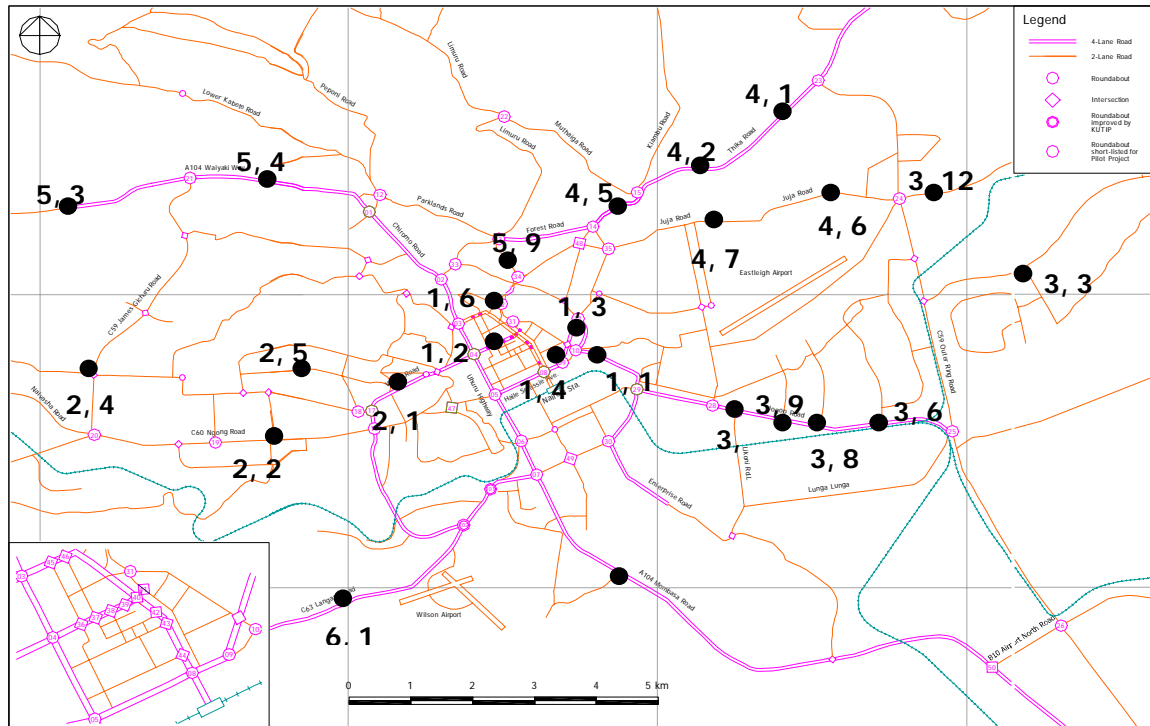


FIGURE 6.2-3 LOCATION OF BLACK SPOTS

## **CHAPTER 7**

# **ORGANIZATION AND INSTITUTIONS**

## CHAPTER 7 ORGANIZATION AND INSTITUTIONS

### 7.1 OVERVIEW

The transport sector, as an integrated transport system, should include roads, railways, waterways, airways as well as pipelines and inter-modal facilities. From the perspective of the Study, however, the main players of the transport sector in Kenya considered priority for examination are selected as follows:

#### Road Infrastructure

- The Ministry of Roads and Public Works (MRPW) and its Road Department (RD)
- The Ministry of Local Government (MOLG) with its Urban Development Department (UDD) and Local Authorities under MOLG
- The Kenya Roads Board (KRB)
- The Forest Department (FD) and the Kenya Wildlife Services (KWS) under the Ministry of Environment and Natural Resources (MENR)

#### Transport Administration

- The Ministry of Transport (MOT)

#### Road Infrastructure and Transport Administration

- City Council of Nairobi (CCN)

#### Public Transport Service Providers

- Kenya Railroad Company (KR)
- Kenya Bus Services (KBS) and matatus

Based on the scope of work, the Study should focus on the organization relating to the road transport in the Nairobi Metropolitan Area, and also should pay attention to railways transport relating organization.

#### 7.1.1 The Road Sector

Key organizations involved in Kenya's road sector are the Ministry of Roads and Public Works (MRPW) and its Road Department (RD), the Ministry of Local Government (MOLG), 46 municipalities including Nairobi City and 58 townships under MOLG, the Kenya Roads Board (KRB), District Road Committees (DRCs), and the Kenya Wildlife Services (KWS) and the Forest Department (FD) of the Ministry of Environment and Natural Resources. Management responsibilities of these organizations are summarized in Table 7.1-1 (See Figure 7.1-1 in Appendix 7 for their relationship and flow of funds). In addition, the Ministry of Transport (MOT) is the prime policy making and regulatory agency for the sector, responsible for overseeing transport-related state corporations.

**TABLE 7.1-1 MANAGEMENT RESPONSIBILITY OF MAIN PLAYERS  
IN THE ROAD SECTOR**

Organization	Responsibility	Designation of Roads	Paved (km)	Unpaved (km)	Total (km)
MRPW (directly)	Maintenance, rehabilitation and construction through its 9 PWOs and 71 DWOs	Classified A	2,886	869	3,755
		Classified B	1,432	1,366	2,799
		Classified C	2,487	5,180	7,669
	Sub-total A, B and C			6,805	7,415
71 DRCs with DREs under RD	DRCs for planning, and RD for execution	Classified D	1,167	10,048	11,216
		Classified E	751	25,798	26,549
	Sub-total D and E			1,918	35,846
Local Authorities DRCs & MORW	107 City, Municipal and Town Councils, 71 DRCs, and MRPW jointly	Classified G,L,R,S,T, W Special purpose road	214	11,090	11,304
Total classified roads			8,937	54,351	63,290
107 City, Municipal and Town Councils	Independent responsibility of CCN and 4 big Municipalities. Other 35 Municipalities and 67 Town Councils with UDD	Urban roads of adopted & no-adopted streets	2,490	12,137	14,627
71 DRCs with DREs under RD	DRCs for planning, and RD for execution	Unclassified rural roads		116,000 estimated	116,000
	County Councils, MRPW for classified roads among which	Roads in 34 reserves		2,736	2,736
MENR	KWS is responsible, and MRPW for classified roads among which	Roads in 25 national parks		4,409	4,409
	Forest Department	Roads in national forest		6,800	6,800
Total Unclassified and rural roads			2,490	142,080	144,572
<b>Total Public Roads</b>			<b>11,427</b>	<b>196,431</b>	<b>207,858</b>

Note: MRPW is directly responsible for the classified A, B and C: 14,221 km through Roads Department and its Provincial Works Offices and District Works Offices. 37,765 km of the classified D and E roads are planned and executed by KRB's two road agencies: Roads Department and District Roads Committees (DRCs). 11,304 km of other classified roads maintained, rehabilitated and constructed by local authorities, DRCs and MRPW. In broadly meaning, MRPW is responsible for 63,290 km of the classified roads. Data Source: KRB, November, 2004, and also Scott Wilson Report. Vol.1 p34 supplemented by interview with KRB.

The creation of the KRB in 1999, as an autonomous organization, has changed the management structure for the road sector in a fundamental way. According to the KRB Act, the responsibilities for class D and E roads have been transferred from the RD to DRCs, and classified special roads transferred for joint management of DRCs and local authorities. KRB is responsible to the Minister of the MRPW, while the RD, DRCs and KWS are road agencies responsible to the KRB. Five permanent secretaries of the MRPW, MOLG, MOT, the Ministry of Finance (MOF), and the Ministry of Foreign Affairs (MOFA) are members of the KRB Board together with private sector representatives. KRB is responsible for managing and allocating the Road Maintenance Levy Fund (RMLF), the most important funding source in Kenya's road sector.

## 7.1.2 Transport Administration

The Key players involved in the traffic management in Kenya with their varying roles are summarized in Table 7.1-2. The KRB, as far as the road sector is concerned plays a major role in coordinating role in traffic management.

**TABLE 7.1-2 MAIN PLAYERS IN TRAFFIC MANAGEMENT**

Item	Ministry of Roads & Public Works	Ministry of Transport	Ministry of Health	Ministry of Education, Science & Technology	Council		Traffic Police		Private Stakeholders (KERSA)
					Nairobi City	Other Towns	Nairobi City	Other Towns	
Traffic Management Policy	-	○	-	-	-	-	-	-	
Traffic Laws and Regulations	-	○	-	-	○	○	-	-	
Traffic Signals	-	-	-	-	○	-			
Traffic Management System such as One-way System	-	-	-	-	○	○	-	-	
Traffic Signage	○	-	-	-	○	○	○	○	
Road Marking	○	-	-	-	○	○	○	○	
Car Parking Control	-	-	-	-	○	○	-	-	○
Road Traffic Safety	○	○	○	○	○	○	○	○	○

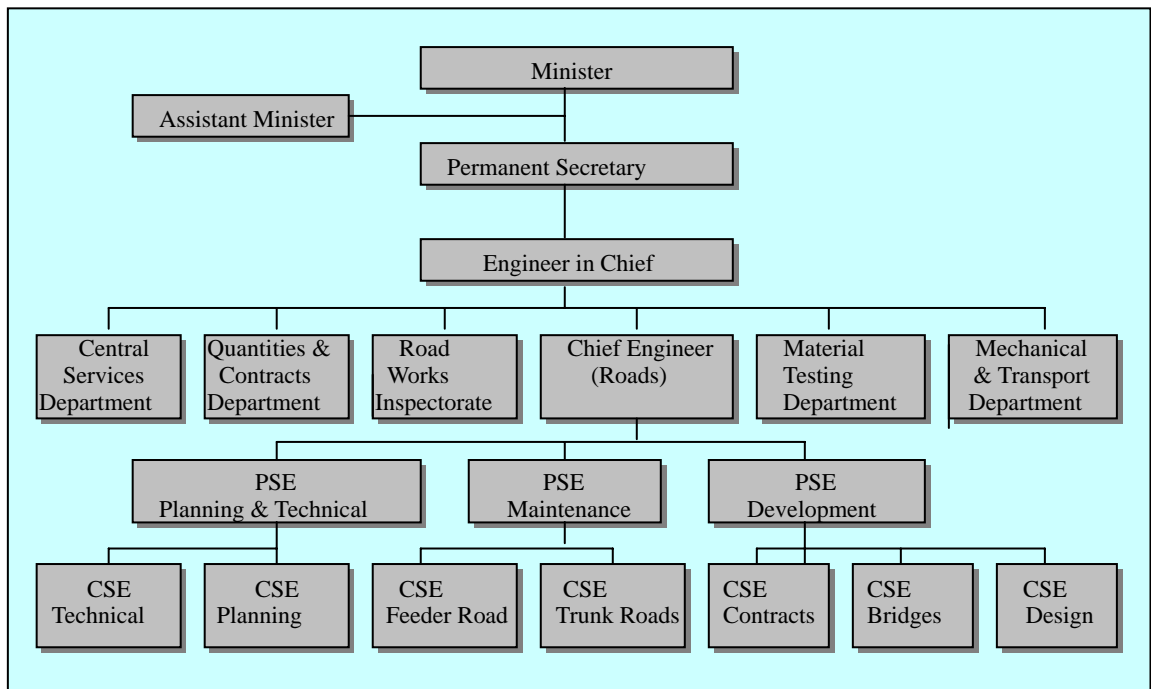
## 7.2 ROAD SECTOR ADMINISTRATION

### 7.2.1 MRPW and RD

The MRPW is the key governmental agency for maintenance, rehabilitation and construction of national trunk roads. Its main duties are as follows:

- To manage, control access and usage of the road network,
- To carry out maintenance of roads and bridges through the PWO and DWO,
- To carry out inspection of roads and bridges to ensure adherence to quality standards and cost effectiveness,
- To provide professional and administrative support in contract management,
- To coordinate donor assisted projects, and
- To carry out registration of contractors, quantity surveyors, architects and engineers.

The organizational structure of MRPW is shown in Figure 7.2-1 (In-dept discussion to each agency is available in Section 7.2 of Appendix 7). The RD is the largest department of MRPW with 3,152 staff under the Chief Engineer as of 2004, accounting for some 80% of the total turnover of the Ministry. The RD, with four units of Planning, Development, Maintenance and Technical Administration headed by Principal Superintending Engineers (PSEs), is responsible for planning, design, construction, improvement, operation and maintenance of the classified A, B and C roads in Kenya.



**FIGURE 7.2-1 ORGANISATIONAL STRUCTURE OF MRPW**

**7.2.2 KRB**

In addition to the five representatives of the Government, the KRB Board have five user representatives: Automobile Association of Kenya (AAK), Association of Tour Operators, Kenyan Association of Manufacturers, Kenya Transport Association, and League of Women Voters, and also three other private sector representatives: Institution of Engineers of Kenya, Institute of Surveyors of Kenya, and Institute of Certified Public Accountants of Kenya. The larger representation from the private sector reflects the recommendation from the Road Sector Institutional Study in 1995-98 to allow business like management.

According to the KRB Act, four core functions of KRB are (1) management of road funds, (2) coordination of the implementation of road-related policies, (3) monitoring of road agencies’ activities, and (4) recommendation to the Government on various user charges, studies, standards and classification, management parameters, and training of human resources related to the sector. To perform its fund management function, KRB prepares, reviews and approves the Annual Public Road Program (APRP). The APRP provides the basis for disbursement of road funds to local agencies and evaluation of road agencies’ activities.



### **7.2.3 Other Organizations**

#### **(1) MOLG and UDD**

One of core functions of MOLG is to carry out public infrastructure development and maintenance projects for local authorities. During the 1990's, the MOLG commissioned two major projects to address urban transport problems in Kenya: the Kenya Urban Transport Infrastructure Project (KUTIP), and the Nairobi Long-Term Transport Study. Under the KUTIP, several sub-studies were carried out to provide guidelines for investment decisions in various major urban areas. The MOLG has two core departments: the Urban Development Department (UDD) and the Department of Local Authorities Inspectorate (DLAI). UDD is also a road sub-agency of KRB.

#### **(2) CCN and CED**

CCN is responsible for the development, rehabilitation and maintenance of a 1,500km road network within its jurisdiction including non-adopted and private roads. A major portion of the road maintenance fund in Nairobi is currently disbursed for wages, and only a small fraction spent on road works. The City Engineer's Department (CED), with a total of 1,652 staff as of 2004, is responsible for delivering road-related services, but suffers from inadequate authority and resources.

#### **(3) KWS and FD**

KWS and FD have respectively extensive road networks that they maintain using their own resources. In addition, some classified roads providing access to parks and reserves are maintained by KWS on behalf of MRPW. KWS is designated as a road agency under the KRB Act, but FD is not.

The classified roads serving parks and reserves account for about 10% of total length of the classified road network. KWS has its own road maintenance unit, which has relatively large resources as a beneficiary of various projects such as the Protected Areas and Wild Life Service (PAWS) project financed by the World Bank and other JICA supported projects. As a statutory corporation, relatively unfettered by government procurement and accounting procedures, KWS is able to operate more flexibly and efficiently. FD has network of access, feeder and plantation roads used for the management of forest resources, which extends to 6,800km and is maintained using its own force account units.

## **7.3 TRANSPORT ADMINISTRATION**

### **7.3.1 MOT**

The MOT is responsible for transport policy making and regulations. Specifically, MOT ensures road worthiness of vehicles through its Motor Vehicle Inspection Unit, and allocates public transport service routes through its Transport Licensing Board (TLB). MOT is also responsible for overseeing operations of the state corporations under the Ministry: Kenya Civil Aviation Authority (KCAA), Kenya Airports Authority (KAA), Kenya Ports Authority (KPA), Kenya Ferry Services, Kenya Railway Corporation (KR), and Kenya National Shipping Lines. Section 7.3 of Appendix 7 has extensive discussion of the same topic.

### **7.3.2 Traffic Management Administration**

#### **(1) CCN-Transport Unit**

Nairobi traffic management is operated mainly by the Transport Unit (TU) of CCN, a large unit under CED with 105 staff as of 2004. The TU has not been effective in providing technical supports related to traffic forecasting, demand management, transport corridor planning, road reserves usage and safety issues.

#### **(2) Road safety administration**

There exist several organizations in charge of road safety management. Road safety policy is the MOT's responsibility, while the implementation of road safety is under the MRPW. Data collection, vehicle inspection and enforcement are in the hands of the Traffic Police, which is under the Ministry of Internal Security. The licensing is under TLB, and emergency services are under the Ministry of Health. During the latest road safety program in the 1980s, the National Road Safety Council (NRSC) was established to ensure coordination and to prepare annual action plans, but the NRSC was inactive. A road safety subcommittee established under the KRB is responsible for preparing annual action plans for road safety.

## **7.4 PUBLIC TRANSPORT SERVICES PROVIDERS**

The Nairobi public transport system, apart from some limited commuter rail operations, consists entirely of road-based services, which are fully private. The system operates in a largely deregulated environment, and there is little or no government control of, or even influence on, such crucial elements as route structure, operational practices, timetables or fares. The system consists mainly of two entirely different sub-systems, the Kenya Bus Services (KBS) and matatus, which compete along the same routes. Since 2002, privately owned large buses entered the market.

### **7.4.1 Public Bus**

KBS, a private company, offers two services: express services with new buses for inter-city transport, mainly to western Kenya and the metro shuttle mini bus services for high/ medium income areas in Nairobi. The Bus Track Company, an augment of KBS, offers the city transport, and is now the main competitor with matatus.

### **7.4.2 Matatu**

The term “matatu system” refers to the system that has existed in Nairobi for the last 25 years. It is not a “technical” definition, but rather a description of a set of practices regarding ownership, route structure, operational structure, control (or lack of it), interaction between various economic interests in the society, existence and indirect tolerance of certain traffic behavior.

When matatu system was legalized in 1973, the establishment of new routes was in principle, free to encourage small enterprises to make a living beside the big business represented by a dominant bus company. Soon, however, syndicates emerged, and today, most routes are controlled by loosely composed “associations” who act as self-appointed “owners” of the route. The vehicles themselves are owned by individual investors, normally not the drivers. Matatu owners are from various levels of society. Although the official cost for starting operations of matatu is Ksh 4,300, consisting of Ksh 800 of registration, Ksh 2,500 of parking fee to CCN and Ksh 1,000 as payment to the cooperative, rumour has it that an owner who wishes to operate his matatu on a particular route has to pay an “entrance fee” which can be as high as Ksh 100,000.

The malpractice characteristics of the matatu industry were accurately and outspokenly documented in the Ministerial Committee Report of 1986, and this led to the recommendation to actively fight the syndicates and to dissolve the Matatu Vehicle Owners Association (MVOA) and the Matatu Association of Kenya (MAK). However, the present situation indicates no improvement and it now appears that the banning of MVOA may in fact have created more problems that made outside control and insight all but impossible.

Some control is at present exercised by the Nairobi Traffic Management Committee, which handles applications from the matatu industry to use terminals. When considering these, the Committee takes into account such factors as availability of land in the city center and entry routes there in, and also whether the proposed route is likely to interfere with the existing ones. In this way, some establishment control can be said to exist.

The matatus have been banned from the western part of the city center on the grounds that

they disturb traffic, a fact which is actually observed. Also, the rule against operating larger vehicles than 25-seaters is adhered to. This would seem to indicate that the matatu sector can indeed be subject to some regulation.

### **7.4.3 Rail Transport**

Shortly following the dissolution of East Africa Railways, the 1978 Kenya Railways Act set up the Kenya Railway Corporation (KR) as a state-owned company. The Act required the enterprise to balance its accounts and operate commercially, but the Act also tied KR management to MOT for control of traffic, fares, investment, and budget. KR was also bound to employ a large cadre of personnel for social reasons, provide entirely for its infrastructure and even engage its own police force. The Act remains in force, preventing KR to become an independent commercial entity that permits private sector participation.

KR remains in a perilous state; its operating loss in 2002 was Ksh 1.5 billion. However, it is worth acknowledging that drastic management changes, focusing on improved service delivery and other measures introduced such as operation of block trains between Mombasa and Kampala, resulted in improved performance (with freight transport increasing by 40% in 2000) and a reduction of turnaround time from 28 days to 10 days and transit time between Mombasa and Kampala from 14 days to 4 days.

## **7.5 PROBLEMS IDENTIFICATION**

The basic problem of the transport sector is that the sector has long been under the process of the structural reform especially the road sector. Problems relating to ambiguity of responsibilities of the sector, mainly due to its weak management structure, have caused such curtailment as (1) time taking process to formulate and to authorize written policy yet to be materialized, and (2) difficulty in formulating consensus for policy/ program/ project implementation. It has to be noted that the basic problem must be partly due to consequent necessity of strict separation of funding and implementation agencies to cope with the inappropriate financial management.

### **7.5.1 Weak Management Structure of Transport Sector in Kenya**

#### **(1) Road sector**

The responsibilities for the Kenya's road sector are fragmented among different government ministries and departments, and different levels of governments. The establishment of KRB has unified the allocation of the RMLF, the most important funding source in the sector for road maintenance. Although MRPW, MOLG and MOT are represented at the KRB Boards,

coordination of policy formation and implementation for road infrastructure development has not been effectively implemented by KRB.

KRB has a mandate, under the Minister of MRPW, to oversee the road network and coordinate its development, rehabilitation and maintenance. The KRB Act vests authority of undertaking the actual development, rehabilitation and maintenance of various roads to road agencies: The RD, DRCs and KWS. MRWP has subsequently designated also CCN and four other larger municipal councils and UDD of MOLG as road sub-agencies under the RD, while MOF (Ministry of Finance) designated CCN and all the municipal and town councils as agencies under KRB. However, they are not well linked with MRPW. Moreover, all the road agencies and sub-agencies and their assigned responsibilities do not adequately cover the entire road network. For example, the FD of MENR is excluded from membership. On the other hand, the position of DRCs is ambiguous, and the relationship between KWS and MRPW is unclear. In practice, the RD continues to assume functions of road agencies for local authorities, rather than DRCs, through its offices of District Roads Engineers.

The Annual Public Roads Programme (APRP) is potentially an effective tool to manage funds for road development. KRB requires its road agencies to prepare their annual roads programme for submission to the Board, reviews them, and consolidates them into the APRP. KRB, however, does not have sufficient capacity and experience to monitor and evaluate activities of the road agencies in the light of the APRP.

Other than the RMLF administered by KRB, many other sources of road infrastructure financing are not managed in a coherent way geared towards an efficient use of the limited resources. They include the LATF administered by MOLG, national parks/ reserves levy by KWS, tea cess by KITA, sugar levy by the sugar industry, government budget allocations by MOF and donor support channeled through various projects and programs of different government ministries and departments.

The weak revenue base and other problems of local authorities make the situation only worse. They hamper investments for road facilities such as dedicated bus lanes and terminal facilities, to say nothing of NMT facilities. Lack of clearly defined ownership is a factor that leads to the encroachment on road reserves. Even Nairobi City currently lacks adequate planning and management capacity for its road network.

## **(2) Transport services and traffic management**

There is no consistent legal and institutional framework for regulation, coordination, and development management of road passenger transport services. MOT is in charge of vehicle

licensing and transport service regulations as well as formulating national transport policy. TLB of MOT issues licenses in response to applications, and does not play any proactive role for regulating transport services demand and provision. TLB does not prepare a road passenger transport plan nor establish standards and regulations. Supervision of licensed operators is left to the Traffic Police, which accords low priority to it, resulting in indiscipline in urban passenger transport operations.

TLB license fees are remitted directly to the Treasury, while TLB relies on government allocation for its operation. Thus TLB is not financially autonomous. TLB also lacks institutional autonomy for decision making as their decisions are subject to ratification by the Government.

An appropriate institutional framework is lacking also for traffic safety coordination and management. Traffic safety policy is not reflected in transport planning, traffic engineering, operations management and vehicle inspection. On-the-spot traffic control by law enforcement is clearly a traffic management priority, but without proactive and reactive control actions, the lack of discipline on the part of users would not be rectified.

Traffic safety management suffers also from inadequate funding. A road safety levy is charged on motor vehicle imports, but it is not used for traffic safety initiatives. General delay in adjudication of traffic offences in law courts due to poor coordination between the traffic control and the adjudication functions also contributes to the indiscipline by some drivers through the lack of respect for the law.

### **7.5.2 Problem of the NMA**

The issues facing the Kenya's road sector and transport management discussed in Section 7.4.1 have more serious implications in the NMA. As shown in the section, the funding gaps are more serious for urban roads in Nairobi City, and planning and management capacity of CCN for its road network is undermined by multiplicity of organizations involved in different and related aspects as well as inadequate human and financial resources.

Furthermore expansion of the metropolitan function of Nairobi to the NMA require integrate planning and implementation of the transport sector projects/programs. This amplifies the above stated problems in the NMA.

### **7.5.3 Constraints of Key Organizations**

#### **(1) Constraints of MRPW and RD**

The main problems constraining the efficient delivery of services by the MRPW and the RD for road development, rehabilitation and maintenance have been identified through discussions with the RD staff. They are as follows:

- Lack of adequate funding for project/ program implementation,
- Inadequate monitoring and evaluation of project/ program implementation,
- Lack of comprehensive strategy for performance improvement,
- Lack of principles in fund allocation,
- Inadequate planning and management systems,
- Inflexible organizational structure hindering effective shift of staff,
- Inefficient daily operation represented by too many meetings,
- Lack of clear division of duties in various departments and units, and
- Improper supervision of public works.

#### **(2) Constraints of KRB**

As the KRB represents a relatively new institution in Kenya's road sector, it suffers from various problems such as communications with other organizations, insufficient track records, and some provisions of the KRB Act. Major constraints have been identified through discussions with KRB staff as follows:

- Heavy reliance on the RMLF as a single fund source and over commitment,
- Lack of a comprehensive and documented national policy and incomplete guidelines and operation manuals,
- Incomplete technical, financial and management system for monitoring and evaluation of the implementation of the APRP,
- Inadequate information and communication technology capacity in terms of a wide area network (WAN) and non-functional road management system (RMS),
- Short track records in road maintenance,
- Insufficient capacity in accessing ongoing R&D and assessing R&D needs,
- Insufficient public information and education on KRB activities,
- Inadequate provision of the KRB Act for succession of the Board of Directors, and
- Inability to perform the policy coordination function stipulated by the KRB Act.

## **CHAPTER 8**

# **FINANCIAL STRUCTURE AND BUDGETING**



## CHAPTER 8 FINANCIAL STRUCTURE AND BUDGETING

### 8.1 BUDGET ALLOCATIONS TO THE TRANSPORT SECTOR

As shown in Table 8.1-1, most of the GOK expenditure for the transport sector had been allocated to roads with an average ratio of 3.2% against the total public service expenditure during 1997/98 – 2000/01. Allocations for the other transport services were basically one tenth of the allocations for roads or smaller. This indicates the dominating importance of the roads sector within Kenya's transport sector. Refer to Section 8.1 of Appendix 8 for comprehensive discussion.

**TABLE 8.1-1 GOK EXPENDITURE IN MAIN PUBLIC SERVICES**

Unit: Million US\$

Public Services	1997/98		1998/99		1999/00		2000/01		Average
	amount	%	amount	%	amount	%	amount	%	%
Administration	613.7	12.2	670.5	17.1	568.0	18.5	1045.8	24.9	17.9
Defense	162.5	3.2	170.9	4.4	143.0	4.7	182.8	4.4	4.1
Social	1,005.5	20.0	983.0	25.1	826.6	27.0	859.3	20.5	22.7
Economic	409.9	8.2	440.9	11.2	379.9	12.4	623.3	14.9	11.4
Public Debt	2,836.4	56.4	1655.9	42.2	1,149.0	37.5	1,484.4	35.4	44.0
Total	5,027.9	100.0	3921.1	100.0	3,066.5	100.0	4,195.6	100.0	100.0
Roads	123.0	2.4	131.3	3.3	121.3	4.0	138.1	3.3	3.2

Sources: Kenya Road Concessioning Assessment, the World Bank, March 2002, p3-3.

#### 8.1.1 Total Government Budget and Expenditure on Roads

##### (1) Government budget for the road sector

The total government budget for the road sector generally increased despite the economic turmoil during 1990's. This was mainly due to the steady increase of the fuel levy following the creation of the Road Maintenance Levy Fund (RMLF) in 1993. It started to increase significantly under the new administration, partly owing to the recovery of development aids. The total budget allocation to the road sector in 2004/05 amounts to US\$276.3 million, twice more than the allocation of US\$137.6 million in 2001/02. Of the total allocation, the development budget for MRPW has an over 50% share, followed by the RMLF allocation accounting for 39.4%. The urban road development has received US\$9.49 million or 3.4%, and the Local Authorities Transfer Fund (LATF) accounts for 3.7%. The transit toll collection contributes US\$2.5 million or 0.9%.

##### (2) Government expenditure on roads

The allocation of the government budget for roads and other public services in recent years is

summarized in Table 8.1-1. The actual government expenditure on roads stayed more or less at the same level up to 2002/03, while the total government expenditure steadily increased in nominal terms. During this period, the development expenditure on roads had relatively small shares of the total expenditure. This is a consequence of the substantial increase in the recurrent expenditure which occurred immediately after the creation of the RMLF. The recurrent expenditure on roads increased from a US\$40 million (in 2000 prices) level prior to 1993 to a US\$90 million level in the late 1990's.

### 8.1.2 Budgets and Expenditure of Road Agencies

#### (1) MRPW

The development budget of MRPW has increased significantly under the new administration, and accounts for 52.6% of the total road budget in 2004/05 as shown in Table 8.1-2. The recurrent budget has also increased due to increased RMLF allocations. The RMLF allocations for classified A, B and C roads were Ksh 4.2 million in 2001/02 and Ksh 4.0 million in 2002/03, but increased to Ksh 2.3 million in the first half of 2003/04.

**TABLE 8.1-2 ROAD DEVELOPMENT BUDGET OF MRPW**

Unit: Million Ksh

Year	Major roads	Other roads	Planning & Design	Total
2003/04	2,749	2,842	208	5,799
2004/05	6,537	3,916	218	10,671

Source: MRPW.

#### (2) CCN

Funds that CCN received in recent years from different sources for road maintenance are summarized in Table 8.1-3. The total fund available in recent years varied widely, depending mainly on the RMLF allocation.

**TABLE 8.1-3 FUNDS FOR ROADS MAINTENANCE IN CCN IN THE FY 2002-03**

Unit: Million Ksh

No.	Sources of Funds	2000/01	2001/02	2002/03	2003/04
01	General Fund	20.6	59.1	7.6	
02	RMLF	144.6	136.2	71.3	285.8
03	LATF		110.0	61.1	60.0*
	Total	165.1	305.2	140.0	345.8
	Total In US\$ million	2.06	3.82	1.75	4.32

Note: Funds from the LATF is estimated by the study team based on the questionnaire to CCN.

Source: The Report submitted by CCN for KRB, Nov, 2003.

**(3) MOLG**

Between 1997 and 2001, MOLG received 20% of the total RMLF for the maintenance of local authorities roads. The KRB Act of 1999 excluded local authorities from playing a direct participatory role in the RMLF funds. However, in 2002, UDD of MOLG was appointed as a road sub-agency. The road funds UDD received between 2000/02 and 2002/03 are summarized in Table 8.1-4.

**TABLE 8.1-4 ROAD FUNDS UDD RECEIVED IN THE FY 2000/01-2002/03**

Unit: Million Ksh

Source of Funding	2000/01	2001/02	2002/03
RMLF			
LATF	156.30	226.10	
Development GOK Account	115.20	54.40	20.00
Development Aids Account	807.00	101.30	1,200.00
Total	1,078.50	381.70	1,220.00
Total in US\$ million	13.48	4.77	15.25

Source: The Report submitted by UDD for KRB, February 2004.

**(4) KWS**

For the last two fiscal years, KWS has received from the Government Ksh 27 million annually as budgets for the maintenance of unclassified roads and airstrips. In the fiscal year 2002/03, KWS as a road agency presented to KRB a budget of Ksh 60 million that was approved. This year, KWS actually received a total of Ksh 51 million from KRB. This funding is mainly used for maintaining the roads in Tsavo National Park, Amboseli National Park, etc.

**8.2 FINANCIAL SOURCES**

Public funding sources for the road sector can be broadly divided into two categories: internal (domestic) and external (development donor aids). In terms of the domestic funding, there is the RMLF created in 1993, and managed by KRB, and the second is LATF, set up in 1999, now managed by the MOLG. Except for the RMLF and the LATF, which focus mainly on national road maintenance and rehabilitation, the GOK lacks other sources for road maintenance and new road construction and relies heavily on donor aid. Provisionally there is another minor source for the road maintenance known as cess. See Section 8.2 of Appendix 8 for more discussions.

**8.2.1 Domestic Sources****(1) RMLF**

In response to the serious lack of sustainable sources of funding for road maintenance and repair and to the recommendations of the 1992 seminar, the RMLF Act was passed by

Parliament in 1993. The Fund would receive the proceeds from a fuel levy on any petroleum fuels consumed in Kenya, and from the transit tolls levied under the Public Roads Toll Act.

The government agency responsible for administrating the RMLF up to year 2000 was the MRPW (the Permanent Secretary). However, with the Kenya Roads Board Act of 1999, the responsibility for operating the Fund was transferred to KRB. In the first fiscal year of the RMLF, the amount levied was about US\$ 34 million, and up to FY 2001/02, it increased to US\$ 90 million with the gradual increase in the levy rate. It has exceeded over US\$ 100 million in the current fiscal year.

During the two and a half year period from 2001/02 to the end of 2003, the MRPW was allocated 53.4% of the total fuel levy received, and CCN only about 1%. In the first half of 2004/04, 57% of the RMLF was allocated to classify A, B and C roads, 31% to classified D and E roads and other roads in districts, and 7.5% to urban roads, of which 20% are in Nairobi. The allocation of the RMLF follows the criteria established in the KRB Act (Table 8.2-1).

**TABLE 8.2-1 FUNDING DIVISION RATE OF RMLF**

Agency/sub-agency	RMLF budget line	Network	% RMLF Allocation 2003/04
RD	Balance RMLF	All classified roads	57.5%
	24% RMLF	D and E roads	7.4%
	24% RMLF	District roads	8.8%
	16% RMLF	Constituency roads	15.3%
	Sub-total		89%
MOLG	24% RMLF	Urban and township roads	7.5%
KRB	3% RMLF	administration	2.8%
Total			100%

Note: Based on the KRB Act, the RD can only use no more than 57% of this fund, but because DRCs can not be operated as legal implementing road agencies, DRCs funding projects are actually implemented by the RD.

Source: KRB Progress Report, March 2004.

## (2) LATF

Under the LATF, the Government allocated 5% of the total annual national income tax revenues for distribution to all local authorities in the country as a grant, based on the strict observation of a transparent criteria. The fund is objected towards supporting good financial management, debt resolution, and service delivery, as well as strengthening participatory development by involving stakeholders in Local Authority programs and activities. The LATF is now operated and managed by the MOLG.

## (2) Cess

Cess (classically means a kind of "tax") is therefore a sort of tax levied on the transactions of agricultural products. It is usually collected by the officials at the transaction centers of the independent authorities, agencies and/or boards in charge of the respective agricultural products. The management of cess funds, however, is not standardized within a particular

policy framework. Some boards forward the funds to local authorities, while others send it directly to the MOLG.

Recently, a good part of cess is controlled by KRB with the authority to administer 80% of cess. KRB administers the cess funds by maintaining linkage with its disbursement to the programs for the collected locals.

### **8.2.2 Donor Aids**

Contribution of international donors to Kenya's road sector was Ksh 3.7 billion in 2003/04, accounting for 64% of the total development budget, while the GOK's contribution was Ksh 2 billion. The total donor aid increased significantly with the support for the Northern Corridor project, amounting to Ksh 7.8 billion, 78% of the total development budget. The GOK contribution increased slightly to Ksh 2.2 billion.

## **8.3 PRIVATE SECTOR PARTICIPATION**

The participation of the private sector in road development and management has been discussed recently as means to overcome problems of limited government capacity and donor funding. A study on road concessions in Kenya was carried out since May 2001, with the support of the World Bank. The study completed in November 2004 with two phases: Phase one for Assessment of concession potential, and Phase two for the design of a concession framework. In line with the study, the World Bank has keenly pursuing the private sector participation in road management and maintenance through the Northern Corridor Transport Improvement Project.

Three types of concession arrangements have been studied: BOT concessions using conventional tolls, BOT concessions using shadow tolls, and construction contract combined with maintenance concession or MOT (maintain, operate and transfer). The financial evaluation on the conventional road concession applied to three cases of the Northern Corridor (A109/A104 Mombasa-Malaba, A109 Mombasa-Nairobi, and A104 Nairobi - Malaba) has yielded acceptable debt service cover ratio and high internal rate of return for each case. See Section 8.3 of Appendix 8 for details.

## **8.4 PROBLEM IDENTIFICATION**

### **8.4.1 Public Budget**

Public economic services including road service are very limited. It is lower than the public debt service, which means that the public debt service in Kenya is too large, amounting to almost 40% of the total public budget, with over 40% in some years. This implies that Kenyan's financial structure is weak.

### **8.4.2 Financial Management**

A serious funds shortage faced by the GOK, is basically due to scarce financial resources, but is also aggravated by its mismanagement which seems to still persist. Although it has been improved in certain aspects through, for example, the implementation of the KUTIP program, it is yet to be modified to materialize an appropriate management framework which acknowledges the fact that the unit cost of road maintenance and rehabilitation is quite high, caused mainly by inadequate and inefficient management.

What needs to be urgently done is to establish procedures, guideline, and regulations of planning, review, approving, audit, monitoring and evaluation on all road works. At the same time, strengthening inspection and audit for works implementation is absolutely necessary. This area has been quite weak and shortcoming for a long time.

### **8.4.3 Funding Gaps**

According to the Kenya Transport Sector Policy and Roads Sub-sector Study, concluded in December 2003, costs of carrying out full maintenance of roads in good conditions and “holding” maintenance of roads in fair condition would cost a total Ksh 8 billion annually. This amount is almost equal to the total revenue presently available from the RMLF. Recurrent government expenditure on roads was Ksh 6.9 million on an average during 1999/00-2003/04. Of the estimated maintenance cost, Ksh 3.6 million is required for urban roads. However, while the RMLF allocation to urban roads was only Ksh 0.89 billion in 2001/02 and Ksh 0.68 billion in 2002/03. Another estimate shows that the annual maintenance cost of the entire road network should actually be about Ksh 15 billion (KRB liaison meeting in 2004).

The same study estimated also costs of restoring/improving the entire road network to a maintainable level. The total amounts to Ksh 128 billion, consisting of Ksh 85 billion for paved roads and Ksh 43 billion for unpaved roads. Of these, the urban road network requires about 20% of the cost for paved roads and about 33% of the cost for unpaved roads. The total cost required for the urban road network is estimated to be Ksh 31 billion.

Another study by a World Bank team shows that estimates of possible maintenance needs for the urban paved road network amount to US\$13.7 per year. Of this total, 65.6% or US\$9 million (Ksh 675 million) needs to be allocated to Nairobi City roads, consisting of US\$3.3 million for routine maintenance and US\$5.8 million for periodic maintenance. The total fund allocated to road maintenance in CCN averaged to a mere US\$3.0 million during 2000/01-2003/04, just one third of the need.

## **CHAPTER 9**

# **MAJOR FINDINGS OF PRESENT CONDITIONS**

## CHAPTER 9 MAJOR FINDINGS OF PRESENT CONDITIONS

### 9.1 MAJOR FINDINGS OF PRESENT CONDITIONS

The major findings of the present condition and problems are summarised below while the transport problems of the urban poor is presented in Section 9.2.

#### (1) Urban and Socio-Economic Condition

Issues	Existing Conditions	Problems
1. Transport Master Plan and Land Use Plan	In 1973, "Nairobi Metropolitan Growth Strategy" was formulated. This is the only strategy that gives the development directions of land use and transport system for Nairobi City. The transport and land use plan should have been formulated and revised. However, such detailed plan and revision have yet to be formulated.	<ul style="list-style-type: none"> <li>• No Master Plan was formulated ever since.</li> <li>• In addition, lack of coordination among organisations/ authorities is an impediment.</li> </ul>
2. Urban Activities in the City Centre	<ul style="list-style-type: none"> <li>• Much urban activities are still concentrated within the city centre, although decentralisation was suggested in the 1973's Strategy.</li> <li>• Business and commercial functions which constitute the CBD generate large traffic volume.</li> <li>• Transfer of commercial and business cores is now taking place outside of the CBD.</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial and business functions are now suffering from the in-sufficient and inadequate transport system in the city centre directly increasing travel time and cost.</li> <li>• This situation leads to the heavy traffic congestion on trunk roads that converge to the central area.</li> </ul>
3. Low Density Development	<ul style="list-style-type: none"> <li>• Urbanization has been occurring towards the northeast along Thika Road, southeast along Mombasa Road, and east along Kangundo Road.</li> <li>• Housing development has taken place mostly in an ad hoc manner without any attention to the connection with business or industrial areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Large and strong demand for transport infrastructure improvement is prevalent in the nearly developed housing areas in the suburb where transport infrastructure is not sufficiently provided.</li> <li>• Because of the low density development and resulting in insufficient public transport services, dependency on private transport and NMT is intensified.</li> </ul>
4. Economic Development	<ul style="list-style-type: none"> <li>• Share of GRDP of Nairobi Metropolitan Area was estimated to be more than 30% of the GDP.</li> <li>• In Nairobi, manufacturing is dominated by food-processing and assembling/ processing industries.</li> <li>• Along with the stagnation of the Kenyan economy, the GRDP of Nairobi Metropolitan Area has stagnated in the past years.</li> <li>• The population however continues to increase (4.3% in NMA and 3.4% in Nairobi city both from 2003 to 2004) due to urban migration. Population of NMA in 2004 was estimated at 4 million and 2.6 million in Nairobi city.</li> </ul>	<ul style="list-style-type: none"> <li>• Real GRDP per capita has not increased in Nairobi Metropolitan Area.</li> <li>• The expanding working population is mostly absorbed in the informal sector due to the weak economic structure.</li> <li>• Such increasing population tends to form informal settlements or slum areas.</li> </ul>



**(2) Road Network and Conditions**

Issues	Existing Conditions	Problems
<b>1. Road Network</b>		
(1) Sub-urban Area	<ul style="list-style-type: none"> <li>• Lack of circumferential or ring road.</li> <li>• Unplanned urban development along major roads (ribbon type).</li> <li>• Effect or impact of topographic features.</li> </ul>	<ul style="list-style-type: none"> <li>• International trunk roads (A104) carrying mixed traffic of international cargo and urban commuter.</li> <li>• Frequent traffic accidents and black spots. (Traffic accident prone area)</li> <li>• Limits of road network development to the north, west, and south direction.</li> </ul>
(2) Urban Area	<ul style="list-style-type: none"> <li>• Radial road system concentrating on Nairobi City Centre.</li> <li>• Dangerous geometrical conditions for traffic.</li> </ul>	<ul style="list-style-type: none"> <li>• The mixing of traffic through the Nairobi City Centre.</li> <li>• Reduction of the road capacity.</li> <li>• Vehicle traffic conflicting with NMT and resulting in accidents.</li> </ul>
(3) Urbanised Area	<ul style="list-style-type: none"> <li>• An informal and highly distorted road network with two different urban development patterns between the East and West zones due to income levels.</li> <li>• Unclear road classification and hierarchy of the CCN Roads.</li> <li>• No coordinating classification between MRPW and the CCN.</li> <li>• No progress of construction of 'missing link' roads.</li> <li>• Nairobi rivers separating the CBD, Eastern commercial areas and residential areas each in west.</li> <li>• Railway cutting connection between City Centre and industrial area.</li> <li>• Lack of NMT ways for pedestrian and bicycle.</li> <li>• Missing links through the residential areas.</li> <li>• Planned roads improvement by the GOK through the community.</li> <li>• A lack of comprehensive IEA for the Southern Bypass construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Sprawling development in the eastern area.</li> <li>• No planned road improvement.</li> <li>• No clear policy framework of the responsible agencies for road and traffic management.</li> <li>• No functional use of radial and circumferential road system.</li> <li>• Inconvenience of transport for the poor.</li> <li>• Lack of communications between the City Centre and Industrial Area NMT.</li> <li>• Increase of traffic accidents.</li> <li>• Unfavourable Environment for the poor.</li> <li>• Destruction of environment in residential area.</li> <li>• Expected deterioration in the quality of urban environment.</li> </ul>
(4) City Centre	<ul style="list-style-type: none"> <li>• Two individual blocks separated by Uhuru Highway.</li> <li>• Only two connecting roads (Kenyatta Avenue and Haile Selassie)</li> <li>• Mixed traffic of transit and commuter on Uhuru Highway.</li> </ul>	<ul style="list-style-type: none"> <li>• Concentration of traffic on two intersections of Uhuru Highway.</li> <li>• Traffic congestions at major intersections at peak hours.</li> <li>• Unclear road function and under-use of road capacity of Uhuru Highway.</li> </ul>
(5) CBD	<ul style="list-style-type: none"> <li>• Dense regular grid road system with commercial and business activities but insufficient right of way for geometrical improvement.</li> <li>• No utilisation of historical and tourism assets such as historical buildings and monuments near the City Office.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited actions for road widening.</li> <li>• Compromising to the use of the limited road space with motorised and non-motorised transport.</li> <li>• Decay of urban façade and less attractiveness to the tourists.</li> </ul>

2. Road Maintenance	<ul style="list-style-type: none"> <li>• Inadequacy of maintenance funds.</li> <li>• Shortage of good gravel materials for maintenance.</li> <li>• Lack of equipment and experience in bridge maintenance.</li> <li>• Delay of maintenance fund.</li> <li>• Blockage and encroachment by the farmers.</li> <li>• Inadequate staff and equipment.</li> <li>• Lack of proper schedule of procurement of materials.</li> <li>• Over-loading and no-control.</li> <li>• Lack of research for available maintenance material.</li> </ul>	<ul style="list-style-type: none"> <li>• Poor conditions of roads.</li> <li>• Lack of bridge maintenance expertise.</li> <li>• Deterioration of roads in the rainy seasons.</li> <li>• Poor drainage in farm lands.</li> <li>• Fast deterioration of pavement.</li> <li>• Delay of maintenance works.</li> </ul>
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### (3) Public Transport

Issues	Existing Conditions	Problems
1. Bus and Matatu	<ul style="list-style-type: none"> <li>• Major public transport mode is Matatu with 14-seat capacity.</li> <li>• Matatu caters for about 85% of total public transport, while 15% is contributed by Bus.</li> </ul>	<ul style="list-style-type: none"> <li>• Small matatu concentrate on major transport corridors.</li> <li>• This causes serious traffic congestion and accidents.</li> </ul>
2. Taxi and Others	Taxi, tuktuk and bicycle taxi operate in the Study Area. But no taxis have Taxi meters.	Inconvenience for taxi users.
3. Railway	3-commuter lines are operated by Kenya Railway Corporation with 350,000 passengers monthly.	Commuter lines operate poor train coaches and station facilities.
4. Model Choice	High income people only use private cars at this moment.	Increase of private cars causes traffic jams and contributes to the deterioration of urban activities and environment.

### (4) Traffic Management

Issues	Existing Conditions	Problems
Traffic Management Administration	Many agencies and organisations involve traffic management.	Without coordination, the actual activities of traffic management are carried out individually.
Roundabout/ Intersection	There are still many roundabouts in the Study Area.	Traffic congestion due to inadequate traffic management in and around roundabouts/ intersection.
Parking	Many road spaces in the CBD are used for illegal car parking.	Serious traffic jams and deterioration of efficient business/ commercial activities in the CBD.
Traffic Safety	Traffic accidents in the whole of Kenya drastically decreased since the enactment of the new Matatu regulation.	Traffic accidents in Nairobi are still at a high level as ever.

**(5) Legislation and Organisation**

Issues	Existing Conditions	Problems
Transport Legislation	Laws related to the transport sector enacted separately by the local Government Act, the KRB Act, and the KR Act.	• Conflicting provisions of the related laws and regulations
KRB	KRB is tasked to manage the Road Maintenance Levy Fund (RMLF), and is responsible for planning (through DRCs) and implementing (through the RD) class D and E roads.	• Over-reliance on RMLF • Insufficient manpower to undertake its mandates • Inability to coordinate with related agencies
MRPW	MRPW takes charge, through the RD, of development, maintenance and rehabilitation of class A, B and C roads.	• Shortage of funds for project implementation • Ineffective organisational structure • Inadequate planning, management and monitoring of project implementation

**(6) Finance**

Issues	Existing Conditions	Problems
Finance for Road Projects	Sources of funds for road projects include RMLF (50% of the total fund), government budget (40%), donor support, LATF and local cess	• Over-reliance on RMLF. • Lack of donor support party due to Kenya's macroeconomic and debt conditions
User Charges for Public Transport	Both bus and matatu services are provided by private operators without any regulation of irregular sales.	• Sometimes irrationally different fares are applied. • No mechanism to apply user charges for transport infrastructure.

**(7) Environment**

Issues	Existing Conditions	Problems
Natural Environments	• Deterioration of air quality and increase of noise pollution • Degradation of forest area	• This cause health problems on inhabitants • Needs of restoration of forest area
Social Considerations	• Increase of slum population • Poor roadside amenity • No spaces for NMT • No space for bus bay for safe riding	• Increasing demand of NMT • Encroachment of road reserve • Under utilization of public transport

**9.2 TRANSPORT PROBLEMS FOR THE URBAN POOR****(1) Use of non-motorized transport (NMT)**

The expansion of urbanized areas tends to increase travel disturbance and time for the poor who rely on Non-Motorized Transport (NMT) as they have limited choice of selection of their residence. Use of NMT in Nairobi City is generally disturbed by insufficient pedestrian/ bicycle lanes and road crossings, reckless driving, and poor security. Poor security especially after dark is the major reason for the unpopularity of motorcycles and bicycles.

**(2) Accessibility to public transport services**

Currently the public transport in Nairobi City depends almost entirely on private bus and matatu services. Recent increases in bus and matatu fares have reduced their use by the poor.

Also the private bus services have effective monopoly in some areas including the central area of Nairobi City. Use of railway is constrained by limited service frequency and route.

### (3) Transport safety

Transport safety in the NMA is threatened in general by inadequate pedestrian/ bicycle lanes and crossings, insufficient traffic signals and street lighting, and poor design and management of most intersections. Moreover, public awareness of transport safety is low not only among drivers but also among pedestrians and cyclists as well.

### (4) Traffic-related pollution

Vehicles in Nairobi City are major sources of pollution due to noise, vibration and exhaust emission. These problems are aggravated with traffic congestion due to the lack of a legal base to control them and poor traffic management.

### (5) Increase in slum population

Informal settlements in Nairobi City are densely populated. A recent estimate indicates that the population in some of them has increased significantly as shown in Table 9.2-1. This implies that the generation of NMT increased and its pattern changed, while existing transport facilities have not coped with the prevailing changes.

**TABLE 9.2-1 SLUM DEVELOPMENTS IN NAIROBI**

Area	1993 <sup>1)</sup>	2002 <sup>2)</sup>
1 Kibera	251,040	291,600
2 Dagoretti	186,250	96,840
3 Kasarani	158,120	277,400
4 Makadara	102,480	99,900
5 Embakasi	31,890	115,200
6 Pumwani	11,890	28,800
7 Parklands	7,330	-
8 Mathare	-	165,600
Total	749,000	1,075,340

Note: 1) Alder, G. (1995) Matrix Development Consultants

2) Estimated by Save the Children Center (SCC), Nairobi.

In October 2004 UN-Habitat started the Kenya Slum Up-grading Programme (KENSUP) with MRPW and MOLG. Although the programme covers urban areas in Kenya as a whole, Nairobi and Kisumu have been selected as pilot urban areas. In Nairobi, the Kibera-Soweto areas have been selected. In these areas, more than 90 % of the households lack basic physical and social infrastructure. While in Kibera security of land tenure is not clear, it is not the case in Soweto.

In order to improve the livelihood of people living and working in Kibera-Soweto, housing improvement, income generation and other programmes have to be implemented. There are various organizations involved in such programmes as are undertaken by the central and local governments, international and bilateral aid agencies including NGOs and private companies. For instance, a number of bicycles are provided for small businesses in operation within the Kibera slum. It is a test case as to whether NMT would become popular in the slum area and if it may be extended to other areas.