



STUDY REPORT
ON
THE PROJECT OF MACHINERY SUPPLY
FOR
ROAD MAINTENANCE
IN
ADDIS ABABA

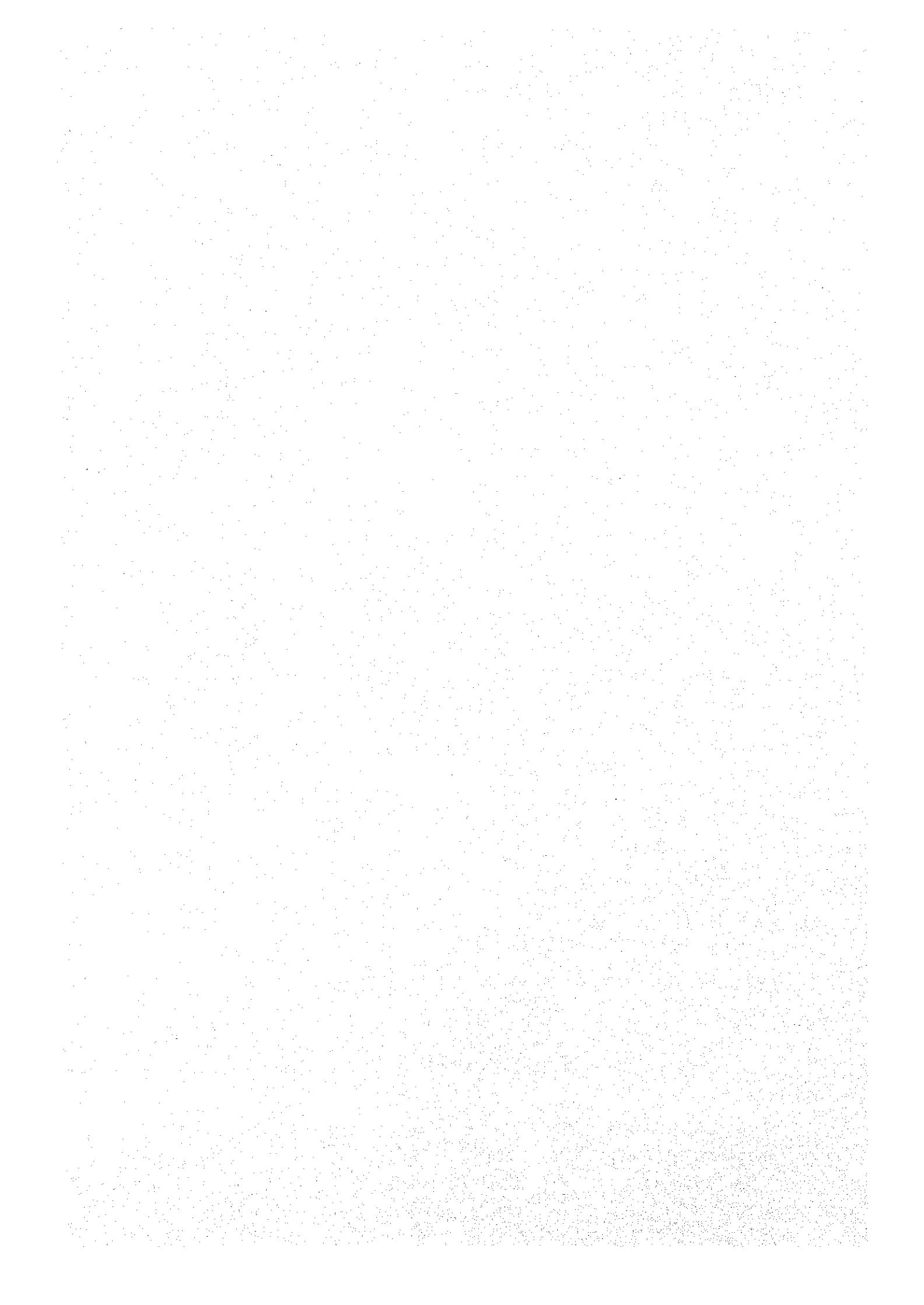
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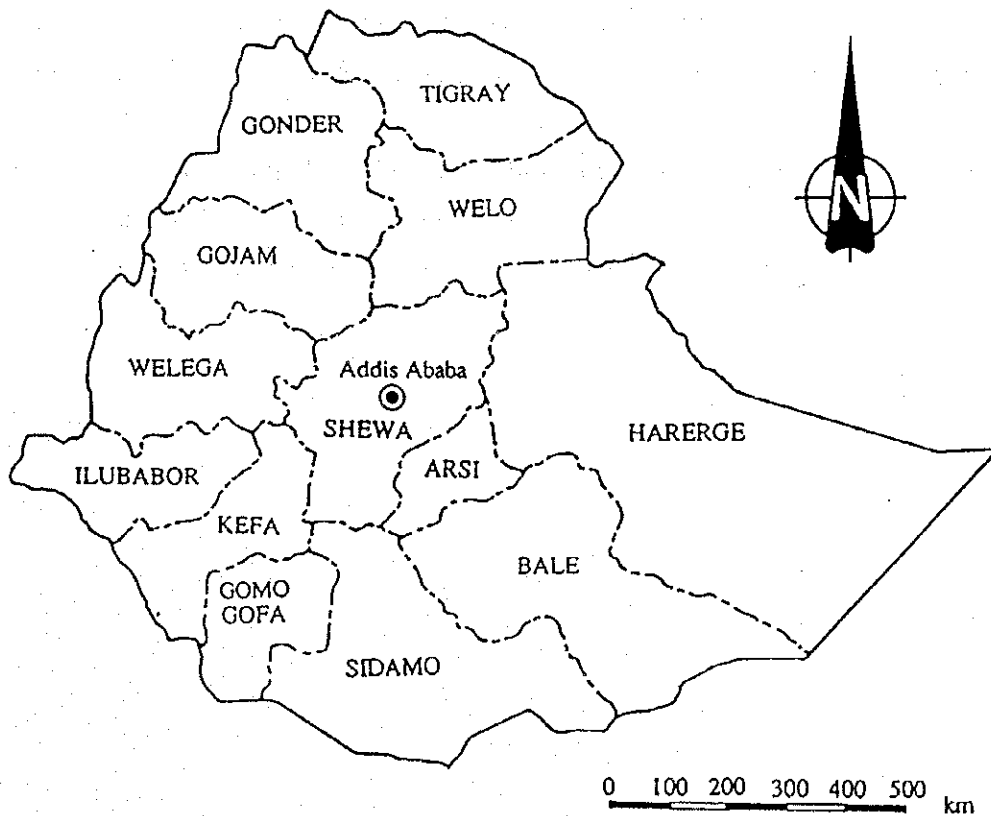
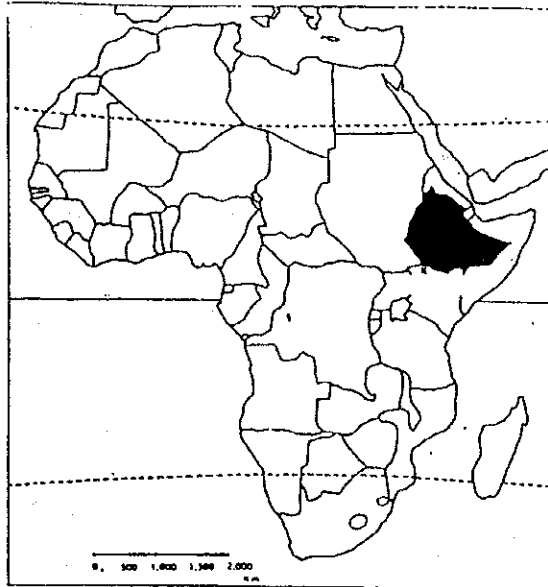
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Chapter 1 Background of the Project

1-1 Background and Contents of the Request

(1) Background of the Request

The economy of Ethiopia remained at the same level in terms of the actual GDP between 1986 and 1991, however, if the level recorded in 1991/1992 is used as a base value, the GDP itself has fallen by around 10%. Around 50% of the GDP is reliant on agriculture and this means that the state of the economy in Ethiopia is affected by trends in agricultural production, which itself is dependent upon climatic conditions.

Since reaching a peak in 1988/1989, the level of exports has been declining and the fall in 1991/1992 was around 33%.

Conversely, imports have been increasing, except for a temporary fall in 1989/1990, and the balance of trade for 1991/1992 showed a deficit of approximately 1.6 billion birr (about 25 billion yen). Around 85% of the country's exports is dominated by agricultural products with reliance on coffee particularly high. However, the decline in exports of this and other important agricultural products, combined with the increased import of capital goods, fuel and foodstuffs etc., has resulted in the aforementioned deficit in the balance of trade. Despite this, the democratic policies of President Meles Zenawi, who came to power in 1991 following 18 years of rule under the Mengistu administration, and the change over to free market economy policies have resulted in a revitalization of trade and the appearance of a plentiful supply of goods in the country's markets, and signs of stable economic growth are being seen. The economic base of Ethiopia was destroyed as a result of long term civil war and socialist rule, and state reconstruction following this and the droughts and starvation, which plagued the country in the 1980s, is an issue that requires urgent attention. Faced with such conditions, the Transitional Government compiled the Economic Recovery and Reconstruction Program (hereinafter referred to as the Program) in an attempt

to carry out structural readjustment centered around conversion to a market economy. One of the initial steps of the Program is the Emergency Recovery and Reconstruction Project (ERRP) and this is currently being promoted by the Transitional Government of Ethiopia. The Transitional Government of Ethiopia regards the maintenance and repair of the infrastructure as the most important issue in its quest for national recovery and reconstruction and, with the help of assistance from the IDA and other international organizations and donor countries, it is carrying out measures to improve the national road network and strengthen and renew machinery for road repair and maintenance. It is against such a background that the Transitional Government of Ethiopia compiled a project for road repair and maintenance in Addis Ababa and requested the Government of Japan to provide grant aid for the supply of machinery necessary for implementation of the project.

(2) Contents of the Request

The following items of machinery and equipment have been requested.

Table -1 List of Requested Equipment (Priority 1)

No.	Machinery/Equipment	Specifications	Quantity
1	Pneumatic Roller	Static Weight 8 Ton	2
2	Vibratory Tandem Steel Roller	5 Ton, Canopy	2
3	Vibratory Tandem Steel Roller	8 Ton, Canopy	2
4	Vibratory Tandem Steel Roller	10Ton, Canopy	2
5	Articulated Motor Grader	135 HP Min., Cabin	2
6	Asphalt Kettle	2000 Lit. Min.	3
7	Wheel Loader	3 m3 Min. Bucket	4
8	Bull Dozer	200 HP, ROPS Cabin	2
9	Hydraulic Excavator (Crawler)	0.7 m3 Min.	1
10	Hydraulic Excavator (Wheel)	1.0 m3 Min.	1
11	Sewer Cleaner	5.5 m3	1
12	Hand Operated Road Marking Machine	50 kg Min.	1
13	Driver Operated Road Marking Machine	400 Lit. Min.	1
14	Dump Truck	9.0 m3	15
15	Truck Tractor & Trailer	35 Ton	1
16	Pick Up	4 x 4, Double Cabin	7
17	Portable Asphalt Plant	50 Ton/hr.	2
18	Dump Truck	2 Ton	5
19	Chip Spreader		4
20	Mud Water Pump	Gasoline Engine, 3"	2
21	Wheel Loader	1.5 m3	3
22	Hand Held Rock Drill	25 kg	2
23	Air Compressor	7.0 m3 /min.	1
24	Spare Parts		1 Unit

Table -2 List of Requested Equipment (Priority 2)

No.	Machinery/Equipment	Specifications	Quantity
1	Concrete Cutter	Cutting Depth 100 mm	2
2	Plate Compactor	80 kg Min.	2
3	Asphalt Distributor	6000 Lit.	1
4	Water Tanker	6000 Lit.	1
5	Vacuum Truck	8000 Lit.	1
6	Air Compressor	7.0 m3 /min.	1
7	Bull Dozer	200 HP, ROPS Cabin	1
8	Vibratory Tandem Steel Roller	8 Ton, Canopy	2
9	Hydraulic Excavator (Wheel)	1.0 m3 Min.	1
10	Asphalt Kettle	2000 Lit. Min.	2
11	Pick Up	4 x 4, Double Cabin	2
12	Dump Truck	9.0 m3	2
13	Wheel Loader	1.5 m3	2
14	Dump Truck	2 Ton	6
15	Spare Parts		1 Unit

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The objectives of the Project are to restore and improve the deteriorated road maintenance functions of the Road Construction Division by supplying road maintenance machinery that is necessary for the Transitional Government's project to improve the road network in Addis Ababa.

2-2 Outline of the Project

(1) Implementing Agencies and Operational Setup

The Road Construction Department, the Urban Development and Works Bureau of the Region 14 Administration shall be the implementing agency for the Project and shall be responsible for the operating and control plan. Moreover, the maintenance, repair and storage of the machinery to be provided shall be performed by the Equipment Service Department of the Region 14 Administration.

The organization of the implementing agency is as shown in Figure 1.

The annual budget of the Road Construction Department is as shown below.

1991/1992	About 28 million birr (about 440 million yen)
1992/1993	About 23 million birr (about 360 million yen)
1993/1994	About 49 million birr (about 770 million yen)
1994/1995	About 43 million birr (about 680 million yen)

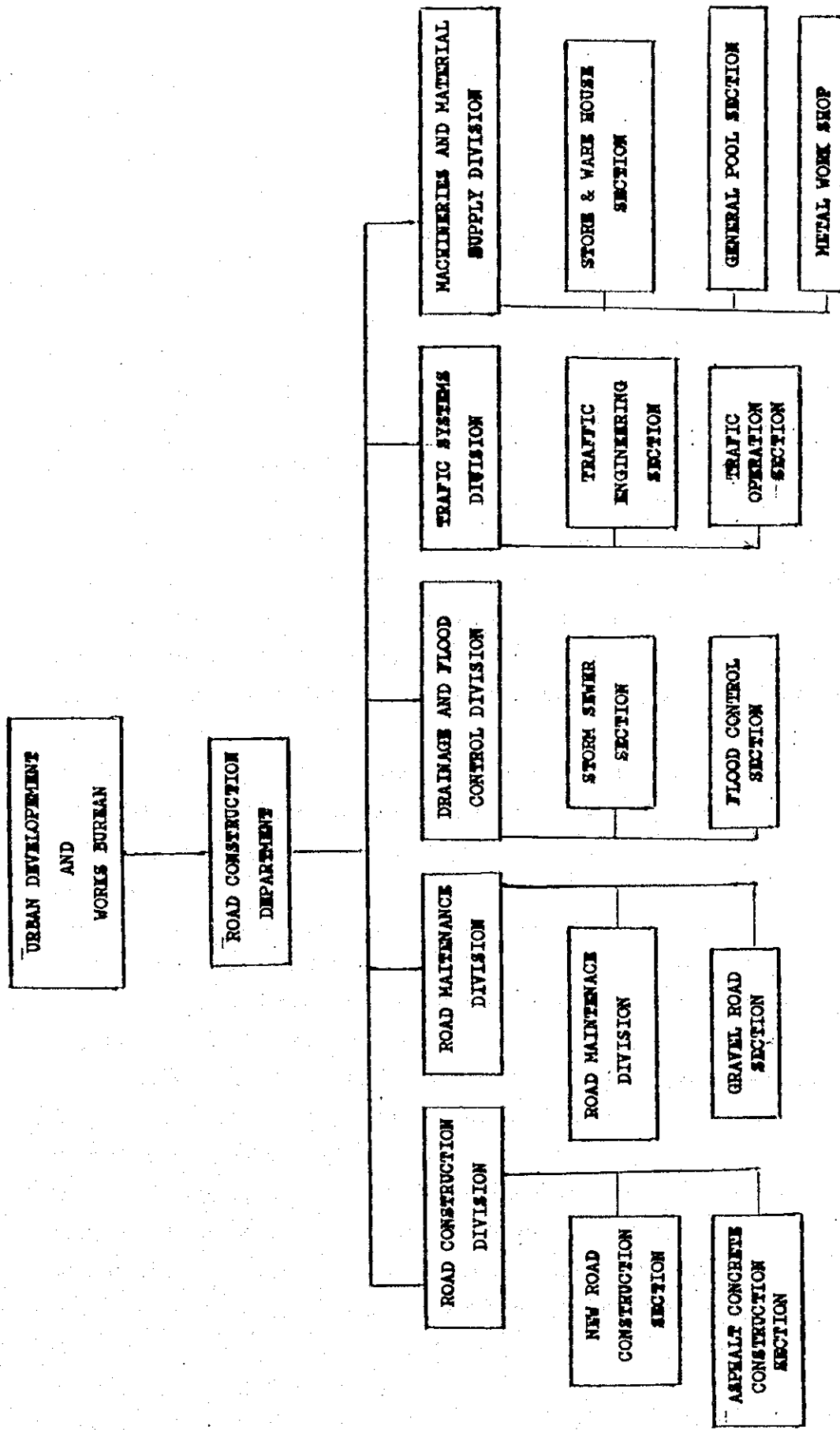


Figure 1. Organizational Structure of Road Maintenance Department

Problems will arise in each agency regarding the budgetary measures for the newly supplied machinery, however, there should be no problems concerning the budgetary distribution for personnel expenses and maintenance costs. Moreover, the Region 14 Administration has promised to double the budget of the Road Construction Department in the event where the Project is implemented, and so there should not be any problems in financial terms in the case of Project implementation. The machinery scheduled to be supplied under the Project will be maintained and stored by the Equipment Service Department of the Region 14 Administration.

The absence of any formal workshop drawings means that exact site area etc. cannot be grasped, however, the layout shown in Figure 2 has been inferred based upon the findings of the survey made. Within a site area of approximately 24,000 m² lie a workshop of about 3,240 m², a processing area of about 500 m² and also a maintenance room (for outdoor periodic inspections and repairs) and a parts store.

The yard contains an old dump truck (overdue for renewal) and other items which provide a source of parts. Various machinery ready for service was found to be contained in the Equipment Service Department.

The Equipment Service Department possesses a certain degree of repair machinery and tools etc. and it is thought that it will be able to cope with the introduction of any new machinery that may be provided under the Project.

Card indexing is used for spare parts storage means and, here too, it is thought that no problems should arise in terms of the workshop's capability.

The staffing of the Equipment Service Department are as indicated in Table 3. It is reported that training and education activities are also conducted in the workshop and again it is considered that there are no problems in this area too.

Table 3 Staffing of the Equipment Service Department
 (Place Where the New Machinery is to be Stored)

Job Type	Number of Staff
Engineer	3
Heavy Duty Mechanics	15
Light Vehicle Mechanics	7
General Work Shop	2
Service Shop	14
Machine Shop	3
Welding Shop	12
Electrical Shop	10
Engine Shop	9
Ware House	14
Office Worker	31
Total	120

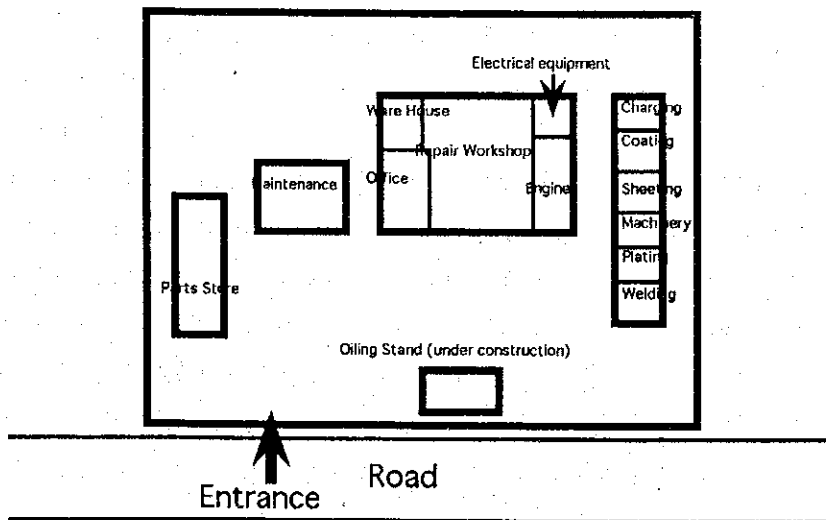


Figure 2 Top View of the Equipment Service Department

2-3 Design Concept

(1) Examination of Basic Conditions

Roads in Addis Ababa are in need of urgent repair and existing gravel roads require paving. After the Project machinery has been provided, each related agency will face problems in terms of budgetary measures for the new machinery, however, there should be few problems concerning distribution of budgets to cover personnel expenses and maintenance costs etc. Moreover, the Region 14 Administration has promised to double the budget of the Road Construction Department in the event of Project implementation and so there should not be any problems in financial terms.

(2) Examination of Each Item of Machinery

The following kind of criteria were adopted in order to select the machinery to be supplied under the Project.

1. Examine the existing machinery and make the replacement of deteriorated items the first priority.
2. Only consider machinery that is necessary for the maintenance of roads within Addis Ababa.
3. Give ample consideration to safety of machine use and economic viability in terms of necessary running and maintenance costs etc.
4. Give consideration to the wishes of the operating agency and the maintenance workshop officials and give priority to machinery for which operation and maintenance activities, such as the local procurement of spare parts, can be performed quickly.
5. Ensure that there is no overlapping with machinery that has been provided by other assistance organizations.

2-4 Machinery Specifications

The specifications of the machinery to be supplied under the Project are indicated in Table 4.

Table -4 Specifications and Quantities of the Machinery to be Supplied

No.	Machinery/Equipment	Specifications	Quantity
1	Articulated Motor Grader	135 HP Min., Cabin	2
2	Wheel Loader	3 m ³ Min. Bucket	4
3	Wheel Loader	1.5 m ³ Min. Bucket	3
4	Bull Dozer	200 HP, ROPS Cabin	2
5	Hydraulic Excavator (Crawler)	0.7 m ³ Min.	1
6	Hydraulic Excavator (Wheel)	0.6 m ³ Min.	1
7	Pneumatic Roller	Static Weight 8 Ton	2
8	Vibratory Tandem Steel Roller	5 Ton, Canopy	2
9	Vibratory Tandem Steel Roller	8 Ton, Canopy	2
10	Vibratory Tandem Steel Roller	10Ton, Canopy	2
11	Dump Truck	9.0 m ³	15
12	Dump Truck	2 Ton	5
13	Pick Up	4 x 4, Double Cabin	7
14	Semi-Trailer	35 Ton	1
15	Truck Tractor	for Semi-Trailer	1
16	Sewer Cleaner	5.5 m ³	1
17	Portable Asphalt Plant (including Truck Tractors)	50 Ton/hr.	2
18	Asphalt Kettle	2000 Lit. Min.	3
19	Chip Spreader (including Dump Trucks)		4
20	Hand Held Rock Drill	25 kg	2
21	Air Compressor	7.0 m ³ /min.	1
22	Hand Operated Road Marking Machine	50 kg Min.	1
23	Driver Operated Road Marking Machine	400 Lit. Min.	1
24	Mud Water Pump	Gasoline Engine, 3"	2
25	Generator	135 KVA	2
26	Plate Compactor	80 kg Min.	2
27	Concrete Cutter	Cutting Depth 100 mm	2
28	Asphalt Distributor	6000 Lit.	1
29	Water Tanker	6000 Lit.	1
30	Vacuum Truck	8000 Lit.	1

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effects

It is clear that implementation of the Project will lead to a major improvement in the state of both trunk roads and branch roads in Addis Ababa and that this will have wide-ranging beneficial effects in that it will allow the establishment of a smooth physical distribution system and thus aid national economic recovery and improve the living standards of citizens. The following kinds of direct benefits can be expected through the supply of the requested machinery:

1. Improvement of the state of roads (repair of pot holes etc.),
2. Reduction of transportation times and higher road safety levels,
3. Reduction in road repair time and lower road maintenance costs,
4. Stronger flood countermeasures and fewer causes of road accidents,
5. An overall bolstering of the social infrastructure and thus the construction of a sound society.

Moreover, the following kinds of indirect benefits can be expected:

1. A major contribution to the Road Development Project, which plays a key role in affecting the outcome of the provisional government's Emergency Recovery and Reconstruction Project,
2. Distribution activities within Addis Ababa will become much smoother and this will contribute to the national economic recovery by leading to increased production, lower distribution costs and more acquired foreign currency through exports,
3. A contribution to the restoration of citizen's living standards in Addis Ababa,
4. Preservation of the scenic beauty of Addis Ababa and thus

a revitalization of economic activity due to the improvement of the basic living environment in the city,
5. A contribution to the smooth operation and higher operation rates of vehicles etc. due to the better roads.

3-2 Recommendations

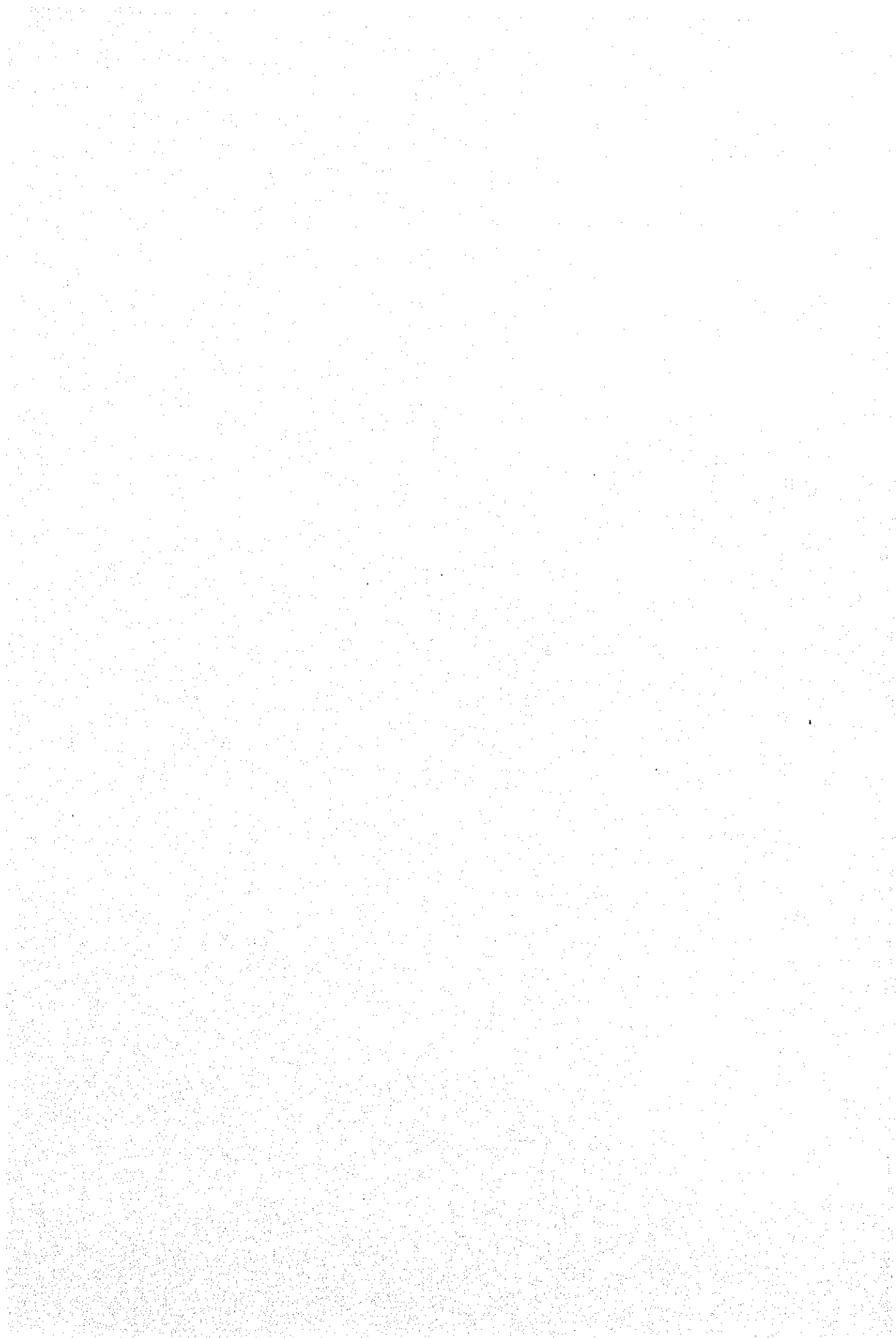
Attention needs to be paid to the following points when implementing the Project.

(1) It is thought that no problems will exist in terms of staffing in the Project operating and management setup and also in terms of the budget for the maintenance of the machinery, however, because the planning division and the repair division are separate, problems in terms of communications and coordination can be foreseen.

(2) The Region 14 Administration has promised to double the budget of the Road Construction Department in the event of Project implementation, however, the definite implementation of budgetary measures should still be requested.

(3) The control of data relating to machinery cannot be described as sufficient and improvements need to be made on the software side in order to ensure that proper operation and management of the machinery to be supplied is carried out.

(4) The Project will be the first instance of Japanese grant aid being provided to the Region 14 Administration and it is therefore necessary to ensure that the said agency fully understands the workings of the grant aid system.



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