社会開発調査部報告書

No. 32

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF WORKS, TRANSPORT AND COMMUNICATIONS
THE REPUBLIC OF UGANDA

THE FEASIBILITY STUDY
OF
IMPROVEMENT OF TRUNK ROAD
AT
KAMPALA URBAN INTERFACE SECTIONS

FINAL REPORT

PART A : MASTER PLAN STUDY
PART B : FEASIBILITY STUDY

MAIN TEXT

NOVEMBER 1997

NIPPON KOEI CO., LTD.
JAPAN ENGINEERING CONSULTANTS CO., LTD.

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PREFACE

In response to a request from the Government of the Republic of Uganda, the Government of Japan decided to conduct a Feasibility Study of Improvement of Trunk Road at Kampala Urban Interface Sections and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Uganda a study team headed by Mr. K. Matsuda, Nippon Koei Co., Ltd., three times between January 1997 and October 1997.

The team held discussions with the officials concerned of the Government of Uganda , and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincerely appreciation to the officials concerned of the Government of the Republic of Uganda for their close cooperation extended to the team.

November, 1997

Kimio Fujita
President
Japan International Cooperation Agency

November, 1997

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

Dear Sir,

We are pleased to submit to you the report on the Feasibility Study of Improvement of Trunk Road at Kampala Urban Interface Sections. The report contains the advice and suggestions of the authorities concerned of the Government of Japan and your agency as well as the comments made by the authorities concerned in the Republic of Uganda. The report consists of a main report, an executive summary and a drawing volume.

The report contains a Master Plan and a Feasibility Study parts. The master plan proposes the road development strategies towards 2015 and high priority road developments projects to be implemented by 2015. The subsequent feasibility study on high priority road development projects concludes that the proposed projects will be technical and economically feasible and will be acceptable from the environmental aspects, and will contribute to the improvement of urban traffic situation in the city of Kampala.

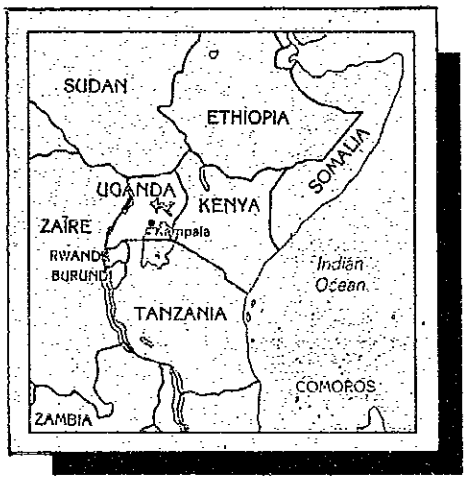
We wish to take this opportunity to express our sincere gratitude to your agency, the Ministry of Foreign Affairs, the Ministry of Construction and the Japan Highway Public Corporation. We also wish to express our deep gratitude to the Government agencies concerned in the Republic of Uganda for the close cooperation and assistance extended to us during our study. We hope this report will contribute to the development of the Republic of Uganda.

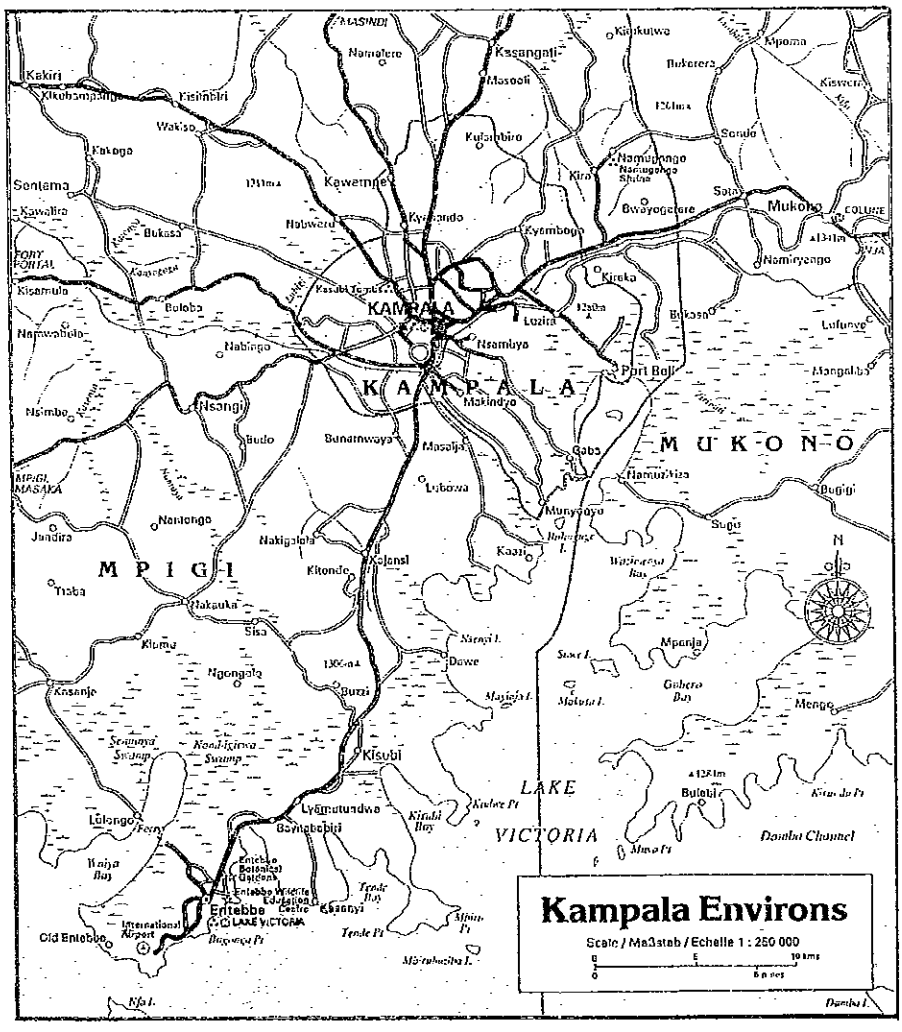
Very truly yours,

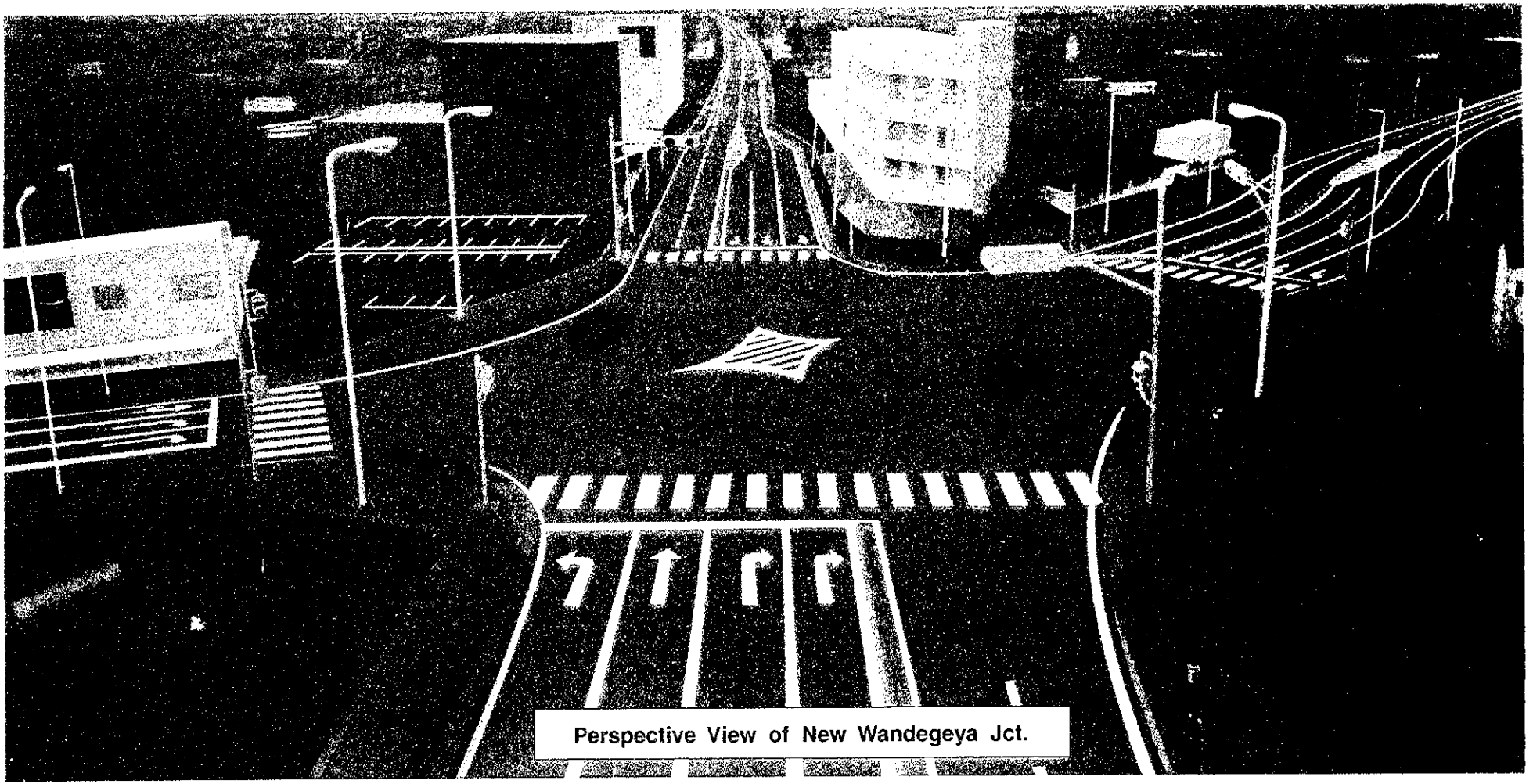
K. Matsuda

Katsuyoshi Matsuda
Team Leader
The Feasibility Study of Improvement
of Trunk Road at Kampala Urban
Interface Sections

LOCATION MAP







Perspective View of New Wandegeya Jct.

Perspective View of New Natete Road near Mengo

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ABBREVIATIONS AND EXCHANGE RATES

ADT	Annual Daily Traffic
ASCII	American Standard Character and Integer Indicators
AASHTO	American Association of State Highway and Transportation Officials
AMC	Asphalt Mixed Concrete
BHN	Basic Human Need
CBD	Central Business District
CBR	California Bearing Ratio
CIF	Cost, Insurance, Freight
CML	Central Material Laboratory
DBST	Double Bitumen Surface Treatment
DRC	Depreciation Replacement Cost Method
EIA	Environmental Impact Assessment
ERP	Economic Recovery Plan
EU	European Union
FOB	Free on Board
FRI	Forestry Research Institute
FY	Fiscal Year
GOU	Government of Uganda
IEA	Initial Environmental Assessment
JICA	Japan International Cooperation Agency
KCC	Kampala City Council
LVEMP	Lake Victoria Environment Management Agency
MIS	Management Information System
MOF	Ministry of Finance
MOLG	Ministry of Local Government
MOLHPP	Ministry of Lands, Housing and Physical Planning
MONR	Ministry of Natural Resources
MOPED	Ministry of Planning and Economic Development
MOWTC	Ministry of Works, Transport and Communications
MRMP	Main Roads Maintenance Programme
NEMA	National Environmental Management Agency
NRM	National Resistance Movement
NTSC	National Tree Seed Centre
NWSC	National Water and Sewerage Corporation
OD	Origin - Destination
PCU	Passenger Car Unit
PIP	Public Investment Plan
PSI	Present Serviceability Index
RSDP	Road Sector Development Proposal

TA	Technical Assistance
TC	Time Cost
TRP	Transport Rehabilitation Project
UHEM	Uganda Highway Evaluation Model
UTODA	Uganda Taxi Operators and Drivers Association
VAT	Valued Added Tax
VOC	Vehicle Operation Cost
WDD	Water Development Department

[Exchange Rates]

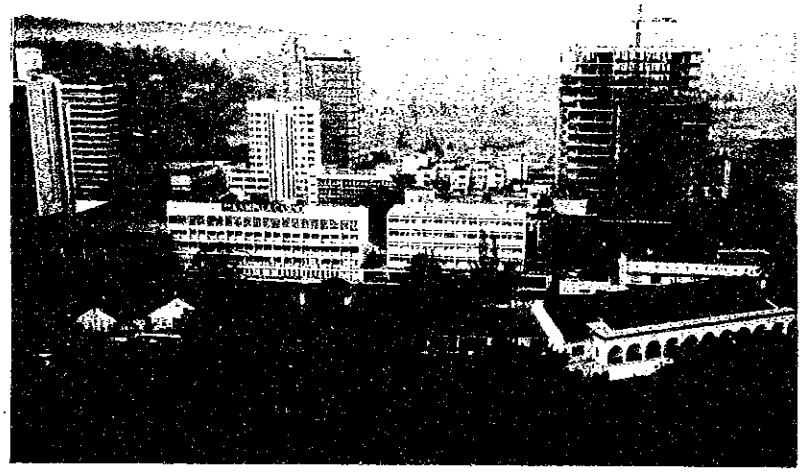
US$1.00 = Ushs. 1,042.52 = ¥120.88

(Average exchange rates during February 1997 and July 1997)

PART A: MASTER PLAN STUDY

CHAPTER 1

INTRODUCTION



1. INTRODUCTION

1.1 Background of the Study

The Government of Uganda is making one of its highest priorities the improvement of the road network within the nation.

The political turmoil and economic decline in the country during the seventies and eighties have resulted in a severe decline in the living standard of the vast majority of Ugandans. Transport and communications have deteriorated severely due to inadequate management and an inappropriate allocation of the nation's resources.

With the initiation of the Economic Recovery Programme (ERP), the government has placed the highest emphasis on rehabilitation and maintenance of the dilapidated road infrastructure. However, the road standard in Uganda at present is still low and further investment work is required for the build-up of the national economy.

The city of Kampala has a road network of 212 km in total of which 126 km or about 60% of the total road length is paved road. However, most of the roads are substandard with insufficient road facilities, with dilapidated road surface condition, narrow sidewalks, and a poorly maintained roadside drainage system.

The road traffic condition in the city is getting worse due to the recent increase in vehicles and sharp concentration of people in the city centre. Traffic congestion on the major trunk roads near the city centre occurs daily and traffic accidents which involve pedestrians are sharply on the increase.

With this background, the Government of Uganda is in urgent necessity of improving the road traffic situation of the city of Kampala and requested the assistance of the Japanese Government of carry out a feasibility study of improvements to the trunk road in the city of Kampala.

In response to this request, the Government of Japan decided to carry out the Study and entrusted its execution to the Japan International Cooperation Agency (hereinafter referred to as "JICA"); the official agency responsible for the implementation of technical cooperation programs by the Government of Japan.

JICA dispatched a preparatory study team to formulate an approach for technical cooperation in addition to organizing an advisory committee (hereinafter referred to as "the Advisory Committee") and a Study Team (hereinafter referred to as "the Study Team").

1.2 Objectives of the Study

The major objectives of the Study are:

1) To formulate a road development plan for the trunk roads in the city of Kampala up to the year 2015, aiming at a reduction of traffic congestion and enhancement of traffic safety levels,

2) To select high priority road sections to be improved, and carry out feasibility a study of them in which road designing is to be carried out, along with an environmental impact assessment and economic evaluation of them, and

3) To promote technical transfer of knowledge and technology, which is necessary for the formulation and implementation of the road development plan, to Ugandan counterparts.

1.3 Study Area

The Study Area covers the entire area of the city of Kampala and its adjacent area.

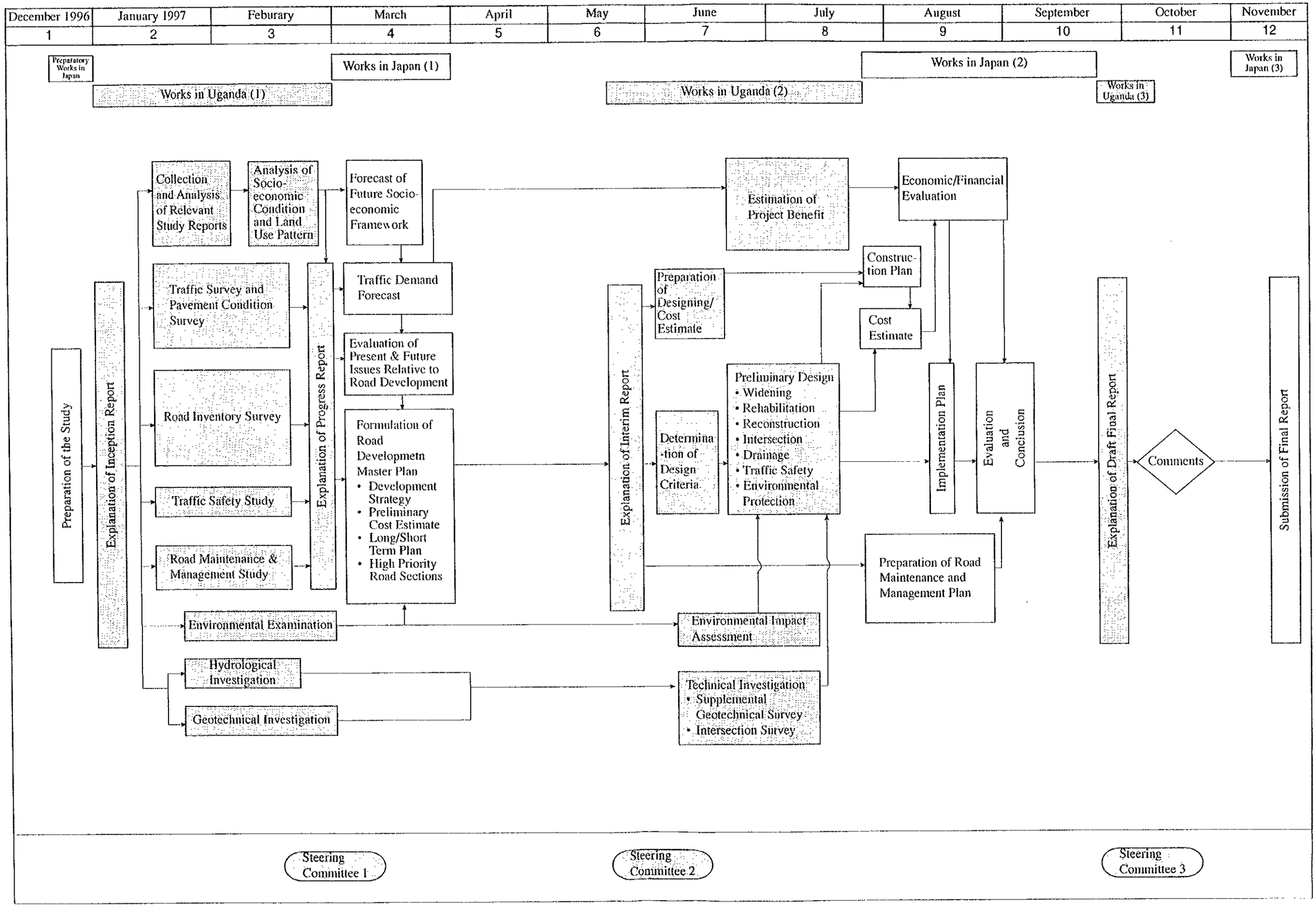
1.4 Work Schedule of the Study

The Study started at the end of December 1996 and will come to end in October 1997. An overall work flow illustrating the inter-relationship of all activities in the Study is presented in Figure 1.1. The main items to be studied in each stage of work are summarized as below:

1) 1st Works in Uganda (Jan. 1997 - Feb. 1997)

- to conduct field surveys and analyze data, including :
- collection and analysis of relevant study reports
- traffic survey/pavement condition survey
- road inventory survey
- traffic safety study
- road maintenance & management study
- environmental examination
- geotechnical survey/hydrological survey

Figure 1.1 Work Schedule of the Study



- analysis of socio-economic condition and land use pattern

2) 1st Works in Japan (Mar. 1997)

- forecast of future socio-economic framework
- traffic demand forecast
- evaluation of present & future issues relative to road development
- formulation of road development master plan

3) 2nd Works in Uganda (May 1997 - July. 1997)

- preparation of designing/cost estimate
- determination of design criteria
- to carry out technical investigation
- environmental impact assessment
- preparation of construction plan
- preliminary design
- cost estimation
- preparation of road maintenance and management plan
- estimation of project benefit
- economic/financial evaluation
- preparation of implementation plan
- evaluation and conclusion

4) 2nd Works in Japan (July 1997 - Sept. 1997)

- preparation of draft final report

5) 3rd Works in Uganda (Sept. 1997 - Oct. 1997)

- to submit and explain about draft final report

6) 3rd Works in Japan (Nov. 1997)

- to prepare and submit final report

1.5 Organization and Assignment of Study Team

The Study will be carried out by the Study Team under the guidance of the Advisory Committee, which is organized by JICA.

The Ministry of Works, Transport and Communications (hereinafter referred to as MOWTC), the Government to Uganda, is the counterpart agency to the Study Team.

The Government of Uganda will establish a Steering Committee consisting of the representatives of relevant organizations.

In carrying out the Study, the Study Team will work with the counterpart personnel assigned by the counterpart agency.

The organization chart and assignment schedule of the Study Team are presented in Figure 1.2 and Figure 1.3 respectively.

1.6 Reporting

Reporting in connection with the Study will be made as follows:

Name of Report	Date of Submission
Inception Report	The beginning of January, 1997
Progress Report	The end of February, 1997
Interim Report	The end of March, 1997
Draft Final Report	The end of September, 1997
Final Report	The end of November, 1997

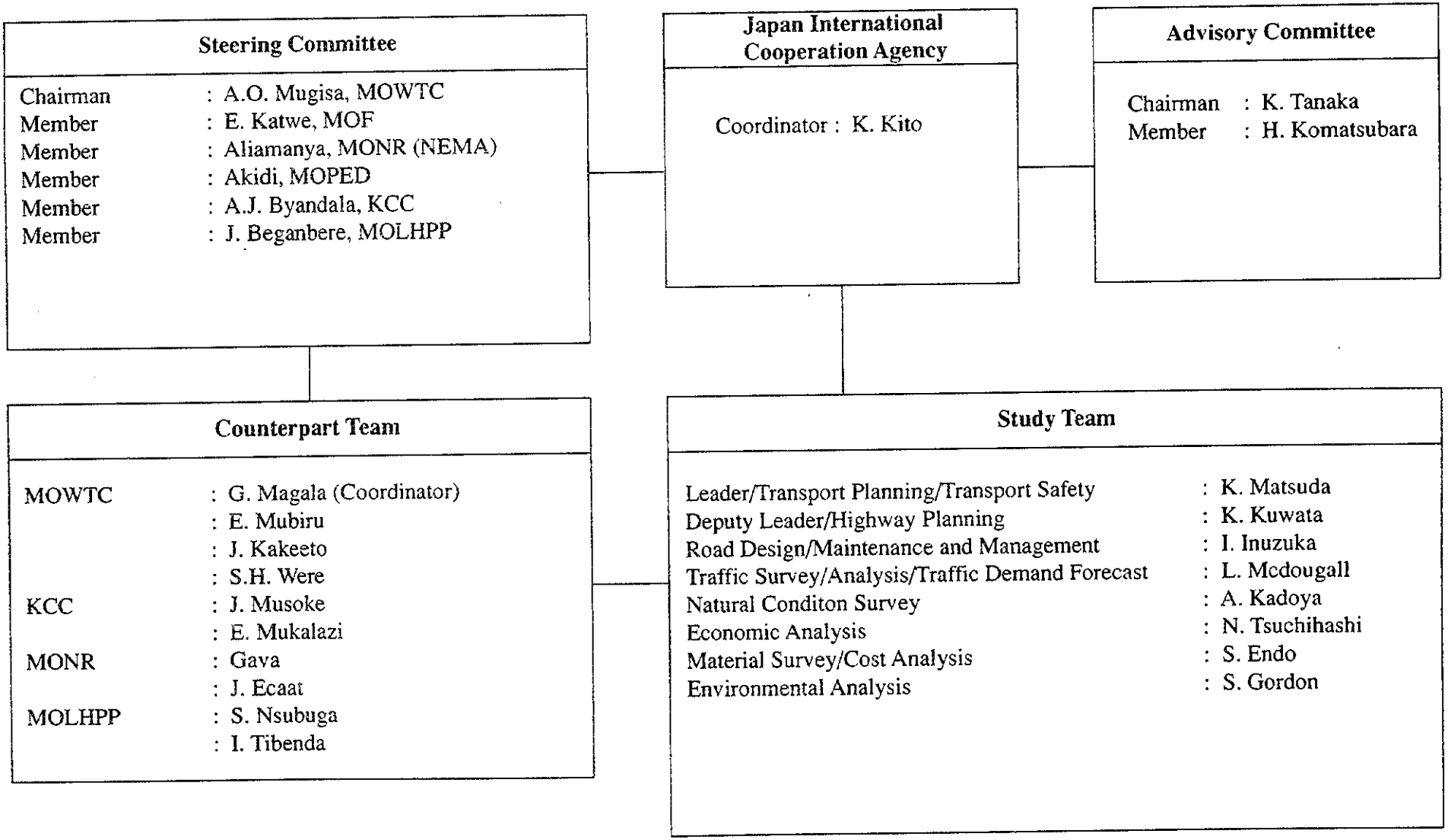


図1.2 Organiztion Chart

Figure 1.3 Assignment Schedule of The Study Team

Position	Name	1996	1997										
		Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.
Leader/Transport Planning/Transport Safety	K. MATSUDA												
Sub-Leader/Road Planning	K. KUWATA												
Road Design/Maintenance and Management	I. INUZUKA												
Traffic Survey/Analysis/ Traffic Demand Forecast	L. MCDOUGALL												
Natural Condition Survey	A. KADOYA												
Economic analysis	N. TSUCHIHASHI												
Material Survey/ Cost Analysis	S. ENDO												
Environmental Analysis	S. GORDON												
Report			IC/R	P/R	I/R						DF/R		F/R

Work in Japan Work in Uganda

CHAPTER 2

SOCIO-ECONOMIC CONDITION

2 SOCIO-ECONOMIC CONDITION

2.1 Introduction

2.1.1 General

Uganda, located at the equator, has a total area of 241,139 km^2 of which 18% (43,405 km^2) is water, swamp and marsh, 12% (28,937 km^2) is forest and game reserves while the remainder 70% (16,897 km^2) is fertile ground potentially available for crop and livestock production. It is a land-locked country surrounded by Kenya in the east, Tanzania and Rwanda in the south, Zaire in the west and Sudan in the north.

Uganda got independence from Britain on 9th October 1962. In 1966, Uganda started experiencing political turmoil that led to the abrogation of the 1962 Independence Constitution. Sweeping socialistic economic reform policies were introduced and these led to the nationalization of private and commercial firms. Political tension within the Government led to the 1971 military coup and an era of military dictatorship followed. There was total economic mismanagement, civil strife, anarchy and disorder until 1979 when the military dictatorial regime was overthrown by force of arms. The attempt to return to civilian rule in 1980 was marred by rigged elections that led to a 5 year guerrilla war up to 1986 when the National Resistance Movement (NRM) assumed power. The post 1986 era has been a period of cherished peace and security. For the last 8 years the Government has been run as a participatory movement democracy and there has been a marked improvement in human rights. A new constitution focused on peace, unity and development has been framed and was promulgated at the end of 1995.

2.1.2 Socio-economic Background

In the period immediately following Independence, the Ugandan economy recorded growth rates around 5% per annum, while inflation was contained within single digit figures. The economy's endowment of social and physical infrastructure was good by Sub-Saharan standards. For example, Uganda's road network of 30,000 km was one of the densest in Africa. A soundly managed macro-economy ensured that the conditions for the private sector were conducive to increased investment, and reasonable living standards were achieved. However, the late 1960s were marked by moves towards increased Government control of the economy including nationalization of domestic and foreign owned companies. The economy started to decline.

Following the take-over of Government by the Military in 1971, the next 15 years were characterized by nearly uninterrupted economic decline. The country suffered extreme civil strife during this period. A combination of the breakdown of the rule of law and abuse of power undermined property rights, eroded the tax base, and precipitated a situation where privilege and power of coercion increasingly determined the allocation of Government and private sector resources.

The result was a dramatic reduction in industrial capacity and output, the virtual collapse of the cotton industry, increased smuggling of coffee, and a retreat into subsistence farming by the majority of agricultural producers. Through unsustainable policies and general neglect, the Governments of this period failed to maintain public assets, and social as well as basic physical infrastructure collapsed. By the mid-1980s, annual growth rates had fallen to below 2%, with per capita income of about US$200, and poor social indicators. The prolonged period of political turmoil had effectively demoted Uganda to one of the World's poorest nations.

When the NRM Government came to power on 26 January 1986, it therefore found itself taking over a country, where economic behaviour had been radically altered by the preceding years of civil strife. Upon coming to power, the NRM Government's first priority was to restore peace and security - a fundamental precondition for development. As security was gradually restored, the Government began the implementation of its policy to develop an independent, integrated, and self-sustaining economy. An Economic Recovery Programme (ERP) was launched in 1987 with the following principal objectives:

1) promote economic rehabilitation and growth;

2) restore internal financial stability and achieve low inflation;

3) reduce imbalances in the external accounts particularly through increases in the volume and diversity of exports.

The ERP was launched with a comprehensive Emergency Rehabilitation Programme supported by donors. Particular emphasis was placed on developing human capital through investment in education, health and other social services. Donors played a particularly large part in rehabilitating the country's road infrastructure.

Restoration of macro-economic stability was a second central pillar of the ERP. Stability is essential for confidence in the currency, and for attracting foreign and domestic investment.

The confidence to invest generated by a stable macro-economy is also essential if Government is to mobilise taxes with which to take the lead in the recovery process.

Complementing stabilisation, Government implemented various measures to improve the reputation of Government viz-a-viz the private sector. These measures included the creation of new bodies including Uganda Revenue Authority for tax collection, Uganda Investment Authority as a "one-stop-shop" for new investors, and the Custodian Board for restoration of properties to rightful owners.

Thirdly, the ERP focused on improving the management of Government's Budget in order to minimize unwanted monetary expansion. Fiscal policy was kept tight with a view to keeping prices stable.

Finally, the ERP promoted the liberalization of international trade. This was intended to relieve the burden on the export sector caused by excessive protection of imports, and began with the abolition of the monopoly position of the Coffee Marketing Board. A process of liberalization of current account transfers and payments was also begun. Finally, a major programme of public enterprise reform was commenced.

2.1.3 Recent Economic Growth

As a result of the successful implementation of the ERP, the Uganda economy is now 2/3 larger than it was when the NRM Government came to power. While the restoration of security acted as a catalyst for this growth, the continuation of economic expansion can now increasingly be attributed to larger volumes, and greater productivity of domestic and foreign investment. Rising domestic consumption, increased regional demand, and improvements in capacity and land utilization are also continuing to contribute to growth.

2.2 Population

2.2.1 Trend in Population Growth

The total population in Uganda was approximately 17 million, according to the latest 1991 Census. Ninety percent(90%) of the population live in rural areas. The table below shows population figures in 1969, 1980 and 1991 and the growth rates between the respective years.

Uganda

Year	Population	Annual Average Growth (%)
1969	9,535,051	
1980	12,636,179	2.6
1991	16,671,705	2.5

If the same growth trend is maintained, the total Uganda population is likely to pass 19 million in 1997.

Kampala City, covering the whole administrative division of Kampala District, had a population of more than 774,000 in 1991. The 1991 Census likewise gives the following figures:

Kampala City

Year	Population	Annual Average Growth (%)
1969	330,700	
1980	458,503	3.0
1991	774,241	4.9

The Study Team estimates that Kampala City population will surpass one million in 1997, although more conservative projection figures appear in such publications as "10 - Year Road Sector Development Programme". It should also be borne in mind that the urban population is expanding beyond the current city limits and into Mpigi District.

The 1991 Census population of Kampala City comprises 730,189 of household population (94.3% of the total) and 44,052 of institutional/floating population (5.7% of the total); the number of households being 182,439, and the average size of households being 4.0 people.

2.2.2 Area Division for Traffic Analysis and Planning

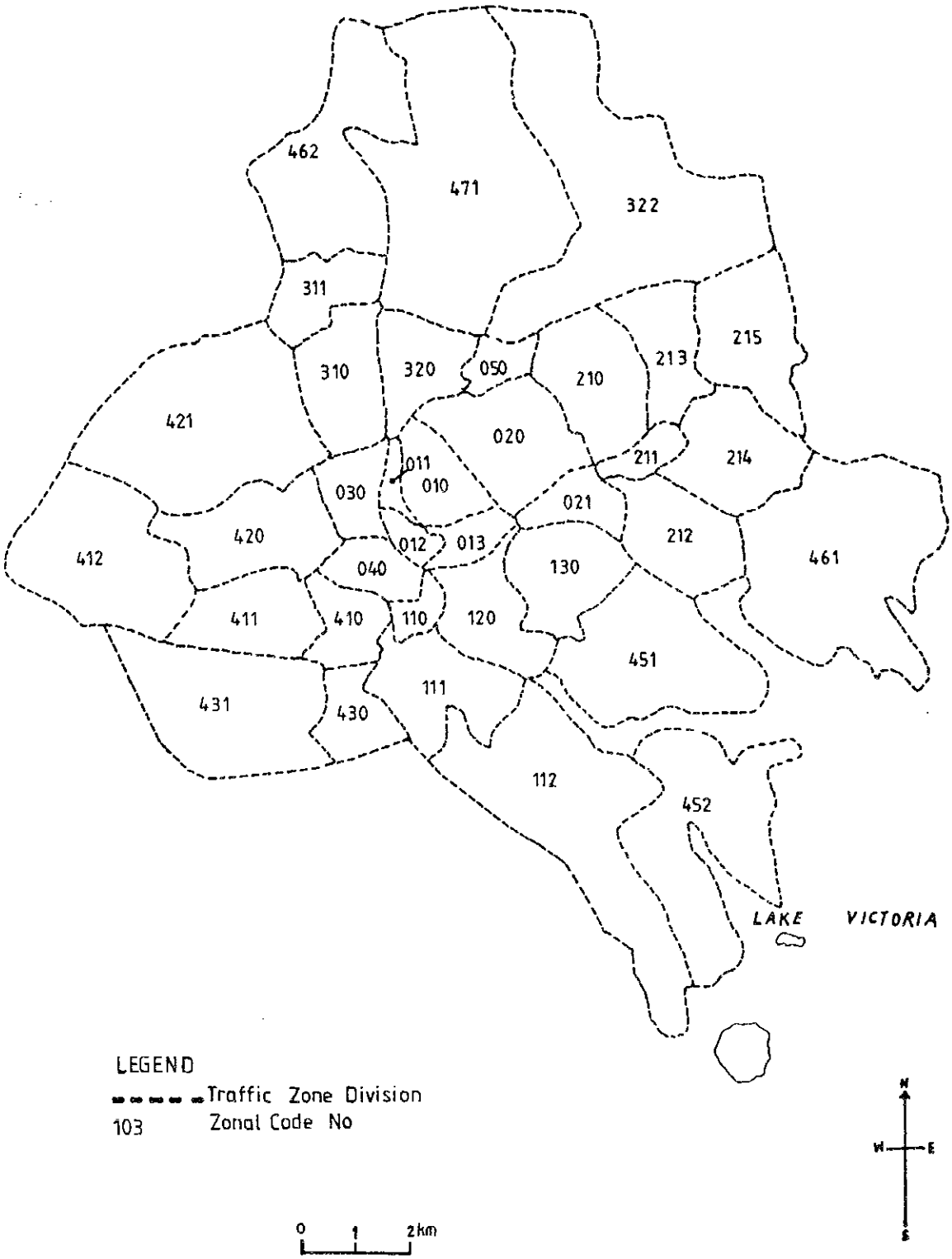
(1) Demarcation of Traffic Zones

In order to analyze traffic survey results as well as to forecast future traffic demand, the entire area was divided into basic area units called "traffic zones" in consideration with the socio-economic characteristics. In demarcating traffic zones, the most important consideration is an availability of data especially population. The 1991 Census contains ward (parish) population figures in

Kampala City, a ward being the smallest area providing data for the purpose of the Study. From the Statistics Dept., an administrative boundary map showing wards/parishes inside Kampala City has been provided, and it was utilized to demarcate the Kampala City inner traffic zones. Outside Kampala City, it was determined that a group of Districts constitute traffic zones; however, Mpigi District which surrounds Kampala was divided into three zones. The neighbouring 5 countries; Kenya, Zaire, Tanzania, Rwanda and Sudan, become one traffic zone each, with the exception that Tanzania and Rwanda were combined. Figures 2.1 and 2.2 illustrate the traffic zone division thus formulated, inside and outside the city of Kampala.

(2) Population by Traffic Zone

As described above, traffic zones were demarcated according to the socio-economic characteristics of areas and analytical planning needs. Table 2.1 shows the Kampala City inner traffic zones and their population based on the 1991 Census. Table 2.2 enumerates the traffic zones outside the Kampala District, but without population figures.



THE FEASIBILITY STUDY OF
IMPROVEMENT OF TRUNK ROAD
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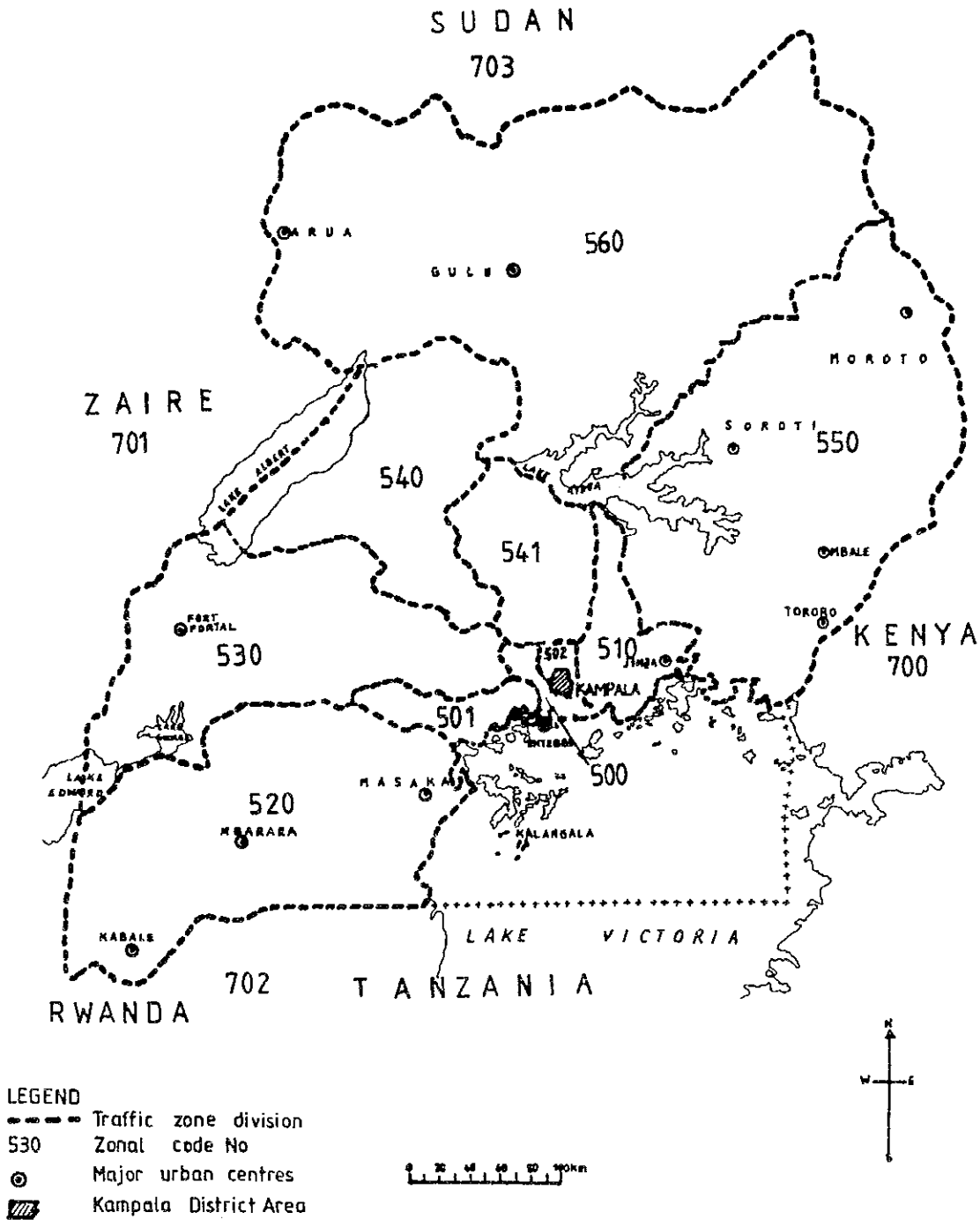
Fig. 2.1

Kampala City Inner Traffic Zones



THE FEASIBILITY STUDY OF
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Fig. 2.2

Traffic Zones
Outside Kampala District

Table 2.1 Population by Kampala City Inner Traffic Zone (1)

Sequence No.	Zone Code	Involved Wards	Ward Population *	Zone Population *	Remarks
1.	010	Nakasero I	2,612		
		Nakasero II	6,478	9,090	
2.	011	Nakasero III	3,521	3,521	
3.	012	Nakasero IV	4,037		
		Nakivubo	4,371	8,408	
4.	013	Civic Center	3,489	3,489	
5.	020	Kololo I	3,238		
		Kololo II	3,164		
		Kololo III	1,399		
		Kololo IV	4,231	12,032	
6.	021	Industrial Area	1,049	1,049	
7.	030	Kagugube	8,238		
		Bukesa	7,787		
		Old Kampala	7,023	23,048	
8.	040	Kisenyi I	3,441		
		Kisenyi II	9,399		
		Kisenyi III	5,318		
		Mengo	10,394	28,552	
9.	050	Kamwokya I	5,161		
		Kamwokya II	12,079	17,240	
10.	110	Katwe I	7,589		
		Katwe II	8,225	15,814	
11.	111	Kibuye I	14,873		
		Kibuye II	6,776		
		Makindye I	8,352		
		Makindye II	12,170	42,171	
12.	112	Luwafu	6,244		
		Lukuli	5,273		
		Salaama	4,414	15,931	
13.	120	Nsambya C.	14,080		C. - Central
		Nsambya E.	1,027		E. - Estate
		Nsambya P.	7,301		P. - Police
		Nsambya R.	4,337	26,745	R. - Railway

Remarks: * - Based on 1991 Census Figures

Table 2.1 Population by Kampala City Inner Traffic Zone (2)

Sequence No.	Zone Code	Involved Wards	Ward Population*	Zone Population*	Remarks
14.	130	Kibuli	14,498		
		Kabalagala	10,323		
		Wabigalo	10,213		
		Kisugu	10,790	45,824	
15.	210	Naguru I	8,313		
		Naguru II	10,436	18,749	
16.	211	Nakawa	5,287		
		Nakawa I.	939	6,226	I. -Institutions
17.	212	Kiswa	4,894		
		Bugolobi	10,698	15,592	
18.	213	Ntinda	6,861	6,861	
19.	214	Mbuya I	4,293		
		Mbuya II	6,052	10,345	
20.	215	Kyambogo	2,066		
		Banda	8,952		
		ITEK	275		
		Nabisunsa	608		
		UPK	787		
		Upper Estate	1,036	13,724	
21.	310	Muluka I	1,623		
		Muluka II	1,387		
		Muluka III	263		
		Muluka IV	1,437		
		Makerere I	6,627		
		Makerere II	8,148		
		Makerere III	9,952	29,437	
22.	311	Bwaise I	11,221		
		Bwaise II	13,277		
		Bwaise III	7,321	31,819	
23.	320	Mulago I	9,647		
		Mulago II	13,889		
		Mulago III	8,933		
		Wandegeya	5,091	37,560	

Remarks: * - Based on 1991 Census Figures

Table 2.1 Population by Kampala City Inner Traffic Zone (3)

Sequence No.	Zone Code	Involved Wards	Ward Population*	Zone Population*	Remarks
24.	322	Bukoto I	8,123		
		Bukoto II	8,625		
		Kiwatule	2,508		
		Kyanja	3,650	22,906	
25.	410	Ndeeba	19,421	19,421	
26.	411	Rubaga	15,124	15,124	
27.	412	Busega	8,661		
		Natete	14,008	22,669	
28.	420	Namirembe	16,381		
		Lungujja	10,681	27,062	
29.	421	Kasubi	24,290		
		Nakulabye	15,275		
		Lubya	12,207	51,772	
30.	430	Najjanankumbi I	9,299		
		Najjanankumbi II	9,271	18,570	
31.	431	Mutundwe	12,279		
		Kabowa	12,431	24,710	
32.	451	Bukasa	8,815		
		Kansanga	14,633	23,448	
33.	452	Ggaba	12,242		
		Buziga	4,822	17,064	
34.	461	Mutungo	15,746		
		Luzira	11,273		
		Luzira Prisons	8,123		
		Butabika	6,974	42,116	
35.	462	Kawempe I	16,102		
		Kawempe II	6,721		
		Kazo	7,106	29,929	
36.	471	Kyebando	12,445		
		Kikaya	3,969		
		Kanyanya	8,996		
		Mpererwe	1,547		
		Komamboga	2,908	29,865	

Remarks: * - Based on 1991 Census Figures

Table 2.2 Traffic Zones Outside Kampala District

Sequence No.	Zone Code	Involved Urban Centres / Districts / Country
37.	500	Mpigi - Entebbe, Busiro
38.	501	Mpigi - Gomba, Butambala, Mawokota
39.	502	Mpigi - Kyaddondo
40.	510	Mukono, Jinja
41.	520	Masaka, Rakai, Mbarara, Bushenyi, Rukungiri, Kabale, Kisoro
42.	530	Mubende, Kibaale, Kabarole, Kasese, Bundibugyo
43.	540	Masindi, Hoima, Kiboga
44.	541	Luwero
45.	550	Iganga, Tororo, Mbale, Kapchorwa, Kamuli, Paliisa, Kumi, Soroti, Moroto
46.	560	Kotido, Lira, Kitgum, Gulu, Apac, Moyo, Arua, Nebbi
47.	700	Kenya
48.	701	Zaire
49.	702	Tanzania, Rwanda
50.	703	Sudan

2.3 Economic Activity

2.3.1 GDP, Economic Trend and Kampala City Characteristics

Table 2.3 summarizes the economic performance during the period 1986 to 1995. Uganda has registered an average annual growth rate of 6.7% in the 10 years. During the same period, per capita GDP has increased moderately as well. Agriculture, the country's major exportation source, grew by 5.0%, contributing over half of the GDP and supporting over 90% of the country's population. The fastest growing sectors are manufacturing and construction with growth rates of 12.1% and 13.2% respectively. Commercial activities have shown a relatively high growth rate, which is 9.1%.

Kampala City is a major commercial and industrial centre of Uganda, accommodating important economic, social and political institutions. The economy of Kampala City is strongly influenced by the national economy. Regional production figures are not available, but the factors attracting manufactures and traders are identified as follows:

- Kampala city is the largest market in the country, with relatively better income than elsewhere, in terms of consumer goods.
- Kampala city has a role of hub of the country's transportation network: roads, rail, air, and water transport on Lake Victoria.
- Financial institutions such as banks and insurance companies are concentrated in the Central Business District.
- Kampala city is the centralized location of government ministries, parastatals (together with Entebbe) and various corporations in the private sector.

According to the "Census of Business Establishments, 1989", Kampala City has 1,161 industrial establishments (employment: 66,234) out of a total 2,787 (employment: 135,451) in Uganda. This means nearly half of the large-scale factories of the country are located in the city area.

Table 2.3 GDP by Major Economic Sector at Constant 1991 Prices, 1986-1995

Unit: Billion Ush.
( ) : Share to GDP (%) in each year.

Economic Sector	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1. Agriculture*	868.1 (56.1)	906.5 (54.9)	963.6 (54.5)	1,019.2 (54.2)	1,060.1 (53.4)	1,086.1 (52.0)	1,116.3 (51.2)	1,170.5 (50.1)	1,245.9 (48.8)	1,300.7 (46.8)
2. Manufacturing	73.5 (4.7)	80.2 (4.9)	93.1 (5.3)	104.0 (5.5)	109.5 (5.5)	122.5 5.9)	132.2 (6.1)	148.7 (6.4)	175.4 (6.9)	205.6 (7.4)
3. Construction*	70.0 (4.5)	98.3 (6.0)	102.8 (5.8)	109.2 (5.8)	115.2 (5.8)	122.1 (5.8)	127.9 (5.9)	140.7 (6.1)	170.3 (6.7)	213.2 (7.6)
4. Wholesale, Retail Trade	160.1 (10.3)	172.9 (10.5)	192.8 (10.9)	206.9 (11.0)	221.1 (11.1)	237.3 (11.4)	246.5 (11.3)	262.1 (11.3)	311.0 (12.2)	351.8 (12.7)
5. Others**	377.0 (24.3)	394.2 (23.9)	416.5 (23.5)	442.2 (23.5)	478.5 (24.1)	519.7 (24.9)	559.2 (25.6)	598.1 (25.8)	652.2 (25.5)	706.4 (25.4)
Total (GDP)	1,548.7	1,652.1	1,768.8	1,881.5	1,985.2	2,087.7	2,182.1	2,320.1	2,554.8	2,777.7
Per Capita GDP (thousand Ushs.)	105.4	109.4	114.0	117.8	120.8	123.5	124.7	128.4	137.2	144.7

Remarks: (1) : * = Production in 'Agriculture' and 'Construction' - aggregate of monetary and non-monetary production values.
(2) : ** = 'Others' stand for 'Mining and Quarrying', 'Electricity/Water', 'Transport/Communications' and 'Community Services' in monetary terms and 'Owner-Occupied Dwellings' in non- monetary terms.
(3) : Average annual growth rate, 1986-1995:

Agriculture:	5.0%		
Manufacturing :	12.1%		
Construction:	13.2%		
W/R Trade :	9.1%	GDP:	6.7%
Others:	7.2%	Per Capita GDP:	3.6%

Source: "1996 Statistical Abstract", Statistics Dept., Ministry of Finance and Economic Planning (July 1996).

2.3.2 Employment

Exact figures in terms of employment are not available at the moment in Uganda. From the 1991 Census, however, the working population in Uganda and Kampala City might be as tabulated below.

Description	Uganda 1991	Kampala City 1991
1. Total Population	16,671,705	774,241
2. Household Population	16,484,556	730,189
3. Household Population aged 10 years and Above	10,849,259	513,422
3'. (Less 'not stated')	10,629,800	509,304
Of which,		
(1) Economically Active	6,348,379	266,147
(2) Economically Inactive	4,281,421	243,157
4. Working Population	6,286,262	253,656

The working population is equivalent to 'economically active population' minus 'number of persons looking for work'. It is obvious that the working population in Uganda almost covers the total employment volume in the country. However, in case of Kampala City, the working population does not wholly cover the employment volume due to commuter movement from the neighboring areas.

2.3.3 Income

"The Uganda National Integrated Household Survey" conducted from March 1992 to March 1993 by the Statistics Dept. contains the following average monthly household income in Uganda as well as in Central Region-Urban in which Kampala City is included.

	Uganda, 1992/93	Central-Urban, 1992/93
Average Monthly Household Income	Ush 52,230	Ush 119,915

It can be concluded that Kampala City residents have more than double the income level of the country population.

2.4 Land Use in Kampala City

2.4.1 Existing Land Use Pattern

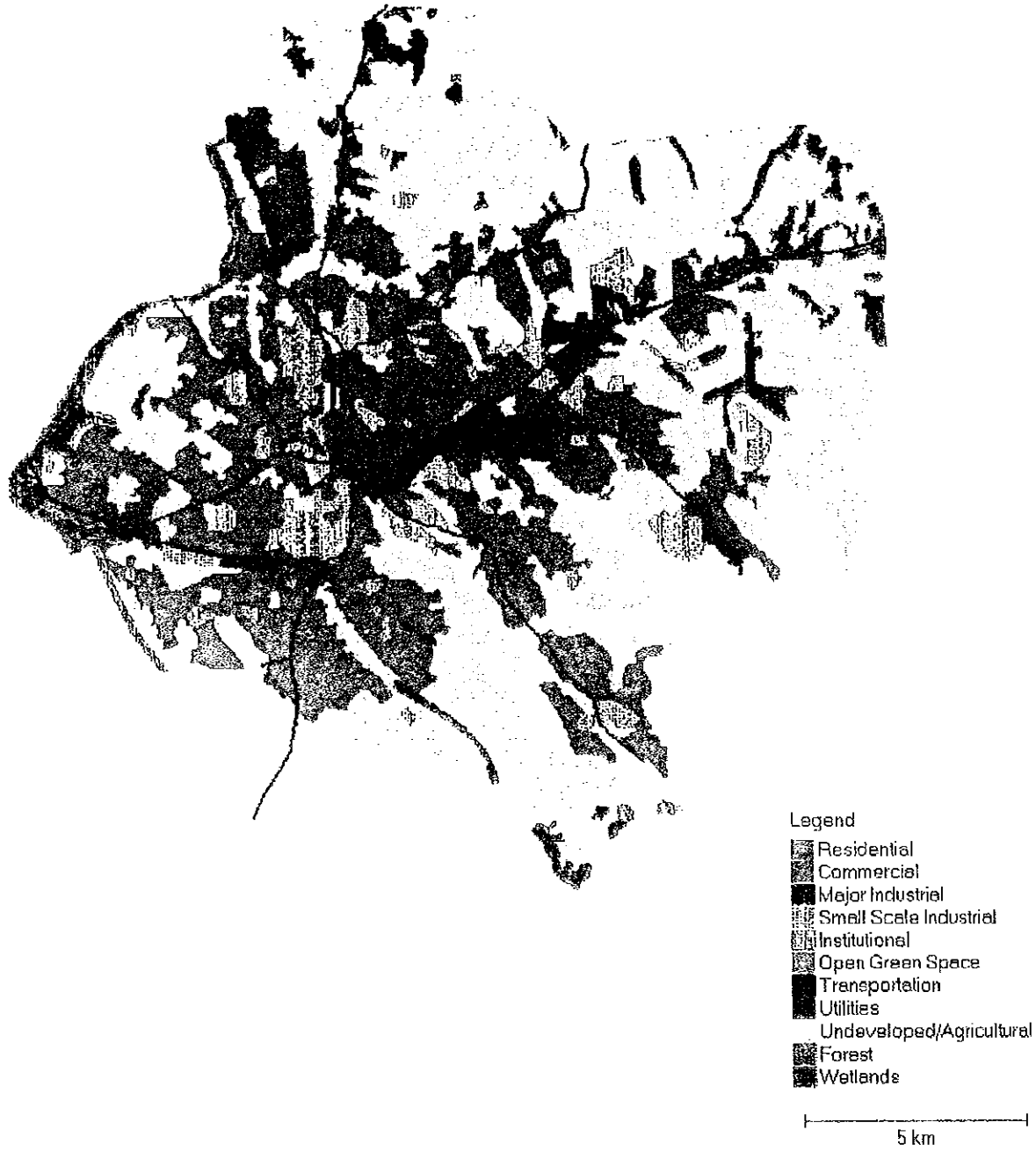
Kampala City, the only District being designated as an urban municipality, encompasses a land area of approximately 176 km^2. Its topography is characterized by a series of low hills surrounded by a network of valleys. Major roads have been located in the valleys. Historically, settlement or township formation began from the western hills such as Old Kampala and Mengo. The major religious/social institutions were located on hilltops, surrounded by upper-class housing. Middle-class residents settled further down the hill, and lower-income groups were left to occupy the valleys. Commercial centers have developed in two forms - either nodes or corridors of the road network. The land area (see Fig. 2.3) in Kampala City is utilized as follows:

Land Use Classification	Area (km^2)	Proportion (%)
1. Residential	54.70	31.0
2. Commercial	5.50	3.1
3. Industrial	5.82	3.3
4. Institutional	12.37	7.0
5. Open Green Space	2.30	1.3
6. Transportation/Utilities	1.69	1.0
7. Undeveloped/Agricultural	83.72	47.5
8. Swamp Forest/Wetland	10.20	5.8
Total (Kampala City Land Area)	176.30	100.0

Source : Study Team estimates, based on "Kampala Urban Study - Final Report, Part 1" March 1994.

2.4.2 Land Use Plan

Figure 2.4 shows the structure plan for the Kampala District and the extended area, formulated under the "Kampala Urban Study" in 1994. The target year of this structure plan is 2004. Basically, it stipulates the intensification of the existing land use pattern and the expansion of residential areas to the north, south and the east. Potential industrial areas are also indicated on some outlying spots. The fundamental structure in Kampala City in terms of land use will not change drastically.



THE FEASIBILITY STUDY OF
IMPROVEMENT OF TRUNK ROAD
AT KAMPALA URBAN INTERFACE

Fig.2.3

Present Land Use in Kampala District and the Extended Area

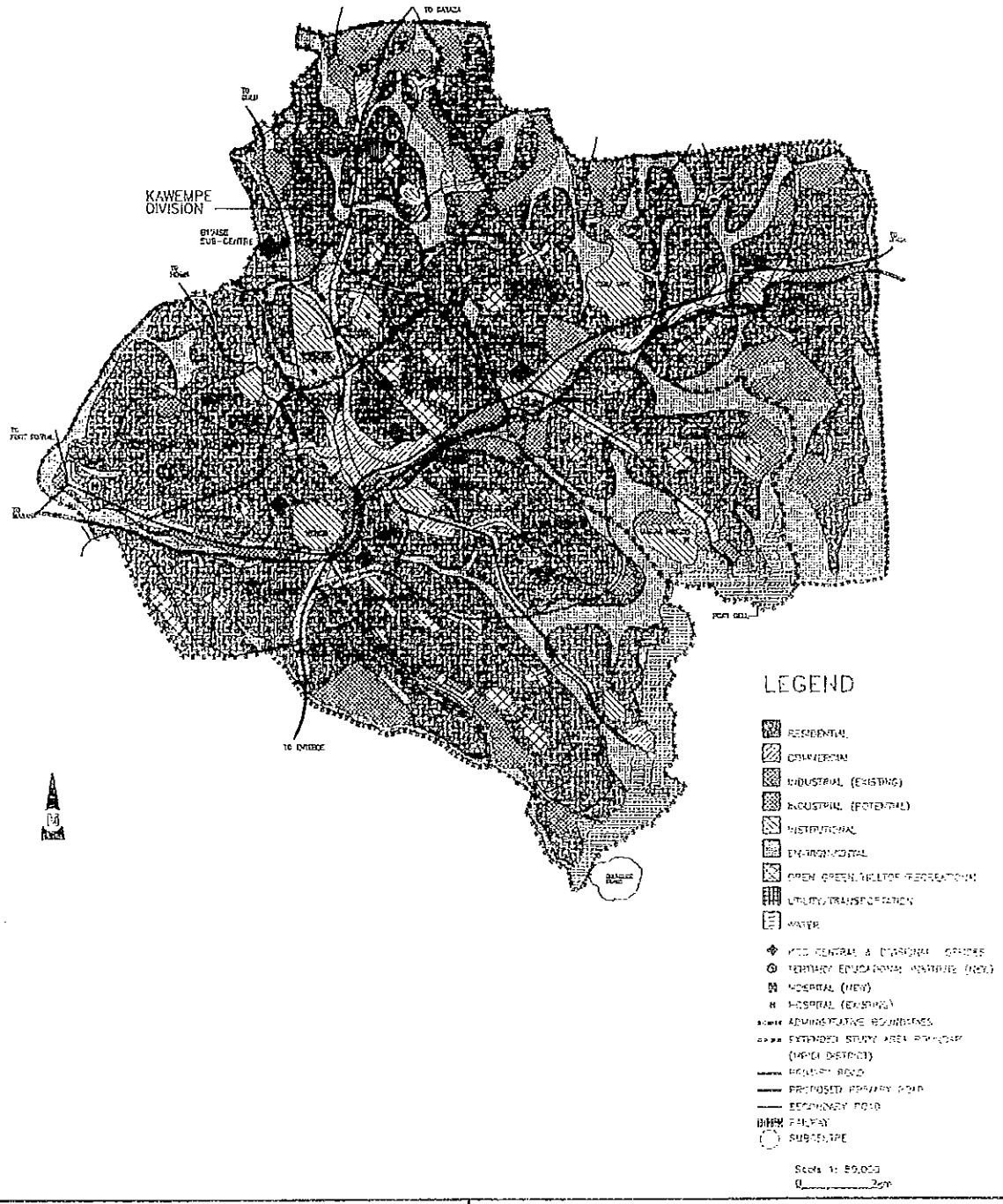


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Fig.2.4 Structure Plan; 1994-2004, Kampala District and the Extended Area

CHAPTER 3

PRESENT TRANSPORT SYSTEM

3. PRESENT TRANSPORT SYSTEM

3.1 Outline of Transport Systems

3.1.1 Outline of the Transport System in Uganda

Transportation in the nation consists of roads, railways, airports and waterways. The nation's transport infrastructure suffered greatly from general mismanagement in the troubled period between 1971 and 1986. Since 1986 Government policy has been focused on improved transport services for the recovery of the nation's economy and consolidation of national unity. Rehabilitation measures for all the transport infrastructure are being undertaken.

Road is the largest sector of transport. The total road length in the nation is about 60,000 km and carries over 90% of passengers and freight in the nation as shown in Table 3.1.

Huge progress has been attained in the nation's road rehabilitation program since 1986. Major trunk roads, such as the "Northern Corridor" route and Trans-African Highway have been completely resurfaced and the condition of most urban and regional roads is greatly improved.

The nation has 1,350 km of railway lines in total, of which the line through Kenya to the Port of Mombasa is the most vital line. The railway system experienced a major decline during the era of mismanagement and most of the railway services were suspended during the period. Since the government introduced a privatization policy of the national railway corporation in 1986, the situation has been gradually recovered. The passenger service between Kampala and Nairobi was resumed in December 1993 after an interval of 15 years. The other branch lines, including northern and western lines, are gradually resuming services as the nation's economy recovers.

Water transport is serviced mainly on Lake Victoria. Three Ugandan ferries operate services from the ports in Uganda to Kisumu in Kenya and Mwanza in Tanzania. Kenya and Tanzania operate one ferry each from Kisumu and Mwanza to Jinja respectively . Railways and waterways cater for about 2% of the nation's freight transportation.

Air transport is mainly serviced at Entebbe International Airport, which is a very important gateway for both international and domestic flights. The total number of passengers using the airport is estimated at about 122,000 in 1993. The authorities

are now considering modernizing all the facilities, including terminal buildings, runways, navigation aids etc., to strengthen the airport's functional potential. There are 12 small local airports elsewhere in the nation, but no regular services are being made at present.

Table 3.1 Uganda Freight Flows 1992 (Thousand Tonnes)

	Domestic Trade	Import	Export	Transit	Total Traffic
Road	3,600	603	135	123	4,461
Rail/Ferry	63	209	113		385
Air	1	5	8		14
Total (1992)	3,664	817	256	123	4,860
Total (1991)	3,400	622	172	74	4,268

Source: MOWTC Transport Data Base

3.1.2 Transport System in the Study Area

(1) Road Transport

Transportation in Kampala City is mostly made by road. There are no regular railway services between urban areas of the city. The total road length in the Study Area is 212 km and these roads are classified into three main groups; trunk road, urban road and community road. The road network in the city consists of eight (8) radial roads extending from the central area of the city. The role and function of these radiating roads are as described below:

- Jinja Road: International artery linking Kampala to Kenya through Jinja, second largest city in the nation; part of Trans-African Highway.
- Port Bell Road: Trunk road linking Kampala to Port Bell , the port town on Lake Victoria.
- Gaba Road: Trunk road linking Kampala to the town of Gaba, suburban residential area of the city and beach resort.
- Entebbe Road: Inter-city trunk road linking Kampala to Entebbe, old Capital of Uganda and gateway city to Kampala.

- Masaka Road: International artery linking Kampala to western part of the nation and to neighbouring countries such as Zaire, Rwanda and Tanzania.

- Hoima Road: Inter-city trunk road linking Kampala to agricultural zones located to the north-west of Kampala.

- Bombo Road: Inter-city trunk road linking Kampala to Gulu and the northern agricultural zone of the nation.

- Gayaza Road: Another north- south trunk road connecting Kampala and districts to the north of it.

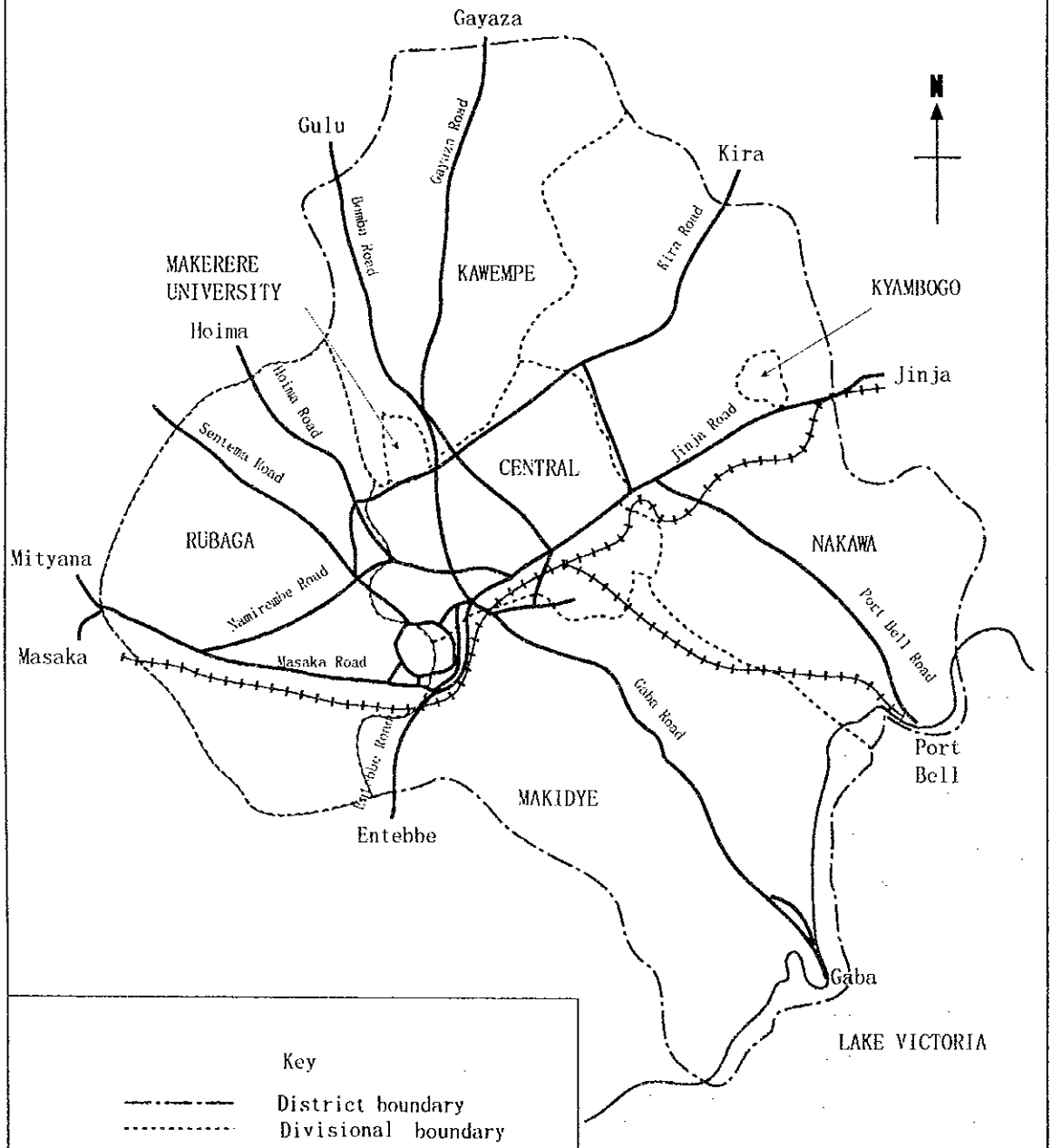
The road network in the city does not have circular roads and/or bypasses which would divert concentrated traffic from the above roads. This fact has resulted in unnecessary congestion of road sections in the central area.

Public transport services in the city are being provided by mini-buses. Most of them are operated by small and medium-sized private companies. Public transport services by mini-buses are provided in a rather disordered manner with no indication of service routes and places of on/off loading. Most of the mini-buses are overcrowded due to infrequent service time and shortage of absolute fleet number, and their service level is far below the satisfactory level.

Most of the important junctions in the city are roundabouts with few signalized ones. These low capacity junctions on the road network are impeding smooth urban traffic flow and are bottlenecks to road traffic.

The mixture of traffic is another factor of impedance to smooth urban traffic flow. The intrusion of pedestrians onto the road space, due mainly to the lack of distinct sidewalks along most of the urban roads, is a major cause of the reduction to vehicle speeds and of the increase in traffic accidents.

Despite the above negative aspects, the urban transport service level in the Study Area is well maintained due mainly to recent road improvement works. However, it is anticipated that the traffic situation will become worse in the near future, should the current high rate of traffic increase, more than 10% annually, continue on the existing road infrastructure in the city of Kampala.



THE FEASIBILITY STUDY OF IMPROVEMENT OF TRUNK ROAD AT KAMPALA URBAN INTERFACE SECTION

Fig.3.1 Transportation System of Kampala City

(2) Public Transport

Public transport in Kampala is very much dominated by the service taxis (matatus) taking workers to central Kampala. The two taxi parks are located off Namirembe Road and Luwum Street. The matatus stop on demand to drop off and pick up passengers and this disrupts the free flow of other traffic. However, given the concentration of employment in central Kampala and the large population catchment area, the matatus are essential to the efficient working of the Kampala transport system. Matatus come in two sizes, with capacity for 14 passengers and 20 passengers.

The study team have contacted the Uganda Taxi Operators and Drivers Association (UTODA), the umbrella organization for matatus, in order to acquire data on the following topics :

- the number of licensed operators and drivers
- the rate of growth in recent years
- authorized routes and conditions on their usage
- desired locations for new taxi parks

Uganda Railways serve inter-regional and international passenger movements with a service of limited frequency. The track alignment leads to speed restrictions. The railway is currently not suited to commuter use, although its alignment paralleling Jinja Road and Masaka Road means that it has the potential to serve commuters approaching from the east and the west. For the railway to serve both long distance and commuter passengers would require investment in track capacity and stations and Uganda Railways are currently suffering from a revenue shortfall. For these reasons and because of the time needed to implement a major railway improvement, it is unlikely that the railway will have much influence on Kampala commuting for 10 years.

Conventional buses have lost out to matatus for a number of reasons. These are related to the relative inflexibility of their operations. They are less frequent and have fixed stopping points rather than being able to stop on demand. It is unlikely that they will regain their earlier market share unless restrictions are placed on the operation of matatus.

3.2 Road Network in the Study Area

The road network in Kampala District consists of eight(8) radial roads administered by MOWTC and a rather complicated urban road network administered by Kampala City Council.

The road classifications are being made based on the road category, design speed and traffic capacity.

The road in Kampala consists of four (4) categories as shown in Table 3.2:

Table 3.2 Category of Roads in Uganda

Category	Description
A	Principal Arterial system (Primary Roads
B	Minor Arterial system (Secondary Roads)
C	Collectors (Tertiary Roads)
D	Local Road system (Feeder Roads)

The roads are classified into six(6) groups by design speed and design traffic as shown in Table 3.3.

Table 3.3 Classification of Roads in Uganda

Class	Design Speed	Carriageway width	Design Capacity (x 1,000/day)
Class-I Bitumen	80 - 110 kph	7.0 m	6 - 10
Class-II Bitumen	60 - 90	6.0	4 - 8
Class-III Bitumen	50 - 80	5.6	2 - 6
Class -A Gravel	70 - 90	6.0	4 - 8
Class -B Gravel	50 - 80	5.6	2 - 6
Class -C Gravel	40 - 60	4.0	< 2

3.2.1 Primary Road (Principal Arterial System)

Primary roads are defined as the roads connecting the national road system and that of neighboring countries and have the nature of international trunk roads. At the same time these roads link provincial capitals, centres of the regional economy.

Trunk roads in Kampala area are being classified as primary road (Class-I). MOWTC administers road sections of five (5) primary roads in the area outside the CBD.

The primary roads administered under MOWTC are as follows:

a)	Kampala - Kawempe	12 km
b)	Kampala - Mperewe	5 km
c)	Kampala - Port Bell	5 km
d)	Kampala - Gaba	7 km
e)	Kampala - Kasubi	10 km
f)	Total	39 km

3.2.2 Secondary Roads (Minor Arterial System)

Secondary roads interlink the primary roads and connect local centres with the principal arterial system. These roads facilitate local traffic and provide access to the primary road network. Kampala City Council is responsible for the maintenance of these Secondary Roads.

3.2.3 Tertiary Roads (Collectors)

Collectors link locally important places in Kampala District and their hinterland areas and also provide services to smaller communities. These collectors are also maintained also by the City Engineer's Department of KCC.

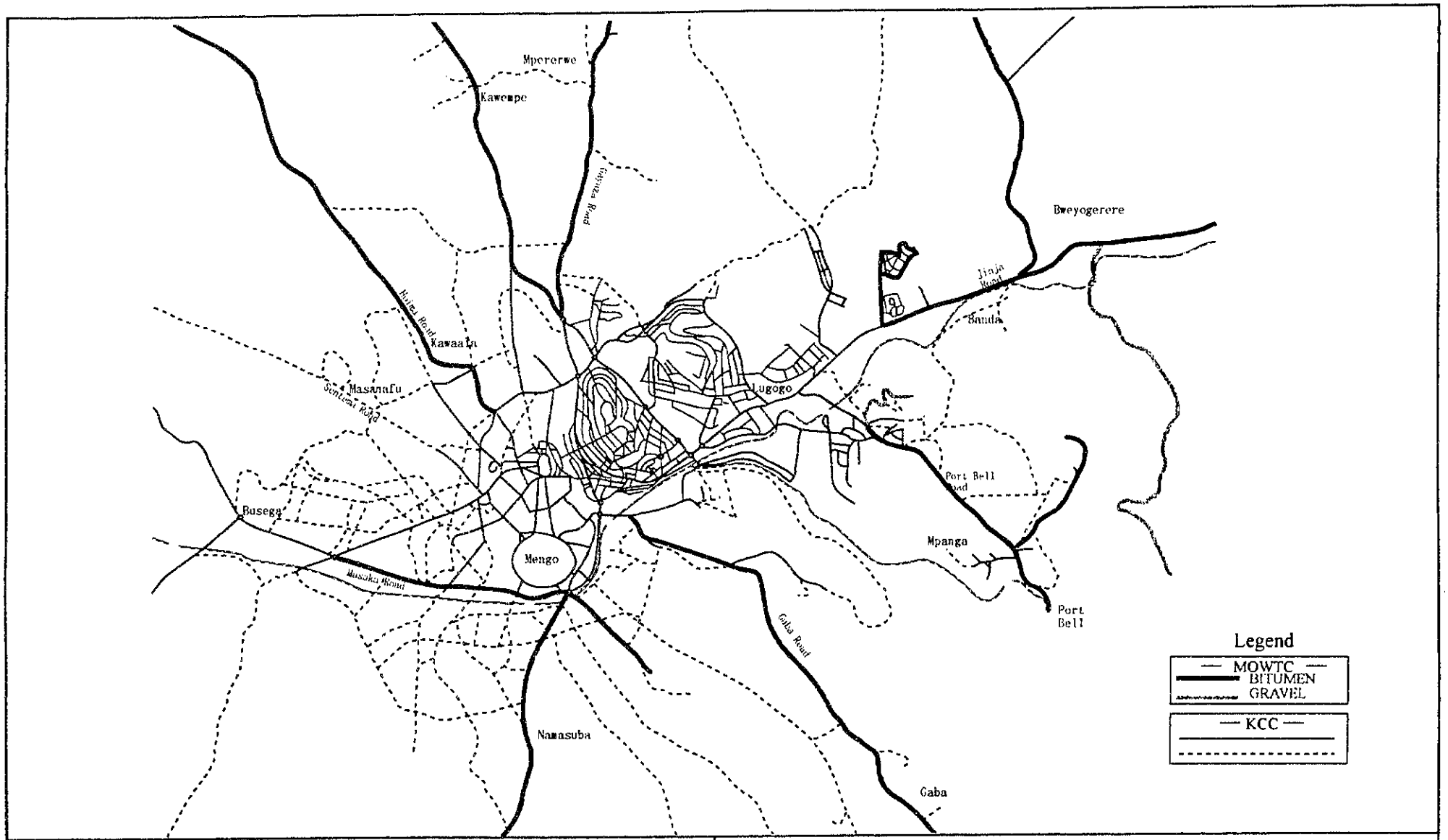
3.2.4 Feeder Roads (Local Road System)

Feeder roads in Kampala City are access roads with short lengths and their primary function is providing access to land adjacent to the collectors. These roads are also under the administration of the City Engineer's Department of KCC.

3.3 Existing Road Condition

A road inventory survey was conducted on all the roads which were identified by the Study Team in the preceding chapter. The total length of routes surveyed was 102.22 km.

The survey was conducted by the Study Team together with their counterpart personnel provided by MOWTC and KCC.



THE FEASIBILITY STUDY OF IMPROVEMENT OF TRUNK ROAD AT KAMPALA URBAN INTERFACE SECTION

Figure 3.2 Road Network in Kampala District

The major items collected during the survey are as shown below:

- Length and width of carriageway and shoulder.
- Type and condition of pavement.
- Road crossing structures including bridges, box's and pipe culverts, etc.
- Necessity of provision of roadside drainage structures

3.3.1 Present Road Conditions

Width of Roads

Most of the roads have sufficient width of carriageway.

Intersections

There are some intersections controlled by roundabouts in the city. Most of them have become overloaded due to the increase of traffic volume in recent years.

Pavement

Most major and important roads in the city are paved with bituminous materials.

Bridge and Box Culvert

Bridge and box culverts located within Entebbe road are generally healthy.

Land Acquisition

With the exception of the roads in the central area, most of the roads in the project area have an adequate right-of way and any land acquisition necessary should be possible. Right -of-way width reserved for each road is generally sufficient.
The existing road condition surveyed by the Study Team is shown in Table 3.4 and Appendix 3.

Table 3.4 (a) Present Road Condition

No	Road Name	Administration		Requested by MOWTC			Measured by the JICA study team			Public Trance Service	Land use along the road			
		MOWTC	KCC	From	To	Length	From	To	Length	Bus route	Institutional	Commercial	Residential	Industrial
1	Queens Way (Masaka)	○		Clock Tower	Busega Rdbt	9.0Km	Clock Tower	Busega Rdbt	8.3Km	○				○
2	Katwe.Lubiri ring Rd		○	Lubiri	Masaka Rd	5.0Km							○	
3	Katwe Rd		○				Mengo Hill Rd	Kibuye Rdbt	1.6Km	○				○
4	Lubiri ring Rd		○				Masaka Rd	Mengo	3.8Km				○	
5	Gaba Rd	○		Kibuli Rd	Gaba	10.0Km	Kibuli Rd	Gaba	11.0Km	○			○	
6	Port Bell Rd	○		Lugogo	Port Bell	5.0Km	Lugogo	Port Bell	6.7Km	○			○	
7	Natete Rd		○	Bakuli	Natete Rdbt	5.0Km	Bakuli Jct	Natete Rdbt	4.0Km	○			○	
8	Hoima Rd	○		Bakuli	Nansana	10.0Km	Bakuli Jct	Nansana	8.5Km	○			○	
9	Jinja Rd	○		Lugogo Jct	Bweyogerere	6.0Km	Lugogo Jct	Ntebetebe	6.9Km	○				○
10	Jinja Rd (2)		○				Jinja Rd Rdbt	Lugogo Jct	1.8Km	○	○			
11	Bombo Rd	○		Makerere Rdbt	Kawempe	8.0Km	Makerere Rdbt	Kawempe	5.1Km	○			○	
12	Gayaza Rd	○		Wandegeya Rdbt	Mpererwe	6.0Km	Wandegeya Rdbt	Mpererwe	5.9Km	○			○	
13	Lugogo by pass		○				Lugogo Jct	Bukoto Jct	2.4Km	○			○	
14	Kira Rd		○				Kitante Rdbt	Kiwatule	8.0Km	○			○	
15	Sentema Rd		○				Bolintema Rd	Lubanyi	5.2Km				○	
16	Jinja.Kampala.Bombo Rd		○				Jinja Rd Rdbt	Wandegeya Rdbt	3.7Km	○		○		
17	Butikiro.Kisenyi Rd		○				Namirenbe Rd	Namirenbe Rd	2.1Km				○	
18	Musajja-Alumbwa Rd		○				Lubiri ring Rd	Kisenyi Rd	0.5Km		○			
19	Mwanga Rd		○				Lubiri ring Rd	Kisenyi Rd	0.6Km				○	
20	Mengo Kisenyi Rd		○				Mengo Hill Rd	Kisenyi Rd	0.7Km			○		
21	Motebi Road		○				Lubiri ring Rd	Katowe Rd	0.4Km			○		
22	Lubiri ring.Queens Way		○				Lubiri ring Rd	Queens Way	0.3Km		○			
23	Lubiri ring. Masaka Rd		○				Lubiri ring Rd	Masaka Rd	0.2Km		○			
24	Entebbe Rd	○					Kibuye Rdbt	Namasuba	3.0Km	○			○	
25	Inner Ring Road		○				Lubiri ring Rd	Lubiri ring Rd	11.5Km	○	○	○	○	
					Total	64.0Km		Total	102.2Km					

Source: The Study Team

Table 3.4 (b) Present Road Condition

No	Road Name	Measured by the JICA study team			Drainage		Pavement			Traffic	Shoulder	Sidewalk	Embank-	Remarks
					Crossing	Side	Reconstruction	Widening	Overlay	Marking	Repair		ment	
		From	To	Length	A	B	C	D	E	F	G	H	I	
1	Queens Way (Masaka)	Clock Tower	Busega Rdbt	8.3Km	○	○		○	○	○		○		
2	Katwe Rd	Mengo Hill Rd	Kibuye Rdbt	1.6Km		○				○	○	○		
3	Lubiri ring Rd	Masaka Rd	Mengo	3.8Km		○	ALL			○				
4	Gaba Rd	Kibuli Rd	Gaba	11.0Km		○			○	○	○			
5	Port Bell Rd	Lugogo	Port Bell	6.7Km		○			○	○	○			
6	Natete Rd	Bakuli Jct	Natete Rdbt	4.0Km		○			○	○	○			
7	Hoima Rd	Bakuli Jct	Nansana	8.5Km	○	○			○	○	○		○	
8	Jinja Rd	Lugogo Jct	Ntebetebe	6.9Km		○			○	○	○	○		
9	Jinja Rd (2)	Jinja Rd Rdbt	Lugogo Jct	1.8Km						○				
10	Bombo Rd	Makerere Rdbt	Kawempe	5.1Km		○			○	○	○			
11	Gayaza Rd	Wandegeya Rdbt	Mpererwe	5.9Km		○			○	○	○			
12	Lugogo By pass	Lugogo Jct	Bukoto Jct	2.4Km										'96 open
13	Kira Rd	Kitante Rdbt	Kiwatule	8.0Km		○	5.2Km ~ 8Km		○	○	○			
14	Sentema Rd	Bolintema Rd	Lubanyi	5.2Km	○	○	ALL			○			○	
15	Jinja.Kampala.Bombo Rd	Jinja Rd Rdbt	Wandegeya Rdbt	3.7Km						○		Repair		
16	Butikiro.Kisenyi Rd	Namirembe Rd	Namirembe Rd	2.1Km	○	○	ALL			○	○			
17	Musajja-Alumbwa Rd	Lubiri ring Rd	Kisenyi Rd	0.5Km		○	ALL			○	○	○		
18	Mwanga Rd	Lubiri ring Rd	Kisenyi Rd	0.6Km		○	ALL			○	○			
19	Mengo Kisenyi Rd	Mengo Hill Rd	Kisenyi Rd	0.7Km		○						○		
20	Motebi Road	Lubiri ring Rd	Katowe Rd	0.4Km		○	ALL			○	○	○		
21	Lubiri ring.Queens Way	Lubiri ring Rd	Queens Way	0.3Km		○	ALL				○	○		
22	Lubiri ring. Masaka Rd	Lubiri ring Rd	Masaka Rd	0.2Km		○	ALL				○	○		
23	Entebbe Rd	Kibuye Rdbt	Namasuba	3.0Km		○			○	○	○			
24	Inner Ring Road	Lubiri ring Rd	Lubiri ring Rd	11.5Km		○			○	○	○			
			Total	102.2Km										

Source: The Study Team

3.3.2 Road Capacity

There are several factors that decide the road capacity. According to the Road Design Manual of Uganda, the factors considered are as below:

Road capacity factors :

- Lane width factor
- Heavy vehicle factor
- Directional factor

The number of trucks and buses are to be converted into passenger car equivalent unit (PCU) for the calculation of road capacity according to the Road Design Manual of Uganda.

However, the degree of mixture of slow speed vehicles such as mini-buses and bicycles are not included in the calculation of road capacity in Uganda. It is recommended to include a factor for the mixture of slow vehicles in the calculation of road capacity for the road planning of the city.

3.3.3 Road Density by Traffic Zone

Road density per square kilometre and per unit of population has been analyzed for each traffic zone as shown in Table 3.5.

The road densities by traffic zone are categorized into five levels 1 to 5 as shown in Fig. 3.3.

The following are the major findings and issues identified through the analysis.

(1) The road network in Nakasero ward, which is a political and economic centre of the nation as well as Kampala, is extremely dense.

(2) High density areas are located in the city centre and to the east and the west of the city averting the swamp area in the north.

(3) High density areas also extend along Jinja road and Masaka road.

(4) The road networks in both of the northern and southern areas of Kampala district are extremely sparse.

(5) Road network development has been constrained by swamp strips and rivers.

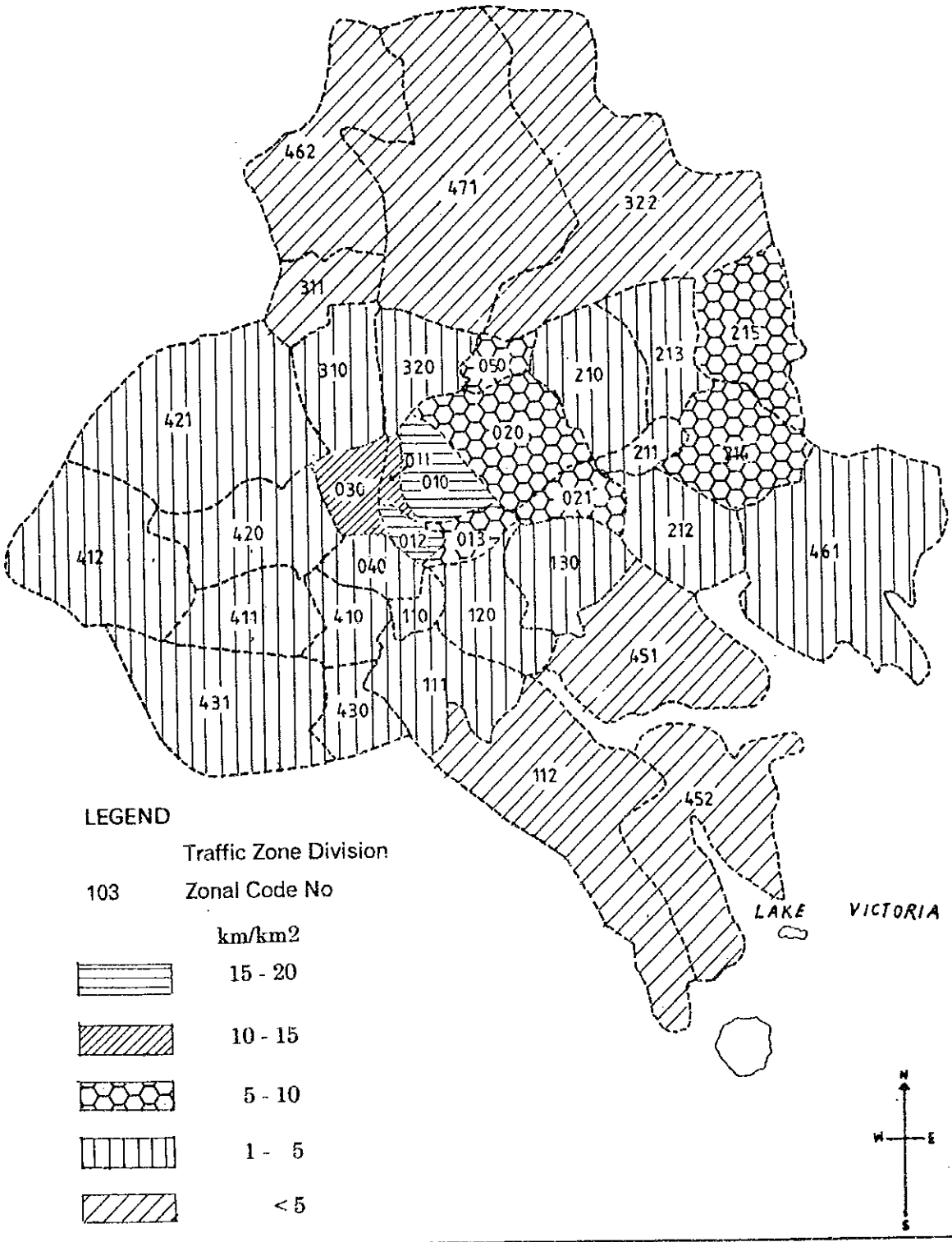


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Figure 3.3 Road Density by Traffic Zone

Table 3.5 (1) Road Density by Traffic Zone

Zone No	Zone Name	Ward Name	(Ha) Zone Area	Population	(km) Road Length	Road Density m/1,000prs	Road Density km/km2
10	Nakasero I, II	Nakasero I	70.3				
		Nakasero II	156.7				
		Sub total	227.0	9,090	41.2	4,537.6	18.17
11	Nakasero III	Nakasero III	47.4				
		Sub total	47.4	3,521	5.0	1,430.8	10.63
12	Nakasero-Nakivubo	Nakasero IV	32.9				
		Nakivbo	21.6				
		Sub total	54.5	8,408	11.3	1,348.1	20.80
13	Civic Center	Civic Center	133.3				
		Sub total	133.3	3,489	12.6	3,609.8	9.45
20	Kololo	Kololo I	120.5				
		Kololo II	111.4				
		Kololo III	83.2				
		Kololo IV	155.5				
		Sub total	470.6	12,032	41.7	3,467.3	8.87
21	Industrial Area	Industrial Area	165.2				
		Sub total	165.2	1,049	16.4	15,608.0	9.91
30	Kagugube-Old Kampala	Old Kampala	62.4				
		Bukesa	62.8				
		Kagugube	46.5				
		Sub total	171.7	23,048	20.0	867.5	11.64
40	Kisengul-Mengo	Kisengul I	22.8				
		Kisengul II	45.2				
		Kisengul III	39.8				
		Mengo	74.6				
		Sub total	182.4	28,552	6.0	209.5	3.28
50	Kamuwokya	Kamuwokya I	58.5				
		Kamuwokya II	53.9				
		Sub total	112.4	17,240	9.9	575.3	8.82
	CENTRAL DIVISION		1,564.50		164.2		10.50
110	Katwe	Katwe I	38.3				
		Katwe II	77.9				
		Sub total	116.2	15,814	2.8	174.4	2.37
111	Kibuye-Makindye	Kibuye I	33.9				
		Kibuye II	50.5				
		Makindye I	177.1				
		Makindye II	111.2				
		Sub total	372.7	42,171	6.0	143.1	1.62
112	Luwafu-Lukuli	Luwafu	193.8				
		Lukuli	410.3				
		Salaam	546.2				
		Sub total	1,150.3	15,931	5.1	321.0	0.44
120	Nsambya	Nsambya Central	191.8				
		Nsambya Estate	54.8				
		Nsambya Police	51.7				
		Nsambya Railaway	30.8				
		Sub toatl	329.1	26,745	4.7	174.0	1.41

Source : The Study Team

Table 3.5 (2) Road Density by Traffic Zone

Zone No	Zone Name	Ward Name	Zone Area	Population	Road Length	Road Density	
						m/1,000prs	km/km2
130	Kibuli-Kisugu	Kibuli	98.0				
		Kabalagala	94.7				
		Wabigalo	65.3				
		Kisugu	115.3				
		Sub total	373.3	45,824	5.1	110.4	1.35
451	Bukasa-Kansanga	Bukasa	474.2				
		Kansanga	318.6				
		Sub total	792.8	23,448	5.2	220.6	0.65
452	Ggaba-Buziga	Ggaba	520.3				
		Buziga	423.1				
		Sub total	943.4	17,068	6.6	387.2	0.70
	MAKINDYE DIV.		4,077.80		35.4		0.87
210	Naguru	Naguru I	155.6				
		Naguru II	306.9				
		Sub total	462.5	18,749	14.2	756.8	3.07
211	Nakawa-Kiswa-Bugolobi	Nakawa	55.5				
		Nakawa Inst	41.0				
		Sub total	96.5	6,226	3.0	485.4	3.13
212	Kiswa-Bugilobi	Kiswa	54.3				
		Bugolobi	311.9				
		Sub total	366.2	15,592	12.6	808.9	3.44
213	Ntinda	Ntinda	260.0				
		Sub total	260.0	6,861	7.9	1,149.0	3.03
214	Mbuya	Mbuya I	241.3				
		Mbuya II	175.1				
		Sub total	416.4	10,345	23.6	2,286.1	5.68
215	Banda-Kyambogo	Banda	181.8				
		Kyambogo	85.2				
		Kyambogo Dist	243.0				
		Sub total	510.0	13,724	28.0	2,039.1	5.49
461	Mutungo-Luzira	Mutungo	416.4				
		Butabika	352.4				
		Luzira	249.6				
		Luzira Prisons	214.2				
		Sub total	1,232.6	42,116	19.6	464.8	1.59
322	Bukoto-Kyanja	Bukoto I	212.9				
		Bukoto II	339.3				
		Kiwatule	256.4				
		Kyanja	592.3				
		Sub total	1,400.9	22,906	12.5	544.9	0.89
	NAKAWA DIV.		4,745.1	136,519	121.4	889.3	2.56
310	Muluka-Makerere	Muluka I-IV	124.9				
		Makelele I	70.6				
		Makelele II	88.1				
		Makelele III	70.3				
		Sub total	353.9	21,437	7.9	367.7	2.23

Source : The Study Team

Table 3.5 (3) Road Density by Traffic Zone

Zone No	Zone Name	Ward Name	Zone Area	Population	Road Length	Road Density	
						m/1,000prs	km/km2
311	Bwaise	Bwaise I	120.7				
		Bwaise II	99.2				
		Bwaise III	72.2				
		Sub total	292.1	31,819	0.83	26.0	0.28
320	Mulago- Wandegaya	Mulago I	90.4				
		Mulago II	91.5				
		Mulago III	57.6				
		Wandegaya	30.3				
		Sub total	269.8	37,560	4.24	113.0	1.57
462	Kawempe-Kazo	Kawempe I	349.0				
		Kawempe II	311.2				
		Kazo	173.1				
		Sub total	833.3	29,929	3.03	101.3	0.36
471	Kyebando-Mpererwe	Kyebando	295.6				
		Kikaya	411				
		Kanyanya	272.5				
		Mpererwe	150.6				
		Komamboga	366.4				
		Sub total	1,496.1	29,865	6.615	221.5	0.44
	KAWEMPE DIV.		3,245.20		22.6		0.70
410	Ndeeba	Ndeeba	200.7				
		Sub total	200.7	19,421	6.90	355.3	3.44
411	Rubaga	Rubaga	386.3		0		0.00
		Sub total	386.3	15,124	12.89	852.3	3.34
412	Busege-Natete	Busege	599.0				
		Natete	220.3				
		Sub Total	819.3	22,669	19.17	845.5	2.34
420	Namirembe-Lungujja	Namirembe	197.1				
		Lungujja	284.8				
		Sub total	481.9	27,062	15.3	566.6	3.18
421	Kasubi-Nakubbye	Kasbi	299.9				
		Lubya	719.8				
		Nakulabye	102.5				
		Sub total	1,122.2	51,772	19.17	370.2	1.71
430	Najjanankumbi	Najjanankumbi I	94.1				
		Najjanankumbi II	96.9				
		Sub total	191.0	18,570	6.23	335.5	3.26
431	Mutundwe-Kabowa	Mutundwe	526.5				
		Kabowa	269.3				
		Sub total	795.8	24,710	21.56	872.7	2.71
	RUBAGA DIV.		3,997.20		101.3		2.53

Source : The Study Team

3.4 Traffic Management

As the road traffic volumes increased, deterioration of the roads and an increase in accidents became common phenomena on the major roads in the city of Kampala. These negative effects are caused by a combination of factors that include: poor road user behaviour, defective road infrastructure, insufficient provision of road facilities, intrusion of activities by nearby communities and lack of strong restriction.

MOWTC is now considering installing axle load control measures at various locations to control the passage of excessively loaded vehicles or heavy trucks. As a result, the passage of heavy trucks in densely populated areas will be greatly restricted, which will contribute to a reduction in traffic accidents and to the mitigation of negative environmental effects.

As far as past road improvement and maintenance works in the city are concerned, it could be pointed out that these works have been executed disregarding such aspects as the welfare of road users, and the protection of nearby communities and the surrounding environment. Most of the trunk roads previously improved are not provided with even a minimum level of sidewalks, road crossing facilities, traffic signs, lane markings.

Furthermore, measures of environmental protection have been completely neglected in the past road improvement works. This is found in poorly designed and malfunctioning roadside drainage systems, where consideration of the excessive erosion was completely neglected.

In order to recover from the past disregard of the above aspects, a variety of measures of traffic management have to be introduced on the road network in the study area. Probable measures to be undertaken are described below:

(1) Physical Measures

- improvement of intersections
- improvement of pedestrian walk/pedestrian crossings
- installation of traffic signs/ markings
- installation of axle load control measures
- installation of bus bays
- improvement of roadside drainage.

(2) Legal/Administrative /Institutional Measures

- review and update of traffic regulation code
- introduction of penalty system in case of violation
- introduction of parking code
- regulation of heavy vehicle operation in urban streets
- introduction of car inspection system.

3.5 Traffic Safety

As stated in the previous section, past road improvements and maintenance works in Uganda have been executed in disregard of the safety aspect of road users and people living near the roads.

According to the traffic accident data in 1995, the total number of traffic accidents in Kampala city and for the whole nation were 7,968 and 11,640 respectively. The share of traffic accidents in Kampala of the national total was about 68%. This is an extraordinarily high percentage. In terms of frequency of traffic accidents per kilometre per annum, figures for Kampala are as high as 37.58/Km, compared to the nation's average of 0.45/Km. It could be pointed out that the study area is amongst the most accident prone areas of the nation. It is another characteristic of traffic accidents in Kampala that the share of the accidents involving pedestrians is very high. Among 7,968 traffic accidents which occurred in Kampala in 1995, there were more than two thousand which involved pedestrians. Details are shown in Tables 3.6 and 3.7.

The high accident tendency is attributed to following facts:

(1) Defective road infrastructure

- sub-standard pedestrian walks
- lack of road crossing facilities
- low capacities of rotary junctions
- lack of traffic signs and markings
- lack of street lights and guard rails

(2) Misuse of road spaces

- intrusion of pedestrians onto the road space
- on/off loading on road space
- socio-economic and communal activities on the roadside

(3) Poor behaviour by road users

- over speeding
- poor driving manner
- ignoring of traffic rules

(4) Traffic related factors

- traffic congestion
- mixture of traffic
- lack of functional hierarchy among roads and streets
- intrusion of unroadworthy motor vehicles

Traffic accident prone spots (black spots) on the road network in the city of Kampala are identified as shown in Fig. 3.4.

Table 3.6 Annual Traffic Accidents in Uganda and Kampala District, 1987-1995

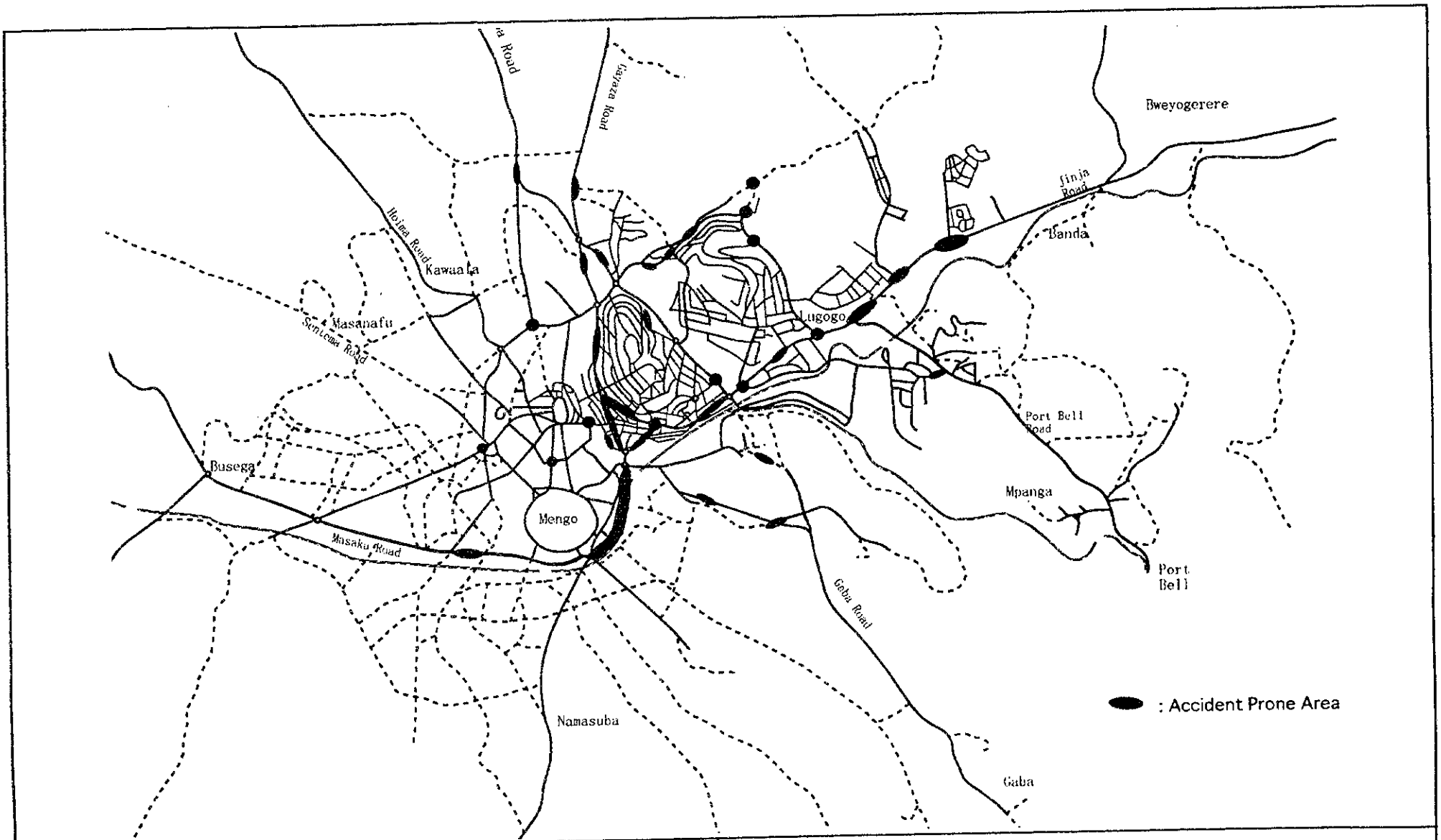
Year	Uganda	Kampala	Kampala (%) of Uganda
1987	4,359	2,850	65.4
1988	4,658	3,613	77.6
1989	5,525	3,840	69.5
1990	5,674	3,871	68.2
1991	5,271	3,718	70.5
1992	5,191	4,194	80.8
1993	7,009	N.A.	N.A.
1994	8,906	6,026	67.7
Total 1995	11,640	7,968	68.4

Source; Uganda Police Traffic Office.

Table 3.7 Traffic Accidents in Kampala District (1995)

Number of Accidents				Persons	Persons
Fatal	Serious	Minor	Total	Killed	Injured
252	1376	6340	7968	284	4105
1.18/ Km	6.49/Km	29.90/Km	37.58/Km	1.34/Km	19.36/Km

Source: Kampala Traffic Police Office



THE FEASIBILITY STUDY OF IMPROVEMENT OF TRUNK ROAD AT KAMPALA URBAN INTERFACE SECTION

Figure 3.4 Traffic Accident Prone Area

3.6 Road Maintenance System

3.6.1 Present Road Maintenance Systems

The maintenance of the roads in Kampala district is the responsibility of MOWTC and KCC. MOWTC is carrying out the maintenance of 587 km of roads while KCC maintain 598 km of road network in the district.

The excessive damage of city roads is due to the following factors:

1) Inadequacy of funds available each year for road maintenance, rehabilitation and reconstruction.

2) Lack of equipment and plant for road maintenance.

3) Higher rate of city growth in all aspects as compared to the ability of the City Authority to provide the required infrastructure.

In the city centre sites, it may be said that trunk roads are in generally fair condition; this is a result of the last City Roads Phase II Project, funded by the EU.

On roads surrounding the city there are fair conditions in road maintenance with side drains protected by concrete plates or masonry walls, but pavement edges are damaged in many places which is due to a lack of kerb stone or pavement stopper.

3.6.2 Present Maintenance Operation

The following are the present road maintenance works carried out by the above two agencies.

Daily Maintenance Works :

Daily maintenance works including road grass cutting, drain clearing, culvert maintenance, road sign maintenance, grading and pothole patching.

Periodic maintenance:

Route repairing, dragging, re-graveling, pothole patching, repairing edges, sealing cracks, surface dressing, and total repair of the carriageway.

Emergency Maintenance:

Emergency road maintenance works including the repair of blocked drainage, potholes, and emergency patching.

Maintenance activities are being carried out using inadequate methods. The works being carried out by the local contractor are relatively good. The local contractors will be fully available for the road maintenance works.

3.6.3 Expenditure on Road Maintenance

The maintenance expenditure by MOWTC during 1992 - 1996 is shown in Table 3.8. The corresponding expenditure by KCC is shown in Table 3.9.

Table 3.8 Road Maintenance Expenditure by MOWTC (Kampala District Station)

Unit: Ush 1,000

Item	1992	1993	1994	1995	1996
Salary and Wages	42,015	40,675	37,866	24,488	25,194
Equipment	7,200	8,400	9,600	10,800	15,600
Administration	22,800	27,600	31,200	39,600	45,600
Labour based Contract	36,000	144,000	168,000	204,000	228,000
Mechanized Contract					5,148,200
Expenditure MOWTC	108,015	220,675	246,666	278,888	5,462,595

Table 3.9 Road Maintenance Expenditure by KCC (Central Station)

Unit: 1,000 Ush

Item	1992	1993	1994	1995	1996
Salary and Wages	51,419	33,223	152,807	220,445	246,524
Equipment	83,234	80,913	78,000	58,119	95,100
Material	436,886	128,200	244,970	244,970	631,300
Development and Capital Items		800,000	1,000,000	1,250,000	510,000
Expenditure KCC	571,539	1,042,136	1,475,777	1,773,524	1,482,924

Year to year fluctuations in the MOWTC maintenance expenditure are explained by the following facts:

- The variations in wage bills are due to incremental differences in the various budgets.

- The funds allocated for construction machinery vary from year to year due to changes in allocations by MOWTC.

- Administrative expenses have continuously increased due to increases in the price levels of consumer products.

- Labour based contract funds have also gone up due to increases in road contract costs per kilometre.

- Maintenance contracts for construction machinery are normally based on the cost of materials and contract agreements. Therefore, they vary from contract to contract.

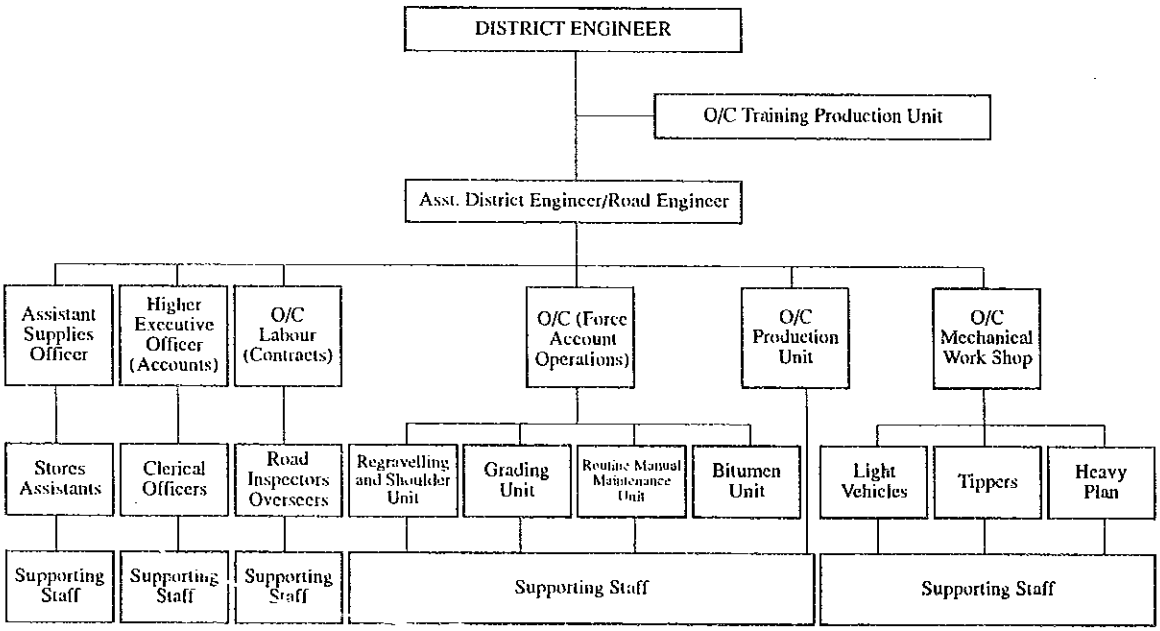
- In an overview of the 1997/98 fiscal year, it is anticipated that there will be a general rise in price levels due to world wide increases in the price of materials and labour coupled with inflation

- At the beginning of 1994 there was a laying off of workers and group employees.

3.6.4 Organization of Maintenance Sections of MOWTC and KCC

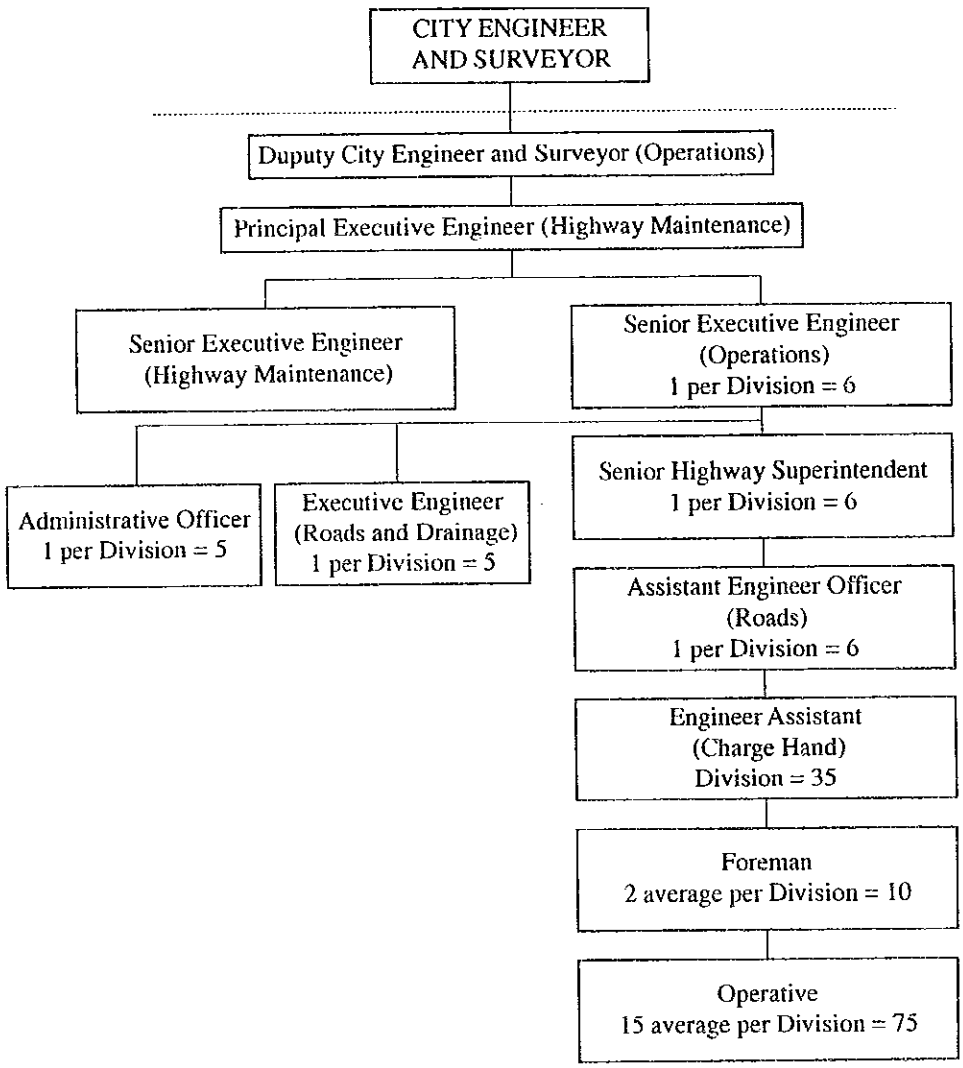
The organization charts of the road maintenance sections of MOWTC and KCC are presented in Fig 3.5 and Fig 3.6 respectively.

Fig 3.5 Organisation Chart of Road Maintenance Section -MOWTC -(Kampala District Station)-



The District station has one controlling personnel, namely Asst. District Engineer; it may be difficult for him to control all the section of the Depot.

Fig 3.6 Organisation Chart of Road Maintenance Section - KCC (Central Station)-



3.6.5 Equipment List for Road Maintenance

The total road maintenance equipment held by MOWTC and KCC is listed in Table 3.10 and Table 3.11 respectively. These figures suggest a shortage of equipment for the growing demand of road maintenance works in the city of Kampala.

Table 3.10 Road Maintenance Equipment - MOWTC (Kampala District Station)

	Equipment	Type	Nos.	Remarks
1	Cargo Truck	12 t	1	
2	Pick-Up	4WD Diesel	2	1,400 cc and 2,000 cc
3	Land Rover	4 WD	1	
4	Dump Truck	7 t	1	
5	Motor Cycles		4	125 cc(l) and 200 cc(2)
6	Tractor		1	international 633
7	Vibration Roller		1	Bomag
8	Wheel Excavator	D.5	1	Komatsu
9	Bulldozer	D-3	1	Cat
10	Bituminous Boiler	1,000 litres	1	

Table 3.11 Road Maintenance Equipment - KCC (Central Station)-

	Equipment	Type	Nos.	Remarks
1	Pick-Up	4WD Diesel	3	
2	Motor Grader	140 HP 3.7m	2	0,5K
3	Road Roller	6t	3	Dynapac
4	Dump Truck	10t	4	UD
5	Wheel Loader	100 HP	1	Fiat
6	Plate Compactor		2	Dynapac
7	Black-Hoe	Wheel Type	1	O.S.K
8	Motor cycles	125 cc	4	Yamaha
9	Tractor Trailer	3t	5	Cat
10	Bituminous Boiler		2	
11	Plate Vibrator		3	
12	Concrete Mixer	$0.3m^3$	3	
13	Premixer Drum		1	
14	Asphalt Paver		1	

According to the inventory studies over the Depot almost all equipment vehicles have long been out of use and there seems no possibility of repair since the required spare parts must be imported and are prohibitively expensive.

MOWTC and KCC are executing road maintenance work in close coordination. Items of cooperation include:

- Adoption by KCC of technical specification made by MOWTC
- Shared utilization of MOWTC Laboratory
- Consistency in planning and execution of maintenance works of roads in Kampala City.

3.7 Road Financing

Since the launching of the Economic Recovery Programme (ERP) in 1987, the financing of major road rehabilitation/construction projects has been predominantly donor-supported under the Development Budget, amounting to approximately US$250 million.

The Development Budget is the government's investment programme, financed from the Consolidated Fund plus some other sources of local funding. The first year of the Development Budget and the Public Investment Plan (PIP) are identical. All projects in the PIP being considered as core projects, their funding requirements are catered for in full during the budgeting procedures. The table below shows the PIP development estimates in the transport and communication sector for Fiscal Year (FY) 1995/96 to FY 1998/99, as of November 1996.

Unit: Billion Ush.

Source	FY 1995/96	FY 1996/97	FY 1997/98	FY 1998/99
1. Donor	107.8	95.3	103.8	76.2
2. Government	23.0	40.0	33.4	36.2
Sector PIP Fund	130.8	135.3	137.2	112.4
Sector Share (%)	20.2	19.5	21.0	24.3

Remark: Excludes additional funding requirement for the 10-year Road Sector Development Programme.

From these figures, it is concluded that almost 70% of funds required in the PIP come from external sources and the remaining 30% is borne by local funds. The PIP includes rehabilitation/construction as well as major maintenance projects in the sector. The government is expecting evenly disbursed donor funds for road rehabilitation/construction to the tune around US$100 million each year, except for FY 1996/97.

In respect of major roads, the government recognizes that the maintenance of recently rehabilitated roads has to be put on a sustainable basis and given priority over further rehabilitation and construction. In June 1994, the government adopted the 4-year Main Roads Maintenance Programme (MRMP, 1995-1998), a formal arrangement with donors. According to the MRMP, the government will gradually increase its financial contribution to major road maintenance as the revenue situation improves; in turn, donors will contribute the temporary financing to eliminate the maintenance backlog generated by the past revenue shortage. The agreed schedule spans FY 1994/95 to FY 1997/98 as shown in the following table:

Unit: US $ million

Item	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
1. Government	13.5	17.0	20.0	24.0
2. Total Cost	24.9	33.4	41.8	42.0

Note: The remainder of the required maintenance costs will be left to donor support.

Through normal budgeting procedures, the shilling equivalent of US$13.5 million in FY 1994/95 and US$17.0 million in FY 1995/96 have been released in full. The release of funds will continue throughout FY 1996/97 to FY 1997/98. To avoid an insufficient and delayed fund release, the government has placed road maintenance in the budget's "strategic areas" that shall be protected from cuts and the delay. By the end of FY 1995/96, should such arrangements fail to solve the problem, the government would take necessary steps to establish a Road Fund with an appropriate taxation measure.

The rapidly increasing annual contributions under the MRMP have made it the fastest growing component in the government's expenditure programme. In the transport and communication sector alone, road maintenance consumes the bulk of expenditures, 52.5% of the total in FY 1995/96. It accounted for almost four (4) times the expenditures of road rehabilitation and construction. The second largest component in the sector is feeder roads rehabilitation/maintenance, which had a share of just over 20% in the same fiscal year.

In October 1996, the "10-year Road Sector Development Programme, 1996/7 - 2005/6" was finalized and published by the MOWTC in association with the World Bank. To this Programme, the government has committed itself to make a dual financial contribution, namely: -

(a) A 5% annual real increase in resources allocation towards main road rehabilitation/construction under the Development Budget, and

(b) Annual increases of US$4 million towards main roads maintenance after FY 1997/98 until the classified road network is fully funded.

These commitments have been made from the assessment of the nation's need for new roads, cash flow implications, and funding requirements in the other economic sectors. In view of the government's current macro-economic framework only covering three years, the detailed projections of financing requirements in this stage have been made up to and including FY 1998/99.

These are as follows:

10-year Road Sector Development Programme: Funding Requirements (Government)

Unit: Billion Ush

(A) Rehabilitation/Construction:

Item	FY 96/97	FY 97/98	FY 98/99
GOU Commitment	4.9	5.4	5.9
Current PIP Provision	4.9	2.5	2.2
Add. Requirements	0.0	2.9	3.7

(B) Maintenance:

Item	FY 96/97	FY 97/98	FY 98/99
MRMP Commitment (US $ million)	20.0	24.0	28.0
Shillings Equivalent	21.5	26.0	32.5
MRMP-PIP Provision	13.4	14.6	13.0
MRMP-RB Provision	8.1	11.4	15.4
Add. Requirements	0.0	0.0	4.1

Note: RB - Recurrent Budget

10-Year Road Sector Development Programme: Funding Requirements (Donor)

Unit: US $ million

(A) Rehabilitation/Construction:

Item	FY 96/97	FY 97/98	FY 98/99
Donor Fund Required	53.1	100.0	100.0
Current PIP Provision	53.1	29.0	23.1
Add. Requirements	0.0	71.0	76.9

(B) Maintenance:

Item	FY 96/97	FY 97/98	FY 98/99
Total Requirements	39.5	44.6	50.4
GOU Commitment	20.0	24.0	28.0
Donor Fund Required	19.5	20.6	22.4
Current PIP Provision	19.5	20.6	16.4
Add. Requirements	0.0	0.0	6.0

Notes: (1) : GOU-Government of Uganda

(2) : As shown above, almost half of road maintenance projects are included in the PIP and under the Development Budget.

3.8 Ongoing Road Development Projects

Regarding road development in Kampala City, several bi-lateral and multi-lateral international agencies have been assisting in the rehabilitation and development. Fig. 3.7 shows past and on-going road development projects financed by international agencies.

On - going and Past Projects

[First Urban Project]: The First Urban Project is designed to support government's efforts to decentralize the responsibility for planning, design and management of urban services to local authorities. The main objective of the project is to support government in improving the delivery of urban services. The project will help restore KCC's capacity with respect to markets, administration, refuse collection and disposal, and the provision and maintenance of infrastructure, particularly roads and storm drainage networks. It is funded by the World Bank, Nordic Development Fund and GTZ. A total of US $ 39.5 million has been committed to the project. The road maintenance component of the Kampala Urban Project includes the provision of a Road Maintenance Specialist, who has been in post since March 1992. In addition to the supervision of a committed program of periodic maintenance for 43.5 km and a program of routine maintenance for 341 km of other roads, the specialist will implement related programs, including strengthening the capacity of the City Engineer's Department to carry out road maintenance.

[KCC Car Park Project]: KCC is promoting the construction of a new car park for taxis near the present park which will provide for approximately 500 car parking spaces and several shopping booths. It was planned to be completed by April 1993 at and estimated cost of Ush 2,500 million.

[Kampala - Entebbe Road Project]: MOWTC has started capacity improvement work for the Kampala - Entebbe Road (Total length 34 km) with US$3.5 million in 1996/97 fiscal year and it is scheduled to complete in 97/98 fiscal year with a budget of US$4.0 million.

Committed Projects

In addition to the ongoing projects described above, several other projects are in the planning stages of preparation, and some of them are committed to be implemented by the donor agencies.

[Kampala Southern By-Pass]: The economic feasibility and engineering design for this highway project was funded by the Economic Development Fund of the EU, with the MOWTC serving as the executing agency. The new road would serve as a by -pass of Kampala linking Jinja Road to the East with Masaka road to the West. The feasibility study phase has been completed. It recommends construction of 4-lane road with grade separated roundabouts at the Masaka Road, Jinja Road, Gaba Road and Makindye Road junctions. Other planned structures include the construction of 3 bridges to cross URC rail line.

[Kampala Northern By-Pass]: A comparative study of a possible northern by-pass and the fully designed southern by-pass was undertaken by consultants to the EU in 1996. The EU's decision on whether to proceed with the original southern by-pass or the northern alternative is thought to be imminent.

[Kampala City Roads Phase II]

The rehabilitation of 30 km of urban roads financed under Lome II resources was completed in 1992. Under Lome III, design studies are being undertaken by EU for the rehabilitation of another 33 km of urban roads in Kampala.

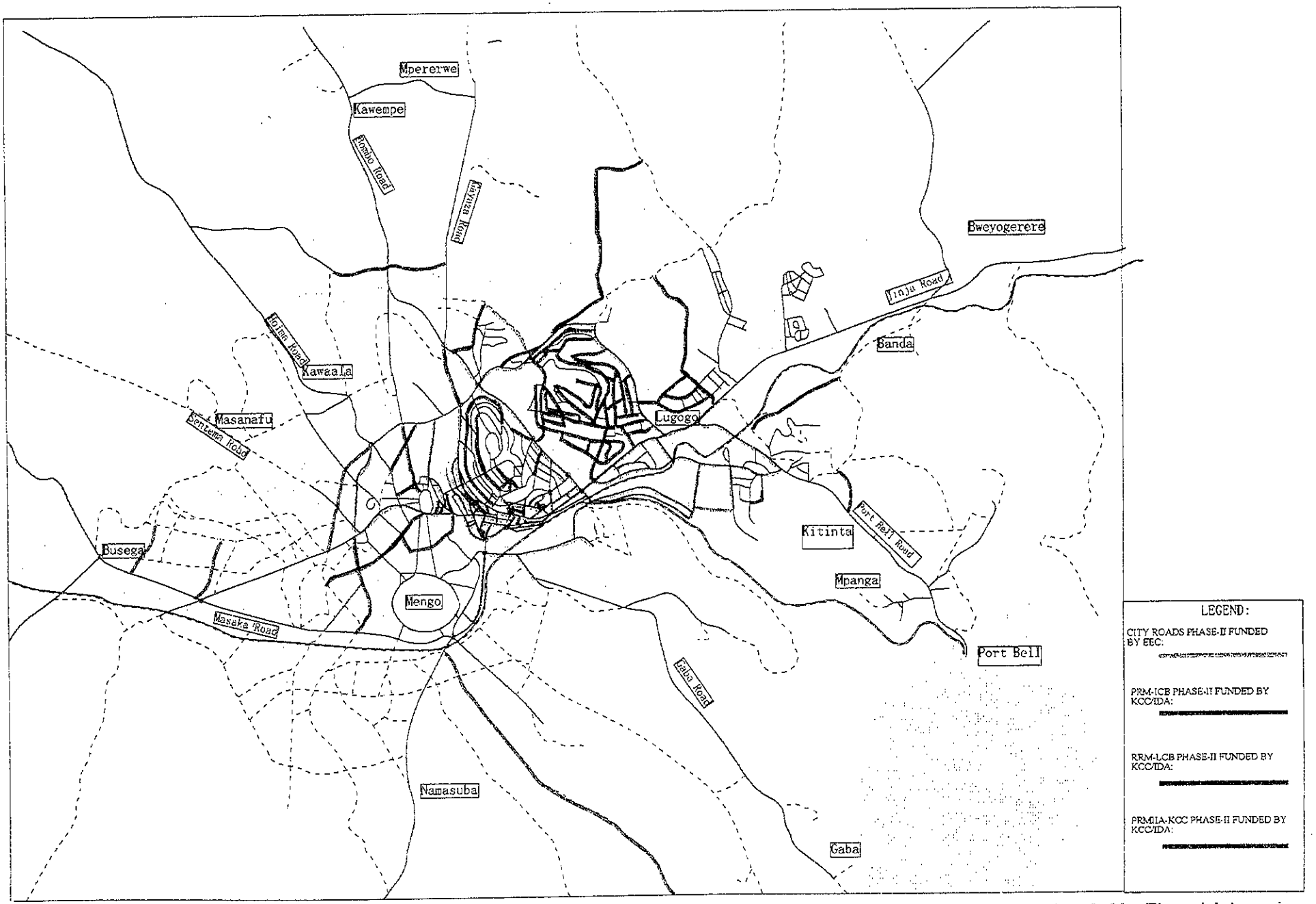


Figure 3.7 Road Maintenance of Streets in Kampala Funded by Financial Agencies