Report No. 896-BT

Appraisal of a Third Road Project Republic of Botswana

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CURRENCY EQUIVALENTS

Except as otherwise stated, all figures are quoted in U.S. Dollars (US$).

Currency Unit	=	Rand (R)
US$1.155	=	R 1
US$1.00	=	R 0.866
US$1,000	=	R 866
US$1,000,000	=	R 865,800

WEIGHTS AND MEASURES

1 meter (m)	=	3.28 feet (ft)
1 kilometer (km)	=	0.62 miles (mi)
1 metric ton (m ton)	=	2,204 pounds (lbs)
1 sq km (km2)	=	0.386 miles (mi)

GLOSSARY OF ABBREVIATIONS

CIDA	-	Canadian International Development Agency
CTO	-	Central Transport Organization
DANIDA	-	Danish International Development Agency
MFDP	-	Ministry of Finance and Development Planning
MLGL	-	Ministry of Local Government and Lands
MWC	-	Ministry of Works and Communications
NORAD	-	Norwegian Agency for Development
ODM	-	Overseas Development Ministry
RSA	-	Republic of South Africa
SIDA	-	Swedish International Development Authority
VOC	-	Vehicle Operating Costs
vpd	-	vehicles per day

GOVERNMENT OF BOTSWANA FISCAL YEAR

April 1 - March 31

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

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This report was prepared by Kenneth Clare (Economist), Brendan Kennedy (Engineer) and Marie Garcia-Zamor (Technical Editor).

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SUMMARY AND CONCLUSIONS

i. This report appraises a road project prepared by the Botswana Government for which a Bank loan of US$5.8 million is proposed. Government is committing substantial resources to road transport because the country's skeletal network is inadequate for either present or projected requirements. Primary thrust is to develop the North-South spine, in the relatively populous eastern corridor, and main roads to serve it.

ii. The Bank Group has had two previous road projects in Botswana and an infrastructure project with a road component. First, a US$3.6 million credit was made available in 1964 (63-BEC) for:

(a) the design, construction, and reconstruction of three roads totalling 570 km;

(b) selected betterment of the North-South road; and

(c) improvement and expansion of the maintenance organization.

The project was satisfactorily completed on time in 1968 within cost estimates; however, according to an audit report, projected economic benefits were not fully realized in the 6-year period following project completion. The second road project was financed by an IDA credit (303-BT) of US$2 million, a Swedish International Development Authority credit of US$4 million equivalent, and a contribution by Government. This project consisted of:

(a) the reconstruction and paving of the 84 km Pioneer Gate-Lobatse-Gaborone-Sebele section of the North-South road;

(b) consultant services for detailed engineering and construction supervision; and

(c) technical assistance to the Roads Branch of the Public Works Department.

These works were also satisfactorily completed ahead of schedule and within cost estimates. Finally, the Bank Shashe Infrastructure Project loan (776-BT) included construction of the 52 km Serule-Selebi-Pikwe road, which encountered some difficulties that have since been satisfactorily resolved. Improvement of the road to bituminous standards will be completed in 1976.

iii. The major component of this project is construction to bituminous standards of a 52 km road (Gaborone-Molepolole) to connect the Kweneng District's administrative and commercial center with the North-South road. Government has provided for the improvement or construction of all sections of the North-South road, except for a 150 km section (Mahalapye-Serule) whose detailed engineering is included in the proposed project.

iv. To assist Government in maintaining the expanding road network, the project also includes a road maintenance study and technical assistance and equipment for a District Road Maintenance Pilot Program.

v. Lack of trained personnel in the Roads Department restricts road maintenance activities. The staff training component of the proposed project addresses this problem. The provision of soils laboratory equipment will help the Department meet increasing maintenance demands. The weighbridges and loadometers provided for will assist Government in enforcing recently-enacted legislation controlling vehicle axle loads.

vi. All project items will be executed by the Roads Department, except for the pilot program, which will be executed by the Ministry of Local Government and Lands through the Central District Council.

vii. Total project cost is estimated at US$7.8 million (US$7.4 million excluding taxes and duties). The foreign exchange component is US$6.3 million, about 81% of total project cost. The project will be financed by a Bank loan of US$5.8 million, which will cover 78% of the total project cost net of taxes and duties, and a US$2.0 million (US$1.6 million excluding taxes and duties) Government contribution, as agreed during negotiations. The Bank loan will cover about 70% of road construction costs (76% excluding taxes and duties, but including contingencies) and the foreign cost of consultant services, technical assistance, and equipment; no local costs will be financed by the loan.

viii. The road construction contract will be awarded and road maintenance equipment procured after international competitive bidding in accordance with Bank Group Guidelines for Procurement; consultants and technical assistance experts will be employed under terms of reference and conditions agreed with the Bank. Road construction is expected to start at the beginning of 1976 and be completed by mid-1977.

ix. The streams of costs and benefits (Table 10) indicate that the proposed investment in the Gaborone-Molepolole road is economically sound. It will yield a 17% economic return; the same return is calculated for each of the two major road sections. The road has a first-year return above 10% when using a 10% discount rate.

x. During negotiations, agreement was reached with Government on the submission of a program and related implementation schedule for improving the Central Transport Organization, which is responsible for all Government equipment, including road maintenance equipment. Agreement was also reached on the other issues set forth in paragraphs 6.01 and 6.02. The project is suitable for a Bank loan of US$5.8 million to the Republic of Botswana. An appropriate loan term is 23 years, including a grace period of three years.

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

1. INTRODUCTION

1.01 The Government of Botswana has applied for assistance in financing a road project whose components are described in this report (paras. 4.02-.07).

1.02 The proposed project, in line with Government's transportation development strategy, will aid Government in expanding the all-weather road network in an important agricultural region, in planning and organizing district and main road maintenance, in strengthening the Roads Department, and in enforcing vehicle weight and dimensions legislation.

1.03 The total project cost is estimated at US$7.8 million (US$7.4 million excluding taxes and duties), with a foreign exchange component of US$6.3 million, about 81% of total project costs. The project will be financed by a Bank loan of US$5.8 million and a Government contribution of US$2.0 million, or US$1.6 million excluding taxes.

1.04 This report is based on the findings of an appraisal mission comprising Kenneth Clare (Economist) and Brendan Kennedy (Engineer), which visited Botswana in January 1975. The report was edited by Marie Garcia-Zamor.

2. THE TRANSPORT SECTOR

A. Effects of Geography and Economic Growth on Transport

2.01 Landlocked Botswana is a large (570,000 km^2), sparsely populated, desert country (see Map). Access to the sea is through Durban, Cape Town, Port Elizabeth, Beira, or Lourenco Marques, each less than 1,500 km from the capital, Gaborone. The country's topography does not present major obstacles to construction of transport facilities, but the scarcity of water and other construction materials caused by widespread desert conditions adversely affects road construction.

2.02 The transport system consists of a thin network of roads and tracks, a railway line in the east, and a considerable number of widely scattered airports or airstrips. A small ferry operates across the Zambezi River between Kazungula in Botswana and Zambia.

2.03 The population is nearly 700,000 and is growing at an annual rate of 2%. Although 75% of the people live in the eastern 10% of the country, average density there is only about eight persons per km^2. As a consequence of the settlement pattern, transport development has been concentrated in the eastern corridor.

2.04 Agriculture (primarily animal husbandry) is the largest sector and contributed 37% of Botswana's GDP in 1973/74. However, mining is rapidly overtaking it as a result of mineral developments at Orapa (diamonds), Selebi-Pikwe (copper/nickel), and Morupule (coal). Government is the third-ranking sector and contributed 14% of GDP in 1973/74. Mineral exploitation is almost certain to be increasingly important to the economy, based upon proven mineral deposits, and will require considerable improvement and expansion of transport facilities, including railway connections. While agriculture is not expected to develop as rapidly, growth in this sector will also stimulate demand for improved transport, especially roads. At present, however, low density freight and passenger flows make the development of a transport system costly.

2.05 Per capita GDP in 1973/74 was about US$300, approximately 43% above the 1971/72 level of US$210. Real GDP, which has grown at an annual average rate of about 20% since the late 1960's, is expected to increase at about 14% toward the end of the 1970's and then level off at about 10% in the early 1980's.

B. The Transport System

Roads

2.06 Chapter 3 gives details of the road system.

Railway

2.07 A nineteenth century-built railway system extends the 642 km length of eastern Botswana and links two large trading partners, the Republic of South Africa (RSA) and Rhodesia. It is owned, operated, and maintained by the Rhodesian Railway Corporation which pays Botswana an annual wayleave of US$350,000. Rail spurs, built by the Botswana Government in 1974 under the Bank Shashe Infrastructure Project loan (776-BT) for mineral transport between Serule and Selebi-Pikwe (65 km) and between Morupule and the main railway line (14 km), are operated and maintained by Rhodesia Railways. In 1972, railway traffic was 1.3 million ton-kilometers, of which 86% was transit traffic, 11% export/import traffic, and only 2% Botswana internal traffic. Passengers totalled about 633,000, of whom 9% were in transit.

2.08 The North-South road runs parallel to the railway line. However, there is little road-rail competition because the railway is primarily a link between RSA and Rhodesia, while the road primarily serves internal traffic. Railway service is not well-suited to satisfying transport needs within Botswana because the comparatively light traffic density and usually short hauls are more suited to road transport. However, as mentioned above, mining industry development has required construction of new rail spurs and railways are expected to play an important role in the country's transport system.

Air Transport

2.09 Government's development strategy emphasizes the need for air connections to integrate widely scattered settlements into the life of the country. In 1972, Air Botswana was established as a parastatal organization wholly-owned by the Botswana Development Corporation; it provides domestic and international services by sub-contracting to private operators. Scheduled domestic flights serve most Botswana population centers with Hawker Siddeley 748 and Douglas DC-3 aircraft. International scheduled services are provided to RSA and Zambia by Air Botswana; Zambian Airways and South African Airways provide air service to Botswana. Approximately 37,000 passengers were handled at the Gaborone airport in FY 1973/74.

C. Transport Policy, Planning, and Coordination

2.10 Botswana's present transport policy has two general aims: to meet current demands by utilizing existing transport resources more efficiently and to expand these resources to meet future demands. Government recognizes the urgent need to integrate the country's economy. Demand for road facilities is being accentuated by the rapid growth in mineral exploitation together with new industrial and agricultural developments. While preferring to decrease dependence on foreign-owned transport facilities, especially the railway, Government recognizes that the railway will continue to play a significant role and hopes to take over operations from Rhodesia in the near future. Details of road transport policy are given in paras. 3.11-.13.

2.11 The current national transport plan is an integral part of the 1973-78 National Development Plan and provides an adequate basis for short-term development programs. However, during the Plan period Government also intends to undertake a comprehensive, long-term, national transport plan which is not immediately needed and should be undertaken only after political relationships in southern Africa are more settled and the development prospects of various mineral resources are more certain.

2.12 The Ministry of Works and Communications (MWC) is responsible for roads and air transport and has a section dealing with railways, but since the latter is controlled from Rhodesia (para. 2.07), the Ministry has

little influence over it. Within the Ministry, a Planning Unit was established in 1972 to prepare and continuously update the national transport plan. This unit has only three professional people and is therefore limited in its ability to undertake comprehensive long-term planning.

2.13 In 1974, Government introduced regulations concerning entry into the road transport industry and vehicle licensing, weights, and dimensions (para. 3.10). Permits from the MWC Transportation Secretary are necessary for either handling one's own goods or providing for-hire service, but applicants need only demonstrate financial responsibility and nominal demand. Consequently, there are numerous truckers. Bus operators are required to charge one cent per passenger kilometer and there is substantial compliance with this regulation. Because this fare level is not adequate to ensure regular service on poorer roads, Government provides subsidies for services on some of them. No control is exercised over freight rates, and there is substantial competition among goods carriers. Previous road improvements have led to substantial reductions in freight rates.

D. Previous Projects in the Transport Sector

2.14 The Bank Group has had two previous road projects in Botswana and an infrastructure project with a road component. First, a US$3.6 million credit was made available in 1964 (63-BEC) for:

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3. THE ROADS

A. The Network

3.01 The trunk and main road network (Table 1) consists of about 5,000 km, some 150 km of which are bituminous-surfaced, 830 km all-weather gravel, and the remainder dry-weather and earth. It comprises a trunk, or spinal system fed by main roads. Both trunk and main roads are built to the same standards. In addition, there is a rural network which a District Council survey estimates at about 11,340 km, only 3,000 km of which have been inventoried. About 1%, or 30 km of inventoried district roads are all-weather gravel; the rest are earth or sand.

3.02 At independence in 1966, Botswana had about 430 km of all-weather roads which mainly served the more populated eastern corridor. Since then, with Bank, SIDA, Canadian International Development Authority (CIDA), United States Agency for International Development (USAID), Federal Republic of Germany, and British Overseas Development Ministry (ODM) assistance, the all-weather main road network has been expanded to about 1,000 km, and the length of bituminous-surfaced roads has increased from 26 to about 150 km. However, western and central Botswana have only dry-weather tracks and are virtually isolated during the rainy season.

3.03 While the generally flat terrain is favorable to road construction, major difficulties and consequent high costs result from lack of suitable road construction materials, including water, in the widespread Kalahari sand areas.

3.04 Recently-accelerated main road construction is described in para. 3.11.

B. Traffic

3.05 During 1965-73, the registered vehicle fleet grew from 3,884 to 8,400 vehicles (Table 2), a 14% average annual growth rate. In 1973, the fleet was composed of about 5,500 goods vehicles (mostly small trucks with less than 3-ton capacity), 2,300 automobiles, 100 buses, and 500 other types of vehicles. Most operators have only one vehicle and few have more than five. Government estimates that foreign-owned motor carriers handle 20% of total goods moved by road transport.

3.06 The Roads Department has conducted traffic counts on selected roads during recent years. Some of these counts have not been taken carefully enough to be reliable, and Government intends to transfer the responsibility to the Central Statistical Office. During negotiations, Government assured the Bank that its data collection system would be upgraded in order to provide an adequate basis for further improving the road network (para. 6.01a).

C. Administration

3.07 The organization of the Roads Department is shown in Chart 1. In addition to the trunk and main road network, the Department is responsible for maintaining airfields and Gaborone's city roads. The Department has four major parts: Data and Planning, Development, Maintenance, and Rural Roads (all headed by a chief roads engineer); the organization is basically satisfactory. The Maintenance Branch is subdivided into the Northern, Southern, and Western Maintenance regions, each headed by a road engineer. All senior posts have been filled, with expatriate experts, under bilateral assistance from ODM, SIDA, Norwegian Agency for Development (NORAD), and Danish International Development Agency (DANIDA).

3.08 Until enough qualified Batswana are available, Government will continue to depend on expatriates for professional staff. This dependence, however, results in lack of continuity in senior and middle-level posts because expatriates normally serve for only two years. There is also a shortage of skilled local technical staff. Although Government is committed to a localization program and ample funds for training abroad are available from bilateral agencies, there is a lack of candidates with suitable educational backgrounds.

3.09 The District Councils, under the Ministry of Local Government and Lands (MLGL), are responsible for the estimated 11,340 km of district roads but have few or no facilities for road maintenance. The poor condition of these roads continues to deteriorate. However, under an ongoing project, with assistance from NORAD, about 900 km of the network are to be reconstructed or improved.

3.10 The Road Traffic Act of 1974 is Botswana's first legislation governing vehicle weights and dimensions and provides adequate legislation to protect the road system. Axle loads are limited to 8 tons, as in RSA. This legislation was timely, because increased mining activity is expected to generate heavy vehicle loads. The proposed project will assist Government in enforcing the regulations (para. 4.07).

D. Planning

3.11 Government's current road development plans include upgrading the main road network, particularly the North-South road, improving rural roads, and providing an all-weather access road to the north and to Botswana's northern neighbors. Including the proposed project road, some 1,112 km of trunk and main roads in the eastern corridor and in the north are to be constructed or improved to all-weather gravel or bituminous standards at an estimated cost of about US$50 million over the coming four-to-five years. Although this may appear a costly and ambitious undertaking, there are substantial indications that the necessary bilateral assistance is forthcoming. Improvement of the North-South road section between Pioneer Gate-Lobatse-Gaborone-Sebele was recently completed to bituminous standards (para. 2.14), and that of the 180 km road between Sebele and Mahalapye is nearing completion with ODM assistance. Detailed engineering for the 150 km Mahalapye-Serule road is included in this project (para. 4.04b); a study is currently underway to determine appropriate design standards. Detailed engineering is being prepared for the 83 km Serule-Francistown road with assistance from the Federal Republic of Germany. The 52 km Serule-Selebi-Pikwe road is to be paved with Bank assistance (para. 2.14). Construction of the 190 km Francistown-Nata road to bituminous standards has recently started with assistance from DANIDA, CIDA, and NORAD. Construction to all-weather gravel standards of a new 360 km road from Nata to the Zambian border at Kazungula is to be completed in 1976 under USAID financing; Government is now considering bituminizing this road. In addition, the 45 km Kanye-Lobatse road is scheduled to be bituminized in the next two years with African Development Bank Assistance.

3.12 The Division of Economic Affairs of the Ministry of Finance and Development Planning (MFDP) is responsible for overall planning and coordination of all sectors. To assist, planning units have been established in other ministries concerned with development. The MWC planning unit prepares detailed economic evaluations of proposed road development projects which, if approved by the MFDP and National Assembly, are included in the ongoing National Development Plan. Because of the growing workload and MFDP's limited economic and planning expertise, responsibility for transport planning will probably be increasingly assumed by the MWC planning unit.

3.13 A senior planning officer and two planning officers supported by a statistics branch comprise the MWC planning unit. The staff is relatively inexperienced but is supported by senior transport advisors and by the Roads Department technical staff. The unit has successfully prepared road projects for various financing agencies.

E. Financing

3.14 Maintenance budget requests are prepared in the MWC, reviewed by the MFDP Budget Administration Unit and Recurrent Budget Estimates Committee, and then included in the General Budget for Cabinet and National Assembly approval. Appropriations are made in full to the MWC at the beginning of the fiscal year. Transfers between item subheads are made with Budget Administration Unit approval, and transfers between MWC departments are made with the MFDP Permanent Secretary's approval. Balances may not be carried over from year to year.

3.15 The Finance and Audit Act specifies that no development expenditure may be incurred unless it is provided for in the National Development Plan. In recent years, almost all capital expenditures for roads have been financed through external grants and loans.

3.16 Road users contribute to Government revenue through taxes and duties on vehicles, fuel, lubricants, and spare parts, and through license and registration fees. All customs and sales duties on goods imported into the common customs area (Swaziland, Botswana, Lesotho, RSA) are paid into a common revenue pool. Only the license fees, which are not paid into the pool, are set by the Botswana Government; this source yielded R 339,000 in FY 1973/74 (US$500,025 at the then-prevailing exchange rate). No specific data are available on total revenues collected, but Government estimated that common pool revenues from road users amounted to about R 3.6 million in 1973/74 (US$5.3 million at the 1973/74 rate of exchange). This estimated revenue substantially exceeded road administration and maintenance expenditures in that year but fell considerably short of total road expenditures including road construction (Table 3).

3.17 Annual road expenditures more than doubled from FY 1970-74 (Table 3) and represented approximately 7% of total Government expenditure in the latter year. Over this period, administration and maintenance expenditures were modest because the road network was so small; however, the sizeable expansion underway indicates that considerable additional expenditures will be required in future. If current road development plans are implemented, by 1980 Botswana will have about 1,100 km of bituminous-paved roads and about 900 km of gravel roads, requiring an annual maintenance expenditure of about R 1.0 million; the maintenance study included in the project (para. 4.04c) will examine in detail the financing needed for future road maintenance.

F. Engineering

3.18 The Roads Department design capacity is basically limited to projects whose size and complexity are similar to the proposed project road. Its capacity is unlikely to increase significantly until the shortage of skilled technicians, surveyors, and soils technicians is overcome. The proposed project includes assistance aimed at strengthening the Department (para. 4.06).

G. Construction

3.19 Road construction is done by international contractors. There are no Botswana road contractors because of a lack of trained professionals, sub-professionals, and managers and shortage of candidates provided by the education system for such training. The infant contracting industry, which is involved mostly in house construction, should be kept under observation to determine when it is ready for development assistance.

3.20 Because of the Roads Department's limited capacity, expatriate consulting firms supervise major road construction and will supervise construction of the proposed project road (para. 4.04a).

3.21 Major contracts are unit-price type; contract conditions conform to international standards and contain acceptable provisions covering bid bonds, performance guarantees, price escalation, advance payments, retention money, arbitration, and first-year road maintenance by contractor.

H. Maintenance

3.22 The Roads Department carries out minimal main road maintenance consisting mostly of grading and bush-dragging gravel or earth roads. This is generally adequate for maintaining the largely unengineered roads at this low standard. However, continuous grading and bush-dragging has caused many roads to sink below the level of the adjoining land so that drainage is ineffective and roads are impassable during rains. The rapid expansion and upgrading of the main road network through the next few years (para. 3.11) will increase maintenance demands, and Government is anxious to ensure that the Department is able to meet them. Provision is made under the proposed project for maintenance assistance (para. 4.04c). Government is also anxious to strengthen the District Councils so they can adequately maintain and improve rural roads (para. 3.09); the project includes assistance for this purpose (para. 4.05). During negotiations Government gave assurances that its trunk and main roads would continue to be adequately maintained and the district roads of the Central District included in the pilot program of this project would also be maintained adequately (para. 6.01b).

3.23 The Central Transport Organization (CTO) provides and maintains all equipment and vehicles hired out to ministries and government agencies. However, inadequate workshops and equipment and a shortage of skilled workers, combined with faulty equipment-management procedures, have resulted in a 30% equipment availability rate and inefficient road maintenance operations. A senior operations expert was provided to CTO by CIDA in February 1975 to make a general assessment of the Organization's need for improvement. Two additional senior equipment management and operations experts are expected

to be provided by CIDA to help review CTO structure and operations and make recommendations for improvement. Technical assistance and training is also likely to be forthcoming from CIDA after the review. During negotiations, the Bank agreed with Government on the submission of a program and related implementation schedule for improving CTO operations (para. 6.02a).

I. Training

3.24 Government's localization program is handicapped because the education system is not producing enough candidates for engineering education. Government is considering setting up a Faculty of Engineering on the Gaborone campus of the University of Botswana, Lesotho, and Swaziland, but the basic need at this time is to provide candidates for engineering education.

3.25 To overcome the shortage of skilled local staff, Botswana artisans are being trained in the National Center for Vocational Training (set up under an International Labor Office/United Nations Development Programme project in Gaborone), and technicians are being trained in the Roads Department's own facility. Such training is satisfactory but the demand for skilled local staff exceeds the facility's capacity. Assistance will be provided under the project to support the Department's efforts (para. 4.06).

4. THE PROJECT

A. Objectives

4.01 The objectives of the proposed project are to assist Government in developing the road network, in planning and organizing district and main road maintenance, in strengthening the Roads Department, and in enforcing vehicle weight and dimensions legislation.

B. Description

4.02 The project consists of:

(i) construction of the Gaborone-Molepolole road (52 km) to two-lane bituminous standards;

(ii) consultant services to:

(a) supervise construction of (i);

(b) prepare detailed engineering for the Mahalapye-Serule road section (about 150 km); and

(c) carry out a Road Maintenance Study;

(iii) a District Road Maintenance Pilot Program comprising technical assistance and equipment;

(iv) provision of staff training and purchase of soils and materials laboratory equipment; and

(v) purchase of loadometers and weighbridges and installation of the latter.

(i) Gaborone-Molepolole Road Construction

4.03 This 52 km two-lane bituminous-surfaced road will link Molepolole, the administrative and commercial center of Kweneng District, with the capital, Gaborone, and connect with the recently-completed Molepolole-Letlhakeng district road to form the District's road artery. It will replace an existing earth and gravel road which is difficult to traverse during the rainy season, particularly on the Molepolole-Mogaditshane section which has poor alignment and a relatively poor surface. The project road, to be built to trunk road standards (Table 4), will pass through flat to rolling terrain, except for a short hilly section near Molepolole. Construction of the project road will significantly reduce user and road maintenance costs (para. 5.04).

(ii) Consultant Services

4.04 (a) Consultants will be provided to supervise the Gaborone-Molepolole road construction and review the designs for this road in the course of their work (para. 3.20). Further, they will assist Government in bidding procedures and evaluation. To reduce construction costs, they will also help Government locate water sources for use in construction;

(b) in addition, consultants will prepare detailed engineering for the 150 km Mahalapye-Serule section of the high priority North-South road. All other sections are either improved, under construction, or planned for (para. 3.11). This earth road is in very bad condition and is impassable during heavy rains. A feasibility study completed in July 1975 shows that improvement to bituminous-surfaced standards is economically justified;

(c) finally, consultants will conduct a Road Maintenance Study. This will assist Government in strengthening the Roads Department and the District Councils by providing a 5-year road maintenance program for the gazetted road network and a

road maintenance pilot program for the Central District, based on economic priority ranking. Resources, equipment, trained staff, materials, and funds needed for implementation of the maintenance program will be identified and recommendations made on meeting any shortfall.

(iii) District Council Road Maintenance Program

4.05 During the first phase of the Road Maintenance Study, consultants will prepare a pilot program for the Central District. Organizational and operational procedures will be set up for the betterment, rehabilitation, and maintenance of these roads, and MLGL, through the Central District Council, will implement them. At Government request, two road maintenance units, mainly geared to labor-intensive methods (Table 5), and technical assistance would be made available for the pilot program. The appropriate blend of labor and equipment for the various operations will be identified during the program and eventually applied to other districts.

(iv) Staff Training and Soils and Materials Laboratory Equipment

4.06 Roads Department staff will be trained in soils and materials technology, road maintenance operations and techniques, and accounting and cost control systems; soils and materials laboratory equipment will also be purchased (Table 6). These measures should significantly increase the Roads Department's capacity to carry out soils and road materials investigations and site control testing and result in more efficient use of local materials for road maintenance.

(v) Loadometers and Weighbridges

4.07 Loadometers and weighbridges will be purchased and installed to assist Government in enforcing vehicle weight and dimensions legislation.

C. Status of Engineering

4.08 Detailed engineering has been prepared by the Roads Department to trunk road standards for the Gaborone-Molepolole road (Table 4) and appears to be satisfactory.

D. Cost Estimate

4.09 Total project cost, including contingencies, is estimated at US$7.8 million, or US$7.4 million excluding taxes and duties. The foreign exchange component is US$6.3 million, or 81% of total project cost. The tax component is estimated at about 5% of total costs. Project cost estimates are summarized below:

	Rand '000			US$'000			% Foreign Component
	Local	Foreign	Total	Local	Foreign	Total	
A. Construction of Gaborone-Molepolole Road (52 km)	777	3,142	3,919	900	3,630	4,530	80
B. Consulting Services for: (i) Supervision of A	34	173	207	40	200	240	83
(ii) Detailed engineering of Mahalapye-Serule Road	61	312	373	70	360	430	83
(iii) A Road Maintenance Study	42	208	250	48	240	288	83
C. District Roads Pilot Maintenance Program: (i) Technical Assistance	26	138	164	30	160	190	83
(ii) Maintenance Equipment	2	138	140	2	159	161	98
D. Strengthening of the Roads Department (i) Training	20	104	124	23	120	143	83
(ii) Soils Laboratory Equipment	1	23	24	1	26	27	98
E. Weighbridges and Loadometers	3	41	44	3	48	51	94
Sub-total A-E	966	4,279	5,245	1,117	4,943	6,060	
F. Contingencies: (i) Physical - about 10% on items A,B,C,D and E	97	427	524	112	494	606	
(ii) Price - (a) 19% on item A	162	657	819	188	759	947	
(b) 10% on items B, C(i), and D(i)	20	102	122	23	119	142	
(c) 8% on items C(ii), D(ii), and E	-	18	18	-	20	20	
Sub-total F	279	1,204	1,483	323	1,392	1,715	
Total Project Cost	1,245	5,483	6,728	1,440	6,335	7,775	81
(Total Project Cost net of taxes)	(909)	(5,483)	(6,392)	(1,050)	(6,335)	(7,385)	86

4.10 The base costs reflect costs expected in August 1975, and were derived as follows:

(a) Road Construction: base costs were calculated on the basis of detailed engineering for the project road and recent bids for similar roads in the country. A physical contingency of 10% was included as well as a price contingency of about 19% to cover local and foreign cost increases to bid date, January 1976, and through the construction period at the following estimated rates: 16% for 1975, 14% for 1976, and 12% for 1977. Foreign costs are estimated at 76% of total costs, of which approximately 7% represents taxes.

(b) Consultant Services: costs were estimated on the basis of similar services provided in the past. The cost of supervision provides for pre-construction consultant services to the Roads Department, including a review of road design and assistance in bidding procedures. Also included were a 10% physical contingency and a price contingency of about 10% to cover cost increases.

(c) Technical Assistance and Training: costs were based on similar services already being provided in Botswana. A physical contingency of 10% was included as well as a price contingency of about 10%.

(d) Road Maintenance and Soils and Materials Laboratory Equipment: estimates were obtained from equipment suppliers. A physical contingency of 10% was included as well as price contingencies estimated at about 8% to cover cost increases to time of delivery; they reflect cost increases of 12% for 1975 and 10% for 1976. Local costs include local handling and transport costs. A provisional list of district road maintenance equipment has been furnished by Government (Table 5); this will be reviewed by the technical assistance experts to be provided to the MLGL and agreed with the Bank.

(e) Loadometers and Weighbridges: costs were based on suppliers' estimates, a 10% physical contingency and price contingencies estimated at about 8% to cover cost increases to time of delivery; they reflect price increase estimates of 12% for 1975 and 10% for 1976. The local costs cover local handling, transport, and installation costs.

E. Financing

4.11 Total project cost is estimated at US$7.8 million (US$7.4 million excluding taxes and duties). The foreign exchange component is US$6.3 million, about 81% of total project cost. The project will be financed by a Bank loan of US$5.8 million, which will cover 78% of the total project cost net of taxes and duties, and a US$2.0 million (US$1.6 million excluding taxes and duties) Government contribution, as agreed during negotiations. The Bank loan will cover about 70% of road construction costs (76% excluding taxes and duties, but including contingencies) and the foreign cost of consultant services, technical assistance, and equipment; no local costs will be financed by the loan.

F. Implementation

4.12 The Roads Department will be responsible for executing road construction, securing consultant services and training, and for procuring soils and materials laboratory equipment, weighbridges, and loadometers; after installation of the weighbridges, weighbridges and loadometers will be operated by the Traffic Police. The MLGL, through the Central District Council, will be responsible for executing the District Road Maintenance Pilot Program, recruiting technical assistance experts, and procuring road maintenance equipment.

4.13 The road construction contract will be awarded and the road maintenance equipment procured after international competitive bidding, in accordance with Bank Group Guidelines for Procurement. Soils and materials laboratory equipment, weighbridges, and loadometers will be procured under standard Government procurement procedures, which are satisfactory for these relatively minor items. Consultants and technical assistance experts for the Roads Department and the MLGL will be employed under terms of reference and conditions agreed with the Bank (para. 6.02b). The specific maintenance equipment needed for the District Road Maintenance Pilot Program will be identified by the technical assistance experts and approved by the Bank.

4.14 Main road construction has generally been equipment-intensive, principally due to the difficulty of organizing a large labor force in a country where the few population centers are widely separated; further, labor, much in demand by RSA mining companies, is generally available only on a seasonal basis. Finally, the logistic costs of providing essential services for a large labor force in semi-desert areas with limited transport facilities are high. However, the construction of culverts, drains, rip-rap paving, and structural excavation will require a substantial labor input, and the degree of labor intensiveness suitable for maintenance will be determined in the course of the pilot maintenance program (para. 4.05).

4.15 The road construction contract is expected to be awarded in early 1976 and the work completed by mid-1977. The road runs through tribal land, but Government has the right of eminent domain and no problems are expected in acquiring land for the right-of-way. The soils and materials laboratory equipment, weighbridges, and loadometers are expected to be purchased by April 1976, and the contract for district road maintenance equipment should be awarded by January 1977. Detailed engineering of the Mahalapye-Serule road and the Road Maintenance Study should start in early 1976 and be completed by early 1977. The District Road Maintenance Pilot Program is to be prepared during the first phase of the Road Maintenance Study and implementation is expected to start in mid-1977. During negotiations, the Bank agreed with Government on the timing of project implementation (Charts 2 and 3) and progress reporting procedures (Annex).

G. Disbursements

4.16 Loan disbursements will be made on the basis of about 70% of the cost of civil works, for an estimated 80% of the total cost of consultant services, technical assistance, and training, and 100% of the foreign costs of all equipment. A disbursement schedule is shown in Table 7. Any surplus funds in the loan account at project completion will be cancelled.

5. ECONOMIC EVALUATION

5.01 The project road serves approximately 4,000 km^2 and about 60,000 people, mostly small farmers. Cattle-raising and crop cultivation are the main sources of livelihood and the principal crops are sorghum, maize, millet, and pulses. Gaborone and Molepolole are the major market centers for the area's farm produce. Although there is some industrial development in Gaborone, the city's economic role is largely that of a distribution center. Molepolole, which has small cottage industries and an increasing number of trading establishments, is a gateway to the Kalahari Desert and western parts of Botswana.

5.02 Government plans to improve livestock raising practices and marketing facilities; such a facility is to be established in Letlhakeng in 1975. Also, the Kweneng Rural Development Association plans to expand its cottage industries in Molepolole, and the District Council in 1974 approved a proposal to build an industrial estate there. In 1974, mineral exploration in Kweneng resulted in the discovery of substantial coal resources which are likely to become an important factor in the local economy. Also, tourism is expected to increase, principally in the Khutse Game Reserve about 160 km northwest of Molepolole, and Government plans to develop tourist facilities there. These developments would all be facilitated by improving the project road.

5.03 In 1973, traffic on the project road reached 330 vehicles per day (vpd) on the Gaborone-Mogaditshane section and 201 vpd between Mogaditshane-Molepolole. On the basis of past traffic growth, averaging over 15% annually in recent years, and the above-described existing and planned development in the area, Government estimates that traffic will grow by at least 10% annually through 1997. In this evaluation, a more conservative forecast is used, namely, 9% annually to 1987, declining to 8% thereafter (Table 8).

5.04 The basis for the economic analysis of the project road is an assessment of expected traffic benefits and costs with and without the proposed improvements over 20 years, the estimated economic life of the road improvement. The investment cost is taken as the net of tax cost of improving the road, including supervision and physical contingency costs. The principal quantifiable benefits are savings in vehicle operation and road maintenance costs (Table 9). There are also other benefits which have not been quantified, such as improved access to social and administrative facilities and some generated traffic.

5.05 The streams of costs and benefits indicate that the proposed investment in the Gaborone-Molepolole road is economically sound (Table 10). It will yield a 17% economic return; the same return is calculated for each of the two major road sections. The road has a first-year return above 10% when using a 10% discount rate.

5.06 Sensitivity tests applied to the economic analysis assumed construction cost increases, traffic growth rate reductions, and decreased vehicle operating cost savings. For example, if project road construction costs increase by 25%, the economic return is reduced from 17% to 14%. If traffic is assumed to grow at only 6% throughout the economic life of the project, the economic return remains satisfactory at about 14%, while a 10% decrease in savings in vehicle operating costs reduces the return to about 16%. In each case the economic return remains satisfactory. Construction cost increases are considered the major risk.

6. AGREEMENTS REACHED AND RECOMMENDATION

6.01 During loan negotiations, assurances were obtained from Government that:

(a) procedures for collecting traffic data will be improved in order to facilitate future road planning (para. 3.06);

(b) Government will continue to maintain the trunk and main roads adequately and will adequately maintain the Central District roads (para. 3.22); and

(c) the additional financing required to complete the project will be made available (para. 4.11).

6.02 During loan negotiations, agreement was reached with Government on:

(a) the submission of a program and implementation schedule to improve the CTO (para. 3.23);

(b) terms of reference for consultant services and technical assistance experts (para. 4.13); and

(c) project execution timing and progress reporting procedures (para. 4.15).

6.03 The proposed project is a suitable basis for a Bank loan of US$5.8 million to the Republic of Botswana. An appropriate loan term would be 23 years with a grace period of three years.

October 16, 1975

TABLE 1

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Length of Road Network, 1967-74

Type of Road	1967	1968	1969	1970	1971	1972	1973	1974
				(km)				
Trunk Roads								
Class A - bitumen	24	26	26	26	26	26	60	146
Class B - gravel	349	354	384	397	522	522	513	506
Class B - dry weather	229	229	229	229	229	229	218	202
Class B1- earth	1,903	1,896	1,866	1,853	1,712	1,712	1,698	1,624
Subtotal	2,505	2,505	2,505	2,505	2,489	2,489	2,489	2,478
Main Roads								
Class B1 - gravel	61	61	62	267	267	297	332	332
Class B1 - dry weather	77	77	78	78	134	134	134	134
Class B2 - earth	1,604	1,764	1,760	2,002	2,000	1,970	1,935	1,935
Subtotal	1,742	1,902	1,900	2,347	2,401	2,401	2,401	2,401
District Roads 1/								
Class B1 - gravel	-	-	-	-	-	-	-	30
Class B2 - earth	3,492	3,332	3,350	3,106	3,080	3,080	3,080	3,050
Subtotal	3,492	3,332	3,350	3,106	3,080	3,080	3,080	3,080
Total all roads	7,739	7,739	7,755	7,958	7,970	7,970	7,970	7,959

1/ A substantial amount of district roads were not covered by the 1974 inventory of the country's road network.

Source: Ministry of Works and Communications, January 1975.

October 1975

TABLE 2

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Vehicle Registration, 1965-73

Year	Number of Vehicles	Annual Increase %
1965	3,884	-
1966	4,302	11
1967	4,992	16
1968	5,101	2
1969	5,681	11
1970	6,215	9
1971	6,462	4
1972	7,663	19
1973	8,400 1/	9

1/ Estimated

Note: Figures do not include government-owned vehicles, estimated at 1,600 in 1973.

Source: Statistical Abstract, 1973

October 1975

TABLE 3

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Annual Expenditures on Roads, 1969/70-73/74

Fiscal Year	Administration	Expenditures		Total
		Construction	Maintenance	
		(Rand thousand)		
1969-70	194	1,636	416	2,246
1970-71	178	664	1,089	1,931
1971-72	164	991	619	1,774
1972-73	150	575	748	1,473
1973-74	214	3,989	887	5,090

Source: Ministry of Works and Communications, January 1975

October 1975

TABLE 4

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Design Standards for Gaborone-Molepolole Road

Characteristics	Unit	Terrain	
		Flat or Rolling	Hilly
Geometric Design Standards			
Speed	km/hr	120	100
Minimum Horizontal Radius	m	500	300
Maximum Gradient	%	3	5
Maximum Superelevation	%	10	
Pavement Crossfall	%	2.5	
Shoulder Crossfall	%	4.0	
Roadway Features			
Road Width	m	10.7	
Bituminous Pavement Width	m	6.7	
Right-of-Way Width	m	60	
Bridge Widths			
Within Curbs	m	7.5	
Footpaths	m	0.75	
Structural Design Features			
Maximum Axle Load	MT	8.2	
Pavement Design		Road Research Laboratory Road Note 31	
Bridge Loading		AASHO - H.20	

Source: Ministry of Works and Communications, January 1975.

October 1975

TABLE 5

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Equipment for District Council Road Maintenance Pilot Program

No. of Units	Description of Unit	Unit Cost	Total Cost (R thousand)
Type A			
6	Four-wheel drive tractors	8	48
6	Trailers	2	12
6	Towed Graders	4	24
Type B			
3	Two-wheel drive tractors	4	12
3	Trailers	2	6
			102
General			
Miscellaneous hand tools, tents, etc.			1
	Total Cost	Rand	103

= US$ 152,000 equivalent, or

US$ 162,000 1/

1/ The former cost estimated at January 1975 prices, the latter at August 1975.

Source: Ministry of Local Government and Lands January 1975

October 1975

TABLE 6

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Soils and Materials Laboratory Equipment

No. of Units	Description of Unit	Unit Cost (Rand)	Total Cost
6	Compaction mold	115.00	690.00
1	Water Bath	250.00	250.00
1	Mech. Compactor for mod. AASHO Compaction Test	1,400.00	1,400.00
1	Compression Testing Machine (capacity 0-5 kn and 0-2000 kn.)	7,700.00	7,700.00
1	Electric Sieve Shaker	350.00	350.00
2	Electric Liquid Limit Device	175.00	350.00
1	Electric Oven (range 50°C - 120°C)	750.00	750.00
1	Electric Water Still (capacity 1-3 liters/hr.)	210.00	210.00
1	PH Meter (accurate to 0.02 units)	295.00	295.00
6	Carrier places for PH Meter	10.00	60.00
1	Los Angeles Abrasion Test Machine	1,026.00	1,026.00
1	Abrasion charge for L.A. Test	75.00	75.00
4	Concrete cube mold	23.00	92.00
4	Moulding bars	1.50	6.00
1	Steel Cylinder with base	40.00	40.00
1	Steel Cylinder measure	7.50	7.50
50	Standard CBR molds	8.00	400.00
5	CBR mould spacer plates	4.50	22.50
10	CBR mould collars	6.00	60.00
2	CBR mould base plate, spacer	14.50	29.00
50	CBR surcharge weights	7.00	350.00
1	Tripod for Swell Gauge	18.50	18.50
1	Dial Gauge 0.01 mm	15.50	15.50
10	Steel straight edge	3.50	35.00
	Subtotal		14,232.00
	Miscellaneous		2,768.00
	Total		17,000.00

= US$ 25,000 equivalent, or
US$ 27,000 equivalent 1/

1/ The former cost is estimated at January 1975 prices, the latter at August 1975.

Source: Roads Department
October 1975

TABLE 7

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Estimated Schedule of Disbursements

IBRD/IDA Fiscal Year and Quarter	Commulative Disbursement at end of Quarter (US$ thousand)
1975/76	
September 30, 1975	
December 31, 1975	
March 31, 1976	1,500
June 30, 1976	2,000
1976/77	
September 30, 1976	3,000
December 31, 1976	4,000
March 31, 1977	4,500
June 30, 1977	5,000
1977/78	
September 30, 1977	5,300
December 31, 1977	5,500
March 31, 1978	5,800
June 30, 1978	

Closing Date: June 30, 1978

Source: Mission Estimates, September 1975

October 1975

TABLE 8

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Projected Vehicles per Day on Project Road

Year	Gaborone-Mogoditshane (5 km)			Mogoditshane-Molepolole (47 km)		
	Light Vehicles	Heavy Vehicles	Total	Light Vehicles	Heavy Vehicles	Total
1973	278	52	330	158	43	201
1977	389	75	464	217	65	282
1982	596	114	710	331	100	431
1987	913	175	1,088	508	152	660
1992	1,341	256	1,597	743	223	966
1997	1,967	375	2,342	1,091	327	1,418

Note: Traffic forecast based on 9% p.a. growth rate 1973-87 and 8% p.a. growth rate 1987-1997.

Source: Ministry of Works and Communications, 1975

October 1975

TABLE 9

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Vehicle Operating Costs[1/] by Type of Road

Vehicle Type	Road Surface		
	Earth	Gravel	Bitumen
	(cents per km: 100 cents equal 1 Rand)		
Passenger Car	8.68	6.51	5.23
Pickup/Minibus	10.80	7.95	6.14
Light Truck	18.76	12.03	8.45
Truck/Bus	27.83	17.59	11.59
Heavy Truck	43.43	25.92	17.05

1/ Net of taxes.

Note:
These units costs have been used to calculate savings in vehicle operating costs (VOC) which constitute the principal type of benefit expected from the road improvement. For example, for 1977, the R 194,000 VOC savings on the Mogaditshane-Molepolole section (Table 10) were derived as follows: first, the 282 vpd for 1977 (Table 8) was analyzed by vehicle type. Second, unit VOC savings by vehicle type were calculated using the data in Table 9 and then adjusted to reflect the fact that the road surface is 75% earth and 25% poor gravel. Finally, 1977 VOC savings were calculated as follows:

Vehicle Type	vpd	VOC Savings per Vehicle Kilometer (Rand)	Number of Days of Traffic In 1977	Length of Road Section (Km)	VOC Savings
Passenger per Car	110	.033	183	47	31,222
Pickup/Minibus	56	.050	183	47	24,083
Light Truck	45	.100	183	47	38,704
Truck/Bus	56	.145	183	47	69,840
Heavy Truck	15	.230	183	47	29,673
Total	282				193,522

Source: Ministry of Works and Communications and Sir Alexander Gibb and Partners and F. H. Kocks, consultants, January 1975.

October 1975

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Economic Costs and Benefits
(Rand thousand)

Year	Gaborone-Mogaditshane Section				Mogaditshane-Molepolole Section				Entire Road
	Capital Costs 1/	Savings in Vehicle Operating Costs 2/	Savings in Maintenance Costs 3/	Total Net Benefits 4/	Capital Costs 1/	Savings in Vehicle Operating Costs 2/	Savings in Maintenance Costs 3/	Total Net Benefits 4/	Total Net Benefits 5/
1976	260			-260	2,629			-2,629	-2,889
1977	128	19		-109	1,295	194		-1,101	-1,210
1978		42	2	44		422	15	437	481
1979		46	4	50		460	27	487	537
1980		51	4	55		502	27	529	584
1981		54	1	55		547	1	548	603
1982		59	5	64		597	28	625	689
1983		65	4	69		650	27	677	746
1984		71	4	75		709	27	736	811
1985		77	4	81		772	27	799	880
1986		85	5	90		842	28	870	960
1987		92	4	96		918	27	945	1,041
1988		99	2	101		992	25	1,017	1,118
1989		108	7	115		1,071	63	1,134	1,249
1990		116	4	120		1,157	40	1,197	1,317
1991		125	7	132		1,250	63	1,313	1,445
1992		136	5	141		1,349	51	1,400	1,541
1993		146	7	153		1,457	63	1,520	1,673
1994		157	4	161		1,574	40	1,614	1,775
1995		171	5	176		1,700	38	1,738	1,914
1996		184	5	189		1,836	51	1,887	2,076
1997		99	4	103		992	31	1,023	1,126
	Economic Return			17%				17%	17%

1/ Economic cost derived by (a) combining estimated financial cost of improvement, supervision, and physical contingencies and (b) reducing this sum by 7% for taxes and duties.

2/ Calculated on the basis of (a) vpd, (b) 365 days, and (c) unit savings in vehicle operating cost per km on existing and improved road.

3/ Savings calculated on the basis of annual maintenance costs per km for existing and improved road.

4/ Total benefits, reflecting savings in vehicle operating costs, savings in maintenance costs, and capital costs.

5/ Sum of total net benefits for the two road sections.

October 1975

TABLE 10

ANNEX

APPRAISAL OF A THIRD ROAD PROJECT

BOTSWANA

Project Progress Reporting Requirements

1. Progress Reports should be submitted quarterly in triplicate, no later than one calendar month after the end of the quarter. The first Report should cover the quarter ending March 31, 1976.

2. The Report should contain the following information:

I. General Information

(a) the physical progress accomplished to date of report and during the reporting period;

(b) actual or expected deviations from the project implementation schedule;

(c) actual or expected difficulties or delays and their effect on implementation schedule and the actual steps taken or planned to overcome the difficulties and avoid delay;

(d) expected changes in the completion dates of the project;

(e) key personnel changes in the staffs of the Roads Department, consultants, and contractors;

(f) matters which may affect the cost of the project; and

(g) any development activity likely to affect the economic viability of the project components.

II. A bar-type progress chart, based on the project implementation schedule, showing the progress in each project component and including a planned and actual expenditure graph.

III. A financial statement set out in tabular form which shows for each of the project components:

(a) original estimated cost;

(b) revised cost, if appropriate;

(c) actual expenditure;

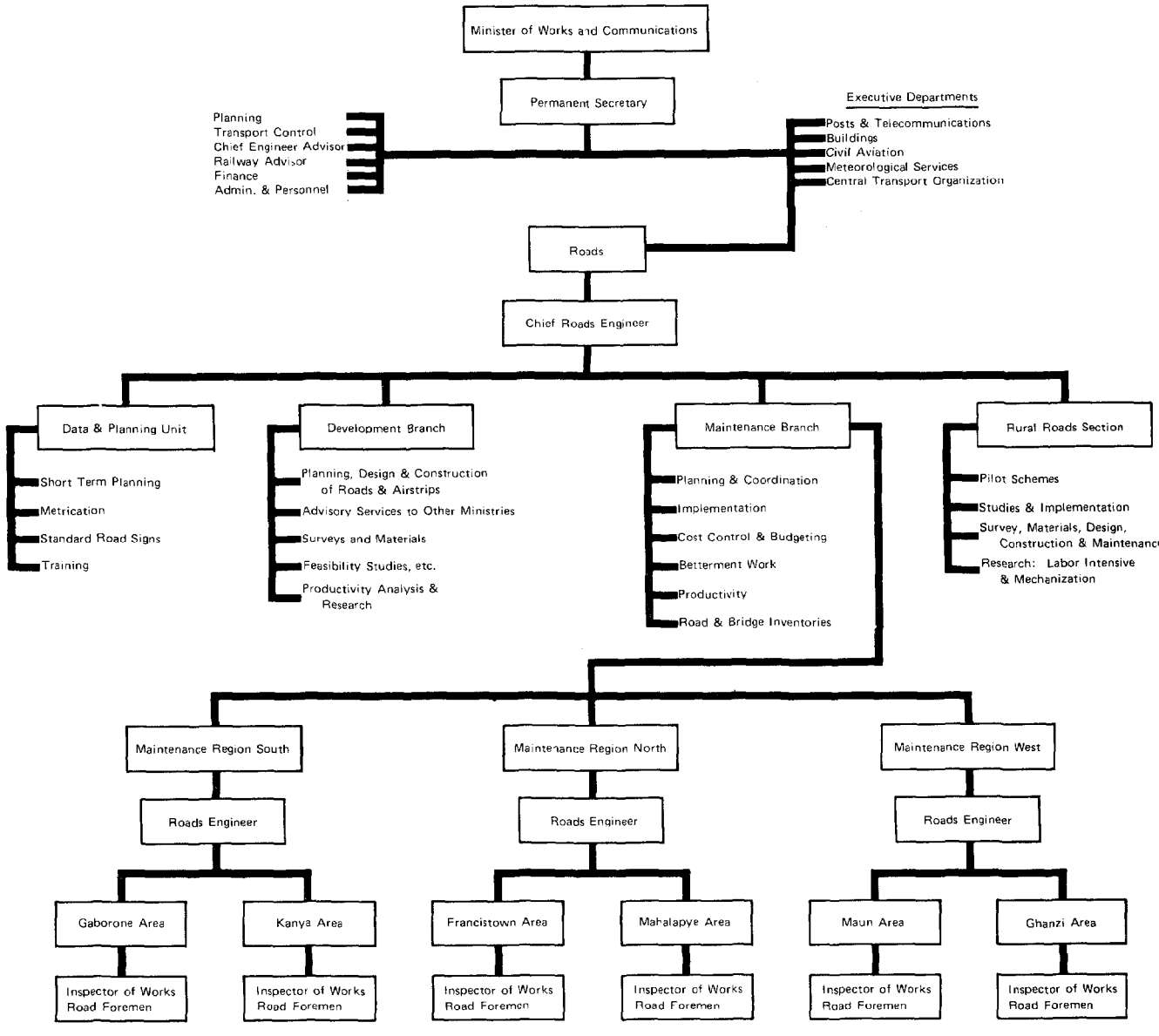
(d) projected expenditure; and

(e) actual withdrawals and projected withdrawals from the Loan Account.

IV. Brief confirmation of the status of action on each of the covenants of the Loan Agreement.

October 1975

APPRAISAL OF A THIRD ROAD PROJECT
BOTSWANA
ORGANIZATION OF THE ROADS DEPARTMENT OF THE MINISTRY OF WORKS AND COMMUNICATIONS



World Bank–9726

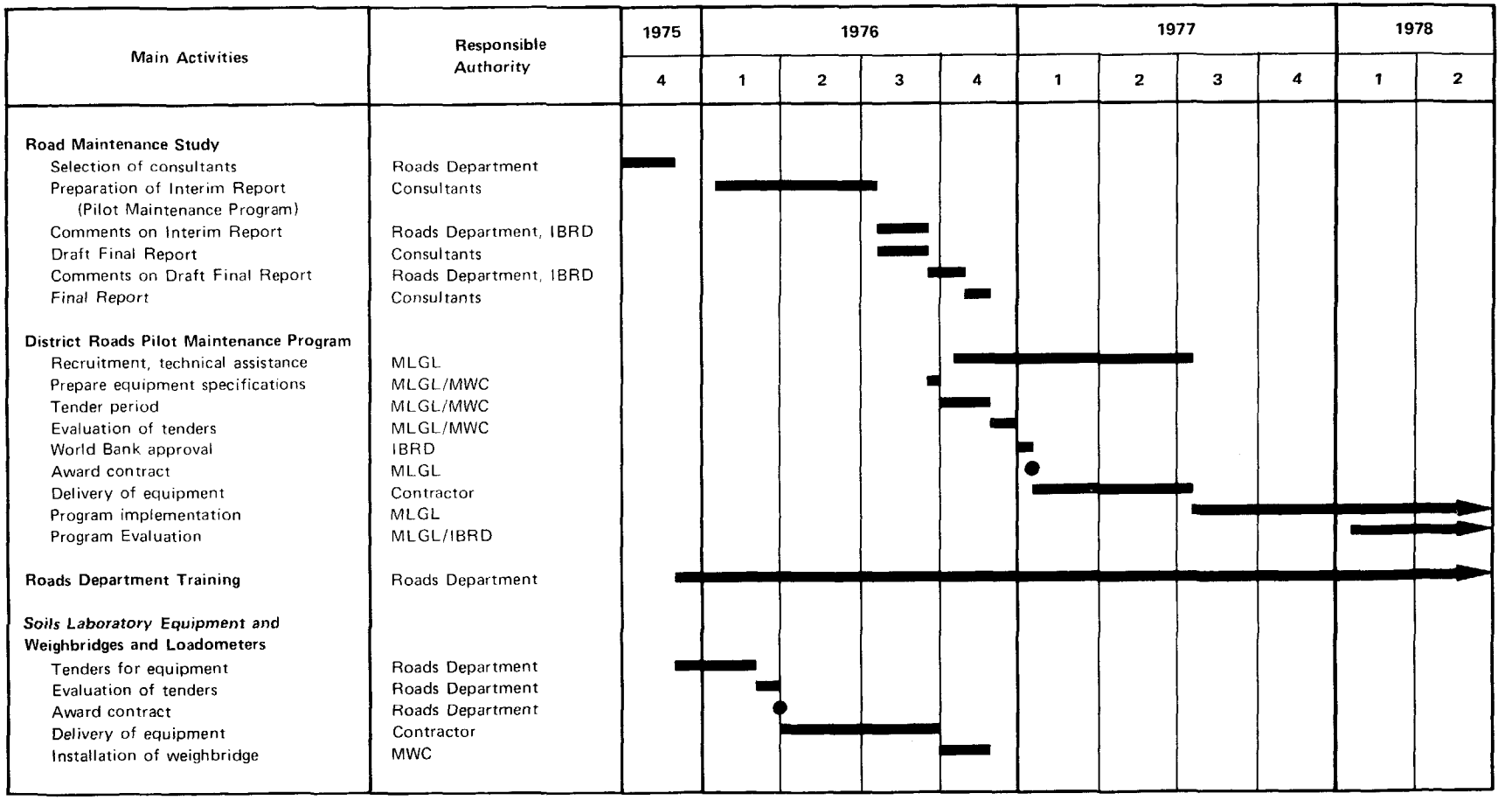
REPUBLIC OF BOTSWANA
THIRD ROAD PROJECT
Project Implementation Schedule

Main Activities	Responsible Authority	1975	1976				1977				1978	
		4	1	2	3	4	1	2	3	4	1	2
Credit Agreement Signed		●										
Date of Credit Effectiveness			●									
Covenants												
Improved procedures for statistics collection												
– Bank approval	IBRD	●										
– Implementation	MWC	———	———	———	———	———	———	———	———	———	———	———
CTO Improvement												
– Bank approval of program	IBRD	●										
– Recruitment of experts	CIDA/MWC	———	———	———								
– Equipment delivery	MWC	———	———	———								
– Training	MWC	———	———	———	———	———	———	———	———	———	———	———
Road Construction												
Selection of consultants for supervision	Roads Department	———										
Review of road design	Consultants	———										
Bidding period	–		———									
Evaluation of bids	*Roads Department,* Consultants		———									
World Bank approval	IBRD		———									
Award contract	Roads Department		———									
Construction	Contractor			———	———	———	———	———				
Detailed Engineering for Mahalapye-Serule												
Selection of consultants	Roads Department	———										
Preparation of draft report	Consultants		———	———	———							
Comments on draft report	Roads Department				———	———						
Final Report	Consultants					———						

World Bank–15248

Chart 2

REPUBLIC OF BOTSWANA
THIRD ROAD PROJECT
Project Implementation Schedule



World Bank–15249

Chart 3

IBRD 3451R2
OCTOBER 1976