

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION
THE REPUBLIC OF UGANDA

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR PROVISION
OF
ROAD MAINTENANCE EQUIPMENT
IN
THE REPUBLIC OF UGANDA**

JANUARY, 1993

CONSTRUCTION PROJECT CONSULTANTS, INC.

JICA
BASIC DESIGN STUDY REPORT ON THE PROJECT FOR PROVISION OF ROAD MAINTENANCE EQUIPMENT IN THE REPUBLIC OF UGANDA
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国際協力事業団

24684

PREFACE

In response to a request from the Government of the Republic of Uganda, the Government of Japan decided to conduct a basic design study on the Project for Provision of Road Maintenance Equipment and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Uganda a study team headed by Mr. Toshiomi Matsunaga, Inspector, Planning and Coordination Division, Technical Office, Hokkaido Development Bureau, Hokkaido Development Agency and constituted by members of Construction Project Consultants, Inc., from 5 September to 24 September, 1992.

The team held discussions with the officials concerned of the Government of Uganda and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Uganda from 24 November to 8 December, 1992 in order to discuss a draft report 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 the two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Uganda for their close cooperation extended to the teams.

January, 1993



Kensuke YANAGIYA

President

Japan International Cooperation Agency

January, 1993

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency
Tokyo, Japan

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Provision of Road Maintenance Equipment in the Republic of Uganda.

This study has been made by Construction Project Consultants, Inc. based on a contract with JICA, from 31 August, 1992 to 29 January, 1993. Throughout the study, we have taken into full consideration of the present situation in Uganda, and have planned the most appropriate project in the scheme of Japan's grant aid.

We wish to take this opportunity to express our sincere gratitude to the officials concerned of JICA, the Ministry of Foreign Affairs and the Ministry of Construction. We also wish to express our deep gratitude to the officials concerned of the Ministry of Public Works, Transport and Communications of Uganda, JICA Kenya Office, and Embassy of Japan to Kenya for their close cooperation and assistance during our study.

As last, we hope that this report will be effectively used for the promotion of the project.

Very truly yours,



Kimio CMIBA

Project Manager

Construction Project Consultants, Inc.



ZAIRE

SUDAN

RWANDA

TANZANIA

KENYA

- International boundary
- District boundary
- County boundary
- Capital city
- District headquarters
- Other town

Note: the boundaries shown on this map relate to the 1980 census

1:3 250 000
0 20 40 60 80 100 kilometres

LOCATION MAP

KEY MAP

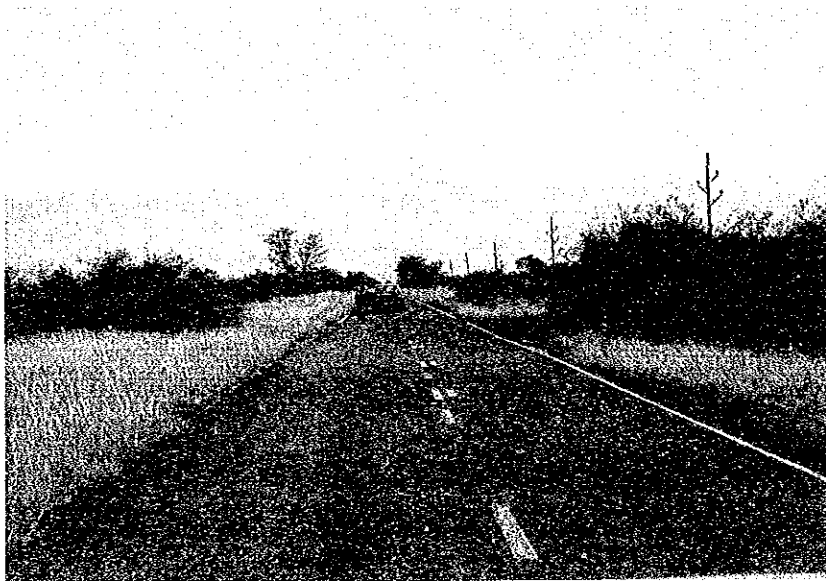
UGANDA

AFRICA



Kampala - Masaka Road

Rehabilitated by double bitumen surface treatment, DBST.



Mbarara - Fort Portal Road
Section: Ishaka - Katunguru

Rehabilitated by DBST



Mbarara - Fort Portal Road
Section: Katunguru - Kasese

Not yet rehabilitated

Mbarara - Fort Portal Road
Section: Kasese - Fort Portal

Not yet rehabilitated



Fort Portal - Mubende Road
Section: Fort Portal - Mukunyu

Rehabilitated gravel road



Fort Portal - Mubende Road
Section: Kyenjojo - Mubende

Not yet rehabilitated





Fort Portal - Mubende Road
Section: Kyenjojo - Mubende

Not yet rehabilitated



Mubende - Mityana Road

Newly constructed by DBST



Kampala Urban Road

Routine Maintenance/
Patching work of DBST

Kampala Bombo Road

Routine Maintenance/
Base course grading work for
DBST



Kampara - Bombo Road

Routine Maintenance/
Patching work of DBST



Lira - Apac Road

Routine Maintenance/
Grading work for gravel road.





MOWTC Central Mechanical Workshop in Kampara, CMW

Warehouse / Spare parts are stored and controlled by using card system.

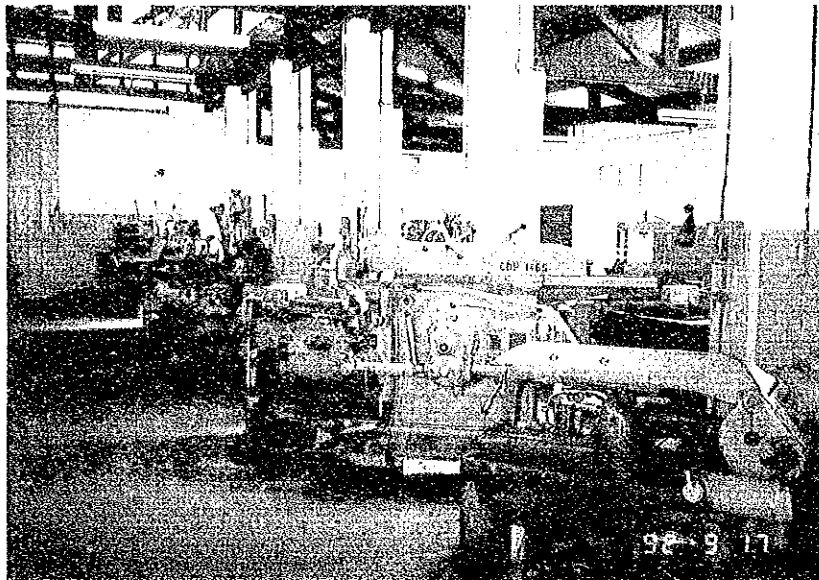


CMW / Heavy duty shop



CMW / Machine shop

Reproducing engine crankshaft



CMW / Machine shop



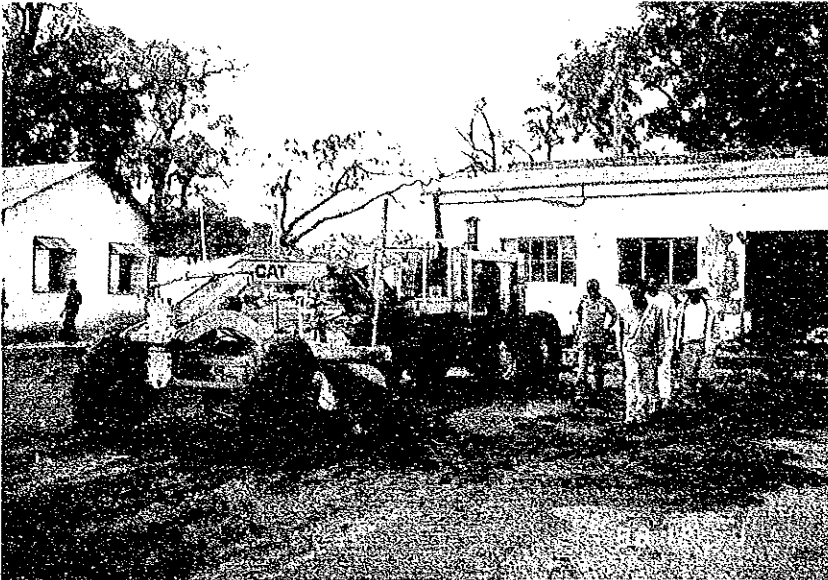
MOWTC Kasese District Office
Workshop and depot/

Equipment procured through
Japan Grant Aid and Third
Highway Project.



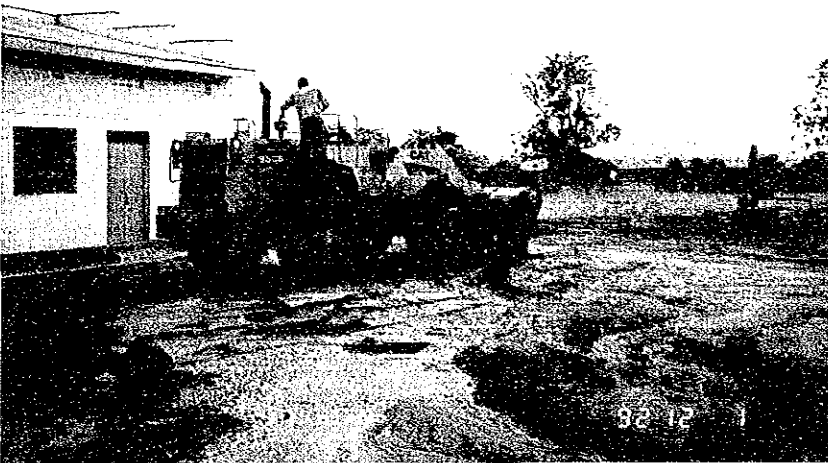
MOWTC Fort Portal Area Office
Workshop and depot/

Tipper truck procured through
Japan Grant Aid and Third
Highway Project.



MOWTC Lira District Office
Workshop and depot/

Existing equipment



MOWTC Lira District Office
workshop and depot/

Existing equipment



MOWTC Lira District Office
Workshop and depot/

Motor grader and tipper truck
procured through Japan Grant
Aid.

SUMMARY

Summary

Uganda is a relatively small landlocked country located in the heart of the great African high plateau that rolls from Ethiopian highlands towards southern Africa. It is bordered by Kenya in the east, Tanzania in the south, Rwanda in the south west, Zaire in the west, and Sudan in the north.

The political turmoil and economic decline in the country during the last twenty years have resulted in a severe decline in the living standard of the vast majority of Ugandans. Transport and communication have been deteriorated severely due to inadequate managerial and technical expertise and the allocation of low level of resources for repair, maintenance and development.

In 1987 the Government introduced the Economic Recovery Programme (ERP), which included policy reform and rehabilitation of investments. In the ERP emphasis had been placed on the rehabilitation and maintenance of dilapidated infrastructure. However, the total maintenance backlog of the classified road network still stands at about 200 km of paved and 3,500 km of gravel roads. In addition, the realisation of reconstruction/rehabilitation programmes has imposed an acute need of keeping the reconstructed roads well maintained so as to protect the investment. Because of very limited capabilities of local construction industry, presently only 20% of road maintenance is contracted and 80% done by the Ministry of Works, Transport and Communications, MOWTC, direct labour units. However under the present Road maintenance policy, coupled with its constraints the maintenance obligation may not ably be handled timely and properly. Particularly the lack of adequate funds caused hindrances:

- i) Insufficient tools and equipment
- ii) Low supply of parts for plant and equipment
- iii) Insufficient fuel, oil lubricants and materials

The majority of equipment that form the present fleet of MOWTC were procured 4-5 years ago through various funding sources. Of a total of 660 effective fleet about 30% are serviceable while 70% are down due to lack of certain spare parts and materials.

The Government of Uganda is putting priority on the maintenance of existing roads. And to realize this objective the Government of Uganda has made a request to the Government of Japan for the procurement of the road construction equipment, which shall be used for maintaining the classified roads of the country.

The Government of Japan decided to hold a study, and the Japan International Cooperation Agency (JICA), sent the study team to Uganda from September 5 to September 24, 1992.

Allocation schedule of equipment was originally intended "to the Area/District offices of MOWTC (21 places) of all over the Country" to supplement existing fleet. But the Government of Uganda strongly requested that the priority to be given to those of Gulu, Lira, Kitgum Arua, Moyo in the Northern Area and Soroti in the Eastern Area, where Northern Uganda Reconstruction Programme (NURP), which was introduced in 1991 is on-going.

The region covered by the Districts of Gulu, Lira, Kitgum, Arua, Moyo and Soroti accounts about 1/3 of the total area of the Country with a population of about 4 million people, of which 96% is rural. Since 1986, the region has been plagued by waves of insecurity which have resulted in many people being displaced and much of the economy infrastructure destroyed. Since 1988 there has been marked improvement in the security situation, agricultural production has resumed and substantial marketable surplus has found its way to Kampala and abroad.

Rehabilitation and reconstruction of highways and feeder roads play an important role in NURP. As a result, a 40% of the total base cost of US\$83.85 million assisted by foreign funding agencies would be allocated to this sector.

Of a total of 2,185 km of roads under the relevant MOWTC's Area/District Offices, 457 km of roads is programmed under NURP, including rehabilitation, regravelling or resealing according to the road section. On the other hand some 1,500 - 2,000 km of routine maintenance per year through the Government recurrent maintenance expenditures is also programmed, which includes the works of light grading, heavy grading, spot gravelling and emergency maintenance, etc..

Executing agency is the Ministry of Works, Transport and Communications, MOWTC, and all the equipment to be procured will be used for the routine maintenance work which is executed by MOWTC's working units. All the equipment and spare parts shall be handed-over to the MOWTC including the Supplier's trial operation, at the Central Mechanical Workshop in Kampala, then allocated to the relevant Districts.

The implementation comprises of a 4 months for Detailed Design and a 12 months for Equipment Procurement including transport and trial operation. The equipment and allocation schedules are shown in the following pages.

The study shows that MOWTC's capacity for operation and maintenance of the equipment to be procured seems substantially enough. The Project will enable the MOWTC to realize its routine maintenance of classified gravel roads at about 2,185 km per year in the relevant Districts in the northern Uganda. The Project is expected to improve the road network significantly, and contributes to the development of this area and reduction of the disparity between the north and south of the Country.

EQUIPMENT SCHEDULE

Equipment	Type	Nos.
1. Tipper Truck	8 ton	10 units
2. Water Truck	6,000 liters complete with pump and accessories	1 unit
3. Pick-up	4x4, 2,500 cc diesel, single cab	8 units
4. Motor Grader	Minimum 135 HP, blade 3.70 m class	4 units
5. Crawler Loader	Minimum 110 HP, bucket 1.5m ³ class with teeth, 3 shank ripper	2 units
6. Wheel Loader	Minimum 130 HP, bucket 1.9m ³ class with teeth	2 units
7. Wheel Excavator	Minimum 90 HP, bucket 0.4m ³ (heap) class	3 units
8. Tractor	4 WD, Minimum 90 HP with 3.0 ton trailer	6 units
9. Vibration Roller	8 ton class	6 units
10. Fuel Truck	8,000 liters	2 units
11. Lowbed Tractor/Trailer	Payload 32 ton	2 units
12. Water Pump	Lift head 5m, 3 inches, diesel	8 units
13. Mobile Workshop	Equipped with generator, glinder, etc.	1 unit

In addition:

- Spare parts of a 20% of the total amount of the above equipment and vehicles
- Spare parts for existing equipment procured through Japan's Grant Aid.

Note: Main equipment and tools mounted on the above mobile workshop are: crane, generator, compressor, hydraulic press, drilling machine, bench glinder, gas welder, battery charger, injector nozzle tester, etc.

ALLOCATION SCHEDULE

(Unit: Nos.)

STATION Area/District	NUMBER OF EQUIPMENT BY TYPE																
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull- Dozer	Motor Grader	Motor Grader	Crawler Loader	Wheel Loader	Wheel Exca- vator	Tractor	Vibra- tion Roller	Pedes- trian Roller	Fuel Truck	Lowbed Tractor Trailer	Water Pump	Mobile Workshop
Northern Area																	
1. Gulu Area Office	1	1	0	2	0	1	0	0	1	1	1	1	0	1	0	2	1
2. Lira District Office	2	0	0	2	0	1	0	0	0	1	1	1	0	0	0	2	0
3. Kitgum District Office	3	0	0	1	0	1	1	1	1	1	1	1	0	0	1	1	0
4. Arua District Office	2	0	0	1	0	1	1	0	1	1	1	1	0	1	1	1	0
5. Moyo District Office	1	0	0	1	0	0	0	0	1	0	1	1	0	0	0	1	0
Eastern Area																	
6. Soroti District Office	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0
Total	10	1	0	8	0	4	2	2	3	6	6	6	0	2	2	8	1

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PHOTO OF EXISTING ROADS AND WORKSHOPS

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ABBREVIATION

MOWTC	Ministry of Works, Transport and Communications
MOLG	Ministry of Local Government
CMW	Central Mechanical Workshop
PWTC	Public Works Training Center
NRM	National Resistance Movement
ERP	Economic Recovery Programme
NURP	Northern Uganda Reconstruction Programme
JICA	Japan International Cooperation Agency
IDA	International Development Association
IBRD	International Bank for Reconstruction and Development
ADB	African Development Bank
ADF	African Development Fund
EEC	European Economic Community
ODA	Overseas Development Administration, UK
KFW	Kreditanstalt für Wiederaufbau, Germany
DANIDA	Danish International Development Agency
IDB	Islamic Development Bank

CHAPTER I INTRODUCTION

I. INTRODUCTION

1.1 The Basic Design Study Team

Since 1987 the Government of Uganda is putting priority on the maintenance of existing roads which had deteriorated due to inadequate managerial and technical expertise and the allocation of low level of resources for repair, maintenance and development. To realize this objective, the Government of Uganda has made a request to the Government of Japan for the procurement of the road construction equipment, which shall be used for maintaining the classified roads of the country.

The Government of Japan understood its necessity and emergency, and deemed the Project's objective roughly appropriate for Japanese grant aid and decided to hold a study. Japan International Cooperation Agency (JICA) sent the study team, headed by Mr. Toshiomi Matsunaga, Inspector, Planning and Coordination Div., Technical Office, Hokkaido Development Bureau, from September 5 to September 24, 1992.

1.2 Content of the Basic Design Study

The study team conducted the following field study, with the cooperation of the Government of Uganda, after confirmation of the content of the requested Project and its background:

- (1) confirmation of the appropriateness, necessity and priority of the Project in the National Development Plan
- (2) investigation of traffic conditions and road conditions in Uganda
- (3) investigation of the road maintenance management condition, the construction equipment status and their services system, and the technical level of MOWTC
- (4) investigation on the equipment which has been procured through Japan's Grant Aid
- (5) investigation of the technical training for civil engineering, equipment operator, mechanic, etc.

- (6) confirmation of responsible/executing organization of the proposed Project (administration plan, operation plan, budgetary plan, staff training plan, etc.)
- (7) confirmation and clarification of related projects.

The study team had carried out analysis in Japan based on the investigation of field study and prepared a Draft Report, on which further discussions with the relevant officials were held at the team's second visit in Uganda.

This "Basic Design Study Report" describes the results of the above mentioned investigation and analysis.

Members of the survey team, survey schedule and minutes of discussion are attached in Appendix.

CHAPTER II BACKGROUND OF THE PROJECT

II. BACKGROUND OF THE PROJECT

2.1 Economy

The political turmoil and economic decline in the country during the last twenty years have resulted in a severe decline in the living standard of the vast majority of Ugandans. At Independence (1962), Uganda was one of the strongest, most promising economies in Sub-Saharan Africa. Uganda's transport system was regarded as one of the best in Sub-Saharan Africa and included access to an effective network of railway, port and airline facilities. The period of political unrest that started in 1970 radically reversed the economic and social progress attained to that point. Under the administration of the National Resistance Movement, which took over the Government in January 1986, peace and security were gradually restored in the country, permitting a resurgence in economic activity. In 1987 the Government introduced its Economic Recovery Programme (ERP), which included policy reform and rehabilitation investments. Since the program was introduced in FY88-91, real GDP growth has averaged about 6 percent per annum and inflation has declined sharply, from 243 percent in FY88 to about 39 percent in FY91. The economy has continued to face severe external payments pressures. However a number of policy initiatives undertaken recently by the Government have helped ease the pressure on the balance of payments.

2.2 Outline of the Road Sector

During the 1970's, transport and communication have been deteriorated severely due to inadequate managerial and technical expertise and the allocation of low level of resources for repair, maintenance and development. The civil strife further accentuated the neglect of the transport system. By 1986 when the NRM government came into power only 10 percent of the classified road network was in motorable condition and the remainder required total rehabilitation. Since Economic Recovery Programme (ERP) was started in 1987, emphasis had been placed on the rehabilitation and maintenance of the delapidated infrastructure. About 55% of the classified road network had been rehabilitated by December 1991, but remaining 45% of the network was still in a state of complete disrepair requiring rehabilitation/reconstruction measures. The total maintenance backlog stood at about 200 km of paved and 3,500 km of gravel roads.

Uganda has a reasonably well distributed network of classified and feeder roads totalling approximately 28,000 km exclusive of village paths, of which about 8,000 km is under control of MOWTC. MOWTC classifies them into three categories according to the importance, i.e. primary road, secondary road and tertiary road which composition are 51%, 26% and 23%, respectively. Road network is shown in Fig. 2-1. Classified road network under the Ministry of Works, Transport and Communications, MOWTC is summarized as follows:

(Unit: km)

Area	Classified Road								Total
	Bitumen				Gravel				
	Pri- mary	Sec- ondary	Ter- tiary	Total	Pri- mary	Sec- ondary	Ter- tiary	Total	
1. Central	740	109	37	886	137	324	142	603	1,489
2. Western	576	2	11	589	552	658	553	1,763	2,352
3. Northern	154	3	0	157	764	664	430	1,858	2,015
4. Eastern	353	0	122	475	829	296	513	1,638	2,113
Total	1,823	114	170	2,107	2,282	1,942	1,638	5,862	7,969

MOWTC plays a key role in over-all transportation policy of the country. MOWTC has responsibility to ensure that the national classified road network is appropriately developed and maintained for safe and efficient use by the road users in keeping with the need of transport, with the aim of promoting the social and economic development of the country. Technical Department of MOWTC comprises 4 Divisions, i.e. Road Maintenance Division, Training Division, Material Testing Division and Mechanical Division, and controls implementation of the programmes of all over the Country, through 22 Area/District offices. Organisation of MOWTC is shown in Fig. 2-2, and those of road maintenance division and mechanical division in Fig. 2-3 and Fig. 2-4, respectively.

MOWTC's road maintenance/rehabilitation work is summarized as follows:

ITEM	TYPE OF WORK	DESCRIPTION	ROAD TYPE	ORGANIZATION IN CHARGE	DIRECT OR CONTRACT
1		Routine Maintenance			
1.1		Manual Work			
		- Grass cutting for road shoulder, slope	- bitumen - gravel	- district	- single man or group contract
		- Cleaning of side drain ditch, drainage	- earth		- direct labour
		- Patching of potholes			
1.2		Mechanized work			
		- Patching of pothole	- bitumen	- district	- direct labour unit
		- Reinstatement of drainage, structure	- gravel - earth	- area	
		- Reshaping of side ditch, shoulder			
		- Grading of pavement, shoulder			
		- Emergency maintenance			
		- Spot gravelling			
2		Periodic Maintenance			
2.1		Regravelling/Rehabilitation of Gravel Road	- gravel	- area	- contract - direct labour unit
		- Reopening			
		- Reshaping			
		- Reinstatement of drainage, structure			
		- Spot regravelling			
2.2		Resealing of Paved Road	- bitumen	- area	- contract - direct labour unit
		- Reinstatement of drainage, structure			
		- Application of single bitumen surface treatment, SBST 1)			
		- Sealing of Shoulder			
		- Concrete lining			

MOWTC's routine maintenance expenditure forecast by Area for the period 1992/93 - 1996/97 is shown in Table 2-1, and details of the programme for the same period is shown in Table 2-2.

The majority of equipment that form the present fleet of the MOWTC were procured since 1986 through various funding sources. Because of poor inventory of spare parts, a good number of

equipment have been rendered unoperational or beyond repair. The equipment condition is summarized as follows:

Equipment Status	Heavy	Light	Total
Condition 5	68	0	68
Condition 4	64	14	78
Condition 3	324	190	514
Condition 2	72	59	131
Condition 0 or 1	94	46	141
Total	622	310	932

Several construction equipment were procured through Japan's Grant Aid in 1985 and 1988. Of a total of 128 pieces, 49 are unoperational or beyond repair, and remaining 79 are operational but requiring repair to some extent. Spare parts of a 15% to the amount of procurement was supplied initially together with the equipment, but they have been consumed over the 24 months of operation. Standard parts are easily available through local dealer, e.g., tyres and tubes, batteries, break linings and bulbs, but not for majority of parts due to constraint in forex. Status of the equipment is shown in Table 2-3.

2.3 Outline of the Request

After independence in 1962, the Republic of Uganda had a well developed road network. However, throughout the '70s and part of the '80s, it deteriorated through inadequate maintenance due to the serious economic depression, particularly it was seriously affected by the civil disturbances in '79 and early '80s. Thus, the capacity of transporting farm products to the domestic market, and principal export commodities such as coffee and cotton to the export port were seriously decreased.

In the Economic Recovery Programme, ERP, launched in 1987, emphasis has been placed on the maintenance of the transportation system and the improvement of organizations concerned with the transport. World Bank, and other international funding agencies have assisted the Government of Uganda for implementation of the plan.

Of a total of 28,000 km of the road network, 8,000 km of classified road is controlled under the Ministry of Works, Transport and Communications, MOWTC. MOWTC has implemented road rehabilitation and reconstructing programs under the framework of Third and Fourth Highway Projects since 1987. Some 4,000 km of the classified road which account 55% of it, was maintained, however, remaining 45% is still in critical conditions.

In connection with the road rehabilitation and reconstruction programs, supply of appropriate type and number of construction equipment is considered essential for smooth implementation. Several construction equipment and vehicles e.g. dump trucks, motor graders, bulldozers, etc. were provided by the Government of Japan through its Grant Aid Assistance in 1985 and 1987 (the later is Non-Project Grand). Those equipment enabled MOWTC to execute the routine maintenance of classified roads of the country, and contributed significantly to the realization of MOWTC's road maintenance programme.

MOWTC is putting priority on the maintenance of existing roads. And to realize this objective the Government of Uganda has made a request to the Government of Japan for the procurement of the road construction equipment, which shall be used for maintaining the classified roads of the country.

Allocation schedule of the equipment was originally intended "to the Area/District offices of MOWTC (21 places) of all over the Country to supplement existing fleet. But the Government of Uganda strongly requested that the priority to be given to those of Gulu, Lira, Kitgum, Arua, Moyo in Northern Area and Soroti in Eastern Area, where Northern Uganda Reconstruction Programme (NURP) which was introduced in 1991, is on-going. The over-all allocation schedule is listed as follows:

ALLOCATION SCHEDULE

(Unit: Nos.)

STATION Area/District	NUMBER OF EQUIPMENT BY TYPE															
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Dozer	Bull- Motor	Grader	Crawler Loader	Wheel Loader	Wheel Exca- vator	Tractor Roller	Vibra- tion Roller	Pedes- trian Roller	Fuel Truck	Lowbed Tractor Trailer	Water Pump	Mobile Workshop
Northern Area																
1. Gulu Area Office	1	1	0	2	0	1	0	0	1	1	1	0	1	0	2	1
2. Lira District Office	2	0	0	2	0	1	0	0	0	1	1	0	0	0	2	0
3. Kitgum District Office	3	0	0	1	0	1	1	1	1	1	1	0	0	1	1	0
4. Arua District Office	2	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0
5. Moyo District Office	1	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0
Eastern Area																
6. Soroti District Office	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0
Total	10	1	0	8	0	4	2	2	3	6	6	0	2	2	8	1

Table 2-1 Routine Maintenance Expenditure Forecasts
1992/93 - 1996/97

Area	Description	Fiscal Year					Total
		1992/93	1993/94	1994/95	1995/96	1996/97	
Central	Road length (km)	1,681	1,845	2,117	2,127	2,117	9,885
	- Paved	900	900	924	979	924	4,627
	- Unpaved	781	945	1,192	1,148	1,193	5,258
	Target length (km)	1,680	1,357	1,893	1,978	1,893	8,802
	- Paved	900	738	814	891	814	4,157
	- Unpaved	781	620	1,079	1,087	1,079	4,645
	Expenditue (US\$1,000)	1,991	1,533	2,026	2,112	2,026	9,688
	Labour Cost	620	518	687	714	687	3,225
	Equipment Consumables	935	694	981	1,016	981	4,607
	Construction Materials	364	260	278	299	278	1,478
	Tools	73	61	80	83	80	377
Western	Road Length (km)	2,343	2,476	2,516	2,641	2,691	12,669
	- Paved	604	604	604	688	738	3,238
	- Unpaved	1,739	1,872	1,912	1,953	1,953	9,431
	Target length (km)	2,001	2,158	2,104	2,279	2,492	11,033
	- Paved	516	509	554	621	738	2,938
	- Unpaved	1,484	1,649	1,550	1,658	1,754	8,095
	Expenditue (US\$1,000)	2,497	2,600	2,453	2,604	2,795	12,949
	Labour Cost	739	792	775	830	897	4,034
	Equipment Consumables	1,291	1,368	1,279	1,375	1,484	6,797
	Construction Materials	389	356	317	312	320	1,694
	Tools	78	83	82	87	94	423
Nothern	Road length (km)	2,030	2,030	2,190	2,311	2,407	10,968
	- Paved	157	236	299	353	601	1,646
	- Unpaved	1,873	1,794	1,891	1,958	1,806	9,322
	Target length (km)	1,122	1,316	1,768	1,825	2,272	8,303
	- Paved	102	126	188	201	466	1,0812
	- Unpaved	1,020	1,190	1,580	1,625	1,806	7,221
	Expenditure (US\$1,000)	1,568	1,609	1,928	1,851	2,217	9,172
	Labour Cost	455	516	658	677	817	3,123
	Equipment Consumables	867	827	967	878	1,005	4,565
	Construction Materials	192	204	225	217	299	1,138
	Tools	54	61	77	79	95	366

(Cont'd)

(Cont'd)

Area	Description	Fiscal Year					Total
		1992/93	1993/94	1994/95	1995/96	1996/97	
Eastern	Road length (km)	2,200	2,248	2,326	2,326	2,326	11,425
	- Paved	432	432	478	488	511	2,341
	- Unpaved	1,768	1,816	1,847	1,838	1,815	9,084
	Target length (km)	1,646	1,763	2,154	2,112	2,326	10,001
	- Paved	272	303	408	355	511	1,849
	- Unpaved	1,374	1,460	1,746	1,758	1,815	8,152
	Expenditure (US\$1,000)	2,050	2,077	2,397	2,270	2,501	11,297
	Labour Cost	627	664	791	774	845	3,702
	Equipment Consumables	1,116	1,104	1,244	1,151	1,259	5,873
	Construction Materials	240	239	279	264	309	1,332
Tools	67	70	83	81	88	390	
Total	Road Length (km)	8,254	8,599	9,149	9,4045	9,541	-
	- Paved	2,093	2,172	2,308	2,508	2,773	-
	- Unpaved	6,161	6,427	6,843	6,897	6,767	-
	Target length (km)	6,449	6,595	7,920	8,193	8,983	38,139
	- Paved	1,790	1,676	1,965	2,067	2,529	10,027
	- Unpaved	4,659	4,919	5,955	6,126	6,454	28,113
	Expenditure (US\$1,000)	8,107	7,819	8,803	8,837	9,539	43,105
	Labour Cost	2,441	2,491	2,912	2,994	3,246	14,084
	Equipment Consumables	4,209	3,993	4,470	4,420	4,730	21,822
	Construction Materials	1,185	1,059	1,099	1,093	1,206	5,642
Tools	271	276	322	331	357	1,557	

Source: MOWTC, The Classified Road Network/Policies, Strategies and Programmes 1992 - 1997 based on National and Maintenance Awareness Seminar, Kampala, Feb 4 - 6, 1992.

Table 2-2 ROADS PLAN 1992/93 - 1996/97

ITEM	PROJECT AND ACTIVITIES	FINANCE SOURCE	TARGET ESTIMATED		SCHEDULE				
			LENGTH km	COST US\$ '000	92/93	93/94	94/95	95/96	96/97
I	Routine Maintenance		43,105		8,107	7,819	8,803	8,837	9,539
1.1	Manual Maintenance	GOU	11,442		-----	-----	-----	-----	-----
1.2	Mechanical Maintenance	GOU	24,465		-----	-----	-----	-----	-----
1.3	Construction Materials	GOU	7,198		-----	-----	-----	-----	-----
II	Periodic Maintenance		2,655	60,987	15,914	20,962	10,247	7,470	6,394
2.1	Resealing SBST only		542	9,763	1,544	1,652	2,117	2,196	2,254
2.10	Jinja - Iganga(Nakalama)	KFW	42	756	-----	-----	-----	-----	-----
2.11	Mbale(Namusi) - Sironko	KFW	19	338	-----	-----	-----	-----	-----
2.12	Iganga(Nakalama) - Muwayo	KFW	52	936	-----	-----	-----	-----	-----
2.13	Muwayo - Tororo - Malaba	KFW	43	772	-----	-----	-----	-----	-----
2.14	Mukono - Kayunga	KFW	50	891	-----	-----	-----	-----	-----
2.15	Bukoloto - Njuru	KFW	43	774	-----	-----	-----	-----	-----
2.16	Muwayo - Busia	KFW	17	308	-----	-----	-----	-----	-----
2.17	Iganga - Kaliro	KFW	32	583	-----	-----	-----	-----	-----
2.18	Jinja - Kamuli	KFW	48	857	-----	-----	-----	-----	-----
2.19	Tororo - Mbale	KFW	50	900	-----	-----	-----	-----	-----
2.20	Mbale - Soloti	KFW	102	1,840	-----	-----	-----	-----	-----
2.21	Makindye Lodge Road	-	2	36	-----	-----	-----	-----	-----
2.22	Capetown Villa Road	-	2	34	-----	-----	-----	-----	-----
2.23	Kampala - Bombo	-	31	558	-----	-----	-----	-----	-----
2.24	Bombo - Wobulenzi	-	10	180	-----	-----	-----	-----	-----
2.2	Regravelling		2,112	51,224	14,370	19,310	8,130	5,274	4,140
2.30	Kumi - Serere - Soroti	IDA(NRP)	78	3,350	-----	-----	-----	-----	-----
2.31	Soroti - Lira	IDA(NRP)	113	6,050	-----	-----	-----	-----	-----
2.32	Guru - Acholibur	IDA(NRP)	82	3,330	-----	-----	-----	-----	-----
2.33	Atiak - Moyo	IDA(NRP)	92	3,550	-----	-----	-----	-----	-----
2.34	Hoima - Kiboga - Busunju	ODA/GOU	145	2,900	-----	-----	-----	-----	-----
2.35	Hoima - Masindi	ODA/GOU	51	1,020	-----	-----	-----	-----	-----
2.36	Masindi - Kisanja - Kigumba	ODA/GOU	39	780	-----	-----	-----	-----	-----
2.37	Hoima - Buluko - Mubende	ODA/GOU	134	2,680	-----	-----	-----	-----	-----
2.38	Masindi - Kafu Bridge	ODA/GOU	39	786	-----	-----	-----	-----	-----
2.39	Busimba - Pachwa - Kenjoro	ODA/GOU	135	2,700	-----	-----	-----	-----	-----
2.40	Masindi - Bullisa - Spurs	ODA/GOU	131	2,620	-----	-----	-----	-----	-----
2.41	Kisanaj - Park	ODA/GOU	50	1,000	-----	-----	-----	-----	-----
2.42	Fort Portal - Kijura - Ndaiga	ODA/GOU	82	1,640	-----	-----	-----	-----	-----
2.43	Fort Portal - Karugutu - Bundibugyo	ODA/GOU	72	1,440	-----	-----	-----	-----	-----

Table 2-2 ROADS PLAN 1992/93 - 1996/97

ITEM	PROJECT AND ACTIVITIES	FINANCE SOURCE	TARGET ESTIMATED		SCHEDULE				
			LENGTH km	COST US\$ '000	92/93	93/94	94/95	95/96	96/97
2.44	Karugutu - Ntoroko	ODA/GOU	50	1,000					
2.45	Hoima - Biiso	ODA/GOU	44	880					
2.46	Kenjoro/Mubende Spurs	ODA/GOU	42	840					
2.47	V.Maria - Nabingora	IDA(TRP)	133	2,660					
2.48	Masaka - Sukakata	IDA(TRP)	37	732					
2.49	Ibanda - Kazo	IDA(TRP)	33	660					
2.50									
2.51	Atiak - Nimule	GOU	61	1,220					
2.52	Nakaita - Kazo	GOU	70	1,400					
2.53	Kilak - Adilang	GOU	64	1,280					
2.54	Tirinyi - Pallisa - Ladot	GOU	62	1,240					
2.55	Arua - Rhino Camp	-	66	1,320					
2.56	Buwama - Katebo Port	-	11	220					
2.55	Kayunga - Nabuganyi	-	20	400					
2.56	Kamuli - Mbulamuti	-	14	272					
2.57	Kamuli - Namasagali	-	20	402					
2.58	Mbarara - Nsongezi	-	51	1,020					
2.59	Kazo - Kabagolo	-	42	838					
2.60	Namagumba - Budadiri	-	19	372					
2.61	Kalule - Bamunanika	-	13	256					
2.62	Tororo - Naconger	-	18	366					
III	Mechanical Inputs (Direct Labour Routine Maintenance)			26,200	4,500	9,000	9,000	1,000	2,700
3.01	Rehabilitation of Plant			2,500					
3.02	Procurement of Equipment			20,200					
3.03	Rehab. Mechanical Workshop			3,500					
IV	Improvement Project		3,322	189,197	16,032	30,007	46,700	48,300	48,158
4.1	Rehab. and Resealing with DBST		397	51,425	4,600	12,945	13,370	14,760	5,750
4.11	Kafu Bridge - Karuma	IDA(NRP)	88	10,120					
4.12	Katunguru - Kasesa (PTA sponsored)	ADB/EEC	50	7,500					
4.13	Kasesa - Fortportal(PTA sponsored)	ADB/EEC	61	9,150					
4.14	Kasesa - Kilemba	-	6	900					
4.15	Equator Road	EEC	38	5,700					
4.16	Kampala Road(3 links)	-	12	1,725					
4.17	Karuma - Guru	-	78	8,970					
4.18	Kamundeni - Lira	-	64	7,360					

Table 2-2 ROADS PLAN 1992/93 - 1996/97

ITEM	PROJECT AND ACTIVITIES	FINANCE SOURCE	TARGET ESTIMATED		SCHEDULE				
			LENGTH km	COST US\$ '000	92/93	93/94	94/95	95/96	96/97
4.2	Application of Overlay		185	18,740	5,000	2,790	5,250	1,140	4,560
4.21	Kampala - Masaka(Sea. A-B-C)	EEC	62	6,200					
4.22	Kampala - Entebbe	IDA(TRP)	32	5,250					
4.23	Kampala - Port Bell	-	7	870					
4.24	Kampala - Gaba	-	9	920					
4.25	Kampala - Busunju	-	75	5,700					
4.3	Surfacing Gravel Road		740	88,812	432	8,052	22,080	26,400	31,848
4.31	Gayaza - Namulonge - Kiwenda	IDA(TRP)	12	1,440					
4.32	Mbarara - Ibanda	IDA(TRP)	64	7,680					
4.33	Mpigi Loop	EEC	4	432					
4.34	Gayaza - Kalagi	ADB	20	2,412					
4.35	Iganza - Tirinyi - Mbale	ADB	95	11,400					
4.36	Kyotera - Mutukula (PTA sponsored)	ADB(S)	45	5,400					
4.37	Kabale - Kisoro - Bunagana(PTA sp.)	ADB(S)	92	10,980					
4.38	Sironko - Kapchorwa - Suam(PTA sp.)	ADB(S)	110	13,200					
4.39	Karuma - Pakwach	ABUF(S)	121	14,520					
4.40	Pakwach - Arua	ABUF(S)	132	15,840					
4.41	Kayunga - Bale	-	46	5,508					
4.4	New Classified Roads		2,000	30,220	6,000	6,220	6,000	6,000	6,000
4.51	Kiwenda - Zirowe - Wobulenzi	IDA(TRP)	44	880					
4.52	Other Feeder Roads	-	1,956	29,340					
V	New Construction		538	162,403	18,863	45,411	51,917	28,215	17,998
5.01	Mityana - Fort Portal(II)	-	138	37,518					
5.02	Kampala Bypass	EEC	10	11,700					
5.03	Ishaka - Ishasha	EEC	67	16,750					
5.04	Masindi - Apac - Lira	IDB	163	41,000					
5.05	Lira - Kitgum	IDB	124	28,900					
5.06	Kampala Urban Interface Sections	-	30	10,500					
5.07	Mbarara Bypass	EEC	5	1,500					
5.08	Bridge on the Nile	-	1	5,000					
5.09	Trucking Laybays & Parking Lots	EEC		1,200					
5.10	Rehabilitation of Major Bridges	KFW		8,235					
5.11	Installation of Weighbridges(II)	-		100					

Table 2-2 ROADS PLAN 1992/93 - 1996/97

ITEM	PROJECT AND ACTIVITIES	FINANCE SOURCE	TARGET/ESTIMATED		SCHEDULE				
			LENGTH	COST	92/93	93/94	94/95	95/96	96/97
			km	US\$'000					
VI	Capacity Building and Other Support Activities			23,590	2,430	12,795	4,010	2,850	1,505
6.01	Training	Various		7,875	-----	-----	-----	-----	-----
6.02	Institutional Strengthening (TA)	Various		8,590	-----	-----	-----	-----	-----
6.03	Plant Hire Pool			7,050	-----	-----	-----	-----	-----
6.04	Roads Authority Study	ADB		75	-----	-----	-----	-----	-----
RECAPITULATION									
	Total Maintenance Activities		2,655	130,292	28,521	37,781	28,050	17,307	18,633
I	Routine Maintenance			43,105	8,107	7,819	8,803	8,837	9,539
II	Periodic maintenance		2,655	60,987	15,914	20,962	10,247	7,470	6,394
III	Mechanical Inputs			26,200	4,500	9,000	9,000	1,000	2,700
	Network Improvement		3,860	351,600	34,895	75,418	98,617	76,515	66,156
IV	Improvement		3,322	189,197	16,032	30,007	46,700	48,300	48,158
V	New Construction		538	162,403	18,863	45,411	51,917	28,215	17,998
VI	Capacity Building			23,590	2,430	12,795	4,010	2,850	1,505
	Total Five Year Programme		6,514	505,482	65,846	125,994	130,677	96,672	86,294

Table 2-3 Status of Equipment of Japan's Grant

(Unit: Nos.)

Equipment	Manufacturer	Model	Number	Operational Condition		Station
				YES	SCRAP	
1ST GRANT AID						
1 Station Wagon 4x4	Mitsubishi Pajero	LO49GVNSR LO49GVNSR	5 7 12	5 3 8	4 * 4	Entebbe, Entebbe Airport, Fortportal, Kampala, Mbale, Soroti, Hoima, Central W.S. * of which 2 nos. stolen
2 Pickup	Mitsubishi	K14TUNSR	15	8	7	Entebbe, Central W.S., Mubende, Masinde, Hoima, Mbarara, Soroti, Mbale, Tororo, Gayaza Road
3 Tipper	Mitsubishi	FM515	40	23	17	Entebbe, Kampala, Masaka, Mubende, Mbarara, Masindi, Port Portal, Hoima, Kasese, Kabale, Gulu, Lira, Arua, Kitgum, Moyo, Mbale, Tororo, Soroti
4 Cargo Truck/Crane	Mitsubishi	FM515	5	4	1	Entebbe, Entebbe Airport, Central W.S., Hoima
5 Low-Loader	Nissan	CKA51BT	1	1		Kampala
6 Mobile Crane	Tadano	JL200E	1		1	Central W.S.
7 Bulldozer	Cat	D6D	1		1	Hoima
8 Front Wheel Loader	Furukawa	FL150	6	5	1	Masaka, Central W.S., Fortportal, Mbarara, Arua,
9 Motor Grader	Mitsubishi	MG350R	4		4	Central W.S., Hoima, Arua
10 Vibro Roller Double	Sakai	SV10 SV40	1 25 26	13 13	1 12 13	Kampala, Masaka, Fortportal, Mbarara, Masindi, Hoima, Gulu, Arua, Moyo, Kitgum
Total			111	61	50	

(Cont'd)

(Cont'd)

Equipment	Manufacturer	Model	Number	Operational Condition		Station
				YES	SCRAP	
2nd GRANT AID 1 Crawler Loader	Komatsu	D53S17	8	8	0	Kampala, Fortportal, Kasese, Mbarara, Hoima, Soroti, Arua
2 Motor Grader	Komatsu	GD511	9	9	0	Entebbe, Kampala, Kasese, Mbarara, Hoima, Lira, Mbale, Soroti
Total			17	17	0	
Grand Total			128	78	50	

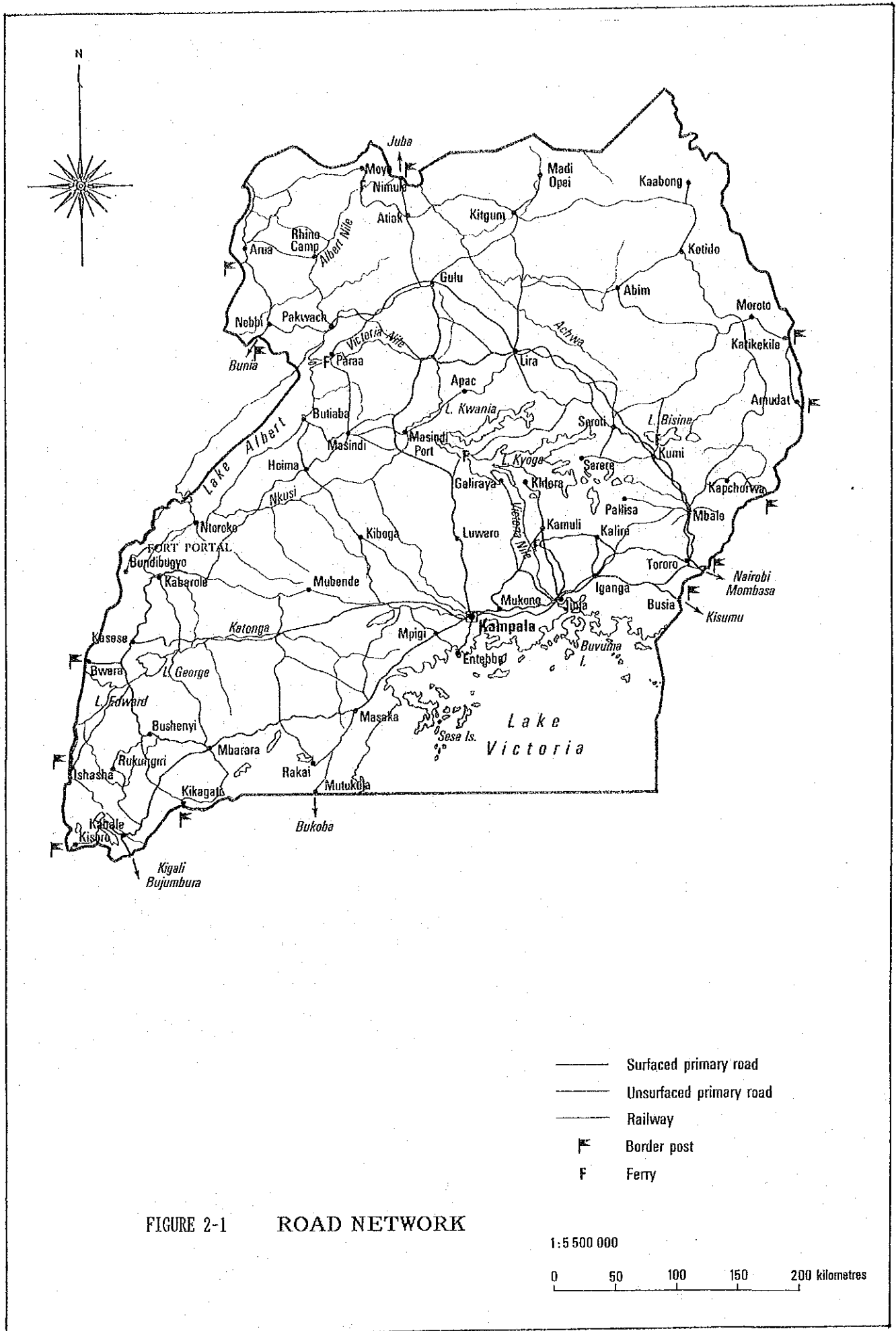


FIGURE 2-1 ROAD NETWORK

FIGURE 2-2 ORGANISATION OF MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION, MOWTC

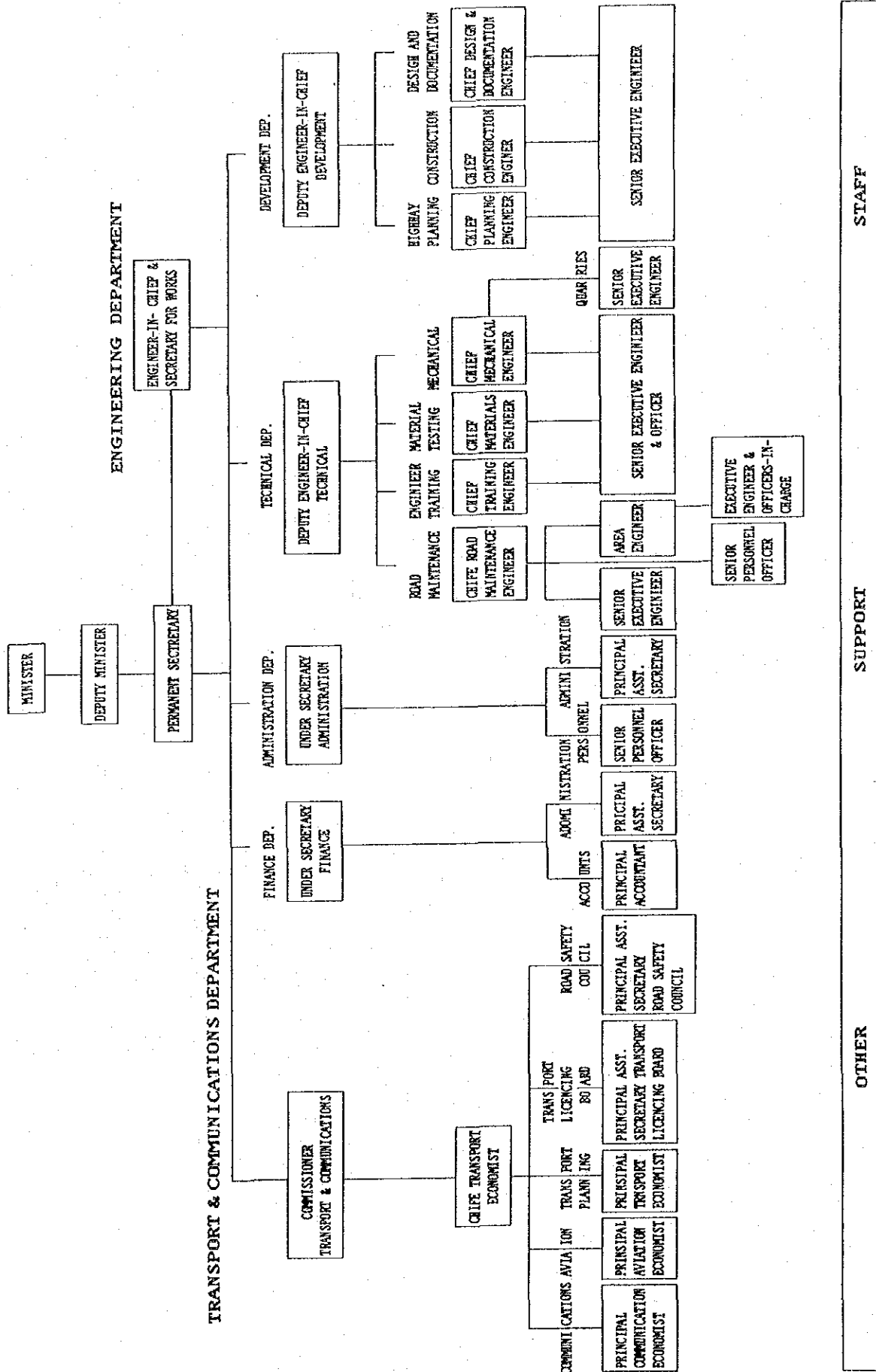


FIGURE 2-3 MOWTC ORGANISATION OF ROAD MAINTENANCE DIVISION

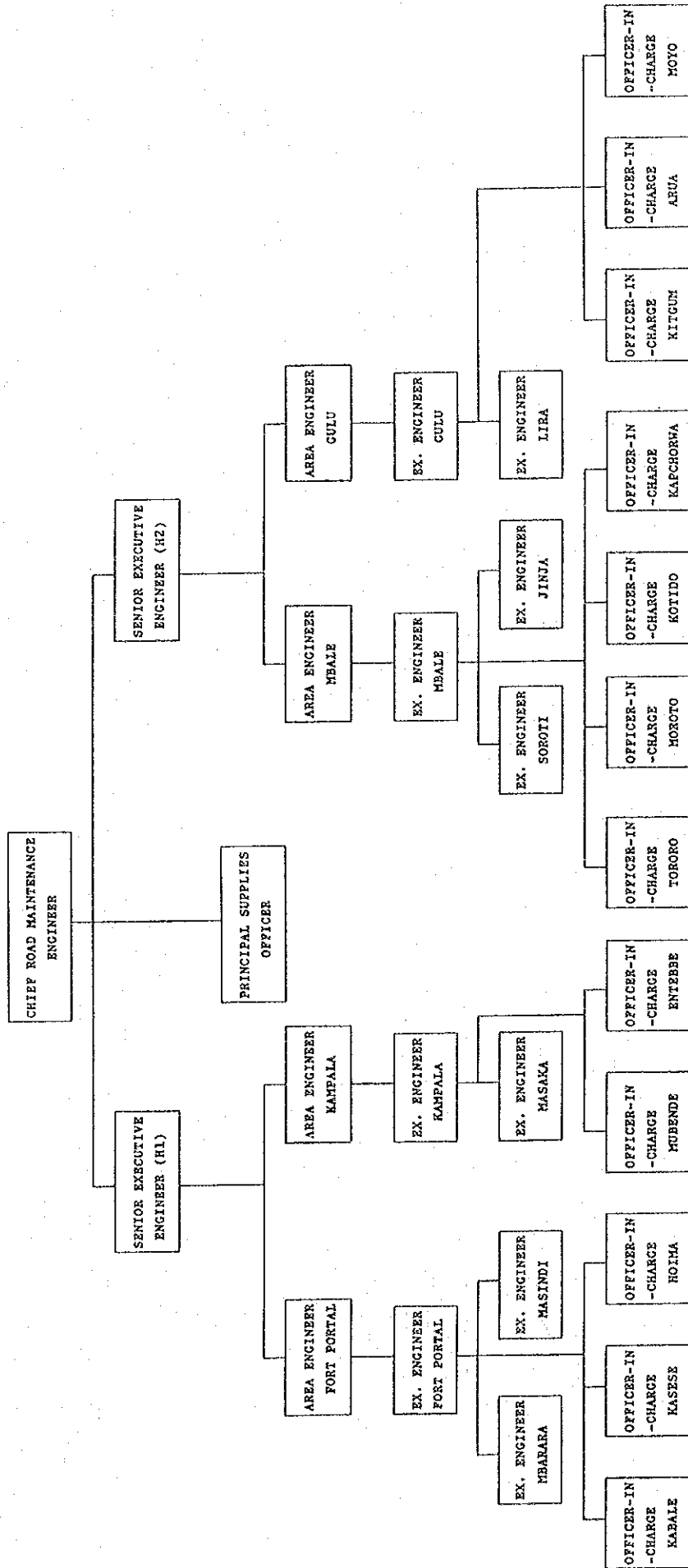
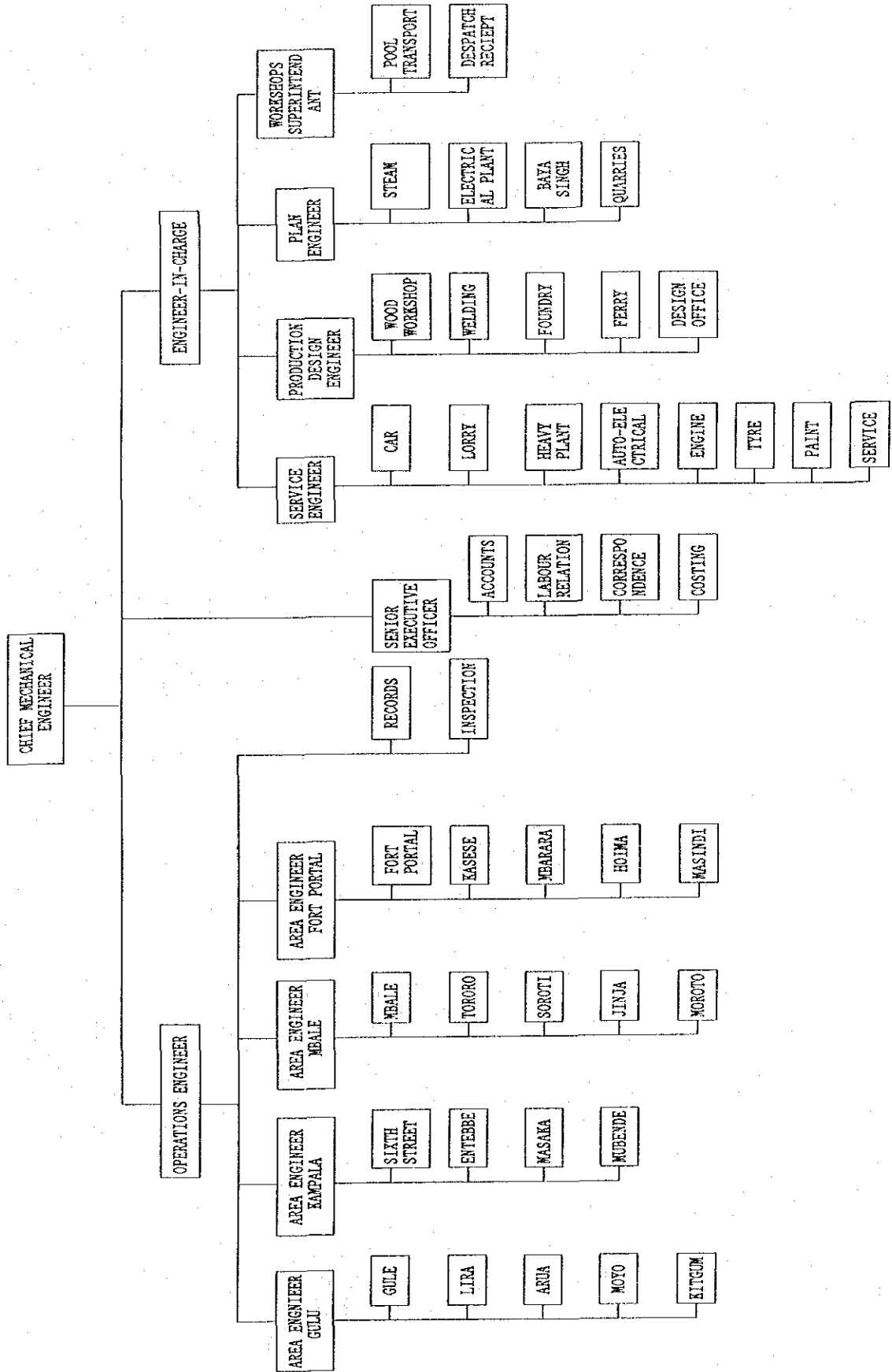


FIGURE 2-4 MOWTC ORGANISATION OF MECHANICAL DIVISION



CHAPTER III OUTLINE OF THE PROJECT

III OUTLINE OF THE PROJECT

3.1 Objectives

Since Economic Recovery Programme (ERP) was started in 1987, emphasis had been placed on the rehabilitation and maintenance of dilapidated infrastructure. However the total maintenance backlog still stands at about 200 km of paved and 3,500 km of gravel roads. In addition, the realisation of reconstruction/rehabilitation programmes has imposed an acute need of keeping the reconstructed roads well maintained so as to protect the investment.

Because of very limited capabilities of local construction industry, presently only 20% of road maintenance is contracted and 80%, which comprises of mechanized routine maintenance work, is done by MOWTC direct labour units. However due to the inadequate number of staff, insufficient technical skill and inadequate funds the maintenance obligation may not ably be handled timely and properly. Particularly the lack of adequate fund caused hindrances :

- i) Insufficient tools and equipment
- ii) Low supply of parts for plant and equipment
- iii) Insufficient fuel, oil lubricants and materials

The majority of equipment that form the present fleet of MOWTC were procured 4-5 years ago through various funding sources. Of a total of 660 effective fleet about 30% are serviceable while 70% are down due to lack of certain spare parts and materials.

The objective of the Project is to suitably increase, strengthen and equip the MOWTC road maintenance units of the District offices at Gulu, Lira, Kitgum, Arua, Moyo in Northern Area and that of Soroti in Eastern Area.

3.2 Study and Examination on the Request

3.2.1 Rationality and Necessity of the Project

The region covered by the Districts of Gulu, Lira, Kitgum, Arua, Moyo and Soroti accounts about 1/3 of the total area of the country with a population of about 4 million people, of which 96% is rural. The average family size is 6 to 7 persons, increasing as one goes northwards. There are an estimated 500,000 farm families in the region, most of them small farmers and fishermen. Agriculture, livestock rearing, and fishing are the main activities in the region. Cassava, finger millet, maize, soybeans, pigeon peas and sesame are the leading staple foods. Cotton is widely grown as a traditional cash crop and tobacco mainly in the western part of the area. Traditionally, livestock production is an important economic activity in the area. Ox-cultivation has been particularly important in Soroti and some other parts of the region. However, civil strife and cattle rustling have reduced the number of animals from 1.3 million heads to less than 300,000 heads. Fishing is limited to areas around lakes Kyoga and Kwana. Poultry and pigs are becoming important sources of protein for the majority of people in the region.

Since 1986, the region has been plagued by waves of insecurity which have resulted in many people being displaced and much of the economic infrastructure destroyed. Insecurity has produced social and economic isolation, driving away many able people and keeping outsiders away. As a result the affected districts have been to a large extent cut off from the rest of the country.

Since 1988 there has been marked improvement in the security situation, starting with Apac and Lira Districts and the urban areas of the remaining districts. As a result, displaced people have been resettled and emergency relief distributed to the needy, orphans and widows. Agricultural production has resumed and substantial marketable surplus has found its way to Kampala and abroad. There has been a large growth in the sale of sesame

seed, potatoes and cassava from favored parts of the region since 1989.

However, the economic situation in the north continues to lag behind that of central and southern Uganda. To overcome this situation the Government has introduced "Northern Uganda Reconstruction Programme", NURP (1991). Of a total of 2,390 km, 457 km of roads is programmed under NURP, including rehabilitation, regravelling or resealing according to the road section. (Basically International Competitive Bidding, ICB, is intended for the works). Because the roads have to be properly maintained once they have been rehabilitated to protect the investment, MOWTC programmes some 1,500 km - 2,000 km of routine maintenance per year through the Government recurrent maintenance expenditures. Since feeder roads under MOLG is being up-graded to the classified roads under its programme, i.e., the rehabilitated feeder roads being transferred to MOWTC, MOWTC's workload for routine maintenance will increase annually in proportion to the increase of the classified roads.

The Government considers NURP the basis for its efforts to bring the northern region into the mainstream of economic development, including the restoration of social services and a reduction in the disparity between the north and south. Such a development is expected to contribute significantly to increased security in the area and to a reduction in defense expenditures.

It can be said that the purpose of the Project under the Japan Grant Aid is to complement NURP by increasing the MOWTC's road maintenance capacity and strengthen the Government's development programme in the North.

Road length covered by the relevant offices of MOWTC is as follows:

(Unit: km)

Item	Station Area/District Office	Bituman Road				Gravel Road				Total
		Pri- mary	Sec- ondary	Ter- tiary	Total	Pri- mary	Sec- ondary	Ter- tiary	Total	
1.	Northern Area Gulu (Area Office)	78			78	386		92	478	556
2.	Lira	76	3		79	54	207	130	391	470
3.	Kitgum					42	256	208	506	506
4.	Arua					282	101		383	383
5.	Moyo						100		100	100
6.	Eastern Area Soroti	48			48	155	27	145	327	375
Total		202	3		205	919	691	575	2,185	2,390

3.2.2 Study on the Implementation

(1) Organization

Within the framework of the Third Highway Project MOWTC has developed a comprehensive road maintenance policy. Particularly for the maintenance of gravel road MOWTC has set out its overall policy in accordance with its Gravel Road Study (October 1991), in which establishment of Maintenance Management Unit, MMU, in the form of external funding and expertise is programmed. MMU is to provide technical assistance in various aspects of the implementation of road maintenance programmes, and act as an agent for MOWTC.

In this context MOWTC intends to re-arrange the local Area and District day labour road maintenance organizations into the following operational components:

- A Partial Rehabilitation Unit which move from District to District with the MMU.
- Routine and Emergency Maintenance Units which will be permanently located in each District.

- The re-introduction of labour-based Routine Maintenance through contracts with grass roots village organisations.
- Implementation of a Periodic Regravelling programme using available domestic contractors, assisted by the hire of surplus Government plant as necessary.
- The adoption of work priorities, programmes and working plans to make optimum use of all affordable maintenance resources.

(2) Finance

MOWTC is considering the following measures:

- Adequate local funding to meet recurrent maintenance expenditures in each District.
- Financial stability through revised funding procedures. It is considered that this might be achieved by extending the application of the quarterly warrants now being issued by the Ministry of Finance, and implementing the proposed General Road Maintenance Fund. The objective of any revision to funding procedures is to guarantee the availability of budgeted funds at District level according to an agreed cash-flow.
- Improved financial delegations to provide Senior Area and District staff with a measure of financial autonomy. It is considered that this include delegations to District Engineers within the scope of normal Financial and Tender Board procedures to:
 - Make monthly withdrawals from the maintenance provision through a local bank account.
 - Enter into appropriate direct supply contracts to improve the delivery of fuel and spare parts and other essential consumables.

- Enter into petty labour contracts for the execution of Manual Routine Maintenance

The following table indicates MOWTC's routine maintenance expenditure for Northern and Eastern Areas for the period 1992/93 - 1996/97.

Description	Fiscal Year					Total
	1992/93	1993/94	1994/95	1995/96	1996/97	
NORTHERN						
Road length (km)	2,030	2,030	2,190	2,311	2,407	10,968
- Paved	157	236	299	353	601	1,646
- Unpaved	1,873	1,794	1,891	1,958	1,806	9,322
Target length (km)	1,122	1,316	1,768	1,825	2,272	8,303
- Paved	102	126	188	201	466	1,082
- Unpaved	1,020	1,190	1,580	1,625	1,806	7,221
Expenditure (US\$000)	1,568	1,609	1,928	1,851	2,217	9,172
Labour Cost	455	516	658	677	817	3,123
Equipment Consumables	867	827	967	878	1,005	4,545
Construction Materials	192	204	225	217	299	1,138
Tools	54	61	77	79	95	366
EASTERN						
Road length (km)	2,200	2,248	2,326	2,326	2,326	11,425
- Paved	432	432	479	488	511	2,341
- Unpaved	1,768	1,816	1,847	1,838	1,815	9,084
Target length (km)	1,646	1,763	2,154	2,112	2,326	10,001
- Paved	272	303	408	355	511	1,849
- Unpaved	1,374	1,460	1,746	1,757	1,815	8,152
Expenditure (US\$000)	2,050	2,077	2,397	2,270	2,501	11,297
Labour Cost	627	664	791	774	845	3,702
Equipment Consumables	1,116	1,104	1,244	1,151	1,259	5,873
Construction Materials	240	238	279	264	309	1,332
Tools	67	70	83	81	88	390

(3) Action Programme

The MOWTC's action programme is as follows:

- Improve workshop and plant maintenance facilities to enable the proper repair and maintenance of essential plant and equipment.
- Improve the serviceability of existing maintenance plant and transport through foreign exchange funding for spare parts and consumables.
- Supply additional plant and equipment where existing resources are not sufficient to meet requirements for the establishment of Routine Maintenance and Rehabilitation Teams.
- Improve the productivity of the plant fleet by expert assistance and training in the repair, maintenance and operation of construction plant.
- Improve district office and rural camp facilities to enable effective administration and flexible work planning.
- Provide technical assistance and training in the preparation of programmes for Routine and Minor Emergency Maintenance, Spot Rehabilitation and Contract Regravelling.
- Providing technical assistance and training to implement programmed Routine Maintenance using both day labour and village-based labour contracts.
- Improve the general condition of selected links by the spot Rehabilitation of failed sections, followed by an accelerated programme of Contract Regravelling.
- Facilitate the productivity of local contractors by making available to them plant, spares at cost and an assured fuel supply plus an opportunity to hire the MOWTC plant as a last resort.

It should be noted that the supply of additional plant and equipment or spare parts has already been incorporated into the above mentioned action programme for the implementation of road maintenance, and it composes one of the essential components of the programme.

3.2.3 Programme Assisted by the Foreign Donner Agencies

Reconstruction/rehabilitation projects for the period 1992/93 - 1996/97 with various donor agencies, i.e. IDA KFW, ODA, EEC are shown in Table 2-2.

Donor assistance has been secured from the KFW for the maintenance of 640 km of roads in Eastern Uganda. The assistance is being solicited from ODA for approximately 1010 km of roads in Masindi, Hoima and Kibale Districts. MOWTC and EEC are presently preparing an immediate action plan for maintenance of roads in Southwest Uganda. Under the IDA Transport Project, Training Aid is planned for the headquarters and northern Uganda, while the maintenance of Northern Uganda Reconstruction Programme, NURP and the Transport Rehabilitation Project roads will be funded for at least 3 years (1994 - 97) after the completion of rehabilitation. So far donor assistance secured will cover approximately 30% of the networks.

New construction is programmed to cover the 110 km of Mubende - Kagorogoro Road, Kampala City by pass, Masindi - Apac - Lira - Kitgum Road, Iganga - Tirinyi - Mbale Road and Gayaza Kalagi road. Other roads might enter the bracket after the ADB funded studies of the PTA sponsored roads and the EEC funded ZBR road links to the Northern Corridor.

As already mentioned in the previous sections, routine maintenance for the once rehabilitated roads is financed by the Government recurrent budget, which includes the procurement of equipment consumables, e.g. fuel, lubricants, tyres and tracks, spare parts and construction materials.

However for strengthening and renovation of existing fleet, the Government could not find any finance source to date and in the near future in spite of the fact that is an essential factor for the smooth implementation of road maintenance.

3.2.4 Study on the Equipment Schedule

(1) Activities

The following maintenance works for gravel road are being implemented in the relevant Districts.

(i) Manual Routine Maintenance

Light or labour-based routine maintenance consists of hand work carried out by a porter on a fixed 2 km section of road. The work carried out by the porters consists of grass slashing, clearing drains and culverts, filling small potholes with local murram (laterite) and, after heavy rain or storms, removing debris from the road and repairing washouts and erosion.

(ii) Mechanized Routine Maintenance

There are three types of heavy, or plant based routine maintenance.

The first activity would be for patrol or light grading. This activity is normally carried out by a single grader. No roller or water truck is used and compaction is achieved by traffic. The advantage of this process is that an improvement to road roughness is achieved quickly, and at relatively low cost. The disadvantage is that the durability of the improvements is generally very poor, and it is usually necessary to alternate patrol grading cycles with grading cycles in which the re-graded road is rolled and compacted.

The second activity is thus for heavy grading and compaction. On these grading cycles, the grader scarifies and reshapes the wearing course, and the finished surface is compacted with a suitable vibratory roller.

The third activity, spot gravelling, is needed to replace at least some of the material lost each year under the action of traffic and rain, so that the basic shape of the camber can be retained. The main elements of a team to undertake this work are a tipper, loader, flatbed and a six-man gang.

(iii) Emergency Maintenance

The most essential feature of the administration of programmed maintenance is the determination and resolution with which the various maintenance programmes are followed. However, by diligently following the programmes, there is the possibility that the local maintenance organisation would lose its ability to respond promptly and effectively to an emergency situation.

To meet this necessary contingency, while preserving the principle of prior commitment for the various designated routine maintenance resources, an additional and completely separate team is required for each District. This resource shall be equipped to have the flexibility and mobility necessary to provide a prompt remedial response to any minor emergency anywhere in the District network.

The emergency gang is a basic element of the maintenance strategy. The function of the gangs are:

- To provide minor emergency road repairs any where in the district

- To provide an additional labour force to assist the Manual Routine Maintenance effort
- To maintain bridges and culvert structures

The utilisation of these gangs is necessarily 'ad hoc' and final resources levels will depend on actual demand, but tipper, motor grader, loader, backhoe are considered main elements.

(iv) Partial Rehabilitation

Partial Rehabilitation is undertaken in each District prior to regravelling. Provided routine and periodic maintenance is properly carried out, the work of the rehabilitation team will be 'once off' on each link. After the initial repairs, future deterioration will be reinstated under the on-going maintenance programmes before it becomes a critical impediment to link function.

(v) Regravelling

The recommended strategy for regravelling is to use local contractors.

(2) Equipment to be applied

Taking into account the above mentioned maintenance activities the equipment schedule shall be decided on the following criteria:

- i) Only the above mentioned
- ii) Mechanized Routine Maintenance, i.e. Light grading, Heavy grading, Spot gravelling, and
- iii) Emergency maintenance were taken into account to figure out the type and number of the equipment, i.e., the work activities intended by the proposed equipment is primarily limited to the above works.

ii) Partial rehabilitation is to be executed by using surplus equipment of the Area by regrouping the unit.

iii) Manual Routine Maintenance is usually executed by hand work, so need no particular heavy equipment, but considering the necessity of transport of tools, materials or other purposes, tractor is to be included.

Based on estimated annual product by a working unit, the proposed equipment schedule for each District was evaluated whether it is reasonable.

The results are shown in Table 3-1-1 ~ Table 3-1-6. Equipment schedule for all Districts concerned is shown in Table 3-2.

3.2.5 Necessity of the Technical Assistance

As already discussed the official establishment shows up particular area of shortage, e.g. Road Inspectors, Senior Road Inspectors, and Assistant Engineering Officers and Senior Assistant Engineering Officers, which constitute the main body of experienced middle level technical managers. As these four categories are particularly important it should be given priority for training.

Long-term training strategy, however, must meet a much wider need. In addition to remedying immediate staffing problems, it must be designed to meet the long-term needs of both MOWTC and all other employers of similar staff, in other words the other road authorities, and the private consulting and contracting firms. Furthermore, it is in MOWTC's own interest to ensure that contractors working for it not only have good operatives and technicians (who can be trained on the MOWTC's normal courses), but also have good know-how in carrying out the managerial functions of a contractor bidding, estimating, documentation, site planning, claims, variations, work planning, progress chasing and all the other elements of complex business.

MOWTC has implemented various training programmes with the assistance of the World Bank and other funding agencies, which includes rehabilitation of training facilities or equipment. For the manpower development, it is expected that support from the World Bank would continue to meet the future requirement as the fleet grows. Also it should be noted that the Government has shown strong interest in the assistance of the Government of Japan in this field. The study team would like to recommend the Government of Japan to proceed a study regarding possibility of its assistance, e.g., provision of training equipment and/or dispatching of training engineers.

3.3 Outline of the Project

3.3.1 Executing Agency and Operational Structure

Executing agency is the Ministry of Works, Transport and Communications, MOWTC, which organization is detailed in Chapter 2. At District level a Road Inspector per 150 km, a Road Overseers per 50 km, and 5 porters per 10 km of road length are allocated.

Composition of a mechanized working unit of the relevant Districts is as follows:

District	Drivers	Operators	Mechanics	Road Workers
Gulu	12	14	15	20
Lira	8	8	10	15
Kitgum	8	10	12	12
Arua	8	10	12	12
Moyo	5	5	8	10
Soroti	8	8	10	12
Total	49	55	67	81

Road workers refers only to those directly engaged on the units.

The above number indicates that MOWTC's capacities of both operation and maintenance for the additional equipment to be procured by the Project to be enough.

3.3.2 Plan of Operation

The equipment to be procured will be delivered to the Central Mechanical Workshop, CMW in Kampala, then allocated to the relevant Area/District offices of MOWTC in Gulu, Lira, Kitgum, Arua, Moyo and Soroti.

The equipment to be allocated to the above offices will strengthen the existing fleet to form mechanized working unit, and be used for the works of routine maintenance, emergency maintenance and partial rehabilitation of the classified gravel roads.

The routine maintenance expenditure for the period 1992/93 - 1996/97 is described in the Section 3.2.2.

3.3.3 Outline of the Equipment

Equipment to be required for the above mentioned maintenance works are described in the Section 3.2.4, and the following table indicates the purposes of use of each equipment.

Main Equipment	Purpose
- Tipper Truck	- Hauling of spoiled material - Hauling of selected material - Emergency maintenance
- Water Bowser	- Watering for shaping and compaction
- Pick-up	- Transportation of tools, small equipment, etc. - Supervision of works
- Motor Grader	- Cutting of side drain - Shaping of shoulder - Scarifying and shaping of carriage way
- Crawler Loader	- Cutting and loading of selected material at borrow pit
- Wheel Loader	- Loading of selected material at borrow pit
- Backhoe	- Excavation and loading of spoiled material - Removal of debris - Emergency Maintenance
- Tractor	- Transportation of spoiled material, construction material, tools, equipment, etc. for Light Routine Maintenance
- Vibration Roller	- Compaction of carriage way, etc.
- Fuel Truck	- Supply fuel to work site
- Lowbed Tractor/Trailer	- Transportation of equipment from depot to work site or from site to site
- Water Pump	- Water supply for structural works or other various purposes
- Mobile Workshop	- Equipment maintenance services on site
- Spare parts	- To maintain the equipment provided by the Japan's Grant Aid in the past in serviceable condition.

3.3.4 Operation and Maintenance Plan

More than a half of the MOWTC's recurrent budget for routine road maintenance is allocated to the equipment maintenance, which comprises the costs of fuel, lubricants, tyres and other spare parts, as is described in the Section 3.2.2. Since 1989 the funds allowed in the budget has been increasing upwards in real terms. A total of US\$867,000 is allocated to the equipment maintenance for 1992/93 fiscal year in the Northern Area. Particularly if the spare parts of the equipment is procured under the Project it ensures not only effective operation of the equipment but also saves scarce resources through repairing the grounded equipment, which were procured through the Japan's Grant Aid in the past. The savings in the budget for equipment maintenance which will accrue by the Project will enable MOWTC to purchase tyres or other consumables.

The following measures to be taken by the Uganda side are strongly recommended by the study team:

- 1) To strengthen the training in Preventive Maintenance of equipment.
- 2) To realize effective supply of spare parts to the up-country workshops from the Central Mechanical Workshop, where all spare parts of MOWTC, vehicles, plants, equipment are controlled.
- 3) To attach adequate and fixed number of mechanics to the mobile workshop to be procured.
- 4) To realize effective use on site of the mobile workshop to be procured by making appropriate work schedule.
- 5) To allocate adequate fund for the training of mechanics.

Table 3-1/1 EQUIPMENT SCHEDULE BY DISTRICT

FOR : GULU AREA WORKSHOP

(Unit: Nos.)

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE														
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor Roller	Vibration Roller	Fuel Truck	Lowbed Tractor Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading						1									
2. Spot Graveling	1		1	1				1							
3. Emergency/Preventive	2		1	1	1	1	1								
4. Partial Rehabilitation															
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0
Available (working or repairable)	4	1	0	2	1	2	1	1	0	1	1	3	0	1	0
Requested	1	1	0	2	0	1	0	0	1	1	1	0	1	0	1
After Procurement	5	2	0	4	1	3	1	1	1	2	2	3	1	1	1

Table 3-1/2 EQUIPMENT SCHEDULE BY DISTRICT

FOR : LIRA DISTRICT WORKSHOP

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE											(Unit: Nos.)					
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor Roller	Vibration Roller		Pedestrian Roller	Fuel Truck	Lowbed Tractor Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading						1								1			
2. Spot Graveling	1		1	1				1									
3. Emergency/Preventive	2		1	1		1		1		1							
4. Partial Rehabilitation																	
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0	0	0
Available (working or repairable)	3	0	0	1	1	2	0	0	0	0	1	1	0	0	0	0	0
Requested	2	0	0	2	0	1	0	0	0	1	1	0	0	0	2	0	0
After Procurement	5	0	0	3	1	3	0	0	0	1	2	1	0	0	2	0	0

Table 3-1/3 EQUIPMENT SCHEDULE BY DISTRICT

FOR : KITGUM DISTRICT WORKSHOP

(Unit: Nos.)

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE														
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor Roller	Vibration Roller	Fuel Truck	Lowbed Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading					1						1				
2. Spot Graveling	1		1	1			1								
3. Emergency/Preventive	2		1	1	1	1	1	1			1				
4. Partial Rehabilitation															
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0
Available (working or repairable)	2	0	0	1	0	1	0	0	0	0	1	0	0	0	0
Requested	3	0	0	1	0	1	1	1	4	1	1	0	1	1	0
After Procurement	5	0	0	2	0	2	1	1	1	1	2	1	0	1	0

Table 3-1/4 EQUIPMENT SCHEDULE BY DISTRICT

FOR : ARUA DISTRICT WORKSHOP

(Unit: Nos.)

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE															
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor	Vibration Roller	Pedestrian Roller	Fuel Truck	Lowbed Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading						1					1					
2. Spot Graveling	1		1	1			1									
3. Emergency/Preventive	2		1	1	1	1	1	1			1					
4. Partial Rehabilitation																
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0	0
Available (working or repairable)	3	0	0	1	1	1	0	0	0	0	1	1	0	0	0	0
Requested	2	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0
After Procurement	5	0	0	2	1	2	1	0	1	1	2	1	1	1	1	0

Table 3-1/5 EQUIPMENT SCHEDULE BY DISTRICT

FOR : MOYO DISTRICT WORKSHOP

(Unit: Mos.)

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE															
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor	Vibration Roller	Pedestrian Roller	Fuel Truck	Lowbed Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading						1					1					
2. Spot Gravelling	1		1	1				1								
3. Emergency/Preventive	2		1	1		1		1			1					
4. Partial Rehabilitation																
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0	0
Available (working or repairable)	2	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0
Requested	1	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0
After Procurement	3	0	0	2	0	1	0	1	0	1	2	0	0	0	1	0

Table 3-1/6 EQUIPMENT SCHEDULE BY DISTRICT

FOR : SOROTI DISTRICT WORKSHOP

(Unit: Nos.)

ACTIVITIES	NUMBER OF EQUIPMENT BY TYPE															
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull-Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Excavator	Tractor	Vibration Roller	Pedestrian Roller	Fuel Truck	Lowbed Trailer	Water Pump	Mobile Workshop
1. Heavy and Light Grading						1					1					
2. Spot Graveling	1		1	1			1									
3. Emergency/Preventive	2		1	1	1	1	1	1			1					
4. Partial Rehabilitation																
Total Requirement	3	0	2	2	0	2	0	2	1	0	2	0	0	0	0	0
Available (working or repairable)	4	1	0	0	0	2	1	0	0	0	0	2	0	0	0	0
Requested	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0
After Procurement	5	1	0	1	0	2	1	0	0	1	1	2	0	0	1	0

Table 3-2 EQUIPMENT SCHEDULE

STATION Area/District	NUMBER OF EQUIPMENT BY TYPE													(Unit: Nos.)		
	Tipper Truck	Water Truck	Flatbed Truck	Pickup Truck	Bull- Dozer	Motor Grader	Crawler Loader	Wheel Loader	Wheel Exca- vator	Tractor	Vibra- tion Roller	Pedes- trian Roller	Fuel Truck		Lowbed Tractor Trailer	Water Pump
Northern Area																
1. Gulu Area Office	1	1	0	2	0	1	0	0	1	1	1	0	1	0	2	1
2. Lira District Office	2	0	0	2	0	1	0	0	0	1	1	0	0	0	2	0
3. Kitgum District Office	3	0	0	1	0	1	1	1	1	1	1	0	0	1	1	0
4. Arua District Office	2	0	0	1	0	1	1	0	1	1	1	0	1	1	1	0
5. Moyc District Office	1	0	0	1	0	0	0	1	0	1	1	0	0	0	1	0
Eastern Area																
6. Soroti District Office	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0
Total	10	1	0	8	0	4	2	2	3	6	6	0	2	2	8	1

CHAPTER IV BASIC DESIGN

IV. BASIC DESIGN

4.1 Design Policy

The followings have been taken into account.

4.1.1 Natural Condition

- 1) Rainfall: 1,400 - 2,000 mm/year, thus several protective measures shall be considered.
- 2) Soil Condition: Predominantly solid lateritic soil, but occasionally swampy areas are observed, thus passage of the equipment shall be considered.

4.1.2 Social Condition

- 1) Remote area
- 2) Poor condition of existing road, occasionally become impassable due to rain
- 3) Difficulty of transportation

Regarding the above items from (1) to (3) the vehicles for fuel supply (fuel tanker) and equipment transportation (lowbed tractor/trailer) shall be included.

- 4) Private garages and dealers are concentrated in the capital area. Also, as mentioned in the above transportation of equipment from the relevant area to the center is not reliable, thus vehicle for equipment transportation and mobile workshop shall be included.

4.1.3 Capacity of the Executing Agency for Operation and Maintenance of the Equipment

As is already described in the previous Chapter, the MOWTC's capacity for operation and maintenance of the equipment to be procured is considered substantially enough. However it is very necessary to include the spare parts not only for the equipment to be procured, but also for the existing fleet, taking into

account various hindrances caused by the lack of spare parts. The supply of mobile workshop will complement the existing workshop facilities and equipment, also provide effective maintenance on-site.

4.1.4 Procurement of Equipment from the Third Countries

All equipment under the Project are produced in Japan. Since superiorities of procuring them from the third countries are not necessarily said in view point of their specification, price, supply period, and spare parts supply, all equipment will be procured in Japan.

4.1.5 Implementation Period

12 months from the start of procurement to the handing-over.

4.2 Basic Plan

4.2.1 Equipment Schedule

The equipment list is shown in Table 4-1. The equipment to be procured comprises vehicles, construction equipment including spare parts, and the spare parts for existing equipment procured through Japan's Grant Aid in the past. Allocation schedule is shown in Chapter 3, Table 3-4.

4.3 Implementation Plan

4.3.1 Basic Policy

The implementation comprises:

- 1) Procurement of equipment including spare parts
- 2) Procurement of consultant for Detailed Design including preparation of tender document and assistance for tender, and Supervision for the procurement of equipment.
- 3) Same kind of the equipment to be procured are commonly used for road works in Uganda. For that reason dispatching of specialist for training purpose is not necessary.

4.3.2 Equipment Delivery

- 1) All the equipment and spare parts shall be handed-over to the MOWTC at the Central Mechanical Workshop in Kampala.
- 2) Trial operation shall be conducted by the Supplier at the Central Mechanical Workshop in Kampala within the period agreed by the Consultant.

4.3.3 Consultant's Supervision

The consultant's supervision comprises:

- 1) Inspection of manufacturer
- 2) Inspection of shipping
- 3) Inspection of handing over including trial operation by the Suppliers.

4.3.4 Procurement of Equipment from the Third Country

All equipment under the Project shall be procured in Japan.

4.3.5 Implementation Schedule

The Implementation Schedule of the Project is shown in Fig.4-1.

Table 4-1 EQUIPMENT LIST

Equipment	Type	Nos.
1. Tipper Truck	8 ton	10 units
2. Water Truck	6,000 liters complete with pump and accessories	1 unit
3. Pick-up	4x4, 2,500 cc diesel, single cab	8 units
4. Motor Grader	Minimum 135 HP, blade 3.70 m class	4 units
5. Crawler Loader	Minimum 110 HP, bucket 1.5m ³ class with teeth, 3 shank ripper	2 units
6. Wheel Loader	Minimum 130 HP, bucket 1.9m ³ class with teeth	2 units
7. Wheel Excavator	Minimum 90 HP, bucket 0.4m ³ (heap) class	3 units
8. Tractor	4 WD, Minimum 90 HP with 3.0 ton trailer	6 units
9. Vibration Roller	8 ton class	6 units
10. Fuel Truck	8,000 liters	2 units
11. Lowbed Tractor/Trailer	Payload 32 ton	2 units
12. Water Pump	Lift head 5m, 3 inches, diesel	8 units
13. Mobile Workshop	Equipped with generator, glinder, etc.	1 unit

In addition:

- Spare parts of a 20% of the total amount of the above equipment and vehicles
- Spare parts for existing equipment procured through Japan's Grant Aid.

Note: Main equipment and tools mounted on the above mobile workshop are: crane, generator, compressor, hydraulic press, drilling machine, bench glinder, gas welder, battery charger, injector nozzle tester, etc.

Fig. 4-1 Implementation Schedule

		1	2	3	4	5	6	7	8	9	10	11	12
Detailed Design	Site Survey	█											
	Detailed Design		█		(4.0 M)								
Procurement	Procurement of Equipment	█											
	Marine Transport						█						
	Inland Transport									█			
	Hand over Inspection											█	(12.0M)

CHAPTER V CONCLUSION

V. CONCLUSION

Impact of the Project and Conclusion

The Project will strengthen the existing fleet of MOWTC for Road Maintenance work through supply of necessary equipment and spare parts in the Districts of Gulu, Lira, Kitgum, Arua and Moyo in the Northern Area, and Soroti in the Eastern Area.

Effects of the Project is summarized as follows:

Present situation and Problems	Measures to be taken by the Project	Expected Effects and Their Extent of the Project																
<p>1. Presently total maintenance backlog of the classified road network stands at about 200km of paved and 3,500km of gravel roads. Routine Maintenance work is executed by MOWTC's Maintenance Unit through up-country offices. However due to lack of adequate type and number of the equipment the road maintenance work is severely hindered.</p>	<p>- To provide a total of 55 equipment and vehicles to the relevant MOWTC District Offices, according to priority.</p>	<p>- To realize the maintenance of gravel roads of:</p> <table border="1" data-bbox="1018 925 1300 1193"> <thead> <tr> <th data-bbox="1018 925 1125 947">District</th> <th data-bbox="1133 925 1300 947">Road Length</th> </tr> </thead> <tbody> <tr> <td data-bbox="1018 981 1077 1003">Gulu</td> <td data-bbox="1173 981 1252 1003">478 km</td> </tr> <tr> <td data-bbox="1018 1005 1069 1028">Lira</td> <td data-bbox="1173 1005 1252 1028">391 km</td> </tr> <tr> <td data-bbox="1018 1030 1109 1052">Kitgum</td> <td data-bbox="1173 1030 1252 1052">506 km</td> </tr> <tr> <td data-bbox="1018 1055 1069 1077">Arua</td> <td data-bbox="1173 1055 1252 1077">383 km</td> </tr> <tr> <td data-bbox="1018 1079 1069 1102">Moyo</td> <td data-bbox="1173 1079 1252 1102">100 km</td> </tr> <tr> <td data-bbox="1018 1104 1101 1126">Soroti</td> <td data-bbox="1173 1104 1252 1126">327 km</td> </tr> <tr> <td data-bbox="1018 1128 1093 1151">Total</td> <td data-bbox="1141 1128 1300 1193">2,185 km (per annual)</td> </tr> </tbody> </table>	District	Road Length	Gulu	478 km	Lira	391 km	Kitgum	506 km	Arua	383 km	Moyo	100 km	Soroti	327 km	Total	2,185 km (per annual)
District	Road Length																	
Gulu	478 km																	
Lira	391 km																	
Kitgum	506 km																	
Arua	383 km																	
Moyo	100 km																	
Soroti	327 km																	
Total	2,185 km (per annual)																	
<p>2. The majority of equipment that form the present fleet of the MOWTC were procured since 1986 through various funding sources. Because of poor inventory of spare parts, a good number of equipment is unserviceable condition.</p>	<p>- To provide necessary spare parts for the equipment procured through Japan's Grant Aid.</p>	<p>- To up-keep a total of 78 equipment of Japan Grant Aid in serviceable condition.</p>																
<p>3. The socio-economic situation in the north continues to lag behind that of central and southern Uganda. The Government hopes to reverse this trend, primary by re-building road infrastructure.</p>	<p>- To provide the above equipment and spare parts.</p>	<p>- To strengthen local government and community organizations - To re-establish an effective trading and stimulate small scale manufacturing sector. - To develop vocational and academic skills - To eliminate insecurity and restore law and order</p>																

The Project will contribute not only to the development of the economy, thus improvement of living standards, but also to the social stability of the relevant area by facilitating mobilities between the north, central and southern areas. Also, it is very reasonable to supply spare parts for the existing equipment in view point of the effective use of scarce resources, since the MOWTC's technical skills for equipment maintenance are substantially enough.

The Government of Uganda well understands the Japan's Grant Aid system and has experiences of procurement of equipment and vehicles through the system, thus the project will be successfully implemented.

APPENDIX

- APPENDIX 1 List of Members of Survey Team
- APPENDIX 2 Survey Schedule
- APPENDIX 3 Minutes of Discussion
- APPENDIX 4 List of the Relevant Officials
- APPENDIX 5 Equipment List of Japan's Grand Aid
in 1985 and 1987
- APPENDIX 6 Northern Uganda Reconstruction Programme,
Project Cost Estimates by Sector

APPENDIX 1 List of Members of Survey Team

- (1) Members of Survey Team for the Basic Design Study in the period from September 5th to September 24th 1991.

Mr. Toshiomi Matsunaga Team Leader/Construction Equipment Planner
Inspector, Planning and Coordination
Division Technical Office, Hokkaido
Development Bureau

Mr. Yasuhiro Morimoto Grant Aid Planner
Official, Grant Aid Division, MOFA

Mr. Kimio Chiba Road Maintenance Planner
Construction Project Consultants, Inc.

Mr. Tamio Shinada Equipment Maintenance Planner
Construction Project Consultants, Inc.

Mr. Tetsumi Masui Equipment Procurement Planner
Construction Project Consultants, Inc.

- (2) Members of Survey Team for explanation and discussion on Draft Final Report, in the period from November 24th to December 8th 1991.

Mr. Kimio Chiba Road Maintenance Planner
Construction Project Consultants, Inc.

Mr. Tamio Shinada Equipment Maintenance Planner
Construction Project Consultants, Inc.

APPENDIX 2 Survey Schedule

(1) Survey for Basic Design Study

<u>Item</u>	<u>Date</u>	<u>Description</u>
1.	Sep. 1991 5 (Sat)	Departure from Tokyo at 13:35 (BA-008) to London Arrival in London at 18:30. Stay overnight.
2.	6 (Sun)	Departure from London at 21:30 (BA-055) to Nairobi
3.	7 (Mon)	Arrival in Nairobi at 08:00 a.m./Meeting with JICA at Nairobi office p.m./Courtesy call to the Japan Embassy, Kenya
4.	8 (Tue)	Departure from Nairobi at 11:30 (QU-321) to Entebbe. Arrival in Entebbe at 13:15 Together with Mr. Takahara, First Secretary, Embassy of Japan in Kenya, and Mr. Shibata, Assistant Resident Representative, JICA in Kenya
5.	9 (Wed)	a.m./Courtesy call to the Ministry of Works, Transport and Communications, MOWTC, at the Central Mechanical Workshops, CMW, in Kampala. p.m./Meeting with MOWTC at headquarters in Entebbe. Courtesy call to the Ministry of Finance and the Ministry of Foreign Affairs by: Mr. Morimoto (member of the team, MOFA, Japan) Mr. Takahara (Embassy of Japan in Kenya) Mr. Shibata (JICA in Kenya)
6.	10 (Thu)	a.m./Meeting with MOWTC at headquarters in Entebbe. Meeting with MOFA by Mr. Morimoto. p.m./Meeting with MOWTC at headquarters in Entebbe.

<u>Item</u>	<u>Date</u>	<u>Description</u>
7.	11 (Fri)	a.m./Inspection of CMW. Journey to the western region for inspection of road condition and MOWTC's Area/District Offices and Workshops. p.m./Inspection of Masaka District Office and Workshop, and Mbarara District Office and Workshop.
8.	12 (Sat)	a.m./Inspection of Kasese District Office and Workshop, and Fort Portal Area Office and Workshop. p.m./Inspection of road condition for Fort Portal - Kampala road.
9.	13 (Sun)	a.m./Inspection of road condition for Kampala - Jinja road, MOWTC Jinja Workshop, and equipment condition of Japan's Grant Aid procured in 1988 and 1989, at MOLG Jinja Workshop. p.m./Inspection of road condition for Kampala - Jinja road. Internal Meeting.
10.	14 (Mon)	a.m./Inspection of Public Works Training Center, PWTC, in Kyambaga. p.m./Signing of the Minutes of Discussion.
11.	15 (Tue)	a.m./Meeting with MOWTC at headquarters in Entebbe. p.m./Mr. Matsunaga (Team Leader) and Mr. Morimoto leave Uganda (QU-320).
12.	16 (Wed)	a.m./Meeting with MOWTC at CMW. p.m./Collecting necessary data, materials, etc. in Kampala.
13.	17 (Thu)	a.m./Inspection of CMW, private garages and dealers in Kampala. p.m./Meeting with MOWTC at CMW.

<u>Item</u>	<u>Date</u>	<u>Description</u>
14.	18 (Fri)	a.m./Inspection of private garages and dealers in Kampala. p.m./Meeting with MOWTC at CMW.
15.	19 (Sat)	a.m./Inspection of road condition for the roads in Kampala area. p.m./Meeting with MOWTC at CMW.
16.	20 (Sun)	Internal Meeting.
17.	21 (Mon)	a.m./Meeting with MOWTC at headquarters in Entebbe. Departure from Entebbe at 11:30 (QU-310) to Nairobi. Meeting with JICA at Nairobi Office.
18.	22 (Tue)	Departure from Nairobi at 11:05 (SR-293) to Zurich. Arrival in Zurich at 17:40. Stay overnight.
19.	23 (Wed)	Departure from Zurich at 12:45 (SR-166) to Tokyo.
20.	24 (Thu)	Arrival in Tokyo at 07:45.

(2) Explanation and Discussion on Draft Final Report

<u>Item</u>	<u>Date</u>	<u>Description</u>
1.	Nov. 1991 24 (Tue)	Departure from Tokyo at 13:45 (BA-008) to London Arrival in London at 17:40. Stay overnight.
2.	25 (Wed)	Departure from London at 17:25 (BA-055) to Entebbe
3.	26 (Thu)	Arrival in Entebbe at 08:10 Meeting with MOWTC at headquarters in Entebbe.
4.	27 (Fri)	Meeting with MOWTC at headquarters in Entebbe.
5.	28 (Sat)	Internal meeting
6.	29 (Sun)	Internal meeting
7.	30 (Mon)	Journey to northern region for inspection of road condition and MOWTC's Area/District Offices and Workshops.
8.	Dec. 1991 1 (Tue)	Journey to northern region for inspection of road
9.	2 (Wed)	Signing of the Minutes of Discussion at the MOWTC headquarters in Entebbe.
10.	3 (Thu)	Departure from Entebbe at 08:00 (GU 415) to Nairobi. Arrival in Nairobi at 10:30. Meeting with JICA at Nairobi office.
11.	4 (Fri)	Meeting at the Embassy of Japan in Kenya.
12.	5 (Sat)	Departure from Nairobi at 23:20 (LH 575) to Frankfurt.
13.	6 (Sun)	Arrival in Frankfurt at 05:50.

14. 7 (Mon) Departure from Frankfurt at 17:00 (LH 710) to Tokyo.
15. 8 (Tue) Arrival in Tokyo at 12:15.