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Annex B
TRANSPORT/COMMUNICATION

A Report to the Congress on

**DEVELOPMENT NEEDS
and OPPORTUNITIES for
COOPERATION in
SOUTHERN AFRICA**



United States Agency for International Development/March 1979

TRANSPORTATION AND TELECOMMUNICATIONS
IN THE SOUTHERN AFRICA REGION

Allen LeBel
Philip Moeller

This sector assessment was undertaken in conjunction with the Southern Africa Development Analysis Project and has been used extensively, but not totally, in the Main Report and Country Papers

Pacific Consultants
Contract afr-C-1424

PREFACE

The following study is presented in fulfillment of the Terms of Reference for the Transport and Telecommunications Sector of the Southern Africa Development Analysis and Planning (SADAP) project, Contract No. afr-C-1424, entered into by the United States Agency for International Development (USAID) and Pacific Consultants. The analysis provides both short-term and long-term considerations of the policy, program, and project needs of transport development, from regional and national perspectives, and offers both specific recommendations for project support and an overall strategy for USAID assistance to the region.

The analysis presented represents the independent perspectives of the two consultants who co-authored the study, Allen LeBel (Railways and Civil Aviation) and Philip Moeller (Roads and Telecommunications). Although USAID policy restrictions were realistically taken into consideration by the consultants, where appropriate such restrictions were not regarded as unalterable constraints or policy directions for the future.

The majority of information obtained during field research resulted from the support of the respective national governments being visited. The consultants greatly appreciate the cooperation they received and, reflecting the Terms of Reference for the study, have sought to present a balanced overview

of national policies and priorities, including those positions taken for non-economic reasons. (For a complete list of individuals contacted during the field research, see SADAP Contact List, Transport/Telecommunications which appears at the end of the study.

Methodologically the study utilized both personal interviews and documentation from primary and secondary sources.

Procedurally this represented four basic stages:

1. Preliminary bibliographic search, including associated briefings and joint sessions with other SADAP consultant teams.
2. Consultation with donor agencies or project sponsors already active in Southern Africa.
3. Extensive field interviews with government or associated transport/telecommunications officials in each of the five countries visited, including the collection of all relevant data made available.
4. Analysis of programs, policies, and projects underway or proposed for each country and for the region as a whole.

The study is presented here in two parts. The first section presents an analytical overview of transport and telecommunications, including donor perspectives, development constraints, and a suggested strategy direction for USAID assistance to Southern Africa. The second section is country specific. Current sector development is summarized and future USAID investment is projected. Where possible, data--and in some cases economic appraisal--is presented in tabular form.

The study includes a brief review of national development programs, policies, and projects for transport and communications in each country. A summary of the development problems and needs of each mode of transport--including roads, rail, air, and where relevant water--seeks to identify both internal sector and associated sector constraints on development. Telecommunications is regarded as an adjunct mode. Under the Terms of Reference, analysis relevant to feeder roads has been transferred from this study to the agricultural sector report being provided by another SADAP team.

The performance of this study was limited on two accounts. The first was the timeframe under which the study was carried out, offering but a few days in each country and a short period for overall analysis of the findings brought back from the field. The second--and more serious--limitation was the prohibition, for security and political reasons, on visits to Namibia, Zimbabwe, and Mozambique, all three of which, nonetheless, remain concerns of this study. Although efforts have been made to compensate for these limitations, the consultants feel professionally obligated to point out their existence.

A selective bibliography is included at the end of this study.

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ABBREVIATIONS USED IN THE REPORT

ABEDA	Arab Bank for African Economic Development
ACP	Africa, the Caribbean and the Pacific
ADB	African Development Bank
ADF	African Development Fund
AEUC	Arab Economic Unity Council
AFCAC	African Civil Aviation Commission
AID	Agency for International Development (US)
AOC	Associated Overseas Countries of the European Economic
ATEC	Transequatorial Communications Agency
ATUC	African Trade Union Confederation
BCEAO	Central Bank of the West African States
BEAC	Bank of the Central African States
BEI	European Investment Bank (EEC)
CAFRAD	African Training and Research Centre in Administration for Development
CAE	Central African Empire
CCCE	Central Economic Co-operation Fund (France)
CECAS	Conference of East and Central African States
CFA	African Financial Community
c.i.f.	cost, insurance and freight
CIPEC	Intergovernmental Council of Copper Exporting Countries
DAC	Development Assistance Committee (OECD)
DOM	Overseas Department (France)

EAC	East African Community
EADB	East African Development Bank
EAC	Economic Commission for Africa
ECE	Economic Commission for Europe
ECGD	Export Credit Guarantee Department (UK)
ECOWAS	Economic Community of West African States
EDF	European Development Fund (EEC)
EEC	European Economic Community
FAC	Aid and Co-operation Fund (France)
FAO	Food and Agricultural Organization (United Nations)
FAR	Federation of Arab Republic
f.o.b.	free on board
Frelimo	Frente de Libertacao de Mocambique
GATT	General Agreement on Tariff's and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
IACO	Inter-African Coffee Organization
IBRD	International Bank for Reconstruction and Development
ICC	International Chamber of Commerce
ICFTU	International Confederation of Free Trade Unions
ICO	International Coffee Organization
IDA	International Development Agency
IDEP	Institute for Economic Development and Planning

IFC	International Finance Corporation
ILO	International Labour Organization
IMF	International Monetary Fund
LNG	Liquid Natural Gas
NATO	North Atlantic Treaty Organization
NDP	Net Domestic Product
OATUU	Organization of African Trade Union Unity
OAU	Organization of African Unity
ODTA	African Tourism Development Organization (OCAM)
OECD	Organization for Economic Co-operation and Development
OMVS	Organization for the Development of the Senegal River
PANAFTEL	Pan-African Telecommunications
RSA	Republic of South Africa
SAR	South African Railways
SDRs	Special Drawing Rights
Stabex	Export Earnings Stabilization System
SWA	Namibia (South West Africa)
Tazara	Tanzania-Zambia Railway Authority
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNDRO	United Nations Disaster Relief Organization
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees

Currency Conversions

July 24, 1978

<u>Country</u>	<u>Currency</u>	<u>Symbol</u>	<u>Value</u> *
Botswana	Pula	P	P1=\$.90
Lesotho	Rand	R	R1=\$1.15
Swaziland	Emalangenani	E	E1=\$1.15
Malawi	Kwacha	K	K1=\$1.13
Mozambique	Escudo	E	E1=\$.03
Zimbabwe	Rhodesian Dollar	R\$	R\$1=\$1.54
Namibia	Rand	R	R1=\$1.15
Zambia	Kwacha	K	K1=\$1.33
South Africa	Rand	R	R1=\$1.15

PART I: INTRODUCTORY SECTOR ANALYSIS

A. SECTOR CONSTRAINTS

A primary goal of this study is an assessment of the constraint transport and telecommunications represent for overall economic growth in Southern Africa. Analysis has been executed on two levels: first, in terms of present and future associated sector dependence; and, second, in terms of internal problems which restrict development of the sector itself. Country specific analysis is provided in the country overviews contained in Part II.

The most central theme presented by government officials in Southern Africa is the recurrent constraint transport and telecommunications place on overall economic development. In each of the countries visited, two or more of the primary sectors--in many cases affecting major exports and sources of foreign currency--are seriously constrained. (See Table I, Southern Africa: Constraints on Primary Sectors by Transport/Telecommunications, by Country.) Even setting aside the issue of feeder roads, various rural development projects and the marketing of agricultural produce and livestock in each of the countries visited are impeded by transport/telecommunications constraints. Commercial exchange is blocked on both a national and a regional basis and potential mineral exploitation is frequently rendered uneconomic because of transport considerations. No other single factor would seem as great a constraint as transport/telecommunications on the utilization of the present and expansion of the potential economic base of the countries in Southern Africa.

TABLE I

SOUTHERN AFRICA: CONSTRAINTS ON PRIMARY SECTORS
BY TRANSPORT AND TELECOMMUNICATIONS (BY COUNTRY)

Sector	Botswana	Malawi	Zambia	Swaziland	Lesotho
Agriculture	● Produce Marketing	● RDP	● Produce Marketing	● Sugar	● RDP
	● Livestock Marketing	● Tobacco ∅ Sugar	● Tea, Rice ● Sugar ● RDP	● RDP ● Tobacco	
Mining	○ Coal	○ Coal	● Copper	○ Coal	
	○ Soda Ash				
	○ Copper				
	○ Other*				
Forestry		∅ Viphya Pulp		● Central Development	
Commerce	● Western Region	● North-South Linkage	● Copperbelt and Northern Region	○ Big Bend and Jeppes Reef	● Western-Central Regions
Tourism	∅ Kavango	● Nyika Game Park	∅ Western Region	∅ Central Region	○ Interior

Key: RDP=Rural Development Projects; *Survey and economic assessment of mineral potential restricted by limited transport development; ○=Constraint on potential development; ●=Constraint on existing development; ∅=constraint on project underway.

Source: Various sources used to construct this table, which is illustrative rather than exhaustive.

It should not be necessary to belabor the constraining factor transport and telecommunications play in marketing operations for associated sectors. Similarly, obvious is the constraint on associated sector development represented by inability to deliver materials and equipment--not to mention labor--to various development sites. What needs to be underlined, however, is that the import of this constraint affects all of society. Rural development projects are tied to national marketing or depend upon supervisory or coordinating activities--even they are dependent upon the level and maintenance of transport service. The situation for the rural poor can often be a make-or-break economic situation.

Less easy to evaluate is the constraining role of transport and telecommunications on human and social development. The extension of such social services as health and education into rural areas, and access to training and employment opportunities external to a region, cannot be readily calculated in direct economic terms. These factors, nonetheless, play a substantial role in determining the productivity of labor in a country and ultimately the extent to which the rural population participates in the cash economy.

Recognition of the constraining role played by transport is not confined, moreover, to the administrative level in Southern Africa, but represents a real concern of the rural masses. Setting aside the inconveniences associated with an

occasional trip to visit a relative or obtain a commodity not at hand in the local market, rural sentiment increasingly relates the felt need for increased communication with the outside world as essential to further improvement of rural life. The interest in further developing local resources is commonly restricted by the perspective that such is profitable only with associated investment in local or regional infrastructure.

Examples of this perspective are common and easy to document. Efforts underway in Botswana, for example, to provide grassroots level input into the next development plan demonstrate local concern with transport issues. Every district report expresses concern with transport as a constraint and the need for development of the sector. Similarly, a small village twenty some miles from Maseru in Lesotho is so convinced of the need for a road to their village that they are building a single lane route by hand.

Various factors explain delayed investment in the transport sector. They include the high cost of construction, economies of scale frequently necessitating equipment-intensive projects, recurrent maintenance costs, and, more recently, donor disillusionment with infrastructure development. The situation is complicated by the existence of certain transport links, dating from the colonial period, upon which certain countries initially have relied but which were not designed to promote balanced economic growth and which,

in conjunction with such political developments as the closing of the Rhodesian border and deterioration of infrastructure in Angola and Mozambique following their independences, have resulted in increased dependence upon South Africa.

Dependence on South Africa ranges from the more obvious level of transport routes to ports or major sources of supply to the more subtle dimensions of transport policy, and is a major or recurrent constraint for every country in the region. (See Table II, Southern Africa: Transport Sector, Policy, Associated Sector and Internal Constraints, 1978.) Although the construction of certain alternate links could reduce such dependency, short-run needs and the long-term uncertainties of the outcomes in Namibia and Zimbabwe--not to mention South Africa itself--seriously complicate regional planning for even dependency modification. Lacking the option of alternate routes, however, Lesotho and Swaziland are forced into the reactive position of drafting their transport policy and regulations to mesh with those of South Africa or face closures of their accesses to even the South African market. All of these policies represent constraints to development, especially for countries in which investment capital is scarce. This distinction, however, is of little significance to governments attempting to cover all contingencies necessary for survival in a very uncertain political context.

Within the context of dependency on South Africa, nearly every government has taken national policy positions which

TABLE II

SOUTHERN AFRICA: TRANSPORT SECTOR, POLICY,
ASSOCIATED SECTOR AND INTERNAL CONSTRAINTS, 1978

	BOTSWANA	LESOTHO	MALAWI	MOZAMBIQUE	NAMIBIA	SWAZILAND	ZAMBIA	ZIMBABWE
Dependence on South Africa	X	X	O	O	X	X	O ¹	O
National Policy	X	X	O		NA	O	X	NA
Associated Sector Dependence	O	X	O	O	X	O	X	O
Admin. Staff Level Planning Capability	X	O	O	X	X	O	O	O
Main Road Links	O	X	O	O	O	O	X	
Railroads	X	O	O	O	O	O	X	O
Port Access	O	X	X	O	O	O	X	O
Air Service	O	O	O		O	O	O	O
Maintenance Service, Equipment Facilities	X	O	O	O	O	O	X	
Skilled/Semi-Skilled Labor	X	O	O	O	X	O	O	O
Training Program Facilities	O	O	O	X	X	O	O	O

¹ Although Zambia has declared its economic independence from South Africa, the resulting complications and her flow of certain items through third countries warrant consideration of this category as a constraint.

Key: X=Major constraint; O=Recurrent constraint/insufficient information; NA=Not applicable.

are not based on economic return or profitability, but rather represent efforts to reduce vulnerability. Botswana seeks assumption of the operation and maintenance of railway transport even in the face of disapproval by the IBRD. Lesotho's refusal to recognize the Transkei has resulted in the costly closing of the southern border and the need for immediate investment in central transport links.

Several countries in the region plan to build international airports not on the basis of projected traffic level, but as a link to other countries within the region, as well as with international routes, clearly reducing the present dependence on Johannesburg. South Africa offers what amounts to subsidized rates for international telecommunications traffic, but the general goal in the region is a national earth-satellite station.

One of the major constraints to the development of the transport/telecommunications sector is an inadequate number of staff members in the ministries responsible for the administration of the sector. The usual expedient is to rely on expatriate advisors who in actuality serve as administrators. The workload is usually inordinate, greatly affecting the planning and coordinating capability of the ministry. Efforts to replace expatriates with qualified nationals frequently are offset by the need for expansion or more specialized expertise. Structural problems in the hiring of expatriates, such as the use of two-year contracts and poorly

phased recruitment, further complicate the situation. This constraint will continue well into the end of this century and deserves careful consideration.

No country in the region possesses a basic grid of main and secondary roads adequate for development needs. Botswana and Lesotho have spinal systems following the concentration of their populations but will need expensive investment to link the remainder of their territories to the central economies. Malawi needs additional links to join its three regions and to tie in major development activities underway. The routes joining the agriculturally-productive northern region of Zambia with Copperbelt consumers is extremely inefficient, and a considerable portion of the entire Zambian system experienced damage during the last rainy season.

By their very nature, moreover, roads are expensive and complicated investments. Once improved, a road must receive maintenance, representing a high recurrent expenditure, or it will deteriorate to its former state. Improving a road may attract additional traffic, necessitating further improvement to a higher standard. The easiest road to maintain is the most expensive to build; generally it requires labor-intensive techniques and should be built to maximum lengths. Seasonal variations, especially the wet periods common to Southern Africa, are especially detrimental to road surfaces and improvements to gravel roads are often eroded within a year.

There is a widespread scarcity in the transport and telecommunications sectors of skilled and semi-skilled labor. This is particularly a problem in telecommunications where an error in installation or repair leaves the line without service. Throughout the region semi-skilled labor is drained off the public sectors by private industry. The shift to parastatal status provides increased salary scale flexibility, but is not an option for all operations. The situation is considerably complicated by inadequate training programs which frequently use training equipment dissimilar to that found in the field.

The construction and operation of a railway on an economic basis requires a complement of sophisticated skills. The return on investment is long term, and the opportunities for inefficiencies are multiple. Railways provide major links to ports in general and primary access to world markets for minerals; although--with the exception of upgrading and certain spur lines of rail--rail development is adequate for the present level of mineral exploitation. Little interest in mining can come without phased development of the railways to handle future needs. Complementary planning between the two sectors will be necessary.

The maintenance of equipment used by the transport sector is an ever present constraint on development. Equipment-down rates sometimes exceed availability rates, but in almost all countries in Southern Africa are over 30 percent.

Spare parts are usually purchased abroad and require the expenditure of scarce foreign exchange. As a result, inventories are low and misused equipment must wait for extended periods of time for receipt of a single part. This situation is particularly crucial in Zambia. The overall result is usually cumulative, resulting in long delays in the provision of transport and telecommunications services.

Development efforts are increasingly being restricted by the inadequacy of telecommunication services. Telephone systems are unable to meet present demand and face serious maintenance problems. Zone switching centers and exchanges can seldom work at capacity, reflecting both a scarcity of trained manpower and spare parts.^{1/} The situation is most serious in Zambia, but Botswana has been trying for about five years to install a new telephone exchange in Gaborone.

On the surface it would seem that the commercial sector would be most immediately affected by inadequate telecommunication services. Certainly it can be argued that the traditional sector has functioned for generations without such service and the rural poor are most sheltered from this constraint. The perspective of this study is not such. Although one can more readily observe the limits on the commercial sector, the constraint is equally pressing on the agricultural sector, particularly in regard to those activities seeking to upgrade rural conditions. Over 200

^{1/} For a brief survey of economic return and social impact of telecommunication projects in Botswana, Lesotho, and Malawi, see International Telecommunication Union. Telecommunications for Rural Development: Identification Mission for the Establishment of Special Telecommunication Services.

letters were examined in Lusaka, for example, which had been written by small- and medium-scale farmers or representatives of rural development projects concerning their need for repairs to or the installation of a phone. In several cases the phones had been out of service or unreliable for one or two years. Included among the various complaints were:

- loss of animals as a result of the inability to contact veterinary help or advice;
- loss of time in the field because a farmer had to personally do what he could have done via phone (usually this involved also transport cost and was complicated by transport inadequacies);
- complications in obtaining fertilizer, seeds, or other necessary inputs;
- inability to verify receipt of correspondence, applications, orders, or other documents sent to private or government offices;
- harvesting and marketing complications;
- loss of opportunity for--or inability to--obtaining short-term labor needs.

Added to these documented complaints must be the larger number of non-reported, daily constraints on agricultural productivity which relate to inadequate telecommunication services.

In some cases investment in telecommunication services is justified on the basis of direct economic return, but in many instances such investment is supportable only on the basis of such strategic considerations as reduced dependence on an external single source or for indirect economic reasons. The importance of telecommunications for rural development, however, warrants continued appraisal, especially in relation to

- government implementation and administration of rural development activities;
- the grazing, watering, migration, and marketing of cattle;
- logistical support for a variety of social services, including health and education;
- maintenance and repair of vehicles and equipment.

B. Donor Perspectives and Activities

One of the central concerns of this study is an overview of donor activity in Southern Africa. The consultants met with representatives of 11 different donor or sponsoring agencies active in the region. Unfortunately there is no central coordinating agency for assistance to Southern Africa as there is for the Sahel, and donors are inadequately informed about one another's activities. Local representatives of the UNDP were the best informed source of donor activity in each country. Donor activity is discussed in conjunction with each mode in the country surveys in Part II. The following section, however, presents first a general discussion of donor activity and then individual donor summaries with a series of charts of each donor's conception of its role and its conception of the role USAID should play in development assistance for Southern Africa. The section is provided as a useful and essential base for subsequent USAID involvement in the region.

Donors generally rationalize assistance to Southern Africa in terms of impact on the rural poor and classification by the United Nations of most of the countries in the

region as the least developed of the developing countries. Emphasis is given to agricultural or rural development projects. The development of local level or village institutions is a common theme; at least two donors actually seek input from the local level in the design and planning of the development of transport and other economic infrastructure associated with rural development. Training is a major component of many projects with less emphasis being given to general or academic secondary education and more support being given to vocational training. Technical assistance is an essential aspect of most national programs and usually results in the provision of expatriate advisors who work either on a direct contract basis with the government or as members of a development project team.

The donor agencies see themselves in quite divergent ways, not necessarily consistent with the image they project or which other donors hold of them. The Ministry of Overseas Development (ODM) of Great Britain is seeking to modify the historical base of its assistance program and denies being better informed on problems in Southern Africa on the basis of having administered colonies there. The German Development Institute (GDI) sees activity on the part of the Federal Republic of Germany in Namibia as the logical extension of an historical presence there, even if such seems somewhat a distant event in objective terms. The United Nations Conference on Trade and Development (UNCTAD) is seeking a broadened leadership role in policy and program research, as well as project design and implementation.

Although some donors express concern over possible restrictions to which assistance from USAID is tied, all of the donors or sponsors contacted would be interested in cooperative assistance efforts with the United States.^{1/} Only six of the agencies contacted, however, have budget resources for project financing. UNCTAD, the Inter-Governmental Maritime Consultative Organization (IMCO), and the International Telecommunications Union (ITU) are heavily dependent upon UNDP sources. They would welcome funding by USAID which would utilize the functional expertise associated with their respective concerns. The Ford Foundation would like USAID to pick up the capital costs for projects suggested by Ford research programs.

The conceptions of a role for USAID in Southern Africa clearly include non-economic functions. ODM is interested in USAID as a long-term stabilizing presence in the region and for development of a rationale for regional cooperation. The Swedish International Development Agency (SIDA) would like to see the U.S. introduce the concept of sector support rather than project-specific assistance. Several donors,

^{1/} For a description of donor role conception, policy issues, and role conceptions for USAID, see Table III, Donor Perspectives, Attachments A through K. Additional comments on donor perspectives, operations, and technical assistance program operations are provided in the Appendix, Annex Donor Summary Statements: Attachments A through K.

As the Norwegian Agency for Development (NORAD), welcome the assistance of USAID in the reduction of the region's dependence on South Africa and the promotion of human rights.

Although not in conflict, these multiple interests will

complicate the coordination of future technical or assistance by USAID in Southern Africa.

Donors see their assistance as part of a rational-regional strategy and most define their programs as specific. The Canadian International Development Agency (CIDA) has included the support of regional institutions and multiple country projects as a major form of its development strategy (1975-1980). ODM, moreover, believes that the greatest basis for regional cooperation is in the transport and communications sector and would be interested in further consideration of such. UNCTAD is particularly interested in a regional approach to transport problems in Southern Africa and such groups as ITU and IMCO would be open to assistance in regional training facilities.

TABLE III. Donor Perspectives: Attachment A, CIDA

Although not a major actor in third world politics and not centrally preoccupied with relations with the developing countries in its foreign policy, Canada projects a potentially significant impact for itself on development cooperation. Lacking colonial relations or ambitions, Canada has helped promote its reputation as a relatively progressive and unbiased participant in third world affairs. Canada projects potential influence on behalf of the developing countries and the possession of certain common interests as the basis for a cooperative role with CIDA serving as an implementing institution.

Role
Conception

Priority to the poorest developing countries and the poorest segment therein. Aid for rural development to be concentrated in limited number of countries on basis of need, commitment to development, other donor assistance, and general Canadian interests.

Policy

1. Associated equipment
2. Expatriate advisers
3. Training programs in Canada, in-country and third countries
4. Research Centers

T/A*

Botswana
Malawi
Lesotho
Swaziland

Primary
Projects
(Transport)

Welcome support of US/AID in furthering agricultural/rural development, regionalism, and multi-partite cooperation.

Role
Conception
For US/AID

* Technical Assistance

TABLE III. Donor Perspectives: Attachment B, EEC

Promotion of financial and technical cooperation on international and regional basis with special emphasis on problems of the least developed countries and correction of structural imbalance in sectors of their economies. Special role in training countries to participate more fully in the administration and management of their own aid projects. Concern for promotion of regional cooperation.

Role
Conception

Emphasis on rural development, training and associated economic and social infrastructure. Work on five-year planning cycle; hope to consolidate projects and increase emphasis on social service projects keyed to income maximization.

Policy

Handled through EDF, mainly grants, various programs including studies, advisers, and projects.

T/A*

Botswana: Road construction, proposed railway training center.

Malawi: Blantyre-Chikwama Road, Chiweta-Karonga-Mwanga Road survey. Possible telephone network improvement project. Considering regional telecommunications school pilot training.

Primary
Projects
(Transport)

Lesotho: Road design, maintenance centers.

Swaziland: Little construction, GOS feels terms too restrictive and complicated.

Interested in possible joint cooperation (internal politics, restrictions, and time delays associated with EEC funding at present should be investigated prior to consideration of joint activities.)

Role
Conception
for US/AID

*Technical Assistance

TABLE III. Donor Perspectives: Attachment C,
Ford Foundation

1. Support of economic development by capacity - development of both institutions and individuals.
2. Promotion of human relations and rights.

Reduction of role in technical assistance except where maximum return expected.

1. Representative agents
2. Training
3. Research

Botswana: Provision of four representative advisers.
Lesotho: Grant for study of external economic relations.

Support of large-scale institutional and infrastructure projects, perhaps pick up capital aspects of follow-up for studies Ford would support such as in the case of National Education Commission Report in Botswana.

Role
Conception

Policy

T/A*

Primary
Projects
(Transport)

Role Conception
for US/AID

*Technical Assistance

TABLE III. Donor Perspectives: Attachment D, GDI.

Performs policy studies related to topical economic, social and political issues in selected developing countries. Envisions itself as similar to the Brookings Institution as public form for evolution of policy. Summarizes current conditions and in-depth research. Sees leading role for self in Namibia because of colonial relationship and number of Germans still resident in Namibia.

Role
Conception

Development of aid strategies for government action.

Policy

In-house and field research and consultants.

T/A*

Summary reports on literature relevant to Namibia and Zimbabwe and the evolution of preliminary development strategies for these countries.

Primary
Projects
(Transport)

Would be interested in sharing research findings with AID and joint coordination of assistance efforts for Namibia.

Role
Conception
for US/AID

*Technical Assistance

TABLE III. Donor Perspectives: Attachment E, ICAO.

<p>Promotion of civil aviation through support of civil aviation training, particularly in relation to the training of pilots. Serves as source for funneling funds to assist countries in civil aviation training and the evolution of a civil aviation training facilities network for each region.</p>	<p>Role Conception</p>
<p>Seeks combination of technical specializations with labor intensive positions; training to take place in Europe or in-country; progressive expansion of facilities.</p>	<p>Policy</p>
<p>Variety of training programs including national and multinational training centers.</p>	<p>T/A*</p>
<p>Botswana: Fellowships and flight-safety training.</p>	
<p>Lesotho: Fellowships.</p>	
<p>Malawi: UNDP/ICAO Project to be terminated 1978. Some fellowships to continue.</p>	<p>Primary Projects (Transport)</p>
<p>Mozambique: Fellowships; ground training center proposed with UNDP funding.</p>	
<p>Swaziland: One DCA and various fellowships.</p>	
<p>Zambia: UNDP/ICAO Project terminated 1976.</p>	
<p>Interested in US/AID assistance as possible supplement to UNDP funds which presently are major source of project support.</p>	<p>Role Conception for US/AID</p>
<p>*Technical Assistance</p>	

TABLE III. Donor Perspectives: Attachment F, ITU.

<p>Maintenance and extension of international cooperation for improvement, effective operation, and national use of telecommunications; allocation of frequency use and regulation of telecommunications operation.</p>	<p>Role Conception</p>
<p>Provision of most effective, integrated service to the widest public possible. Particular emphasis on development of networks for developing countries and training national planning authorities.</p>	<p>Policy</p>
<ol style="list-style-type: none"> 1. Fellowships 2. Training specialists 3. Equipment 	<p>T/A*</p>
<p>Botswana: Sector development planning</p>	<p>Primary Projects</p>
<p>Lesotho: Financial advisers</p>	<p>Primary Projects</p>
<p>Swaziland: Management advisers</p>	<p>Primary Projects</p>
<p>Zambia: Training center establishment now being used for Namibia training program.</p>	<p>Primary Projects</p>
<p>Interested in cooperative efforts using ITU expertise. See particular need for training center in Mozambique, continued funding Malawi center.</p>	<p>Role Conception for US/AID</p>

*Technical Assistance

TABLE III. Donor Perspectives: Attachment G, IMCO.

<p>Promotion of technical aspects of maritime operations and safety, including shipping, ports and harbors, marine pollution, and associated areas of training, legislation, communications, and shipbuilding/repair with specific goal of promotion of uniform operational standards on an international base.</p>	<p>Role Conception</p>
<p>General: Priority on maritime training and development of indigenous institutions. Also country specific.</p>	<p>Policy</p>
<p>Provides advisers, equipment, fellowships.</p>	<p>T/A*</p>
<p>Namibia: Have discussed basic outline of administrative and program needs with U.N. Commission for Namibia.</p>	
<p>Mozambique: Discussed establishment of training facility for Portuguese speakers with Government of Mozambique. Norway is also interested in funding such a project.</p>	<p>Primary Projects</p>
<p>Malawi: 25 fellowships for training deck and engineering cadets over a five-year period supported by UNDP at cost of \$1,149,760.</p>	
<p>Would welcome association with US/AID in funding of maritime training programs.</p>	<p>Role Conception for US/AID</p>

TABLE III. Donor Perspectives: Attachment H, NORAD.

Facilitate development of human and economic infrastructure with major emphasis on rural and agricultural feeder roads, rural health projects, and village development. Such input from local institutions for project design.

Role
Conception

No emphasis on development of regional cooperation but strong interest in reduction of economic dependence on South Africa.

1. Initially offered aid on very soft conditions but now demanding more control over project design.
2. Seeking to consolidate projects.
3. Link expatriates to aid.
4. Special concern for village development and role of women.

Policy

Use volunteers and contract consultants for various projects.

T/A*

Botswana: Rural roads, health, village development.

Mozambique: Third major target in southern Africa but little transport.

Zambia: Cooperating with FAO on funding transport/marketing project in northern region of country.

Primary
Projects

Strong interest in reducing dependence on South Africa and feel that US/AID completion of inner circle route (Kanye to Ghanze to Maun to Nata) with links to Namibia and Zimbabwe would both facilitate development programs and reduce dependency.

Role
Conception
for US/AID

TABLE III. Donor Perspectives: Attachment I, ODM.

Traditionally has seen obligation to provide assistance based on historical relationship with former colonies. Mix of capital assistance and technical assistance, but see need to support localization and reduce physical presence. Wish to play less of a "donor-of-last resort" role and to increase economic return rates for project.

Role
Conception

Priority on poorest countries/poorest segment with rural development. Also associated economic infrastructure. New policy since 1978 emphasizes training programs, eventual goal of localization. De-emphasis on health.

Policy

Extensive supplementation program provides expatriate advisers.

T/A*

Malawi: Road projects, North-South links.

Lesotho: Major donor. Rural roads and telecommunications.

Zambia: GNP too high for capital aid program, but supplementation program, training programs, spare parts and maintenance assistance.

Primary
Projects

Mozambique: Program aid facilitates spares and maintenance, especially for transport, road projects.

Very interested in multilateral funding. Would welcome increased US/AID involvement in area.

1. Long-term stabilizing presence.
2. Rationalization of framework for regional cooperation.

Role
Conception
for US/AID

TABLE III. Donor Perspective: Attachment J, SIDA.

<p>Support efforts of southern African countries to create viable independent states which, by definition, includes reduction of dependence on South Africa. Little concern with regionalism since such better supported through international organizations.</p>	<p>Role Conception</p>
<p>Attempting to restructure aid from project-specific basis to general sector support in order to increase flexibility and provide aid as an integrating mechanism.</p>	<p>Policy</p>
<p>Mainly personnel, but training/fellowships often tied to projects and some project-related equipment.</p>	<p>T/A*</p>
<p>Botswana: Road engineers. Zambia: Capital funds for materials/balance of payment support; trucks, railroad advisers for car manufacturing; expansion of telephone exchanges.</p>	<p>Primary Projects</p>
<p>Promotion of integral and program rather than project-specific aid. But this approach is best way to bring about permanent structural/functional change, even if it is slower and more difficult.</p>	<p>Role Conception for US/AID</p>

*Technical Assistance

TABLE III. Donor Perspectives: Attachment K, UNCTAD.

Within overall program of assisting developing countries in field of trade and development, particular emphasis being given to the countries classed as least developed. Special program also land-locked and island developing countries.. Have sought leadership role in intensified research and analysis on the policies and programs of these countries for broadened technical assistance.

Role
Conception

Support more flexible country/situation specific assistance.

Policy

Special advisory services including research and analysis plus associated project equipment and training.

T/A*

Preparing analysis of transport in southern Africa, in association with UNDP, to include concrete project proposals. Short-run emergency project to clear port of Dar es Salaam and two-year regional study of major transport corridors and associated use-costs.

Primary
Projects

Presently restricted by heavy dependence on UNDP for funding. Would welcome US/AID role as supplemental source of funding for cooperative projects. Especially interested in some pilot projects based on such cooperation.

Role
Conception
for US/AID

*Technical Assistance

C. Summary of Recommendations

1. In general, this study does not recommend major capital investment in additional transport infrastructure. Emphasis is given, rather, to improving the maintenance and operation of existing facilities through technical assistance and manpower training. Exceptions to this position are tied to the provision of key links--as in Botswana--the promotion of associated sector development, or political considerations outlined in each case. (For a summary of country specific recommendations, see Table IV, Summary of Recommended Assistance by Modes, Attachments A-H included at the end of Section C.) This position is based on the perspective that deterioration and mismanagement are not the only major constraints to efficient transport in the region; there are various other considerations:

- Large-scale investment in any one of the countries would cause absorption problems and dislocations in the internal economy. A survey of this issue has just been conducted under the auspices of IBRD and should be considered in conjunction with assistance in programming. Similarly, investment in development projects often results in increased recurrent budgeting and manpower needs, even after the termination of the project.
- The logic for designing major capital investment priorities is closely tied to political developments in Namibia and Zimbabwe. Until the dimension of the settlements and orientation of the governments become clear, major capital investment initiatives are premature.
- Various regional transport studies by such groups as UNCTAD and IBRD and certain national transport surveys by various consulting firms have just been completed, are underway, or are under consideration. Large-scale investment should await an appraisal of the findings of certain of these studies.

A major role is projected for technical assistance. Particular targets are management, maintenance, and a variety of manpower training programs. In certain cases, however, technical assistance is suggested as a means of providing advisors on a contract basis who will supplement ministry staff. The role of these specialists will be functionally oriented, following the basic orientation of present USAID programs, and should involve counterpart training where relevant. The timeframe for such assistance, especially in view of the shortage of qualified personnel in most of the countries in Southern Africa, may well necessitate one or more contract renewals. Although localization should be an essential element of development planning, it should not be regarded as a primary goal for short-run planning.

It is also recommended that liberal use be made of short-term consultants. These specialists can be assigned to a specific task regarded as essential to immediate ministerial planning needs but for which staffing has not been provided. To work effectively, this approach must be flexible to task and time demands. It could be handled through discretionary local USAID mission funds. Assignments should range from transport policy and passenger/freight rate analysis to pre-feasibility studies.

2. Implicit in the assumption of this study is the position that there needs to be a redefinition of the Congressional mandate guiding USAID assistance. Micro-level projects providing direct impact on the rural masses are gratifyingly

visible but macro support may be necessary in order to ensure that the economy as a whole grows in ways maximizing the impact of rural development. The farmer who can grow twice his crop yields benefits only to the extent that transport constraints allow him to market that crop.

A village with a new well may have a higher standard of living but can still lose as many members to disease as a whole because medical help or supplies cannot reach them.

To maximize impact on the rural poor, investment should be keyed to:

- Agricultural and rural development projects and their associated feeder route networks
- Linkage of production and marketing areas, or of two different modes, providing an expansion of the overall marketing network
- Support of associated sector development
 - especially when it encourages employment generation (frequently there will also be a need to provide manpower training)
 - especially if it frees a sector from major constraints resulting in indirect employment generation from sectoral spillover
 - often will require phased inter-sector planning for reciprocal development
- Direct-hire income generation--labor-intensive techniques may not work well on major route construction, but painting lane markers, sign maintenance, etc. can provide permanent employment opportunities (recurrent costs must be considered here)

3. It is recommended that USAID take specific action to encourage donor communication and participation. Periodic donor conferences keyed to the transport sector should be encouraged.

A regional coordinating office similar to that now operating in Paris for the Sahel should be considered. (See the next section for further discussion.) Although UNDP project lists are useful, supplemental information, including project start-ups, completion dates, and new agreements, could be the basis for a periodic fact-sheet or newsletter. Particular concern should be maintained for the social impact of transport development policies, and USAID should attempt to draw on both technical expertise and understanding of the socio-economic interface held by other donors and international development project sponsors. Joint funding or matched phasing of projects should be increased.

4. Regionalism as a viable approach to development in Southern Africa has been applied far less than one might hope. The very nature of the transport sector and the Southern African geographic configuration, in which six countries in the region are landlocked states, dependent upon one another and the coastal states for their transport needs, necessitates an integrated approach. Recommending that USAID promote regionalism in its assistance program for the region, however, requires certain guidelines. Basically:

- Regional cooperation which is not tied to an institutional structure is likely to have little permanence.
- Regional cooperation which is not based on pragmatic gains is likely to be short-lived.
- Regional cooperation at the cost of national policies, programs, or institutions will be of little interest.

Various functional issues seem predisposed to regional cooperation. Included might be:

- costing studies providing a basis for realistic charges on a regional basis;
- regional appraisal and upgrading of storage facilities;
- analysis of regulatory transport policies, including permits and fares;
- joint efforts at modal selection to facilitate traffic flow;
- investigation of impact of such expected innovation as containerization on regional transport;
- education/training programs for special transport skills.^{1/}

^{1/} The establishment of regional training programs has already been initiated, with varying degrees of success. Nearly every country would prefer to train its own nationals at home but are prohibited from doing such due to the costs involved. Setting aside cultural and political questions, regional programs are often too theoretical. The evolution of regional training programs has also been restricted by the diversity of equipment being used in the region. Participants often receive general system training but must relearn equipment-related training through on-the-job experience upon their return. The development of national training programs will remain essential until equipment is standardized on a regional basis. Regional institutions can be useful, however, in providing intermediate or advanced training where equipment specificity is not as important or where greater degrees of standardization exist. Initial acceptance of regional training can be phased through the use of exchange programs, including administrators, instructors, and national participants. Assistance in structuring these exchanges should be provided by consultants in cross-cultural and small group relations. For a summary of ICAO proposals for regional development, see Appendix, Annex III, Proposed Organization of Civil Aviation Training in Africa.

5. For both political and economic reasons, it is recommended that USAID projects promote modification of the dependency on South Africa, which characterizes the region. Displacement of this dependence is most difficult functionally and structurally, and it is modification, rather than elimination, of the relationships with South Africa which is at stake. Efforts in pursuit of this goal can have high emotional appeal, but they will have little permanent value or impact unless they are pragmatically based and take into account the extended impact of their implementation.

6. Except for the regional project discussed in conjunction with the BLS, investment in civil aviation has been restricted largely to manpower training. Investment in this mode is costly, must meet international standards to be effective, and currently is not a USAID priority. Such investment, however, could provide selected social services to remote areas on a regular or emergency basis, deliver vital spare parts or repairmen, facilitate general administration of a country, aid supervision of development or training projects, serve as a back-up mode for times of crisis affecting surface modes, promote regionalism, and provide various symbolic functions. This study would recommend a more selective discussion and rationalization of USAID policy concerning the role of civil aviation in national development planning. Similar consideration should be made for telecommunications.

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODE.

Attachment A, Botswana

ROADS

- Technical Assistance in Transport and Management Development, MWC, transport policy and regulation
- Technical Assistance in Manpower Training and Equipment Management, RD/CTO (also associated with capital assistance) training in road construction and maintenance
- Capital Assistance, Tuli Block Road
- Technical Assistance and Associated Capital Assistance in Arid Land Road Construction and Stabilization for Ghanzi Road

RAILROADS

- Capital Assistance, locomotives, for emergency takeover
- Technical Assistance, development of cost-base rate structure
- Technical Assistance, survey of short-, intermediate-, and long-term manpower shortages
- Technical Assistance/Fellowships for regional training school
- Technical Assistance, update of feasibility study for railroad from Francistown to Sua Pan site
- Technical Assistance, engineering and economic analysis of Trans-Kalahari Railway, linking to Walvis Bay

CIVIL AVIATION*

- Regional Coordination, capital and training needs for BLS
- Technical Assistance, feasibility study for regional BLS airline

TELE-COMMUNICATIONS

- Technical Assistance, Gaborone Exchange installation
- Technical Assistance, feasibility and cost analysis Ground-Satellite Station
- Technical Assistance in Telecommunications Management and Training, DP & C
- Capital Assistance, Zone Switching Center, Gaborone, Mahalapye, and Francistown

*Need for USAID position on G.A. and Development priorities.

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES

ATTACHMENT B, LESOTHO

	<ul style="list-style-type: none"> • <u>Technical Assistance</u> in road maintenance and manpower training, mechanical branch, MW • <u>Technical Assistance</u> in freight haulage regulations, MTT; in particular, concern with negotiations with South Africa • <u>Capital Assistance</u>, road construction, Mofales Hoek to Mpitl
RAILROADS	<ul style="list-style-type: none"> • None
AL	<ul style="list-style-type: none"> • <u>Regional Coordination, Capital and Training for BLS</u>
TELE- COMMUNICATIONS	<ul style="list-style-type: none"> • None

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES
Attachment C, Malawi

ROADS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> in transport policy regulation and enforcement; Ministry of Transport and Communications • <u>Technical Assistance</u> in modal linkage relationship between road and lake traffic; Ministry of Transport and Communications & Economic Planning Division, Office of the President and Cabinet • <u>Technical Assistance</u> in road engineering, upgrading engineering competence • <u>Capital Assistance</u> for road construction, Project No.12
RAILROADS	<ul style="list-style-type: none"> • <u>Technical and Associated Capital Assistance</u> for diesel-electric school at Limbe
CIVIL AVIATION	<ul style="list-style-type: none"> • <u>Capital Assistance</u>, Air Malawi Fleet • <u>Technical Assistance</u>, Malawi Polytechnic expansion • <u>Support</u> of ICAO efforts for multinational training center
TELE-COMMUNICATIONS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for survey of rural telecommunication system expansion • <u>Technical Assistance</u> for training in telecommunications engineering and maintenance, prefeasibility and design • <u>Capital Assistance</u> for maintenance training equipment
LAKE TRANSPORT	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for modal analysis, traffic flows lake/road vessel, and associated facilities

TABLE IV . SUMMARY OF RECOMMENDED ASSISTANCE BY MODES
 ATTACHMENT D, MOZAMBIQUE

RAILROADS

- Technical Assistance and Fellowships for support of regional training school at Limbe in Malawi
- Capital Assistance for establishment of railhead at Moatize

PORTS

- Technical Assistance and Capital Assistance for IMCO training program

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES

Attachment E, Namibia

ROADS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for design of master road development plan
RAILROADS	<ul style="list-style-type: none"> • <u>Feasibility Study and Economic Analysis</u> of benefits of spur lines into homeland areas • <u>Feasibility Study</u> on linkage with Trans-Kalahari Railroad included associated investment costs and returns for upgrading of Walvis Bay
OTHER	<ul style="list-style-type: none"> • <u>Coordination and Support</u> of survey of infrastructure development and conditions, maintenance and capital investment requirements, personnel and manpower needs

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES

Attachment F, Swaziland

ROADS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> in road maintenance and maintenance training, roads branches, keyed to upgrading road maintenance and deterioration since 1975 • <u>Technical Assistance</u> in vehicle and equipment maintenance and training, CTO; reduction of equipment downrate • <u>Technical Assistance, Statistics, Management Training and Staff Development</u> to expand professional staff • <u>Capital Assistance, Workshop Development, CTO</u> meshed to assistance from U.K.
RAILROADS	<ul style="list-style-type: none"> • Not immediate, but survey of containerization may be needed in medium-term
CIVIL AVIATION	<ul style="list-style-type: none"> • <u>Technical Assistance, Training</u> in airport management and operations, support of proposed training program • <u>Capital Assistance</u> in fire fighting and safety equipment
TELE-COMMUNICATIONS	<ul style="list-style-type: none"> • None

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES
ATTACHMENT G, ZAMBIA

ROADS	<ul style="list-style-type: none"> • <u>Capital Assistance</u>, road rehabilitation, Department of Roads; repair project for severe damage from rains • <u>Technical Assistance</u> in management and mechanics • <u>Technical Assistance</u> in management, planning, engineering planning and construction design • <u>Technical Assistance</u> in administration and management training, National Transport Corporation • <u>Capital Assistance</u>, National Group Inspectorate Program • <u>Capital Assistance</u>, freight holding equipment and spare parts project • <u>Technical Assistance</u>, engineering study for Angola road. • <u>Capital Assistance</u>, Chembe Bridge construction
RAILROADS	<ul style="list-style-type: none"> • <u>Capital Assistance</u>, locomotive spare parts • <u>Capital Assistance</u>, Chipata and Moatize warehouse facilities • <u>Technical Assistance</u>, feasibility of wagon manufacturing plant in Malawi for export to Zambia • <u>Technical Assistance and Fellowships</u>, training school at Limbe
CIVIL AVIATION	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for planning study of division of programs between Zastl and regional ICAO-related training center
TELE-COMMUNICATIONS	<ul style="list-style-type: none"> • <u>Package Assistance</u>, Lusaka exchange development • <u>Technical Training</u> in system operation and maintenance • <u>Capital Assistance</u> for vehicle support • <u>Capital Assistance</u> for equipment purchase, supply of telephones • <u>Capital Assistance</u> for exchange structure construction • <u>Technical Assistance</u> in telecommunication engineering and skills • <u>Capital Assistance</u>, earth satellite station conversion • <u>Management Training and Development</u>

TABLE IV. SUMMARY OF RECOMMENDED ASSISTANCE BY MODES
ATTACHMENT H, ZIMBABWE

ROADS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for road and <u>Capital Assistance</u> for associated equipment, maintenance development and training • <u>Technical Assistance</u> in transport management and policy development • <u>Technical Assistance</u>, survey of road construction needs for African areas • <u>Capital Assistance</u>, road construction for African areas
RAILROADS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for policy and operational planning, Rhodesian Railways • <u>Capital Investment</u> for upgrading system to mesh with post-sanction situation • <u>Capital and Technical Cost</u> of maintenance for immediate and long-run programs • <u>Policy</u> for rerouting traffic to Beira and Maputo • <u>New Tariff Rates and Regulatory Policy</u>
CIVIL AVIATION	<ul style="list-style-type: none"> • <u>Technical Assistance</u> for maintenance training • <u>Technical Assistance</u> for surveys of maintenance, telecommunication needs and safety
TELE-COMMUNICATIONS	<ul style="list-style-type: none"> • <u>Technical Assistance</u> in management, maintenance and manpower training

D. A Suggested Approach: Donor and Project Integration

Although rationalization of the recommendations presented in this study into a unified strategy for USAID assistance for transport development in Southern Africa lies beyond the scope intended for this study, the introduction of an innovative approach to transport planning would represent a distinctive contribution to economic development in general for the region. The ability to project and promote such an approach would clearly also assist the interest of the U.S. in establishing the image for itself as a responsible presence in Southern Africa.

Just as this report does not recommend massive capital assistance to the transport sector, neither does it envision a dominant principal assistance role for the U.S. in Southern Africa. Rather, what would be proposed would be selective assistance designed to encourage donor cooperation in achieving regional solutions to transport problems constraining Southern Africa.

A suggested point of departure for this approach would be support for UNCTAD activities in the region. At the present time UNCTAD is designing two transport projects for immediate implementation. These projects are keyed to analysis and resolution of transport constraints in the region. Major emphasis is being given to flows of passenger and freight transport to and from Zambia and adjacent landlocked states.

The first project is a UNDP-funded crash program to clear the Port of Dar es Salaam. The project is being designated for a four-month period. A team leader and 10 consultants in such fields as railway shipping, truck transport, port management, and transport economics will provide an estimated total of 36 man months. The significance of the project is that in trying to solve the crisis at Dar es Salaam the project will examine problems external to Tanzania. This perspective clearly relates to the focus of the second UNCTAD project.

The second project is being designed as a two-year project with an estimated personnel and operating cost of about US \$2 million. The focus of the project is transport throughout Southern Africa as a whole. In addition to two transport economists, specialists for each of three modes--roads, railway, and ports--will be included. Short-term consultants in such fields as transport management/operations, cost analysis, air freight, and storage are planned.

The project will seek to analyze trade flows in the region and prepare economic, social, and financial costs estimated for over 30 different transit routes. (See Table V, UNCTAD: Provisional Corridor Study List - Southern Africa Transport Project.) Financial and economic analyses of improvements to the transit systems, including investment in management and training, will also be provided. Suitable pricing policies will be suggested and the best trade flow for each mode and route will be suggested. Such associated

TABLE V
 UNCTAD: PROVISIONAL CORRIDOR STUDY LIST
 PROJECTED SOUTHERN AFRICA TRANSPORT PROJECT

Routes Being Used	Routes That Have Been Used	Potential Routes	Trade Routes
Lesotho-Durban			Lesotho-Johannesburg
Lesotho-East London			
Swaziland-Durban		Swaziland-Richards Bay	Swaziland-Johannesburg
Swaziland-Maputo			
Botswana-Cape Town	Botswana-Beira	Botswana-Walvis Bay	Botswana-Johannesburg
Botswana-Durban	Botswana-Maputo		
Botswana-Maputo			
Botswana-Port Elizabeth			
Malawi-Beira	Malawi-Rhodesia	Malawi-Dar es Salaam	
Malawi-Nacala	Malawi-Johannesburg (Via Rhodesia)		
Malawi-Johannesburg (via Zambia/Botswana)			
Zambia-Dar es Salaam	Zambia-Lobito	Zambia-Matadi	
Zambia-Beira (Mozambique)	Zambia-Beira (via Rhodesia)		
Zambia-Beira (Malawi)	Zambia-Johannesburg (Rhodesia)		
Zambia-Nacala	Zambia-Mombasa		
Zambia-Johannesburg (Botswana)			

Total Number of Routes that could be Studied: 16 for Routes being Used; 8 for Routes that have been Used; 4 for Potential Routes, and 3 for Trade Routes.

issues as storage problems will be included in the study framework. The project will seek to resolve transport constraints as they are identified by flows of external assistance.

In certain respects the project resembles the study framework suggested by IBRD for implementation after the resolution of the situation in Zimbabwe. The idea of feeding assistance through the framework of the ongoing study is indeed an innovation. The very dimensions of the project would suggest renewal for at least a second two-year period, and it is conceivable that a more permanent situation could evolve.

Consultation with representatives of UNCTAD in Geneva revealed considerable interest in an expanded role for UNCTAD in donor assistance in Southern Africa in the transport sector. This interest is also reflected in the self-image projected in UNCTAD documents and publications. UNCTAD feels the need for an integrated approach which takes into account the links between countries and provides a more rational framework for investment by donors in transport. UNCTAD would like to see the project function as a pilot project for other regions.

The ability of UNCTAD to support such a function would most certainly require more staff support than presently available in Geneva, and one would suggest locating operations in a less expensive, regional setting. Before suggesting support for an expanded role for UNCTAD one would

need to consider such options as establishing a group similar to the Club des Amis du Sahel with which the UNCTAD project could be associated. It is the merger of the integrated analysis and the funding operation with minimal interface delays that is important, not who actually provides the coordinating function. UNCTAD is interested but is not insistent upon assuming this role.

UNCTAD would clearly welcome alternate and supplemental sources to UNDP funding. Expanded operations are clearly restricted by the fixed portion of UNDP funds allocated for Africa and total resource limitations of the organization. It is not the recommendation of this report that USAID seek to replace the UNDP funding. The costs of the two-year project already exceed the initial projection of UNCTAD and there will be a need for donor assistance. Although USAID might consider funding a major portion of the projected deficit, multi-donor support should be a goal. Clearly, initiatives in support of an expanded coordinating role for UNCTAD or some other mechanism for the integration of donor investment must be based on consultations with other donors.

There is considerable interest in the UNCTAD project by the governments of countries in the region. The BLS states have supported the integrated approach of the project's design from its inception. Tanzania welcomes both the emergency and the two-year projects as meaningful steps toward the resolution of constraints on its transport sector.

The benefits for Zambia, Malawi, and a Zimbabwe with reopened borders are equally obvious. Thus, the popularity of resolving the practical issue of transport would seem to provide the ideal basis for the promotion of regional cooperation on an institutional basis. It is an opportunity which USAID should consider carefully.

PART II: COUNTRY STUDIES

A. Botswana

1. National Objectives and Priorities

a. A Basic Overview

National objectives for the transport sector are contained in the National Development Plan (NDP IV) 1976-1981, which represents the fourth in a series of rolling five-year plans. The overall priorities delineated by the NDP IV include:

- rapid economic growth
- social justice
- economic independence
- sustained development

Priorities specified in the NDP for the transport sector include:

- reduction of the high cost of transport
- maximization of social impact benefits arising from the development of transport infrastructure
- reduction of vulnerability of the transport system to external factors and events

These priorities basically represent a restatement of those in the NDP III, but particular emphasis has been given under the present plan to a more precise definition of these priorities and associated objectives and policies.

Preparation of the National Development Plan 1979/80-1985/86 is underway. Preliminary to this effort has been the preparation of district plans for each of the nine districts in the country. This exercise of balancing

grassroots input and decentralized planning against overall national programs on an integrated and coordinated basis is an especially interesting endeavor. The government has evidenced interest in technical assistance from USAID for the final preparations of the plan.

The nine district plans are especially relevant to the transport sector. Repeated throughout the text of these plans is the theme that economic expansion in all sectors is constrained by the limited development of the transport sector as a means of major impact on the rural poor. Such a perspective is consistent with the overall strategy presented in the introduction of this study and provides a documented example of local support for investment in transport.

The most detailed discussion of transport policies is to be found in the National Transport Plan, the first phase of which has been published in the National Transport Plan and the Terms of Reference for Phase II have been drafted.

The Transport Plan projects policies for both the private and public sectors over a 20-year timeframe and considers needs ranging from construction to administration. Similarly valuable are studies of passenger and freight transport under consideration by the Botswana

Development Corporation (BDC) and the Ministry of Commerce and Industry.

Provisional discussion of national objectives for the transport and communications sector indicate a modification of the transport objectives as stated in the NDP IV to the following:

- to reduce the high costs of transport;
- to increase the net benefits to Botswana from transit traffic;
- to provide transport that will stimulate internal growth and linkages within Botswana;
- to ensure that benefits of transport reach all sections of the country and community;
- to reduce the vulnerability of the country;
- to generate as much unskilled/semi-skilled employment as financial considerations make possible;
- to improve quality and quantity of telecommunications and postal services, with special emphasis on subsidized rural service.

b. Development Strategy

The basic transport development strategy includes:

- Improvement of the North-South Road system to all-weather standards
- Completion of the Botszam Road to provide alternate trade connections through Zambia
- Maintenance of existing road system
- Upgrading access and feeder roads; increased utilization of labor-intensive maintenance and construction at this level
- Development of viable indigenous trucking industry
- Assumption of operational and maintenance operations of rail service
- Encouraging the expansion of air services and facilities

In conjunction with an emphasis on social service and human development needs, a major share of infrastructure investment during the NDP 76/81 will be concentrated in rural areas. Transport and communications projects in such areas will seek to create easy outlets and widened markets for agricultural products as well as facilitate the introduction of social services. Main road projects seek to link both the agricultural and mining sectors with Botswana's northern neighbors--Zambia, Tanzania, Angola, and Zaire--and to modify the structure and degree of economic dependency on South Africa.

c. Emphasis on Transport and Telecommunications

Throughout the 1970s development expenditures for the transport sector have represented a significant portion of budget allocations. Under the National Development Plan 1976-1981 (NDP 76-81) P73.7 million, or almost 30 percent, of the budget was devoted to roads, air services, railroads, and associated facilities and organizations. In certain years, however, expenditures have not been as great as allocations. For the fiscal years 1973-1975 only about 65 percent of the P28.0 million allocated for the transport sector was spent. The planned capital expenditure for posts and telecommunications was less than three percent of the total budget; for the corresponding three fiscal years actual expenditures were only about 64 percent of the total budgeted.

The transport system, combining road, railway, and air services, remains largely undeveloped. It is located mainly in the more fertile eastern region of the country where 80 percent of the population lives. The main flow of traffic is on a north-south axis.

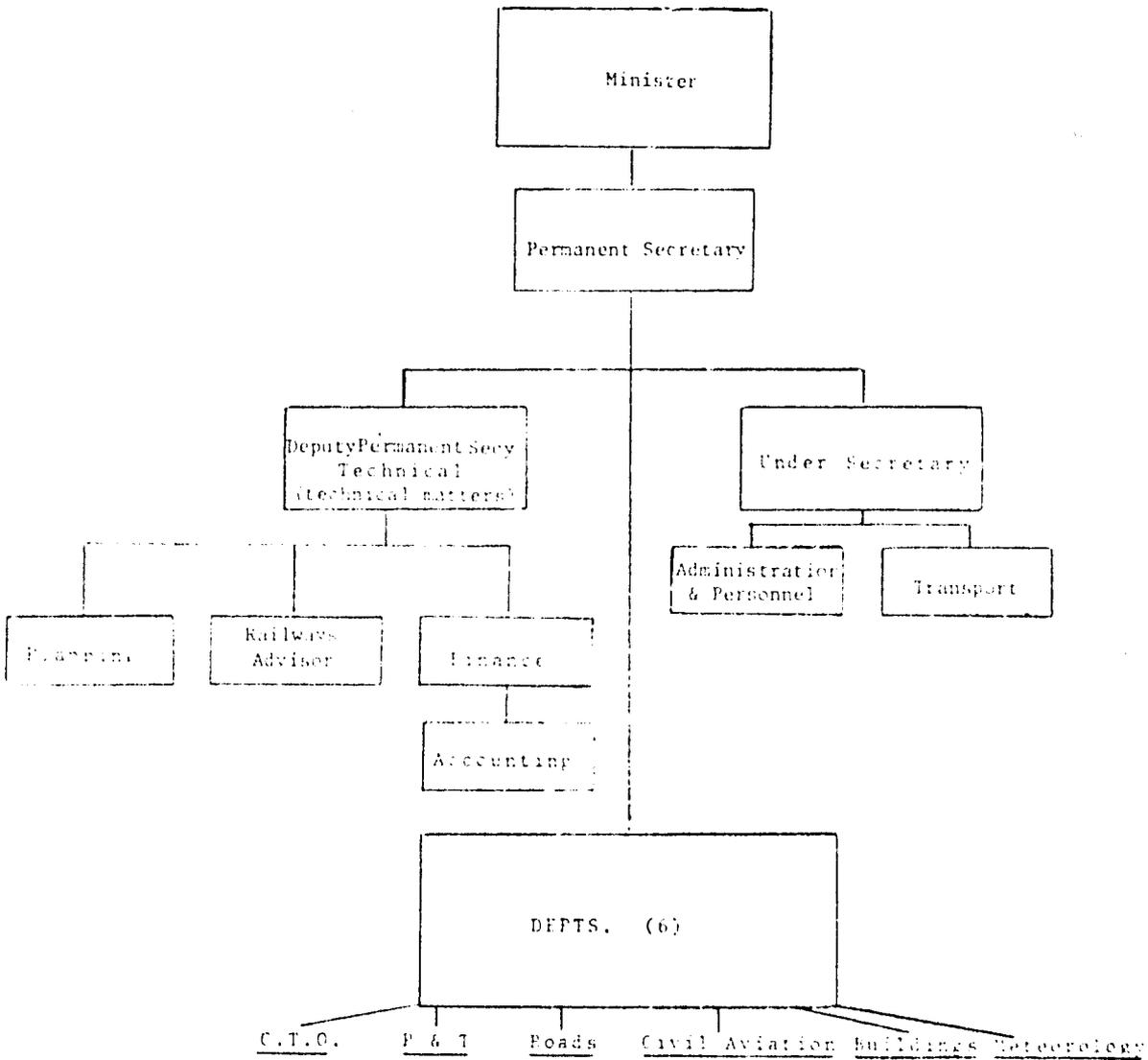
Topography does not present major problems for the construction of transport facilities but the restricted amount of water and other construction materials found in the arid region constrains both construction and maintenance. Low-density freight and passenger flows result in high unit costs, but the rate of return on most transport projects has been acceptable to international donors. A recent appraisal by the World Bank indicates that expansion in the agricultural and mining sectors during the mid-1970s has strained transport facilities and projects, and there is a need to improve and expand facilities as a requirement for increased development, especially mineral exploitation.

d. Institutional and Organization Structures

Administrative responsibility for the transport sector resides with the Ministry of Works and Communications (MWC). (See Figure VI, Organization of the Ministry of Works and Communications.) Included among the executive departments of the ministry are: Roads, Civil Aviation, and Central Transport Organization. There is also a Railways Advisor and a Transport Control Unit. Although the organizational structure of the ministry is adequate for

FIGURE VI

BOTSWANA: ORGANIZATION OF THE MINISTRY OF WORKS & COMMUNICATIONS - 1978



Source: Ministry of Works and Communications

national needs, the scarcity of trained personnel restricts the quality and quantity of ministerial activity. In order to fill senior and essential administrative positions the government has had to rely on expatriate advisors, often under some form of bilateral assistance. Many positions, however, remain vacant.

Responsibility for overall sector planning and coordination belongs to the Division of Economic Affairs of the Ministry of Finance and Development Planning (MFDP). An increasing workload and the limited expertise of the MFDP, however, have resulted in increased responsibility for transport planning under the Planning Unit of the MWC. The ability of this unit to provide this capacity is restricted by the same problems faced by the Division of Economic Affairs. Planning is further complicated by the unreliability in the past of such statistical information as traffic counts. Efforts to remedy this problem have included the establishment of a statistics unit in the MWC under a senior planning officer, but the need for qualitative and quantitative improvements in statistical reporting remains.

2. Analysis of Respective Modes

a. Roads

1) Development Constraints

The majority of domestic traffic is serviced by the road system. Most of the roads are unengineered and

many feeder and rural roads are hardly more than tracks. In 1977, for example, only 5 percent of the 7,200 kilometers of gazetted roads were paved. (See Figure VII, Botswana: Gazetted Roads Inventory, 1975 - Projections 1981.) Although an estimated 25% of the total development expenditure under the NDP 76-81 is devoted to the road system, only a marginal increase in system kilometers is projected for 1981. Emphasis will rather be on doubling the number of kilometers of paved roads and general system maintenance. A breakdown of projected activity indicates increasing upgrading of access to agricultural areas under the Rural Roads Project, but feeder roads essential to East-West traffic are expected to remain insufficient for national development needs. (See Table VIII, Botswana: Road Operations, Achievements and Projections, Department of Roads 1976/77-1978/79.)

Reconstruction and paving of the major North-South trunk up to Nata is expected to be completed by 1980. Major projects on this route projected for completion during 1977 and 1978 include:

- The North-South Road Phase III, Artesia to Mahalapye contract value P4 million, projected completion date 1977
- Mahalapye-Serule, contract est. of P13 million, projected completion date fall 1979 (150 km) FBCD
- Francistown-Serule, contract value P8.3 million, projected completion date 1979 (83 km) KFW
- Francistown-Nata, contract est. P9.5 million, opened November 1977; some final work mid-1978 (190 km) DANIDA, CIDA, NORAD

FIGURE VII

BOTSWANA: GAZETTED ROADS INVENTORY, 1975
PROJECTIONS 1981

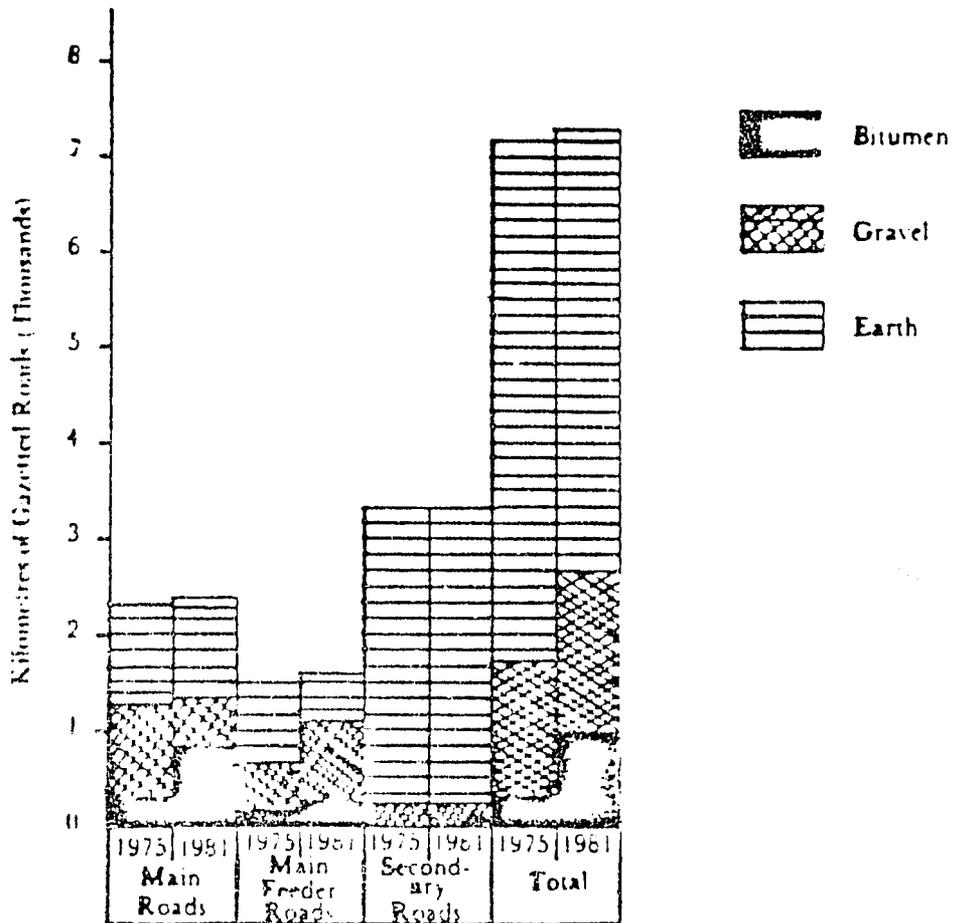


TABLE VIII

BOTSWANA: ROAD OPERATIONS, ACHIEVEMENTS AND PROJECTIONS

DEPARTMENT OF ROADS 1976/77-1978/79¹

Road Activity	Achievements 1976/77	Achievements 1977/78	Anticipated 1978/79	Anticipated by 1979	Target for 1979 in NDP IV
Main Roads Bitumen	291	83	75	449	540
Feeder Roads Bitumen	60	52	45	157	250
Main Roads Ground	306	--	--	300	145
Rural Roads Project	103	142	150-250 ²	395-495	600
Secondary Roads	-	46	115	161	100

¹Table reflects distances open to traffic, i.e. only road projects which are substantially completed and in use are included in the table.

²Depends on road standard (spot improvements, earth or sealed gravel)

Source: Unofficial data presented in preliminary draft subject to further discussion with the GOB National Development Plan V, 1979-1985, Ministry of Works and Communication, GOB, Gaborone, n.d., Keynote Paper.

TABLE IX

BOTSWANA: PER KILOMETER CONSTRUCTION COSTS BY ROAD STANDARD
1978 PRICES

Type	Standard	P (Pula-000s) Per Kilometer
Dirt	Spot Improvements	2-4
Gravel	Low Traffic	10-12
Gravel	High Traffic Full Standard	30-35
Bitumen	Main Road Standards	80-100 ¹

¹Figure could be lower, depending on standards for road base.

- Dumela Road, contract estimate P.5 million, projected completion date 1979
- Nata-Kayungula Road, contract value P11 million, projected completion date for design phase August 1978 (360 km) USAID (standard uncertain)

Projects linked to North-South trunk include:

- Gaborone-Molepolole, contract estimate P3.2 million, projected completion date fall 1978 (52 km)
- Lobatse-Kanye, contract estimate P3.7 million, projected completion date mid-1979 (45 km)
- Lobatse-Ramatlabama, contract estimate P3.7 million, projected start-up date 1979
- Serule-Selebi-Pikwe, contract P2.0 million, completion date 1977 (52 km)

The major project underway is the upgrading and paving of the Botszam Highway, linking Nata and Kasane. USAID is providing technical assistance for this road in the form of supervisory/design specialists. The EEC through EDF is to cover construction costs. Funding has been delayed for administrative reasons, and completion may be delayed beyond the projected target of 1980.

Although manpower is scarce at all levels, the scarcity is most visible at the professional/managerial level. In early 1978 there was only one national in the Roads Department who was a qualified civil engineer and the government was dependent on expatriates for 60% of all ministerial staff operations. The engineering design capacity of the Roads Department is limited to small-scale projects and is especially restricted by a shortage

of surveyors and soil technicians. The department remains dependent upon the assistance of foreign consultants for detailed engineering in general, and feasibility studies in particular. Although often impressively committed to government objectives, many expatriates are highly over-worked, and uncertainties over contract renewals, recruitment, and external assistance to support their salaries complicate planning and program implementation. The government has a stated policy of localization but realizes that this is an idealistic policy which is not immediately achievable. It will take some time to adjust, for example, the considerable difficulties encountered in obtaining suitably educated candidates for university-level training abroad. The dependence on expatriates will extend well into the 1980s.

Effective road maintenance is hindered by both ineffective management and low vehicle and equipment availability rates, in turn reflecting the scarcity of personnel trained in mechanical skills. In 1972 the Central Transport Organization (CTO) was established to serve as a centralized transport system for all government ministries and to oversee transport operations in general. Although sound in conception and initial planning, the CTO inherited inadequately trained mechanics from the Public Works Department. Inadequate repair skills and facilities, poor servicing policies--representing the cause of half of all repairs--procurement policies restricting interchangeability of spare parts, and inadequate inventory levels

contributed to low availability rates. In 1977, for example, only 30 percent of the vehicles and equipment assigned to the Roads Department were operable. This compared to a government goal of about 60%. Certain ministries were at least temporarily allowed to return to the decentralized system formerly in use, which has only served to further complicate the situation.

Local staff training for the Roads Department is being offered at the national center for vocational training, supported by an ILO/UNDP program, but few graduates have yet passed through the training cycle. The Roads Department itself has undertaken a training program schedule to include instruction for surveyors, road section officers, draftsmen, soil technicians, road foremen, and equipment operators. There are only two expatriate teachers providing instruction, and both classroom facilities and training equipment are inadequate. Provision is made under the Fourth IBRD Highway Project for supplementation of this program, but the supply of trained labor will still not meet demand.

Most main road construction tends to be equipment-intensive, but the construction of culverts, drains, and structural excavations still requires substantial inputs of labor. Much of the unskilled labor force is drained off the market by mining companies in South Africa. The cost of labor and, correspondingly, the cost of road construction and maintenance, is high. Recruitment is

complicated not only by migratory shifts but also by the distance between population centers and construction sites.

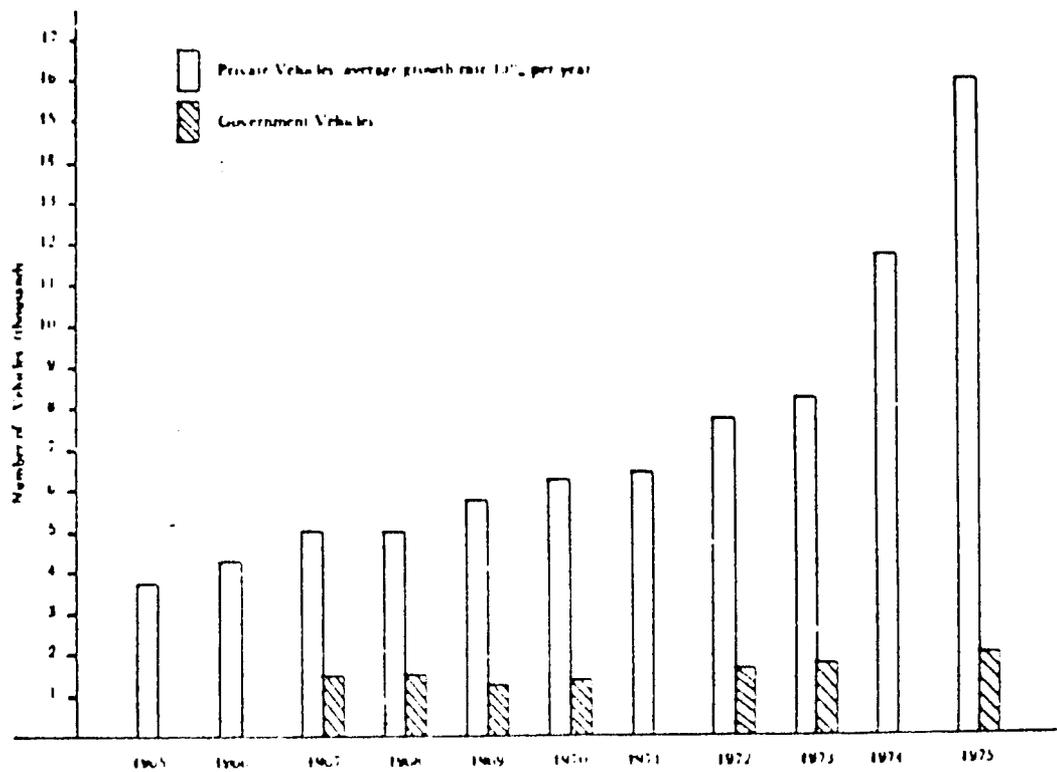
Responsibility for district road maintenance belongs to the district councils under the Ministry of Local Government and Lands. The councils generally lack both maintenance facilities and funds. Roads under their jurisdiction are generally in poor condition and continue to deteriorate. Maintenance of district and feeder roads is largely restricted to grading and bush-dragging of gravel. In many cases these techniques cause portions of the earth roadbed to sink below the adjoining land. Draining is ineffective and these roads are impassable in the rainy season.

Although government-owned and operated vehicles continue to play a vital role in the transport fleet, the ratio of government to private vehicles is on the decline. This situation has occurred primarily due to a doubling of private vehicles between 1973 and 1975. About 30 percent of the private fleet in 1975 consisted of light pick-up trucks, as opposed to 30 percent passenger vehicles and 40 percent trucks/busses, reflecting the absence of highly developed trucking industry. (See Figure X, Botswana: Motor Vehicle Licenses, 1965-1975.)

In 1972, under British technical assistance the Road Traffic Safety Act and the Road Transport (Permits) Act were drafted and the Transport Division of the Roads

FIGURE X

BOTSWANA: MOTOR VEHICLE LICENSES, 1965-1975



Department was established to administer these acts. Implementation did not really begin until 1974/75 and was only operational by 1976. It is difficult to appraise the system as a result of inadequate statistics. The government personally feels it is not very effective--especially in regard to transit traffic and excess vehicle weights--may, in fact, be a bottleneck to transport development, and needs to be revised.

Additional constraints are provided by industries associated with the transport sector. Both trucking and construction, for example, are infant industries. Over 60% of all trucking firms in the country have only one vehicle and few have more than five. The cost of trucking over poor roads is high and there is a correspondingly high rate of failure in the industry. Most of the demand generated by mineral projects has been filled by foreign operators. Similarly, most Botswana contractors limit their activities to housing construction and lack the technical and managerial skills necessary for large-scale road construction.

2) Proposed Projects

The GOB is interested in assistance for the construction of five major road construction projects. (See Table XI, Botswana: Proposed Road Projects, 1978.) The first priority is the Tuli Block Road, a T-shaped route, the long leg of which would run parallel to the S. Rhodesian border.

TABLE VI

BOTSWANA: PROPOSED ROAD PROJECTS, 1978

Project Route ¹	Priority ²	Standard	Economic Appraisal	Donor Interest
Francistown to Ramaquabane	2 *	Bitumen Trunk or Main Road	Would be essential element in strategy to reduce economic dependence on South African market. Could begin in 2 years time.	IBRD for feasibility and design study
TULI Block: A) Martin's Drift near Palapye and/or Zanzibar to Selebi-Pikwe: B) Baines' Drift to Sherwood Ranch Crossroads or the parallel "back line" road	1	Bitumen Main Road suggested, but flexible	Presently is easier for farmers in area to transport corn and other crops to Rhodesian market than to markets in Botswana. Produce from Rhodesia being imported into Botswana. Transportation costs inflate prices. Almost 300 km., depending on options selected.	IBRD, preliminary study. Terms of Reference for feasibility study drafted. No donor for construction.
Nata-Ghanzi A) Nata-Maun	4		Would assist potential exploitation of mineral resources, bulk shipments by rail, but need to fit in specialized equipment.	
Nata-Ghanzi B) Maun-Ghanzi	4		Would complete interior circle route	
Ghanzi-Mamono	3 *		Access to Namibian transport system and eventually to Trans East African Highway. Also could use to reduce dependence on South Africa. Could be vital if Zambian roads continue to deteriorate and Zimbabwe and S.A. unstable.	
Kanye-Ghanzi	3 *	Gravel, low traffic, 1-1/2 ton, 50-60 km.	550 km. across Kalahari Desert. Value in linking Ghanzi agricultural zone. Experimenting with TRRL in sand stabilization techniques. Could possibly use for trucking cattle.	Have discussed with USAID; overall interest, esp. first phase.

* See note below.

¹ See Figure . Botswana: Road System.

² Priorities are based on SADAP Consultant's appraisal; asterisk indicates priority particularly subject to political developments in Namibia and Zimbabwe.

Source: Summation based on discussions with Ministry of Works and Communication.

At present it is easier for farmers in the area to transport corn and other produce for sale to markets in S. Rhodesia than it is to market them domestically. Produce from S. Rhodesia, however, is being imported by Botswana at prices reflecting both transport costs and the higher S. Rhodesia subsidy prices for agricultural products. The Tuli Block Road would reorient agricultural marketing, providing the domestic economy with produce at lower costs, and would also expand the domestic cash market.

The GOB has discussed in some detail with USAID assistance for at least upgrading to gravel standard the Kanye-Ghanzi Road. This 500 km route across the Kalahari Desert would link the Ghanzi agricultural zone to the national economy. Presently the area is heavily oriented toward Namibia. With the addition of a Ghanzi-Mamono link the route to Namibia would be opened. Other proposals represent links in the interior circle route which could be a benefit to mineral exploitation.

The government would be particularly interested in extending the paved North-South route to the S. Rhodesian border. This would open the way to a reorientation of the economy towards the new Zimbabwe and would reduce dependence upon South Africa if a peaceful transition is found for Zimbabwe.

The government has also designed a roads training center project with an estimated total cost of P700,000

and required external assistance of P269,000. The project is designed to provide the Roads Department with physical resources for training:

- Technicians with full mid-level technical training
- Technicians specializing in surveying or materials use
- Supervisors in maintenance and construction
- Plant operators
- Theoretical background for appointed staff. Some places will be allocated in the Ministry of Local Government and Lands. Physical plant is to include:

- a theoretical training site with classrooms, stores, offices;
- general training facilities, including additional classrooms;
- dormitory facilities for trainees.

3) Recommended Assistance

- Technical Assistance in Transport and Management and Development, Ministry of Works and Communications.
A mix of contract advisors and short-term consultants is suggested to provide technical expertise to supplement staff. Initial target should be transport policy and regulation. Also, assistance for feasibility studies and development planning is required.
- Technical Assistance in Manpower Training and Equipment Management and Associated Capital Assistance, Road Department/CTO. Other donors have expressed some interest in supporting GOB-proposed training project for a roads training project. It is suggested that major priority be given to the technical aspects of

training existing personnel and new trainees in technical skills for road construction and maintenance. A broad range of topics from vehicle operation and maintenance to inventory control to spare parts should be considered, perhaps as separate projects under an umbrella program.

- Capital Assistance, Tuli Block Road. USAID should assist feasibility study and construction stage, if warranted. Completion of this project would have immediate high impact on rural population. Cooperation with the IBRD recommended, since they did preliminary study. Joint funding is very possible solution for costs.
- Technical Assistance and Associated Capital Assistance in Arid Lands Road Construction and Stabilization for Ghanzi Road. Suggest phased project with upgrading of route to paved standard if Namibian settlement proves conducive to transport. The road would clearly provide a major link toward Namibia and port access for landlocked states, with considerable benefit for Zimbabwe, Zambia, and Malawi. Technical assistance component should be keyed to specific problems of arid land construction, including sand stabilization. Findings would be useful for roads throughout the country and in other arid regions. Should Zimbabwe move toward acceptable settlement, the eastern border route should be considered.

b. Railroads

1) National Objectives, Plans, and Priorities

a) Background

The railway system in Botswana consists of a main line which links Bulawayo in S. Rhodesia with Mafeking in South Africa (640.5 kms to border) and two branch lines to Selebi-Pikwe (57 kms), and Morupule (16 kms). The main line is owned by S. Rhodesia Railways, whereas the branch lines are owned by the Government of Botswana. All lines are operated and maintained by S. Rhodesia Railways. In addition, S. Rhodesia Railways has running rights in Mafeking on the South African Railways' own section from the Botswana/South Africa border, a distance of about 26 km. All together, these lines of rail total 740 km.

The railway system, though originally established as a connection between S. Rhodesia and South Africa, must function to ensure Botswana's economic survival. The railway is used to export copper-nickel through the Port of Beira, but more significantly, it carries over 80% of the import and export traffic between South Africa and Botswana, which is of critical importance to the economy of Botswana. The main commodities transported by the rail system, and which would be affected by closure of the border with South Africa, are:

- coal shipped by rail from Morupule-Colliery to the copper-nickel mine at Selebi-Pikwe;
- copper-nickel matte from Selebi-Pikwe to South African ports and overseas;
- cattle southward to the abattoir at Lobatse, and thereafter as beef to South Africa and overseas.

These commodities represent the major imports, exports, and productive processes of Botswana, and failure to provide for their transportation would bring the economy to a standstill.

The railway is also important to Botswana as it provides employment for about 900 Botswana and is needed for future developments in mineral exploitation; specifically, copper in Ngamiland in the west, and salt/soda ash at Sua Pan.

b) Strategies Related to the Railway

(1) Current Policy

The Government of Botswana intends to take over the Rhodesian line in the long run, and has developed a contingency plan to take over the railway in the short run if political conditions in S. Rhodesia prevent Rhodesia Railways from maintaining adequate levels of railway service (GOR Project Memorandum, pp. 5-6). The decision to take over the railway became a formal policy of the government in 1974.

In a policy statement as reported in The Botswana Daily News of Monday, September 16, 1974, His Excellency, the President of Botswana

stated, "...I am therefore pleased to announce that my government has decided that we must plan to run the railway line in Botswana ourselves as soon as the necessary arrangements can be made... and we feel that such a system could best be developed and operated by us instead of being left to Rhodesia Railways."

The government's rationale for a long-run takeover has three components. First the railway is the foremost effective means for transport of essential goods from South Africa that are needed for Botswana to function on a day-to-day basis. At the same time, the railway is controlled by S. Rhodesia, whose political system guarantees continued political conflict. Second, the development of the mining sector, with its critical dependence on railway infrastructure, would be easier to plan if the operation of the railway were under national control. Third, the Government of Botswana desires to increase the rate of localization and training of Botswana's staff employed by the railway (GOB Project Memorandum, p. 5).

The Botswana Government's rationale for developing a contingency plan that can guide the takeover of the railway in the short run is also described in the GOB Project Memorandum (pp. 5-6). It is the fact that before an orderly long-run takeover of the railway can be implemented,

political conflict in S. Rhodesia will reduce the availability of railway services in one of several ways, which include:

- increased guerrilla attacks on the Bulawayo-Francistown link which would force S. Rhodesia to concentrate service on the Beit Bridge, direct link to South Africa;
- drain of skilled white manpower through the armed forces and through emigration, thus reducing S. Rhodesia's ability to maintain two railway lines;
- reduction of import and export traffic in S. Rhodesia as political conflict raises operating costs and reduces service;
- the possibility of civil war between rival factions of the Patriotic Front, which would reduce or eliminate railway service.

(2) Evolution of Organizational Relationships Involved in the Railway Takeover

(a) Overview

The Government of Botswana and several consulting organizations have conducted six studies to develop detailed plans for the short-/long-run takeover of the line of rail in Botswana. The studies, as a group, identify resource requirements, specify technical plans, and produce and provide detailed recommendations concerning organizational structures and working relationships with Rhodesia Railways that would facilitate the takeover. Two organizations which have conducted studies of the takeover procedures, Transmark and a Joint Working Committee composed of officials of the Government of Botswana and Rhodesia Railways, will have opera-

tional responsibilities for management of the railway during and after the Botswana takeover. Two additional studies have analyzed the technical and economic feasibility of extension of the railway in Botswana to Sua Pan and across the Kalahari Desert to Namibia at Gobabis.

This section contains a discussion of the impact of two studies so far completed (CANAC and TRIMAC) on GOB policies related to the railway takeover and the interrelationships between study teams that will have operational responsibility for aspects of the takeover. The next section contains a summary and analysis of the findings of the six studies concerned with GOB takeover of the railway and the two studies concerned with the extension of this railway within Botswana.

(b) CANAC and TRIMAC Studies

In 1974 the Government of Botswana asked the Canadian Government to provide the necessary technical assistance for study of the eventual takeover of the Rhodesian-operated railway line in Botswana. This request resulted in a report prepared by CANAC, completed in August 1975 on long-term aspects of the takeover. While this study was being carried out the likelihood of disruption of service became apparent because of changes in the political scene in S. Rhodesia, and the CANAC team was requested

to comment on the implications. CANAC concluded that a team should be brought together to make a more detailed analysis of the long-run takeover, as well as to study requirements of a contingency takeover. They further stated that if a contingency situation should arise during the presence of a team, it would be a significant advantage to have the team resident.

Following this report the Canadian Government was approached again for a team to be concerned with a long-run takeover, but the Canadian Government took the view that further study should be confined to contingency transport planning as distinct from the long-term takeover of the railway (GOB Project Memorandum, p. 2). TRIMAC Consulting Services was subsequently engaged for this study, to be carried out in stages as follows:

- Stage I - prepare an outline of contingency plans for discussion with the Botswana Government;
- Stage II- refine selected contingency transportation plans to a state of readiness when required.

TRIMAC completed the final Stage II report in June 1977 and concluded:

- A comparison of road and rail transport in an emergency situation indicates that use of the railroad--rather than roads--during an emergency situation would save P9.5 million during the first year of the emergency (TRIMAC Executive Summary, p. 18).

- Therefore, Botswana must create a capability to manage and operate the rail system with a minimum disruption to the economy. TRIMAC estimates that to take over the railroad the capital cost requirements are estimated to be a minimum of P17.0 million prior to a contingency takeover and an additional P26.0 million following it. The projected operating loss foreseen is at least P2.8 million per annum at 1977 freight rates, excluding interest and depreciation.
- As the first step to takeover of the railroad, TRIMAC recommended establishment of an Implementation Committee comprised of government officials and technical experts.

(c) GOB Implementation of TRIMAC Findings

The Government of Botswana "broadly accepted the proposals put forward by TRIMAC" (GOB Project Memorandum, October 1977, p. 3) and set up an Implementation Committee, composed of two committees, which are:

- Policy Making Committee (PMC), which is composed of permanent secretaries and senior level government officials, and which is chaired by the Permanent Secretary, Office of the President. The purpose of this committee is to:
 - make recommendations to and receive instructions from the Cabinet in relation to preparation of contingency takeover, as well as for a long-term takeover;
 - establish policy on recommendation from the Implementation Committee, in the context of creating an operating capability for the railway in a contingency situation;
 - consider and approve all matters recommended by the Implementation Committee, having both major financial and legal implications, including approval of technical reports.

All decisions of the PMC will be implemented by the Ministry of Works and Communications through an implementation body called the Policy Implementation Committee (PIC). This committee is composed of:

--Government officials, Ministry of Works and Communications

- Permanent Secretary
- Senior Planning Officer
- Railway Advisor

--a Transmark consultant team which includes: 1/

- Coordinator/general manager
- Civil Engineer
- Mechanical Engineer
- Traffic Manager
- Financial Advisor

The tasks of the PIC are mainly of a technical nature and include:

- assessment of the physical and personnel requirements for running the railway in a contingency situation;
- establishment of procurement plans for material and personnel;
- preparation of training programs;
- completion of all legal, commercial, and planning aspects related to Botswana operation of the railway;
- recommendations on location and arrangements of the administrative and operational headquarters of Botswana Railways;
- negotiating contracts with carriers.

1/ This team is currently on site in Botswana and is provided to GOB by ODM.

(d) GOB Joint Working Committee with Rhodesian Railways

In addition to the Implementation Committee proposed by TRIMAC, the Botswana Government and Rhodesia Railways established a Joint Working Committee in 1977 which was charged with formulation of an "outline plan in such detail as is critical and necessary for the progressive take-over by Botswana of that portion of Rhodesia Railways as is operating in Botswana. The outline plan should embrace all aspects of railway operation and the essential infrastructure and equipment." (First Report of the GOB/RR Joint Working Committee, in 1978, p. 5.)

The Working Committee is composed of three officials of the Botswana Government and three officials of the Rhodesia Railways. It does not include, however, members of the Transmark consulting team, which is part of the Policy Implementation Committee.

The Joint Working Committee has structured the Botswana takeover of the railway in two stages:

- Stage I - Control of day-to-day operations in Botswana, but with ownership and headquarters directed by Rhodesia Railways. Stage I is expected to be completed by 1982 and would be accomplished by Botswana takeover of sections of the railroad working northward from the South African border.

- Stage II - The establishment of an independent and self-contained Botswana Railways by about 1986.

The working Committee has agreed that the plans for the Botswana takeover of the railway will be timed in a flexible manner to reflect the uncertainty of finance to the Botswana Government. The committee has also agreed that the Botswana Government should, at their expense, finance all construction work and the acquisition of facilities necessary for the takeover of the line, while the Rhodesia Railways would agree to lease any locomotive and/or rolling stock units recommended for purchase by the committee and which the Botswana Government is able to acquire from time to time.

The committee agreed further that the question of final ownership of the line in Botswana is to be settled at an appropriate time during the five- to six-year takeover period, and it has agreed that throughout the first phase transition period the operation and maintenance of the line should be under the overall control of the Rhodesia Railways, which will provide all head office direction and the provision of workshop and other headquarters services from Bulawayo. The committee believes that direction of operations from Bulawayo needs to continue for some time beyond

! that necessary for the localization of railway operation and maintenance in Botswana.

The committee also agreed to accomplish its mandate as rapidly as possible and to report formally, whether work is complete or not, at six-month intervals from the date of the first meeting of the Working Committee.

The Government of Botswana plans to use the highly experienced Transmark team of railway staff in conjunction with the Botswana Government/Rhodesia Railways Joint Working Committee to adjust the pace of takeover of the railway in the light of evolving circumstances (see GOB Project Memorandum, p. 6). The operational plan worked out by the management team will be based on TRIMAC recommendations conditioned by the availability of external finance and the operating capability of the Rhodesia Railways. Should a peaceful settlement be obtained and opposing elements of the liberation forces unite in S. Rhodesia, the urgency for takeover will lessen, and although the ultimate goal remains the same, more time will be utilized to prepare for the railway takeover. On the other hand, if events in S. Rhodesia move rapidly to a less certain future, the emergency aspects of the takeover plan will be accelerated.

(3) Summary and Analysis of Previous Studies

(a) Overview

This section contains a summary and analysis of the findings of the six studies concerned with GOB takeover of the railway and the two studies concerned with the extension of this railway within Botswana. The analysis of these studies is intended to provide insights into the complexity of considerations related to the the proposed takeover and major determinants of future profit and loss of the railway.

(b) Summary of Previous Studies

Resource requirements for takeover and expansion of the railway line in Botswana that have been estimated by CANAC, TRIMAC, and six other studies conducted since 1975 are summarized in Table XII. The organizations which performed these studies, and the basic intent of the studies, are:

- The Botswana Government performed a staff analysis of the results of the TRIMAC study in 1974.
- Transmark performed a detailed analysis of requirements for GOB takeover of the line of rail in Botswana in 1978, using the TRIMAC study as a point of departure, but with extensive cooperation of Rhodesian Railways. The members of this team are experienced railway officials who are intended to be the core management of the Botswana Railways when it is established.

79C

June, 1977)

Botswana goods, but no other goods and no passengers) Assumes P5.0 ml. compensation for right of way

P38 ^{3/} 5

(2.8) ^{4/}
Excludes interest and depreciation

1300

Botswana Government (1978)

a. Emergency takeover. Trimac assumptions plus increased expatriate recruitment and depreciation of capital

(P7-9) ^{5/}

TRANSMARK (Team to implement Trimac Plan: estimates are as of March 1978).

a. Takeover with provision for current freight and passenger service. Includes cost of a 10 year track renewal program costing P24 ml. and purchase of all required wagons

P81

30

^{6/}

b. Takeover with provision for current freight service but no passenger service. Assumes hire rather than purchase at 267 wagons and exclusion of P24 ml. for 10 year track renewal program. Also excludes Trimac estimate of P5 ml. compensation for right of way and includes about 1/3 of Trimac estimate for stores/ bldg/facilities/ trackage & housing.

P43.8

P 5.9 ^{7/}
Excludes depreciating on capital

30

460

1089

1549

	c. Takeover with provision of 100% Botswana goods but no freight into Rhodesia and no passengers. Excludes P24 ml. 10 year program of track renewal Also excludes Trimac estimate of P5 ml. compensation for right of way and includes about 1/3 of Trimac estimate for stores/bldg./ facilities/trackage and housing. <u>6/</u>	P30.44		(P6.22) <u>8/</u> Excludes depreciation on capital	12	292	879	1171
JOINT WORKING COMMITTEE (1978)	a. Botswana Government/ Rhodesian Railways Joint Working Committee for the planning of the takeover of the line of rail in Botswana (takeover with provision for current freight and passenger service. <u>9/</u>				48	1216	698	1914
PARAH REPORT (1977)	a. Emergency takeover (60 percent Botswana goods, but no other goods and no passengers)	P14			10			not estimated
EXPANSION								
Polquhoun, 'Donnell and Partners (1975)	a. Francistown-Sua Railway- Feasibility Study (174 KM) <u>10/</u>	P33.5	nonexistent	CANAC suggests that this extension could make the total Botswana R.R. profitable				
Botswana Ministry of Works (1978)	a. Trans-Kalahari Railway- Pre- Feasibility Analysis Francis- town-Sua-Mamuno (830 KM) <u>11/</u>	P200	nonexistent	Depends on long term cooperation with Namibia and mineral exploration and development				

FOOTNOTES FOR TABLE XII

Resource Requirements for Railway Takeover and Expansion, 1978

- 1/ CANAC estimates that "this loss would be improved by up to 275,000 Rand (one Rand equals 1.04 Pula) by replacing high cost expatriates with local staff, by 250,000 to 350,000 when traffic increased to current levels, with profit-operations likely being attained after a new line to a soda/ash mine is brought on stream, tentatively expected about 1980." (CANAC report, Executive Summary, p.IV)

The Government of Botswana states, in contrast to the CANAC report itself, that "CANAC estimated that the system would incur a loss of P1.7 million per annum, excluding interest and debt repayment (in a long term takeover situation)." Government of Botswana. Railway Take-over--Current Status Report. Gaborone: Ministry of Works and Communications, 13th of March, 1978, p.2.)

Railway Take-over--Current Status Report states that "CANAC estimated the cost of various equipments and facilities as P33 million" for this option, but this estimate is not contained in the CANAC report.

This estimate of an operating loss of P2.8 million per annum, excluding interest and depreciation, was not found in the CANAC report, but was taken from the report, Railway Take-over--Current Status Report. (p.2)

The Government of Botswana has stated that the CANAC estimate of the annual loss that would arise from an emergency takeover of the railroad at P2.8 million rises to P7-9 million when cost of interest, expatriate recruitment, and depreciation of capital are taken into account. (For further information see Republic of Botswana, Project Memorandum. Gaborone, March 1978.)

The Transmark estimates are taken from the minutes of Transmark Meeting, Gaborone, March 1978.

Transmark estimates that the profit of P5.9 will occur in the base year of the take-over and rise to P18.28 million after seven years. The assumptions on which these estimates of profit are based are: (a) that both borders remain open and all traffic is retained (internal and transit); (b) that no growth occurs in transit traffic and current levels are projected forward; (c) that growth in internal traffic increases at 9 percent per annum in line with the National Development Plan; (d) that interest on capital is 8.5 percent per annum (a former World Bank rate--as of July 1978 the World Bank rate is 7.9 percent per annum); and (e) that staff complements include an assessment for annual and sick leave.

- 8/ Transmark estimates that this loss of P6.22 million in the base year of the take-over will become P4.06 million in seven years after the take-over. Assumptions not stated in the table, on which these calculations are based, are (a) that the northern border is closed and no traffic passes to and from the north; (b) that the railroad terminates in the north above Francistown at Tsessebe; (c) that growth in internal traffic and traffic to and from the south grows at 9 percent per annum (this rate of growth is reflected in the National Development Plan and in later projections of the Ministry of Works and Communications); (d) that interest on capital is 8.5 percent per annum (a former World Bank rate); (e) that staff complements include an assessment for annual sick and leave.
- 9/ Data from the Botswana Government/Rhodesian Railways Joint Working Committee is taken from The First Report of the Botswana Joint Working Committee for the Planning of the Take-over of the Line of Rail in Botswana, 1978 (p.11 and p.28)
- 10/ Data concerning the Francistown-SUA Railway are taken from Brian Colquhoun, Hugh O'Donnell and Partners, Republic of Botswana, Ministry of Mineral Resources and Water Affairs: Francistown-SUA Railway Feasibility Studies, Volume 1. April, 1975 (p.4)
- 11/ Data concerning the cost of the Trans-Kalahari Railway were obtained from Mr. G. W. McKenzie, Deputy Permanent Secretary of the Ministry of Works, Botswana, 1978 and are corroborated in the paper by Dr. Charles J. Johnson, A Railroad to Unlock Botswana's Mineral Potential, Government of Botswana, Ministry of Mineral Resources and Water Affairs, June 1977.

- Botswana Government/Rhodesian Railways Joint Working Committee performed a detailed analysis in 1978 of requirements for GOB takeover of the line of rail in Botswana independent of other studies such as those of CANAC, TRIMAC, and Transmark, but with the benefit of Rhodesian Railways' experience with operation of the line of rail in Botswana and its supply of data concerning the railway.
- The Farah Study, a U.N.-sponsored study that reviewed the railway situation in Botswana in 1977 and recommended immediate aid of P14.0 million to enable Botswana to purchase equipment and construct facilities to transport 60 percent of Botswana's freight traffic.
- Brian Colquhoun, Hugh O'Donnell, and Partners, Consulting Engineers, based in the United Kingdom, performed a feasibility study of a railway line from Francistown to Sua Pan in 1975.
- Botswana Ministry of Works performed a pre-feasibility study of a Trans-Kalahari railway line.

Table XII does not contain information concerning recent studies of the railway situation in Botswana by the World Bank. The Bank has studied the Botswana Railway situation as late as 1978 and concludes that continued consolidation of the rail services in S. Rhodesia and in Botswana is 25% less expensive than creation of separate railroads in both countries. The Bank prefers not to provide any financial assistance related to the railway until either the political situation is resolved in S. Rhodesia or until an emergency situation actually develops.

(c) Analysis of Studies of Railway Takeover

Reference to Table XII indicates that the resource cost of one of the least-expensive

levels of service that could be provided after the takeover of the railway has been explored, by both TRIMAC and transmark. This form of takeover would involve transport of 100% of Botswana goods, but it would not include the transport of any passengers whatsoever. Transmark estimates that the capital cost of new equipment for this level of service would be P30.44 million, while the TRIMAC estimate is somewhat higher at P38.0 million.

The Transmark estimate seems suspiciously low for at least three reasons. First, it excludes any portion of the P24.0 million ten-year program of track renewal that Transmark estimates as part of the P81.0 million required for takeover of the full complement of railway services currently provided. Second, the Transmark estimate does not reflect any costs that may be required to purchase existing facilities or the right-of-way from Rhodesian Railways, while TRIMAC estimates these costs at P5.0 million. Third, the Transmark estimate excludes depreciation on capital and may underestimate cost of expatriate recruitment. When these costs are taken into account the annual loss to the railway in the base year of takeover rises from the Transmark estimate of P6.22 million to the

Botswana Government's estimate of P7.0-P9.0 million. All of these estimates are presented with accompanying explanations in Table XII.

The financial importance of freight service into S. Rhodesia is apparent from comparison of the profit and loss estimates of Transmark for (a) takeover with provision of current freight service in Botswana and S. Rhodesia, and (b) for takeover with provision of Botswana freight service, with no freight and no passenger service into S. Rhodesia. Takeover with freight service into S. Rhodesia could result in a profit of P5.9 million, while takeover with no freight service into S. Rhodesia could result in a loss of P6.22 million.

Takeover of the railway would be warranted even if trade stopped with S. Rhodesia; however, since the railway carries over 80% of the import and export traffic between the Republic of South Africa and Botswana, and since such traffic is of critical importance to the economy of Botswana. The main commodities transported by the rail system, and which would be affected by closure of the border with South Africa, are, as noted above:

- coal - shipped by rail from Morupule-Colliery to the copper-nickel mine at Selebi-Pikwe;
- petroleum products - imported and distributed to the main storage center in the country;
- copper-nickel matte - from Selebi-Pikwe to South African ports;
- cattle - southwards to the abattoir in Lobatse and thereafter as beef to the Republic of South Africa and overseas.

These commodities represent the major imports, exports, and productive processes of Botswana, and failure to provide for their transportation would bring the cash economy to a standstill. Nevertheless, the Transmark estimates indicate that the railroad would operate at a substantial loss without continued freight transport into S. Rhodesia and perhaps at a substantial profit if such freight transport continues.

The Joint Working Committee for the Planning of the Take-Over of the Line of Rail in Botswana believes that there is a high probability that transit traffic in Botswana will decline substantially with the opening of the S. Rhodesia-Mozambique border. The first report of this committee points out that the Republics of Zaire, Zambia, and S. Rhodesia can all be considered as central contributors to the transit traffic but that, in the long run, as political situations

stabilize and congestion declines at ports, these countries will use the shortest routes to ports and the shortest routes would bypass the Botswana line. (See the first report of the Botswana Government/Rhodesia Railways Joint Working Committee for the Planning of the Take-Over of the Line of Rail in Botswana, p. 8.)

The committee points out, however, that calculations of transport strategy based on shortest routes illustrate the risk of transit traffic in Botswana but "do not offer sufficient evidence to disregard this traffic. Hence, it is prudent to accept the present (76-77) level of traffic, but to refuse to consider any escalation thereof," (GOB/RR Joint Working Committee, p. 9). The financial importance of transit traffic into S. Rhodesia supports the Botswana Government's efforts to achieve an orderly takeover of the railway and the need to maintain imports of essential goods on a day-to-day basis from the Republic of South Africa supports the Government of Botswana's efforts to develop an effective contingency plan for the takeover of the rail line.

A comparison of Transmark and Joint Working Committee estimates of locomotives required for takeover of the railway, with provision for current freight and passenger service,

also suggests that the Transmark estimates may be optimistic. Transmark estimates that 30 locomotives would be required for this level of service, while the Joint Working Committee's estimate is 48 locomotives. Moreover, the Transmark estimates of manpower required for this level of service (1,549 persons) is only 81% as large as the Joint Working Committee's estimate of 1,914 persons.

Reference to Table XII also indicates that Transmark has lower estimates of total manpower requirements for emergency takeover of the railroad than either CANAC, TRIMAC, or the Botswana Government. Transmark estimates that 1,171 persons will be required for an emergency takeover of the railway, while TRIMAC estimates that the same scale of takeover would require a staff of 1,300 persons. The CANAC estimate is slightly higher at 1,570 persons, partly due to different assumptions concerning the scale of the takeover.

The Transmark estimates of manpower requirements for a full-service takeover of the Botswana line of rail are also optimistic. As noted above, the team estimates that 1,549 persons will be required for a complete takeover, while the Botswana Government/Rhodesian Railways

Joint Working Committee estimates that 1,914 persons will be required for a full takeover of the railway.

(d) Analysis of Studies of Railway Expansion

Resource requirements for expansion estimated are referred to in the last two studies cited in Table XIJ. As noted in the background to in Table XII. As noted in the background section of this report, the existing railway lines in Botswana are made up of the section of the main Mafeking-Bulawayo line within Botswana, a distance of 640.5 km, and two branch lines owned by the Botswana Government, but maintained and operated by Rhodesia Railways. These branch lines are:

- Serule to Selebi-Pikwe, 57 km, to service a copper-nickel mine
- Palapye to Morupule, 16 km, to service a coal mine

In addition, Rhodesia Railways has running rights into Mafeking on the South African Railways' own section from the Botswana/South African border, a distance of about 26 km. This provides a total operating length subject to takeover of about 740 km.

Two extensions of the railway are under consideration, principally for mining

purposes. A 174 km extension could be developed between Francistown and Sua Pan to service a salt/soda ash mine that is considered for development in the next five years. Present plans envision extraction of salt and soda ash valued at approximately P30.0 million per year. At this level of extraction, UNDP/UNCTAD Botswana proposals for strengthening the external sector state that the deposits could last hundreds of years (UNDP/UNCTAD, Botswana, Proposal for Strengthening the External Sector, p. 20).

An extension of a railway from Sua Pan another 656 km to Mamuno, the western border of Botswana and Namibia, is a longer-term possibility referred to as the Trans-Kalahari Railway. This railway would permit exploration of the Northwest Copperbelt in Ngamiland. Modest exploration to date in this area has identified roughly 20 million tons grading 2% copper. No commercially viable copper deposits have been discovered, but the geology of Ngamiland is similar to that of the Zambian Copperbelt. Exploration in this area is modest due to a lack of transportation facilities. It is highly probable that a railroad would be the necessary catalyst for a much higher level of exploration in the region. The GOB paper, entitled

"A Railroad to Unlock Botswana's Mineral Potential," (hence forth referred to as RUBMP), p. 2 states that using moderately optimistic assumptions such exploration might lead to production from the region of 150 to 250 thousand tons of copper and other base metals. In the long term, the price of copper is at least equal to the marginal cost of new copper capacity which is of the order of \$1 per pound of copper in 1977. The sales revenue from the above two levels of production is US \$330 million per year. Assuming direct taxes and royalties at a somewhat arbitrary level of 12% of sales revenue, the annual direct revenue to GOB would range from US \$40 (P33) million to US \$66 (P55) million. Mine and smelter employment might fall in the range of 5,000 to 8,000, and a town of 20,000 to 35,000 people would be required. Water and power facilities that would have to be constructed for the mines could help to benefit the entire region. Other benefits of the railway cited in the GOB paper RUBMP include:

- The railroad would pass near the large Orapa-Lethlakane Diamond Mines and township to facilitate movement of goods and people into and out of the region.
- An abattoir would probably be built either near Sua Pan or further west along the railroad, thus facilitating the expansion of the beef industry in the north.

- Botswana's coal resources are estimated at 40 billion tons, which is impressive by any standard. Washing of some of the better coals can produce quality export steaming coal and possibly a modest supply suitable for blending as a coking fuel. Shell Coal is exploring these coal fields at a cost of \$1 million per year and would want to produce 5 to 10 million tons a year.

It is doubtful, however, that the South African Railway Line has a capacity that would permit transport of more than one million tons a year.^{1/} In a major study, "Coal Exploration and Development Policy," which was completed in 1974, the consultants concluded that "ultimately the most attractive proposition (for large tonnage coal exports) is the construction of a railway to join the existing South African Railways' network at Gobabis in Namibia to give access to the South African port of Walvis Bay." (RUBMP, p. 3)

- The existing Selebi-Pikwe mine could ship its matte (worth close to P100 million in capacity) over the railroad.
- Small copper-nickel deposits at Matsitama and Phoenix-Selkirk could use the railway; so could manganese mines at Palapye and yet-to-be-developed uranium mines.
- The railway would permit development of tourism at Moremi Wild Life Reserve near the Okavango Swamps (the largest inland water delta in the world) and agricultural development of about 15,000 hectares of land there.
- Chromite from the Bush Veld Complex in the south of Botswana in the Kgalagadi District of Botswana could be shipped by rail to Gaborone, Francistown, and west to Walvis Bay. Moreover, if significant supplies of

^{1/} Mr. John Walls, Chief Planning Engineer for South African Railways, reports that as of March 1977 the rail line from Witbank to Richards Bay will be operating at capacity, carrying 20 million tons of coal per year.

chromite are found, large supplies of Botswana coal will be needed to process it. Coal energy will also be needed for the soda ash production at Sua Pan. Cement requirements for the railroad bedding, coupled with current cement requirements for road transport, would permit development of a cement industry within Botswana. In addition, a small-scale bottle industry could be established to utilize soda ash from Sua Pan and silica from adjacent sources within Botswana.

- Finally, the railroad would provide insurance of a lifeline to the sea, which would become critical if both the Rhodesian and South African railroads became disrupted for an extended period. Two policy considerations related to railway infrastructures in Southern Africa also deserve consideration in relation to a Trans-Kalahari Railway. First, perhaps the only reason to build a Trans-Kalahari Railway is if it is not possible to refurbish and fully utilize at least two of the four railroads and ports that are available outside of South Africa. These railroads and ports are:

- The Tazara Railway to the Port of Dar es Salaam
- The railway to the Port of Beira in Mozambique
- The railway to the Port of Nacala in Mozambique (provided that a link is built in the railway from Malawi to Zambia)
- The Benguela Railway to the Port of Lobito. (This railroad is currently out of operation due to guerrilla warfare in Angola, but an article in The Washington Post, Tuesday, July 18 1978 states that "Zaire and Angola agreed to reopen the Benguela Railroad, closed since the 1975 Angolan Civil War, at a meeting of diplomats from the two countries..the communique (announcing the agreement) failed to explain when the two countries planned to reopen the rail line, however." (p. 12)

Second, large costs may be required to improve port and railway facilities in Namibia as part of the Trans-Kalahari Railway System. Apparently the water depth at dockside at

Walvis Bay is 33 feet,^{1/} while currently used vessels that carry ore require 75 feet of water for their payload of 200,000 tons. Dredging requirements could be determined from the admiralty charts on Walvis Bay, which are available through South African Railways. A rough estimate of the dredging cost is P100 million. In addition, what in the way of infrastructure exists between the Botswana border with Namibia and Walvis Bay is disfunctional for unit trains that haul heavy payloads of ore 24 hours a day. South Africa expects to rerail the Namibian line at a 48 km standard in about 1990. This is the standard track of the type used in S. Rhodesia, South Africa, and Botswana. It is expected to cost between P100 and P150 million. Hence, the addition of these costs to the P200 million estimate required to extend the railroad from Francistown to Mamuno yields a total cost of between P400 and P450 million. With a 10% add-on for contingencies and allowance for inflation, this estimate would be well in excess of P500 million.

2) Appraisal of Constraints on Railway Takeover

a) Policy and Institutional/Organizational Constraints

The Government of Botswana has developed clear policies related to takeover of the railway, and had had consultants develop plans and estimate resource requirements for the railway takeover. The government has developed a sophisticated organizational structure which includes the Working Committee, comprised of officials of the Botswana Government and Rhodesia Railways and the Transmark consultant team. These actions represent major progress toward the removal of policy and institutional/organizational constraints to the railway takeover,

^{1/} See the 1975 Admiralty Charts on Walvis Bay which are available through South African Railways and partially presented in the section of this report concerned with Namibia.

and virtually eliminating short-run constraints in these areas. The most significant constraint yet to be overcome to achieve a successful takeover of the railway relates to manpower shortages and the development of a strategy to ensure the economic profitability of the line after takeover.

b) Manpower Constraints

The major constraint to the Botswana takeover of the railway is the current lack of Botswana skilled manpower employed by the railroad or available to it in the near future. Currently there are about 900 Botswana working on the railway, almost all in unskilled positions. In September 1975 Rhodesian Railways initiated a localization program that involved training of Botswana citizens as checkers, commercial clerks, shunters, and plate layers. As a result of this effort the number of Rhodesian staff on the Botswana portion of the line has come down from about 150 to 100 since 1975. Nevertheless, the operation of the rolling stock, maintenance, accounts and management are carried out entirely by Rhodesian staff based in Bulawayo.

Rhodesian Railways has agreed to hire all Botswana citizens who can be trained for existing posts related to the Botswana line. Currently 24 locomotive drivers are being trained in Malawi; eight of

these trainees have been in training since September 1977. The training program consists of 1-1/2 years of training at the Malawi Railways School, followed by one year in Botswana under the tutelage of Rhodesian Railways staff.

Twenty trainees have been sent to the Kenya Railways Training School in Nairobi to be trained as artisans in a four-year course. In addition, 12 trainees will be sent soon to Kenya Polytechnic for a technician course. Current training efforts will contribute only a very small portion of manpower requirements for the railroad. For example, while 24 locomotive drivers are undergoing training in Malawi, approximately 150 trained crews are needed for the Botswana railway line.

The manpower shortage on the railway is related to the general shortage in Botswana of school graduates for employment as high- and middle-level manpower. High school graduates with low-level matriculation are very much in demand in all sectors of the monetary economy in Botswana. Moreover, most graduates prefer further education or higher paying jobs in the private sector than government-related employment, since private sector salaries are market-determined, while government salaries are regulated

by a Wage and Policy Committee. In 1975 CANAC summarized the availability of educated manpower for the railway as "Current education plans in Botswana forecast some 500 to 650 secondary school leavers per year for the next five years, with only some 20% of these expected to have satisfactory passing grades. Under these conditions an immediate takeover would see some 10 to 15 years elapsed before localization is reasonably complete." (CANAC Executive Summary, pp. ii-iii) Sufficient donor support is available for an expansion or modification of existing training activity, but careful study is needed before further training initiatives are warranted. Government officials believe that training funds are sufficient to send all qualified candidates to existing railway training schools in Kenya and Malawi and they also believe that these schools provide adequate training. Nevertheless, Transmark will be engaged by the EDP and EEC to study the need for a centralized training school for Botswana, Mozambique, and Swaziland for all railway occupations.

The EEC has tentatively earmarked 2.0 million units of account, or approximately 2.4 million dollars, for this training center. EEC representatives in Lesotho report that the first task required for commitment of these funds is for the governments of the three countries to develop Terms of Reference for a feasibility study of the training project.

For Botswana, Transmark plans to have a training expert assess staff and training requirements, as well as the supply of training available. The expert is expected to produce a report in the early fall of 1978. The Transmark expert will have as a point of departure for this study a complete analysis of the various categories of employees who would be required to work for Botswana Railways, which analysis has been prepared and submitted to the Director of Personnel, Botswana Government, by the GOB/Rhodesian Railways Joint Committee. (The first report of the GOB/RR Joint Working Committee, p. 27.) The shortage of school leavers is so pervasive in Botswana, however, that the supply of Botswana citizens available for a railway career will be quite small for a number of years. The percentage of technical and professional posts in government filled by expatriates is approximately 85% and is rising; they even filled nearly 3/4ths of the posts requiring staff having only a secondary education. In recent discussions in Botswana SADAP team members were told that the government cannot find one qualified accountant for the Ministry of Posts and Telecommunications, and yet the railroad would need about 200 accountants of similar qualifications.

c) Economic Profitability

As noted above in the discussion of resource requirements for railway takeover, the Botswana line would operate at a loss of between P6.22 and P9.0 million if the railway provides only transport of 100% of Botswana's freight needs and no other freight needs, and no passengers. Transmark estimates, however, that the rail line could realize a profit of P5.9 million, excluding depreciation on capital, if the takeover involves provision of the current level of freight service, but no passenger service. CANAC's less sanguine conclusion is that the railway could break even when railway traffic increased to current levels and expatriate staff were replaced by local staff; and it would be profitable after the line between Francistown and Sua Pan were opened. Hence, the importance of maintaining transit traffic on the Botswana line serves as a point of departure for policy decisions concerning U.S. assistance to the railroad, when qualified in four respects: First, overall cost estimates for the Rhodesian Railways are difficult to calculate, since they are the residual of operating costs and revenues, together with overhead and capital charges. Railways as a rule are not profitable operations, and the Rhodesian Railways system as a whole requires a substantial deficit payment each year by the S. Rhodesian Government.

Losses are reported to have amounted to \$24.0 million for FY '75/'76, and are projected to be \$39.0 million for the year ended 30 June 1977. It is not possible from the Rhodesian Railway accounts to identify the profitability of individual sections of the line, but it is conceivable that because of substantial through traffic (80% of total traffic) Rhodesian Railways breaks even on its operations in Botswana. Without the through traffic, however, Botswana Railways would use fixed capital of the railway at less than capacity, at least until additional lines, such as Francistown-Sua Pan link, are opened (GOB Memorandum, p. 7).

Second, the South African Railways and Rhodesian Railways have historically established railway rates based on what the traffic could bear; now both are perceptively moving towards a cost-based rating system. In the past both railways extended the ability to pay principal to full-cost subsidies whereby low-value commodities such as minerals are carried below cost, while any surplus revenue margin required is recovered by carrying high-value (and general non-bulky) commodities at well above cost. The Joint Working Committee recommends that Botswana use a cost-based rate structure to encourage transit traffic and establish a realistic competitive structure between roads and rail transport.

Third, Rhodesian Railways raised all or most of its railway rates approximately 25% on or about June 16, 1978.

Fourth; the Botswana Government's ability to meet the capital and recurrent costs of the railway takeover depends on the availability of funds from external sources. At the present time the prospects for international support are as follows:

- U.K. - 3 million pounds -- for Transmark team, wagons, and U.K. equipment
- USAID - \$8 million -- to be available FY 77/78 for purchase of locomotives
- F.R. Germany - (FR) DM 7 million -- to be appraised by KFW for expenditure on equipment
- Denmark - Pl.2 million --wagon purchase under Danish State Loan II if price is affordable
- EEC - Pl.0 million -- 50 wagons for coal traffic tender awarded
- IBRD - \$5.0 million --dependent on the Bank playing a coordinating role

The information on sources and amounts of aid was current at October 1977 and needs revision (GOB Project Memorandum, p. 9).

3) Recommendations

- The U.S. implement the Farah recommendation that the U.S. finance the Botswana Government's purchase of a sufficient supply of locomotives to permit emergency takeover of the railway, if necessary. Until such an emergency arises, the Botswana Government can--and should--lease the

locomotives to Rhodesian Railways.

- A fully specified rate structure for Botswana Railways should be established based on a cost-base rating structure. Once this is accomplished the Government of Botswana should renegotiate its weigh-leave agreement with Rhodesian Railways. This agreement was last negotiated in 1965/66 to provide payment by Rhodesian Railways of P2.0 million per year to the Botswana Government for right-of-way privileges. Once a rate structure for Botswana Railways is fully specified the financial profitability of the railroad under different assumptions concerning traffic can be explored, especially the financial importance of transit traffic on the current railway line, transit traffic on a potential Trans-Kalahari line, and potential mineral traffic with the extension of a railway line from Francistown to Sua Pan.
- A study is needed of the short-, intermediate-, and long-term manpower shortages that the Government of Botswana is likely to face in general and for the railway. The economy of Botswana is growing at approximately 9% a year, the percentage of government posts filled by expatriates is 85% a year and growing, and

as many as 1,216 posts on the railway are filled by expatriates, according to the Joint Committee. Once specific bottlenecks are identified at the secondary, vocational, and technical levels specific steps can be taken to overcome them.

- The regional training school for railway workers that is under consideration for Botswana, Mozambique, and Swaziland can be expanded to take into consideration railway training schools used for regional purposes in Kenya and Malawi. Locomotive drivers are trained in Malawi; artisans and maintenance technicians for locomotives are trained in Kenya. Moreover, Malawi is interested in expanding its training school to establish a regional training school for fully qualified electricians and mechanics to repair diesel locomotives (it recently requested a diesel-electric fitter for its school from South African Railways).
- Notwithstanding emergency takeover requirements, the Botswana Government should phase its takeover of the railways in relation to the availability of Botswana manpower. The situation seems ideal for this practice, since a high level of cooperation exists between the Botswana Government and Rhodesian Railways. Rhodesian Railways is willing to localize all

Botswana-related posts on the railway as fast as the Botswana manpower supply permits, but any on-the-job training that Botswana will receive from the long-established Rhodesian Railways will prove invaluable when Botswana runs its own railway. Moreover, economic returns from increased railway traffic in Botswana can be obtained by the Botswana Government through negotiations with the Rhodesian Railways. It seems especially important, however, that a well defined program be established to provide the Government of Botswana with responsibility for periodic maintenance of GOB rolling stock and any locomotives that the government may acquire. Major repairs of this equipment may have to be contracted to firms in S. Rhodesia or South Africa in the short run. The establishment of a maintenance program will ensure that GOB has training goals that (a) remain stable even if Rhodesian Railways is forced by political events in S. Rhodesia to reduce the level of attention it currently pays to training needs of Botswana manpower employed by the railway; and (b) can be used as a benchmark to evaluate progress with training during the takeover period.

- An update is needed of earlier analysis of the profit and loss implications for the railway of establishment of a line from Francistown to Sua Pan within perhaps the next five years. Earlier sections of the text note that in 1975 Colquhoun, O'Donnell, and Partners concluded that this line would be profitable and CANAC concluded in the same year that the extension would be needed to make the entire line of rail in Botswana profitable with current freight levels and local--rather than expatriate--staff.
- A detailed engineering and economic analysis is needed of a Trans-Kalahari Railway from Francistown or Sua Pan to Gobabis and then to Walvis Bay. Once a technical and economic feasibility study has been completed, such a railway should be established with either the cooperation of South Africa or the government of an independent Namibia. Botswana already depends on South Africa for importation of essential goods needed for the day-to-day functioning of its economy, and consequently the establishment of an additional railway link to a port through the South African-run country of Namibia would not change the political relationship between Botswana and South Africa. The importance of transit traffic for profit and loss of the current Botswana line suggests that possible revenues that could be

derived from transit traffic on the Trans-Kalahari railroad should be taken into account in any further studies of the economic viability of such a railway. Maxwell Stamp Associates, Ltd. submitted an "Outline Proposal for an Engineering and Economic Survey of the Trans-Kalahari Railway" to the Government of Botswana in May of 1978. The consultants suggest that they be appointed:

- to report to the Governments of Namibia and Botswana on a rail link passing through Namibia and Botswana and connecting the existing Botswana and Namibian railway systems, in such detail as to allow the Governments concerned to decide if they view with favor the proposed rail connection;
- without prejudice to the generality of the foregoing, to
 - study and report on the economic and engineering aspects of the above-mentioned rail link from a suitable point on the existing Botswana Railways systems through Windhoek to Walvis Bay;
 - study and report upon the port development at Walvis Bay;
 - estimate the ultimate maximum capacity of the Port of Walvis Bay;
 - provide an estimate of the rate of return on capital investment which would be achieved at various levels of traffic over the route--railway and harbor investment to be treated separately;
 - provide an estimate of the construction period of the railway using the most economical methods;
 - provide an estimate of the cost of using accelerated railway construction techniques, giving details of such techniques, and the probable saving in time as a result of their use;

-consider proposed Namibian and Botswanan development projects in order to ensure that the routing of the line, as may be recommended, is such as will serve the best interests of both countries; and that

-the two governments agree to make available to the consultants all existing relevant data which they should use to the fullest possible extent.

An additional consideration related to a Trans-Kalahari Railway between Francistown and Gobabis is Zambia's desire for a similar rail line between Livingstone and Grootfontein. The Francistown-Gobabis line, however, seems more desirable for three reasons. First, Botswana's only outlet for exports is through South Africa or S. Rhodesia, while Zambia has export routes through a number of countries. Second, the good rail connections that exist between Livingstone and Francistown via S. Rhodesia will be available to Zambia in the longer run after an internal settlement is achieved in Zimbabwe. This connection would permit Zambia to utilize a Trans-Kalahari rail link through Botswana. Third, the Republic of South Africa is rumored to have built a bitumen road from the road network in Namibia above Walvis Bay into the Caprivi Strip to within a short distance from Livingstone. If this rumor is correct, then completion of the road to Livingstone would provide Zambia with a road connection to Walvis Bay that is an effective substitute for a rail link between Livingstone and Grootfontein.

c. Civil Aviation

1) National Objectives, Plans, and Priorities

a) Background

The country is landlocked, the service transportation system is limited, and aircraft operations are increasing rapidly (at least 30% per year). There are eight main airports, and a new international airport at Gaborone is planned. There are also over 70 airfields or strips in the country.

The three largest airdromes in Botswana are capable of receiving DC-3 aircraft. Each of these airdromes is 5,000 feet long. Those at Gaborone and Francistown are 80 feet wide and the third, at Selebi-Pikwe, is relatively newly built (1974) and is 100 feet wide.

The airdromes at Gaborone and Francistown are poorly constructed with little drainage capacity; both were seriously damaged during the last four years of heavy rains. During the first two of the last four years the Ministry of Finance took little action to repair the airdromes, but rehabilitation projects have begun in the last two years. At Francistown efforts are underway to reconstruct landing runways and taxiways and to improve the lighting facilities so that the facilities are acceptable for C130s and Boeing 737s. The airdrome in Gaborone cannot be

expanded to any meaningful extent, however, since it is located in the town itself. Currently no freight aircraft with worthwhile payloads can use the Gaborone facilities, due to its short length and weaknesses in the subsoils of the runway, which limit payloads.

b) Strategy Related to Civil Aviation

The government believes that economic benefits are to be gained by selective expansion of this sector, but that the sector should be self-financing. That is, as stated in the National Development Plan 1976-81, the revenues collected by the Department of Civil Aviation and the profits made by Air Botswana should together meet all costs, including the opportunity cost of capital. The government plans to modify the earnings structure of this sector to achieve this goal, including the levy of a charge on the airlines for each passenger landing.

For Air Botswana the objectives during the Plan period are:

- to provide improved domestic and international scheduled air services;
- to satisfy public demand for air services;
- to maintain reasonable profits.

For the Department of Civil Aviation, the objectives during the Plan period are to provide sufficient airfield, navigation, and communications

facilities so as not to impede the safe development of air transport in Botswana.

2) Proposed Projects

a) Capital Projects

The government would like to construct a new international airport outside of Gaborone partly to become more self-sufficient from neighboring countries in the long run, but more importantly, to ensure supplies of necessary goods for Botswana should an emergency situation in S. Rhodesia or South Africa preclude Botswana's regular importation of very large supplies of essential goods from South Africa.

On May 18, 1978 the Government of Botswana signed a contract with the consulting firm of Sir Alexander Gibb and Partners for a two-phase study of airport requirements at Gaborone. The study is costing \$700,000 and will include both a Phase One Feasibility Study and a Phase Two Master Plan. The Master Plan, which will be completed by year-end 1979, will contain a design of the airport in sufficient detail to serve as a contract document for the airport construction contract. The facilities of the new airport include a 4,000 meter runway capable of receiving freight aircraft of the 707 and 320C scale.

Air finance is available for up to 40% of the cost of the new international airport at an interest

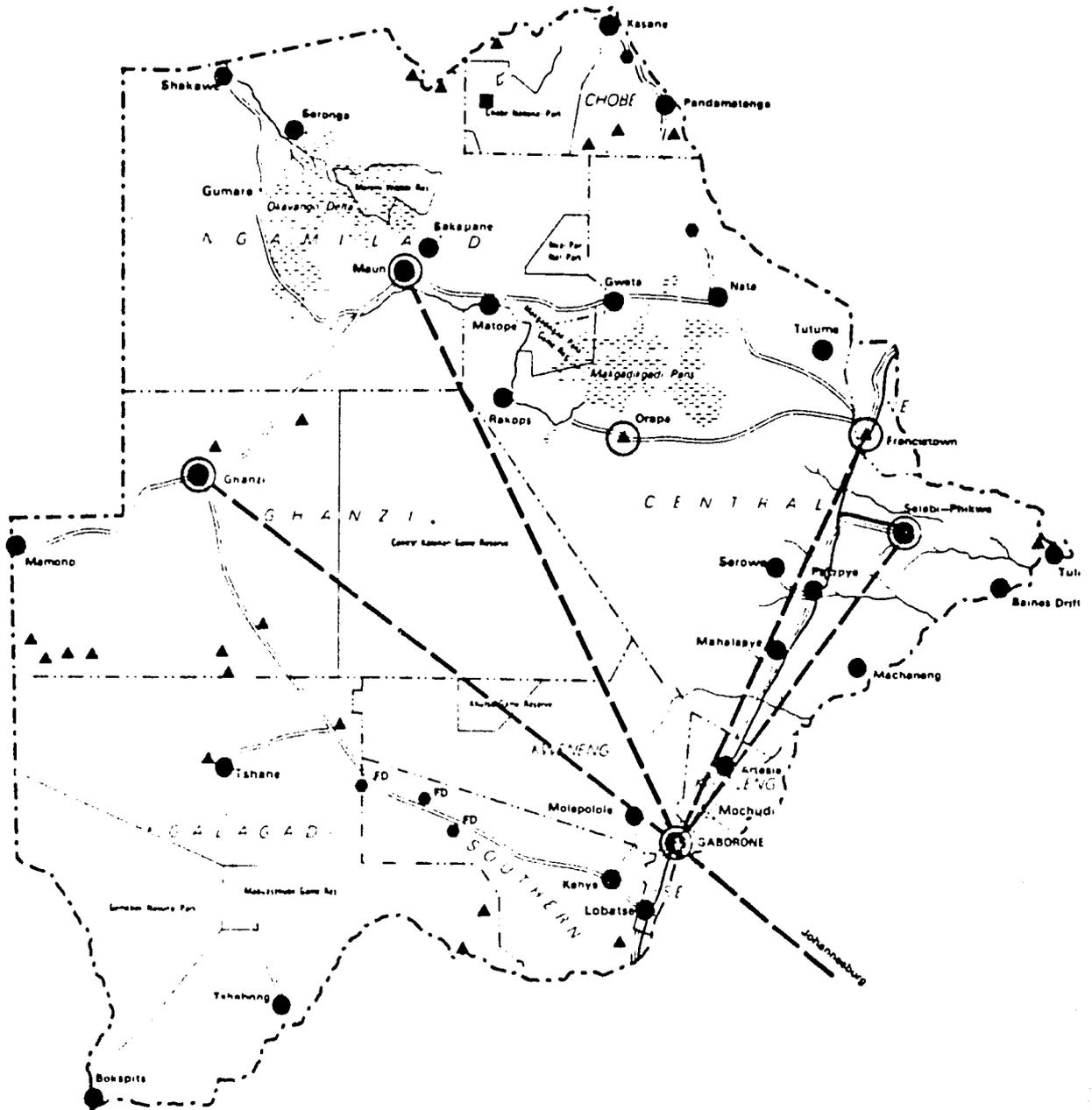
rate of 2 to 3% from Arab sources, but these sources forbid procurement of any goods or services from South Africa. Government officials in Botswana estimate that this restriction on purchases from South Africa would raise the cost of the airdrome approximately 35%. Consequently, it might be less expensive to borrow the funds from the World Bank at 7 to 8% interest. Unfortunately, government officials do not believe the World Bank will be willing to finance the airport, which is estimated to cost roughly \$20 million at 1978 prices.

In addition to the construction of the new international airport at Gaborone, which is discussed in the previous section, the Government of Botswana has planned a number of upgrading projects for airports that are so far not funded. These projects include:

- Rebuild the airports at Kasane and Maun to bitumen standard at a cost of P1.0 million each. These two airports are situated in game parks and are needed for tourism development.
- Improvement of a number of rural airports to increase safety and provide rural people with better access and health services. (For the location of major airfields and in Botswana, see Figure XIII, Botswana: Government Airfields, Private Registered Airfields, and Emergency Landing Grounds, 1978.)

FIGURE XIII

BOTSWANA: GOVERNMENT AIRFIELDS, PRIVATE REGISTERED AIRFIELDS, AND EMERGENCY LANDING GROUNDS, 1978



Road

Railway

District Boundary

National Park

River

0 100 200 Kilometers

Government Airfields

Private Registered Airfields

Wildlife Department Airfield

Emergency Landing Grounds

Flying Doctor Service

Radio Network

Airfields with Radio Navigation Beacons

b) Training Projects

The training needs for civil aviation in Botswana are sufficient to justify national training schools in at least some specialties, in addition to those presently available for fire/rescue and COM operators. Unfortunately sufficient supplies of candidates with appropriate qualifications in math and science are not available in Botswana. The shortage is partly expressed by the fact that all of the 23 posts in the Department of Civil Aviation are filled by expatriates. Hence, a more immediate need than establishment of training schools is a program to ensure continued expatriate assistance and a flexible fellowship program that provides opportunities for qualified students as they become available. Current efforts to meet present and forecast training needs include:

- Communications are being strengthened through UNDP/ICAO Project Grant Number Bot/74/023
(1) for OPAS Experts and Fellowships. The grant totals \$105,000 and is operative through 1979. It provides \$80,000 for experts and \$25,000 for fellowships.
- A grant for OPAS and DCA is funded through UNDP/ICAO. This grant, Number Bot/75/006,
(2) contains \$118,000 for assistance through 1980.
- A grant for Flight Safety is funded through ICAO. This grant, Number Bot/76/004, is for
(3) expatriate instructors/experts (OPAS); \$187,000 is available for the period 1978 through 1980.
- A grant for Fellowships is funded through UNDP/ICAO. This grant, Number Bot/76/005, is
(4) for \$38,000 and is available in 1978 through 1980, with the government contribution being

an additional 20 percent, or \$8,000.

A need exists for an additional 27 fellowships at an estimated cost of \$428,000, for 428 m/m of training. Financing for this is not yet arranged. The government contribution will be \$86,000.

- A grant for provision of an Airdrome Engineer is funded through UNDP/ICAO. The grant number (5) is Bot/77/004 and funds have been assigned for three years, commencing April 1, 1978 at a cost of \$160,000.
- A grant is needed for training. A variety of training equipment is needed at an estimated (6) cost of \$285,000. The government contribution will be \$29,000. Financing has not been arranged.
- The United Kingdom provides many experts under an OPAS-type program, and the government is (7) hopeful that the present negotiations with West Germany for the provision of fire-fighting equipment will be successful.

Desired external aid that is not committed beyond the period 1978/80 includes:

- In relation to Item 1 above (Strengthening Communications), there is a need to extend this assistance from 1980 through 1981 at least. The cost is estimated at \$110,000.
- In relation to Item 2 above, despite efforts to train counterparts a need exists to extend OPAS and DCA assistance. The estimated cost is \$112,000.
- In relation to Item 3 above which is for Flight Safety, additional funding is required in 1980 and thereafter. The estimated cost for 1980 and 1981 is \$158,000.
- In relation to Item 4 above for Fellowships, \$428,000 will be needed shortly, and every effort is being made to ensure that suitable training is available.
- In relation to Item 6 above which is for Training and Equipment, \$285,000 is needed.

In the more distant future the Botswana Government would like to establish a training capability beyond that which it currently has for fire/rescue COM operators. ICAO, in its manpower study of African countries during the period 1974-1976, found that training needs in Botswana are sufficient to justify establishment of training schools for several types of civil aviation workers. These types of workers and the number that ICAO estimates are needed between 1975 and 1979 are referenced below.

<u>Type of Civil Aviation Worker</u>	<u>No. of Workers Needed Between 1975 and 1979</u>
Aviation Communications Officer	36
Aviation Radio Technician	18
Air Traffic Controller	29
Airport Fireman, Level 3	80

The Government of Botswana would also like to establish a pilot training capability, but ICAO has found that the manpower requirements are not sufficiently large to warrant in-country training for this discipline or for aircraft mechanics.

3) Recommendations

- The U.S. develop a homogeneous policy to provide support for both capital and training needs of Botswana, Lesotho, and Swaziland. All three countries wish to develop international airports, have extensive needs for manpower training in the aviation sector, are landlocked, and belong to the Southern African Customs Union, which also has as members the Republic of South Africa and Namibia. The U.S. policy should probably be developed in coordination with UNCTAD efforts to develop programs for landlocked countries.

- U.S. support for capital projects seems to have a lower priority in Botswana than short-run needs related to road and rail transport. The U.S. should therefore provide greater levels of assistance in the short run to road and rail transport rather than to civil aviation. Nevertheless, the international airport will be developed sometime in the future and the U.S. should consider partial support of this project through multilateral assistance efforts.
- U.S. support of manpower training for aviation could probably be accomplished most effectively through the U.N. The International Civil Aviation Organization and the African Civil Aviation Commission, which are both agencies of the U.N., jointly conducted the 1974/75 study of manpower requirements in African countries referenced earlier in the text, and both organizations help define U.N. assistance with manpower training in Botswana. Moreover, these organizations have developed a plan to rationalize provision of training for the civil aviation sector by way of a three-tiered approach that includes use of:

--two multinational training centers in Africa, one for anglophone countries and one for francophone countries;

--national training facilities;

--a fellowship program to provide certain training outside the continent of Africa.

This three-tiered approach is described in detail in Appendix, III entitled "Proposed Organization of Civil Aviation Training in Africa."

- The U.S. should consider funding a feasibility study to determine (a) the economic and political viability of a regional airline service among the BLS countries; and (b) the financial viability of national airlines in the BLS countries when each country has an international airport and the consequent necessity to compete on an increased scale with international carriers. Malawi should also be included in this study, because Air Malawi will face much greater competition from international carriers when its second international airport opens in 1980/81. The subsequent section in this report concerned with

civil aviation in Malawi explains that the narrow runway at Blantyre currently limits international competition. In part, the rationale for this study is:

--Government officials in Botswana and Lesotho spoke of a desire of the BLS countries to establish a regional air-line service.

--Government officials in Malawi are presently analyzing the ability of Air Malawi to compete successfully with international carriers when its new international airport at Lilongwe opens during the period 1980-82.

--Rumor exists that the Government of Swaziland is concerned about the financial implications of its commitment to build an international airport and maintain a national airline.

--The U.S. should consider funding a feasibility study of the relative costs of provision of selected social services such as medical and veterinary services to rural areas in Botswana by road and air. If funded, the study should also identify specific investments in road- and air-related infrastructure that are needed to implement provision of each type of social service by whichever of the two modes of transport is more economical. Due to the very inadequate road connections to rural areas in Botswana and the extensive distances involved, air transport may be more economical than road transport for social services that can be provided by professionals who are required in areas for only a short term on a periodic basis.

d. Telecommunications

1) Development and Constraints

Telecommunication services in Botswana are in seriously short supply, both in terms of domestic service and international connections. Government policy places major emphasis on the upgrading of the

the internal system and reduced dependence upon South Africa for international service. Regional network development is seen as economically unprofitable and not relevant to domestic traffic patterns.

Botswana is presently serviced internally by both a land wire system and a microwave system running from Lobatse through Gaborone and north to Francistown, connecting with a land wire system in Kasane with 100 subscribers. For a service charge of P1,000 subscribers can obtain a radio link with the central exchange at Gaborone.

Although the internal microwave system has a listed capacity of 600 channels, zone switching center capacity can handle only 120 channels. The land wire system provides another 56 channels but when the overall system down rate of 40% is taken into account service is available only on about 90 channels at any one time. The present zone switching center represents a major bottleneck in the system which seriously restricts district level communication.

The major external link is a land wire to South Africa. International service is channeled through this link to satellite ground facilities access, which is made available by South Africa at very reasonable rates. There is also a low traffic

ground wire from Kasane to Bulawayo to Francistown, but high frequency radio transmissions provide the only service with Zambia.

The land connection to South Africa provides service on 54 circuits. Although this number is expected to increase to 60 by fall of this year, the current demand is for 90 circuits. Botswana needs to either significantly upgrade this service or to supplement existing land line circuits with microwave or ground satellite equipment.

Development of telecommunication services is the responsibility of the Department of Posts and Telecommunications under the Ministry of Works and Communication. The department suffers from an acute shortage of middle- and upper-level technical and professional personnel and is highly dependent on expatriate staff members and consultants. Most expatriates serve for two years, resulting in recurrent turnover problems. Recruitment lag time, however, frequently results in personnel gaps. The department has only three technical staff members, compared to the 15-member staff designated by the ADB as essential for basic operational effectiveness. No Botswana are qualified to serve in a technical capacity as engineers and none are in training. Technical expertise in regard to equipment installation is equally

grossly inadequate to meet system needs and no Batswana serves in a capacity more than one step above a trainee. These scarcities have not only project implementation but also delayed the obtaining of financing for subsequent system expansion.

The management of technical aspects of system improvement is clearly deficient. Contracts are generally awarded on a piecemeal basis rather than being system- or installation-inclusive. Installation of a new 200-line telex unit was begun in 1973 but no plans were made for equipment outside Gaborone; it will be another year before a telex terminal repeater will be in operation. Installation of a new 3,000-circuit exchange for Gaborone was begun in 1974. By 1976 installation was reported as 98% complete, but the exchange still is not in operation. It is estimated the delay in installation represents a loss of revenue of P80,000 a month.

2) Proposed Projects

Concurrent with the arrival of the SADAP team was the receipt by the GOB of the technical report for a 20-year master development plan for telecommunication development.^{1/} The plan provides an analysis of existing sector conditions and forecasts of demand and required facility investment to meet that demand.

^{1/} International Telecommunications Union. Republic of Botswana Telecommunications Development Plan, 1977-1997. ITU/BOT/01/78. Geneva: ITU, 1978.

Included in the document are detailed proposals for:

- national transmission
- national and international switching and signalling
- national numbering
- national rates and charges
- network and routing structure

The plan was prepared to mesh with plans to link all of the region under the PANAFTEL microwave system.

Full details are included for the period up to 1984/85, during which an investment of some P22.0 million, or about a third of the total budget of P67.0 million, is proposed. (For a summary of this plan, see Appendix, Annex Botswana: Telecommunications Development Plan 1977-1997, Summary.)

Having just received the plan, the GOB has no official position in regard to the acceptability of the document.^{1/} Anticipating some delay in analysis of the plan, the department has prepared and presented to the SADAP consultants its own package of priority projects with a total value of about P26.0 million. (See Table XIV, Botswana: Telecommunications Projects Proposed as of June, 1978, Department of Posts and Communications.) The largest single item by cost is for zonal switching centers, estimated at about P10.3 million. Other major projects include upgrading the main line microwave system and an earth satellite station at Gaborone.

^{1/} In general, on the basis of past discussion with the Ministry, it views ITU cost figures as low and disagrees with projections as to staff needs.

TABLE IV
 BOTSWANA: TELECOMMUNICATIONS
 PROJECTS PROPOSED AS OF JUNE, 1978
 DEPARTMENT OF POSTS AND COMMUNICATIONS

Priority Number	Name of Project	Estimated Cost (in Pula (000s)*	Estimated Completion Time in Years
1	Zonal Switching Centres (CSCs) at Gaborone (1500), Mahalapye (400 lines) and Francistown (700 lines) along with associated interphase equipment for local exchanges.	10,276	2 to 4 years
2	a. 200 (200 to 400) lines Siemens TWK telex expansion	317	1 1/2 to 2 years
	b. 200 teleprinter machines along with spares	500	1 1/2 to 2 years
3	Lobatse-Gaborone-Mahalapye-Francistown 960-channel wideband. Protected microwave system with provision for TV channel.	5,000	3 to 5 years
4	P & T headquarters building	1,000	2 years
5	Staffing--finance division ¹		
6	Gaborone (Broadhurst) main automatic exchange		
	a. Building for 10,000 lines	1,165	2 years
	b. Equipment for 2,000 lines	1,672	2 to 3 years
7	Rural Telecommunications Projects		
	a. HF/VHF links as a turnkey project for western, northwestern and south-western Botswana rural areas from Gaborone to 10 stations like Hukuntai, Tsabong, Kang, Bokspits, Shakawe, Mamuno, Bray, Glanzi improvements, etc.	1,000	1 to 2 years
	b. Ghanzi (western Botswana) to Maun UHF (TRCS Equipment)	300	1 to 2 years
	c. Manual local telephone exchanges along with connected equipment for "a" above.	50	1 to 2 years
	d. Local lines, apparatus and cables for 500 rural subscribers from "c" above.	250	1 to 2 years
	e. Maun to Nata 12-channel Carrier System and associated test equipment linking northwestern rural areas to northern areas.	60	2 to 3 years
	f. Maun to Nata trunk line upgradation	300	1 to 2 years
	g. Long subscriber lines, farm lines, party lines in areas of "c" above	40	1 to 2 years
	Total for Priority 7	2,000	
8	Gaborone Telecommunication Training Centre (equipment)	100	
9	Earth satellite station at Gaborone along with terrestrial link and International Switching Centre	3,200	
	Grand Total	25,230	

*1 US dollar=0.828 Pula

¹The Department has plans to restructure the organization as a parastatal body. The organization will undergo major changes and particularly financial and accounting practices will be fully commercially oriented. There is a shortage of accounting staff and stores management staff. A few Financial and Cost Accountants and Stores Managers as working units will be required. Initial requirement will be for about four accountants and four Stores Managers (two of whom should have technical background in telecommunication engineering). After setting up the basic organization the exact manpower needs will be determined.

Source: Department of Posts and Telecommunications, Ministry of Transport and Works, Government of Botswana, specifically prepared for discussion.

In addition to the overall telecommunications development, ITU has also done a feasibility study for the microwave link from Francistown to Kasane and across the border to Livingstone in Zambia. The GOB feels that the low-rate of domestic traffic over this route does not justify the cost of such an investment. The link is regarded as a regional transit trunk which the GOB is unwilling to finance out of its limited resources. ITU proposed this link not only as a regional link between eastern and southern traffic but also for strategic reasons to counter-balance potential disruptions in S. Rhodesia. In view of the hope for a peaceful transition, ITU also suggests delaying investment in this project.

The GOB views the interest of ITU in PANAFTEL as a source of bias in favor of microwave links in all ITU proposals. The ITU sector development plan does discuss long-range use of earth satellite stations, but regards the costs excessive for present investment. In terms of cost, the GOB feels continued use of facilities in South Africa is the most economic approach but for strategic reasons finds this unacceptable. Discussions are currently underway with Cable and Wireless, a British firm, for a package project to include:

- management of telecommunications system, including both administrative and technical services;
- earth satellite station;
- financing for the entire package.

The GOB is interested in restructuring the department as a parastatal body. This would result in major changes in organizational structure and a commercial reorientation of financial and accounting practices. Thus, in addition to technical expertise there will be a need for financial and cost accountants and stores managers. Initial dependence on expatriates for these positions is expected.

Appraisal of the various proposals being considered by the GOB must take into account:

- seriousness of system inadequacy in terms of equipment; management, and technical skills;
- sizeable costs of any investment in either microwave or earth satellite facilities for international linkage;
- pressure government feels to take action without further delay.

Although the interest in an earth satellite station is an understandable move toward an independent system, present discussions have not been based on a feasibility study and have not included proposals competitive to the Cable and Wireless package. Both steps are necessary before investment is made. Dependence on South Africa does not seem an immediate complication and major short-term emphasis should be placed on upgrading the internal system and administrative reorganization. Assistance in technical and financial areas should be another short-term priority.

Maximal use of existing equipment should be facilitated, including a reduction in down time and elimination of switching zones. Bottlenecks should be considered for short-/medium-range implementation.

3) Recommended Assistance

Telecommunications represent bottlenecks not readily handled by GOB. Assistance as indirect aid to the competitiveness of associated sectors is suggested.

- Technical Assistance - Gaborone Exchange Installation.
Key should be short-term project facilitation--completion of installation, phased supervision of operation, and maintenance of exchange at Gaborone. Immediate time-frame with training component to be meshed with subsequent technical assistance.
- Technical Assistance, Feasibility and Cost Analysis - Ground Satellite Station
The preliminary examination of economic and political priorities relative to the Cable and Wireless satellite proposal is not adequate, considering the size of the investment. Analysis of utility and costs needs to be done to determine USAID interest in possible assistance. This represents a strong interest on the part of GOB and would modify dependency on South Africa, but such is not seen as an immediate issue.
- Technical Assistance in Telecommunications, Management, and Training - Department of Posts and Telecommunications
Key to this project is reorganization and creation of separate parastatal for telecommunications. Short-term and contract consultants in management and administration should be followed by a fuller program supporting expansion of technical staff by at least three to five members over the next two years. A special training component should round out project. The goal of increased proficiency of repair and installation crews should

facilitate reduction of system down time. Contract personnel will be needed to continue support roles for at least four years after establishment of parastatal, and the training component is to have minimum life of five years.

- Capital Assistance - Zone Switching Center, Gaborone, Mahalapye, and Francistown, Department of Posts and Telecommunications
Acceptance of proposed investment is suggested but it may be desirable to expand exchanges to be included.

Start up for all investment classes is immediate. Once reorganization of the administrative system and technical training is underway subsequent assistance to telecommunications development should be re-examined, especially in connection with associated sector needs.

B. Lesotho

1. Introduction

a. Overall Development Approach

Lesotho's Second Five-Year Plan builds on the accomplishments of the first Plan (1970-1975) and provides the guidelines for the government's national development efforts over the period 1975/1976-1979/80. Lesotho's national aims remain unchanged from the first Plan. They are:

- Economic growth
- Social justice
- Maximum domestic employment
- Economic independence

In order to accomplish these aims, GDP at factor cost is projected to rise from 71.2 million Rand in 1974-75 to 104.1 million Rand at constant prices in 1979/1980. Priority will be given to the rural sector, in which 80% of the population of Lesotho resides. GDP in the sector is expected to rise from 32.0 million Rand in 1974/75 to 44.1 million Rand in 1979/80, an increase of 38% as compared to a projected increase in overall GDP of 46%. Agriculture is expected to make the largest contribution to GDP over the Plan period, although this contribution is expected to decline somewhat, from 44.9% in 1974/1975 to 42.4% in 1979/80. This growth will be achieved through special efforts to raise the yields of traditional crops through the nationwide implementation of a plan to increase production of traditional dryland crops through a network of village distribution points. In the mountainous areas where livestock is the chief agricultural resource government efforts will center on range management,

breed improvement, and fodder production. Improvements will be made in the provision of agricultural credit, marketing of both crops and livestock, extension services, and appropriate mechanization. Value will be added to farm products through increased processing. Notable in this regard are the planned abattoir, the wool and mohair scouring plant, and the asparagus cannery. Rural development will be encouraged by locating industrial activities outside the large towns and the promotion of handicrafts and cottage industry.

One of Lesotho's most serious constraints to development is its limited domestic construction capacity. This problem is recognized in the Second Five Year Development Plan and is traced to the more general problem of Lesotho's severe shortage of managerial and administrative skills. This shortage of manpower is primarily the result of Basotho migration to South Africa for employment; over 50% of the male labor force (140,000 to 230,000 men), plus some 10% of the female labor force (about 25,000 women) are estimated to be employed in South Africa. Many of these workers are relatively young members of the labor force who receive higher wages in South Africa than could be obtained in alternative employment in Lesotho.

Total earnings of Lesotho workers in South Africa for many years have been at least as high as Lesotho's total GDP. In fact, in more recent years these earnings have gone up so sharply (as a result of steep increases in wages in South African mines) that they are probably more

than double the estimated GDP. In the mines, the minimum cash wage of R0.42 per shift in 1971/72 went up to R1.60 by December 1974 and is now R2.20. In 1974/75 total earnings of Lesotho miners in South Africa are tentatively estimated at R95 million, including about 40% provided in kind. In addition, earnings of Lesotho workers in South Africa outside the mines have been estimated at R70 to R80 million. No detailed data about GDP for 1974/1975 are available yet; on the basis of GDP estimates for real growth in the intervening years, GDP for 1974/75 may have been of the order of R70 million, a figure less than half the earnings of Basotho working in the Republic of South Africa.

This dependence of Lesotho on employment in South Africa, apart from the political and social questions it raises and the long-term insecurity it may impose, has both a positive and a negative impact upon economic growth. On the one hand, income from employment abroad has raised the standard of living of the majority of the population and people have become accustomed to a monetary economy and the discipline of an industrial life. On the other hand, only a small part of the total earnings abroad is of benefit to the domestic economy, and the absence of so many able-bodied workers, some with skills, tends to diminish the effectiveness of measures aimed at promoting domestic development. For 1974/75 it has been estimated that about 35% of total earnings of Basotho mine workers in South Africa were remitted to Lesotho, partly in the form of goods imported.

The total capital and technical assistance requirements for the Second Development Plan are R224,398,500. Approximately 15% of this total, or R33,272,900, will be spent on economic infrastructure, the subject of this report. Of the expenditures on economic infrastructure, approximately 70%, or R23,415,000, will be spent on roads and transport services; 5.8%, or R1,919,200, will be spent on civil aviation; 13.5%, or R4,482,700, will be spent on telecommunications; 8.5%, or R2,830,000, will be spent on power; and the remaining 2%, or R626,000, of the expenditures on economic infrastructure will be spent on postal services.

b. Impact of Transkei Status on Development Requirements

Lesotho's Second Five Year Development Plan, which is for the period 1975/76 to 1979/80, has been modified to a significant extent due to South Africa's declaration of independence of Transkei, which is located on the southeast border of Lesotho. The U.N. has interpreted South Africa's attempt to make Transkei an independent country as an abrogation of its responsibility to this Xhosa homeland, recognizes that Transkei is not sufficiently separated from South Africa politically to be considered an independent country, and consequently refuses to recognize it as such. The border with Transkei was closed in late 1976 and as a consequence Lesotho has had to reroute some of its transportation and communications infrastructure. In January of 1977 the Secretary General of the U.N. dispatched a mission

to Lesotho. In its report, entitled "Assistance to Lesotho," the mission recommended a program of international assistance totaling about \$113 million. Of this sum, \$47 million was for 24 projects in an accelerated development program.^{1/} Funds were not identified for all of these projects, but the Secretary General appealed to all states to offer assistance and requested the United Nations and the organizations in programs concerned to assist Lesotho with these projects. (For a summary of donor response, see Table XV, Lesotho: International Response to the Appeal for Assistance to Lesotho.)

The U.N. sent a review mission to Lesotho in September 1977 to appraise international response to Lesotho's needs and to further identify requirements for assistance. This mission was led by Mr. Abdulrahim Abby Farah, and resulted in the production of the Farah Report. Recommendations of the Farah Mission that relate to transportation and communications are discussed in the body of this report.

c. National Transport Study

Germany is financing a general transport study of all sectors in Lesotho that will discuss development requirements in the short-, intermediate-, and long-term. The study will begin in October 1978 and will be finished in January 1980.

According to the Terms of Reference for the study which is referred to as the "Lesotho Transportation Study," the purpose of the study is to provide the government with:

^{1/} See Official Records of the Security Council 30-2nd Year Supplement of January, February, and March 1977. S/12315.

TABLE XV

LESOTHO: INTERNATIONAL RESPONSE TO THE APPEAL FOR
ASSISTANCE TO LESOTHO

Project	Contribution 000s of US\$	Status of ¹ Contribution	Donor ²
Spot improvements, Sekaka to Qacha's Nek Road	1,840	G/AD	EDF
Thaba-Tseka to Mpitl Road	18,080	G/FP	Canada
Ministry of Works Maintenance Centers	170	G/AD	EDF
Mafeteng to Mhales Hoek Road	3,500	G/FP	EDF
	1,200	G/FP	Netherlands
Mokhotlong to Taung Road	520	G/FP	UK
Strengthening the civil aviation fleet	2,400	G/FP	Canada
National Airport	3,500	G/FP	EDF
	4,100	SL/FP	Kuwait
	750	SL/FP	Abu Dhabi
Mountain region food reserve	800	G/FP	WFP
Grain processing self-sufficiency	1,840	SL/AD	OPEC
Agricultural Development Bank	700	SL/FP	West Germany
Identification of hydroelectric site or sites and feasibility study	1,000	G/FP	Canada
Training of vocational school teachers	Fellowships		Various
Stockpile of drugs, etc. and extension of medical stores	100	G/FP	Rep. of Korea
Qacha's Nek Hospital	495	UA/AD	Denmark
Stone crushing plant, Ramorakane	230	G/FP	Australia
Contributions not for specific projects	115	G/FP	India ³
	5	G/FP	Pakistan ³
Total	41,405		

¹G: Grant; SL: Soft loan; UA: Contribution for UN Special Account; UD: Aid already handed over; FP: Firmly pledged.

²EDF: European Development Fund; WFP: World Food Program; OPEC: Organization of Petroleum Exporting Countries; IDA: International Development Association

³For purchase of Lesotho's requirements from the donor country.

Source: Adapted from United Nations Report of the Economic and Social Council, Assistance to Lesotho, Notes by the Secretary-General, Thirty-Second Year, agenda item 12, A/32/3R3, S/12438, 9 November 1977.

- a short-term, detailed program of development of passenger and goods transport for the period from April 1979 to March 1989;
- a long-term program covering all modes of transport in outline;
- a plan for coordination of various modes of transport and recommendations on the appropriate organization for operating units, government units included, and for a coordinating body;
- a program of investments and recurrent expenditures and recommendations for raising funds in appropriate organizations to finance management and control.

The program shall cover all feasible methods of passenger and goods transport and shall pay particular attention to the needs of the agricultural sector and take into account the role of the foreign sector in Lesotho's transport development.

d. UNCTAD Transport Appraisal

An UNCTAD report on the external sector (international trade) of Lesotho, done in January 1976, detailed overall transportation and transit problems (UNCTAD/RD/90/Rev. 1; GE76-61354, pp. 12-15). The report states that the external trade of Lesotho is gravely constrained not only by the poorly developed internal transport infrastructure, but also by the lack of adequate transit facilities. Lesotho's main access to the sea is Durban, which is served by South African railways and roadways. As a result of the Republic of South Africa's policy of encouraging the monopoly of railway transport, the bulk of goods imported into and exported out of Lesotho is carried by South African Railways. Only in certain cases of perishables are licenses

issued for road transport, but even in such cases it is becoming increasingly difficult for Lesotho-owned vehicles to be granted such licenses.

The UNCTAD report states that the heavy dependence upon South African railway transport has given rise to a range of adverse effects on Lesotho's export-import freight:

- The transport cost of certain goods imported into Lesotho is higher than it would otherwise be, assuming that in the absence of protection from the railway at least some of the traffic so conveyed would be moved more economically by an alternative mode.
- Delivery times by rail are longer than they would be by direct road delivery.
- Goods suffer frequent damage or loss; compensation claims are cumbersome and difficult.
- Distribution of railed goods is costly, since the only rail head is at Maseru.
- Except in Maseru, the labor provided for transshipment does not provide employment opportunities for Lesotho nationals.

Another problem facing Lesotho transit trade is that the country has no storage facilities at Durban or East London. The only facilities available are the commercial ones, for which high insurance premiums must be paid.

e. Negotiation of an Improved Transit Agreement

Although there is a clause in the new Customs Agreement providing for freedom of transit for Lesotho's goods through the Republic of South Africa, the services and conditions for such transit are very unsatisfactory and efforts made in the meetings of the Customs Union Technical Committee on Road Transportation to work towards a better solution have not been successful.

To assist with negotiations to improve the transit agreement with South Africa, the UNCTAD Mission recommended in its report of January 1976 that UNCTAD should put at the disposal of the Lesotho Government the services of an advisor on transport and transit problems. The recommendation was considered to be urgent by the mission since the Government of Lesotho was in the process of preparing the draft agreement to negotiate with South Africa in Pretoria in mid-September 1977.

UNCTAD provided Lesotho with an Inter-Regional Advisor on Trade Facilitation and, in response to the request of the Lesotho Government, had members of its team concerned with the trade facilitation project study the draft of the desired transit agreement prepared by the Lesotho Government. Comments on this report were sent to the Government of Lesotho, but the transit negotiations in Pretoria broke down in the early stages and were not completed.

In June 1977 UNDP/OTC sent an advisor to Lesotho to become head of the Department of Transportation. The Government of Lesotho has begun to prepare groundwork for further transit negotiations with South Africa by way of the recently established working group composed of representatives of the South African Railways and the representatives of the Government of Lesotho. The Government of Lesotho, however, is in need of technical assistance to perform staff work for this working group and for other efforts related to the negotiation of a new transit agreement with the Republic of South Africa.

The objective of the Lesotho Government in negotiations is not only to seek better forwarding treatment for the commodities that are handled by the South African Railways, but also to reach an acceptable arrangement regarding the licensing of Lesotho-owned carriers used in transit trade by Lesotho authorities. The present practice is that only the South African Road Transportation Board in Bloemfontein is responsible for issuing permits to Lesotho carriers. The slow and cumbersome licensing procedures have created substantial frustration in Lesotho. Furthermore, when Lesotho carriers are licensed to move commodities between the South African ports and Lesotho no permission is granted for a return load. The basis for the transit agreement is Article 16 of the Customs Union Agreement which provides for freedom of transit for goods consigned to and from Lesotho through the Republic of South Africa.

An additional recommendation of the UNCTAD Mission is that UNCTAD should arrange long-term assistance for Lesotho and that the External Economic Affairs Secretary should, in collaboration with the Transport Commissioner being sponsored by the OTC, be kept in touch with UNCTAD's work program on problems of landlocked developing countries, so that Lesotho can benefit from the services that are available under the program.

2. Analysis of Respective Modes

a. Roads

1.) Development and Constraints

Lesotho's road system consists of about 2,800 km of primary, secondary, and tertiary roads, only about eight percent of which are paved and about 60 percent of which are tracks. The remainder are one- or two-lane gravel roads. The majority of the road system is located in the western lowlands with little access to the interior and southernmost parts of the country. The paved link runs from Mafeteng to Maseru to Leribe. Improvement of the basic 123 km. link was the focus of the First IBRD Road Project. Other links run to Morija, to Noma, to Maseru Bridge, and to the border from St. Monica's Mission.

The decision to upgrade the basically peripheral western lowland route rather than construct a road into the interior was the subject of some internal political controversy. The Second IBRD Highway Project clearly gave preference to interior connections, somewhat balancing construction investment. The situation became especially serious, however, with the efforts of Transkei to win de facto--if not de jure--recognition. The southern region of Lesotho had used road lines from the Transkei area of RSA for food, other imports, and pedestrian traffic. The refusal by Lesotho to acknowledge the legitimacy of the Transkei "Government"--

in keeping with U.N., OAU, and U.S. policy--neither to recognize Transkei transport documents nor to permit its citizens to obtain Transkei visas substantially resulted in the closing of the southern border.

In response to international concern for the vulnerability of Lesotho as a result of its support of the U.N. position of non-recognition for Transkei, the Farah Mission previously discussed was sent to analyze development needs in relation to the closing of the southern border. Following the subsequent donors' conference, the EEC agreed to immediate spot improvements for the Sehoke/Qachas Nek Road, the most crucial portion of the link to the southern region expected to be cut off from transport through Transkei. USAID subsequently expressed interest in improving the entire link from Mofale's Hoek to Qachas Nek. CIDA agreed to do a feasibility study of the link from Thaba-Tseka to Mpiti/Qachas Nek which represented the last portion of a circular route through the interior mountainous region of the country.

The provision and maintenance of all vehicles and heavy equipment for road projects is the responsibility of the Mechanical Branch of the Ministry of Works. The use of this central pool was introduced in 1971/72 through a phased turnover of the physical plant held by each of the ministries. The Ministry of Agriculture continues to retain some plant, especially in regard to rural

development, but is scheduled to surrender such shortly. Equipment and vehicle availability is estimated at about 65 percent. A study of equipment and maintenance service operated by the Mechanical Service Branch has just been completed but is not immediately available.^{1/}

The operation of road transport is neither well managed nor operated, except for government trucks. The bulk of all freight traffic is done by private traders for their own outlets, and long-distance hauling is really nonexistent. With the exception of vehicles used for construction work, the system is very inefficient. There are no clearing houses for goods, and the flow of commodities is rather spasmodic as a result. The government-owned Co-op Lesotho also operates transport services and is scheduled for a substantially increased role in freight haulage.

Government freight haulage regulations essentially represent an extension of South African policy and interests.^{2/} Negotiations in 1975 and 1976 sought liberal terms of regulation, but the draft proposal was rejected by South Africa. Taking the position that the key to progress was held by South African Railways,

^{1/} See T.P. O'Sullivan and Partners, Consulting Engineers, in Association with Roughton and Partners. A Study of the Plant and Vehicle Pool Service. Maseru: Kingdom of Lesotho, Ministry of Works, June 1978.

^{2/} Basically, therefore, emphasis is given to the use of the railway transport wherever possible and rates have never been calculated on cost.

Lesotho established a working group in 1977 to deal with representatives of the railway. South Africa has agreed in principle to the direction of discussions and has even modified a few of its regulation policies. The GOL is optimistic about continued progress.

In 1975 the GOL decided to assume responsibility for the provision of bus passenger service and established the Lesotho National Bus Service Corporation. Private operators, all of which were small-scale operations, were restricted to certain remote areas which offered marginal profitability at best. Many operators transferred to the operation of smaller vehicles, technically classed as taxicabs and only minimally subject to government controls. These vehicles continue to operate in competition with the government monopoly by cutting their rates. They are usually overcrowded and represent a serious safety hazard. The LNBSO sought to standardize its fleet by using 30 Mercedes-Benz buses. The vehicles used by the national service, moreover, are five years old and have been severely damaged by use on gravel roads, for which they were not designed.

2) Proposed Projects

The GOL is presently letting a contract for a 1-1/2 year study of transport needs. Support for this study is being provided by West Germany, and a German consulting firm will be used.^{1/} The GOL projects the

^{1/} The recommendations of this study will greatly influence future development plans for the transport sector, and donor support should carefully consider the report before subsequent funding is made.

the development of considerable safety and regulation projects as a result of this study. Roadblocks to assure the use of safety belts have already been employed. This action is intended to ensure compliance with new South African regulations by Lesotho nationals driving into South Africa--reducing the potential for harrassment--but is representative of projects the GOL would hope to initiate. Safety inspection stations are to be established in Maseru and two other locations. Motor vehicle registration is to be organized and such service facilities as bus terminals are to be considered. The GOL has only partial funding for these projects.

Under assistance being provided by West Germany, the GOL intends to reorganize freight haulage under a new parastatal to be called Lesotho Freight Services Corporation. The projected date for start up is 1979. An estimated 30 trucks are to be supplied by West Germany and it is hoped that the EEC will provide an additional 10 vehicles. A major freight terminal and garage is planned for Maseru but other facilities will be placed at at least two or three other strategic points, probably including Qachas Nek. One of the major goals of this operation is to redirect freight haulage from the Transkei border.

There are 13 different road links either under construction or being considered in conjunction with the national road network presently being considered.

(See Table XVI, Lesotho: Major Road Projects Underway or Proposed - 1978/79.) With the completion of these links the country will have a basically circular perimeter road and an interior mountain road linking western and eastern points on the perimeter road. Although donor commitment for the construction costs of some of these routes has not been made, donors are at least generally committed for feasibility studies.

3) Recommended Assistance

- Technical Assistance in Road Maintenance and Manpower Training - Mechanical Branch, Ministry of Works
In view of substantial construction underway or projected for the near future, resulting in a system over twice the length of existing roads, it will be necessary to upgrade road maintenance capacity both qualitatively and quantitatively. Included should be phased training program meshed with construction underway, including associated vehicles and equipment.
- Technical Assistance, Freight Haulage Regulation - Ministry of Transport and Telecommunications
Use of either short-term consultant or contract advisor for aiding GOL in the design of freight haulage regulations in conjunction with negotiations with South Africa. Project would be intended to be staff supplementation to Ministry.
- Technical Assistance, Freight Haulage Management and Coordination - Ministry of Transport and Telecommunications
Support one contract advisor and two short-term consultants in road transport organization to facilitate establishment of private association of quasi-public body to facilitate transport coordination and provide short training sessions in transport management open to private sector operators.

TABLE XVI

LESOTHO: MAJOR ROAD PROJECTS UNDERWAY OR PROPOSED - 1978/79

Road Link	Economic Appraisal	Cost (Millions/Rand)	Stage	Donor
Tsakholo to Ramoihloe	Spur link of main road system into western border agricultural region		Under Construction	UK
Van Rooyens Gate to Mafeteng	Link to border crossing and spur of main road system into western border agricultural region		Under Construction	UK
Mafeteng to Mhales Hoek	Preliminary link to interior via southern route, joining US/AID project	4.5		EEC (ODM, Holland)
Mhales Hoek to Mpiti	Key link in efforts to compensate for closure of border with Transkei and integrate southern portion of economy with western region	23 ¹		USAID (Prelim. by EEC/Holland)
Roma to Ramabanta	Joint links from existing paved system to southern US/AID road	4.5	Start-up (1977) delayed	Design ADB Construction KFW
Ramabanta to Sekake	Joint links from existing paved system to southern US/AID road		Ready for tender	Feasibility KFW
St. Michaels to Thaba-Tseka	First phase: Major link to agricultural (cattle) and rural development projects in the interior and eventual link to southern economic region. Will supplement southern link	5.5	Under Construction; Projected completion 1979	IDA
Thaba-Tseka to Qdaches Nek	Second phase: Link joining Thaba-Tseka to southern economic region	15.5	Feasibility Study	FS/CIDA
Leribe to Joels Drift	Extension of western lowland bitumen network	8.5		C/ADF
Joels Drift to Oxbow	Extension of western lowland bitumen network and link to diamond production		Feasibility Study	ADF*
Oxbow to Mokhotlong	First link joining northern tip to southern economic region via north-south road		Feasibility Study	F/UK*
Mokhotlong to Sani Pass	Connects Sani Pass to eastern tip with eastern north-south link	14 for joint construction	Feasibility Study Expected 1979	F/UK Con/UK*
Mokhotlong to Taung	Second link in eastern north-south road, also links to central mountain road and ties in Sani Pass			

- o Capital Assistance for Road Construction, Mchales Hoek to Mpiti
USAID commitment to this route assumed. Support should be given to upgrading the entire route to paved standard and restricting U.S. involvement in road construction to this project, as other donors seem willing to support remaining road construction.

b. Railroads

A spur of the South African railway system runs from Bloemfontein to Maseru, which is located a short distance inside the northwest border of Lesotho. Traffic requirements within Lesotho do not suggest the need for additional railway facilities within the country, however, and the government has no plans to develop any railway lines.

c. Civil Aviation

1) National Objectives, Plans, and Priorities

a) Strategy Related to Sector

The government's first objective in the development of civil aviation continues to be provision of adequate internal air services, particularly in the most isolated areas. However, the government feels the growing urgency of finding means to reduce dependence on South Africa for external communications and therefore gives a high priority to construction of a new airport. This will enable Lesotho to make direct connections with countries outside of South Africa.

b) Development Emphasis on Sector

(1) Projects Underway

(a) Airfield Improvement

For airfields in the interior, the aim is to increase safety, comfort, and efficiency of flights, to reduce wear and tear on aircraft through installation of better runway marketings, drainage facilities, surfacing, passenger shelters, radio facilities, navigational aids, and fire-fighting equipment in the places where these are most needed. Works in progress include airport lighting at Maseru, radio and navigation aids at Maseru and other airfields, fire-fighting equipment at three airfields, passenger shelters at five airfields, and radio stations at two airfields. Markings and improvements to surfaces and drainage, where needed, will be completed in 1978/79.

Germany is expected to make some additional improvements in the airport at Maseru to improve its safety, but so far no donor has been found to provide the VDF navigational equipment at Maseru which was recommended in the Farah Report at an estimated cost of US \$50,000, nor has financing been found for improvement of eight airstrips in the mountainous areas, which was recommended

in the Farah Study and estimated to cost US \$460,000.

(b) Civil Aviation Training Unit

The Civil Aviation Training Unit is to offer courses in air traffic control and firemanship. After completing the basic course in Lesotho and gaining some practical experience, students of air traffic control will be sent for further training abroad. CFTC has provided an advisor who will run the basic air traffic course, and ICAO will be requested to deploy a fire and rescue advisor to give basic training for firemen. Government will recruit and employ the personnel who receive the training. The building for the unit was completed on schedule in March 1977 and the British Government has contributed training aids.

(c) Lesotho Airways

Lesotho Airways Corporation (LAC) operates a fleet of two Islanders and three Cessna 206 aircraft. The scheduled and charter flights ensure regular supplies, travel facilities, and urgent medical attention to remote areas. CIDA has provided two twin Otters which will be delivered in mid-1978. The enlarged fleet will enable LAC

to expand operations in the interior and also to operate new routes to somewhat more distant points, such as Gaborone and Johannesburg. Initially, expatriates will be employed to operate the expanded fleet until local personnel are recruited and trained to replace them. At a future date the acquisition of medium-range jet aircraft capable of economically viable operations to other Southern African countries can be considered.

(2) Projects Planned

(a) National Airport

The limitations of the Leabua Jonathan Airport in Maseru, a former polo field with a mountain at one end and a ravine at the other, are great. The largest craft that the airport can accommodate is the Hawker-Siddeley 748, which operates on the route to Johannesburg. The scheduled flights are restricted to early hours to lessen the heavy penalties on payloads imposed by temperature and tailwind conditions; consequently, passengers coming from outside South Africa are obliged to stay overnight in Johannesburg. Returning, they are often obliged to wait long hours in Johannesburg for connecting flights.

As a consequence, passengers cannot avoid experiencing South African racial policies.

Since it is not economical to extend the present airport at Maseru, a new airport is being planned that is capable of accommodating longer-range aircraft. A feasibility study done by ICAO and Swedish consultants indicates that by 1980, or soon thereafter, an airport capable of accommodating medium-range jets would be economically feasible. The Farah Mission recognized the importance of this airport to reduce dependence on South Africa and recommended that, as part of the emergency program, the detailed engineering study for the new airport should be promptly carried out. This feasibility study is being undertaken at a cost of approximately \$870,000, which is financed by the Abu Dhabi Fund. The Farah Report estimates that the cost of construction of the airport will be \$23 million, which is substantially higher than the \$13,320,000 that was estimated in the report of the first Mission.^{1/} Toward this cost, an amount of \$3.5 million is available from the European Development Fund (EDF) and \$4,040,000 from the Kuwaiti Funds.

^{1/} The term, first "Mission," refers to the mission sent to Lesotho in January 1977 by the Secretary General of the U.N.

The Government of Lesotho will provide \$1.5 million toward the construction of the airport and will forego \$2.5 million in customs revenues, since donor-provided equipment will enter Lesotho duty-free.

Other potential contributors to the airport include BADEA, Saudi Arabia, and the United States. The Government of Lesotho intends to have a donor conference on the project to determine which components each donor will finance.

The present timetable is to complete the preparatory studies for the airport during 1978 and to start construction in 1979. The airport would not be operational until 1981 but, and as the Farah Report notes, financing must be arranged expeditiously if this timetable is to be met.

(b) Rural Airports

Rural airports are planned for development at four locations. These airports and the desired condition to be attained is referenced in Table XVII, below.

TABLE XVII

LESOTHO: RURAL AIRPORT DEVELOPMENT

<u>Airport</u>	<u>Desired Condition</u>
1. Mokhetlong	ground
2. Qachas Nek	thin bitumen
3. Thabatseka	ground
4. Bemonkong	ground

(c) Training Requirements

(1) Overview

ICAO estimated the technical assistance and training requirements for Lesotho as part of its 1974/75 manpower survey of Africa (Manpower and Training, Civil Aviation Africa, pp. 92-3). Just as the Declaration of Independence of Transkei by the Republic of South Africa in December of 1976, however, led to the revision of airport development priorities, it also led to a revision of manpower requirements for civil aviation in Lesotho by the Farah Mission and by the government itself. The training and technical assistance requirements estimated by the Farah Mission are less complete than those of the Government of Lesotho, and the timing of the two studies suggests that the estimates developed by the Farah Mission were probably derived from both the ICAO estimates and the estimates of the Government of Lesotho.

(2) Farah Estimates

The Farah Mission separated requirements for technical assistance into three categories: most critical requirements, other requirements for technical and cooperation staff, and fellowship needs.

Their recommendations were:

Lesotho Central Government: Urgent Technical Cooperation

Needs

I. Most Critical Requirements

<u>Post or Title/Description</u>	<u>Number of Experts and Man/ Months</u> (M/Ms were estimated)
Civil Aviation Maintenance Engineers	2 experts
Telecommunications Engineer (for design and maintenance assistance)	1 expert for 24 m/m

II. Other Requirements for Technical Cooperation Staff

Director, Department of Civil Aviation	24 m/m
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III. Training, Study and Vocational Fellowships Needed

<u>Field</u>	<u>Number of Fellowships</u>
--------------	------------------------------

a. Civil Aviation Directorate

Deputy Director Civil Aviation	1
Air Traffic Services Administrator	1
Senior Air Traffic Controller	1
Air Traffic Controller	1
Aeronautical Information	2
Aeronautical Communication Officer	2
Aeronautical Station Operator	12

Communication Maintenance Technician (Radio, Electronics, Nav Aids)	5
Aerodrome Engineer	1
Aerodrome Maintenance Technician (Civil)	2
Aerodrome Maintenance Technician (Electrical)	2
Aerodrome Maintenance Technician (Mechanical and Power Plant)	2
Personal Licensing Officer	2
Air Transport Officer	1
b. Lesotho Airways Corporation	
General Manager	1
Operations Manager	1
Chief Pilot	1
Pilot	3
Cabin Attendant	3
Dispatcher (1 Chief, 2 Dispatchers)	3
Traffic Manager	1
Station Manager (1)	1
Chief Engineer, Aircraft Maintenance Engineer	4
Crew Chief	3
Mechanic	10
Storekeeper	1
Chief Accountant	1

(3) Lesotho Government Estimates

As noted above, the report of the UNDP/ICAO Manpower and Training Survey of Africa for Lesotho, January 1976, has been updated by the Government of Lesotho to reflect the government's recent decision to develop a new international airport based on events in South Africa. The government's estimates, which are summarized in Tables XVIII and XIX, include manpower requirements for both the Civil Aviation Directorate and Lesotho Airways Corporation. Table XVIII, Lesotho: Number of Posts, contains the government's estimates of the number of posts, personnel trained, personnel funded to be trained, and unfunded training requirements by persons, courses, and man months required for both the Civil Aviation Directorate and Lesotho Airways Corporation. Reference to this Table indicates that a total of 829.5 man months of training are estimated to be required for both of these organizations and are so far not funded by any donor.

Table XIX provides details of fellowships for training requirements that donors have so far agreed to fund. These fellowships are referenced as "Personnel Funded to be Trained" in Exhibit XVIII.

TABLE XVIII *W-11*

LESOTHO:

NUMBER OF POSTS, PERSONNEL TRAINED, PERSONNEL FUNDED TO BE TRAINED,
AND UNFUNDED TRAINING REQUIREMENTS
BY PERSONS, COURSES, AND MAN-MONTHS

		Number of Posts
<u>CIVIL AVIATION DIRECTORATE:</u>		
<u>Director and Deputy Director, Civil Aviation</u>		2 persons 2
Civil Aviation Administration - Special course for senior staff (Instant DCA)	1 person x 12 Man- Months (M/M)	12 M/M
Air Transport Economics Courses and seminars	2 persons x 2 1/2 M/M	<u>5 M/M</u> 17 M/M
<u>Air Traffic Services</u>		
Total Requirement	10 persons (1 ATSA, 1 SATCO and 8 ATCOS)	10
(1 in position; 2 under training due back in June 1978 and 4 due for training in pipeline - 2 to USSR back in 1981 and 2 to Nigeria back in 1979).		
Balance to be trained in basic ATC		3 persons
Area Control (ATSA 1, SATCO 1 and ATCOS 3)		5 persons
Refresher and Improver Courses (ATSA 1 and SATCO 1)		2 persons
ATC administration and management (ATSA 1)		1 person
ATC attachment (ATSA 1 and SATCO 1)		2 persons
<u>Courses</u>		
Basic ATC	3 persons x 12 M/M	36 M/M
Area Control	5 persons x 3 M/M	15 M/M
Refresher Course	2 persons x 2 M/M	4 M/M
Improver Course	2 persons x 3 M/M	6 M/M
ATC administration and management	1 person x 3 M/M	3 M/M
ATC attachment	2 persons x 3 M/M	<u>6 M/M</u> 70 M/M
<u>Aeronautical Information Officer</u>		
Total Requirement	3 persons	3
(In position nil; under training 1 - will be back in 1977. Balance to be trained 2)		
AIS General Course	2 persons x 8 M/M	16 M/M
AIS Briefing	1 person x 2 1/2 M/M	2 1/2 M/M
AIS Publication	1 person x 2 1/2 M/M	<u>2 1/2 M/M</u> 21 M/M

Source: Department of Civil Aviation, Ministry of Transport and Communications,
Maseru. Projection of Civil Manpower and Training Requirements, August,
1977.

		<u>Number of Posts</u>
<u>Aerodrome Maintenance Technicians (Civil)</u>	6 persons	6
(In position, under training or training in pipeline - Nil)		
(Out of 6, 4 will be for Civil Engineering works and no training is needed and they will get attachment training)		
To be trained	2 persons	
Aerodrome Maintenance Technician (Pavement)	2 persons x 6 M/M	12 M/M
<u>Aerodrome Maintenance Technician (Elect) and Mechanical and Power Plant</u>		
Total number required	4 persons	4
(In position, under training or training in pipeline - Nil)		
To be trained	4 persons	
Electrical	2 persons x 6 M/M	12 M/M
Mechanical and Power Plant	2 persons x 6 M/M	<u>12 M/M</u> 24 M/M
Draughtsman (No training requirements)		1
<u>Others:</u>		
<u>Airworthiness Inspector</u>		
Total requirement	1 person	1
Under training	1 person	
Balance to be trained - Nil		
<u>Personnel Licensing Officer</u>		
Total requirement	2 persons	2
(One was under training at CASC, Beirut but course interrupted; training to commence afresh)		
Special course for Government Operations Officer - Personnel Licensing	2 persons x 7 M/M	<u>14 M/M</u> 14 M/M
<u>Air Transport Officer</u>		
Requirement, 1 person to be trained	1 person	1
Air Transport Economics	1 person x 2 1/2 M/M	2 1/2 M/M

			<u>Number of Posts</u>
<u>Statistics Officer</u>			
Requirement	1 person		1
In position - Nil			
Balance to be trained	1 person		
Aviation statistics	1 person x 6 M/M	6 M/M	
<u>Aerodrome Manager</u>			
Total Requirement	1 person		1
In position - Nil			
To be trained	1 person		
Aerodrome Management - Commercial and Administration	1 person x 12 M/M	12 M/M	
Aerodrome Management - Attachment Training	1 person x 3 M/M	<u>3 M/M</u>	
		15 M/M	
<u>Chief Fire Officer</u>			
Total Requirement	1 person		1
To be trained	1 person		
<u>Fire Officer</u>			
Total Requirement	3 persons		3
To be trained	3 persons		
Junior Fire Officers Course	4 persons x 3 M/M	12 M/M	
Senior Fire Officers Course	1 person x 3 M/M	<u>3 M/M</u>	
		15 M/M	
Firemen (No training requirements)			24
Other Supporting Staff (No training requirements)			16
<u>LESOTHO AIRWAYS CORPORATION</u>			
<u>General Manager</u>			
Requirement	1 person		1
To be trained	1 person		
Degree Course in Aviation Management	3 persons x 12 M/M	36 M/M	
Attachment Training	1 person x 12 M/M	<u>12 M/M</u>	
		48 M/M	

			<u>Number of Posts</u>
<u>Operations Manager</u>			
Requirement	1 person		1
To be trained	1 person		
CPL/IR/ALTP Theory Pilot Course	1 person x 15 M/M	15 M/M	
Flight Operations Administration/Management Training by attachment		<u>6 M/M</u> 21 M/M	
<u>Chief Pilot</u>			
Requirement	1 person		1
To be trained	1 person		
CPL/IR/ALTP Theory Pilot Course	1 person x 15 M/M	15 M/M	
Training by attachment		<u>6 M/M</u> 21 M/M	
<u>Pilots</u>			
Total Requirement	10 persons		10
(In position 3. 1 under training at Perth - will be back by 1978. Training in pipeline - 2 to USSR - will be back by 1981; 1 on EEC fellowship - will be back by 1979). Balance to be trained 3)			
CPL/IR/ALTP Theory Pilot Course	3 persons x 15 M/M	45 M/M	
<u>Traffic Manager</u>			
Total Requirement	1 person		1
In position - Nil			
To be trained	1 person		
Airline Traffic	1 person x 3 M/M	3 M/M	
Airline Sales	1 person x 3 M/M	<u>3 M/M</u> 6 M/M	
<u>Station Manager (Foreign)</u>			
Total Requirement	1 person		1
To be trained	1 person		
Airline Sales	1 person x 3 M/M	3 M/M	
Passenger Services	1 person x 3 M/M	<u>3 M/M</u> 6 M/M	
<u>Chief Engineer and Aircraft Maintenance Engineers</u>			
Chief Engineer	1 person		
A.M.E.	3 persons		4

for training basic A.M.E. due back in September, 1977; 1 to go to Perch for training basic A.M.E. due back in September, 1979; 2 to go to USSR A.M.E. due back 1981)

no basic A.M.E. training is required but training is required for higher ratings
Additional - Airframes
Plants, etc.

Airframes and Power Plants 2 persons x 7 M/M 14 M/M

Mechanics and Crew Chiefs

Total Requirement (Crew Chief + Mechanics 10) (5 to be trained during 1978-1980) 13 persons 13

Mechanics 5 persons x 24 M/M 120 M/M
120 M/M

Avionics Engineer

Total Requirement 1 person 1

To be trained - Nil

Radio Technicians

Total Requirement 1 person 1

(Training in pipeline - 2 persons going to USSR and will be back in 1981) Balance to be trained - Nil

Electrical/Instrument Technician

Total Requirement 1 person 1

(One person booked for training in January 1978 and will be back by middle of 1980) Balance to be trained - Nil

Cabin Attendants

Total Requirement 3 persons 3

To be trained 3 persons

(087) Cabin attendants 3 persons x 4 M/M 12 M/M

Aircraft Dispatchers

Total Requirement 3 persons

To be trained 3 persons

(?) Dispatchers 3 persons x 7 M/M 21 M/M

Storekeeper

Total Requirement 1 person 1

To be trained 1 person

			<u>Number of Posts</u>
Storekeeper - Attachment Training	1 person x 3 M/M	3 M/M	
<u>Chief Accountant</u>			
Total Requirement	1 person		1
To be trained	1 person		
Accountant - Training by attachment	1 person x 6 M/M	6 M/M	
Other Supporting Staff (No training requirements)			71
Total Man-Months Training Requirements		<u>829.5 M/M</u>	

TABLE XIX

LESOTHO: DETAILS OF FELLOWSHIPS - ONGOING AND IN PIPELINE

COURSE	PLACE	NO. OF PERSONS AND MM	DURATION		SPONSORED BY	REMARKS
			FROM	TO		
<u>CIVIL AVIATION:</u>						
<u>Ongoing</u>						
(1) Air Traffic Control	CATC, Nigeria	2 (42)	Sept. 76	Jun. 78	CFTC	
(2) Aeronautical Information Officer	AIS, Pinner, UK.	1 (3)	Aug. 77	Oct. 77	EEC	
(3) Communication Maintenance Technician	ESA, Nairobi	1 (33)	Jan. 75	Sept. 77	ICAO	
(4) Airworthiness Inspector	Northrop USA	1 (45)	Jan. 75	Dec. 78	ICAO	
<u>In Pipeline</u>						
(1) Air Traffic Control with PPL	CATC, Nigeria	2 (32)	Sept. 77	Dec. 78	EEC	Confirmed
(2) Air Traffic Control	USSR	2 (96)	Sept. 77	Aug. 81	UNDP	Confirmed
(3) Aeronautical Communication Engineer	South London, U.K.	1 (36)	78	81	UK	
<u>LESOTHO AIRWAYS CORPORATION</u>						
<u>Ongoing</u>						
(1) CPL	Perth, UK	1 (19)	June 77	Dec. 78	EEC	
(2) Aircraft Maintenance Engineer	Perth, UK	1 (28)	April 75	Sept. 78	UK	
<u>In Pipeline</u>						
(1) CPL	USSR	2 (96)	Sept. 77	Aug. 81	UNDP	Confirmed
(2) CPL	Perth, UK	1 (19)	78	79	EEC	
(3) Aircraft Maintenance Engineer - Airframes and Engines	USSR	2 (96)	Sept. 77	Aug. 81	UNDP	Confirmed
(4) Aircraft Maintenance Engineer - Airframes and Engines	Perth, UK	1 (24)	Oct. 77	Sep. 79	EEC	Confirmed
(5) AME - Avionics	USSR	2 (96)	Sept. 77	Aug. 81	UNDP	Confirmed
(6) Electrical/Instrument Technician	UK	1 (30)	Jan. 78	Jun. 80		
		159				

Additional information contained in the Government of Lesotho report on training and manpower requirements includes:

- Summary of costs showing external funds required and government contribution in kind for fellowships and technical assistance that is currently being funded by donors
- Annual breakdown of fellowship training, currently being funded by donors and the cost of such training.
- Current numbers of expatriate experts assigned to the Civil Aviation Directorate and Lesotho Airways, funding source, and period of funding.

2) Recommendations

- The U.S. should develop a homogeneous policy of support to both capital and training needs related to civil aviation for Lesotho, Botswana, and Swaziland. All three countries wish to develop international airports, have extensive needs for manpower training in the aviation sector, are landlocked, and belong to the Southern African Customs Union. For all three countries the U.S. policy should probably be developed in coordination with the UNCTAD efforts to develop programs for landlocked countries. In addition, the Transkei situation is a special case for Lesotho; consequently, the results of the Farah Report on capital and training needs, as well as the Government of Lesotho's thorough summary of manpower requirements, should be taken into account in the decisions of the U.S. Government. Support for civil aviation has a low development priority, but seems required in view of the poor condition of the currently used airport at Maseru. Whatever aid the U.S. may decide to provide for capital development or manpower training related to civil aviation should probably be a part of a multilateral assistance program. As noted in this report, Lesotho plans to have a donor conference to coordinate the assistance for the proposed international airport. Assistance for technical assistance and manpower

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training related to civil aviation that the U.S. may provide could be funded through the International Civil Aviation Organization and the African Civil Aviation Commission. As noted in the report for Botswana, these organizations have developed a plan to rationalize provision of training for the civil aviation sector through a three-tiered approach that includes use of:

- two multinational training centers
- national training facilities
- an international fellowship program

One rationale for the development of a homogeneous policy regarding U.S. assistance to airport development is the possible complementarity of such aid with aid in other sectors. For example, the U.S. might consider provision of aid for communications equipment if it also desires to provide other forms of assistance for telecommunications in some of these countries. This way efforts could be made to coordinate development of airport communications systems with national and international microwave systems and other elements of telecommunications systems that complement communications facilities required for civil aviation.

The SADAP team was told that a detailed list of the capital components of the proposed international airport in Lesotho and their costs is available in Lesotho. The team was not able to obtain a copy of this list before its departure, however. Such lists may also be available in Botswana and Swaziland. In the process of developing a homogeneous policy to supply assistance to new international airports being developed in Southern African countries, the U.S. Government should utilize this list (and similar lists developed for Southern African countries which desire international airports), which could serve as a point of departure for identification of particular types of capital expenditures that the U.S. would consider funding in each country.

- The U.S. should consider funding a feasibility study to determine (a) economic and political viability of a regional airways service among the BLS countries, Malawi, and perhaps Zambia; and (b) the financial viability of a national airline in each of the BLS countries, when

each country has an international airport and Malawi opens the Lilongwe international airport. As noted in the report for Botswana, once a country has a full-scale international airport it must compete with a large number of international carriers for passengers.

- The U.S. should consider establishment of a grant program for Lesotho that would finance policy studies requiring one to six man months of effort. Policy studies that deserve consideration in Lesotho include:

- a feasibility study regarding the establishment of a regional airways service with Botswana, Swaziland, Malawi, and perhaps Zambia

- the provision of staff to work on Lesotho's preparation for transit negotiations with the RSA. As noted in the report, negotiations for a new transit agreement broke down in September 1977, but since that time the U.N. has supplied a new director for the Department of Transportation in Lesotho and the working group consisting of representatives of both the Government of Lesotho and South African Railways has been established to reconsider the transit agreement defined in Article 14 of the Customs Union Agreement. SADAP team members have discussed the potential usefulness of such a grant program for provision of technical services for these two tasks with officials of the Government of Lesotho and the officials were very interested in the proposal.^{1/}

^{1/} Another example of a useful study would be containerization of Lesotho goods. Containerization would reduce the damage and loss of rail goods that is noted in the UNCTAD Report on the external sector of Lesotho (UNCTAD, pp. 12-15). As part of this project, the U.S. could also consider ways to provide storage facilities for Lesotho at Durban or East London. The need for these facilities is also cited in the UNCTAD Report on the external sector of Lesotho. A subsequent section of this report concerning assistance requirements of Swaziland notes the need for containerization equipment there. Insofar as provision of U.S. assistance to railway development in Southern Africa is concerned, perhaps the U.S. should make a decision about assistance for containerization that applies to all Southern African countries. This type of assistance, however, seems to have a low priority.

d. Telecommunications

1) Development and Constraints

The provision of the telecommunications services is the responsibility of the Department of Telecommunications. Basic guidelines for the development of telecommunications include:

- laying the groundwork and establishing the infrastructure and procedures for the long-run growth of telecommunications;
- taking appropriate short-run action to overcome major problems affecting the present level of service to the subscribers;
- managing training of local staff, formal instruction, field training, and on-the-job training.

The western perimeter of Lesotho is served by a ground line, carrier system joining ten automatic exchanges and thirty manual exchanges. This system has 2,300 direct exchange lines and 5,200 telephone stations, of which about 75% are in Maseru.^{1/} Backup subscription orders are estimated at about 1,000, at least half of which are for Maseru. The rugged escarpment surrounding the central portion of the country seriously complicates communication between the western perimeter and the interior. Various local systems in the latter portion of the country are operational but their reliance on lines through the Transkei is politically unacceptable as well as ineffective.

^{1/} The largest exchange outside Maseru has 150 lines.

The western perimeter system is linked at several points with local exchanges across the border in South Africa. This greatly facilitates communication with the most immediate centers of economic importance. There is also a three-channel line through Bloemfontein providing access to international routing via the Cape Town cable. A single-channel HF radio link gives service to Nairobi, but this route is unreliable. Telex service is tied to international channels through facilities in South Africa. Although this is regular, quality service there is a political concern as to the reliance upon and potential for line monitoring by South Africa for not only Telex, but all types of international service.

Basic system maintenance and repair has been almost completely localized. The exception is in regard to radio equipment. Considerable delay exists between the identification of the need for a repair and the performance of that repair. This is generally the result of deficiencies in skills rather than a shortage of equipment. It is estimated that 40 to 60 percent of all system faults on a daily basis are the result of faulty installation. The situation is especially serious in regard to maintenance of the trunk system.

The telecommunications staff has a total of 255 employees. Of these, 95 are classed as permanent staff, 65 are listed as non-established positions, and 100 are designated as construction workers.

Although in absolute numbers this staff should be adequate for needs, there are qualitative differences in staff skills. Only 10 (or about 4 percent of the total staff) are engineers. Only one of these is Basotho, but another is in training. At least one more expatriate will have to be hired by the end of 1978.

Rationalized planning for the development of telecommunications on a more-than-current basis is recent in evolution and at present remains confined to a timeframe of about two years. Thus, current planning projects needs through 1980. A summary of telecommunications needs was completed as early as 1972 under a grant by SIDA, but the findings and recommendations have been only partially adopted. Major assistance for development planning is being provided by SWEDTEL, primarily through the use of expatriates. This activity is too recent to judge the effect of expatriate turnover on management development.

2) Proposed Projects

Major plans are underway for upgrading the telecommunications system. The existing western grid will be augmented by the installation of two new automatic exchanges and a new exchange for Maseru. The new equipment for Maseru is scheduled for installation by the end of August 1978 and will

provide an initial increase in capacity of from 1,600 to 3,000 lines. A phased plan has been designed for the connection of subscribers on the waiting list. Subsequent expansion of the exchanges is intended to increase system capacity by another 1,000 lines. Long distance trunk switching for the western grid will also be upgraded.

Plans also call for the addition of three new automatic exchanges in the eastern interior region. These exchanges are to be located at Thabatseka, Mokhotlong, and Qachas Nek. They will be jointed to the main system by either a small 60-channel microwave system or by radio links. Completion of these projects is projected for the end of 1980 and funding by SIDA and ODM is anticipated.

The government is presently considering the preliminary draft of legislation which would establish a parastatal company for the direction and development of telecommunications services in Lesotho. This would provide greater flexibility in regard to salaries and personnel policies. This would increase the attractiveness of employment and hopefully reduce the drain of employees who have been trained by the service into other, more lucrative, sectors of the economy. It would also give

greater control over resource use for management of the service. Should the Cabinet regard the legislation favorably, implementation could take place in mid-1979 or sometime early in 1980.

Although the present network basically meets the demand for international service at a very advantageous cost, the government has expressed an interest in obtaining a Standard B earth satellite station. This would eliminate dependence on South Africa for international service and is a politically sensitive issue. The estimated cost of the station, an international telephone switching center, and telex service has been estimated by Cable and Wireless at R3.5 million.^{1/} Studies by both the IBRD and the ITU indicate that the station would be economically viable.

Basic operations and development of telecommunications is being assisted by ODM, West Germany, and SIDA, with projected budgets running until 1980. Particular interest exists in the improvement of service productivity. The need for three or four staff members and some project- or task-oriented consultants has been proposed, but funding is not immediately

^{1/} Cable and Wireless propose to offer station management. _____

available. In view of the high profile played by SWEDTEL, support for this project would best come from SIDA.

3) Recommended Assistance

No assistance is recommended.

C. Malawi

1. Background

At independence in 1964 Malawi was the poorest of the three territories of the former Central African Federation. Its main assets are moderately fertile soils, good water resources, and a climate that is favorable to crop production. Unlike its neighbors, however, Malawi has no substantial mineral resources. Forests constitute the main, essentially untapped resource which could be exploited on significant scale in the future.

Measured against the country's natural endowments, progress since 1964 has been remarkable. Between 1964 and 1976 GDP at constant prices grew at an average annual rate of 6.5%, domestic investment and savings increased rapidly, and government finances have improved sufficiently to eliminate budgetary aid provided by the British during the years immediately after independence. Agriculture, which dominates the economy and contributed 46% of GNP in 1976, has been directed toward export markets by encouraging production of cash crops on estate and integrated rural development schemes. Industrialization has also progressed since independence; industry accounts for 9% of GNP in 1964 and 12% in 1976. Nevertheless, Malawi, with a GNP per capita of only US \$140 is listed by the United Nations among the world's poorest countries.

The economic planning of the Government of Malawi is based on a three-year rolling plan that implements the government's 1971 Statement of Development Policies (DEVPOL). DEVPOL contains guidelines for major economic targets up to 1980 and states the main socio-economic objectives, among which are:

- to raise living standards and productivity in rural areas;
- to achieve an average annual growth in GDP of 8% through the parallel development of small-holder output, estate agriculture industry;
- to promote a more balanced regional development; and
- to develop local initiatives and a gradual increase of local participation in the economy.

The investment program in the public sector is summarized in Table XX.

TABLE XX
MALAWI: PUBLIC SECTOR INVESTMENT 1971-1980 ^{a/}

	<u>K million</u>	<u>% of Total</u>
Transport	110	29
Agriculture	72	19
Social services	55	15
New capital city	50	13
Utilities	42	11
Telecommunications	20	5
Other	<u>25</u>	<u>7</u>
TOTAL	374	100

/a .Includes investment by public corporations.

Source: Statement of Development Policies, 1971-1980.

Between 1978 and 1980 the proportion is expected to be temporarily higher (46%) because of the concentration of several substantial investments in those years.

2. Strategy Related to Transportation and Communications

Malawi's present transportation policy, outlined in the Statement of Development Policies, has a three-fold objective:

- to improve the administrative, social, and economic integration of the country by linking all three regions with reliable all-weather connections;
- to support the country's rural development efforts by improving access roads to the rural areas; and
- to provide within Malawi efficient links with transport routes leading to seaports on the Indian Ocean, for exports and imports.

Significant investments are now underway or are planned in all modes of transport, and this sector is expected to account for 46% of planned expenditures during the period 1978-81. This percentage represents a substantial increase over the 29% expenditure over the 1971-75 period. When these investments are completed the transport share of the government's capital expenditures is expected to revert to its previous average.

The responsibility for coordinating the transport investment plans rests with the Economic Planning Division of the Office of the President and Cabinet, which reviews proposals put forward annually by the ministries concerned, notably the Ministry of Works and Supplies for Roads and the Ministry of Transport and Communications for all other

modes. The government exercises considerable control over transport through its ownership of major carriers such as Air Malawi and Malawi Railways, including the latter's two subsidiaries, Lake Services, Ltd. and Road Motor Transport Services, Ltd., a large trucking company. All of these companies are under the jurisdiction of the Ministry of Transport and Communications (MTC), which is also responsible for regulating private carriers, including those in road transport.^{1/}

3. Analysis of Respective Modes

a. Roads

1) Development and Constraints

Malawi has a classified road system of about 6,650 miles, of which 1,002, or about 15%, are paved. Approximately another 300 miles are ground and 5,354, or about 80%, are earth. (See Table XXI, Malawi: Classified Roads, March 31, 1978.) In addition, there are over 1,200 miles of unclassified feeder and crop extraction roads in conjunction with major agricultural travel development projects in the country, as well as several thousand miles of undesignated earth tracks, some of which are to be

^{1/} Initially the management and development of transport and communication services was the responsibility of the Ministry of Works and Communication. Structurally and functionally, however, the Ministry separated the administration of posts, telecommunications, and civil aviation from such operations as water projects, the licensing of vehicles, road safety, and road construction. In November 1975 the Ministry was split into the Ministry of Works and Supplies-- with a separate Roads Department to supervise construction and maintenance-- and the Ministry of Transport and Communications. The latter is divided into the Department of Transport, the Department of Telecommunications, the Department of Civil Aviation, and the Department of Posts.

TABLE XXI

MALAWI: CLASSIFIED ROADS, MARCH 31, 1978

Highway Authority	Class	Length within surface type				% of Total
		Bitumen km (miles)	Gravel km (miles)	Earth km(miles)	Sub-total km (miles)	
Chief Roads Controller	Main (M)	1,437(893)	303 (188)	1,281(796)	3,021(1,877)	28.21
Chief Roads Controller	Secondary (S)	183(114)	169 (105)	2,094(1,301)	2,446(1,520)	22.84
District Council (24)	District (D)	-	-	5,037(3,130)	5,045(3,135)	47.12
Chief Roads Controller	Branch (B)	-	-	60 (37)		
Others (Estates - 2)	Branch (B)	-	-	29 (18)	89 (55)	0.83
Chief Roads Controller	Estate (E)	-	-	107 (67)	107 (67)	1.00
Total		1,620(1,007)	472(293)	8,616(5,354)	10,708(6,654)	
Percentage of Total		15.13	4.41	80.46		100.00
Municipal Council	Main, secondary and adopted roads within the designated areas of the Capital City of Lilongwe and the City of Blantyre.					
Town Council	Main, secondary and adopted roads within the designated areas of the Zomba, Balaka, Mangochi, Dedza, Salima, Mzuzu and Liwonde townships.					
Width of road reserves	Main-60m (200 feet); secondary and district-36m (120 feet); branch and estate-18m (60 feet).					

absorbed as district roads. The low quality of much of the network results in high transport costs.

Almost 600 miles, or about 60%, of the paved roads and about 74 miles, or about 25%, of the gravel roads, in the country have been built since 1968. (See Table XXII, Malawi: Road Development Program, 1968-1977, and Projects Underway, 1978.) The existing system provides major links for the southern and central regions where the majority of the population resides, but links to the northern region are incomplete. Paved roads run from Bangula to Blantyre and on to Lilongwe and Nasungu. (See Figure XXIII, Malawi: Principal Roads Network, 1978.) Completion of a paved network is complicated by the existence of a sharp escarpment parallel to the lakeshore which creates two north-south corridors, communication between which is very difficult. As a result, a paired system with a coastal route and an interior route is planned at least until Rumphu. Links between these routes are planned at five strategic positions.

Government engineers complain that the rising costs of construction make it difficult to complete what constitute economically viable links in the road network. Main paved road construction in 1971 was about K60,000 per mile. By 1977 the cost had reached almost K90,000 and the projection for 1979 was K152,000. Even discounting for possible differences in topography, inflating costs were

TABLE XXII

MALAWI: ROAD DEVELOPMENT PROGRAM 1968-1977 AND PROJECTS UNDERWAY, 1978

PERIOD - Years 1968-1977 Completed projects.

Agency	Bridges (1-3)			Road and Bridges (4-8)				
	No (1)	Av. span-m(ft) (2)	Cost-K (3)	Gravel km(miles) (4)	Cost Col (4) -K (5)	Bitumen km(miles) (6)	Cost Col (6) - K (7)	Cost Cols (5)(5)(7) (8)
Direct Labour	4	95 (320)	633,355	119 (74)	632,993	592(368)	16,146,929	17,413,277
Contract	3(a)	126 (413)	2,025,873	Nil	-	357(222)	20,484,022	22,509,895
TOTAL	7	109(359)	2,659,228	119 (74)	632,993	949(590)	36,630,951	39,923,172

(a) Including adaptation Chiromo bridge span 181 m(593 ft) to a rail/road facility; cost included Col. (3).

PROJECTS IN HAND - cost anticipated as at 31 March 1978.

Direct Labour	Minor (b)	-	550,000	Nil	-	169(105)	8,425,000	8,930,000
Contract	Nil	-	-	-	-	435(270)	42,573,254	42,573,254
TOTALS	-	-	550,000	-	-	604(375)	50,998,254	51,553,254

(b) Construction of 4 No and replacement of Bailey superstructure with precast post tensioned inverted RC T-beams and cast in situ RC deck to 10 No minor bridges.

seriously complicating road development planning. This problem is reinforced by the structural needs of the Malawian system but represents a problem for countries throughout the region. It is particularly disturbing to the Malawians to have prepared the engineering details and other backup associated with their projects only to wait for donors as construction costs soar.

The Ministry of Works and Supplies is responsible for construction of all classified roads except district roads, which are the responsibility of the District Councils. About 60% of the paved roads constructed since 1968 have been built by direct labor projects. The remainder have been awarded to independent contractors under the supervision of the Roads Department or consultant engineers acting on behalf of the Department. Most main road construction is not labor-intensive--except for the construction of culverts, drains, etc.--but labor-intensive methods are being introduced on a trial basis under the District Roads Improvement and Maintenance Program funded by the IBRD. Local contractors often construct estate roads, but they lack the ability to handle major road projects, all of which are presently handled by foreign contractors.

The Ministry of Works and Supplies also is responsible for the maintenance of all classified roads, except district roads, which again are the responsibility of the District Councils. There are divisional offices in each of the three regions which are directly responsible

for road maintenance projects; road planning and overall supervision are handled by the headquarters staff in Lilongwe. Road maintenance is largely mechanized but manual labor is used for certain routine operations. Each region has its own pool of maintenance personnel, and maintenance of all-weather roads is satisfactory.

The construction and maintenance of district roads have been given inadequate support, but in 1974 under the Second Highway Project promised by IDA a District Roads Improvement and Maintenance Project was initiated. The original pilot scheme was started in Kasungu District. Most labor has used intermediate technology but there has been some experimentation with labor-intensive techniques using hand tools. Initially the project is being operated by the Ministry of Works and Services, but in late 1978 or early 1979 responsibility will be transferred to the Kasungu District Council. The project has trained foremen from all 24 districts in office and workshop administration and such associated tasks as concrete culvert casting and repairs to timber bridges. The pilot scheme has been successful in general and will be extended to service additional districts at an estimated cost of about US \$3.6 million, provided by IDA or World Bank assistance.

Road planning and overall supervision are handled by the headquarters staff of the Ministry in Lilongwe. There is a Design Department consisting of

almost 70 engineers, technicians, and surveyors, which is responsible for the engineering of roads and bridges, but it is primarily concerned with the design of structures and water supply facilities; it carries out only preliminary studies and minor road and bridge designs and relies on engineering consultants for major road projects. The Department has a well-equipped laboratory for testing materials and soils and has developed design standards keyed to topography and traffic conditions in Malawi.

There is a Plant and Vehicle Hire Organization with workshops in all regions and a central workshop in Blantyre for major repairs. Created in 1971, this organization is responsible for procuring and maintaining all government-owned equipment and vehicles. The Ministry is assessed a rental fee for the use of construction and maintenance equipment based on purchase cost and maintenance charges. The equipment availability rate is about 70%, but the government would like to increase the rate to about 85%.

The Ministry of Works and Supplies faces a continuing problem in obtaining professional staff members. Although the government operates an active program for selecting, educating, and training Malawi nationals, there is a scarcity of qualified candidates and supply never equals demand. Training supported under assistance by

mainly Britain, Canada, and the UNDP is more than adequate to meet qualified students. Although still dependent upon expatriates, two out of every three engineers are Malawi nationals. The Malawi Polytechnic is expanding its training capacity and the need to send engineers overseas for training will gradually be reduced. Considerable progress has been made in training such personnel as road engineers, foremen, and equipment operators. Although able to supply its own needs, the Training Branch of the Ministry estimates that it has trained three times as many mechanics as it employs; the difference represents losses to the private sector or to other public programs.

The regulation of road transport is the responsibility of the Ministry of Transport and Communications. The Ministry does prescribe freight rates and passenger fares, but in view of the proportion of small freight operators there is considerable undercutting of freight rates. A schedule of vehicle dimensions and weight regulations, with the maximum axle load being nine tons, has been established, but enforcement of these regulations has been weak. Under the Second Highway Project three weighbridges were installed. These have helped enforcement, but road deterioration caused by overweight vehicles continues.

By 1976 the road transport fleet had reached 29,600 registered vehicles, about 75% of which were registered in the southern region. About 34% were passenger

cars, and about 36% were goods vehicles. The estimate for the vehicle fleet in 1978 is about 32,000. Over 65% of the goods vehicles have less than a 3-ton carrying capacity and only 3% have more than a 10-ton capacity. The government-owned Road Motor Services, Ltd. and the major private company, United Transport, together handle about one-third of the fleet and 60% of the many small-scale truckers had only one truck. The fleet has been growing at about 6% annually, but the number of trailers doubled between 1977 and 1978. Truck/tractor combinations have become common on main routes and have provided for an increase in volume beyond motorized fleet expansion. Efforts are underway to improve transport statistics, especially in regard to traffic flow, for which the government projects an annual increase of 9%.

2) Proposed Projects

In conjunction with a special symposium (June 26 through June 29), the GOM prepared an enumeration of road development needs, officially presented as the National Highway Development Programme, 1978/79-1980/81. This enumeration presents 15 major proposed projects for which the government is seeking financing. (See Table XXIV, Malawi: Proposed Road Projects, National Development Program, 1978, and see Figure XXV.) These projects are at varying states of preparedness; several await pre-feasibility studies and three (#3, #4, and half of #10 south of Benga) can be begun as soon as funded.

TABLE XXIV

MALAWI: PROPOSED ROAD PROJECTS - NATIONAL DEVELOPMENT PROGRAM, 1974

Project Identification	Ranked ² Priority	Stand- ³ ard	Economic Appraisal	Donor Interest
1	2 ⁴	1	Relevant to potential coal field development at Mgana in which Japanese and South African investors have expressed interest. Coal field has at least 30-year supply for Malawi at current use rates and may be as high as 60 years. Will need harbor development (Karonga) and lake transport development; should be package plan. Chitipa route important for tie in to IBRD agricultural development project between Karonga and Chitipa. Regional link to East Africa Highway.	CIDA considering as part of corridor study in conjunction with coal field feasibility study
2	5	2	Important as link to Zambia to provide year-round access to Nyika Plateau and game park in support of tourist industry. Presently access to park restricted during wet season which is most beautiful time to visit. Agricultural projects adjacent to route would also benefit.	None
3	3	1	Link in national N-5 system; design already funded by ADF. Projected cost of K10 million.	None
4	4	1 or 2	Specific roads not fixed, not part of N-5 system but important as link to feeder roads in this district planned in conjunction with 3 rural development projects.	None (See #5 below)
5	2	1	Important link in national N-5 system, estimated cost K35 million. Link in national N-5 system and also use as logging route. Expect that project #4 may be included in package proposal.	IBRD doing feasibility study for corridor
6	2	1	Essential link to get timber from plateau to Viphya pulp mill near Chintcheche. Estimated cost of K30 million.	None
7	2	1	Link in lake shore route important for Viphya development/operation.	None
8	4	1	Cross link between N-5 plateau to lake shore routes. Have done preliminary survey but need feasibility study. Would connect feeder roads in agricultural development zone east of Kasungu and cement plant mid-way on route. Line could also be sent up to the pulp mill over this route.	Possible ODM Interest
9	4	1	Access route to feeder roads in established tobacco growing zone	
10	1	1	Top priority as link in lake shore route and access to sugar refinery.	CIDA considering
11	3 ⁵	2	Access to Bunda Agricultural College and to feeder routes in Lilongwe Land Development Program phase 4 (IDA).	
12	2.5	1	East segment important link between plateau roads in national N-5 system. Probably do in conjunction with upgrading of M15, M17, and M18 (see text).	Interested in UNICEF consideration
13	3.5	1 or 2	Access to rural development project areas.	None
14	2	1	Blantyre-Zomba section of M1 is in bad condition and needs reconstruction. M14 would 1) bring relief to traffic level; 2) allow reconstruction; 3) save fuel (1 gal. per vehicle per trip north); 4) reduce long-run maintenance costs for Blantyre-Zomba section.	
15	3.5	1	This link to southern Africa used to be of major importance for imports. Relative shift to reliance on European sources reduces importance. Would provide access to Zambizidevupment and regional transit link for Mozambique traffic. Political factors make investment controversial.	EDF considering feasibility study as part of regional study of Malawi-Mozambique links ⁶

¹Project identification numbers correspond to designations on official government maps (See Figure Malawi: Proposed National Road Development Program, 1974.)

²Ranking of road projects based on informal consultation with the Ministry of Works and Supplies and as such represent unofficial economic priorities subject to change and government review.

³Class 1: 32-foot base, 22-foot bitumen surface with 2 lanes, 20-year life with design speed of 60 mph normal terrain. Class 2: 28- to 32-foot base, 18-foot bitumen surface with 2 lanes, 20-year life with design speed of 60 mph normal terrain.

⁴The leg to Mgana 2, Chitipa leg 4, as regional link 2. First stage could go just to Nkuru River crossing.

⁵Bunda north 3, south loop 4.

⁶Funding under regional classification not expected by EDF even though included under regional corridor feasibility study.

Sources: Adapted from Republic of Malawi, Major Illustrating Development Projects, 1974-1980/81. Department of Surveys, Blantyre, 1974, in conjunction with discussions with the Deputy Secretary and Staff of the Ministry of Works and Supplies.

Projects were selected for inclusion in the enumeration on the basis of:

- providing a link in the national N-S plateau and lakeshore routes;
- providing access to such areas offering potential development returns, as the Viphya and sugar refining sites;
- providing access to agricultural/rural development projects and their associated feeder roads;
- providing external link.

Completion of these projects will provide the major routes for the national system and regional linkage. The coastal and interior links will run all the way to Rumphu and then a single link will run to Naronga and Chipata. Most of these routes have associated sector importance. Primary emphasis is being given to the sugar and pulpwood projects, but other links are keyed to rural development and mineral exploitation.

The GOM is interested in USAID assistance for Project #12, which would provide an East-West link between the lakeshore and interior plateau routes. Since USAID assisted with the Monkey Bay Road to which this joins, and which is in need of upgrading, the government feels USAID best able to coordinate overall construction and improvement. In view of active donor interest in transport, the major interest expressed by the government in USAID assistance is for feeder roads and the provision of technical and mechanical training.

3) Recommended Assistance

The consultants were unable to attend the session of the Donor Conference. Although donor reaction is still forthcoming, the preparations of the government were impressive and strong interest in considering assistance for road projects has been expressed by such donors as CIDA, ODM, EDF, and IBRD. In general, the immediate needs of the country would warrant only selective assistance.

- Technical Assistance in Transport Policy Regulation and Enforcement - Ministry of Transport and Communications
The project should be keyed to appraisal of effectiveness of present methods, relationship between surface failures and road damage, and possible training suggestions for subsequent projects. One contract advisor and two short-term consultants, for a total of 24 man months would be required.
- Technical Assistance in Modal Linkage - Ministry of Transport and Communications and Economic Planning Division, Office of the President and Cabinet
Project should be keyed to a study of the relationship between road and lake traffic. A design for phased development of the two modes should be produced with suggested costing of independent development. Suggest rate levels and volume for profitable lake traffic should be included or developed as part of a separate prefeasibility study. (See Section , Lake Traffic.) Project should also concern upgrading coordination by Economic Planning Division of investment in road and lake transport and could include overall perspective of investment adjustment for all modes.
- Technical Assistance in Road Engineering
Suggest a mix of one or two contract advisors and short-term consultants to augment staff of Ministry of Works and Supplies. Suggest also short-term consultant to study coordination with various ministerial-level planning agencies in terms of the effective utilization of staff with engineering experience or background. Upgrading competence in this area will be an essential complement to major capital inflows and donors for road construction proposed at Roads Symposium.

● Capital Assistance for Project #12

Assistance for this project recommended because:

- GOM has stated interest in specific USAID assistance for project;
- former USAID involvement in Monkey Bay;
- key element in development of lake transport.

Development of this entire link should be keyed to feasibility study for lake transport development as a whole. (See Lake Transport Section.) Project returns should be keyed to eventual needs for passenger and freight transport and to major associated sector development, including coal, pulpwood, sugar refining, and tourism.

b. Railroads

1) National Objectives, Plans, and Priorities

a) Improvement of Current System

The rail network comprises a railway line from Salima in the central region through Blantyre to the southern border (277 miles), where it connects with the Mozambican line leading to the Port of Beira on the Indian Ocean; and a branch line (63 miles) offering an alternative route to the sea from Nkaya to Nayuci, where it connects with the Mozambican line to the Port of Nacala. In addition, a westward extension from Salima to the capital city of Lilongwe, financed by a grant from the Canadian Government, will be available for operation in August of 1978. The Canadian Government has also financed an extension under construction westward from Lilongwe through Mchinji to the Zambian border; this line will be completed in 1980/81, but no rail line in Zambia exists to meet it. The Canadian Government is

considering a request from the Government of Zambia to finance an extension of the line from Mchinju, Malawi to Chipata, Zambia, a distance of 31 kms. In 1977 the railway carried about 1.3 millions tons of freight and about 1 million passengers. The largest amount of freight was carried in 1973 (1.5 million tons), and the largest number of passengers were carried in 1975 (1.2 million).

Two rehabilitation projects are underway on the Malawi Railway. First, CIDA has financed rerailling of the Balaka-Salima track with 80# rail. Second, ODM has provided MK800,000 per year for three years to rehabilitate the line from Balaka to the southern border of Malawi.

b) Railway Employment, Finance, and Equipment

Malawi Railways had 4,127 employees in 1976. During the same years its subsidiary, Lake Services, Ltd., employed 517 workers and its other subsidiary, Road Motor Services, employed 357 workers.

Railroad receipts and expenditures have risen steadily during the period 1967-76, with receipts reaching Malawi Kwacha (MK) 10 million in 1976. Railway operating expenditure was at MK2 million in 1967, declined to MK0.8 million in 1969, and rose erratically to become MK2 million in 1976.^{1/} The Malawi railroad

^{1/} Unless otherwise specified, the statistics discussed in the text concerning Malawi Railways are taken from the publications, Malawi Railways, Compendium 1976 and Malawi Railways Statistics, December 1977 (Provisional).

makes an operating surplus, but no an overall surplus. The railroad would probably make an overall surplus, however, if it had not been called upon to finance the line of rail from Balaka to Malawi Railways, including the latter's two subsidiaries, Lake Services, Ltd. and Road Motor Transport Services, Ltd., a large trucking company. All of these companies are under the jurisdiction of the Ministry of Transport and Communications (MTC), which is also responsible for regulating private carriers, including those in road transport.

Locomotives and rolling stock used by the railway in 1976 are referenced in Table XXVI.

TABLE XXVI

MALAWI: LOCOMOTIVES, RAIL CARS, AND ROLLING
STOCK AS AT DECEMBER 31, 1976

1. <u>LOCOMOTIVES (Diesel)</u>	
A.E.I. Diesel/Electric - Main Line	10
M.L.W. Diesel Electric - Main Line	4
Nippon Sharyo - Hydraulic - Main Line	4
Hunslet - Hydraulic - Main Line	7
Hunslet - Hydraulic - Shunters	4
Bhenall - Hydraulic - Shunters	2
Andrew Barclay - Hydraulic - Shunters	<u>2</u>
TOTAL	33
2. <u>RAIL CARS</u>	
Drewery Diesel	2
3. <u>COACHING STOCK</u>	
Second Class	2
Third Class	30
Dining Car	<u>1</u>
TOTAL	33
4. <u>GOODS STOCK</u>	
Cattle Bogies	6
Cattle Shorts	1
Covered Bogies (pallet)	20
Covered Bogies	318
Fuel Tanks	47
High-Sided Bogies	141
Low-Sided Bogies	148
Rail Bogies	<u>22</u>
TOTAL	703
5. <u>SERVICE VEHICLES</u>	
Ballast Bogies	48
Breakdown Vans	2
Inspection Coaches	2
Water Tank Bogies	<u>3</u>
TOTAL	55
6. <u>VANS</u>	
Passenger Brake	1
Campo Kitchen	3
Goods Bogies Brake	16
Goods Short Break	<u>1</u>
TOTAL	21
7. <u>ON-HIRE</u>	
Diesel-Electric Locos ex-Zambia	6
Fuel Tank Cars ex-Morewear Industry, S. Rhodesia	<u>9</u>
TOTAL	15

2) Constraints to Railway Transport

The Malawi rail system is well run, but experiences difficulties in exporting goods due to inefficiencies in the rail system in Mozambique. It also experiences reduced passenger traffic due to Mozambique's recent imposition of visa requirements and due to closure of the border with S. Rhodesia.

Approximately ninety percent of Malawi's imports and exports move by rail on one of two routes into Mozambique; the route to the east crosses the border at Nayuchi where it connects with the Mozambican line to the Port of Nacala via Entre-Lagos, while the other line crosses the southern border of Malawi to connect with the Mozambican line running from Vila Nova da Fronteira to the Port of Beira. Hence, the efficiency of rail transport from Malawi to the sea depends on the effectiveness of the railway infrastructure and manpower in both countries as well as the effectiveness of the port facilities and manpower in Mozambique at Nacala and Beira. Unfortunately, the major constraint is a lack of railway manpower in Mozambique.

As a result of the manpower shortage, the level of service on each line into Malawi from Mozambique is two or three trains a day. Also, there are fluctuations in schedules and in the number of trains per day, depending on manpower difficulties in Mozambique. Malawi's trade prospects would permit movement of approximately 400,000 tons of goods per month across the Mozambique border each

month, but current railway conditions in Mozambique permit movement of only about 200,000 tons per month.

As noted above, two events caused passenger traffic between Malawi, S. Rhodesia, and South Africa to decline considerably since 1965. First, the closure of the S. Rhodesian border had a slowly increasing negative effect on passenger traffic over time. Second, Mozambique's imposition of the requirement that non-citizens have visas to enter the country reduced passenger traffic.

3) Recommended Assistance

- The U.S. should consider possible aid to Malawi for the establishment of a school at Limbe for diesel-electric technicians. Malawi is already negotiating with South African Railways for an instructor of diesel-electric technology. The school could serve the needs of Malawi's rail and lake equipment. The diesel-electric school could also become a regional training school. Malawi already provides regional training for locomotive drivers. Perhaps this school could become the component of the school for railway training that the EEC is considering providing for Botswana, Swaziland, and Mozambique.

c. Lake Transport

1) National Objectives, Plans, and Priorities

a) Background

Freight and passenger transport on Lake Malawi is provided by Lake Services, Ltd., a subsidiary of Malawi Railways, and principally serves the remote northern areas of the country. The tonnage carried by Lake Services reached an all-time high of 41,500 tons in 1977, a 30% increase over the 33,200 short tons carried in 1976. The number of passengers

carried by the Lake Services has declined slightly each year since 1975 when the number peaked at 147,500; approximately 130,000 passengers were carried in 1977. The decline is mainly attributable to Mozambique's establishment of a visa requirement. Freight and passengers moved by the Lake Services during the period 1970-77 are summarized in Table XXVII.

TABLE XXVII

MALAWI: FREIGHT AND PASSENGERS MOVED BY
THE LAKE SERVICE - 1970-77

Year	Short Tons	No. of Passengers
1970	25,600	109,100
1971	35,300	142,400
1972	31,000	105,900
1973	36,000	137,800
1974	38,300	142,900
1975	35,400	147,500
1976	33,200	132,300
1977 (Estimated)	41,500	130,000

Source: Ministry of Transport and Communications.

The gross operating losses and surpluses of Lake Service during the period 1970-77 are referenced in Table XXVIII. The increase in tonnage carried by Lake Services in 1977, plus an 18 percent increase in freight tariffs in May of 1977, contributed to the MK20,000 operating surplus realized that year by the subsidiary. These increases are estimated to be sufficient for the service to cover operating costs in 1978. A loss of MK183,000 was experienced the previous year, and the only year since 1970 that the subsidiary realized a surplus was 1973, when the surplus reached MK76,000.

TABLE XXVIII

MALAWI: GROSS OPERATING LOSSES OF THE LAKE SERVICE - 1970-77

Year	K'000
1970	121.2
1971	83.6
1972	131.0
1973	(76.0) Surplus
1974	22.0
1975	95.0
1976	183.0
1977 (Estimated)	(20.0) Surplus

Source: Ministry of Transport and Communications.

The Lake Service's operating losses averaged US \$62,000 per annum during the period 1970-74, a considerable improvement on the average loss of US \$180,000 per year over the preceding five-year period.

The major ports on the lake are Chipoka in the south, which is served by the railway, and Nkhata Bay, which is slightly more than half way up the lake. Approximately 75% of freight traffic is northbound, with all but less than about 2% of it being forwarded from Chipoka. Data are not readily available to describe which commodities flow between certain ports, but a breakdown of freight tonnage by commodity that Lake Service carried during the period 1976-77 is summarized in Table XXIX^{1/} For 1977, cement, fertilizer, and fuels comprised almost half of the 42,000 tons booked. These commodities are probably the bulk of the goods shipped north on the lake, while the agricultural goods, mainly rice, maize, and sugar, were probably transported south on the lake. Nkhata Bay experiences the greatest flow of passenger traffic;

^{1/} Malawi Railways maintains excellent records of shipments booked and almost certainly could specify tonnages of each commodity shipped north and south on the lake.

TABLE XXIX

MALAWI: LAKE SERVICE GOODS TONNAGES BOOKED DURING 1976-77

<u>COMMODITY</u>	<u>GOODS BOOKED IN 1976</u>	<u>GOODS BOOKED IN 1977</u>
Beer & Minerals		2,046
Cassave		158
Cement	3,392	2,747
Fertilizers	2,098	5,057
Flour	611	305
Ground Nuts	112	117
Maize	1,198	3,239
Rice (including paddy)	3,995	7,154
Sugar	2,232	1,926
Other Traffic	9,946	7,296
Diesel, Light	5,857	8,390
Paraffin	823	758
Petrol	2,783	2,884
Lake Service Stores Free	<u>186</u>	<u>52</u>
TOTALS	33,233	42,129

TABLE XXX

MALAWI: LAKE SERVICE VESSELS IN SERVICE AS OF DECEMBER 31,
1976

<u>VESSEL DESCRIPTION</u>	<u>GROSS TONS</u>	<u>NO. OF VESSELS</u>
M.V. "Ilala" (passenger)	617	1
M.V. "Chauncy Maples" (passenger)	266	1
M.V. "Mpasa"	325	1
M.V. "Nkwazi"	295	1
M.V. "Karonga"	380-400	1
Barges		7
Tugs		5
700 h.p. tug		1
Pontoons		6
Vipyha Pontoon		1
Motor Launch		<u>1</u>
TOTAL		26

in 1976 approximately 22% of the 132,348 passengers of Lake Services began or completed their trips at this port. The port with the second largest passenger traffic is Chipoka, but it experienced only about 11% of the total passenger traffic in 1977. Approximately 60% of passenger traffic occurs between Nkhata Bay and southern ports.

Lake Services had 26 vessels in operation as of December 21, 1976. Refer to Table XXX, which describes vessels in operation as of December 31, 1976. The Table indicates that Lake Services has two passenger and three freight vessels in addition to a number of barges, tugs, and pontoons.

b) Strategy Related to Lake Transport

The predominance of the northbound traffic flow on Lake Malawi may change substantially in the next five years for two reasons. First, the development of lake transport has not received the attention that road and rail transport have received. The World Bank report on the Third Highway Project in Malawi stated, for example, that "modal development in the past has tended to be complementary rather than competitive, but recent experience with rail investment and possible future competition between road and lake transport suggests that a closer analysis of intermodal tradeoff is now required." The report attributed the lack of coordination between transport modes mainly to staff constraints within the Economic Planning Division of

the government. It points out, however, that the recent recruitment of a local economist by the Ministry of Works and Supplies will relieve the division of project preparation work and enable it to concentrate more on intermodal issues.

Second, a number of development projects in the northern areas of Malawi will create additional demands on lake transport during the next five years.

These projects include:

- Dwangwa Sugar Mill started production of 75,000 tons of sugar a year beginning in 1977. The decision has to be made whether to ship this sugar by road or by lake to the railhead at Chipoka.
- The proposed development of a pulp mill at Chinteche in the northern region in connection with the Viphya timber exploitation scheme would increase freight requirements on the lake substantially. A study of the infrastructure needs of this scheme is being financed by IDA Credit S-17-MAI.
- Development of the northernmost port of Kapora is being considered in relation to exploitation of coal deposits in the area. The port would also serve as a means to provide tourists with passenger service from southern portions of the lake to game reserves near Kaporo.

c) Development Emphasis on Lake Transport

(1) Projects Underway

Development projects related to lake transport that are currently being implemented include:

- The World Bank has financed the first stage of improvements and redevelopment of the Chipoka Harbor and a contract for the work was awarded early in 1978.
- Arrangements were completed during 1977 to raise the level of the jetty at Chirumba.
- Agreement was reached with the West German Development Agency, KFW, for a loan to purchase a new passenger vessel and tender documents were prepared in 1977. The docking weight of the vessel will be 485 tons; it will be prefabricated overseas and assembled at Monkey Bay.

(2) Proposed Projects

The Government of Malawi would like a donor to finance a study of the long-term docking requirements at Monkey Bay. The purpose of this feasibility study would be to specify the optimum size of dry dock facilities required for this harbor and the range of sizes of freight vessels that would be compatible with these dry dock facilities.

The Lake Service would like to expand its passenger vessel fleet further. Two passenger ships it now has are 26 and 27 years old; one has the capacity of 400 passengers and 100 tons of freight, while the other has a capacity of 180 passengers and 20 tons of freight, which usually consists of baggage. Together the two ships have a capacity for 11 first-class passengers. Both ships are fully booked for a highly popular 7-day excursion trip on the lake. The government would

like to replace these two passenger ships with one ship that has a capacity for 500 to 600 passengers, including a first-class capacity of 30 to 40 passengers.

The Government of Malawi would like to establish a school at Limbe to train fully-qualified diesel-electric mechanics. The country has an insufficient supply of these mechanics for both the Lake Service and the rail service. The school, hostel, and laboratory are estimated to cost K0.5 million. Additional funds would be needed to supply the teachers required for technical instruction within the school. Officials at Malawi Railways have developed a broad design of the training school, but consultants would be needed to develop specific plans for it. The school would have a population of about 75 students who would be enrolled in a four- to five-year training program. At the end of the course students would take an examination that would be developed to reflect the specific work requirements of diesel-electric mechanics that work on lake and railway equipment in Malawi itself.

The Government of Malawi would like to establish a training program in Malawi for ships' staff on the lake vessels. Currently the Malawians are sent to the U.K. to train as deck officers and marine engineers. The failure rate is high for

for these students because they spend a considerable amount of time adjusting to living conditions in the U.K. In addition, many students come home to Malawi demoralized because while at sea for practical training they learn from staff on the vessels that the rate of pay for a novice on an ocean-going vessel is at least twice the amount they will earn while employed in Malawi on lake-going vessels. In addition, the training received in the U.K. relates to ocean-going transport, and therefore is not fully relevant, since Malawi is concerned only with lake transport. It should be said, however, the Lake Malawi, being 65 miles long and 52 miles wide, does develop ocean-like conditions at times. Up to Force Nine winds have been charted. Also, some vessels used on the lake are of the ocean-going class.

In order to establish the school the Malawi Government desires, a building would need to be found, or built, in Monkey Bay. Technical assistance would also be required. The estimated cost of establishing the facilities is MK600,000.

Another reason for establishment of a training school for ships' crews is that the government is not achieving localization goals on lake transport vessels because Malawians trained abroad refuse to work for the relatively low salaries they receive from the Lake Service. Expatriates comprise 80% to 90% of the professional classes on the lake vessels.

3) Recommendations

- USAID should consider financing a study to identify:

- the economically desirable flow of goods traffic in Malawi by road, rail, and by lake;

- vessel and such associated harbor facilities as dry docks require for future goods traffic on the lake, especially at Monkey Bay;

- associated land infrastructure support for overall development of a lake transport industry. (See Roads Section, Malawi.)

The last national transport study was conducted in 1974 and is considered to be rather academic, but the World Bank, in its appraisal of the Third Highway Project in Malawi, referred to this study as a point of departure for an analysis of tradeoffs between road, rail, and water transport.

- USAID should consider technical assistance for funding a school for ships' crews on lake vessels. As noted in the text, Malawi's experience with fellowship programs for training ships' crews abroad indicates that overseas training is not directly applicable in most instances to lake transport and Malawian students become demoralized when they realize the differential salary paid to crew members in Malawi and in other countries.

d. Civil Aviation

1) National Objectives, Plans, and Priorities

a) Introduction

Malawi is landlocked and consequently aviation is not only an industry that provides an important source of income and employment, but is also an effective mode of transport in the event of border closures. In 1978 Air Malawi operated their services with eight aircraft, namely:

- 1 - VC-10
- 1 - BAC 1-11
- 2 - Viscount 700s
- 2 - Hawker Siddley 7-48s
- 2 - Britten Norman Islanders

Scheduled services were operating to London, Nairobi, Sychelles, Mauritius, Lusaka, Johannesburg, and Beira. In 1977 an additional service to London via Amsterdam was inaugurated.

In 1977 freight traffic totaled 14,577 tons at Chileka Airport near Blantyre, an increase of 27.1% over 1976 freight haulage. Mail handled rose slightly for the first time in three years to 246 tons, an increase of 5.6% over the 1976 level. Chileka handled 179,798 passengers in 1977, an increase of 3.6% over 1976.

In the Department of Civil Aviation and Meteorological Services 22 officers were undergoing training in various specialties in the United Kingdom, the U.S., Canada, Kenya, and at the University of Malawi Polytechnic.

A new airport is being constructed at Lilongwe with all attendant complexities of ensuring efficient commissioning, operation, and management. At least eight international carriers run scheduled operations through the country and non-scheduled operations and charter flights are numerous. The country has 40 airports and landing fields.

b) Strategy Related to the Sector

The Lilongwe Airport will become operative in 1980 and by that time the government must decide whether or not to purchase a wide-bodied aircraft for Air Malawi. This decision depends on (a) forecasts of the profitability of Air Malawi after the new airport opens and it is forced to compete with more international carriers, and (b) the government's concern to have a national airline in the event of possible border closure with neighboring countries, which would then preclude or seriously limit ground travel. Currently Air Malawi competes with only BEA, since this carrier uses the VC-10 with its fuselage-mounted engines.^{1/} Other international carriers use wing-mounted engines and consequently cannot operate out of Chileka.^{2/} Hence, competition now limited at Chileka Airport will become much greater at Lilongwe International Airport. Air Malawi is currently evaluating the usefulness of a variety of long-haul tri-jet aircraft that have the flexibility of hauling freight or passengers. Apparently traffic is not likely to be great enough to fill the aircraft for five years, but in the meantime this type of aircraft can be used to haul freight as well as passengers. If the government decides to purchase a wide-bodied aircraft, Air Malawi will also need a hangar for it at Lilongwe; the hangar to be built would probably need to be large enough to house a 747.

^{1/} The VC-10 is an uneconomical aircraft likely to be phased out of use throughout the world within the next five years.

^{2/} The outboard engines of these long-haul aircraft overhand the runway and consequently would suck in stones during operation.

A number of rural airstrips are in need of maintenance, but these needs have so far not been identified in sufficient detail for discussion with donors.

The government carries out important training activities of its own in preparatory and basic training in several specialties (such as fire/rescue and ATC) and wishes to improve these still further. However, a substantial need exists for both basic and advanced training additional to that which can be provided locally.

2) Proposed Projects

a) Capital Projects

The Government of Malawi will need financial assistance to purchase a long-haul aircraft if it decides to continue to have a commercial airline operation after the opening of the Lilongwe Airport. The cost of the aircraft will be between 40 and 50 million dollars, with an additional 25% required for spare parts. Aircraft being considered by the government include the Douglas DC-10, a Boeing aircraft to be specified by the manufacturer, and a Lockheed 1011-500. These aircraft are all tri-jet, wide-bodied models that are suitable for long-haul transport of both passengers and freight.

If the government decides to maintain Air Malawi after the opening of the International Airport at Lilongwe, a hangar will be needed of sufficient

size to house a Boeing 747. Costs of the hangar facilities were not available to the SADAP team.

Approximately 700 units of housing will be needed at the new airport for all levels of airport staff.

b) Training Projects

According to ICAO, the total aviation training needs of Malawi for a period of approximately five years is \$2.547 million. This figure includes a government contribution of \$278,000 in local cash, or kind. In addition, through its own resources the government is conducting formal basic classroom training, using on-the-job methodology. Toward the remaining amount of \$2.269 million the UNDP is offering \$0.776 million. This leaves a shortfall of \$1.493 million, which would be approximately \$1.4 million for fellowships and on-the-job training experts (mostly to localized flight and ground crew personnel) and \$0.0934 million for training supervisors for the new airport. ICAO considers these estimates of training requirements to reflect the proposals outlined in the "General Plan for Meeting Civil Aviation Training Needs in Africa" adopted by AFCAC. (UNDP/ICAO, Manpower and Training Civil Aviation Africa, p. 101.)

Localization requirements are presently identifiable from an analysis of the expatriate composition of the total staff of Air Malawi, which is referenced in Table XXXI.

TABLE XXXI

MALAWI: COMPLEMENT OF STAFF - AIR MALAWI

<u>Staff Category</u>	<u>Local Staff</u>	<u>Expatriate Staff</u>	<u>Total Staff</u>
Captain	1	18	19
First Officer	2	13	15
Flight Engineer	6	1	7
Navigator	0	4	4
Ground Engineer	13	24	37
Other Staff	664	47	711
	---	---	---
TOTALS	686	107	793

A manpower need not referenced in the UNDP/ICAO estimates is for the training of accountants. Malawi has no training school at the present time, although the University and Polytechnic have business courses which do not provide students with professional qualifications. Three students are currently obtaining foundation courses in the U.K. that will prepare them for entrance to degree courses in accounting. Two of the students will require two years to complete the foundation courses, while the other student will require three years. All educational costs of these students, plus subsistence payments to their families, are being financed by Air Malawi.

3) Recommendations

a) Capital Assistance

- USAID should consider financing the aircraft that Air Malawi may wish to buy for operation at Lilongwe Airport.

b) Technical Assistance

- U.S. interest in the Malawi Polytechnic should be expanded from concern with development of the Science Department to

provision of assistance for development of degree instruction in accounting.

- U.S. Government should determine its interests in financing ICAO efforts to develop multinational training centers, which are discussed in Annex III and the previous section of this report concerned with Botswana.

e. Telecommunications

1) Development and Constraints

Malawi has a basic telecommunication grid with over 10,500 telephone exchange lines and almost twice that number of telephones. The system is composed of a microwave link, ground lines, and UHF and VHF radio links. Major centers in the system include Blantyre and Lilongwe, but Mzuzu and Zomba are also important exchanges. The system is primarily oriented in a north-south direction, except for international links. (See Figure XXXII, Malawi: Existing Telecommunications System and Projects Underway, 1978/79.) About 90% of the exchanges in the system are automatic.

There are four major UHF and five major VHF links in the telecommunication system. They carry anywhere from two to almost two hundred channels. (See Table XXXIII, Malawi: UHF and VHF Transmission, Telecommunication System, 1978.) The major links are Zomba to Limbe and Limbe to Lilongwe.

Throughout the 1970s the demand for telephone service has been increasing, and during 1977 was projected to have increased by 12%. Efforts to meet new

FIGURE XXXII

MALAWI: EXISTING TELECOMMUNICATIONS SYSTEM AND PROJECTS UNDERWAY, 1978/79

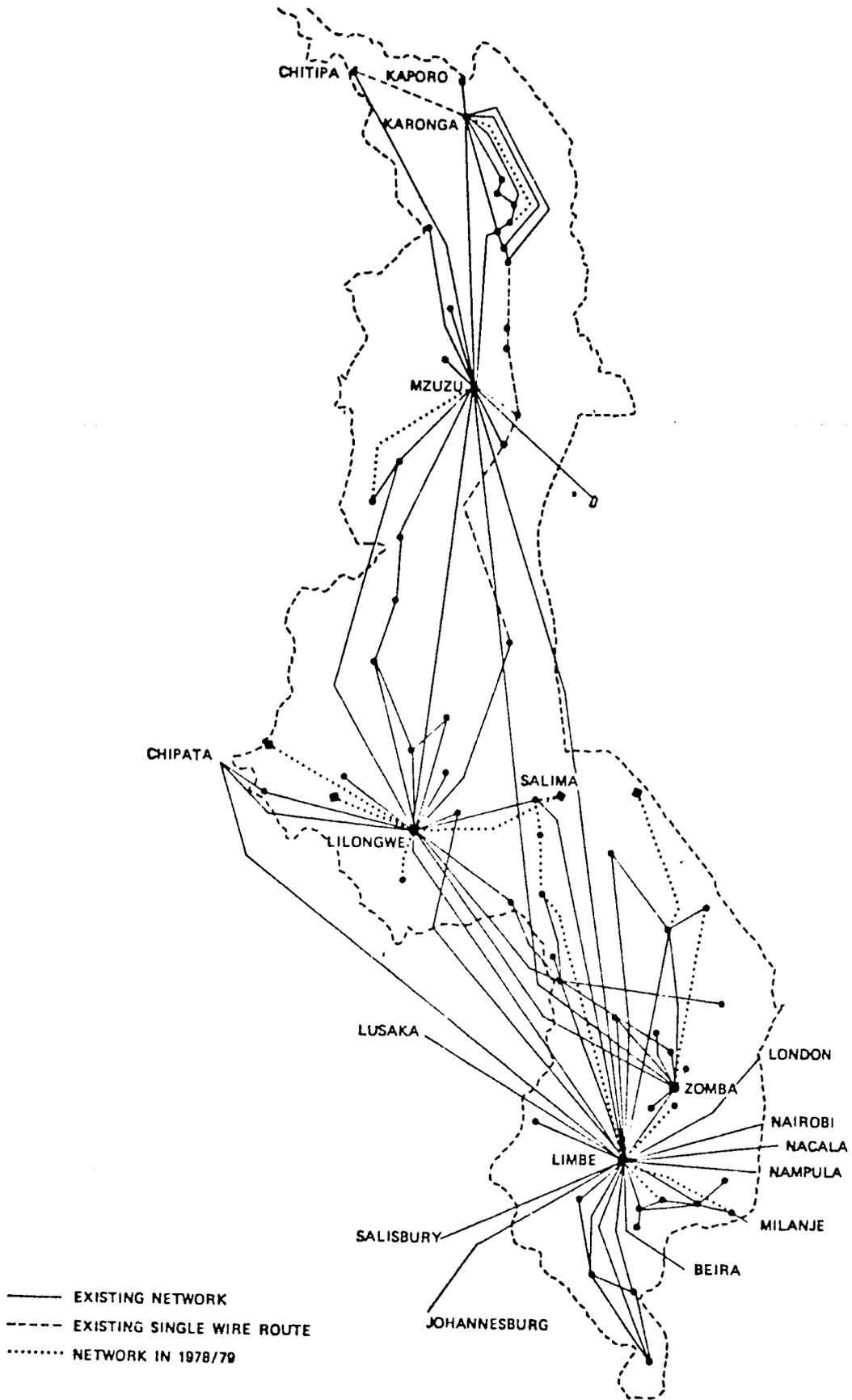


TABLE XXXIII
MALAWI: UHF AND VHF TRANSMISSION,
TELECOMMUNICATIONS SYSTEM, 1978

UHF	Zimba - Limbe	120 channels
	Limbe - Lilongwe	192 channels
	Lilongwe - Mzuzu	48 channels
	Blantyre - Thyolo	24 channels
VHF	Blantyre - Mulanje	15 channels
	Blantyre - Ngabu	9 channels
	Chilnida - Mzuzu	12 channels
	Chilnida - Karonga	5 channels
	Blantyre - Mwanza	2 channels

demands have focused primarily on the Lilongwe and Blantyre/Limbe exchanges. An additional 1,000 lines were added to the Lilongwe exchange and the installation of equipment for a trunk transit exchange at Lilongwe has been begun. A new crossbar and manual exchange replaces the old Lilongwe South Exchange. A trunk transit exchange was opened for Limbe allowing automatic service to Balaks, Dedza, Nasungu, and Mangochi. Equipment is on order to provide automatic service to Salima at the end of 1978. The microwave system between Lilongwe, Blantyre, and Zomba is also being upgraded to provide an increased number of trunk circuits.

International service includes satellite linkage and connects to Nairobi, to London, to four points in Mozambique, and to Salisbury and Johannesburg. A new UHF link has been opened between Lilongwe and Chipata to improve service with Lusaka. Cable and Wireless presently operates the 26-circuit earth satellite station for Malawi on a rental basis, but the government anticipated assuming ownership by the end of 1978.

The government is very interested in the PANAFTEL proposal and would seek assistance for microwave links to neighboring countries interested in participating in the proposal. Malawi would like to upgrade all existing international links, especially those with Mozambique.

2) Proposed Projects

A major government interest in telecommunications expansion is in conjunction with the development of new navigational and communication equipment for civil aviation. The government is interested in expanding the air space covered to the entire country and is proposing a central system controlled from Lilongwe and linked by expanded microwave connections. There is some interest on the part of the Japanese in supporting this project.

Although system expansion has provided increased service, there are recurrent complaints about system maintenance. The official attitude toward problems being what it is in Malawi, the cause of these complaints was not openly discussed in detail. It would seem to be a question in part of scarce service vehicles, but there is also a scarcity of technical and engineering staff. The government is interested in the receipt of technical assistance from USAID for a maintenance unit program which would include telecommunications engineers.

In order to increase coverage for the Shire Valley, a VHF project is planned with a base station at Ngabu, which already has a VHF link to Blantyre. Five sub-stations are planned, one for each: There're, Nichalo, Dolo, Sorgin, and Bangula. The total cost of the project, including both equipment and investment, is estimated at US \$41,600.

Various other projects are included under the telecommunication development program projected for completion by 1985. The government is interested in expanding telecommunications service to rural areas where the economic rate of return does not always justify investment; the projected cost for such expansion is MK3.0 million a year for a five-year period. Plans are underway to convert magneto exchanges in service in rural areas to automatic exchanges. Certain automatic exchanges already in service will be extended, and the number of inter-urban trunk circuits will also be expanded. The UNDP is supporting the cost of a feasibility study for trunk expansion and assistance for such may be a later interest.

The government feels the need for upgrading training in telecommunications. IDA has already assisted training development and the government has requested support from the EEC equivalent to about US \$2.0 million. The major problem is a lack of training equipment, and the government feels it will need an additional US \$500,000 for supplemental purchases.

3) Recommended Assistance

- Technical Assistance for a Survey of Rural Telecommunication System Expansion - Department of Telecommunications

This project should survey the government interest in extending service to rural areas not justified on the basis of return on investment. Alternate links and levels of investment should be examined in comparison to cost and social/economic impact. The project could be a useful pilot project for other countries in the region.

- Technical Assistance for Training in Telecommunications Engineering and Maintenance

- Prefeasibility and Design

- Existing programs needed to be examined with perspective of increased integration and utilization of both facilities and equipment. Supplemental courses, including on-the-job training and short in-house training sessions, should be designed. Emphasis should be on the use of equipment such that it will simulate field systems. Costing of recommended equipment for the project should also be undertaken.

- Technical Assistance for Training

- Support for operational costs of training is recommended. Probably two contract advisors and several short-term consultants for a two-year period will be needed.

- Capital Assistance for Maintenance / Training Equipment

- The projected cost suggested by the government seems rather high. The expenditure could probably be reduced, but equipment should be closely meshed to training outlined in the design phase.

D. Mozambique

1. Overview

The SADAP team did not visit Mozambique, so the information contained in this paper was obtained from a variety of secondary sources. These sources include:

- U.N. reports on assistance to Mozambique
- Conversations with railway officials in Swaziland
- Conversations with officials of South African Railways in Johannesburg
- Conversations with officials of the Intergovernmental Maritime Consultative Organization in London

2. U.N. Appraisal of Transport Needs

a. Urgent Needs

In Resolution 32/95 of 13 December 1977 on Assistance to Mozambique, the General Assembly of the U.N. strongly endorsed Security Council Resolution 411 (1977) June 30, 1977, in which, inter alia, the Council condemned the illegal regime of S. Rhodesia for its acts of aggression against Mozambique and requested the international community to provide financial, technical, and material assistance to enable Mozambique to overcome the severe economic loss and destruction of property brought about by acts of aggression. The U.N. report, entitled Assistance to Mozambique, a Report of the Secretary General, states that after an encouraging initial response to an appeal for special assistance in the context of sanctions, only \$20 million of assistance has been pledged or provided since February 1977 (p. 45). None of the assistance so far provided appears to relate to transportation or communications. Nevertheless, the U.N. report lists

a number of transportation and communications projects for which "assistance is urgently required." (See Table XXXIV, Mozambique: Transportation and Communications Projects for Which Assistance is Urgently Required.)

b. Less Urgent Needs .

The U.N. report, entitled Assistance to Mozambique, identifies additional transport assistance that Mozambique requires to improve its traffic links with Zambia.

Mozambique and Zambia have been cooperating in developing routes for Zambian imports and exports through Beira and Nacala. A transfer point between road and rail has been developed at Moatize and the road connection with the Great East Road in Zambia is being improved. Some of the work needs to be done in Mozambique, some in Zambia.

The present road, although being improved, is not all-weather standard and can only be used during the dry season. The capacity of the route has been estimated at 70,000 tons. With improvements to the road, more trucks for the Zambian-Mozambique haulage freight, and additional cargo-handling equipment at Beira and Moatize, this route could carry nearly 10,000 tons in each direction. Assistance to Mozambique directed towards greater traffic on this route would make a significant contribution to meeting Zambia's needs and to reducing the strains on the Port of Dar es Salaam, for the benefit of all of the countries using it. In this connection, the provision of facilities to handle 20-foot containers at Beira, Moatize, and in Zambia would increase the speed

TABLE XXXIV

MOZAMBIQUE: TRANSPORTATION AND COMMUNICATIONS
PROJECTS FOR WHICH ASSISTANCE IS
URGENTLY REQUIRED (000s of US\$)

<u>Projects</u>	<u>Estimated Costs (US\$)</u> (000s)
2 Launches for the Marine Department	\$1,584.0
Equipment and Maintenance for Navigation Network	3,135.0
Reopening of Marrupa/ Mutarrara Station	13.2
Reopening of Chinradzi Station	6.6
Replacement of Radar Equipment at Beira Airport	54.5
Weather sub-station at Beira Meteorological Station	435.6
Refitting Zambo-Montepuez Meteorological Station	13.2
TOTAL	\$5,242.1

and efficiency of the route, and would reduce the costs of transport for Zambian imports and exports.

The assistance required in Mozambique consists of:

- a storage and transfer facility at Moatize and equipment to handle 20-foot containers;
- 12 - 5-ton fork lifts and 3 - 20-ton expanded fork lifts for Beira port;
- 20 - 5/15-ton and 30-ton lorries (7½-ton axle load) to augment the Moatize/Zambia road haulage fleet; and
- a scale at Moatize to ensure that axle loadings are not exceeded.

Appropriate facilities will also be required in Zambia to make this route effective, but these are not specified in the U.N. document (pp. 25-6).

3, Mozambique's Poor Economic Situation and Extensive Investment in Transport

The U.N. report, entitled Assistance to Mozambique, points out that the economic and financial position of Zambia remains grave. The government's budget continues to be characterized by deficits and the balance of payments position weakened even further in 1977. The estimated deficit for the regular government budget for 1978 is \$85.8 million. The deficit of the major parastatal organizations is expected to reach some \$35 million during 1978, giving a combined state and parastatal accumulated deficit of over \$305 million by the end of 1978. Accumulated deficits have been financed largely by the central bank, with consequent pressures on price levels and the balance of payments.

The National Investment Program for Mozambique during the period 1978-79 is presented in Table XXXV. This Table indicates that planned investment in transport and communications is expected to total \$110.6 million, or 23.9% of the total national investment of \$460 million that is planned for the period 1978-79. Almost 70% of this investment, or \$70.3 million, will be directed to ports and railways. Information concerning the specific projects to be undertaken to improve ports and railways is not known; information concerning potential donors, sources of technical equipment, and consulting or contractor assistance is also not known.

4. South African Assistance

Evidence from various sources suggests that the Republic of South Africa is providing significant amounts of assistance to Mozambique for ports and railways. Elements of this evidence include:

- Conversations with officials of mining companies indicate that in October or November 1977 Mozambique reactivated a 1922 agreement between its Port Authority and a consortium of mining companies^{1/} to obtain assistance with its transport needs. The consortium subcontracts the work to South African Railways. The agreement is essentially a contract whereby South African Railways (SAR) will:

^{1/} These companies include General Mining, Palaboro Mining, Anglo-American Corporation, Rand Mines, Rand Carbide, Samancor, and other chrome producers.

TABLE XXXV

MOZAMBIQUE: NATIONAL INVESTMENT PROGRAMME 1978/79
(Millions of US\$)

	<u>TOTAL INVESTMENT</u>	<u>% OF TOTAL INVESTMENT</u>	<u>GOVERNMENT SHARE</u>
<u>Public Works</u>			
Dept. of Public Installations	31.1		
Water Department	68.5		
Housing Department	14.4		
Building Industry	23.8		
Highways Department	<u>104.7</u>		
<u>Sub-Total</u>	242.5	52.6	<u>207.9</u>
<u>Industry & Energy</u>			
Energy Department	14.9		
Geology and Mines	17.4		
Fisheries	8.3		
Industrial Services	<u>5.4</u>		
<u>Sub-Total</u>	46.0	9.9	<u>39.6</u>
<u>Transport & Communications</u>			
Civil Aviation	9.1	1.9	
Marine	9.4	2.0	
Road	17.5	3.8	
Ports and Railways	70.3	15.3	
Telecommunications	<u>4.3</u>	<u>0.9</u>	
<u>Sub-Total</u>	110.6	23.9	<u>19.8</u>
<u>Agriculture</u>	38.9	8.4	33.0
<u>Other</u>	<u>24.0</u>	<u>5.2</u>	<u>20.0</u>
TOTAL INVESTMENT	460.0	100.0	320.0

Source: Report of the Economic and Social Council, Assistance to Mozambique, Report of the Secretary General, pp. 20-21.

- provide technical assistance for rail/port operations;
- rebuild and modernize the Maputo port on a commercial basis;
- assist with repair and maintenance of old equipment;
- replace worn out equipment with new equipment.

This agreement will not include payment to SAR for the salaries of its personnel, and the two countries have agreed that all South African personnel will commute daily in and out of Maputo by air.

- The Republic of South Africa's interests in Maputo for export of minerals and Mozambique's need for food imports have historically provided a basis for good cooperation between the two countries. Dr. Loubser, the Director General of South African Railways, stated in 1977 that "firm agreements (between the two countries) exist with regard to transport, as well as in respect of other fields, such as mine labor. Maputo is the nearest harbor to the largest industrial complex in the country, via the Witwatersrand and the Vaal Triangle. For this reason the railway lines to these areas were strengthened and electrified at a cost of approximately R70 million so as to have a high carrying capacity." (The Political Role of South African Railways, p. 18.)

He states further that,

"The Natal main line to Durban, at present the second nearest South African commercial harbor to the Witwatersrand, is at times occupied to full capacity. Durban Harbor carries more than two-thirds of South Africa's total general commercial traffic. Up to this stage Richards Bay has been developed on the basis of a deep sea harbor for bulk exports and will serve its purpose only fully by 1980.

When viewed against this background, it is economically essential that the railway line to Maputo, and the harbor of Maputo itself, remain available to South Africa. It is in the interest of South Africans that technical and operating assistance be provided to achieve this goal effectively.

Export is an economic requisite and should thus be stimulated. All available transport facility should be used productively, especially insofar as chrome ore exports in bulk are concerned. The Harbour of Matola/Maputo has the modern equipment that is necessary to handle this strategic and profitable commodity on a large scale. At this stage Maputo's facilities are better than those of any South African harbor. In 1975/76 approximately 20% of South Africa's total export volume was shipped through Maputo/Matola. By October of this year (1977) Swaziland's ore exports through Maputo will also cease, making available to South Africa an additional export capacity of 2 million tons at Matola." (Loubser, pp. 18-19)

Dr. Loubser explains that, should Maputo harbor be closed to the Republic, it would be necessary for the Republic to provide alternative harbor capacities for ten commodities, referenced in Table XXXVI.

TABLE XXXVI

SOUTH AFRICAN MINERAL EXPORTS SHIPPED FROM MAPUTO

Asbestos
Granite
Chrome
Magnetite
Vermiculite
Fluorspar
Clay
Ferrous Alloy
Ferrochrome
Coal

Finally, Loubser points out that the South African Railways is prepared for such an eventuality, but that it promotes a good-neighborly relationship with Mozambique by providing the country with food supplies. He states that Mozambique is "largely dependent on the Republic for these food supplies. (Loubser, p. 19)

The limited response to the international appeals of the U.N. for assistance to Mozambique are referenced in the U.N. report, Assistance to Mozambique, which seems to confirm Loubser's position that Mozambique depends partly on South Africa for food. The report states that "because the level of international assistance provided has been far below the amounts required, the Government of Mozambique has had to divert scarce resources from urgent development projects to rebuild the destroyed towns and infrastructure and to resettle displaced people. It has also been necessary to delay programs to improve

education and health facilities in the rural areas and for the benefit of the poorer sections of the urban population. Major development schemes in agriculture and in transport have had to be postponed. The Government of Mozambique is eager to obtain assistance with the development of a wide variety of sectors of the economy. (Assistance to Mozambique, p. 41)

The U.N. report states further that "Mozambique will need to import at least 192,000 tons of major food products during the balance of 1978 and preliminary estimates suggest that the 1979 requirements will total 385,000 tons (Assistance to Mozambique, p. 45)

- Mr. John Walls of the South African Railways has summarized for the SADAP team the assistance that the South African Railways provides to Mozambique. In his words, assistance is provided in two forms, which are:

--The South African Railways renders assistance to the Direccao Nacional Dos Portos Caminhos De Ferro (DNDPCF) in the form of technical advice, particularly in connection with improvements to the track and to the signaling system. In addition, motive power is leased to the DNDPCF and assistance is given in regard to the maintenance of its rolling stock.

--Harbor equipment at Maputo is provided and maintained where necessary and technical advice is supplied by a consortium actually formed for this purpose by General Mining, Palabora Mining, Anglo-American Corporation, Rand Mines, Rand Carbide, Samancor, and all other chrome producers.

5. Constraints to Railway Transport

a. Manpower

A major constraint of the railway in Mozambique is a lack of railway manpower. The Portuguese ran the railway themselves before independence, but did not train sufficient numbers of Mozambicans to take their places when they left. Hence, and according to railway officials in Malawi, the Mozambique rail line suffers from insufficient:

- shunting capability
- maintenance and service manpower;
- shortages of spare parts due to inadequate methods of inventory control and planning.

Although the railway is suffering from a very serious shortage of manpower, available staff are making a good-faith effort to maintain railway service. Moreover, congestion does not exist at either port. Nacala is handling far less than its current capacity of goods, and Beira, while handling more goods in relation to its capacity than Nacala, is provided assistance by the South African Government.

The equipment on the Beira line in Mozambique is in good working condition and is similar to the equipment of the Malawi Railways, Ltd. For example, Malawi has four M.L.W. and ten A.E.I. locomotives, while Mozambique has ten M.L.W.s and a small number of A.E.I.s. The other locomotives on the line in Mozambique are G.E.C.s and steam engines. Mozambique is soon to receive sixteen more M.L.W.s.

As noted in the earlier section of this report concerned with Malawi Railways, railway service is

insufficient in Mozambique. Malawi's trade prospects would permit movement of approximately 400,000 tons of goods per month across the Mozambique border each month, but current railway conditions in Mozambique permit movement of only about half this tonnage. Representatives of Zambia have visited authorities in Mozambique to request a transit capacity of 10,000 tons per month on its rail route to Beira. Zambia plans to transport goods to Moatize by road and then by rail to Beira. Technical assistance requirements within Mozambique to establish a railhead for this purpose at Moatize are discussed in the first section of this report on Mozambique.

b. Port Bottlenecks in the Future

When the border between S. Rhodesia and Mozambique opens, Beira will become congested and Malawi, and perhaps Zambia, will be forced to rely more heavily on Nacala for its exports. Currently Beira struggles under the freight requirements of Malawi, Zambia, S. Rhodesia, and South Africa. Before independence in Mozambique, a Beira Port Advisory Committee, comprised of representatives of Malawi, Zambia, S. Rhodesia, and Mozambique, met regularly to allocate tonnages among the countries, but currently no tonnage agreement exists.

Technical and logistical considerations suggest that Nacala will become a more important port to Malawi and Zambia in the future, for several reasons.

First, Beira is subject to silting and needs continuous dredging. In addition, it presents limited possibilities for expansion. By contrast, Nacala is perhaps the finest deep water port along the east coast of Africa; it consists of three smaller bays--Namelala, Muananculo, and Bengo--and covers an area of 46.5 million square meters, an elongated form measuring 12.5 km long and maximum width of 3.5 km. The Bay of Nacala connects with the Indian Ocean through the Bay of Fernaoneloso; the connection of these bays is made through a straight half-a-mile wide, with depths reaching 60 meters.

Mozambique is considering improving the Nacala line to facilitate transport of coal from Moatize. Currently the coal is shipped to Korea and Japan through the Port of Beira, but it may be more economical to upgrade and extend the rail route to Nacala and the port itself. The Ministry of Transportation of Mozambique has commissioned Transmark to perform an engineering and feasibility study of the rail line and perhaps the port. Transmark is rumored to have detailed grade and curve improvements for the rail line that could be undertaken at minimal cost and which would improve the performance of the line considerably. In addition, Transmark is rumored to have performed feasibility studies of at least two alternative routes that could be used to connect the northern-most tip of the rail line running from Moatize to Mutarara in Mozambique to Utale in Malawi. Malawi is not expected to have any political

objection to the line. The production capacity of the coal mines in Moatize is approximately three million tons per year.

6. Proposed Projects

IMCO is interested in obtaining assistance for the establishment of a maritime academy and training program for Mozambique. At present there are no Portuguese language training facilities. This project would greatly benefit operation of the Ports of Maputo, Beira, and Nacala and could also be keyed to the development of coastal shipping as a complement to surface shipping. Landlocked countries interested in the use of ports in Mozambique would also profit and port operations in Maputo by South Africa could be displaced.

Assistance is needed for the cost of internationally recruited advisors and trainers, fellowship training abroad for certain specialties, and importation of training or demonstration equipment. Under the terms of previous agreements IMCO has negotiated with recipient countries; the recipient country itself pays for such local support costs as land, the construction of training and dormitory facilities, and service or infrastructure needs.

IMCO has yet to cost projected expenditures for the project. External costs for a similar facility in Fio de Janeiro funded in 1971 were about US \$16 million. Assistance for a project in Alexandria, Egypt also begun

TABLE XXXVII

IMCO

SAMPLE TRAINING PROJECT COSTS

Budget Item	Rio de Janeiro, Brazil Training Center (US\$)	Alexandria, Egypt Training Center (US\$)
<u>IMCO-Supported Costs</u>		
Internationally re- cruited experts	928,100	1,492,368
Fellowship training abroad	65,276	275,031
Imported training or demonstration equip- ment	508,816	914,628
Other	<u>124,898</u>	<u>105,520</u>
Total	1,627,090	2,787,547
Locally Supported ¹ Costs	1,941,013	46,697,000
<u>Total Cost</u>	3,568,103	49,484,547

¹Included are land acquisition, construction costs, and salaries for national staff.

Source: Technical Cooperation Division, Intergovernmental Maritime Consultation Organization, London, 1978.

in 1971 but still being developed, is projected at about US \$2.8 million. Even allowing for an inflation rate of 5% per annum, the minimum project cost estimate would be about US \$2.0 million. Norway has expressed some interest in this project and USAID might be able to obtain Congressional approval on the basis of a joint funding arrangement.

A major study of the transport sector of Mozambique is reportedly underway by a group of Swedish consultants. The study is scheduled for completion in September and is to be presented as a series of seminars as well as in written form. Distribution of preliminary findings is restricted. Although it is believed that officials in Mozambique might discuss the basic content of the final report, it is expected that the entire report will remain confidential. Appropriate efforts to discuss this study should be made as part of an overture of U.S. assistance relations with Mozambique.

7. Recommended Assistance

- The U.S. should consider support to both Zambia and Mozambique for establishment of a railhead at Moatize. As noted in a subsequent portion of the text, the assistance required in Mozambique consists of:
 - a shortage and transfer facility at Moatize and equipment to handle 20-foot containers;
 - 12 - 5-ton forklifts and 3 - 20-ton expanded forklifts for the Beira port;
 - 20 - 5/15-ton and 30-ton lorries (7-1/2-ton axle load) to augment the Moatize/Zambia road haulage fleet; and
 - a scale at Moatize to ensure that axle loadings are not exceeded.

- The U.S. should consider establishment of a regional training school for railway staff at Limbe in Malawi. Mozambique and Zambia both have well established working relationships with Malawi Railways and consequently both countries might be willing to utilize a training school in Malawi. Malawi's request for such an institution is discussed in the previous section of the report concerned with Malawi railways.
- The U.S. should consider assistance to IMCO for its proposed training facility for port and ship workers in Mozambique. Comparisons should be made, however, between the costs of (a) this form of training; and (b) training by South African Railways (SAR), which is already providing technical assistance at Maputo and Beira; and (c) a fellowship program that would permit use of the Rio facility by Mozambican trainees.

E. Namibia

1. Background

The SADAP team collected available background information on Namibia, but did not visit the country or talk to SWAPO, for political reasons. As a consequence, this report is based on background information concerning transportation infrastructure. This information is limited due to the Republic of South Africa's control of the Territory.

South Africa's interests in the Territory of South West Africa, which later was to become Namibia, began with the British establishment of a base at Walvis Bay in 1878 and was expanded to provide it with total control of the Territory after World War I.

The area presently encompassed by Namibia has long been the home of several indigenous groups of people. The Ovambo settled in their present land near the Cunene River, Hereros and Namas moved into the central plateau area, and bushmen resided in different locations to the south and east. The country became a German colony in 1892, except for the 435-square mile area of Walvis Bay, which became a part of the British Colony of Good Hope. The Bay, as well as the rest of the colony, later became one of the four provinces of the Union of South Africa.

South African forces occupied the country in the first few months of World War I. After peace treaties were signed, the League of Nations awarded South Africa a mandate to administer the former German colony. After the Second World War, however, after initial tacit

recognition of U.N. authority through the Trusteeship Council, South Africa refused to place the mandated territory under United Nations protection. Instead, it requested that the territory be incorporated as the fifth province of the Union of South Africa. When the United Nations refused, South Africa began to act on its own. In 1949 the South Africa Parliament passed an act which gave the white population of the territory representation in the South Africa Parliament (two senators and six deputies). In 1966, after years of debate, the United Nations withdrew South Africa's mandate and in 1967 appointed a commission to administer the territory for the United Nations. South Africa refused to accept this decision and undertook a series of measures to integrate Namibia more completely into the Republic. In 1971 the International Court of Justice declared the South African presence in the territory illegal.

The dispute that the Republic of South Africa has maintained over Namibia's status since World War II has meant that the Republic has not permitted detailed investigations of Namibia's development needs. Moreover, a development strategy for the country, and more particularly for the transportation sector, can only be established after a majority-rule government takes control of the country.

2. Transportation Infrastructure

When consideration is taken of the vast distances that separate the groups of Namibia's sparse population of 852,000 in 1974, the country has a good rail and road system with adequate air service and the modern, efficient Port of Walvis Bay (Transition in Southern Africa, pp. 1-5, IV-44).

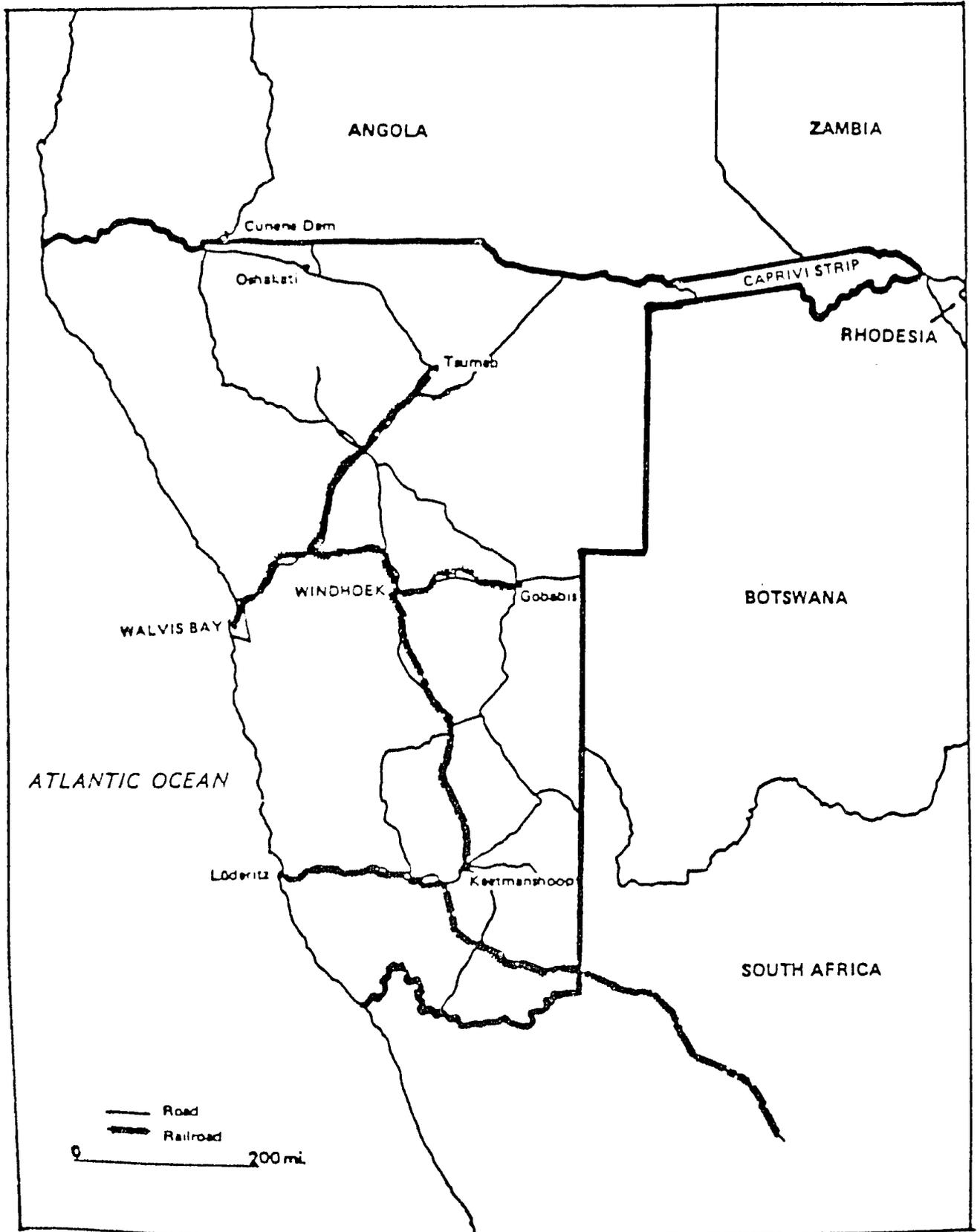
a. Roads

Reports suggest that major expenditures have gone into improving the road transport system between 1964 and 1974 (Transition in Southern Africa, p. IV-44). Between 1965 and 1971 over R17 million was spent annually to improve the system. In 1953 there were no paved roads. By 1963 there were 447 km, and by 1973 2,772 km of road had been paved. Over the same twenty years road bridges increased from 35 to 373. The South African Government estimated the entire road network was worth R172 million in 1973.

Major roads connect Cunene and Oskakati with Tsumeb in the north; Tsumeb with Walvis Bay and Windhoek; Windhoek with Gobabis in the east, Walvis Bay in the west, Keetsmanshoop and South Africa in the south; and Lüderitz with Keetsmanshoop. (See Figure XXXVIII, Namibia: Roads and Railroads.) In addition, there are 9,248 km of unpaved main roads, 19,627 km of district roads, and 25,408 km proclaimed farm roads. Rumors suggest that a sealed road has also been constructed from Tsumeb into the Caprivi Strip for security purposes.

FIGURE XXXVIII

NAMIBIA: ROADS AND RAILROADS



The road system is geared toward Walvis Bay and South Africa to facilitate trade. It is efficient at getting goods out of or into the country, but does little to encourage rural development in predominantly African areas. Upon independence the system will require re-examination to determine if it fits the needs of the entire population. It is likely to require more extensive development in the northern areas where population is more concentrated.

There are several problem areas relating to the national road system. With the country's size, low population density, physical conditions and climate, construction is a very difficult task. Roads to carry heavy traffic have to be built over great distances without a gravel bed because in many parts of the country there is no gravel to be found. Many bridges have to be designed to withstand floods which may occur once every fifty years. Bridge foundations have to be driven through as much as 30 meters of sand in order to rest on bedrock. In the Namib, special barriers against wandering dunes have to be erected.

Perhaps the most important problem is the economic justification for these expensive projects which connect points with small populations situated at great distances from one another. It is this limitation that has directed most road building toward north-south or hinterland-port trade routes.

b. Railways

Namibia's rail service, which is also burdened by long hauls, is owned and operated by the South African Railways. As such, the South African Government has total control over this critical element of Namibia's economy. Most incoming traffic from the Republic consists of manufactured goods, coal, and refrigerated fruits and vegetables. Outgoing goods are primarily ore and livestock.

South African Railways (SAR) has divided its rail lines into ten "systems," and system 10 is slightly greater than the railway for Namibia. As noted on the attached map of the 10 railway systems, which was provided the SADAP team by South African Railways, the Republic/Namibia border is crossed by the railway line near Nakop. Currently the Southwest Africa system of SAR includes all rail lines in Namibia, plus the line of rail south of Namibia that runs from De Aar to Nakop, a length of 550 km. The length of the railway network in Namibia, including the section to De Aar, is 2,890 km.

The railway system in Namibia was the first one to be completely dieselized by SAR due to difficulties involved in obtaining adequate supplies of water for operation of steam locomotives in Namibia. The diesel shed is located at Windhoek.

Officials of SAR report that Namibians are being trained to operate the railway system when the country becomes independent.^{1/} Details of the type and extent

^{1/} Conversation between Mr. John Walls, Chief Planning Engineer, SAR, and a member of the SADAP team.

of training are not available, however a diesel shed is located at Windhoek.

This extensive mix of goods creates an important operating problem for the system. Loads hauled to Namibia require a different kind of car than loads hauled from the country. Because of this, both types of cars must be hauled up to 1,000 miles, although one will ride empty on the way up, while the other will be empty for the return. The same problem often occurs with internal shipments--the goods needed at Tsumeb cannot ride out in the same cars which brought copper to Walvis Bay.

As a result of the high construction costs and forced operating inefficiencies, the rail service operates at constant losses. By 1970 the accrued losses totaled R63 million. This can be compared to total assets of R220 million for the Railway Administration. Further losses are incurred annually from the Road Transport Services, also run by the South African Railways.

Keeping these services running is essential to the economy, but it would require substantial increases in fares for the operations to pay their own pay. Mining and agricultural spokesmen claim they could not absorb such increases.

c. Civil Aviation

Namibia has four major airports and numerous smaller fields and landing strips. South African Railways makes

20 direct return flights every week between centers in the country and the Republic and two SAA planes per week connect in Windhoek with international flights. In 1972/73 the major airports handled 154,900 passengers, with the overwhelming majority going to or from South Africa.

As is the case with rail and road transport, air travel is not paying for itself in Namibia. The great distances and small load factors result in losses for the airlines, with SAA losing almost R1 million per year on Namibian service between 1962 and 1972.

d. Ocean Ports

There are only two operational ports in Namibia--Walvis Bay and Luderitz--however, Swakopmund was a functioning port under the Germans and Mowe Bay has been considered for port development. Both ports are operated by South African Railways.

Walvis Bay is Namibia's most important harbor. It has been modernized and equipped with efficient unloading, loading, and repair facilities and is planned for another R8 million in development. Total cargo landed and shipped was 1.3 million tons in 1973. This represented 97% of the country's total. (Transition in Southern Africa, p. IV-47) Table XXXIX, Namibia: Walvis Bay Harbor, describes the harbor facilities of Walvis Bay in 1975. Reference to the Table indicates that the water depth is about 30 feet. Hence, additional dredging or extensive use of lighters would be

TABLE XXXIX

NAMIBIA: WALVIS BAY HARBOR

Wharfage	Length	Depth at L.W.O.S.T.	No.	Cranes (Electric)	
				Lifting Capacity: Tons	Gauge of Track (Rail Centres)
Berths 1, 2 and 3 (working portion 477.2 m)	487.68 m	10.06 m	{ 1 8	{ 3 tons 4 tons	4.12 m
Berths 4, 5, 6, 7 and 8	926.6 m	10.67 m	{ 21 1 1	{ 4 tons 15 tons 3 tons	
Tanker Berth (Dolphin type)	Can accommodate tankers up to 192.02 m in length	10.06 m	—	—	—

SHED AND STORAGE ACCOMMODATION —

Floor space for cargo in sheds	10 212.6 m ² (net)
Cubic capacity of sheds (based on stacking height of 3.42 m)	35 029.2 m ³ (net)
Ore platforms, raised level (uncovered)	4 708.00 m ²
Ample storage for rough goods	

FUELLING FACILITIES — Light diesel oil only, but special prior arrangements must be made as supply is effected by tank wagons. Coal bunkers are available in an emergency only.

FRESH WATER can be supplied to vessels at the rate of 15 tons per hour.

ENTRANCE CHANNEL — 3 436.3 m long and 134 m wide, with a depth of 10.06 m at L.W.O.S.T.

MISCELLANEOUS CRAFT — One lighter of 140 tons capacity, one 40 ton hopper and one combined grab dredger anchor barge. (Not self-propelled.)

TUGS — Two first-class tugs equipped with radar, wireless telegraph and telephone, direction-finding apparatus, and salvage and fire-fighting appliances; and two pilot launches.

MECHANICAL APPLIANCES — 1 15-ton mobile crane
 2 shunting tractors
 6 2-ton fork lift trucks
 15 3-ton fork lift trucks
 11 4-ton fork lift trucks
 2 7.5-ton fork lift trucks

4.5 million Rand were slated for the construction of the fishing harbor, but the Mowe Bay project was postponed indefinitely due to insurmountable problems in harbor development.

e. Telecommunications

The distances involved and the low population density are problems for the communications system, as well as for the power grid. Post office and telephone/telegraph services are relatively expensive to maintain for the population served. Because of the distances involved and the paucity of subscribers, an internal high-frequency radio-telephone system has been found most cost-effective. It provides patching service whereby telephone calls can be made to any telephone subscriber in Namibia by going through 305 mobile stations which, in turn, route the call through one of the seven fixed Post Office radio stations.

During the period 1963-1973 the number of telephones doubled from 18,561 to the present number. The Post Office is also proceeding with its plan to convert all manual exchanges to automatic. From 1970 to 1973 the trunk lines increased from 594 to 984, making a total of 13,900 miles of physical trunk lines. During the same period nineteen major projects involving the laying of underground cables were completed at a cost of R1 million. Up to 1973, 366 telegraph channels, representing 66,700 miles of circuit, had been installed with work progressing on an additional 55 circuits

representing 9,300 miles of physical lines. In the same 10-year period radio services increased from 394 to 1,756. (Transition in Africa, p. IV-50)

f. Summary and Prospects

Namibia will inherit good road, rail, and air transport and telecommunications infrastructure from South Africa. If the Walvis Bay question can be resolved, Namibia will also have access to the sea through an excellent, well-equipped port.

On the other hand, maintenance costs for these systems are high and operating losses are the norm. It will be expensive for a new government to pick up the cost of subsidizing rail and road transport operating costs on top of the heavy construction costs borne by government. Yet, increases in rates would have immediate and marked effect on profitability of agriculture and mining.

In any case, a country as large as Namibia, with its small economic and population base, will always have difficulty providing complete transportation and communications services.

3. Recommendations

- o A working committee should be established between South African Railways and international organizations to compile as much information as possible about infrastructure in Namibia. Documents should be developed that describe:
 - assets and conditions of roads, railroad, port, civil aviation facilities, and telecommunications facilities;
 - maintenance and capital investment requirements for each mode of transport and communications that are planned or recommended by South African Railways;
 - detailed information concerning South African Railways' efforts to train personnel to maintain, manage, and continue to develop each form of infrastructure (it would also be useful if South African Railways would estimate total training needs).
 - Studies should be conducted as soon as possible to develop a program for expansion of the road system. Angola can be reached by only one good sealed road, Botswana is only accessible from Namibia by dirt roads, and Zambia and S. Rhodesia are only accessible over very complicated, roundabout routes. Extension of the road which the Republic is rumored to have built recently for security reasons from Tsumeb into the Caprivi Strip could be extended to provide Zambia with access to Walvis Bay for its exports. Many of the homelands in Namibia are serviced by very inadequate road systems. Moreover, within the homelands all-weather and feeder roads are lacking in all areas.
 - A feasibility study is needed for the economic benefits and costs involved in connecting the homelands to the railway system. At the present time none of the homelands--not even those with some crop cultivation potential, such as Ovambo, Kavango, and eastern Caprivi--are connected to the railway.
 - An economic and engineering feasibility study should be conducted of the Trans-Kalahari Railway. A new line of rail would be required from Francistown, Botswana to the Botswana border and then to Gobabis in Namibia. The line of

rail in Namibia running from Gobabis to Walvis Bay probably would need to be upgraded. Rumor suggests that South African Railways expects to re-rail certain portions of this line by about 1990. The likelihood that this line of rail would need to be upgraded is high, since the major purpose of the line would be to carry ore to Walvis Bay. To maximize ore-carrying capacity of the line, it probably needs to be upgraded from its current 48 KG track to 60 KG track, the weight of the track on South Africa's Sishan line. An additional cost associated with the Trans-Kalahari Railway might be dredging requirements at Walvis Bay. Currently the Bay is approximately 30 feet deep, while modern ore-carrying vessels require 75 feet of water for the cargo of 200,000 tons. The cost of improvement of the railway system in Namibia might be between R100 and R150 million and the cost of harbor improvements could approach R100 million.

F. Swaziland

1. Development Objectives, Plans, and Constraints

a. Overall Development Objectives

Swaziland has three overall development objectives that are considered to be open-ended, according to the country's Third Development Plan. These objectives are:

- Economic growth
- Self-reliance
- Social justice and stability

1) Economic Growth

To achieve economic growth, the aim is to increase growth of domestic product by 7% per annum. Between 1973/74 and 1976/77 GDP, at factor cost in constant 1977/78 prices, grew from E222.5 million to E272.1 million, or 7% per annum, notwithstanding the world-wide recession and in particular the depressed economy of Swaziland's chief supplier, South Africa, in the later years of the Plan. During the Plan period the government hopes to increase agricultural production by 6.5% per annum, to promote industries which advance the stage of processing of mineral and agricultural raw materials, and to complete the geological mapping of the country.

The production target for industry is to increase manufacturing and processing output by 7.0%, which means creating 6,200 new jobs in industry, bringing total employment in Swaziland to about 15,000 by the end of the Plan period.

2) Self-Reliance

To achieve a greater measure of self-reliance, the strategy is to reduce foreign control of productive activities, to strengthen government's administrative capacity, to develop local sources of goods and services, and to diversify external economic relations. Transport initiatives related to this objective include (a) the establishment in July 1978 of Swaziland's own national airline and air services with other countries, and (b) construction of a new rail link from Phuzumoyo to Golela on the border with South Africa to provide alternative outlets for export.

3) Social Justice and Stability

Social justice and stability will be promoted by spreading economic opportunities and social services more widely. The government plans greater utilization of traditional institutions to bring people an awareness of the possible benefits of available services and productive technologies and to attain greater involvement of rural people in decisionmaking matters which concern their well being.

b. Transport Objectives

The government plans to use transport infrastructure as a means to facilitate industrial development and exploitation of mineral resources, to promote

agricultural development through both the increase and diversification of production, and to make possible the improvement of health, education, and socio-political cohesion among the people of the country.

Transport goals during the next five years are:

- to achieve a stage in roads development whereby 28% of the entire network of roads will be tarred;
- to ensure efficient and reliable road freight and passenger transportation;
- to ensure that Swaziland Railway will become operationally independent and to accomplish economically feasible extension of the railway network in the country;
- to ensure the development of civil aviation to the point where the operational and safety standards are reached and maintained;
- to expand and improve the efficiency of the posts and telecommunications networks in the country.

c. Constraints on Development Plans Related to Transport and Telecommunications

The capital inputs required to achieve the development objectives of the economic infrastructure sector for the next five year period appear to be ensured. The proposed capital budget for 1978/79, as the first year of the Plan, has been approved in its entirety.

A major constraint, however, is the lack of sufficient expertise and skilled manpower for the greater part of the Third Five Year Plan period.

Another constraint is the lack of a well defined training program for the government as a whole. Swaziland's manpower constraints are partly addressed in the government's summary of the technical assistance and training requirements of the Ministry of Works, Power, and Communications over the development plan period. This report, which is entitled "An Assessment of Technical Assistance Requirements for the Ministry of Works, Power and Communications," June 1978, Mbabane, provides a detailed list of the ministry's manpower shortages and it illustrates use of an effective framework to summarize manpower requirements for the government as a whole. The more fully these needs are identified, the greater the government's ability to utilize its manpower most effectively and to seek to obtain external support for training and technical assistance.

2. Analysis of Respective Modes

a. Roads

1) Constraints and Projects Underway

During the last decade economic growth in the wage sector of the economy has taken place largely in four established core regions:

- Mbabane-Manzini--manufacturing, construction, tourism, and urban expansion
- Pigg's Peak-Havelock--asbestos, timber, and citrus
- Mhlume--sugar and citrus
- Big Bend--sugar and citrus

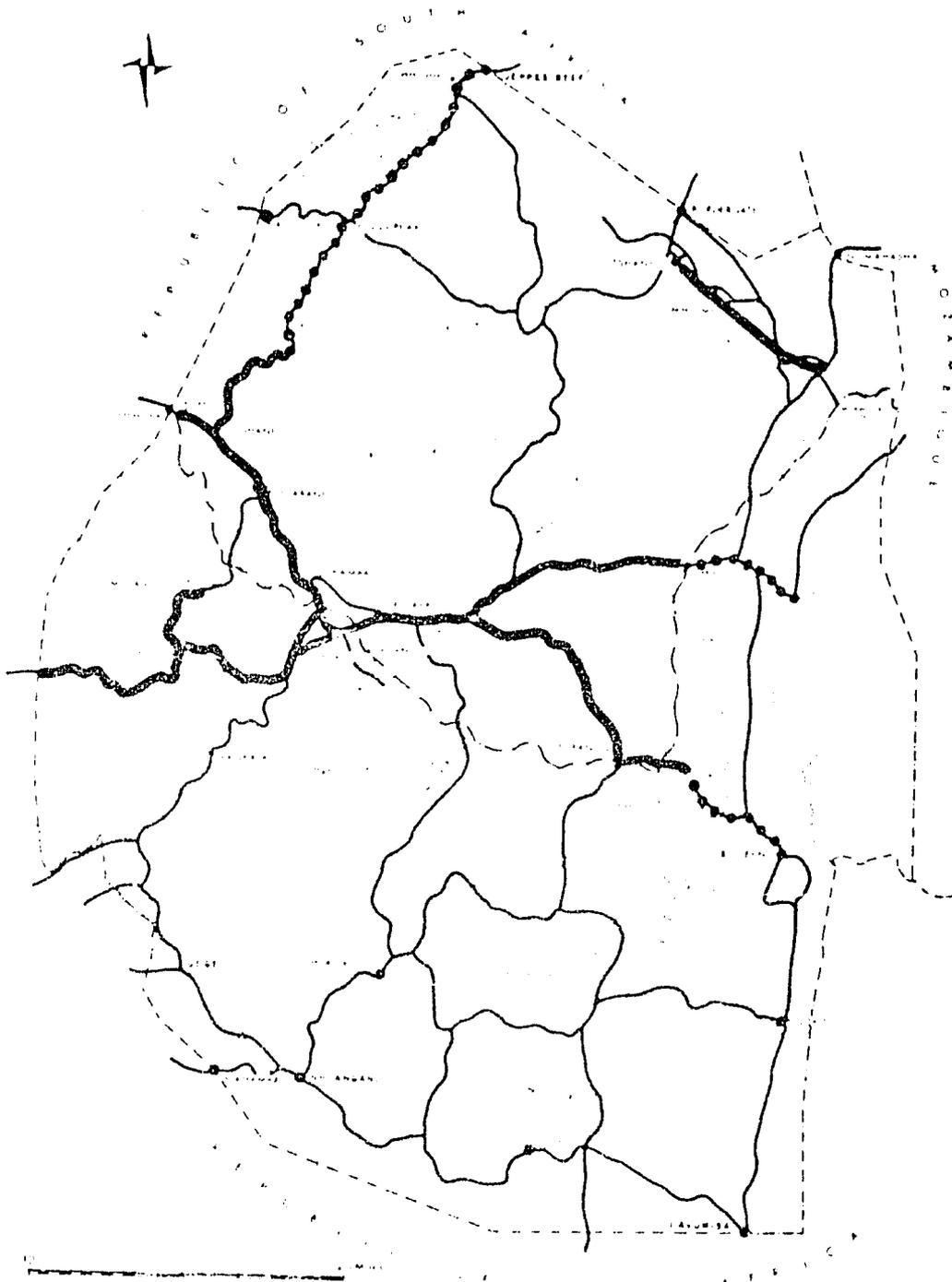
It is these four core areas that generate most of the traffic on the country's roads and also provide almost all of the export traffic for rail shipment.

It is difficult to assess the extent to which roads represent a constraint to economic development in the country. Two-thirds of the country is within 8 km of an all-weather road, and road projects to date have sought not only to expand the system but also to link to major development sites.

Increased lumbering and projects in industry and tourism would well lead to the development of a fifth core region centered on Nhlingano in the south. Peripheral economic development is represented by the Rural Development Area programs. The basic network of paved roads--which in 1971 were almost entirely located in the Mbabane-Manzini core region--were so established to facilitate economic and functional ties, which, in fact, have tended to be weak between the core regions. Thus, the present program underway is extending the paved road system into the periphery, thus facilitating the internal transportation of sugar and citrus exports to railbeds at Phuzumo and Mlawula, and to enable the export of timber and citrus from the Piggs Peak area to South Africa. (See Figure XL, Swaziland: Third Development Plan, Paved Roads by the End of 1977/78.)

TABLE XL

SWAZILAND: THIRD DEVELOPMENT PLAN, PAVED ROADS BY
THE END OF 1977/1978



————— Paved roads by March 1978
..... Projects on-going

The total length of the road system is 2,653 km, of which 1,428 km (or about 54%) are classified as main roads and 1,225 km (or about 46%) are classified as district roads. Of the total, however, only about 280 km (or about 10% are paved. Thus, although in possession of a fairly dense road system, Swaziland faces high transport early as a result of low mileage of paved roads and insufficient maintenance of the remainder.^{1/} Both main and district roads are divided into three classes with distinct design criteria. (See Table XXXXI, Swaziland: Government Minimum Road Design Criteria, 1978.)

There are six major ongoing road projects in 1978. Two of these, the Motshane-Jeppes Reef and the Phuzumoya-Big Bend roads, are more than 50% finished. (See Table XXXXII, Swaziland: On-Going Road Projects and Costs - 1978.) Another two, the Northern Sugar Road and the Helehele-Phuzumoys roads, are basically open to traffic and are awaiting but finishing touches. The Mpaka-Siteki link is an especially important route to new RDA project.

^{1/} Note: It is estimated that, dependent upon the type of which--terrain and level of maintenance--the vehicle operating cost on a gravel road is 20% to 40% higher than on a paved road.

For further information, see Maasdorp, G.G., Bennett, T.H. Feasibility Studies of Road Improvements in Swaziland: A report prepared for the Ministry of Works, Power, and Communications, Kingdom of Swaziland. Dept. of Economics, University of Natal, Durban, June 1977.

TABLE XL

S.W.A.Z.I. AND: GOVERNMENT MINIMUM ROAD DESIGN CRITERIA, 1978

CLASS	MAIN ROADS				DISTRICT		
	1	2	3		1	2	3
Design speeds	60 km/h	80 Km/h	110 Km/h		40 km/h	60 Km/h	80 Km/h
TOPOGRAPHY	Mountainous	Hilly or rolling	Flat		High veld	Middle veld	Low veld
Minimum Surfaced Pavement Width	6.10 m	6.70 m	6.70 m	Formation Width	7.60 m	8.50 m	9.70 m
Minimum Shoulder Width	1.22 m	1.80 m	2.50 m	Running Surface	5.50	6.40 m	6.40 m
Maximum Gradient %	9%	7%	5%		15%	10%	6%
Desirable Maximum Length at Max. grade	400 m	500 m	900 m				
Minimum Horizontal Radius	110 m	200 m	500 m		45 m	75 m	150 m
Minimum Sight	80 m	120 m	170 m				

Source: Roads Branch, Ministry of Works, Power, and Communications, GOS, 1978.

TABLE XXXXI

SWAZILAND: ON-GOING ROAD PROJECTS AND COSTS -- 1978
(in thousands of Emalangi)

Identification	Projected Cost	Major Donor	Completion Date	Economic Appraisal
Motshane-Jeppes Reef	4,600 ^{A/}	Local	1979/80	Facilitate traffic, serving forestry, mining, and tourism; also additional link with neighboring region.
Phuzumoya-Big Bend	750 ^{B/}	IBRD	1978/79	Important link to Big Bend area, and serves Natal-bound traffic.
Mpaka-Siteki	1,296 ^{C/}	West Germany	1979/80	Connects district center of Siteki to existing paved road to central development area. Also RDA projects.
Lavumisa-Lomshasha (Design) ^{1/}	160 ^{D/}	IBRD	1978/79	
Northern Sugar Road ^{2/}	50	IBRD	1978/79	Connects to sugar project.
Mhlume-Phuzumoya ^{2/}	50	IBRD	1978/79	

A/ Estimated remaining cost 4.6; total cost 8.2 M

1/ Design included under 3rd Project; donor support for completion uncertain

2/ Roads being opened to traffic; only work remaining is finish work

B/ Estimated remaining cost of E750,000; total cost of E2.5M

C/ Estimated remaining cost of E1,296,000; total cost of E2.05M

D/ Estimated remaining cost of E160,000; total cost of E260,000

Source: Government of Swaziland, Roads Branch, Ministry of Works, Power and Communication.
Selected data from third draft of National Development Plan, July 1978.

In addition to main road projects, there is a substantial district roads program, designed to link feeder roads. Between 1970, when the program was initiated, and 1977 thirteen district road projects were completed to gravel standard. This represented a total of about 260 km of roads and fourteen bridges or culvert causeways. This represents an average yearly rate of less than 40 km, or about two district roads per year.

The government has sought grassroots input for this program. Priority lists of target roads are periodically structured, usually every two or three years, beginning with consultations between the local chiefs and the District Commissioner. Each district presents a list of three or four schemes, which list is culled and integrated with the interests of other districts. The final list of roads and the priorities granted to these roads is based on such factors as access or associated sector development, and includes the recommendations of state services as the police and reports of consultants in road development.

The Roads Branch of the Ministry of Works, Power, and Communications is responsible for the construction, maintenance, and upgrading of all proclaimed roads, except for those in urban areas or on private property. The branch has only 50% of its projected professional staff needs, and there is extensive reliance on the use of expatriate personnel as

consultants. Out of a total of 700 employees, less than 50 are appointed staff and the rest are daily wage employees. Only 150 are skilled workers or administrative staff, and less than 10 are deemed as professionally or technically skilled. Only four engineers are members of the staff. In addition to a general scarcity of technical and engineering expertise, there is a serious deficiency in such statistical information as traffic, in turn complicating development planning.

The GOS generally prefers IBRD or ADB financing for road construction. Arrangements with other sources are felt to be too complicated. Construction for main roads is felt best placed in the hands of South African contractors and suppliers. To do otherwise increases project costs by up to 40%. Unless such financing represents a grant, the government is not interested in financial support with restrictive clauses. It has avoided EEC funding as a result and has channeled ODM support to district roads and CTO projects.

Although contractors are usually used for main road construction, district road construction and maintenance is dependent on the CTO for plant and vehicle support. CTO is understaffed both qualitatively and quantitatively. The availability rate for equipment is projected at about 50%. This is somewhat misleading since the interdependence of transport and various kinds of construction equipment makes the rate lower at times. The management structure of

CTO is expected to be revised under support from ODM at E1.8 million, the main component of which is to be a workshop at Matsapa.

System maintenance has begun to be a serious problem. In the early 1970s the condition of roads was fully satisfactory, but since 1975 the Roads Branch has fallen considerably behind in its projected schedule, especially in regard to gravel surfaces. A five-year repaving program was begun in 1977/78, but since direct labor-intensive programs have a capacity of only about 50 to 80 km per year, some of the work has been let to contractors. By mid-1978 an estimated 177 km have been regraveled.

2) Proposed Projects

Under the terms of the Third Development Plan the GOS is proposing work on twelve main road projects (see Table XXXXII, Swaziland: Proposed New Road Projects 1978/79-1982/83). The Ministry of Finance, the authority ultimately responsible for contract negotiations, has arranged for donor support for four of these projects and expects support to be forthcoming for two other projects. Several of these routes represent vital links between areas, as well as facilitating access to RDA projects or such other economic activities as sugar, citrus, or cattle projects. Only one of these, the Junction MR.7L Maphiveni route, is in need of donor support. Completion of these projects will provide major

TABLE XXXXII

SWAZILAND: PROPOSED NEW ROAD PROJECTS 1978/79-1982/83

PROJECT ROUTE	PROJECTED START UP	PROJECTED COMPLETION	PROJECTED COST 1000% of Em.	LENGTH in km.	ECONOMIC APPRAISAL	DONOR INTEREST
Mahamba-Hlatikulu	1978/79	1980/81	4,390	41	Part of main link between Manzini and Nhlengano-Mahamba area, as well as Piet Retief. Passes through existing and proposed RDAs.	ADB/ADF
Manzini Mhondo river	1978/79	1980/81	4,490	32	First part of link from Manzini to the south of the country. Includes two major high-level bridges.	IBRD
Big Bend-Nsoko	1978/79	1980/81	1,800	30	To serve as link to one of main sugar and citrus producing areas, as well as important link to Natal road and railway networks and ports of Richards Bay and Durban	IBRD
JNTN.MR.7-Maphiveni	1980/81	1981/82	1,750	32	To link Mpaka-Siteki Road and the northern Sugar Road. Important link between regions and connection to port of Maputo. important cattle ranching and sugar growing areas.	none
Nsoko-Lavumisa	1980/81	1982/83	2,100	35	Will link Nsoko with Natal road network, serving cattle ranching and cotton producing areas.	ADB/ADF ?
Mkondo River-Hlatikulu	1980/81	1982/83	3,600	43 ^{1/}	Central part of "Road to the South"	ADB/ADF
Mafutseni-Mliba	1978/79 <u>2/</u>	1982/83	2,700		Important link between northeastern and central region, passing through dense area with cattle ranching, rice and cotton production, and mixed farming activity.	(IBRD) ?
Luyenso-Mankayane	1980/81	1982/83	2,300	26	Link with route to Piet Retief	none
Gege-Nhlengano	1980/81	1982/83	1,700	23	Link to afforestation project	none
Maphiveni-Lomahasha	1980/81 <u>3/</u>	After 1982/83	1,000	20	Link to Maputo	none
Mbabane-Manzini	1978/79 <u>4/</u>	After 1982/83	3,400	-	Extremely dangerous road requiring upgrading - possibly to four lanes; possibly divided. Feasibility study for 1978/79.	none
Mbabane-Mhlambanyati	1978/79 <u>5/</u>	1983/84	1,078	22	Reconstruction of existing route	none

^{1/} 40 km. of new road plus 3 km. of link to Hlatikulu^{2/} Start up 1978/79 but major activity 1981/83^{3/} Start up 1980/81 but major activity 1982/83 and after^{4/} Start up 1978/79 but major activity 1982/83 and after^{5/} Start up 1978/79 but major activity 1982/83 and after

Source: Consultations with Government of Swaziland, Roads Branch, Ministry of Works, Power and Communications, and selected documents including Third Draft of National Development Plan, July 1978.

north-south links to the existing system.

(See Figure XXXXIII, Swaziland: Third Development Plan - Main Roads Construction Programme, 1978/79-1982/83.)

There are nine district road projects in which the government is presently interested.

(See Table XXXXIV, Swaziland: Proposed Program, District Road Scheme, 1978.) Swaziland is presently receiving assistance from ODM for these projects. The government would like to increase the rate at which these projects are being implemented. To do so would require additional equipment, additional supervisory personnel, and the introduction of contractor/capital-intensive operations. The rate presently charged by CTO is very reasonable. ODM does not support this interest and feels it to be too ambitious, and support of this interest should be made only in consultation with ODM representatives.

In order to upgrade CTO operations, the GOS expects to receive British help for a new workshop at Mapsapa. The cost of the workshop is estimated at E1.35 million and represents 75% of the total figure being discussed. In addition, there is a need for an additional E200,000 to E300,000 for additions to five other workshops. Some upgrading will be covered under the local budget for the first year, but no donors exist for the remainder. The government feels these additions essential in order

FIGURE XXXXIII

SWAZILAND: THIRD DEVELOPMENT PLAN

MAIN ROADS-CONSTRUCTION PROGRAMME 1978/79 - 1982/83

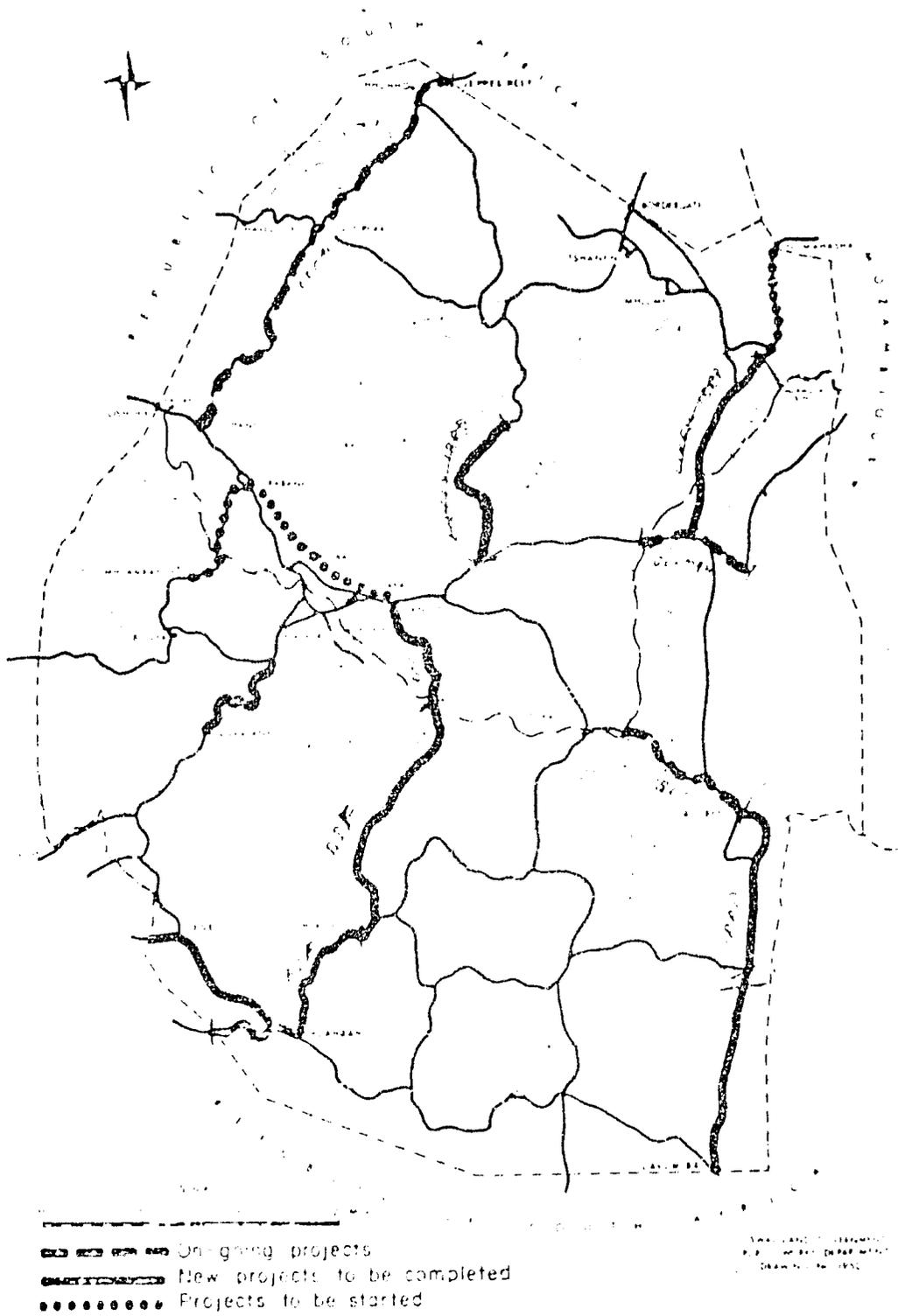


TABLE XXXXIV

SWAZILAND: PROPOSED PROGRAM, DISTRICT ROAD SCHEME,
1978

<u>PRIORITY</u>	<u>SCHEME IDENTIFICATION</u>	<u>DISTRICT</u>
1	Upgrading D11 - Ntfhonjeni	Hhohho
2	Hluti	Shiselweni
3	Mafutseni	Manzini
4	Upgrading	Hhohho
5	Mashobeni/Mritsini	Shiselweni
6	Phunga Clinic to join MR8 (Nkonjane)	Lubombo
7	Bulunga to join MR8 near Gilgal School	Manzini
8	Mbalala Loop	Shiselweni
9	Bridge Construction	Ludzewdze

Source: Government of Swaziland, Roads Branch, Ministry of Works,
Power and Communication, 1978.

to keep present levels of maintenance. In addition to the road development projects to be included in the Third National Development Plan, there are also various projects in which the government is interested. During the rainy season, for example, certain roads in hilly terrain dip to low points, sometimes for bridges, which are easily flooded. Even though some of these roads are main routes, they often have low traffic rates which, when compared to other priorities, do not justify the investment needed to correct the problem. The situation is further complicated by the fact that investment of such level should mesh with the overall standards to which the route will eventually be upgraded.^{1/} Typical of such a problem--and the largest of six possible projects--is on Main Road 8 south of the Usutu River, where a 200 meter bridge is needed. A smaller project is needed for Ngwavuma River crossings where silting is a particular problem.

3) Recommended Assistance

- Technical Assistance in Road Maintenance and Maintenance Training - Roads Branch of the Ministry of Works, Power, and Communications Keyed to deterioration of roads since 1975, should include mix of contract consultants and short-term consultants. Special training component to expand number of crews and their skills.

^{1/} Note: A similar problem exists on other main routes, the final alignment of which has not been determined.

- Technical Assistance in Vehicle and Equipment Maintenance and Training - Central Transport Organization
Project should be keyed to reduce equipment-down rate. Contract advisors for initial operations and for development of training program. Should be meshed with CTO reorganization under aid from ODM.
- Technical Assistance, Statistics, Management Training and Staff Development - Roads Branch, Ministry of Works, Power, and Communications
Target should be expansion of professional staff with preliminary use of contract advisors for staff support and phased training component. Also development of statistical methodology. Some donor interest already, but need expanded project and also funding for associated equipment.
- Capital Assistance, Workshop Development - Central Transport Office
Project designed to provide five workshops in addition to those expected from British assistance. Should be meshed to British project and procurement key to standardization. Other capital investment not recommended at present.

b. Railroads

1) National Objectives, Plans, and Priorities

a) Background

Swaziland's single railway line began operations on 1 October 1964, to move high-grade iron ore from the mine at Ngwenya in the west of the country to the Port of Lourenco Marques, Now Maputo, in Mozambique. The 224 km of the railway line in Swaziland, which includes the 6 km Matsapha's spur, runs from Ka Dake in the west of the country to connect the Mozambique railway line at the eastern border, 74 km from Maputo. The original plan for the railway

was to move approximately 20 million tons of ore over the ten years, during which time the finances of the Swaziland Railway Corporation--the parastatal operating authority--were designed to retire the original construction debt, cover all operating costs and produce a reserve fund of E1.0 million. In addition, such general traffic as could use the railway conveniently was to be secured and the net revenues obtained put to the benefit of the railway.

Although iron ore still represents two-thirds of the tonnage traffic on the line, a progressive diversification of demand has occurred. Reference to Table XXXXV indicates that export commodities other than iron ore, such as sugar, molasses, woodpulp, fruit, and coal are transported by rail. Some import commodities are brought in exclusively by rail. The import, export, and local traffic are summarized in Exhibit XXXXVI for the period 1973/74-1977/78.

At the commencement of operations, the Swaziland Railway Corporation made a comprehensive operating agreement with the Caminhos de Ferro e Transportes de Mozaambique, which covered all operational maintenance and accountancy activities of the railway in Swaziland and the provision of train services, a fee being charged for these services. The Swaziland Railway Corporation established itself as a directing body, leaving management and operations

TABLE XXXV

RAILWAY TRAFFIC BY COMMODITY
(in thousands of tons)

Commodity	1973/74	1974/75	1975/76	1976/77*	1977/78*
Iron ore	2276	2088	1984	1488	1333
Sugar	158	180	168	165	203
Wood pulp	121	123	127	72	122
Petro, oil & related products	87	85	98	58	99
Molasses & other tank car goods	48	54	52	75	77
General Goods	257	205	202	190	273
Total	2947	2735	2631	2048	2107

*Provisional figures

Source: December 18, 1977 draft of Swaziland's Third Development Plan.

TABLE XXXXVI

RAILWAY TRAFFIC BY TYPE
(thousands of tons)

Type	1973/74	1974/75	1975/76	1976/77*	1977/78*
Exports	2733	2554	2465	1896	1939
Imports	171	147	142	122	140
Local	43	34	24	30	28
Total	2947	2735	2631	2048	2107

*Provisional figures

Source: December 16, 1977 draft of Swaziland's Third Development Plan.

to the C.F.M. and their staff. The railway was well built, operations conducted efficiently, and satisfaction given to the customer until about mid-1975, when the political independence of Mozambique led to the withdrawal of the majority of the Portuguese management and operating staff, which seriously reduced the efficiency of C.F.M. and consequently, of the Swaziland Railway. (See Transmark, A Development Study of the Swaziland Railways.) It has managed to continue operations under increasing difficulty, due to the lack of properly trained and experienced Swazi managers, supervisors, and staff, and the rapidly worsening standards of supporting services and repair provided by C.F.M. at Maputo. Expatriate management and technical assistance have been obtained from Canada and South Africa, but despite this the service given to the main customers--Swaziland Iron Ore Development Corporation--has fallen short of requirements; there is still a large stockpile of ore to be moved to the port, even though mining operations finished at the end of 1977. The service given for general traffic, that is, nearer to the port and away from the more difficult operating sections of the line in the western part of the country, has been maintained at a reasonable standard.

The original financial objectives of the railway were met by 1975 when the railway was free of

debt and had a contingency reserve of E920,000. As Table XXXXVII indicates, however, this reserve has declined since that time due to rising costs, increased rates, less than adequate operational efficiency, and greater use of other modes of transport by railway users. This Table indicates that at the end of financial year 1978 the railway is expected to stand free of debt, but have a contingency reserve of only E37,000.

At the beginning of 1978 the sources of revenue included a growing volume of general traffic and a backlog of 3 million tons of iron ore still to be moved. In addition, capital for the railway has been provided by the Swaziland Government and by the operation of the iron ore freight rate agreement to such an extent that at the end of FY 1977 the railway's capital account exceeded the depreciated value of the fixed assets by E712,000. (See Transmark, A Development Study of the Swaziland Railways.) The sharp reduction in the railway's accumulated surplus from E648,000 in 1976/1977 to E37,000 in 1977/78 is explained by the decline in the volume of iron ore traffic and a major accident on the line in 1977.

TABLE XXXXVII

PROFIT AND LOSS ON THE WORKING ACCOUNT
(in thousands of emalangení)

Account	1973/74	1974/75	1975/76	1976/77*	1977/78*
Revenue	4307	4865	5430	5619	6410
Working Expenses ^x	4371	4669	5502	5819	7021
Surplus (Deficit)	(46)	(196)	(792)	(200)	(611)
Accumulated Surplus	724	920	848	648	37

*Provisional figures

^xIncludes depreciation

Source: December 18, 1977 draft of Swaziland's Third Development Plan.

b) Strategy Related to the Sector

(1) Present Situation and Trends

To adjust to the altered situation in Mozambique and the decline in iron ore exports, the Government of Swaziland has changed the management of the railways, leased locomotives, modified its repair, maintenance and training practices, and begun construction of a new railway line. Personnel provided by South African Railways (SAR) have taken over the management responsibility for the Swaziland Railways from the expatriate management provided by the Canadian Government during the period 1972-1977. The railway now leases eleven steam locomotives for R37 per day from SAR to replace Mozambican locomotives; Swaziland Railways plans to substitute diesel for steam locomotion in approximately five years. All heavy repairs are provided by SAR in South Africa, and SAR is providing training assistance.

A 94 km southern link between Phuzumoya on the existing line and Golea, the rail terminus of the South African Railway on the border, is under construction and scheduled to be completed by the end of October 1978. This link will aid development of coal reserves and provide access to Natal's consumer markets. With this line

Swaziland is expected to carry one million tons of traffic other than iron ore by 1980 (draft Development Plan).

Construction in the future of a link between the rail line in the northeast corner of Swaziland to the South African rail line to the north would permit South African exports to pass through Swaziland to South African ports to the south. Minerals, including chrome and hematite from Witbank, Belfast, and other mining areas in Eastern Transvaal, could be shipped on the rail lines through Swaziland to permit SAR to use the alternative rail line around Swaziland almost exclusively to transport coal; by March of 1979 South African Railways plans to use this line to capacity to carry about 20 million tons of coal per year through South Africa. The through traffic on the Swaziland rail line could be between 3 million and 6 million tons per year and provide sufficient revenue to pay the full cost of the railroad, including interest and depreciation on the capital.^{1/}

(2) Development Objectives and Targets

The general objectives of the development of the railway as stated in the Third Development Plan of Swaziland are:

^{1/} Estimates of the amount of freight and revenue to be derived from through traffic were obtained in an interview with Mr. A. A. Weidemann, Chief Executive Officer, Swaziland Railways.

- to provide an adequate and efficient system of freight transport for exports and imports and such through traffic as may be required;
- to ensure that Swaziland Railways becomes operationally independent and continues to be financially self-supporting;
- to provide Swaziland's importers and exporters with a choice of alternative outlets to overseas markets;
- to reach the maximum possible re localization of posts during the plan.

c) Development Emphasis on Sector

(1) Specific Development Projects

Projects set forth in draft of Swaziland's Third Development Plan that are to be accomplished by 1982 are:

- to establish an organizational structure to ensure safe, efficient, and reliable operation;
- to improve and expand maintenance facilities and maintain the permanent way in a good state of repair;
- to replace as required rolling stock and build up the rolling stock fleet as needed for the envisaged growth in traffic;
- to complete construction of the southern rail link between Phuzomoya and Golela;
- to investigate the economic feasibility of providing additional spurs and sidings;
- to implement a training program to localize management;
- to secure additional traffic for conveyance by the railway.

(2) Projects Underway

Progress to date with railway projects referenced above that are already underway includes:

- Phuzomoya-Golela rail link. As noted above, this project involves building a single track 94 km railway. This rail link will include a signaling and communications system, passing loops and sidings, three stations with loading and unloading facilities, and housing for staff. Southern African contractors are being used for this project and South African Railways has provided Swaziland Railways with a civil engineer who is monitoring the contract, which is for approximately R9,000,000.^{1/}
- Improvement of workshop facilities. A locomotive leasing agreement with South Africa includes the cost of heavy repairs while light running repairs remain the responsibility of the Swaziland Railway. The workshop facilities at Swidvokodvo are to be improved, and machinery and equipment purchased. Railway workers currently receive short-term training at Sidvokodvo in safety practices, carriage and wagon maintenance, and permanent way maintenance. This training is provided by instructors from South African Railways.
- Maintenance of permanent way. Substantial improvement is needed in the permanent way since very little maintenance has been done since 1974. Some rail replacement is required. Currently 100 employees of Swaziland Railways are receiving training in permanent rail maintenance at Sidvokodvo.
- Replacement of rolling stock. Additional wagons are needed for petroleum, molasses, fruit, and general goods. Currently 100 wagons are on lease from SAR. Once the stockpile of approximately 3 million tons of iron ore has been transported from Ka Dake to Maputo (about 1980), these wagons will no longer be needed and will be scrapped.
- Relaying of the Matsapha spur. Heavy traffic has so worn the lightweight track that it will need to be replaced in 1978/79.

The capital costs and phasing of these projects are shown in Table XXXXVIII.

^{1/} Information concerning the involvement in the rail link by South African contract and by South African Railways was obtained from Mr. John Walls, Chief Planning Engineer, South African Railways.

TABLE XXXXVIII

CAPITAL COSTS, SWAZILAND RAILWAY
(in thousands of emalangeni)

Action Program	1978/79	1979/80	1980/81	1981/82	1982/83	Total
1. Referenced in Third Plan						
Phuzomo-moya-Golela Rail Link	19,038	-	-	-	-	17,038
Improvement of Workshop Facilities	200	200	200	200	200	1,000
Maintenance of Permanent Way	250	250	250	250	250	1,250
Replacement of Rolling Stock	-	375	375	375	375	1,500
Relaying of Matsapha Spur	50	50	-	-	-	100
Total	17,963	825	825	825	825	21,263
2. Projects Not Referenced in Third Plan						
Flatcars for Containers (10 cars)						200
Containers & Container Handling Equipment						200
Total						400

The Government of Swaziland is also conducting a feasibility study for the development of extensive coal deposits in the area around Tshaneni. If exploitation of the deposits is economically feasible, a rail spur may be constructed to the mine site. This rail spur would be approximately 40 km in length and could serve the Mhlume sugar mill and the third sugar mill, as well as the coal mine.

The government wishes to expand the railway in accordance with the requirements of industrial development, and has commissioned Transmark to identify future railway needs. The committee has completed the study, entitled "Development Study of the Swaziland Railways." It identifies middle- and long-term railway development needs and will be used by the government as a basis for policy development related to expansion and modification of the present railway system.

(3) Proposed Projects

Two projects not referenced in Swaziland's Third Development Plan, but which the government wishes to consider in the future, relate to containerization. The government would like 10 flat cars for containers, containers, and containerization equipment. These cars and equipment are cited in Table II under the heading, "Projects Referenced in the Third Plan and Estimated to Cost a Total of E400 Thousand."

TABLE II

CAPITAL COSTS, SWAZILAND RAILWAY (in thousands of emalangen)

Action Program	1978/79	1979/80	1980/81	1981/82	1982/83	Total
1. Referenced in Third Plan						
Phuzomoye-Golela Rail Link	19,038	-	-	-	-	17,038
Improvement of Workshop Facilities	200	200	200	200	200	1,000
Maintenance of Permanent Way	250	250	250	250	250	1,250
Replacement of Rolling Stock	-	375	375	375	375	1,500
Relaying of Matsapha Spur	50	50	-	-	-	100
Total	17,963	825	825	825	825	21,263
2. Projects Not Referenced in Third Plan						
Flatcars for Containers (10 cars)						200
Containers & Container Handling Equipment						200
Total						400

World Bank missions to Swaziland in March, July, and October of 1977 developed a loan for Swaziland Railways that the government will consider accepting after the new railway management becomes familiar with the railway problems and prospects for development.^{1/} The loan is designed to provide those minimal improvements to the railway that are needed for it to maintain operations until all of the iron ore stockpiled at Ka Dake is shipped to Maputo. More extensive loans would be needed if the Government of Swaziland decides that it wishes to maintain the railway after the iron ore contract is completed. The equipment and costs provided for in the loan are referenced in Table LI, Possible Future Loan by the World Bank for Swaziland Railway.

2) Constraints

Swaziland Railways suffers from a shortage of workers of all skill levels and a detailed analysis is needed of current and future manpower training requirements. Aspects of the current manpower situation include:

- A sufficient supply of unskilled and semi-skilled workers were not available in Swaziland for the construction of the Phuzumoya-Golela rail link. As a consequence, the office of the Deputy Prime Minister of Swaziland gave permission for the importation of 200 unskilled workers from South Africa for this construction project. Officials of

^{1/} Swaziland Railways began to be managed by a team from South African Railways in August of 1977.

TABLE LI

POSSIBLE FUTURE LOAN BY THE WORLD BANK FOR SWAZILAND RAILWAY

(Costs in 000s of Rand)

Loan Item	Local Contribution	Foreign Exchange Requirements	Total
Track Material (Rails & Sleepers)			R422
Price Contingency for Price Changes Between July 1977-80			R 48
Track Equipment			R106
Price Contingency			R 5
Sub-Total			R581
Workshops			
a. Buildings	R53	R174	R227
b. Physical contin- gency	R 6	R 17	R 23
c. Price contin- gency	R 8	R 26	R34
d. Equipment	-	R 47	R47
e. Price contin- gency	-	R 7	R 7
Sub-Total for Workshops	R67	R271	R338
Purchase of 50 wagons	-	R1,302	R1,302
Price Contingencies	-	R192	R192
Re-Wheeling	-	R600	R600
Rebuilding wagons	-	R150	R150
Sub-Total	-	R2,244	R2,244

/continued/

Loan Item	Local Contribution	Foreign Exchange Requirements	Total
Technical Assistance	-	R1,365	R1,365
Price Contingency	-	R 135	R 135
Sub-total	-	R 1,500	R1,500
Training	R 21	R 111	R 132
Price Contingency	R 3	R 12	R 15
Sub-Total	R 24	R 123	R 147
Consultants Fee	-	-	-
a. Development Study for Future Justification of the railroad	R43	R 116	R 159
b. Workshop design	R 6	R 46	R 52
c. Price Contingency	R 2	R 8	R 10
d. Sub-total	R51	R 170	R 221
Grand Total without Contingency Costs	R123	R4,439	R4,562
Contingency Total	R 19	R 450	R469
Grand Total	R142	R4889	R5031

Swaziland Railways believe that the wages and bonuses offered to the unskilled workers were sufficient to have attracted them, but that the location of the work site, in the south of Swaziland away from all major cities, may have contributed to worker reluctance to work on the rail link.

- South African instructors provide short-term training at Sidvokodvo for employees of Swaziland Railways in
 - safety procedures;
 - carriage and wagon maintenance (30 railway workers were recently trained for a period of 3 months and 95% of them passed the course);
 - permanent way maintenance (100 employees were recently trained in this course.
- Fitters from South African Railways overhaul steam locomotives that Swaziland leases from SAR and provide training for light maintenance of these locomotives and rolling stock at Sidvokodvo. The government is considering the purchase of diesel locomotives in approximately five years to phase out the steam locomotives, but no action will be taken until such purchases are economically and technically appropriate. The government plans to use the next five years to train diesel drivers and repairmen. Currently Swazi crews drive the steam engines, but sufficient crews are not yet available to drive all of the steam engines and none of these drivers are qualified to operate the more complex diesel engines.
- Swaziland's College of Technology produces graduates qualified to enter railway apprenticeship programs.
- South African Railways, which is providing training for railway workers in Transkei, Namibia, and Swaziland, plans to erect a college for lower-level training in South Africa. The managing director of South African Railways believes that current efforts and plans for training by South African Railways are more feasible than Transmark's recent suggestion for a centralized training

school that would accommodate students from Mozambique as well as the neighboring majority-rule countries. The managing director believes that the language and political differences between Mozambique and neighboring countries is likely to lead to a reluctance on the part of officials of the Mozambique Government to participate in a regional training program.

- Manpower requirements identified in the draft final report of the Transmark Study of Swaziland Railways, referenced above and entitled "Swaziland Railway Development Study," are tentative until the final report is completed, but currently are:

EXPERTS/TECHNICAL OFFICER

The study recommends the provision of 30 expatriate personnel of different categories, for a period of 10 years (various duration of appointment for different posts. Total estimated cost of the programme is in the region of E1.85 million. It has been estimated that during the period of the first 5 years (1979-1983) needs for expatriate personnel will be particularly great, the total cost for the period being in the region of E1.34 million (72% of total). From the fifth year the need for expatriate personnel will gradually diminish as a result of the implementation of the training programme proposed in the study.

TRAINING

The study recommends implementation of a training programme, the total cost of which is in the region of E1.68 million for a period of 10 years. Global components of the programme for the first five years (1979 - 1983) is as follows:

- (i) Internal training, 12,220m/m -----E
613,000
- (ii) External training, 564 m/m-----E
564,000

TOTAL	1,784 m/m	1.177,000
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This program is likely to be substantially scaled down after the fifth year, amounting to about E100,000 per annum.

An interesting proposal of the consultants is to attempt to organize the railway training on a regional basis. If this approach is tried and proved successful, the estimated cost of the proposed training program might substantially change. Neither the scale of implementation of the proposed programs, nor the strategy for their implementation, nor the sources of financing have yet been identified. However, the greater part of the training program implementation, particularly the internal training, will probably be capable of being financed from the railway's own resources.

3) Recommendations

U.S. assistance to the Swaziland Railway does not seem to be required in the short run. While the country is in the process of deciding whether or not it wants a railway after the approximately 3 million tons of iron ore are shipped from Ka Dake to Maputo, the railway is under the capable management of South African Railways and leases whatever equipment it needs from SAR. In addition, the World Bank is prepared to provide Swaziland Railway Corporation with a loan to upgrade track, develop workshops, and institute larger training programs, as noted above.

In the longer run the U.S. might consider provision of assistance for containerization needs of the Swaziland Railway. These needs would amount to approximately R200,000 for 10 flat cars for containers and R200,000 for container handling equipment. This form of assistance is cited in Table II as a project request unrelated to the Third Development Plan.

It is likely to continue to have low priority in the distant future because Swaziland Railways is likely to be sufficiently profitable if it establishes a northern link with South African Railway lines to finance containerization costs. Another reason for the low priority of assistance is that Swaziland Railways has such a close working relationship with South African Railways that South African Railways probably would be willing to provide financial assistance for capital projects of Swaziland Railways, especially since South African contractors usually perform the capital development projects of Swaziland Railways.

Civil Aviation

1) Constraints and Projects Underway

Although there are fifteen airports in the country, the Matsapha facility is the only manned airport accommodating international traffic. Other facilities are smaller and have grass runways. Six are licensed and the other eight are registered. Matsapha itself does not conform to ICAO standards. National air service is operated through Swazi Air under a private contract with South Africa. This agreement is to be terminated at the end of July, at which time a new national service is planned. Present service provides scheduled flights connecting to Johannesburg, Durban, and Maputo. Flights to Blantyre were discontinued in 1975 after a trial period of one year.

International agreements with various neighbors for regular connections have been negotiated and could provide the basis for expanded service.

The supervision, provision, and upkeep of aviation service in conformance with international standards of safety is the responsibility of the Civil Aviation Branch, established in 1972. By the end of 1977/78 the number of established airports in Swaziland was 31, compared to 19 at the time the branch was first established. Major emphasis has been on staff training, but certain programs have not materialized. Twelve staff members did attend courses abroad in such areas as air traffic control, radio maintenance, airport management, commercial pilot training, communications, and fire service. In-country training in rescue and fire have also been provided to sixteen of the staff members either through courses or on-the-job training.

2) Proposed Projects

The Matsapha airport fails to meet ICAO standards and is inadequate for future needs. The GOS is interested in building a new facility at a different site but presently lacks the finances for it. In the meantime upgrading of the existing facility is planned. The GOS has allocated about E1.1 million for the first year of the projected five-year program, but needs donor support for the remainder,

estimated at the cost of about E615 million. (See Table LII, Swaziland: Civil Aviation Projects 1978/79-1982/83.) Included in the package are runway extensions and repair, terminal building construction, and fire and safety equipment. The airport presently lacks any security equipment, but the GOS hopes to be able to include such in projected investment.

Short-run plans to upgrade airport facilities and operations will also necessitate the training of approximately 45 new staff members and the upgrading of the qualifications--including both advanced training and refresher courses--of an additional 20 personnel. The total cost of the project is projected at about US \$684,000. (See Table LIII, Swaziland: External Training Requirements, Civil Aviation Branch, 1978.) The government has proposed a project document and has applied to the UNDP for preliminary funds. Additional donor help is necessary.

Beginning August 1, 1978 national air service will be provided by the Royal Swazi National Airways Corporation (Royal Swazi), a totally government-owned enterprise. Initial service will provide three weekly flights to Johannesburg, with expanded weekly service to Zambia, Lesotho, and Malawi projected for initiation in September, October, and November. Royal Swazi will start with one Faulker F28 Jet and a Viscount 810 Turbot Prop for a backup. Clearly there will be a need for additional craft.

TABLE LII

SWAZILAND: CIVIL AVIATION PROJECTS 1978/79-1982/83

(1978 Constant Prices)

<u>ON-GOING PROJECTS</u>	<u>78/79</u>	<u>79/80</u>	<u>80/81</u>	<u>81/82</u>	<u>82/83</u>	<u>TOTAL</u>
	(in thousand of emalangeni)					
Housing (min. progr.)	30	-	-	-	-	30
Radio Navigation Equip.	35	-	-	-	-	35
<u>NEW PROJECTS</u>						
Land Acquisition	200	-	-	-	-	200
Taxiway Pavement	38	-	-	-	-	38
New Apron Pavement	163	18	-	-	-	181
Terminal Building	100	200	115	-	-	415
Equipment	448	674	394	300	300	2116
Fire Station	42	-	-	-	-	42
Fire Appliance	-	170	0	0	0	170
Housing	80	120	200	-	-	400
Existing Apron Pavement	-	-	-	163	18	181
Runway	-	-	-	-	90	90
Shoulder Areas	-	-	-	-	90	90
	<u>1,136</u>	<u>1,235</u>	<u>1,309</u>	<u>1,363</u>	<u>1,438</u>	<u>6,481</u>

1) Costs for Security Equipment not included.

TABLE LIII

SWAZILAND: EXTERNAL TRAINING REQUIREMENTS,
CIVIL AVIATION BRANCH
1978

Post Designations	Number of Personnel To be Trained	Estimated Duration of Each Course	Estimated Man/Months Required	
1. Airport Manager	1	5 m.	5 m/m	(1)
2. Air Traffic Controller	7 ⁽¹⁾	17 m.	164 m/m	(1)
3. Radio Maintenance Technician	5 ⁽²⁾	24 m.	180 m/m	(2)
4. Meteorological Observer	7	4 m.	28 m/m	
5. Meteorological Forecaster	3	24 m.	72 m/m	
6. Communications Supervisor	1	3 m.	3 m/m	
7. Communicator	4	9 m.	36 m/m	
8. Airport Electrician	3	6 m.	18 m/m	
9. Senior Airport Fire Off.	2	3 m.	6 m/m	
10. Junior Airport Fire Off.	7	4 m.	28 m/m	(3)
11. Airworthiness Inspector	1 ⁽³⁾	4 m.	7 m/m	(4)
12. Airworthiness Inspector	1 ⁽⁴⁾	28 m.	32 m/m	(4)
13. Air Transport Operation Officer	1	3 m.	3 m/m	
14. Deputy Director of Civil Aviation	1 ⁽⁵⁾	7 m.	14 m/m	(5)
15. Director of Civil Aviation	1	12 m.	12 m/m	
15 TOTAL	45 ⁽⁶⁾		608 m/m	(6)

NOTE: (1) In addition to number of personnel indicated in column 2, an advanced refresher training for nine personnel, of an estimated five months duration, is also required. The number of additional man/months involved has been included in column 4.

(2) Similar to (1) above, advanced/specialist training for six personnel, of an estimated ten months duration is also required. Column 4 indicates total man/months requirements.

(3) In addition to the airworthiness Inspector course, it is envisaged that the incumbent will also attend two more specialized courses (Accident Investigation - Prevention and Government Administrative) the duration of which is estimated at 3 months all together. Column 4 indicates total man/months requirements.

- (4) In addition to the Basic Aircraft Maintenance Engineer Course, it is envisaged that the incumbent will also attend the Airworthness Inspector Course of 4 months duration. Column 4 indicates total man/months requirements.
- (5) In addition to the Government Operations/Personnel Licencing course, it is envisaged that the incumbent will also attend a 5 month course in Airport Management, and a 2 months course in Accident Investigation/Prevention. Column 4 indicates total number of man/months requirements.
- (6) Total number of personnel to be trained is 45, but with the additional advanced training as explained in notes (1) to (5) above, total number of required personnel training units, is 65.

The most pressing need related to the establishment of Royal Swazi is manpower training. Some crew will be supplied by Faulker and also some by Ireland. Others will have to be hired directly. For the most part, there are no qualified local personnel to staff these positions. The GOS has proposed a training program with an estimated external cost of US \$683,720 to prepare various staff ranging from pilots to traffic control. (See Table LIV, Swaziland: External Training Requirements, Royal Swazi.)

The major long-run transport project envisioned by the GOS is the creation of a new international airport. Implementation of this project will necessitate relocation of the airport at a point at least 30 miles from the present location. To date the government lacks a master plan and estimates the cost of the new facility at about E618 million. This is really a rough figure which needs considerable refining. The cost of a master plan is estimated at between E50 to E70,000. There is no donor at present for either the master plan or for the new facility itself.

3) Recommended Assistance

Assistance for the proposed new airport is not recommended on the basis of economic costs, but might be warranted if relations with South Africa deteriorated. If such should develop, USAID might

TABLE LIV

SWAZILAND: EXTERNAL TRAINING REQUIREMENTS, ROYAL SWAZI

(Estimated Costs - US \$)

Courses	No. of Train. Units	Course Duration	Tentative Locat.	Estim. Tuition Fee per Course	Allow. and Accom. per Unit	Travel Cost per Unit	TOTAL CCST
1. - Management - General	2	2 months	U.K.	4950	600	1563	
- Appreciation of Management		1 month	U.K.	2160	300		
- Directing, International Ops.		1 month	U.K.	2430	300		
- Corporate Planning/Development of Managerial Effectiveness/ Problem solving		1 month	U.K.	1980	300		29,166
2. Aerodrome/Approach/Terminal Area Control (Basic)(PT1)	7	17 months	Nigeria	3600	3186	875	53,627
Air Traffic Control Refresher/Special/improver course	9	5 months	Australia	3500	1500	1875	61,875
3. Aeronautical Radio Maintenance	5	24 months	Kenya	3600	7200	625	57,125
Communications Maintenance (Advanced Radio Maintenance)	6	10 months	U.K.	13000	5000	1563	177,378
4. Aeronautical Meteorological Observer (class IV Course)	7	4 months	Kenya	500	1200	625	16,275
5. Meteorological Forecaster Class II Course	3	24 months	Kenya	3600	7200	625	34,275
6. Communications Services Supervisor	1	3 months	Nigeria	790	900	875	2,565

* Based on the "ICAO Directory of Training Courses Open To Foreign Students, 1978/79", Document No. 9172/2

ESTIMATED COSTS (in US Dollars)*

Courses	No. of Train. Units	Course Duration	Tentative Locat.	Estim. Tuition Fee per Course	Allow. and Accom. per Unit	Travel Cost per Unit	TOTAL COST
7. Aeronautical Fixed Service Operator - Teletypewriter	4	9 months	Nigeria	1080	1800	875	15,020
8. Airplane Maintenance - Airfield lighting	3	6 months	Egypt	3670	1800	1500	20,790
9. Senior Airport Fire Officer	2	3 months	U.K.	3840	900	1563	12,506
10. Junior Airport Fire Officer	7	4 months	U.K.	4000	1200	1563	47,341
11. Airworthiness - Government Insp.	2	4 months	Australia	3000	1200	1875	12,150
Airworthiness Administration	1	1 month	Australia				1,100
Accident Investigation	2	2 months	U.K.	2340	600	1563	9,106
12. Aircraft Maintenance - Airframe and Powerplant	1	28 months	U.K.	23400	2800	1563	27,763
13. Air Transport Economics	1	3 months	U.K.	10620	900	1563	13,083
14. Government Operations/ Personnel Licencing	1	7 months	Lebanon	2000	2100	1625	5,725
15. Air & Space Law	1	12 months	Canada	1500	3600	1750	6,850
Sub-Total	65	608		290720	231802	81198	603,720
16. Chief Fire Services Adviser (internal training)	1/18	24 months	Matsapa	N/A	N/A	N/A	80,000
GRAND TOTAL		632					683,720

consider financing the feasibility study. Training and upgrading existing facilities are suggested as immediate needs.

- Technical Assistance, Training in Airport Management and Operations - Civil Aviation Branch
Project should provide phased staff support using contract advisors designed to mesh with the proposed training program for 45 staff members. Training is to range from refresher courses to advanced training for five different categories of personnel as described in Table of External Training Requirement. The project document needs further refinement and modification. The project could readily collapse some of the training needs for the new air service for inclusion in overall frame of reference; and certain aspects of training might be deferred until the second project year.
- Capital Assistance, Fire Fighting, Safety Equipment
This assistance should be paired with training program suggested above. Associated vehicles and a full range of equipment is to be included in support of fire fighting and safety training component. Security equipment would be recommended, but its use is restricted by the small size of the terminal.

d. Telecommunications

1) Development and Constraints

Under the last Development Plan major achievements included:

- the procurement and installation of automatic telephone exchanges at Mbabane, Manzini, Lobamba, and Malkerns, yielding a total capacity of 4,000 lines;
- the purchase and installation of a 200-line automatic telex exchange and extension of the telex network;
- automation of multi-pay lines;
- procurement of subscriber equipment and associated line plant.

Throughout the 1970s there has been a steady increase in demand for telecommunications services. (See Table LV, Swaziland: Telecommunications Services, 1968-1976.) Although the total number of telephones increased by 80% between 1968 and 1976, unsatisfied demand at the end of 1977 equalled about twenty percent of the exchange connections. Automatic telephone equipment is being installed. The new exchanges will provide completely automatic service for the Mbabane-Manzini corridor for both local and international connections.

2) Proposed Projects

Proposed expansion of the telecommunications system includes the provision of exchange equipment with network experience, including microwave and UFR links, automatic switching equipment, and expansion of the national training program.^{1/}

A third development phase is projected for the years 1983/84 to 1987/88. Funds generated by operations are expected to be adequate to finance the project and there is little interest on the part of PLT to even discuss a role for U.S. assistance. No assistance recommended.

^{1/} Note: Middle-level technical and supervisory training at the center in Blantyre and advance training is provided in Kenya.

TABLE LV

SWAZILAND: TELECOMMUNICATIONS SERVICES -- 1968-1976

Type of Service	1968	1969	1970	1971	1972	1973	1974	1975	1976
Exchange Connections	2237	2557	2578	2700	2771	2885	3128	3428	3585
Telephone Stations	4461	4822	5092	5592	5972	6211	6964	7483	8074
Metered Call Units (millions)	1.8	2.0	2.3	3.3	4.1	4.5	11.8	21.0	27.0
Telex Installations	21	27	34	49	51	54	84	106	124
Telex Calls (000s)	11	21	29	35	48	50	80	83	155

G. Zambia

Introduction: Constraints on Transport^{1/}

The economy of Zambia has not been able to withstand the series of shocks which Zambia has experienced since 1965. In addition to the heavy burden carried by the government and the people of Zambia following the application of sanctions, there have been a number of other difficulties. First, and perhaps most important, has been the increasing difficulty of transporting imports and exports. The transport bottleneck became particularly serious with the closure of the border with S. Rhodesia in 1973. This problem was further aggravated by the closure of the Benguela Railway in 1975. The reorientation of supply routes and the transport problems caused substantially higher costs and delayed imports and exports in such a way as to add dramatically to the difficulties facing Zambia.

Incursions by forces of the illegal regime in S. Rhodesia disrupted economic activities and necessitated heavy and growing expenditures on defense. There has been a large influx of refugees. To add to these problems, Zambia is now faced with a serious balance of payments deficit resulting from a decline in the price of copper and a continual worsening of its terms of trade.

The Goundrey Report states that "this compounding of detrimental effects means that Zambia is now facing an

^{1/} Much of the information contained in this report is taken from the report of the U.N. Mission to Zambia in 1978 that was led by Mr. Gordon Goundrey. Henceforth this U.N. Report, entitled "Assistance to Zambia, Report of the Secretary-General," is referred to as the Goundrey Report.

extensive economic and financial crisis and requires assistance in much greater measure than ever before. The amount and kinds of assistance required at this time can best be assessed not so much in relation to the burden of sanctions, but rather in the light of the current economic and financial situation, the special factors affecting Zambia and the government's development priorities and policies. It is important to emphasize, however, that the economic and financial crisis is essentially short term; the long-term development prospects are bright, particularly if stability and peace are established in Southern Africa." (Goundrey, p. 7)

a. Current Economic Situation

Salient characteristics of Zambia's economic situation are:

- Gross Domestic Product: When an adjustment is made for changes in the terms of trade,¹/ Gross Domestic Product at 1964 prices declined from K1067 million in 1973 to K765 million in 1977.
- Government Finance: For the period from 1973 to 1977, the government faced an overall accumulated deficit of K889 million, primarily due to the fall in revenue from the depressed prices in the copper industry. While copper production has remained stable since independence in 1964, the mining industry contributed one-half of the government's revenue in 1974 but made practically no contribution to it in 1976 and 1977.
- Inflation Since 1973: An increased money supply resulting from deficit financing, the high cost of rerouting Zambia's imports and exports, and a steady deterioration in Zambia's terms of trade have resulted in accelerated price increases. In 1976 consumer prices increased by about 18% and a similar increase was registered in 1977.

The Government of Zambia has undertaken a number of measures to deal with the current crisis. Among the

most important of these measures were restraints on government current and capital expenditures, the expansion of non-mineral tax revenues, changes in bank reserve and liquidity ratios, increased interest rates, cost-saving measures in the mining sector, programs to improve the efficiency of parastatal organizations, and wage restraints. In addition, tax incentives were introduced to stimulate investment, both domestic and foreign, and the Kwacha was devalued by 20% in July 1976 and by a further 10% in March 1978. These measures, combined with outside financial support, particularly by the International Monetary Fund, constituted a stabilization program to deal with the financial crisis.

b. Illegal Declaration of Independence in S. Rhodesia

Many of Zambia's current economic problems are the result of transport bottlenecks and distorted development programs that resulted from seizure of power by the illegal regime in S. Rhodesia in 1965. The policy pursued during the colonial period aimed at the complete integration of the economy of Northern Rhodesia with that of S. Rhodesia and, to some extent, with that of South Africa. The transport system of Zambia, road and rail, was routed southward through S. Rhodesia to South Africa and through the Portuguese colony of Mozambique. The headquarters of the businesses connected with copper and related activities were in S. Rhodesia or South Africa. Trade, tariff and payments policies were directed towards ensuring that S. Rhodesia and South Africa supplied

the bulk of the needs of the then-colony of Northern Rhodesia. All the major manufacturing establishments were thus located in S. Rhodesia or South Africa. The Railway headquarters and workshops, power sources, coal supplies, were all outside of Zambia.

The application of sanctions, and the reduction of integration with the economies of S. Rhodesia and South Africa, meant that very heavy investments were necessary to reduce Zambia's complete dependence on S. Rhodesia for power, coal, and transport. A pipeline had to be constructed for Zambia's necessary petroleum imports. The manufacturing sector had to be developed more with a view to replacing imports from S. Rhodesia and South Africa than to utilizing domestic raw materials and resources.

These expensive projects disrupted Zambia's development program; they made it impossible to select projects on purely developmental grounds, and they interfered with most appropriate timing for projects. Thus, Zambia had to postpone projects costing some \$200 million which were included in the Second National Development Plan, and postpone the beginning of the Third National Development Plan until January 1979.

Zambia's current strategy is to attempt to solve its transportation problems within the next two years with external assistance, but outside the framework of a development plan. The Third National Development Plan,

on the other hand, will be oriented to a longer run diversification of the economy with emphasis on agriculture.^{1/} In broad summary, for a development plan Zambia is seeking assistance with (a) rural development projects, (b) the establishment of industries based on agriculture and forestry, (c) the expansion and creation of industries based on domestic mineral resources, and (d) establishment of provincial projects related to agriculture, forestry, fishing, and water resources. A summary of the estimated costs of these selected projects over the plan period is given in Table LVI, "Costs of Selected High Priority Development Projects and Programs."

TABLE LVI
COSTS OF SELECTED HIGH PRIORITY DEVELOPMENT
PROJECTS AND PROGRAMS

Rural development projects	K 81,100,000
Industries based on agriculture and forests	K 97,000,000
Industries based on domestic mineral resources	K 25,000,000
Provincial projects	K 21,200,000
	K 224,300,000
<u>Total</u>	

c. Current Assistance for Transport

Development Assistance provided to Zambia for transport by multilateral and unilateral donors is summarized in Table LVII.

The strategy for the Development Plan is described in detail in the Goundrey Report, pp. 74-5.

TABLE LVII

REPORT ON DEVELOPMENT ASSISTANCE TO ZAMBIA FOR TRANSPORT IN 1977

Project/Activity	Source of Assistance	Assistance Committed for 1977 (\$DS Equiv.)	Duration of Total Project Begin-End Dates	Nature of Assistance and Location
**Transit Transport for the landlocked developing countries of Southern Africa sub-region (RAF/77/017)	UNDP/UNCTAD		1976-1978	Preparatory assistance anticipated to be carried out in 1978
Regional Projects: Study of East African Port facilities	UNDP/ECA, Donors within TCDC and ECA members governments	Nil	Sep 77-79	Regional analysis of post operation and transport constraints from Dar es Salaam to Zambia (future provision of experts)
Railways Management	Canada (CIDA)	3,000,000	1976-80	Management personnel Zambia Railways, Kabwe
Management, Supervision and training, National Transport Corp.	Denmark	83,330	1974-79	Technical Manager and two senior workshop supervisors, Freight Holdings Ltd., Lusaka. Head of Mechanical Dept. Mimosa Training School, Chilanga
National Transport Corp.	Denmark	13,750	1975-78	Automobile electrician in maintenance at Mimosa Training Center, Chilanga
National Transport Corporation Personnel Assistance	FFG	***1,220,770	1974	6 experts to advise on management and technical problems in connection of long distance road haulage Lusaka
Fellowship Training	France	13,800	1977	5 scholarships for training in France: 1 Zambia Railways; 1 Road transport; 3 Aeronautical training
Fellowship Training in Railway Signalling	Pakistan	N/A	1977	4 scholarships at the Pakistan Regional Training Center, Lahore
Kafue Railway Bridge	UK	Not Known	1977	A feasibility study of Kafue Railway Bridge to improve Kafue rail crossing.

2. Analysis of Respective Modes

a. Roads

(1) Development and Constraints

The road network consists of about 36,000 km of roads. Of these, about 19,500, or 54% of the total, are territorial, main, or district roads. Of these, 4,968, or about 25%, are Class I paved roads and 7,715, or about 40%, are Class II and II gravel roads. About 6,800 are unclassified. The remaining 16,000 km are earth roads under the jurisdiction of rural councils (see Table LVIII, Zambia: Main, Territorial, and District Roads by Class, 1971-1976, and Table LIV, Zambia: Road Specifications by Class, 1978.)

The major road route is an 885 km link from Tunduma in the northeast to Livingstone in the southeast. Major trunk routes include: the Great North Road (810 km) to Tanzania; the Great East Road (585 km) to Malawi; and vertex branches toward Angola to Mongu (585 km) and to Solwezi (180 km). A road also has been constructed parallel to the Namibia border and connects Livingstone and Sesheke. There are few roads in the western half of the country and links with Namibia and Angola cannot support heavy traffic and are sometimes impassable. Responsibility for highway construction falls to the Department of Roads of the Ministry of Public Works, formerly constituted with the Ministry of

TABLE LVIII

ZAMBIA: MAIN, TERRITORIAL, AND DISTRICT ROADS BY CLASS, 1971-1976

<u>YEAR</u>	<u>CLASS I ROAD</u> <u>(PAVED)</u>	<u>CLASS II & III</u> <u>(GRAVEL ROADS)</u>	<u>UNCLASSIFIED</u> <u>(DARTH)</u>
1971	3216	7221	7222
1972	3876	7434	7149
1973	4099	7391	7281
1974	4456	7513	6992
1975	4561	7609	6849
1976	4808	7378	6833
1976	4968.4	7,715.5	n.a.

Notes:

- The highway system of Zambia is composed of international main/territorial roads (T)

Main Roads (M)
 District Roads (D)
 Branch Roads (B)
 Rural Roads (R)
 Estate Roads (E)

- Adjusted figures for 1976 based on maintenance schedules.

Source: Ministry of Public Works, Department of Roads, Lusaka, n.a.

TABLE LIY
ZAMBIA: ROAD SPECIFICATIONS BY CLASS, 1978

Class	Formation width at finished Surface lends in meters	Carriageway width in meters	Type of Surface
Class 1A	13.30	7.30	Bituminous
1B	10.70 to 17.7 According to traffic needs	6.7	Bituminous
1C	10.10	6.1	Bituminous
II	10.10	Minimum 6.1	Ground
III	7.50	minimum 5.5	Ground where necessary for all weather standards
Unclassified	Cleared and stumped back of 5.5 minimum width and skeleton drainage		Earth with 3.5 meter ground surface where essential

Note:

1. At the present time no roads in the country meet specifications for 1A or 1B.
2. Estimated costs at 1977 prices
 - 1A n.a.
 - 1B K150,000 per km
 - 1C K100,000 per km
 - II K65,000 per km
 - III K8-9,000 per km (highly dependent on terrain and distance from contractor's base operation)

Power and Transport as the Ministry of Power, Transport, and Works. The department is manned at only 50% of projected staff needs. The planning function of the department is seriously deficient and design responsibility can only be handled for Class III roads.

Although the road system was regarded as in generally good repair in the early 1970s, maintenance has become an increasing problem. The 1977/78 rains left 45% of the road system in need of repair. This is a substantially higher percentage than normal and is regarded by the government as reflective of combined weather and maintenance deterioration.

Maintenance is the responsibility of the Department of Roads and is also implemented on a decentralized basis in each province by the Departments of Personnel and Equipment. Equipment is allocated through the Central Transport Service, which is also responsible for equipment maintenance. Since 1974 the CTS has been operated by the Ministry of Defense, a step taken to increase the effectiveness of CTS operations. The Public Works Departments of the Rural Councils are responsible for construction and maintenance of local roads (see Table LV, Zambia: Roads Classification - Maintaining Authority and Types of Surface, 1976).

TABLE LX

ZAMBIA: Roads Classification - Maintaining
Authority and Types of Surface, 1976

CLASSIFICATION	MAINTAINING AUTHORITIES	CLASS I BITUMEN	CLASS II GRAVEL	CLASS III GRAVEL	UN-CLASSIFIED	TOTAL KILOMETERS OF ROADS MAINTAINED	TOTAL KILOMETERS
Inter-territorial main roads	Roads Department	2,723.0	9.6	127.0	175.5	3,035.1	3,035.1
	Cities, municipalities and Management Boards	62.7	-	-	-	62.7	62.7
	TOTAL	2,785.7	9.6	127.0	175.5	3,097.8	3,097.8
Territorial Main Roads	Roads Department	1,594.5	1,700.3	446.7	18.1	3,759.6	-
	Cities, municipalities and Management Boards	-	-	-	-	17.3	-
	TOTAL	1,611.8	1,700.3	446.7	18.1	3,776.9	3,776.9
District Roads	Roads Department	570.9	1,001.4	4,430.5	6,635.0	12,637.8	-
	Rural, Local Authority	-	-	-	10,185.8	-	-
	TOTAL	570.9	1,001.4	4,430.5	16,820.8	22,823.6	22,823.6
Rural roads	Rural, Local authority	-	-	-	5,714.3	5,714.3	-
	TOTAL	-	-	-	5,714.3	5,714.3	5,714.3
Roads Branch (maintained by Government Funds)	Rural, Local authority	-	-	-	7.9	7.9	-
	TOTAL	-	-	-	7.9	7.9	7.9
Roads Branch	Not Maintained From Government Funds	-	-	-	-	-	432.0
Main and District Roads	Not Maintained From Government Funds	-	-	-	-	-	164.1
	TOTAL	4,968.4	2,711.3	5,004.2	22,736.6	35,420.5	36,016.6

Total kilometres of Designated Roads

Total kilometres of Roads Maintained

Note B14 = 164 Kilometres maintained by Malawi Government as part of their Great North Road

Internal document presented during discussion with Source:

Ministry of Public Works, Department of Roads, Lusaka, June 27, 1978,
alternately published in government reports.

Included among the reasons for substandard road maintenance are:

- a shortage of vehicles for the transport of labor to work sites;
- a shortage of heavy road equipment;
- low availability rate on equipment, estimated at 20% to 35% due to
 - shortage of spare parts
 - inadequate servicing
 - scarcity of lubricating oils;
- high cost of fuel..

In conjunction with the Third Highway Project financed by the IBRD, a special road maintenance project is planned. Included among the goals of this project are:

- the rehabilitation of the entire Zambian road network;
- the provision of technical assistance personnel, including advisers and mechanics.

The government is currently recruiting personnel, after which project start up-can be scheduled.

The National Transport Corporation (NTC), a parastatal, provides transport service through three subsidiaries: Contract Haulage Ltd., United Bus Company of Zambia, Ltd., and Bulk Carriers of Zambia, Ltd. Bus service is restricted to internal service and Bulk Carriers of Zambia deals exclusively with the transport of fuel. Engineering and repair services are provided to all NTC

subsidiaries by Freight Holding, Ltd. and the provision of basic facilities and housing for NTC staff is provided by Transport Holding of Zambia, Ltd. NTC suffers from the absence of management training, poor organization, low level of manpower qualifications, a scarcity of spare parts, inadequate maintenance, and poor driving habits.

NTC operates half the vehicles engaged in public transport of freight. These vehicles represent the larger vehicles in the fleet, resulting in the direct control by NTC of the majority of total transport carrier capacity. Private transport is regulated by the Road Traffic Commission. No permits are granted to private operators by RTC without consultation with NTC. Taxi service remains unregulated despite the announcement several years ago to create a national taxi service and to discontinue private operation. All road traffic to Dar es Salaam is handled by Zambian Tanzania Road Services, Ltd., of which 35% is owned by NTC of Zambia, 35% by NTC of Tanzania, and 30% by Intersomer, an Italian firm.

(2) Proposed Projects

The Department of Roads is particularly interested in funding for four major road projects. The most beneficial of these in terms of impact are the Angola Road Project and the Chemba Bridge Project. (See Table LVI, Zambia: Proposed Road Projects, 1978.) The Angola Road Project would provide a

TABLE LXI

ZAMBIA: PROPOSED ROAD PROJECTS, 1978¹

Project Route	Standard	Economic Appraisal	Status
Zambia-Angola Route Kaoma to Zambezi to Chevuma	IB	Provide link to rail operation to Port of Lobito would take off pressure from Dar es Salaam. Estimated cost at K60 million.	No engineering study but GOZ feels economically viable.
Zambia-Mozambique Katite to Carsacatinza	IB	Would provide link to Beira, reducing pressure on Dar es Salaam, Mozambique in process of upgrading road link on their side of the border. Estimated cost K4.5 million.	Pre-feasibility study complete; bridge design nearly complete and road design underway.
Chembe Bridge over Luapula River	Not less than IC	600 meter span would join Pedicle Road (68 km.) joining midlands and Northern Province traffic across Zaire. Almost all traffic on this route is Zambian. Now is gravel road with ferry. Benefit: 1) ten schemes; 2) fishing development in northern lakes; 3) potato/rice cultivation; 4) potential sugar scheme; and 5) rural development projects by opening up copper-belt markets. Estimated cost K4.5 million.	Uncertain
Kasungula Bridge	IB	Use of ferry at Nasungula blocks flow on East-West Highway.	Uncertain

¹ Priorities for these projects reserved for further consultation with GOZ.

Source: Informal discussions, Ministry of Public Works, Department of Roads, June 27, 1978.

link to the Port of Lobito via connection with a point midway on the Benguela Railroad. The upper section of the railroad enters Zambia after passing through Zaire, but is currently out of service. At least five bridges have been damaged and the roadbed needs maintenance before service can be re-established. The road link to the lower section of the railway would facilitate East-West flow in the region and would release some of the pressure on Dar es Salaam. The engineering study for the road has not been undertaken, but the probable route is from Kaoma to Zambezi to Chavuma. An alternate route would run from Mongu to some point on the Gago-Coutinho road in the Bundas area of Angola. Although shorter, this route would pass through marshland, complicating construction on the assumption of the northern link, which is reportedly underway by the Angolans on their side of the border. The Government of Zambia gives this road high priority. The Chemba bridge project would greatly facilitate the traffic flow from the northern region of the country to the Copperbelt markets. It would effect a variety of development programs underway or planned for the region and provide marketing income generation potential for the rural poor in the region. The road across Zaire, however, would have to be upgraded to handle the new traffic.

USAID might wish to consider the Zambia-Mozambique route as a regional link; additional information about upgrading underway in Mozambique is needed before a decision can be made. Construction of the Kasungula bridge awaits stabilization of security in the area.

NTC has expressed interest in an upgraded inspectorate program to cover all its associated subsidiaries as well as ZTRS operations within Zambia. The program cost schedule is estimated at K537,000. (See Table LVII, Zambia: Estimated Cost Schedule - N.T.C.'s Group Inspectorate.) About 60% of this figure represents vehicles and radio equipment. The remainder is mainly for spare parts. A year-long training program in the U.S. for one Zambian technician is also included. The West German government may be interested in providing some assistance for this project.

In order to alleviate the spare parts shortage and to upgrade workshop facilities for its subsidiary, Freight Holdings, Ltd., NTC proposes a K2.3 million program. (See Table LVIII, Zambia: Estimated Cost Schedule - Freight Holdings Limited.) Of the total assistance proposed, about 53 percent is for spare parts. (For an expanded description of spare parts suggested by Freight Holdings, see Appendix, Annex V, Freight Holdings Ltd.: Suggested Spare Parts, 1978.)

TABLE LXII

ZAMBIA: ESTIMATED COST SCHEDULE - N.T.C.'s GROUP INSPECTORATE

American Loan

	K
1. <u>Inspectorate Vehicles</u>	
12 Willis Jeeps at K16,000 each	192,000.00
1 Light - Radio Van for Technicians at K12,000 each	12,000.00
2 Ford Cars - Administration at K8,000.00 each	16,000.00
2. <u>Radios</u>	
40 SGC International 12 volts at K1,600.00 each	64,000.00
3. Tools and Equipment for Radio Repair + 25% of (2) above (inclusive of Masts and Antennae)	16,000.00
Sub Total	300,000.00
4. 1 Year Training in Technology in America for one Zambian	12,000.00
5. Spare Parts for (1) (2) and (3) 75% of Total Purchase Price	225,000.00
TOTAL	537,000.00

Source: Informal discussion, Corporation Security, NTC, at Ministry of Power, Transport, and Communications, June 29, 1978.

TABLE LXIII
ZAMBIA: ESTIMATED COST SCHEDULE -
FREIGHT HOLDINGS LIMITED

WORKSHOP EQUIPMENT & SPARE PARTS

<u>PARTICULARS</u>	<u>NUMBERS</u>	<u>TOTAL (K)</u>
Lathe	2	120,000
Crank Shaft Grinder	2	60,000
Skimmer	2	7,500
Reboring Machine	2	4,000
Injector Pump Calibrating Machine	2	25,000
Crank Shaft Arch Welding Machine	1	80,000
Crank Shaft Straiting Press	1	5,000
Crank Shaft Chrome Plating Machine	1	9,000
Camshaft grinding machine	2	18,000
Con Rod Straiting Machine	2	4,000
Con Rod Standardizing Machine	1	2,500
Surface Grinder	1	13,000
Wheel Aligning Machine	2	20,000
Brake Reverting Machine	1	2,000
Brake Lining Turning Machine	2	6,000
Hydro Brake Tester	1	1,500
Wheel Balancing Equipment	1	7,000
Dynomometer	2	40,000
Crankcrack Detector	1	2,000
Valve Guide Rebuilding Machine	1	3,000
Fly Wheel Grinder	2	10,000
Electrical Test Equipment	1	25,000
Auxiliary Vehicles (P&H Crane)	2	600,000
<u>GRAND TOTAL SUMMARIZATION</u>		<u>K1,064,500-00</u>
Workshop Equipment		K1,064,500-00
Workshop Tools & Special Equipment		K 9,670-32
Spares		<u>K1,212,111-74</u>
<u>GRAND TOTAL</u>		<u><u>K2,286,282-06</u></u>

(3) Suggested Assistance

The road transport system is a serious constraint on associated sector operations and development and needs immediate consideration. Coordination with investment by the IBRD under the Third Highway Project should be programmed.

- Capital Assistance, Road Rehabilitation - Department of Roads
Short-term project designed to repair damage to major roads during last rainy season. Flexible project design keyed to consultation with IBRD on most effective way to bring immediate relief which is consistent with Third Highway Project.
- Technical Assistance in Management and Mechanics
Central Transport Service: Project should be targeted to reduction of equipment downtime and should include funding for spare parts and lubricants.
- Technical Assistance in Management, Planning and Engineering - Department of Roads
This project should be keyed to staff supplementation. A preliminary survey by a management/transport consultant should identify key posts for two-year contract personnel and opportunities for counterpart training. Particular concern should be given to planning and construction design.
- Technical Assistance in Administration and Management Training - National Transport Corporation
Targets should be organizational revision and upgrading management skills.
- Capital Assistance, National Group Inspectorate Development Program - National Transport Corporation
Assistance mainly for purchase of equipment as outlined in cost schedule, but suggest addition of short-term consultants to facilitate project development and design.
- Capital Assistance, Freight Holding Equipment and Spare Parts Project - National Transport Corporation
Spare parts are a pressing need, but it is suggested that the amount of assistance be

reduced from that suggested by NTC. Preliminary survey and design phase will have to guide project scale, but a balance of needs with complementary investment should be offered.

- Technical Assistance, Engineering Study for Angola Road.
Completion of the engineering study for this road should be an immediate priority. Particular concern should be given to projected traffic and axle load restrictions. Consideration of development by Angola on its side of the border to meet this link should be taken into account by the study. Preliminary discussion indicates that the road would offer an economic return on investment. Based on recommendations of the engineering study it is suggested that USAID provide assistance for the construction of this link up to IB standard.
- Capital Assistance, Chembe Bridge Construction
Capital assistance and associated technical assistance should be offered for this 600 meter bridge. The project should be matched with upgrading of the Pedicle Road through Zaire, however, possibly through joint or multilateral funding.

b. Railroads

(1) Overview

This discussion of railways in Zambia is based on discussions that members of the SADAP team had with government and railway officials in Zambia and on information contained in the Goundrey Report. As noted earlier in this report, the Goundrey Report contains much detailed information concerning railway conditions and problems in Zambia that is directly related to this report. Hence, major sections of that report were adopted for use in this report. Any information from the Goundrey Report that is used in this report is, however, carefully documented as such. Finally, although much substantive information used in this report is derived from the Goundrey Report, the assistance requirements of Zambia that are identified in the Goundrey Report are much broader than the recommendations of this report. This difference is due mainly to the fact that while both reports are concerned with the specific priorities and problems of the transport sector, the Goundrey Report is also concerned with economic and external trade conditions that relate to transport and to Zambia's overall economic development.

2) Transport Links and Constraints

a) Rail and Road Connections to Ports

Table II shows that the Zambian exports and imports by all available routes fell between 1970 and 1977. The Goundrey report attributes this decline to both a reduction in available transport routes and to a shortage of foreign exchange that curtailed or delayed the purchase of transport equipment and other imports.

(1) Available Routes

Goundrey states that "by 1977, Zambia was relying on the Tanzanian rail and routes to carry over 80 percent of its exports and 85 percent of its imports. If one excludes Zambia's direct trade with Zaire, the relevant percentages are 95 percent of exports and 85 percent of imports. When TAZARA was planned, it had been assumed that no more than 65 percent of Zambia's trade would move through Dar es Salaam, the balance using the Lobito route. Small amounts were expected to continue to move into Zambia by road from Mombasa.

The Lobito route has been closed for some time and there are no indications of when normal operations will be resumed."

(Goundrey, p.22). At a meeting in Brazzaville

in mid-July 1978 representatives of Angola and Zaire agreed to reopen the Benguela Railroad to this port, but no date was set for the reopening (The Washington Post, July 18, 1978, p.A12). The closure of the road link through Tanzania to Mombasa has also caused problems. There is a direct road link to Mozambique, but this road is only passable in the dry season. Until an all-weather road, now under construction, is completed, it is unlikely that more than 70,000 tons annually could be carried on through this route. The road with Botswana has not yet been surfaced and suffers from a number of limitations. Both the road and the ferry at Kazangula are vulnerable to disruption by the forces of the illegal regime in Southern Rhodesia. The combined road and rail route through Malawi has only a limited capacity and involves not only extensive road haul but, thereafter, trans-shipment to rail. Air transport carried only 1 percent of the total tonnage in 1977 and is very expensive, particularly now that Zambia is so short of foreign exchange.

Although the links through Botswana, Mozambique and Malawi are valuable and can make a limited contribution, Zambia has no short-term alternative to the Tanzanian route via Dar es Salaam

for the bulk of its imports and exports. Thus, in the short run, efforts need to be concentrated on improving the TANZAM corridor and the port of Dar es Salaam." (Goundrey, pp.22-24.)

(2) Ratio of Imports to Exports

The second important feature shown in Table II is the decline in Zambian imports during the 1970's. In 1970, this figure had fallen to 0.7 million tons, although the volume of exports had remained remarkably stable over this period. While this fall in tonnage reflects the shortage of foreign exchange resulting from the low price of copper, Goundrey suggests that another factor is involved. It is the "lack of transport capacity, rather than shortage of foreign exchange, that is at present the immediate problem for Zambian foreign trade." (Goundrey, p.26). He reasons that a shortage of foreign exchange is responsible for a shortage of spare parts and delays in making payments have interfered with the movement of exports and imports.

(3) TAZARA

"If TAZARA's expected capacity of an initial million tons per annum (more than 80,000 tons per months) in either direction had been realized and Dar es Salaam port had sufficient

TABLE LXIV
ZAMBIAN EXPORTS AND IMPORTS BY ROUTE
('000 tons)

Year	Tanzania		Lobito/ Zaire	Mozambique			Kenya (Mombasa)	Botswana Kazungula	Air	Total
	Rail	Road		via Rhodesia	via Malawi	Direct road route				
Exports:										
1970	-	253	187	398	6	-	-	-	4	648
1971	-	221	176	390	9	-	-	-	2	798
1972	-	210	170	467	7	-	-	-	-	854
1973	-	284	438	5 <u>a/</u>	41	-	45	-	-	813
1974	-	319	509	-	10	-	86	-	-	924
1975	46	349	309 <u>b/</u>	-	66	10	2	-	-	782
1976	349 <u>c/</u>	323	131 <u>d/</u>	-	49	35	12	-	-	898
1977	524	181	131 <u>d/</u>	-	34	-	1 <u>e/</u>	-	-	871
Imports: <u>g/</u>										
1970	-	248	118	1,293	18	-	-	-	4	1,631
1971	-	295	269	1,048	29	-	-	-	7	1,648
1972	-	202	144	864	30	-	-	-	8	1,257
1973	-	200	418	35 <u>a/</u>	109	-	68	4	25	859
1974	18 <u>f/</u>	271	438	-	125	-	86	15	29	932
1975	69	311	257 <u>b/</u>	-	129	30	22	41	20	879
1976	326 <u>c/</u>	248	4 <u>d/</u>	-	71	58	22	9	21	759
1977	413	156	1 <u>d/</u>	-	25	9	3 <u>e/</u>	47	18	672

For the first 14 days before border closure with Rhodesia in January 1973.

Lobito route severed in August 1975.

First full year of operations from August 1976.

Zambia's direct trade with Zaire.

Halted in March 1977.

To Mwanza.

Excludes crude oil imports through the TAZAMA pipeline from Dar es Salaam, averaging 800,000 tons p.a. in 1976/77

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

capacity, Zambia would not now be experiencing a transport crisis: the emphasis would have been completely shifted to the foreign exchange shortage as the reason for the shortage of imports. But the railway's achievements so far have been far from expectations.

The best measure of a railway's effectiveness is the utilization of its rolling stock, as determined jointly by: (a) average wagon loading achieved; (b) availability (or "serviceability") of wagons; and, (c) average turnaround times of available wagons." (Goundrey, p.31).

(a) Wagon Loading

"Average wagon loading currently achieved by TAZARA (27 tons per wagon for imports and 43 tons for exports) appears excellent. However, these figures reflect the fact that there is very little empty movements of wagons, though a substantial amount of empty running would normally be expected." (Goundrey, p.31).

(b) Wagon Availability

"TAZARA's wagon fleet (excluding wagons for track ballasting, etc.) is as follows:

TABLE LXV

<u>Wagon Type</u>	<u>Capacity (tons)</u>	<u>No. of Wagons</u>
High-sided open	50	399
Drop-sided open	50	735
Covered	.30	523
Flat	50	<u>161</u>
<u>Total</u>		<u>1,818</u>

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

The availability of wagons is now said to be about 80 percent, but has apparently been as low as 60 percent recently, which is unacceptable, particularly for a fleet that is still almost new. An 80 percent availability reduces the effective fleet from 1,818 to about 1,450. The main reason for low availability was reported to be a design fault in the suspension system of the wagons. In spite of difficulties in obtaining the appropriate type of metal, springs are now slowly being replaced, and TAZARA hopes to achieve a more acceptable figure of 90 percent availability in the near future." (Goundrey, pp.31-2).

(c) Wagon Turnaround Time

"It is in the round trip times between leaving Dar es Salaam, unloading and reloading at terminals throughout Zambia, and repeating the process in Dar es Salaam, that the greatest room for improvement lies. TAZARA management is aiming at an

average turnaround time of 22 days, a rather generous figure. But actual turnaround time is averaging between 35 and 45 days. This means that the effective wagon fleet of 1,450 wagons is achieving what 700-900 wagons could achieve if turnaround time was 22 days. The effective capacity of available wagons is consequently cut to about one-half, and TAZARA's effective capacity has been only about one-half of what was originally planned.

Although a complete analysis of the factors determining turnaround time is not available, there are clear indications of the major problem areas. Goundrey, pp. 33-3).

(d) Wagon Terminal Time at Dar es Salaam

"One area of concern is the off-loading of copper and zinc exports at the port. Until the new storage facilities for copper are completed outside the port area, wagons are shunted into the port area, where loose billets are either banded for unitization and then off-loaded by forklift trucks or manhandled from the wagons piece by piece and subsequently banded. Wagon turnaround time could be improved with greater unitization on the copper belt and additional mechanical handling equipment to eliminate the slow and difficult task of unloading manually at the port.

Wagon detention at Dar es

Salaam resulting from exports is, however, only a minor contributory element in overall wagon turnaround time. The mission was informed that the whole terminal time, including shunting from TAZARA to the port, and cleaning, banding and off-loading the copper, usually takes about four days. Much more important is what happens to the wagons once they are off-loaded.

A major problem in achieving an efficient off-take of imports from the port and, indeed, efficient wagon turnaround times overall, is the difficulties caused by sudden changes in the priority accorded to various kinds of imports. Determining the off-take on the basis of needs in Zambia is not always consistent with efficient port and railway operations. To illustrate the problem, there is at present some 30,000 tons of Zambian general cargo imports within the port, of which most is fully documented and ready for shipment to Zambia. In addition, there is an equivalent amount of imports at the TAZARA terminal (mostly wheat and fertilizer) some of which has been stored under unsatisfactory rudimentary tarpaulin cover for up to two years. In spite of this, priority needs in Zambia might result in empty wagons being held at Dar es Salaam for some urgent imports (for example, coke) without regard to

the fact that the coke is in a ship outside the port awaiting a berth. In these circumstances, the wagons stand empty at Dar es Salaam, and the "lower priority" imports available immediately for loading continue to cause port congestion.

The solution to this unacceptable situation involves making the legitimate demands of Zambia for determining import priorities more compatible with the equally legitimate demands of the port and the railway that empty wagons be used as effectively as possible to clear the port and railway area of imports already available for loading. The first need is for much earlier collaboration between the Zambian authorities, the port, and the railway from the time it is known that "priority" shipments are likely to arrive, and an agreement on the logistics of dealing with these priority shipments without undue detention of empty wagons.

The second need is for adequate storage facilities for imports, outside the port. This would not only reduce the wastage of cargoes detained under inadequate conditions, but would also provide buffer stocks from which Zambia could meet its most urgent needs. It is clearly much easier to fulfill a priority from stocks already available for loading, than from a ship which may or may not be unloading in the port during the next week or so." (Goundrey, pp. 31-5).

(e) Wagon Terminal Time in Zambia

"The time spent in offloading imports at terminals in Zambia is another major reason for poor overall wagon turnaround times. One problem may be Zambia Railways' shortage of shunting locomotives. Although Zambia Railways has 16 diesel shunters, only three are currently serviceable. Zambia Railways is thus obliged to divert some of its 12 light (1,500 hp) mainline locomotives to shunting operations in spite of its shortage of mainline motive power.

A much more important source of delay in Zambia arises from the slow off-loading at destination, particularly of bulk imports such as wheat and fertilizer arriving in train loads. There is a clear need for more mechanical handling equipment to speed up the operation, and for more storage to accommodate the traffic. At present the wagons themselves are being used as "storage" on a substantial scale. Better storage facilities at Dar es Salaam could also ease the situation, by allowing bulk commodities to be forwarded a few wagons at a time, over an extended period, rather than in train load quantities that overwhelm the consignees' limited facilities. A penalty in this case, however, would arise from the additional

shunting and marshalling that would be required to assemble a train load of mixed traffic and to distribute the wagons to a number of terminals in Zambia rather than to one particular destination. The provision of general storage close to Kapiri M'Poshi, where TAZARA joins the Zambia Railways network would also help to reduce delays. This would eliminate the need to exchange some of the TAZARA wagons with the Zambia Railways system and allow them to be returned much more quickly to the port. It would also offer the flexibility of using either rail or road transport for forwarding within Zambia. Again, however, this solution is likely to involve more wagon shunting and marshalling, and double handling at the intermediate storage depot.

A combination of these solutions would probably provide the best answer. In any event it should be noted that all of them have two requirements in common: more storage, and more mechanical handling equipment. It is also important that the consignees be given every incentive to off-load wagons with the minimum delay. To this end, Zambia Railways has recently raised its wagon demurrage charges from K.5.00 to K.10.00 (after two free days). This roughly approximates the capital servicing charges of a wagon reduced to a daily basis, but it likely to understate very considerably the

true value of releasing the wagon for use of other traffic under present circumstances." (Goundrey, pp.36-7).

(f) "The quality of TAZARA's track is generally excellent, consisting of 90-pound rail and concrete sleepers laid on good ballast. All the evidence also suggests every effort was made to provide high quality locomotives and rolling stock. But there are innumerable examples of wagons and locomotives, which after demonstrating years of exemplary service in their home environment (North America, Europe, Japan) were subject to initial problems when they were introduced to foreign railways. In the case of TAZARA's wagons their suspension has caused some difficulties. The main-line locomotives were expected to haul a gross trailing load of 1,300 tons over easy terrain, but in practice they have achieved no more than 1,000 gtt. An experiment to increase this to 1,150 gtt is said to have been a failure.

But the major problem is keeping wagons and, even more significantly, locomotives operational. Diesel locomotive availability of about 80 percent would be acceptable and an achievement of 85 percent would be above the average for Africa. Table following shows the availability of locomotives on the three sections of TAZARA on which they normally operate.

TABLE LXVI

Section of Line	Base for Maintenance	No. of Mainline Locomotives Assigned	Percentage Mainline Locomotives Available					
			1977		1978			May 15 ^{a/}
			Nov-Dec		Jan-Feb-Mar			
Dar-M'Limba	Dar	15	78.2	81.5	75.3	71.3	69.0	66.7
M'Limba-Chosi	Mbeya	43	74.8	78.0	74.1	67.0	62.1	55.8
Chosi-Mapiri	Mpika	27	54.8	53.9	58.5	57.3	53.9	25.9
M'Poshi		85						

^{a/}When the Goundrey Mission visited Zambia.

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

These figures prompt a number of observations. The locomotives are assigned to three separate sections of TAZARA and are not scheduled to work trains throughout the 1,860-km route from Dar es Salaam to Kapiri M'Poshi. This reduces the opportunities for optimum utilization, but is probably justified because it means that each of the three motive power depots has fewer locomotives to become acquainted with. All the mainline locomotives are standard 2,000 hp diesel-hydraulic units, but each can nevertheless develop individual idiosyncrasies of which maintenance staff should be aware. Mbeya has the biggest fleet because it has a section including a grade of 2 percent which requires trains to be double-headed.

The availability of mainline locomotives is clearly unsatisfactory, particularly when it is noted that none have yet been in service long enough to reach the normal scheduled mileage for a major overhaul.

At all three depots the situation has been deteriorating but is particularly bad on the Zambian section from Chose-Kapiri M'Poshi.

The locomotive maintenance function typifies a general observation on TAZARA as a whole. The infrastructure and equipment provided--the track, buildings, etc.--all appear to be excellent. But the infrastructure and equipment need trained and seasoned staff to make proper use of it, and this is undoubtedly TAZARA's most urgent need. The machinery available to the workshops appears to be of good quality, but small in numbers compared to the size of the workshops.

One explanation for the poor performance at Mpika, and to a lesser extent at Mbeya, compared with Dar es Salaam, is that staff are hard to recruit and harder to retain. Once the railway has trained its mechanics, many leave Mpika for more attractive surroundings, and higher wages, on the Copper Belt. By contrast, staff is being attracted to the Dar es Salaam area from the less well paid, less well equipped, Tanzania network of the former East African Railways.

A major improvement in the labour situation might be sought by introducing wage differentials between the various sections of the railway

by way of hardship allowances. There may also be a need for more careful selection of recruits for training. But to resolve the present critical state of locomotive maintenance, the only foreseeable solution is increased technical assistance on a substantial scale.

To ease the burden of TAZARA's motive power, Zambia Railways has recently, on occasion, provided locomotives on the TAZARA section between Kapiri M'Poshi and Mpika. But Zambia Railways is, itself, short of effective motive power and is understandably reluctant to work locomotives over a line which has no repair facilities or experience with diesel-electric locomotives. This option should only be undertaken under the most critical circumstances." (Goundrey, pp. 37-41).

(g) "TAZARA wagons are able to work over the Zambian railways network (both railways are 3'6" gauge), but some problems are reported in doing so. TAZARA's trains use air brakes, but its wagons are also equipped with less efficient vacuum brakes, to make them compatible with the Zambian system. Automatic couplings on both railways are identical.

TAZARA's track is designed for 21-ton axle loading and Zambia Railways for 17 tons for locomotives and 15.3 tons for wagons. This means that

TAZARA locomotives cannot safely work on Zambia Railways and some wagons might well be overloaded in relation to the Zambia Railways limit, particularly when wagons for copper export are in short supply.

Wagon turnaround times could be improved with more pre-sorting of wagons according to destination in Zambia and more sidings at the exchange point at Kapiri M'Poshi." (Goundrey, pp.41-2).

(h) The Road Route to Dar es Salaam

"Zambia's exports and imports by road, on the TANZAM Highway, reached a peak in 1975, the year that the Lobito route was closed, and the year before TAZARA began full-scale operations (in August 1976). It was planned to reduce road services with the initiation of TAZARA. But, when TAZARA's effective capacity proved to be less than expected, efforts to resuscitate the road alternative were disappointing. Again, it is the imports side which is the key indicator of capacity available in both directions (see the following Table).

TABLE LXVII

Imports from Dar es Salaam (000 tons per month)

<u>Year</u>	<u>By Road</u>	<u>By Rail</u>	<u>Total</u>
1973	17	-	17
1974	23	2	25
1975	26	5	31
1976	21	27	48
1977	13	34	47
1978: Jan	11	34	45
Feb	10	31	41
Mar	7	29	36
April	7	30	37

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

There are several reasons why road haulage has been disappointing. First, it should again be remembered that performance during the early months of 1978 was hampered by exceptionally heavy rains which delayed handling operations at the port and slowed both road and rail turnarounds accordingly. Second, of Zambia Tanzania Road Services' (ZTRS) fleet of some 520 vehicles (excluding trailers), 340 were stopped for major repairs at the end of March 1978. Of these 340, ZTRS reports that only 100 are fit for further service after repairs. In other words, the effective operational fleet is only some 180 trucks." (Goundrey, pp.42-4). Third, Tanzania has imposed a 30-ton weight restriction for vehicles'

using its roads. This weight restriction was lifted for three months during 1978, however, to hasten clearance of goods at Dar es Salaam (Africa Diary, 1/28/78, p.8849).

"A fleet of only 180 operational trucks, with ample trailers, should have been able to carry up to 7,000 tons of imports a month and about 11,000 tons of exports. Actual achievements are far short of this, the 6,500 tons of imports carried by road from Dar es Salaam in April 1978 only being achieved with substantial supplementary help from sub-contractors. The availability of sub-contractors has been affected by difficulties they have experienced in repatriating their earnings from Zambia.

If TAZAPA's efficiency can only be improved by technical assistance to help in the slow process of building up a well-trained well-disciplined work force and if other routes to the sea can, for some time, make only a limited contribution, the only practical programme is to improve road transport capacity on the TANZAM Highway. This will be expensive and will absorb considerable amounts of foreign exchange for new vehicles, spare parts and payments to non-Zambian sub-contractors. According to press reports dated 20 May 1978, some 200 trucks have been ordered for ZTRS, with deliveries beginning in June

1978. The cost is said to be about \$35,000 per truck." (Goundrey, pp. 44-5).

b) The Port of Dar es Salaam

(1) Overall Port Conditions

"Dar es Salaam was only a lighterage port until its first three deep-water alongside berths were completed in 1956. Eight more were in operation by 1975. In spite of this considerable expansion-- 11 alongside berths are now available-- the port has experienced an almost continual state of congestion. There was a brief respite in 1975 when the last three berths were added, but there is now serious congestion, with all deep-water berths fully occupied, and ship-waiting time outside the port extending to up to 25 days. The Conferences Lines impose a surcharge of 15 percent.

The basic reason for the congestion has been the continuing shift of Zambia's traffic to the port; first, in 1965, then in 1973 when the Rhodesian border was closed to Zambian traffic, and then, to an even greater extent, when the Lobito route was cut in August 1975. The expansion of Zambian traffic through Dar es Salaam is summarized in Table.

TABLE LXVIII

Zambian Dry Cargo Imports and Exports
Through Dar es Salaam

<u>Year</u>	<u>000 Tons</u>	Percentage of Total Zambian Import/Export Traffic on <u>All Routes</u> (Percentage)
Before 1965	Negligible	-
1970	501	20
1974	608	32
1977	1,274	83

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

However, Dar es Salaam's immediate problem is not a shortage of berths. Berth capacity would be adequate for present traffic if occupation time were kept down to reasonable levels.^{1/} There are several reasons why this is not being achieved." (Goundrey, pp.45-6).

(2) Congestion Caused by Zambian Imports

"Another reason for concern about the capacity to move imports is the build-up of Zambian imports in the port at Dar es Salaam, available for movement inland but not being moved. Table shows the monthly movement of imports from Dar es Salaam to Zambia during the first four months of 1978, compared with the average for 1977.

^{1/}The lighterage berth, however, is currently being rehabilitated, which is restricting the off-loading of ships at mid-stream moorings, and the use of lighters to speed up the turnaround of ships at the deep-water berths.

TABLE LXIV

Zambian Imports Through Dar es Salaam (000 Tons Per Months)

<u>1978</u>	<u>By Rail</u>	<u>By Road</u>	<u>Total</u>
January	34.3	11.0	45.3
February	31.2	10.2	41.4
March	29.0	6.6	35.6
April	<u>30.1</u>	<u>6.5</u>	<u>36.6</u>
<u>Average</u>	31.1	8.6	39.7
<u>1977</u>			
January-April	31.9	13.1	45.0
Average			
<u>Average for Year</u>	34.4	13.0	47.4

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

The take-off at the port during the early months of the year is normally low because loading is interrupted by the rains. However, the achievements during the first four months of 1978 were significantly lower than during the same period a year earlier and below the average for 1977. There has, therefore, been a dangerous build-up of Zambian imports at Dar es Salaam.

TABLE LXV

Zambia--Imports on Hand at the Port of
Dar es Salaam, 30 April 1978

<u>Documented</u>	<u>Undocumented</u>	<u>Total</u>	<u>Ships</u>		<u>Other</u>	<u>Total</u>
			<u>Unload- ing</u>	<u>Wait- ing</u>	<u>Local Sources</u>	
19.0	10.9	29.9	5.4	21.6	0.8	57.7

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June, 1978.

To this must be added over 30,000 tons of bulk imports stored outside the port in TAZARA's goods yard. In total, therefore, some 90,000 tons of imports were being held at the port or in the vicinity.

The major problem is the slow take-off of Zambian imports from the port area, and the weaknesses in the system for deciding which particular imports should be given priority movement. In addition, damage from poor packing and careless handling appears to be very high--one source put it as high as 10-16 percent of the total. One factor contributing to damage is the continual need for multiple handling of cargo as a result of the overall confusion and congestion.

The amount of imports, whether damaged or undamaged, taking up valuable space within the port

itself engenders further congestion by slowing up cargo handling and by making the identification of particular consignments extremely difficult. This is considered a major reason why the productivity of cargo handling staff, which significantly improved when the new berths were opened in 1975, had fallen to a very low level by the first quarter of 1978.

TABLE LXVI

Port of Dar es Salaam Average Tons Handled per Gang-Shift

<u>Year</u>	<u>Average Tons Handled Per Gang-Shift</u>
1974	61
1975	65
1976	69
1977	55
1978 January	51
February	49
March	41

Source: Gordon K. Goundrey, Assistance to Zambia, Report of the Secretary-General of the United Nations, June 1978.

Such low productivity makes it impossible to keep the port "fluid", and one inevitable result is that the berth occupancy of ships is unreasonably high, with the resulting queueing of vessels outside the port awaiting berths." (Goundrey, pp.28-30 and 46-8).

(3) Backlog of Imports

"A major effort is needed to remove the substantial piles of damaged and valueless imports cluttering the port. Although everyone agrees that this would help significantly, there are frustrating difficulties in attempting to clean up the port. First, the customs authorities require cargoes to be identified before allowing their disposal and this is now a very difficult and time-consuming task, if not impossible in some cases. There are obvious problems in destroying a useless consignment if the consignee, located in Zambia, has no evidence that it is indeed worthless. Nevertheless, a campaign to clean up the port, particularly in respect to Zambian traffic, is badly needed. An ultimatum to consignees to inspect their goods within a specific time limit may be necessary.

For undamaged Zambian imports stored within the port, progress is needed in at least three ways. First, the off-take from the port to Zambia must be speeded up. Second, adequate storage must be provided in Dar es Salaam outside the port; and, third, consignees must be persuaded to stop using the port as if it were a storage area." (Goundrey, p.48).

(4) Cargo Unitization Issues

"The port is attempting to simplify its

handling of imports by discouraging "break-bulk" consignments and encouraging "unitization". This involves banding, or otherwise packaging individual items into larger units suitable for palletizing, or the use of containers. Currently, the port is offering priority berthing to any ship whose cargo is more than 50 percent unitized.

The advantages of properly implemented unitization are well known and well established on a world-wide basis. It allows vessels to turn around in a fraction of the time taken with "break-bulk" cargoes; it allows the optimum use of mechanical handling equipment within the port; and, especially important in the case of Dar es Salaam, it reduces the problem of orderly stacking and identification and location of traffic in transit. With all these advantages, it can increase the annual throughput of an expensive berth sixfold.

It is clear that unitization is a desirable long-term objective but it is incurring a number of initial problems in Dar es Salaam. In the first place, it is not easy to determine whether a ship should really qualify for priority berthing on grounds of its unitized cargo. Much of the traffic claiming to be within this category is so badly packaged as to cause at least as many problems as

"break-bulk" cargo. Second, the only equipment for lifting containers is one side-loader and one 30-ton mobile crane, with no standby equipment. Third, there is no planned container park, containers being placed wherever there happens to be room available. Fourth, at the present, a large proportion of containers are stuffed or unstuffed in the port, which much reduces the potential cargo handling space of the port. But real unitization and containerization could make a major contribution and should be encouraged." (Goundrey, p.49-50).

(5) Bulk Cargoes

"One cause of high berth occupation by bulk carriers is the absence of adequate bulk storage to allow rapid discharge from ship to shore. It is necessary to offload wheat, for example, into very small hoppers and the offtake depends on the number of rail wagons or road trucks available for immediate loading. Although better facilities are planned, the lack of bulk storage is causing serious difficulties at this time." (Goundrey, p.50).

(6) The Labour Force

"Although it is true that cargo handling in the port is inhibited by congestion, the cargo handling operations are inherently inefficient even after allowance is made for these factors. The down-

time of much handling equipment is extremely high, due to the lack of skilled maintenance staff and spare parts and to careless handling by drivers. It is difficult to promote labour efficiency and job satisfaction in such inefficient, untidy surroundings, which only serves to exacerbate the inefficiencies. A further problem has been caused by the uncertainty arising from the demise of the East African Harbours Corporation and its replacement by the Tanzania Harbours Authority. For example, future conditions of employment have not yet been determined. In addition, the Authority is gradually taking over the activities of the separate Cargo Handling Services Company which again creates uncertainties among the staff about their future." (Goundrey, p.50).

(7) The Foreign Exchange Problem

"Zambia's shortage of foreign exchange is, itself, contributing in many ways to its transport crisis. Substantial sums are owed for port charges on Zambian cargoes and clearing agents are waiting for payment. Although no traffic has apparently been stopped as a result of payment arrears, their elimination would improve the chances of efficient cargo handling and clearing." (Goundrey, p.50).

3) Assistance Required to Reduce Transport Constraints

a) Dar es Salaam Corridor

As noted in previous discussion, Zambia depends almost exclusively on the Dar es Salaam corridor at the present time for its imports and for its exports. The rail connection, the road connection, and the port do not have sufficient capacity in the short run to meet Zambia's needs. Assistance in the transport sector needs to concentrate on elimination of many causes of delay and shortages of effective capacity on the route to Dar es Salaam.

The assistance required to increase the effective capacity of this route involves a number of components. First, technical assistance to TAZARA is needed in order to increase the availability of locomotives and rolling stock. Currently, of the 102 locomotives that the Chinese supplied with the TAZARA LINE, over 50% are out of operation due to lack of maintenance expertise, spares, and management weaknesses. Rates of utilization are somewhat lower and maintenance and repair are somewhat less effective on the Zambian section and 70% on the Tanzanian section. One explanation for the difference in repair efficiency appears to be Tanzania's greater access to experienced mechanics who became available with the breakup of the railway services provided by the East African Common Services Organization of Kenya, Tanzania, and Uganda.

Second, spare parts, additional locomotives, improved maintenance capability, and modern traffic control equipment are required for Zambia Railways. In addition, Zambia would like a railway sleeper plant similar to Malawi's or assistance with foreign exchange required to import a substantial supply of sleepers. Zambia Railways are 100% owned by the Zambian Government and they are 90% Zambianized. The railway is managed by Zambians, but has 15 Canadian advisors supplied by CIDA and 50 advisors supplied by India. Constraints on the performance of this railway system, which is totally independent from TAZARA, are due to primarily a shortage of spares and the age of its locomotives. The locomotives, all of which are GEC diesels manufactured in the U.S., break down often due to their age and heavy workload. Seven locomotives are not functioning due to a lack of spares, but they could be operational within two months if spares were available. Officials of Zambia Railways express their needs for assistance and their order of priority as:

- spare parts valued at K1.2 million to repair the 7 locomotives that are currently not functioning;
- an additional 10 locomotives, model U-20C, at a value of 600K each;
- technical assistance is needed to improve the maintenance capability for locomotives and rolling stock;

- a new centralized traffic control system is needed; the current system is 20 years old and lacks spare parts for which distributors have limited supplies since the parts are no longer manufactured. Approximately K8.0 million would be needed to replace all components of the inside plant of the centralized traffic control system; an additional K2 million would be needed for installation of this equipment, but those funds need not be foreign exchange.
- Assistance is needed to finance a program of rail restoration.
- Assistance is needed to purchase railway sleepers or to develop a plant to produce them within Zambia. The Canadian Government recently built a sleeper plant in Malawi and Zambia would like a similar plant. The estimated cost of the plant is K6 million, of which K3 million would be foreign exchange.

Third, storage is required at the port in Dar es Salaam, and the TAZARA yards at Dar es Salaam, at Kapiri M'Poshi and at strategic locations along the Zambian line of rail.

Fourth, additional equipment needs to be provided in order to ensure faster unloading of cargoes and better turn-around times for rolling stock. Among the equipment required are mobile cranes or side loaders for the port at Dar es Salaam, more forklift trucks and cargo handling equipment at the port, and bulk loading and unloading equipment at the port and at storage centers to be constructed in Zambia. In this connection, such bulk cargo as wheat, coke, and fertilizer merit special attention, although, in the case of the latter, storage should be provided when the present system to build fertilizer

warehouses throughout Zambia is implemented (Goundrey, p. 64).

Fifth, a rapid build-up is needed in the capacity of the road haulage fleet. This is the only quick method to eliminate the present backlog of imports for Zambia at Dar es Salaam and to prevent congestion from reoccurring. Although it has recently been announced that TANZAM Road Services have ordered 200 trucks, it is unlikely that this number will be sufficient to meet the urgent need for road haulage between Dar es Salaam and Zambia. The Goundrey report suggests that, based on past performance, an additional 100 trucks seem to be required for this route (Goundrey, p. 64).

Sixth, in addition to more trucks a major effort needs to be made to provide a stock of spare parts for the existing and the new fleet of trucks. In Zambia's situation, with transport problems and long delivery times, a higher than normal allowance for spares is required.

b) Development of Alternative Transport Corridors

The diversion of all of Zambia's traffic to Dar es Salaam in the past has created difficulties not only for Zambia but for other countries in the region. The congestion at the port affects the imports and exports not only of Zambia and Tanzania, but also of Rwanda, Burundi, and Zaire. In the case of Zaire, the lack of capacity in Dar es Salaam has increased

transport problems caused by the closure of the Lobito route. Efforts to improve alternate routes for Zambia will reduce the excessive demands on Dar es Salaam and, if successful, free capacity for the benefit of all the countries in the region.

The Goundrey Report recommends immediate assistance for three corridors. First, the all-weather road to Moatize in Mozambique would give Zambia access to the Mozambique Railway System and the Port of Beira. Work has already begun to establish a railhead for Zambia at Moatize.

Second, establishment of a railhead at Chipata, inside Zambia, would give Zambia access to the Malawi rail system and the Port of Nacala. The Canadian Government will probably finance the extension of the railway line in Malawi that ends at Mchinji into Zambia to end at Chipata. The Canadian Government is not entertaining the construction of warehouse facilities at Chipata, however, and consequently another donor could consider finance of these facilities. CIDA is also considering withdrawal of assistance for Zambia state railways in the early 1980s; it has provided management assistance to the railroad since the 1960s, but does not believe it has realized substantial success in the training of local personnel or in the replacement of expatriate personnel. Currently it is attempting to systematize training activity in Zambia Railways as

part of its plan to reduce its aid efforts in the next few years. When it decreases its assistance to the railways, it will probably increase the level of aid it provides for rural development and agricultural projects.

Third, an all-weather improved road from the western province of Zambia to Angola would give Zambia access to the Angola Rail system and the Port of Lobito. The cost of this road would be approximately K60 million and work on the Angolan section of the road from Caripande has already begun (ARB/EFT, 6/30/78, p. 4727).

In order to utilize these routes, which even under present conditions have a capacity of over 10,000 tons a month in each direction, additional vehicles need to be added to the Zambian fleet. Another 100 trucks would be required if these routes were to be utilized at anything near their capacity (Goundrey, p. 65).

The need to utilize road haulage on existing and new routes to a greater extent will also necessitate additional expenditures on repair and maintenance of roads. For this purpose, more road maintenance equipment will be required along with technical assistance and training. If road haulage is to make a greater contribution, freight rates will need to be re-examined and, in some cases, raised. The dangers of overloading in the attempt to make profits or reduce trucking costs need particular attention.

Significant additions to the capacity of Zambia Railways and the Zambia road haulage fleet in the near future are unlikely to be wasted in the longer run. The Goundrey report states that "none of the countries bordering Zambia would appear to have excess capacity in the transport sector. Certainly Zaire, Angola, and Mozambique are faced with a shortage of effective rolling stock and it is likely that the railroad in an independent Zimbabwe will, in the first instance, be faced with similar deficiencies and shortages. Such considerations also apply to road haulage. All of the countries bordering Zambia face chronic shortages of road haulage vehicles. There is, thus, every likelihood that any excess capacity in Zambia which might result from supplying additional equipment would be easily absorbed by neighboring countries." (Goundrey, p. 66.)

4) Recommendations

a) The U.S. should consider assistance to Zambia for the spare parts Zambia Railways needs for its 7 locomotives that are currently out of service.

b) The U.S. should also consider the construction of warehouse facilities at Chipata and at Moatize so that Zambia can utilize more fully these two corridors to the Ports of Nacala and Beira. The development of warehouse facilities at Chipata and Moatize seems important not only as a means to stimulate Zambia's

imports and exports, but also because they might augment any rural development projects that either exist or are planned for locations near these two sites.

c) The U.S. should explore the feasibility of production of railway sleepers in Malawi for export to Zambia and take steps to encourage such export if sufficient production capacity exists.

d) The U.S. should consider establishment of the training school at Limbe, Malawi for diesel-electric technicians, which school was recommended in the discussion of Malawi railways and lake service. This school could help meet Zambia's needs for improved railway maintenance.

3) Any assistance that the U.S. provides to Zambia should perhaps be coordinated for the International Consultative Group on Zambia.

c. Civil Aviation

(1) Background

Zambia has an international airport at Lusaka, two regional airports at Ndola and Livingstone, and 15 airports in the interior. The country operates an extensive domestic air network, and is heavily dependent on aviation for access to the interior because of its location, as well as the political situation in the region. There is a demonstrated need for skilled manpower to handle not only Zambian requirements in civil aviation, but also to ensure the safe operation

of the 20 international airlines which serve Lusaka. To meet these responsibilities, the government has expended more than \$3 million to establish the Zambia Air Services Training Institute (ZASTI), which offers courses to Zambian students in aviation services, engineering, and flying. A substantial part of the instructor and fellowship costs of civil aviation training has been provided in the past by the UNDP, but these funds are no longer available. Instead, UNDP is concentrating its funds on two multinational training centers, one for francophone states at Francoville, Gabon, and one for anglophone states at Addis-Ababa, Ethiopia. The rationale for these centers is discussed in detail in Appendix, Annex III. UNDP is also involved in the establishment of a sub-regional training center at Soroti, Uganda. The African Civil Aviation Commission, a technical unit of the OAU, concurs with the UNDP decision to establish these two multinational training centers and the one sub-regional training center.

(2) Recent and Current Assistance

Recent national and multilateral efforts to meet present and forecasted training needs include:

- Technical Instruction - a five-year UNDP/ICAO project, which terminated in 1976 provided funds for expert instruction and fellowships through ZASTI.

- Ground Training - continuation of expert instruction in ATC, radio and aircraft maintenance, plus fellowships and equipment in these areas, are required. Total cost would be \$512,000. Government's contribution \$102,000. (Experts \$330,000, fellowships, \$72,000 equipment, \$110,000).
- Fellowships - a wide range of fellowships totaling 476 man-months is required over the period 1978-1982. Total cost would be \$714,000; the government would contribute approximately 20% of program costs, or \$143,000.
- Training Center - ZASTI - the requirements for external assistance to maintain training functions and activities at ZASTI, not included in elements 2 and 3 above, total \$610,000 and are top priorities of the government (fellowships \$8,000, and equipment, including training aircraft, \$602,000).

Some assistance for training has been given by the Indian Government and there have been a few fellowships through the British Council. Otherwise, the government has not been able to negotiate other arrangements.

(3) Assistance Requirements

Training requirements in Zambia were identified by ICAO in its 1974-75 survey of manpower requirements for civil aviation in Africa. Included were:

- Ground training - the external aid would cost \$510,000 and the government would contribute \$102,000.
- Fellowships - external aid of \$717,000 is needed, with the government's contribution being \$143,000.
- The ZASTI Training Center - aid of \$610,000 is needed to continue the school after UNDP withdrawal of support.

New equipment is needed at Lusaka International Airport.

This equipment includes:

- Aviation communications equipment. Current equipment is now ten years or more old and is obsolete. Manufacturers have recently

notified the government that spares are no longer being manufactured for this equipment. Hence, when the current supply of spares is depleted new equipment will be needed, if it is not replaced sooner due to its obsolescence.

- The government would like to convert the instrument landing system at Lusaka Airport to a microwave landing system.
- Most planes of the government are ten to fifteen years old and need to be replaced.
- A maintenance organization is needed for the airlines; currently aircraft are repaired and serviced in Kenya or South Africa.

Detailed lists of equipment requirements and training courses specified by officials of the Directorate of Civil Aviation in Zambia are referred to in Appendix, Annex III.

(4) Appraisal of Assistance Requirements

Multinational assistance will probably only be available for in-country training to a significant extent, since UNDP/ICAO and the African Civil Aviation Commission have agreed to establish multinational training centers. Moreover, the Government of Zambia has not provided any funds for ZASTI either, so ZASTI is likely either to close down completely or to operate at a considerably reduced scale determined by the availability of funds.

The centralization of air-related training to the multinational training centers seems to be a wise decision when viewed in relation to the international competition for qualified pilots and the highly technical aspects of this industry. Aircraft pilot,

engineering, and service personnel tend to be paid on an international standard, while national training schools such as ZASTI pay instructors as little as one-half or one-third of what they could earn working rather than teaching in the industry. The need for high instructors' salaries to minimize turnover and maintain quality of instruction, plus the extensive amount of highly technical and expensive equipment needed for such instruction, suggests that training efforts should be concentrated in multinational training centers. The relatively homogeneous salary structure for workers in the industry, however, also means that some students who train in multinational training centers may not wish to return to their home countries after training and experience a standard of living considered to be low by international standards.

(5) Recommendations

As noted in earlier sections of this report, the United States should consider supporting the multinational training centers and identify ways for expanding national training centers such as ZASTI to complement--but not substitute--these larger-scale training centers. Studies are needed to identify low and intermediate skilled training related to aviation services that could be conducted at national training centers, and to identify economical ways for training centers to adjust their training efforts to meet these basic and intermediate skill shortages where they exist.

Examples of training that should be provided by ZASTI rather than by the multinational training center would be for meteorological assistants and fire rescue workers.

d. Telecommunications

1) Development and Constraints

One of the most demonstrable constraints on economic activity in Zambia is the breakdown of telecommunication services. The situation is particularly pronounced in Lusaka and for rural party-line subscribers. At least 60% of all attempts to reach a number in Lusaka are unsuccessful because of system malfunction, and it is virtually more effective to go by taxi to make appointments than to rely on phone calls. Subscribers in certain rural areas complain that their phones have operated for but a few days out of an entire year. Farmers complain that they must leave their farms to take up business that otherwise could be handled by phone. It is impossible to calculate the economic loss that results from inadequate telecommunications support, much less project the human frustration presented by the situation. The main factors contributing to system malfunction include:

- lack of vehicles for repair operations;
- maintenance and repair of vehicles complicated by scarcity of skills, lubricants, spare parts;

- o scarcity of telephones and equipment with installation;
- o scarcity of tools;
- o qualitative and quantitative staff deficiencies;
- o lack of standardization creates both servicing and spare parts problems;
- o inadequacy of exchange facilities.

The country is serviced by about 57,300 phone stations with a total of about 11,200 applications on waiting lists. This compares to respective figures in 1975 of 50,351 and 11,003. Of the total, about 55,000 (or 96%) are linked to automatic telephone exchanges. Out of an equipped capacity of 36,499 exchange lines, 29,392 (or about 80%) are in use. (See Table LXVII, Zambia, Telephone and Telex Statistics Summary, 30th June 1977.)

A major improvement in international service came with the construction of the K3.2 million Mwenbeshi Earth Station. Direct connect is provided to London, South Africa, Nairobi, Rome, Peking, and Delhi; one channel provides service to the United States via a patch in London. The system also provides color or black and white TV linkage. The projected shift to a new signal system for Intelsat communication presents a serious problem for PTC. There is no choice but to make the conversion or lose Satellite service. PTC has attempted to float

TABLE LXVII

ZAMBIA: TELEPHONE AND TELEX STATISTICS SUMMARY
30 June 1977

Telephone	June 1975	December 1975	June 1976	December 1976	June 1977
<u>Automatic Telephone Exchanges</u>					
Equipped capacity	34,023	33,473	33,273	35,430	35,324
Total exchange lines in use	28,806	29,429	29,306	29,295	28,573
Spare lines	5,217	4,044	3,967	6,135	6,751
Waiting list	11,003	11,511	12,168	11,383	10,981
Subscriber main telephone lines including party lines	29,427	30,276	30,096	30,210	30,705
Total telephone stations	50,351	52,686	53,004	53,856	55,720
<u>Manual Telephone Exchanges</u>					
Equipped capacity	817	826	926	1,025	1,125
Total exchange lines in use	714	728	806	843	819
Spare lines	103	98	120	182	306
Waiting list	312	311	411	338	310
Subscriber main telephone lines including party lines	896	920	961	1,060	885
Total telephone stations	1,378	1,359	1,424	1,547	1,625
<u>National Totals</u>					
Equipped capacity	34,840	34,299	34,199	36,455	36,449
Total exchange lines in use	29,520	30,157	30,112	30,138	29,392
Spare lines	5,320	4,142	4,087	6,317	7,057
Waiting list	11,315	11,822	12,582	11,721	11,291
Subscriber main telephone lines including party lines	30,323	31,196	31,057	31,270	31,590
Total telephone stations	51,729	54,045	54,428	55,403	57,345
<u>Telex</u>					
Subscribers	448	469	470	637	765
Waiting list	206	185	250	36	39
Equipped capacity	-	-	-	1,023	1,024

Source: Discussions with Posts and Telecommunications Corporation, Southern Regional Office, Lusaka, June 28, 1978, alternately available through published government statistics. Changes against 1978 over 1977 regarded as minimal.

its own line of credit in order to purchase the equipment. The equipment has been on order for several months but funding remains uncertain. The Earth Station was purchased from a Japanese firm and ten Japanese volunteers are providing technical support for station operation.

The lack of standardized equipment has been a recurrent problem affecting both training and availability of spare parts. The original telex system utilized both British and American equipment. The American firm Astrodata went bankrupt. One of the transformers they supplied has burned out, and there is no source for the original specifications in order to repair it. A new transformer will cost over K13,000. PTC had hoped to continue using the type of exchanges in operation, but the insistence of the IBRD on international competition tenders has resulted in the introduction of a whole new system again.

The major effort underway to upgrade the system is the replacement of the 4,000-station capacity exchange in Lusaka with a 15,000-capacity NXIE exchange. This exchange is being purchased from Northern Electric under a K33 million loan from the IBRD. The equipment is scheduled for arrival in July 1978 and operational use is programmed for February or March of 1979. Under the terms of the contract the exchange is to be compatible with existing equipment with minimal installation time. Included in the contract is a training

program in system operation and maintenance at the factory and an in-country trainer for a period of 12 months. The exchange incorporates such current technological advances as the capacity for push-button dialing.

Management, operations, and repair of the telecommunications system is the responsibility of the Posts and Telecommunications Corporation (PTC), a 100 percent overnment-onwed parastatal responsible to the Ministry of Transport, Posts, and Communications. The corporation has been seriously understaffed since 1975 and continues to rely heavily on expatriates. The general housing shortage limits the introduction of additional staff even if budget constraints and foreign currency scarcity did not. The government pressure on PTC to move its personnel from government housing into private or PTC-financed units further complicates the situation. Both the housing and office space shortage is restricting PTC interest in relocating the central headquarters now in Ndola to Lusaka.^{1/}

Zambia has a special microwave system running from Livingstone up along the Great North Road with two hand carriers each capable of 960 channels. The link can also carry 625/50 monochrome or color television transmission. Individual exchange systems are

^{1/} The headquarters was moved from Lusaka to Ndola in 1975, primarily on the basis of proximity to the training center. The move has complicated coordination of PTC operations, and a return to Lusaka is under consideration.

tied to this system, but there are problems with the switching zone centers and wiring in some of these exchanges. Present plans include extension of the service to Malawi by the end of the year and putting out for tender a link towards Angola. PTC is anxious to obtain support for the PANATFEL links and expects IBRD funding. (See Table LXVIII, Zambia: Existing Telecommunications System, 1977, and IBRD Project Underway.)

Ground line service to the U.K., Kenya, and neighboring states for telephone, telegraph, or telex were initiated in the 1960s, and during the early 1970s telex links to South Africa, the U.K., and Kenya were added.

The exchange currently in use in Lusaka includes 47 party-line systems, providing service to a total of about 600 subscribers. Each of these has a capacity of 20 phones. Since the new exchange will be able to handle only 12 stations per line, PTC has tried to keep the number of stations on each of these lines to 12. Certain lines presently have 15 or 18 stations, however, necessitating the running of additional lines--for which there is no budget--or the reduction of subscriber service.

Conversion to the new system will provide separate circuits for all current utiliziers of party lines. Adjusting existing equipment and facilities for this conversion is the responsibility of PTC.

The problems involved in making phased conversion of the party lines, essential to their incorporation in the new exchange, implies that certain lines could be out of service for an extended period.

At the present time there is a waiting list of about 7,000 applications for service in Lusaka. The installation of the new exchange will not, however, in and of itself remedy this problem. Although good quality copper wire is made locally, avoiding the foreign exchange scarcity, there is only a limited budget for additional lines. There are, more importantly, no additional telephones to connect to new lines. Even if these two problems were eliminated there are no funds for the additional staff needed to install the new phones. Even if there were more staff, there aren't enough vehicles to support the logistics for the present staff level. Additional considerations include spare parts, fuel, and lubricant scarcities.

Under the terms of the IBRD loan Zambia is responsible for the provision of structures to house the new telephone exchange. The government originally allocated K17 million for this construction, but has subsequently cut the figure to K3 million. The agreement includes a heavy penalty clause for failure to comply with the terms specified. If the equipment arrives as scheduled, PTC will be in violation of compliance.

Operation and maintenance of the new exchange will require the retraining of six technicians. Three technicians have already been sent to study at the North Electric Plant. The cost of this training is covered under the contract but the government must cover travel expenses and maintenance. PTC is having difficulty meeting these expenses and is uncertain that it will be able to send three additional technicians scheduled to leave in August.

The PTC operates its own training facility at Ndola. Formerly the recipient of technical assistance under an ITU program, this school presently suffers from a shortage of instructors. Technical assistance from Sweden is providing one instructor and two field trainers. Unfortunately the two field trainers are not experienced with the type of equipment being used in Zambia. The school is presently producing more trainees per year than there are skilled technicians with which the trainee can be paired. Most of the skilled technicians, moreover, have only had two or three years experience themselves.

2) Proposed Projects

Current budget and international exchange restrictions have limited the prospects for major telecommunications projects beyond projects presently underway; the major concern of PTC is keeping the existing system operational until relief arrives. An extensive file exists illustrating repeated system break-

down and long delays between the reporting of system failure and the economic and human costs associated with such. (For a sample better demonstrating associated sector costs of telecommunications system see Appendix, Annex--Zambia: Zambesi Ranching Correspondence, Ref. Telephones.)

Should political developments in Zimbabwe lead to an opening of the border or should the tie-up in Dar es Salaam be reduced, foreign currency pressure might be eased somewhat. The relief such would bring to the telecommunications sector would be marginal without an upswing in the price of copper. Justification for aid to the telecommunications sector is best seen independently of scenario speculation. The time-frame for such aid is the immediate future.

The most pressing need is for service vehicles; without these even the existing level of staff cannot operate effectively. Support also is needed to upgrade the Lusaka exchange for training Zambia technicians in the U.S., for in-country, on-the-job technical training, for telephone sets, and for the installation of equipment. Financial support for earth station conversion also needs to be considered.

Intermediate assistance should include support of the Ndola training facility. Only with the funding of these inputs should PANAFTEL links be expanded.

3) Recommended Assistance

Immediate assistance is recommended in order to prevent further deterioration of the system and to support efforts underway for system improvement. Primary focus should be given to Lusaka exchange.

- o Package Assistance, Lusaka Exchange Development. Project should be keyed to fit needs and problems not presently covered in the IBRD project.
- o Technical Training in System Operation and Maintenance. Funding for training in US at factory of three remaining technicians and on-the-job program under these technicians for other linemen.
- o Capital Assistance for Vehicle Support. Designed to fit initial need for installing new exchange plus general need for system maintenance. Should include funding for spare parts, fuel and lubricants for at least two-year period.
- o Capital Assistance for Equipment. Supply of new telephones for new exchange and associated equipment not in IBRD package.
- o Capital Assistance for Exchange Structure Construction. Construction of structures to house new telephone exchange, estimated cost for total is K15 million but multilateral funding might be arranged. This represents an urgent and immediate need.
- o Technical Assistance for Management Training and Development, PTC. A survey of staff needs by short-term consultants should be used to design a supplemental staff project using contract advisors in management, on-the-job training, and planning. Housing and office space also may have to be also funded. Goal of long-term upgrading of institutional structure and function.
- o Technical Assistance in Telecommunication Engineering and Skills. Ndola Training School overview of operation of facility and recommendations for program adjustment to be supplemented by contract visitors. Design should include on-the-job training

using contract trainers. Associated equipment needs matched to equipment in use should also be funded.

- o Capital Assistance, Earth Satellite Station Conversion. The conversion of the Mwembeshi Station to new signal system needs assistance. Support possible coordination with Japan which already provides some technical assistance for station operation.

H. Southern Rhodesia (Zimbabwe)

1. National Priorities and Development Policy

At the time of the Unilateral Declaration of Independence (UDI) in 1965 Zimbabwe possessed one of the best developed transport and telecommunications sectors in Southern Africa. Investment in the transport sector between 1955 and 1965 had represented about 20 percent of total expenditures in fixed capital formation, and such indicators as the length of the road and rail systems, the volume of freight handled, and the number of vehicles in use were impressive. UDI brought structural and functional changes. Although the present system remains relatively advanced, there is a major need for investment in maintenance and expanded facilities and capacity. The existing volume of traffic is straining the system and in the long run would produce serious deterioration of the system.

Government interest in export earnings has resulted in a disproportionate investment in expansion of the railroad system. Road transport has been incurred as a supplement to rail traffic, and main road links were emphasized. Various rural sections of the country, and particularly Tribal Trust Lands (TTL), have not been linked to the national system and there is an observable disparity in the service provided to the white and black segments of the population.

The anticipated repeal of the international sanctions and the subsequent opening of the borders of Zimbabwe

will necessitate a readjustment of the transport and telecommunication sector to regional and international factors, from which the sector is now "protected".^{1/} Significantly, sector adjustment cannot revert to former patterns but must account for new economic and political realities. The balancing of urgently needed investment in maintenance and facility expansion with modal modification and realignment is a complex operation and, in itself, could easily lead to modal inefficiencies and disruption in service.

Several reports have attempted to survey the transport and telecommunications sector in Zimbabwe either in relation to assisted sectors, or as part of macro economic analysis.^{2/} Unfortunately, they, as in this report, have had to work in isolation from an established--though illegal--government with a specific transport policy perspective. The UNCTAD proposal for Zimbabwe discussed later in this country's section is intended to compensate input for this limit. Clearly, the detail and effectiveness of new transport policy will be dependent on the actual timeframe

^{1/}

It is a basic assumption of this study that USAID assistance will be dependent upon majority-rule government and international concurrence with the final settlement in S. Rhodesia. Other scenarios are not considered for this analysis. Considerable variation remains, however, in the structure and direction of policy to be advocated by the new government. Such policy could be a constraining or facilitating factor on USAID assistance.

^{2/} See, for example, Annette Pinkney. A Preliminary Survey of the Transport-Communication Sector, Paper No. 7 (Preliminary Draft, AID/ -D-1254) Center for Research on Economic Development, University of Michigan, 1976.

for transition planning and implementation. Certain guidelines are presented here for further consideration, regardless of the timeframe:

- o System Maintenance. Government policy will have to develop investment priorities just to maintain the present structural and functional levels of transport and telecommunications infrastructure. A history of delayed investment in this area will necessitate relatively immediate and comprehensive investment.
- o System Expansion. As it stands, the transport and telecommunications sector is keyed to the needs of the white, urban society. The sector will need to be expanded into rural areas in order to facilitate agricultural development, marketing, and the extension of such social services as health, education, and rural development. Particular concern will have to be given to the TTL areas.
- o System Adjustment. For the last ten years investment has been keyed to the artificial economy resulting from the imposition of sanctions and closure of the border. Internally: Realignment of production, associated sector needs, and internal economic priorities will influence the extent and direction of infrastructure change. Regionally and Internationally: While the borders were closed both Zimbabwe and its neighbors have been investing in their economies. A return to the trade patterns and relations of pre-UDI days is most probable. Considerable negotiation and compromise will be necessary to facilitate commodity flows. A whole new perspective of relations with South Africa will have to be developed. Associated with each of these areas will be modifications in national infrastructure.
- o Manpower Analysis and Training. It is obvious that, regardless of the perspective of the new government, there will be a loss of professional and technical skills resulting from white flight. In the case of an extreme perspective, the situation could be characterized by crippling scarcities at all levels. The new government will have to set forth projections of manpower needs on the basis of various levels of white flight. Even under optimal conditions, there

will be a need to rely on expatriate advisors. Hopefully, these can be drawn from a wide enough international base or from international organizations so that their presence will be stabilizing rather than disruptive. In addition to job replacement, there will also need to be an integration of black Africans into the overall stream of skilled positions in the transport and telecommunications sector.

- o System Economies. Under UDI policies the government provided a variety of subsidies to transport, channeled investment according to strategic interests sometimes with only marginal relevance to economies, and distorted the entire issue of cost accounting and profitability. Special consideration will have to be given to the costs of various modes for different types of goods and for different distinctions. Allocation of modal use, modal modification, and subsequent investment will have to be keyed to such costing. Rate structures and general transport policy will also have to be redesigned in conjunction with this costing.

2. Sector Survey

As stated above, although there have been various studies of the Zimbabwean economy, most of these have not been carried out by Zimbabweans nor have provided for input by potential policy-makers. A macro-economic survey (project PAF/78/010) of Zimbabwe, with the Patriotic Front (PAF) as the cooperating agency and UNCTAD serving as the executing agency, has been designed to provide this missing input. The study is a six-month project with an original start-up date of July 1978. Start-up has been delayed and now is not expected until early 1979.

Although the study is intended to be action-oriented rather than academic, it will provide structural and functional analysis of the economy as a whole and specific

sectoral analysis, including transport and communication.

Immediate objectives include:

- o Pooling statistical background essential to structural functional analysis
- o An Evaluation of existing surveys
- o Delineation of the main problem and issues and possible solutions or strategic directions for short- and long-term time frames
- o Drawing up an inventory of possible projects requiring international financial and technical assistance.

The delayed start-up of this project and the acceptability of the perspective of the PAF to external groups in a position to influence assistance to Zimbabwe limit the value of the study. Nevertheless, there remains a need for internal policy input and a more comprehensive analysis than possible under the time- and country-frames of such surveys as SADAP. Capital investment projects can have no base without a policy framework and, in fact, much of the assistance recommended for Zimbabwe in this study is designed to facilitate policy formation and development planning. Serious consideration should be given to the integrated approach offered by the UNCTAD study, and balanced consideration of the study's findings should be used in the formulation of future assistance policy by USAID in Zimbabwe.

Two more narrow studies are also recommended. Neither study is as comprehensive as the proposed UNCTAD survey, and both could be treated as separate studies or in conjunction with a larger framework. The first concerns the role

of transport, particularly in regard to railways, as a source of employment, and the second study is tied to associated sector development for tourism.

The railway plays a major role in the economy; it is the largest industrial organization in Zimbabwe and employs nearly 20,000 workers. Although skilled positions are usually reserved for white labor, blacks represented 67 percent of the total labor force in the transport sector and 27 percent of the total wage and salary receipt in the sector. There is some evidence that blacks have been allowed to seek skilled positions in certain areas usually reserved for white labor. This has been an issue raised, for example, in labor disputes between white and black engineers over main-line service preferences. The extent to which this reflects employment in the sector as a whole, or just employment on the railroad, is not known, but clearly the railroad system warrants consideration as a major employer of black labor.

Before UDI, tourism was the fourth largest earner of foreign currency, the leading earners in order of importance being tobacco, asbestos, and refined copper. The importance of the industry has, however, seriously declined since 1972 with increased security problems. The structure of both national production and international demand has changed considerably, but in view of the depressed price of copper, tourism might well again represent a major foreign currency earner. The number of visitors from South Africa might decline, but international interest will undoubtedly increase once a settlement has been reached.

The major tourist attractions requiring diverse transport support, include:

- o Victoria Falls
- o The Zimbabwe Rains
- o Game Reserves
- o Lake Kariba
- o The Eastern Highlands
- o The Matupo Hills

These locations are already serviced by transport facilities, but there will be a need for expansion and upgrading of these facilities. The incorporation of phased development for tourism into overall national transport planning may seem of secondary strategic importance but will lead to the stimulation of the hotel and catering industry, as well as diverse tourist facilities which have the capacity to provide employment for a sizeable number of only marginally skilled employees, as well as offering employment mobility.

3. Analysis of Respective Modes

A. Roads

1) An Overview

The road network consists of about 50,000 kilometers of classified roads, of which 53,000 kilometers (or almost 11%) are tarred, two-lane highways or main roads. There are approximately 400 high-level and 300 low-level bridge crossings. Most roads were built before UDI. Since then road expenditures have

been concentrated mainly in upgrading and realigning certain main roads, allowing an upgrading of axle loads for main roads to 8,200 kilograms in 1971. The only major construction between 1969 and 1974 was the Victoria-Beitbridge road.

Responsibility for the administration and maintenance of all roads is divided between five different administrative authorities:

- o Main Roads. Main roads and all bridges are the responsibility of the Ministry of Roads and Traffic.
- o Rural Roads. All rural roads, main roads excepted, are under the Administration of Local Rural Councils.
- o African Area Roads. All roads in areas designated as African areas are under the responsibility of either the Ministry of Internal Affairs or, with the consent of the Ministry, may be delegated to the African District Council for the area.
- o Municipal Roads. Roads in municipal areas are the responsibility of the respective municipal government.

The Ministry of Roads does not possess an in-house capability for either road construction or maintenance, both of which are presently handled by private contractors.

- o Main roads are constructed with a design life of twenty years, and a good majority of these roads have already reached that age or more.
- o The road system generally serves as a duplicate, backing system or as feeder links to supplement the railway system.

- o The present road system was built up during the 1950's with emphasis given to construction of all-weather roads linking major urban centers and outlets toward the coast.
- o Regional variations exist in the development of secondary routes, with the best network found in the Central High Veld. The number and conditions of roads in the TTLs and African purchase areas are clearly inferior to other areas, and it is reported that road surfacing frequently abruptly ends at the edge of an African area. Most African areas are served only by gravel roads. There is regularly scheduled bus service to these areas, but the condition of the roads and bridges is inferior and many routes become impassable in the rainy season.

2) Recommended Assistance

Again, it is difficult to make recommendations independent of the anticipated UNCTAD study and in the absence of an independent government able to define its priorities and allocate domestic resources; clearly, however, there will be several immediate needs.

Technical Assistance for Road and Capital Assistance for Associated Equipment Maintenance Development and Training

The government presently has no capacity for in-house road maintenance and does all such operations by contract. It is not certain the extent to which the contractors are South African firms

or Rhodesian firms, nor is it certain that these firms will be able to meet the need of the road system for major maintenance. An increasing dependence upon black labor will be an essential element of maintenance projects, regardless of the use of private firms or a government maintenance service for this operation. This is likely to be a major problem for road transport within the immediate timeframe. Actual structure of the project will be dependent upon the delineation of government policy. It is suggested that a modal study for both construction and maintenance be supported as the first phase of this project. This study would present the government with different options for short-term and long-term construction and maintain programs and recommend private, public, or mixed operations. The second phase should include assistance in implementing the approach designed in the preliminary survey.

Technical Assistance in Transport Management and Policy Development

This project should be keyed to the development of the private road transport fleet, one of the primary supplements to short-term adjustment of rail system inadequacies and a major area for black entrepreneurial activity. The project should be divided into two sections. The first should provide assistance for the design of road transport policy, including rates and traffic allocations. The second should facilitate the establishment of a freight motor vehicle operators' association or cooperative. Ideally, this group should have a credit program designed to encourage the emergence of black truckers. The organization could also offer special training in accounting and transport management. Alternatively, the road transport service operated by the railroad could absorb this function, placing all trucking under a public corporation. This particular structure of the project again awaits government policy input.

Technical Assistance, A Survey of Road Construction Needs for "African Areas"

The imbalanced development of the road system will clearly necessitate the construction of several levels of main road classification. USAID should

assist in immediate survey of development needs for these areas, again possibly in conjunction with the UNCTAD study or, because of the time-frame, as an expansion of the findings of the study. Clearly, feeder roads should be a prime consideration.

Capital Assistance, Road Construction for
"African Areas"

USAID should initiate construction of one or two of the suggested routes from the UNCTAD survey and encourage other donor support for prime routes, assuming concurrence of an independent Zimbabwe government. Particular emphasis should be placed on rural development projects, but also on associated sector development relevant to "African areas."

b) Railroad

(1) Overview

The railroad consists of 1,568 miles of lines built on 3'6" South African gauge. The system, operated as a government enterprise, handles most freight transport, frequently in conjunction with its own fleet of trucks for road transport.^{1/} In general, the system suffers from obsolete equipment, rising costs, heavy debt servicing charges, and various labor problems. Joint operation with Zambia Railways was terminated on June 30, 1967, but Rhodesian Railways continues to operate service for Botswana. (See Railroads, Botswana; takeover of rail operations through the

^{1/}The Road Motor Service (RMS) operates over 80 different routes linked by 22 control stations and serves a route of about 12,000 kilometers.

territory of Botswana is under negotiation.)

The network was primarily designed to facilitate west-to-east haulage of mineral exports from neighboring states to the ports of Mozambique. Thus, the exports of neighboring countries, especially Zambian copper, provided the major portion of revenues for the system. Internally, the system ran from Victoria Falls on the Zambian border to the rail center at Bulawayo and then southward towards South Africa and westward to Salisbury. Before 1956 direct internal links ran from Bulawayo to Botswana, from Victoria Falls to Zambia, and from Salisbury to the Port of Beira in Mozambique. In 1956 a new link was completed from Gwelo to Maputo (then to Lourenco Marques). The two ports in Mozambique handled over 60% of all foreign trade.

The imposition of sanctions brought a redirection of front line country exports, especially Zambian copper. This resulted in a loss of earnings for S. Rhodesia, new investment in alternate routes of neighboring countries, and heavy demands on the Port of Dar es Salaam. The closing of the border with Mozambique in 1973 caused considerable dislocations. Both Beira and

Maputo were sealed and exports had to move through Botswana in order to reach South African ports.

In order to cut some of the transit distance, and particularly to open up a life-line for badly needed petroleum, the government invested about \$100 million in the construction of a rail link to Beit Bridge in South Africa. Annual capital investment in plant for railroad operation use went from R\$31.2 million for the three-year period 1969/72 to R\$114.4 for the 1973/76 period. Since 1971 the Central Statistical Office has consistently reported an increasing loss for railway operations. The actual structural causes for and real dimension of this loss is open to considerable interpretation.

It is obvious that the construction of the Beit Bridge link not only preceded major losses in transit tariff but also represented serious costs for Rhodesian Railways.

- o The decision to build the link was a costly decision based not on such economic factors as return on investment but on strategic considerations for survival. The end of sanctions will clearly warrant redirection of traffic, resulting in substantial under-utilization of this route.
- o The use of the longer route through South Africa has raised the cost of exports from Zimbabwe, making them less competitive internationally, even when laundered through South Africa, and has

also caused delays and backups in traffic.

- o Opportunity costs resulted from the use of capital funds to create the new facilities rather than maintaining the railway and other modes.
- o Opportunity costs also resulted from redirected capital investment in structure of other modes.

A major problem for immediate consideration is the adequacy of the system's rolling stock. With the separation of Rhodesian and Zambian operations in 1967, most of the rolling stock was passed to Rhodesian Railways. Most of that which is still in use is obsolete. The closing of the border with Mozambique, moreover, resulted in a loss of about 17% of the operational rolling stock of Rhodesian Railways, valued at about R\$26 million.^{1/} Zimbabwe has purchased some locomotives from South Africa and has begun to manufacture certain types of wagons, but rolling stock remains very obsolete and in short supply.

(2) Recommended Assistance

The role of the railroad in the Zimbabwe economy makes it a crucial factor in the transition period. A complex set of factors needs to be examined and corresponding policies

^{1/} Sources vary as to whether or not these figures account for several locomotives which were also lost.

structured. The extent to which the UNCTAD Study will be able to facilitate this process is uncertain and the extent to which there will be any cooperation from South Africa is unknown. Clearly, the association between Rhodesian Railways and South African Railways makes assistance from South Africa to this sector a most logical economic choice; however, political and strategic considerations will restrict such cooperation. USAID should determine the depth envisioned for the UNCTAD survey of the rail system and likely cooperation with South Africa and propose supplemental or alternative Technical Assistance for Policy and Operational Planning, Rhodesian Railways. The project should survey:

- o Capital investment necessary to equip and upgrade the system to meet realities of post sanction period
- o Capital and technical assistance cost of maintenance needed immediately and for creation of permanent care
- o Policy of rerouting of traffic to Beira and Maputo
- o New tariff rates and regulating policies, employment generation policies. (See also opening section, Zimbabwe) This survey should involve short-term consultants, plus contract consultants, to assist in management decision-making relevant to policy formation. A cooperative project, including such donors as Canada, might be considered, especially if South Africa proves unwilling to provide assistance or if such assistance is judged too biased to be useful. Following this survey, capital investment can be better evaluated.

c) Civil Aviation and Telecommunications

(1) Overview

Before UDI, air service was provided jointly for S. Rhodesia, Zambia, and Malawi by Central African Airways (CAA). After UCI, air service from S. Rhodesia to all countries except South Africa was terminated, and in 1967 it was decided to dissolve CAA. Air Rhodesia, a state-owned corporation, was established on September 1, 1967 and continues to provide regularly scheduled service internally and to South Africa. A number of private, commercial operators also provide non-scheduled air service on a hire basis.

According to somewhat dated information from 1977, Air Rhodesia operates with a fleet of about 11 planes. Included are seven Viscounts, a DC-3, and three Boeing F20's. The F20's are almost 16 years old and were obtained second hand. Even allowing for possible upgrading of the fleet in 1978, there is a serious need for more modern aircraft just to meet present demands. Efforts to extend service to neighboring countries will clearly necessitate additional planes, even if service to South Africa is terminated. It would be hoped that this transit link to Johannesburg would, however, remain open.

There are two airports capable of international traffic: the Salisbury runway has been expanded, making

it one of the longest runways in the world; and the Bulawayo airport has also been extended to facilitate international flight. Other major airports include Victoria Falls, Fort Victoria, Wankie National Park, Buffalo Range (Chiredyi) and Kariba. All but Kariba have been reconstructed to serve aircraft up to Viscount weight. In addition to these, there are numerous small airfields scattered throughout the country. Improvements both both runways and terminal facilities have been made for strategic reasons, as well as to cope with increased passenger and freight traffic. The cost of air freight remains high, restricting demands.

Little current information is readily available on the telecommunications network. The basic system serves basic needs and is relatively advanced, compared to facilities in most Front-Line states. Investment in repair, especially with increasing security problems, has resulted in the deterioration of certain aspects of telecommunication, but system operation as a whole has been given priority by the government for obvious strategic reasons.

(2) Recommended Assistance

Civil Aviation. No immediate capital assistance is suggested, but USAID should support an overview of civil aviation by ICAO, preferably serving as a link to the UNCTAD study. Areas for study should include: 1) Maintenance 2) Telecommunications 3) Safety. Simultaneously, a management and training survey should be incorporated in overall manpower planning by ILO. Multiple

source funding is preferable. Should disruptions in the quality of service and safety develop, USAID should be ready to provide emergency Technical Assistance for Maintenance Training. This should be a very flexible project keyed to sector breakdown and designed to provide technical supplementation of ground crew operations. Project structure will be dependent upon percentage of personnel lost during transition and early independence period, but probably will need to be keyed to selected higher skills and mid-level training in general.

Telecommunications, Technical Assistance in Management, Maintenance, and Manpower Training

Again, the nature of this project depends much on personnel losses. The project should be keyed to system maintenance rather than expansion. The timeframe should be immediate, but should be preceded by a preliminary survey of system needs. Areas covered should include: 1) Management 2) Development planning 3) Equipment installation 4) Exchange operation and maintenance, and 5) Line service and maintenance.

III APPENDIX

III APPENDIX

ANNEX I

1. Donor Summary Statements: Attachment A, CIDA
2. Donor Summary Statements: Attachment B, EEC
3. Donor Summary Statements: Attachment C, Ford Foundation
4. Donor Summary Statements: Attachment D, GDI
5. Donor Summary Statements: Attachment E, ICAO
6. Donor Summary Statements: Attachment F, ITU
7. Donor Summary Statements: Attachment G, IMCO
8. Donor Summary Statements: Attachment H, NORAD
9. Donor Summary Statements: Attachment I, ODM
10. Donor Summary Statement: Attachment J, SIDA
11. Donor Summary Statement: Attachment K, UNCTAD

ANNEX II

1. Southern African Assistance Policies of the British Ministry of Overseas Development (ODM)
 - a. Attachment A: ODM Assistance to Malawi. 1978/79-1980/81 Development Program for Malawi. Projects Proposed for Financing from UK Development Grant
 - b. Attachment B: Botswana: ODM Assistance to Botswana. UK/Botswana Talks for the Triennium 1979/80-1981/82
 - c. Attachment C: ODM Assistance to Lesotho. Statement of Conclusions Reached Between the Delegations of the British Government and the Government of Lesotho at the Negotiations for Aid During the 1979/82 Triennium, Maseru, 22-25 May 1978.
 - d. Attachment D: ODM Assistance to Zambia

ANNEX III

Proposed Organization of Civil Aviation Training
in Africa

ANNEX IV

Botswana: Telecommunications Development Plan,
1977-1977 Summary

ANNEX V

Zambia: Freight Holdings, LTD; Suggested Spare
Parts, 1978

Annex VI

Zambia: Zambesi Ranching Correspondence, Ref.
Telephones

Annex VII

Zambia: Department of Civil Aviation - Request for
Capital and Technical Assistance

CIDA is particularly concerned with the changing international economy, particularly in regard to food, fuel, and fertilizer, and the impact of these changes on third world countries. The essentials of the CIDA program include: a more focused program--including priority for the poorest countries, geographic concentration of assistance, and regional cooperation--; such more efficient resource transfer as the untying of procurement restrictions; and more flexible program management. Support for regional cooperation includes regional institutions and development projects undertaken by two or more countries.

CIDA is interested in evolving a permanent planning capability and offers varied programs for technical assistance. Canadian advisors are sent overseas and training programs, including fellowships, are offered in Canada and in third countries.

In relation to Southern Africa - CIDA has been particularly active in support of transport both in association with rural development and overall national development. Activities include road construction and railway management and operation.

ANNEX I. Donor Summary Statements: Attachment B, EEC.

The EEC is concerned with both financial and technical cooperation with the over 40 countries of Africa, the Caribbean and the Pacific (ACP). In addition to such Lomé Convention activities as trade arrangements and stabilization of export earnings, the EEC supports economic and social infrastructure projects, rural development and training schemes. Increased support for regional and inter-regional cooperation seeks (1) increasing economic cooperation in development; (2) faster diversification of the economies of the ACP countries; (3) Reduction of economic dependency of ACP countries on imports, (4) Setting up sufficiently extensive markets inside the ACP countries and neighboring states, (5) maximum use of resources and services in ACP countries. Support for small- and medium-size firms and small-scale basic development schemes is emphasized. Funding is provided through the European Development Fund (EDF).

Basic participation by ACP countries in administration and management of aid programs including definition of general orientation of aid and successive stages in project life: (1) programs, (2) preparation and investigation of projects, (3) preparation of financing discussions, (4) project execution, (5) project evaluation. ACP countries submit their proposals for consideration to the EDF for consideration. In the case of rejection, advice is offered on amending and resubmitting the proposal.

In Relation to Southern Africa

Additional consideration given to countries on special list, both in regard to terms of finance and technical assistance for participation in project preparation and management. Included are Botswana, Lesotho, Malawi, and Swaziland.

ANNEX I. Donor Summary Statements: Attachment C, Ford Foundation

The Ford Foundation sees two major roles for itself in southern Africa. The first is the support of economic development by capacity development of both institutions and individuals. The second is concerned with the promotion of human relations and rights, with particular emphasis at present on South Africa. Primary activity for technical assistance is the provision of representative advisers who serve directly on the staff of the host government, and also support research programs. Financing provided by foundation budget. Scale of operations between 500,000 and 1 million for 1978-1979.

Activities directed through regional office in Nairobi. Representatives sent to field 2 or 3 times a year. Proposals are presented to representative or directly to regional office. Project selection based on 1) expected impact for largest segment of population, 2) institutional development, 3) government ability to utilize/implement effectively. Regional office recruits and pays costs of representative advisers. Usually two-year assignment with possible renewal. Specialists placed directly on ministerial staff of host government, and it is the host government rather than the specialist which reports back to the foundation. Budgeting considerations result in interest in reduced role in technical assistance except where maximum results expected.

ANNEX I. Donor Summary Statements: Attachment D, GDI.

The German Development Institute (GDI; alternately DIE and, more correctly, the German Institute for Development Policy) functions as a public policy arm for economic, social and political issues particularly as they relate to investment by the German Government in selected developing countries. Particular concern exists for practical policy alternatives that can be used for institutional approaches to problem solving. Research programs frequently include field research but not technical assistance which is handled by GTC (German Corporation for Technical Cooperation).

In Relation to Southern Africa

Particular concern for future development programs in Namibia but also concern for Zimbabwe. Upon resolution of Namibia's independence GDI plans to do an on-site, intensive study of current economic issue and development projects for Namibia. GDI also plans an analysis of the international competitiveness of the price and quality of manufactured good produced in Rhodesia.

ANNEX I. Donor Summary Statements: Attachment E, ICAO.

ICAO is primarily interested in training preparatory to the development of civil aviation as a vital component of the transport sector. For developing countries air transport can serve to distribute technological and scientific change and bring social development to the rural areas. Particular interest in manpower training ICAO seeks development of national and multinational training centers. A special protocol in regard to the operation of these centers has been developed including administrative organs to be established, their terms of reference, and the allocation of costs and responsibilities. ICAO has actively sought OAU and ECA support of multinational centers.

Technical assistance programs including training in flight safety, telecommunications, and associated engineering and mechanical skills as well as training for pilots. Associated equipment costs sometimes are also covered. Major funding for programs is provided by UNDP (For fuller discussion of ICAO training see Appendix, Annex

ANNEX I. Donor Summary Statements: Attachment F, ITU.

ITU is primarily concerned with the maintenance and extension of international cooperation for the improvement and national use of telecommunications. In promoting the development and most efficient operation of technical facilities, ITU seeks to increase the general availability of communication services on an integrated basis to the public. Activities range from the allocation of the radio frequency spectrum and general regulation of telephone, telegraph, and radio operation to the creation, development, and improvement of telecommunication equipment and networks in developing countries, especially in participation with various programs of the United Nations. Particular emphasis in regard to the later activities is given to educating national planning authorities about the multiplier effect of investment in telecommunications. The majority of ITU projects have been financed through the UNDP.

ITU projects include both regional and national orientations. Usually a pre-feasibility team is sent to survey each proposed project. The use of regional advisers has been temporarily terminated and upon resumption of their operations they will serve as general field representatives for the Geneva office. Projects provide fellowships, trainers, equipment.

IMCO is interested in the technical, rather than the economic aspects of maritime operations and safety including shipping, ports and harbors, marine pollution and such associated areas as training, legislation, safety, communications and shipbuilding/repairs. High priority is given to the promotion of uniform standards on an international basis, an interest demonstrated by IMCO's support for the drafting of an international convention on maritime training and certification. The need to provide expertise to developing countries is facilitated by a technical assistance program which emphasizes training activities. IMCO is dependent on other donor sources, largely the UNDP, for funding this program, and IMCO's regular budget is for administrative and supervisory operations.

The various projects under the technical assistance program vary according to the individual needs of each country. In some cases a regional approach has been utilized. Although it varies with the financial situation of each country, the host country usually provides local facilities and associated costs. IMCO pays for the cost of 1) technical advisory services 2) equipment 3) fellowships. Regional advisers make periodic country tours to 1) identify problems 2) suggest advisory services required 3) facilitate drafting of project proposal documents for submission to the

UNDP or other donor source. Highest priority is given to maritime training, especially for engineers, navigators, inspectors.

In regard to southern Africa:

IMCO already has anglophone and francophone programs underway in Accra and Abidjan respectively. There is no facility for Portuguese speakers, but IMCO reports an interest by the Government of Mozambique in establishing such a facility. The Secretary General would especially welcome US/AID interest in this project. IMCO has talked with the UN Commission for Namibia concerning the basic parameters for a national maritime organization.

ANNEX I. Donor Summary Statements: Attachment H, NORAD.

NORAD is concerned with the development of both human and economic infrastructure. Particular emphasis is placed on health, roads, and village development. Program focus includes the role of women and the promotion of leadership on the village level. Support is given to transport to facilitate the delivery of social services to rural areas and conversely for access to marketing centers. NORAD has a strong interest in reducing economic dependency on South Africa. The lack of local firms to implement development contracts is a serious restraint on NORAD's preference for non-South African firms. Regional projects have not been an interest.

Technical assistance is provided through salary support for expatriate advisers and the provision of volunteers with technical specializations. Efforts are underway to link additional support to technical assistance projects. NORAD is also seeking direct input from district and rural-level institutions in project design and selection and, reciprocally, hopes to encourage the evolution of institutional effectiveness at the local level.

Past ODM projects have reflected historical links between the metropole and former colonies. Present interest is in moving away from being the main donor and modification of the colonial relationship. Currently funding a multiplicity of small projects from various sectors. This involves heavy administrative costs and would like to concentrate involvement for administrative effectiveness. Heavy emphasis on agriculture (production to marketing), associated economic infrastructure and water resources. New programs give less emphasis on health and general secondary education. Technical/vocational training and manpower planning are strong interests.

In general, country programs are not designed on a regional basis but in terms of individual country needs. ODM believes, however, that there is a greater basis for regional cooperation in transport and communications than in other sectors. Technical assistance provided through supplementation program paying for salaries of expatriate advisers who usually serve in some direct administrative capacity. ODM would like to reduce this support and encourage indigenous manpower training in order to facilitate localism.

In relation to Southern Africa:

The foundation is particularly impressed with the ability of the government of Botswana to profit from technical assistance and for this reason continues support for four representative agents in the country.

- 1) Ministry of Finance
- 2) Ministry of Minerals and Water Resources
- 3) Ministry of
- 4) Ministry of

Program activities in Zambia have been terminated, and a proposal by Malawi turned down. A grant to the University of Lesotho is providing support for a two-man study

in association with the Ministry of Finance, of external economic relations: currency questions, the customs union, etc.

ANNEX I. Donor Summary Statement: Attachment J, SIDA.

SIDA is interested in the promotion of viable economics for developing states. Little concern in bilateral aid for regionalism since such is handled through multi-lateral programs. Major interest in agriculture, rural development, health and education. All projects give emphasis to training whenever possible.

National projects have been based on specific agreements with detailed goals, usually covering three-year basis. Overall aid programming agreements signed with each country for one or two years. Frequent consultations with governments, and mid-year reviews facilitate submission of proposals by government. Attempting to shift away from project specific aid, however, to general agreement for sector support which will give more flexibility and provide more permanent integral development. Heavy emphasis on personnel aid with training capacity.

In relation to Southern Africa:

General policy of supporting efforts to create viable independent states, including reduced dependence on South Africa has resulted in dispersal of aid throughout the region and to front-line states. The special geographic and political situation of Zambia and Botswana has given them a prominent position. SIDA has a particular concern for manpower problems expected in Zambia and expects to play role in aid for training in both Namibia and Zumbabwe. It is concerned

with various needs in Mozambique. Strong support is being given to rural development and studies in disease, especially through WHO.

UNCTAD approaches development programs largely from the perspective of trade needs but has undertaken a new role in research and analysis on policies and programs keyed to specific development needs of the least developed countries. UNCTAD came late into field of technical assistance, but is interested in major role as advisory unit, leading to broader approach and decision-making framework to aid development planning. Particular concern exists for integrated planning and the links between countries. There is a special interest in the problems of land-locked countries. Specific goals include accelerating amount and rate of assistance; increasing absorptive capacity of recipients; more flexible assistance policies; improved assistance in administration and management; more effective coordination. Major dependence for financing is on UNDP.

Interested in both regional and country-specific projects. Close association with resident representatives of UNDP in each country but have designed programs for sub-regional advisers for Eastern and Southern Africa to be supported by UN volunteers. Outside consultants used both for project design and implementation.

In regard to Southern Africa:

UNCTAD considers transport bottlenecks in southern Africa particularly in regard to Zambia as a major constraint on

economic development in the region and is currently engaged in the design and implementation of a two-stage project to facilitate commodity movements. The first phase is to be crash program to clear the port of Dar es Salaam. The second phase is to be a study of about thirty different transport routes in the region. This latter phase will analyze and suggest changes in infrastructure development, management, and operational procedures. Cost comparisons of route use will also be included. UNDP funding is available for the first phase but additional donors will be necessary for the second phase.

SOUTHERN AFRICAN ASSISTANCE POLICIES OF THE
BRITISH MINISTRY OF OVERSEAS DEVELOPMENT (ODM)

Summary of a discussion with Peter McLean and Peter Carter of the British Ministry of Overseas Development (ODM):

ODM's current aid policy to south African countries is to find a balanced mixture of rural development projects and infrastructure projects. The rural development projects are closely related to ODM's current aid strategy of providing aid to the poorest members of the developing country and the infrastructure projects, which are easy to manage and customarily have rapid and high rates of expenditure; help keep overall disbursement levels for development projects at levels that are sufficiently high to be acceptable to ODM's management.

In the last five years ODM has moved away from being the principal donor, a donor that financed large numbers of small projects in almost any sector that the host government requested aid, to one that prefers relatively large projects which are susceptible to effective administration. ODM's role in Malawi five years ago illustrates its previous willingness to accept a number of small projects; just after independence it had over 100 small projects in the country.

Other than not being involved in mineral or manufacturing projects, ODM does not seem to have any hard and fast rules about projects it will accept or reject. Nevertheless, ODM is systematically attempting to reduce its level of effort with relation to three types of projects. These

are:

- Manpower supplementation projects whereby ODM advisers work for and are paid by host governments, but have their salaries supplemented to donor country levels by ODM.
- Projects related to health care assistance.
- Projects related to livestock--ODM's emphasis has shifted to dry land agriculture and it funds large-scale projects of this type wherever possible.

Specific projects funded in Malawi, Botswana, Lesotho, and Zambia are referenced in Attachments A, B, C, and D. ODM currently has no projects funded in Swaziland, but the country has requested assistance for its railroad and international airport. ODM is currently not convinced of the need for either of these projects, but has not reached a decision concerning its willingness to fund either of them.

In 1976 ODM negotiated a £10-million loan to Mozambique for agricultural projects. An FAA-Nordic consortium, however, had gotten into Mozambique first and apparently funded all of the more desirable projects. As a consequence, 6 million of the £10-million loan from the UK was spent on roads and the remaining £4 million was spent on power generators for Kuelimane, Pemba, and Angoche.

During the UK-Mozambique negotiations concerning the road projects, ODM learned that Mozambique is more concerned with rural roads and rural infrastructure than with main roads. Moreover, Mozambiquans wanted the development of the road system to occur on a provincial basis. Scandinavian countries had already taken Tete and Niaca provinces

and so the Mozambique Government asked the UK to provide assistance to the Gaza province. As a consequence, the UK is supplying spares for equipment, road supplies, and manpower to develop 150 km of road per year until 500 km of road are developed at a cost of £6 million. The project will take five years to complete. One of the major goals of the project is to construct roads that are less susceptible to floods than current roads.

Studies of Mozambique related to development needs that have been completed or are underway include:

The Italians did a study of development needs in 1974.

VTK in Sweden is doing a comprehensive study of Mozambique development needs. This study will be available in about August 1978.

ODM also gave Mozambique a loan for transport equipment just before independence. The loan was for £10 million with a year to finance import of spare parts for vehicles, vehicle maintenance, importation of vehicles, and importation of spare parts for textile and other industrial machinery.

ATTACHMENT A

ODM ASSISTANCE TO MALAWI

1978/79-1980/81 DEVELOPMENT PROGRAM FOR MALAWI

PROJECTS PROPOSED FOR FINANCING FROM U.K. DEVELOPMENT GRANT

PROJECT	GROSS				NET U.K. GRANT				LOCAL RESOURCES			
	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Years
HEAD 071 - EDUCATION												
Secondary Education	472	500	628	1600	425	450	565	1440	47	50	63	160
Domasi In-Service Training Centre	50	50	50	150	45	45	45	135	5	5	5	15
Technical/Vocational Education	768	453	129	1350	691	408	116	1215	77	45	13	135
Development of Polytechnic	450	500	650	1600	405	450	585	1440	45	50	65	160
TOTAL	1740	1503	1457	4700	1566	1353	1311	4230	174	150	146	470
HEAD 074 - HEALTH												
Improvements to District Hospitals	360	300	300	960	324	170	270	864	36	30	30	96
Peripheral Health Units in Urban Centres	70	70	70	210	63	63	63	189	7	7	7	21
Upgrading Rural Hospitals	160	160	160	480	144	144	144	432	16	16	16	48
TOTAL	590	530	530	1650	531	477	477	1485	59	53	53	165
HEAD 075 - HOUSING												
Development of Traditional Hous. Areas - General	500	500	500	1500	450	450	450	1350	50	50	50	150
TOTAL	500	500	500	1500	450	450	450	1350	50	50	50	150

PROJECT	GROSS				NET U.K. GRANT				LOCAL RESOURCES			
	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Years
<u>HEAD 076 - MISCELLANEOUS SERVICES</u>												
National Census	20	-	-	20	20	-	-	20				
TOTAL	20	-	-	20	20	-	-	20				
<u>HEAD 077 - AGRICULTURE</u>												
Smallholders Tea Development	200	200	200	600	180	180	1980	540	20	20	20	60
Farm Machinery Research and Development	100	50	200	200	90	45	45	180	10	5	5	20
National Rural Devpt) Project (UJ)												
Phalome Rural Devpt) Project												
Mwanza Rural Devpt) Project												
Central Services Unit (Blantyre	1942	2409	2473	6824	1748	2168	2226	6142	194	241	247	682
National Sample Survey of Agriculture												
Agricultural Research Services and Rice Seed Improvements	120	-	-	120	108	-	-	108	12	-	-	12
Housing for Agricultural Extension Staff	100	83	92	275	90	75	83	248	10	8	9	27
Seed Production Project	120	50	20	190	108	45	18	171	12	5	2	19
Dryland and Irrigated Settlement Schemes	300	300	219	819	270	270	197	737	30	30	22	82
Seed Storage and Processing	200	50	12	262	180	45	11	236	20	5	1	26

PROJECT	GROSS				NET U.K.GRANT				LOCAL RESOURCES			
	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Years
Land Husbandry Devpt	251	125	125	501	226	112	113	451	25	13	12	50
Irrigation Development	25	100	35	160	23	90	31	144	2	10	4	16
Crop Storage Research and Development	130	115	50	295	117	103	45	265	13	12	5	30
TOTAL	3488	3432	3276	10246	3140	3133	2949	9222	348	349	327	1024
<u>HEAD 078 - FISHERIES</u>												
Fisheries Development	170	170	160	500	153	153	144	450	17	17	16	50
TOTAL	170	170	160	500	153	153	144	450	17	17	16	50
<u>HEAD 079 - FORESTRY AND GAME</u>												
Timber Plantations	400	500	650	1550	360	450	585	1395	40	50	65	155
Viphya Pulpwood	1493	1400	1200	4093	1344	1260	1080	3684	149	140	120	409
Viphya Sawmill Project	500	-	-	500	450	-	-	450	50	-	-	50
Dev.of Wildlife Resources	255	207	238	700	230	186	214	630	25	21	24	70
Viphya Forest Industry Trials	55	53	42	150	50	43	38	136	5	5	4	14
Rural Fuelwood and Poles	100	100	100	300	90	90	90	270	10	10	10	30
TOTAL	2803	2260	2230	7293	2524	2034	2007	6565	279	226	223	728
<u>HEAD 080 - SURVEYS AND LANDS</u>												
Precise Levelling Survey	50	50	50	150	45	45	45	135	5	5	5	15
TOTAL	50	50	50	150	45	45	45	135	5	5	5	15

PROJECT	GROSS				NET U.K. GRANT				LOCAL RESOURCES			
	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Years
<u>HEAD 081 - VETERINARY SERVICES</u>												
Disease Control	350	350	350	1050	315	315	315	945	35	35	35	105
Integrated Livestock Development	400	424	376	1200	360	382	338	1080	40	42	38	120
New Capital Smallholder Poultry Project	40	-	-	40	36	-	-	36	4	-	-	4
Dairy Development (Mzuzu)	60	50	50	160	54	45	45	144	6	5	5	16
Mzuzu Smallholder Poultry Project	138	67	55	260	124	60	50	234	14	7	5	26
TOTAL	988	891	831	2710	889	802	748	2439	99	89	83	271
<u>HEAD 082 - NEW CAPITAL</u>												
New Capital Traditional Housing Estates	400	400	400	1200	360	360	360	1080	40	40	40	120
	400	400	400	1200	360	360	360	1080	40	40	40	120
<u>HEAD 083 - POSTS AND TELECOMMUNICATIONS</u>												
Trunk and Junction Circuit Growth	399	407	439	1295	359	366	441	1166	40	41	43	129
Internal Telegraphs Calibration & Repair Centre	258	239	151	646	232	215	136	583	26	24	15	65
Rural Telecommunications Development	35	5	25	65	32	4	23	59	3	1	2	6
	143	153	160	456	129	138	144	411	14	15	16	45
TOTAL	835	804	825	2464	752	723	744	2219	83	81	81	245

PROJECT	GROSS				NET U.K. GRANT				LOCAL RESOURCES			
	1978/79	19/80	80/81	Total 3 Yrs	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Years
<u>HEAD 084 - POWER</u>												
Rural Electrification - Boma Headquarters	346	-	-	346	311	-	-	311	35	-	-	35
TOTAL	346	-	-	346	311	-	-	311	35	-	-	35
<u>HEAD 085 - TRANSPORTATION</u>												
Roads												
Key Rural Roads	500	500	500	1500	450	450	450	1350	50	50	50	150
Benga/Nkhoskota/Nkhata Bay/ Mzuzu Road	2500	2500	2500	7500	2250	2250	2250	6750	250	250	250	750
<u>Other Transportation</u>												
Malawi Railways: Renewals and Improvements	300	300	300	2400	300	300	300	2400	-	-	-	-
Goods Handling Facilities	100	-	-	100	100	-	-	100				
Wagon Weighbridges	80	80	80	240	80	80	80	240				
TOTAL	3980	3850	3880	11740	3680	3580	3580	10840	300	300	300	900
<u>HEAD 086 - WATER SUPPLIES AND SANITATION</u>												
Blantyre Water Board Develop- ment Phase IV	1700	-	-	1700	1530	-	-	1530	170	-	-	170
Loan to Blantyre Water Board for Water Meters	120	120	-	240	108	108	-	216	12	12	-	24
TOTAL	1820	120	-	1940	1638	108	-	1746	182	12	-	194

PROJECT	GROSS				NET U.K.GRANT				LOCAL RESOURCES			
	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.	1978/79	79/80	80/81	Total 3 Yrs.
<u>HEAD OFF - WORKS ORGANIZATION</u>												
Training Centre Improvements	40	40	-	80	36	36	-	72	4	4	-	8
Additional Plant and Vehicles for PVHO (1978/79)*	?	?	?	?	?	?	?	?	?	?	?	?
TOTAL	40	40	-	80	36	36	-	72	4	4	-	8
GRAND TOTAL	17770	14630	14139	46539	16095	13254	12315	42164	1675	1376	1324	4375

* Provisions for vehicles contained in the main Project Submissions.

ATTACHMENT B

BOTSWANA: ODM ASSISTANCE TO BOTSWANA

UK/BOTSWANA TALKS FOR THE
TRIENNIUM 1979/80-1981/82

Record of conclusions reached during the talks in the Ministry of
Finance and Development Planning which ended on 18 May 1978

Delegation

Mr P A Raftery, MBE,
Acting High Commissioner

Mr M J P Lynch
Under-Secretary
Ministry of Overseas
Development

Mr M J Fairlie OBE
Eastern and Southern Africa
Department
Ministry of Overseas
Development

Mr J R Goldsack MBE
Agricultural Adviser
British Development Division
in Southern Africa (BDDSA)
Lilongwe

Mr M Todd MBE
Engineering Adviser
BDDSA
Lilongwe

Miss L R H Roberts
Administrative Officer
BDDSA
Lilongwe

Mr G H Malley
Second Secretary (Aid)

Mr N J Stevens
Economic Adviser
BDDSA
Lilongwe

Mr B I Gasennelwe
Acting Permanent Secretary
MFDP

Mr O K Matambo
Principal Planning Officer
MFDP

Mr M L O Stevens
Director of Economic
Affairs,
MFDP

Mr J Cross
Senior Finance Officer
MFDP

At the final meeting the following understandings were reached:-

Commitment Level

1. The British delegation said that a total of £13 million (P19.5 m) would be made available for new commitment during the triennium 1979/82; this figure for commitment is over and above the commitment of £10 m (P15 m) which was agreed for the preceding triennium as well as the emergency grant of £3 m for special aid following the Farah Report and assistance for refugees which is channelled through international agencies. The British delegation would expect that disbursements arising from the £13 m (P19.5) new commitment and from unexpended commitments arising from the Farah Report, together with disbursements outstanding from the £10 m (P15 m) commitment for the 1976/79 triennium should be realistically estimated at £13 m (P19.5). For their part, the Botswana delegation estimates a level of disbursement in 1979/82 from all the sources mentioned of p22 m. The British delegation undertook that, should their own estimate of disbursements threaten during the triennium to be lower than could in fact be achieved, the proposed new commitment level of £13 m (P19.5 m) would be reviewed in the course of the triennium.

Carryover of unspent funds

2. At present the commitment authority for 1976/79 expires on 31 March 1980. The British delegation agreed that favorable consideration should be given to extending that date if this should prove necessary and agreed that undisbursed funds from commitments relating to the 1976/79 triennium could be carried over for disbursement in the 1979/82 triennium.

Disbursement procedures

3. The system of retrospective financing should be continued in accordance with the exchange of letters dated 3 December 1976 between the Vice President of Botswana and the British High Commissioner. The British delegation emphasized that the Botswana Government is at liberty to submit claims as often as their needs required.

Exchange Rate

4. Sterling is the constant currency and the national rate for conversion to Pula should be revised from time to time.

Terms of Aid

5. Aid will be made available on the same terms (40% grant and 60% loan of 25 years duration, interest free with a 7 year grace period) as for the tranche for the 1976/79 triennium (£10 m or P15 m). It may be spent on British or Botswana goods and services but the agreed list of items for which waivers for third country purchases are automatic will remain in force. Applications for special waivers will be considered on their merits. It is, however, the general desire of both sides that, where this can be done without serious delay or diseconomy, the proportion of off-shore procurement from the United Kingdom will increase.

Next Steps

6. The British delegation undertook to produce a draft exchange of letters modifying the exchange of letters dated 3 December 1976 between the Vice President of Botswana and the British High Commissioner so as to give effect to the new commitment of £13 m (P19.5 m). An indicative list of the projects to be proposed for financing under the agreement, or to be completed from

existing or newly-committed funds, is attached to this record.
At the present stage these projects are not agreed for financing
but will be subject to the usual processes of discussion and
appraisal.

Gaborone 18 May 1978

Distribution:

Mr B Gaolathe, Permanent Secretary, MFDP (6 copies)
Mr P S McLean, Ministry of Overseas Development London (4)
Mr W T A Cox, BDDSA, Lilongwe (2)
Mr G H Malley, British High Commission, Gaborone (4)

PROJECT SUMMARY

Agriculture

Animal Health Service Centres
Reorganization of Extension Services
Evaluation of Farming System and Agricultural Implements
Integrated Farming Pilot Project
Veterinary Diagnostic Laboratory
Improvements to Disease Control Facilities
Central Research Station
Rural Training Centres
Cooperative Development Bank
Agricultural Extension (Small Projects)
Botswana Agricultural Marketing Board
Cooperative Credit Societies
Seed Multiplication and Distribution
Arable Lands Development Programme
Additional Veterinary Cordon Fences

Water Resources and Supplies

Evaluation of Underground Water Resources
Small Village Water Supplies
Underground Water Development

Education

Kgari Sechele, Molefi and Seepapitso Secondary Schools
Francistown, Lobatse and Serowe Teacher Training Colleges
Mater Spei College
Fourth Teacher Training College
Teachers' In-service Training Centres
University Campus of Botswana

Transport

Secondary Road Improvements
Ghanzi-Kanye Road (Test Strips)
Main Line Railway

Urban Development

Lobatse Physical Development
Gaborone Expansion (Design)

Rural Development

Land Use Plans
Development of Land Boards

Government Infrastructure

Serowe Prison

ATTACHMENT C

ODM ASSISTANCE TO LESOTHO

STATEMENT OF CONCLUSIONS REACHED BETWEEN THE DELEGATIONS OF THE BRITISH GOVERNMENT AND THE GOVERNMENT OF LESOTHO AT THE NEGOTIATIONS FOR AID DURING THE 1979/82 TRIENNIUM, MASERU, 22 - 25 MAY 1978.

The two Delegations agreed that the general strategy for the triennium 1979/82 should be concentrated on rural development, communications including roads, and the creation of opportunities for employment. In the discussions special account was taken of the particular difficulties, especially in communications, being undergone by sections of the Lesotho population in the present political circumstances.

Commitment Level

It was agreed that the amount of capital aid to be offered by the British Government for commitment during the triennium 1979/82 should be £20m (R30m). The commitment figure for the 1976/79 triennium, including both the regular programme and the additional emergency aid, was £13.5m; the higher commitment of £20m for the triennium 1979/82 has been agreed in recognition of the special difficulties faced by Lesotho at the present time and in particular of the British Government's willingness to finance two major road construction projects in the mountain areas.

Carry-over of Unspent Funds

At the request of the Lesotho Delegation the British Delegation agreed that claims arising from expenditure incurred on agreed

projects during 1976/79 triennium may be presented for reimbursement up to 31 March 1980. This date may be extended by agreement between the two Governments. Such disbursements will not be counted against the £20m commitment of new funds referred to in the preceding paragraph. Funds approved for expenditure from the 1976/79 grant before 31 March 1979 but not spent by that date may be carried forward into the new triennium and similarly will not count against the ceiling of the commitment of £20m.

List of Projects

The following indicative list of projects to which funds would be committed in the triennium 1979/82 was agreed between the two Delegations. This is an indicative list only and may be subject to modification by agreement between the two Governments. Each will be the subject of appraisal by the British Development Division in Southern Africa and to specific financial approval by the British Government. Projects not included in the list which may come forward as a result of changes in the general situation during the triennium can be considered, but their inclusion would be contingent upon appropriate adjustments to the list below so that the total commitment level of £20m was not exceeded.

	<u>Rands million</u>
<u>Basic Agricultural Services</u>	1.70
<u>Crop Supporting Activities</u>	
Intensive Horticultural Production	.20
Woodlots Project	.55
Special South East Woodlots Programme	1.00
Intensive Arable Area Conservation	1.00
Lesotho Agricultural College Phase IV	.20
<u>Livestock Production</u>	
Mountain Livestock Development Programme	2.29
National Pig Breeding Herd	.17
Fisheries Development	.22
<u>Rural Communications</u>	
Mokhotlong-Taung Road	} 13.60
Mokhotlong-Sani Pass Road	
Mechanical Assistance to Food Tracks	.97
Telecommunications	1.13
<u>Rural Infrastructure</u>	
Offices, Quarters, District Markets	1.35
Orthophoto Mapping	1.10
Projects for providing employment opportunities	1.11
Village water supplies	.67
Rural Clinics	.60
<u>Education</u>	
National University of Lesotho	.94
Primary Schools	1.00
<u>National Infrastructure</u>	
Lands & Surveys Offices Phase II	.20
	<u>R30.00m</u>
	<u>£20.00m</u>
<u>Terms of Aid</u>	

The whole of the new commitment will be in grant form. The sums shall as far as possible be spent on British or Lesotho goods and services but the agreed list of items for which waivers for

Third Country purchases are automatic will remain in force. Applications for special waivers will be considered on their merits; the Lesotho Delegation undertook that such applications would be made to the British High Commission as early as possible and while projects were still at the planning stage. It is, however, the general desire of both sides that, where this can be done without serious delay or diseconomy, the proportion of off-shore procurement from the United Kingdom will increase.

Exchange Rate

Sterling is the constant currency and the notional rate of conversion to Rand may be reviewed in the event of substantial and significant changes in exchange rate parities.

Review of Progress

The programme for the 1979/82 triennium may be reviewed by the Head of the British Development Division in Southern Africa and his Advisers in cooperation with the Lesotho Government at about the middle of the triennium; and regular reviews of the progress of individual projects may be made at any time by the British High Commissioner in Maseru and his officers and during normal routine visits to Lesotho by the staff of the British Development Division in Southern Africa and the Ministry of Overseas Development.

Technical Cooperation

In addition to the capital funds provided for the British aided projects, the full range of British Technical Cooperation services will be available to the Government of Lesotho.

Next Steps

The British Government will produce as soon as possible a Draft Exchange of Letters modifying the Exchange dated 2 August 1976 between the Minister of Foreign Affairs in the Kingdom of Lesotho and the British High Commissioner so as to give effect to the new commitment of capital aid for the 1979/82 triennium and to give effect to other minor amendments proposed by the Government of Lesotho and agreed by the British Government.

Maseru
25 May 1978

ATTACHMENT D

ODM ASSISTANCE TO ZAMBIA

1978

1. A £7.5m loan for agricultural development. The loan is signed.
2. A £15m loan for agricultural development and transport equipment. This loan is not signed yet.
3. A £1.76m loan for Leyland buses and spares. This loan is signed.

1976

A £5m grant of which:

- a. £4m spent so far for road building equipment.
- b. £1m to be spent during 1978/79 for:
 - o Dairy bottling machinery
 - o Animal feeds
 - o Milling machinery
 - o Chilanza cement machinery (mainly vehicles)

PROPOSED ORGANIZATION OF CIVIL AVIATION
TRAINING IN AFRICA

In 1974/1975 a manpower-training survey was sponsored by the United Nations Development Program (UNDP) and carried out by the International Civil Aviation Organization (ICAO) to determine the immediate and long-term (five years) needs for civil aviation in government and airlines in the states south of the Sahara. The final report for the survey, published in June 1975, described a serious shortage of training capacities within Africa.¹ The survey estimated current training capacity at 17,000-man once a year and a need of 34,200-man once a year, or double the existing capacity.

During its fourth plenary session in Libreville in August 1975, the African Civil Aviation Commission (AFCAC) adopted a three-tier approach to increasing the manpower training capacities needed for Africa. First, small training units at the national level would be expanded in some African countries and established in others to provide primarily basic training needs in a variety of disciplines including initial pilot training. Second, two multi-national training centers would be established, one for the francophone states at Franceville, Gabon and one for anglophone states at Addis Ababa, Ethiopia. These training centers would meet what AFCAC

The title of the report is A General Plan for Meeting Civil Aviation Training Needs as Revealed by the African Manpower and Training Survey.

refers to as a serious difficulty in providing training, especially advanced training, for pilots and aircraft technicians for airlines. The AFCAC recognizes, however, that useful training facilities, especially for basic pilot training, already exist in both northern and southern Africa. Third, fellowship programs would be continued to meet the need for a residual of training requirements which are of a sufficiently specialized nature or required for so few candidates as not to justify the creation at this time in Africa of appropriate training facilities. Such subjects include air law, medicine, air transport economics, air line organization and similar highly specialized needs.

Many African countries will experience small residuals of training needs that cannot be met nationally by existing institutes or which do not meet the economic criteria for the creation of a training facility. The plan is for these training requirements to be absorbed in other existing national or regional training facilities. Where a country does not have a training facility for a discipline, then there is no alternative but to provide the training needed outside the country through fellowship programs.

Similarly, the multi-national training centers will not have the capacity to meet all of the needs for training in Africa in the disciplines for which the centers train. The residual training requirements are intended to be absorbed by national training units in various African countries.

The rationale for national training units is as follows:

- Satisfy national desires to determine, control and manage air-related training
- Maintain flexibility in organizing training courses to meet peak demands

- Allow for introduction of additional requirements at short notice and progressively to expand the available resources to keep pace with national developments
- Maintain the ability of governments to have direct control of trainees
- Avoid personal or cultural disturbances sometimes associated with training in other countries
- Reduce the impact of course failures
- Augment a nation's feeling of self-reliance and self-sufficiency
- Provide an opportunity for African countries to realize substantial savings over training abroad that can accrue where training needs for a discipline exceed the fixed cost of establishing a national training school and are within the capacity of the facility.
- Permit convenient provision of refresher training or training in new developments

The rationale for multi-national training centers is as follows:

- Very few countries have individual requirements high enough to justify the creation of their own national schools. Collectively, however, the UNDP/ICAO Manpower and Training Survey identified a need for 1,400 new pilots and 1,300 new aircraft technicians over the period 1974/75-1984/85. These requirements will in part replace expatriates and in part fill gaps created by the steady and continuing increases in civil aviation activities.

- Overseas training for African students is an alternative to multi-national training centers, but this would deny Africa the opportunity to play an active part in its own development; to create and foster its own skills; and eventually, to become self-sufficient in this type of training.

BOTSWANA: TELECOMMUNICATIONS DEVELOPMENT PLAN,
1977-1997 SUMMARY

The forecasts prepared as the basis of this study indicate that main telephone stations can reasonably be expected to increase from 6564 as at 1977, to some 13511 at 1984 and 36273 at 1997, giving penetration factors at those years of 0.94, 1.57 and 2.87 main telephone stations per 100 population respectively. By the year 2027, main stations are expected to be approximately 118,000, which can readily be accommodated within a 6-digit numbering scheme.

The national numbering scheme proposed will permit subscriber Trunk Dialing between exchanges having the necessary facilities. Each subscriber number will consist of two parts, the first part identifying the exchange to which the subscriber is connected and the second, the number of the subscriber within that exchange. When dialing a subscriber on the same exchange, only the second part of the number will need to be dialed, together with the trunk prefix.

The numbering scheme has considerable spare capacity to cater for any unexpected growth which might occur over the next fifty years.

For trunk charging purposes, it is proposed that the country is divided into four zones centered on Gaborone, Mahalapye, Francistown and Maun. Trunk exchanges will be located in each of those centres except that the trunk unit at Francistown will also handle trunk traffic to or from exchanges in the Maun zone initially. The routing plan accords with the charging plan, all local exchanges within the zone are connected to their parent zone centre which has direct routes to each of the other zone centres. Thus the most demanding trunk connection will consist of only three circuits in tandem, i.e., the circuit from the calling subscriber exchange to its parent trunk zone centre, the circuit to the zone centre on which the called subscriber is parented and the circuit between that zone centre and the called subscriber exchange.

Because the maximum number of tandem-connected circuits is limited to three, it is possible to use initially two-wire switching at both the local and trunk switching units, thereby enabling cost savings to be made at the trunk switching units. Eventually four-wire switching will be used in the trunk switching centres.

It is recommended that all international traffic is concentrated via an international exchange located in Gaborone. This would be a four-wire switching unit.

The transmission plan based on the above routing and switching proposals will afford nominal reference equivalent levels of 21 dB sending and 12 dB receiving.

The charging plan proposes that local calls are charged at a single rate irrespective of the time of day. Trunk rates will apply for all calls between zones, periodic pulse metering will be employed for this purpose in automatic exchanges.

A master development plan is included outlining development over the next 20 years and fully detailing proposed provision year by year up to 1984/85. The proposed investment totals some P 22 million up to 1984/85 and some further P 45 million for the period 1985-1997. The economic viability of the proposals has been analyzed and found to be satisfactory providing that the tariff increases proposed for 1978 are implemented. The analyses extend to include sensitivity checks of the estimated investment and operating costs and the necessary adjustment that would be required to tariffs indicated, should there be significant variation from the estimated figures.

Included in the master development plan are recommendations for the replacement of the existing vulnerable backbone microwave routes with protected systems which fully meet the necessary transmission performance standards. The improved performance in this part of the network will enable economies to be made in the lower sections of the network, giving overall cost savings.

The study proposes a revised organizational structure for both the Headquarter Office and the outstationed Service Area Offices. The main objectives of the revision are to provide a satisfactory infrastructure for handling work in a smooth, orderly manner throughout the planning, implementation and operational phases of a project, to ensure that the various elements of the proposed development programme proceed in a coherent, integrated manner, and to provide an enduring base for future expansion.

Source: International Telecommunications Union. Republic of Botswana Telecommunications Development Plan, 1977-1997. Report No. ITU/BOT/01/78. Geneva: ITU, 1978.

FREIGHT HOLDINGS LIMITED

FREIGHT HOLDINGS LIMITED

SPARE PARTS ORDER SHEET

SPARE PARTS ORDER SHEET

GMC PARTS ASTRO 95

SHEET NO 1
ORDER NO
DATE 28.6.78

SHEET NO 2
ORDER NO
DATE 28.6.78

NO.	PART NUMBER	DESCRIPTION	QTY	K	M
1	5199800	Liner Fit	500	100,000.00	
2	5199805	Ring Fit	500	30,500.00	
3	5199805	Ring Fit	250	18,750.00	
4	5199810	Gasket Fit	100	50,000.00	
5	5199810	Filters	1000	6,000.00	
6	FF.132	Filters	1000	5,000.00	
7	T.552	Filters	1000	5,000.00	
8	5114951	Liner	300	18,000.00	
9	5196319	Main BRG. STD.	500	10,000.00	
10	5196320	R/End BRG. STD.	800	16,000.00	
11	-	Main BRG. SI	500	10,000.00	
12	-	R/End BRG. SI	800	16,000.00	
13	-	Main BRG. SII	500	10,000.00	
14	-	R/End BRG. SII	800	16,000.00	
15	5199150	Piston	500	105,000.00	
16	5199153	Piston	500	35,000.00	
17	5112605	Thrust Washer	300	1,200.00	
18	5100071	Cylinder Head	200	260,000.00	
19	5198090	Seal	200	1,600.00	
20	5114335	Seal	200	2,400.00	
21	5190250	Washer	500	500.00	
22	5199806	Thermostat	100	4,000.00	
23	5113358	Thermostat	200	8,000.00	
24	5116779	Belt Set	200	3,000.00	
25	5195167	Valve	1600	24,000.00	
				1,742,950.00	

NO.	PART NUMBER	DESCRIPTION	QTY	K	M
26	5110941	Spring	1570	3,200.00	
27	5172217	Insert	800	2,400.00	
28	5109419	Guide	500	4,000.00	
29	9912457	Bearing	40	1,000.00	
30	5199800	Gasket Fit	200	9,000.00	
31	117411	Connector	500	500.00	
32	141743	Connector	500	500.00	
33	610000	Belt	100	1,600.00	
34	5177871	Fan Blade	30	4,500.00	
35	840815	Windscreen L.P.	100	10,000.00	
36	887859	Windscreen R.H.	100	12,000.00	
37	ALDISON HT 750 AUTO	TRANSMISSION	40	300,000.00	
38	1117225	Alternator	50	25,000.00	
39	111414*	Stator Motor	25	12,500.00	
40	5 28260	Injectors	200	30,000.00	
			2.1	935,200.00	
			1.	742,950.00	
			2.	515,000.00	
			TOTAL	1,181,150.00	

ADDITIONAL DATA

ADDITIONAL DATA

ZAMBIA: ZAMBESI RANCHING CORRESPONDENCE,
Ref: Telephones

ZAMBESI RANCHING CORPORATION LIMITED

TELEPHONE
TELEGRAMS
ZAMBESIA

BRANCHES AT
LUSAKA
MAZABUKA
CHOMA
KALOMO
ZIMBA

GENERAL MANAGER
P.O. BOX 95
MAZABUKA
PHONE 48/
TELEGRAMS
ZAMBESIA

CROP SECTIONS AT
LUSAKA
MAZABUKA
CHOMA

your ref
our ref GMD-16/295
please reply to MAZABUKA.

17th May, 1975.

The Regional Telephone Engineer,
P.O. Box 284,
LUSAKA.

Stm c.

Dear Sir,

TELEPHONES, LUSAKA, 719116 & 719129

In spite of repeated verbal requests from our Rietfontein Ranch Manager near Lusaka during the past four years and in spite of letters written to the Telecommunication Department from this office during the past three years, the above stated two telephones are still not working.

On the very few occasions that anyone from your department has been to repair the telephones and/or the line, they may have worked for one or two days and then gone dead again.

It is extremely important for me to keep in constant touch with our Rietfontein Ranch where we run two and a half thousand head of cattle and grow up to 400 acres of cash crops. The frustration and loss resulting from my having to travel 394 kilometers everytime I have to make contact with our Manager at Rietfontein is great indeed. Not to mention the loss we have incurred in not being able to contact Veterinary Surgeons in time and not having telephone access to Government Agricultural Departments, commodity marketing organisations and dealers in agricultural goods and machinery.

We ask that you permanently repair the telephones 719116 and 719129 and/or the line that goes to them so that we may continue to run this important Agricultural Estate with the use of the essential telephone.

Please let me know at your earliest convenience when this will be done.

*Reply to ADES
14.6.75*

2/.....

DEVELOP AND CONSERVE **ZRC**

ZAMBIA: DEPARTMENT OF CIVIL AVIATION - REQUEST FOR
CAPITAL AND TECHNICAL ASSISTANCE

LCA/106/2/7

Project or Commodity	Estimated Cost (K)	Remarks
<p>(A) <u>Replacement Of Equipment</u></p> <p>1. <u>Aerocom</u></p> <p>(a) 2 Radio Tele-type Transmitters (b) 1 Single Side Band Transmitter (c) Associated Receivers</p> <p>2. <u>WILCOX</u></p> <p>Very high Frequency Omnidirectional Range (VOR) and distance measuring equipment (DME)</p>	<p>120,000</p> <p>Cost not yet known</p>	<p>The Department has in service, to a considerable extent two makes of United States equipment. These are Aerocom and WILCOX.</p> <p>Aerocom equipment is used on VHF and UHF communications and non directional radio beacon (NDB). All the Aerocom equipment has given excellent service and must be given full marks for the following:-</p> <ul style="list-style-type: none"> (a) Reliability (b) Performance and (c) Ease of maintenance <p>The Department proposes to phase out ageing Radio Tele-type Transmitters and also replacing aerocomobile equipment with single side band (SSB) equipment. This is an ICAO requirement. Aerocom equipment would be preferred for both replacement schemes however of recent due to lack of foreign exchange it has not been possible for the Department to proceed with the above scheme and it has been difficult to obtain the very necessary spares. The Department would very much appreciate any assistance in procuring the above equipment.</p> <p>The Department has in operations four VORs and two DMEs all of which are manufactured by</p>

(B) <u>NEW EQUIPMENT</u>	Cost not yet known	<p>Wilcox. One of the VORs has been in service for over 20 years and is now due for replacement. While Wilcox equipment has given excellent service again the Department is coming up against frustration in being unable to obtain spares due to lack of foreign exchange. As an example the Lusaka International Airport DME has been out of service 4 months due to a burnt out Transformer in both the main and standby equipment. Similarly no standby facilities are available on the Ndola Airport VOR due to non-availability of spares.</p>
(a) 2 VORs Model 493A		
(b) 1 LME Model 406		
(c) <u>SPARE PARTS</u>	4,942	<p>To provide accurate navigational facilities there is a requirement to provide VOR equipment at Kasama Aerodrome. This would provide accurate navigational on the route Ndola-Kasama-Mbeya. Also a VOR to be installed at Choma to provide a navigational facility between Lusaka-Choma-Livingstone. Any assistance in the provision of this equipment would be greatly appreciated.</p>
Various spares as listed in the attached. "Memorandum of Spare Parts"		<p>As has been mentioned above the spares situation is desperate for the above equipment. As a matter of priority, assistance in obtaining spares can be greatly appreciated. The lists of outstanding spares for the existing equipment are attached for ease of reference.</p>
(I) <u>TRAINING</u>		
(a) Radio Engineering (2 per year for 3 years)	Not known	<p>The maintenance of all Wilcox equipment at present is completely dependant on expatriate radio engineers as training facilities are not available for local Zambia radio Engineers. Wilcox does have training facilities at the Wilcox International Air-Navigational Aids Training Centre located in U.S.A.</p>

(b) Air Traffic Control
Radar Directors Course
(2 per year for 5 years)

Not known

The Department has at present Zambia Radio Engineers who have had no specialised training on Navigational Aids supplied by Wilcox. It would be of great assistance if this training was provided through the Technical Aid Programme.

Each course is designed for three weeks duration.

At present the Department has only managed to train a limited number of Radar Directors due to limited places at institutions in the U.K. and Nairobi, Kenya, and also the limited training resources. Funds have been very limited and the training programme has been slowed down. It would be appreciated if sponsored training facilities in the United States could be made available, if not funds could be made available for training in the United Kingdom.

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