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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

BELIZE

PROJECT PAPER

RURAL ACCESS ROADS AND BRIDGES

AID/LAC/P-164

Project Number:505-0007

UNCLASSIFIED

PDAAP 157

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A = Add, C = Change, D = Delete — Amendment Number — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: BELIZE

3. PROJECT NUMBER: 505-0007

4. BUREAU/OFFICE: LAC/DR

5. PROJECT TITLE (maximum 40 characters): Rural Access Roads & Bridges

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 01 DD 01 YY 87

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)
A. Initial FY 83 B. Quarter 4 C. Final FY 84

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 83 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(5000)	(-)	(5000)	(5400)	(-)	(5400)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country	-	1720	1720	-	2050	2050
Other Donor(s)						
TOTALS	5000	1720	6720	5400	2050	7450

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN	220	061	-	-	-	5000	-	5400	-
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 720

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BS	TNG					
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

To increase the capability of the Government of Belize(GOB) to build, maintain and protect its rural access road infrastructure through training, technical assistance, and equipment procurement.

14. SCHEDULED EVALUATIONS
Interim MM 01 YY 85 MM YY Final MM 02 YY 87

15. SOURCE/ORIGIN OF GOODS AND SERVICES
☐ 000 ☐ 941 ☐ Local ☐ Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

17. APPROVED BY
Signature: Neboysha D. Brashich
Title: Neboysha Brashich, AID Representative
Date Signed: MM 01 DD 09 YY 84

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM 09 DD 13 YY 83

AID 1330-4 (8-79)

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D C 20523

THE ADMINISTRATOR

PROJECT AUTHORIZATION

Name of Country: Belize

Name of Project: Rural Access Roads and Bridges

Number of Project: 505-0007

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Rural Access Roads and Bridges project for Belize involving planned obligations of not to exceed Five Million Four Hundred Thousand United States Dollars ($5,400,000.00) in grant funds ("Grant") over a one year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of the project is three years and three months from the date of initial obligation.

2. The project ("Project") consists of assistance for reconstruction, rehabilitation and maintenance of rural access roads and bridges.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Grant shall have their source and origin in Belize or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have Belize or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the grant shall be financed only on flag vessels of the United States or countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing.

b. Conditions Precedent to Disbursement

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, other than for technical assistance, the Government of Belize (GOB) shall, except as A.I.D. may otherwise agree in writing:

(i) Cause to be prepared, in consultation with A.I.D. and submitted to A.I.D., in form and substance satisfactory to A.I.D., the following:

(a) A plan for the deployment of personnel from the Ministry of Works (MOW) to participate, for the duration of the Project, in the Construction/Rehabilitation Training Unit;

(b) A plan for the assignment, for the duration of the Project, of counterpart MOW personnel to the Project's technical assistance specialists.

(c) A set of criteria to be used for selecting specific roads for reconstruction or rehabilitation;

(d) A plan for collecting baseline data for the post-project evaluation of changes in agricultural production in Project areas.

(ii) Establish, in consultation with A.I.D., a District Level Maintenance Office in each District of Belize and, in connection therewith, prepare and furnish to A.I.D., in form and substance satisfactory to A.I.D., a plan for the operation of these maintenance offices that

(a) assures the continued maintenance of the roads and bridges repaired, rehabilitated, reconstructed or maintained during the course of the Project;

(b) contains an organizational design;

(c) identifies the financial resources and equipment allocated for the implementation of the Project.

(iii) Cause to be established and staffed within the MOW a permanent Office of Planning and Budget which will operate as counterpart to the Management Improvement Component of this Project.

c. Other Condition Precedent

Prior to the disbursement, or the issuance of any commitment documents for the reconstruction of any particular roa segment, the GOB shall, except as A.I.D. may otherwise agree in writing, prepare and furnish to A.I.D., in form and substance satisfactory to A.I.D. a detailed engineering plan for that particular road segment which shall incorporate A.I.D.'s construction and environmental protection standards for gravel surfaced all-weather rural access road construction as outlined i the A.I.D. October 1980 publication entitled "Environmental Desig Considerations for Rural Development Projects."

d. Covenants

The GOB covenants that, except as A.I.D. otherwise agrees in writing:

(1) Roads selected for reconstruction, rehabilitation or maintenance under this Project shall be identified by means of criteria to be developed under Condition Precedent No. (i)(c).

(2) The GOB will, after the completion of the Project, provide adequate funding levels for the District level Maintenance Offices to continue to carry out maintenance operations.

(3) The GOB will assure the continuing operation of the MOW Office of Planning and Budget by establishing a routine budget line item for the duration of the Project and beyond, which provides adequate funding levels for the operations of this office

(4) Roads in and through designated national parks, forests, wildlife reserves, and other recognized ecologically sensitive areas will not be reconstructed with resources from this Grant.

(5) Mayan ruins or other archaeological sites will not be used as a source of construction material or in other ways destroyed or damaged in the process of implementation of this Project. The Commissioner of Archaeology, Ministry of Trade and Industry, will assist the GOB in the identification of appropriate sites for borrow pits, gravel pits and deposits or sources of construction materials.

e. Waivers

1. Competition in the procurement of goods is hereby waived and a single-source negotiated contract is hereby authorized in order to permit the procurement of approximately 14 items of Caterpillar heavy equipment in the approximate value of $1,600,000.

2. Competition in the procurement of goods is hereby waived and a single-source negotiated contract is hereby authorized in order to permit the procurement of approximately 25 Ford trucks with a value of approximately $870,000.

M. Peter McPherson
Administrator

9/29/83
Date

Clearances:
A/GC:JMullen Date 9/29/83
A-AA/PPC:RDerham Date 9/29/83
A-AA/LAC:MDBrown Date 9/29/83

GC/LAC:PJohnson/gw 0083A/Ext. 632-3272/9-23-83

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I. Summary and Recommendations

A. Recommendations

The AID Mission to Belize recommends authorization of a grant of $5,400,000 to finance the Rural Access Roads and Bridges Project (505-0007).

B. Project Summary

The Grantee will be the Government of Belize (GOB). The implementing agency will be the Ministry of Works (MOW). Through the technical and financial resources provided under this grant, the GOB will be able to improve its performance in the areas of rural access road construction, rehabilitation, and maintenance. It will achieve this improvement by means of training its technical, managerial and laboring workforce, development and adoption of appropriate management systems and procurement of new capital equipment. The ultimate goal of this project is to increase Belize's agricultural production through the rehabilitation and maintenance of all-weather rural access roads and bridges. Its purpose is to increase the capability of the GOB to build, maintain and protect its rural access road inventory through training, technical assistance, and equipment procurement.

Project inputs will include technical assistance, training, equipment procurement, and institutional development support for strengthening the capability of the MOW to discharge its rural access road construction and maintenance responsibilities. By the end of the project, it will have assisted in substantially improving the all-weather access of Belizean farmers to markets, sources of necessary agricultural inputs, and basic human services, thereby enhancing the prospect of expansion of the agricultural sector in Belize.

C. Project Issues

The following are key issues for consideration as identified by the Project Development Team during project formulation:

1. The appropriateness of the Mission's choice of PSCs rather than a consulting firm for provision of technical assistance;

2. The likelihood of permanent MOW program changes, particularly those related to the rural access road maintenance function;

3. The availability of sufficient and satisfactory heavy equipment and bridges through Excess Property channels; and

4. The rationale for and adequacy of the project implementation schedule.

D. Project Development Team

Neboysha R. Brashich, AID Representative to Belize

Robert O. Otto, LAC/DR/CAR Loan Officer

Alex Powers, Consulting Engineer

Nigel Rockliffe, Consulting Economist

Richard R. Wilk, Consulting Social Scientist

II. Project Background and Rationale

A. Background

1. Economic Overview

Belize is a central American country of about 20,000 square kilometers (5.7 million acres), with a very low population density. The population of 150,000 is evenly split between rural and urban areas, with more than a quarter of the population living in Belize City. While this city retains its British Colonial heritage and is predominately English-speaking, the rest of the the country is ethnically diverse, and a majority of the rural population speaks Spanish as a first language.

During early Colonial times Belize's economy was based on export-oriented extractive industry, with forestry dominant. Rural infrastructure and interest in agriculture remained underdeveloped until quite recently, and the population has depended heavily on food imports. With no mineral resources or other basis for heavy industry, and a limited potential for light industry, agriculture offers the greatest potential for both import substitution and export diversification.

Boosted by sugar exports, the Belizean economy performed well in the 1970's, with an annual average growth rate of five percent. Decline or stagnation in world prices for major export commodities has led to a sharp decrease in the rate of economic growth since 1980, with only a 1% growth in GNP in 1981. All of the major export crops - sugar, citrus, and bananas - face serious production and marketing problems, while still accounting for about 60% of total exports. At the same time, foodstuffs account for 27% of the total import bill.

A number of factors make agriculture a priority sector for further development. The large import of food means that there is a potentially large domestic market available. Many of the rural Spanish-speaking, Mayan, and Mennonite people have a long tradition of agriculture, already own land, and are eager to increase their income. A small sector of rural entrepeneurs, already involved in wholesaling and transport, is poised for expansion. The government of Belize has made agriculture a priority, and is currently involved in infrastructure development, including a revamping of the extension service under a plan developed by the Caribbean Agricultural Extension Program. USAID is implementing a livestock development project, with swine, beef and dairy components, and has targeted agricultural diversification and the development of new export crops as future priorities.

2. Constraints on Agricultural Production

Production of the major export crops of sugar, citrus and bananas has stagnated or declined in recent years due to management problems, lack of capital, and soft world markets. Production of livestock and foodstuffs for domestic consumption has been hampered by inefficient management of the government marketing board (which handles the corn, rice, and bean crops as well as feeds and agro-chemicals), lack of modern farm inputs and shortage of capital. The population remains dispersed over a large area, poorly served by transport and communication networks, causing problems both for the flow of agricultural products out of rural areas, and the flow of market information, training, credit, seed and chemicals to the farmers. With unreliable markets, and sporadic access to improved technology and crop inputs, most Belizean farmers outside of the sugar and citrus areas continue to produce largely for their own subsistence, with some surplus for sale. For many, farming is a part-time occupation, providing food to complement cash earnings from wage labor.

Slash-and-Burn farming (the milpa system) is the predominant cropping system, with fallow periods ranging from 5 to 15 years. As long as the farmer has abundant land available, this method provides high yields with little labor input. Most of the corn, beans and rice grown in the country come from milpas. While this method is highly productive and can be used on hilly terrain and marginal land, it can support only very low population densities, because most of the land must lie fallow at any one time. Milpa farmers therefore tend to disperse in small villages, hard to reach with roads, and expensive to support with social services. Milperos are reluctant to adopt capital intensive mechanized farming techniques, and tend to remain just above subsistence level.

The GOB has indirectly encouraged milpa farmers to expand into new areas of land and continue their way of life, through its lands policies and by building new roads to serve milpa farming villages. Landholders with large undeveloped tracts often rent

plots to milperos for a nominal fee, and leases on small areas of government land are easy to obtain. Squatting is also common. By continuing to build crop roads into new milpa areas, the government is in effect practicing its own form of "shifting cultivation"; prompting farmers to clear and plant new areas of forest through the construction of new (and temporary) roads and then (by failing to provide necessary road maintenance) allowing those roads to deteriorate to impassibility) prompting farmers to move on to new areas when new areas are opened by still more new and temporary roads. The result is destructive to the remaining areas of virgin forest, and is a constant strain on government services and the ability of the MOW to provide minimum standard road service to the nation.

If Belizean farmers are to adopt more intensive modern farming methods and are to produce for the market and not for subsistence alone, milpa farming must be discouraged, and investment in land improvement must be promoted. This has already happened in several areas of the country, and the main cause has been the construction of high-quality all-weather roads. A good all-weather road provides a number of incentives for farmers to settle down and intensify their farming efforts; most important are access to markets for produce, improved education, health services, and technical inputs. Rises in land values along good roads also promote stability of settlement and land improvement. Where GOB has built major highways and adequate all-weather feeder roads, population has increased and cash crop production has risen markedly during the last ten years (as in Cayo, Orange Walk and Corozal Districts). Where roads remain inadequate, and passable only during the dry season, population remains dispersed and at subsistence level. Table 1 shows that during the last ten years the population of villages with adequate roads has increased rapidly, while those served by poor roads or foot-paths has increased at a much slower rate. The farmers' response to road improvement is clear cut.

Table 1. Change in Population and Settlement by Road Quality

	Population		
	1970	1980	% Change
Villages served by main highways	15,796	26,790	41.0
Villages served by high-quality feeder roads	5,926	8,848	33.0
Villages served by inadequate feeder roads	20,142	28,355	29.0
Villages without roads	2,231	2,912	23.4

It is often said that Belize's main agricultural resource is its huge area of untapped arable land. While it is true that large areas of forest remain, much of this land is rugged and of marginal fertility, and can only be developed at high cost. Most of the large areas of level fertile land have already been settled (having been sought out by milperos), but remain underpopulated and inadequately developed because of poor road access.

It must be remembered that the Belizean agricultural population is very small and thinly scattered. The high costs of providing services to scattered rural settlements has been prohibitive. From a long-term land use planning perspective, government should pursue a policy which encourages more intensive use of areas already settled, rather than opening up new marginal lands to milperos. The improvement of the existing rural road system will be a crucial step in this development, while the construction of many new roads would retard progress in this direction.

3. Existing Road Network

The Ministry of Works has not developed a coherent policy or program for the construction and maintenance of Belize's road network. The present system, according to MOW figures, includes 272 miles of primary paved road which connect Belize city with four district towns, the capital city (Belmopan), and international borders with Mexico and Guatemala. Major improvements to these roads in the last ten years have been funded by the UK. More than 40% of the rural Belizean farming population lives on, or close by these paved roads, which are used for farm transport.

MOW also lists 898 miles of gravel and marl roads, including the Southern Highway to the Toledo District, as well as access roads connecting villages to primary roads, and a number of farm roads. There is also a large, but unmeasured mileage of publically and privately built unimproved tracks, bulldozer passes and logging roads, which are seasonally passable at best. Maintenance on unpaved roads varies considerably, with the most attention paid to the Southern Highway and village access routes in the sugar districts of the North. Conditions vary seasonally, with many roads only intermittently usable during the rainy season (June to September), and passable only at slow speeds the rest of the year. Rather than operating on regular maintenance schedules, the MOW performs mostly emergency maintenance, when a road becomes totally impassable or a local political representative calls attention to problems. Transport in rural areas therefore remains above all unpredictable, and farmers cannot operate in the sure knowledge that crops can be brought to market, or seed carried to farms.

For the purposes of this project, the Project Development Team, aided by MOW District Road Superintendents, classified Belize's existing road network into three categories (as per Table 2).

First are 'Highways'; major paved or unpaved arteries which are reasonably well maintained and heavily used. 'Existing Good' roads are rural access roads which are maintained to adequate standards, are passable throughout the year, and do not require major reconstruction in order to be maintained according to technical standards. The last category, 'poor' roads, includes rural access roads which connect villages to highways, existing good roads, or other villages on a route to the highway. Roads in the 'poor' category are candidates for rehabilitation under this project. (Farm access roads were not included in the listing in Table 2; only roads which serve settlements of more than 50 peoplewere included).

Table 2. Road Quality and Mileage by District

District	Highway	Existing Good	Poor
Corozal	46.0	12.5	116.0
Orange Walk	58.0	15.0	71.0
Belize	47.0	16.0	72.0
Cayo	84.0	24.5	68.0
Stann Creek	92.0	17.0	63.0
Toledo	53.0	7.0	44.0
Total	380.0	92.0	440.0

4. Ministry of Works

The MOW currently employs about 450 mangerial, professional, and field personnel. Major administrative offices are in Belmopan, as is the major maintenance yard for equipment. Each district has a MOW office and equipment pool, which varies in quantity and quality from district to district. Minor equipment maintenance is done at the district level, while major jobs must be sent to Belmopan. While MOW has recently attempted to decentralize its management, Belmopan and local political representatives still have a major influence on weekly work schedules and procedures at the district level.

MOW has historically placed greater emphasis on new road construction than on maintenance of existing roads. Recently, private contracts have been granted for some new road construction, but maintenance still lags, and is largely ineffective due to poor planning, lack of trained personnel and suitable equipment, and the necessity for 'emergency patching' rather than regularly scheduled activity. Essentially, field personnel are rushed from problem to problem, with no time for preventative maintenance. The existing MOW strategy seems to be one of returning the road to passibility each time an emergency maintenance activity is done. This is a very expensive and inefficient way to manage the road inventory. The result is that most existing rural access roads have deteriorated to the point where total reconstruction is needed and routine maintenance

operations are impossible.

5. Other Donor Activities

MOW has underway several activities with other international donor agencies. They are currently working with resources from the United Kingdom and the World Bank primarily on construction, rehabilitation and maintenance of the country's primary road system. The current U.K. project includes:

-- Construction of a Northern Highway alternate route

-- Supplemental funding for primary roads maintenance;

-- resealing 33 miles of pavement on the Western Highway;

-- delivery of 80 pieces of equipment used on the Northern Highway project and rebuilt with British Development Division financing; and

-- the rebuilding of portions of the Southern Highway.

The recently signed loan agreement with the World Bank will provide for added resources to finance the rehabilitation and maintenance of primary roads which have deteriorated to the point where routine maintenance is no longer effective. It includes:

-- the rehabilitation of about 43 miles of paved roads;

-- drainage improvements to 65 miles of the Southern Highway;

-- rehabilitation of 11 bridges; and

-- financing certain preliminary improvements to the MOW's road maintenance management system, totalling US$ 350,000, for technical assistance for primary road rehabilitation, parts for disabled MOW equipment, and the establishment of a system of reporting and data collection at the Ministry level.

B. Project Rationale

The rural access road inventory of the Belizean MOW is, by and large, deteriorating to a degree and at such a rate that it presents an obstacle (not an asset) to rural development initiatives. Improperly built and not properly maintained key road segments wash out during the rainy season and must join a long queue of other roads, including the country's primary roads, which need immediate, emergency priority attention.

The MOW does not practice any routine, scheduled maintenance on its rural road network. There are no offices, divisions, branches, or any other organization entities responsible for such work. The MOW is in a vicious cycle of trying to provide emergency repairs, on a holding action basis, to the nation's inventory of deteriorating rural access roads. Virtually all the

resources of the MOW Roads Department are working on emergency road repairs on a full-time basis. Further, the Project Development Team, having visited five of six MOW District offices, did not find any operating plan, budget, or timetable related to rural road maintenance. Current practice for the MOW is to build rural roads upon request, infrequently perform minimum surface dressing of the roadway and occasional brush removal either by hand or "bush hog". (No routine ditch cleaning or culvert clearing is attempted.) As the condition of the roadway deteriorates to the point of impassibility, crews with trucks, loaders, and graders are dispatched to essentially rebuild those portions of the road which are impassible.

The MOW often has difficulty responding to even emergency work requirements because of equipment failures. Each District has a long list of equipment that is deadlined because of their inability to get replacement parts, equipment abuse by poorly trained operators, inadequately trained mechanics, age of the equipment and "cannabilization" for parts for other equipment.

The proposed Project will improve MOW's management of its limited equipment and manpower resources through improved operations planning and budgeting, technical training for its personnel, improved road construction practices, and improved road and equipment maintenance processes. Without these inputs, the MOW will continue to maintain and repair its aging equipment fleet on a haphazard basis at high cost to the GOB. It will continue to provide high cost emergency repair services to rural access roads, and it will never be able, with its limited resources, to stay abreast of the problem of maintaining the rural access road inventory, a capital resource that should be an asset to the GOB's plans for rural and agricultural development.

III. Project Description

A. Project Goal and Purpose

Goal: To increase Belize's agricultural production through the rehabilitation and maintenance of all-weather rural access roads and bridges.

Purpose: To increase the capability of the GOB to build, maintain and protect its rural access road infrastructure through training, technical assistance and equipment procurement.

B. Statement of Objectives

In order to fulfill the goal and purpose given above, this project has set a number of objectives to be achieved through implementation of this Project. They include:

-- Rehabilitation of 300 miles (or 27%) of Belize's rural roads.

-- Reduced costs per mile for rural road maintenance by 33%.

-- Reduced costs per mile for rural road construction by 50%.

-- Training of over 150 foremen, equipment operators and laborers in rural road construction and rehabilitation.

-- Training of 100 road maintenance workers.

-- Training of 75 equipment shop mechanics and allied tradesmen.

-- Establishment of an improved internal management and control system for the MOW.

-- Establishment of a permanent, national system for the maintenance of Belize's rural road system.

-- Preparation of a national rural access road inventory.

C. Project Outline

The Project will be comprised of components whose collective purpose is the improvement of the Ministry of Works' capability to construct and maintain Belize's rural access roads. The components are as follows:

1. Construction/Rehabilitation Training Unit (CRTU)

This project element will combine a training program for rural

road construction and rehabilitation through on-the-job experience for MOW foremen, equipment operators, technicians, and laborers. While the training process moves forward over the life of the project, approximately 300 miles (or 27%) of rural access roads in all six MOW Districts of Belize will be rebuilt to standards such that they can be effectively and economically maintained for all-weather use. Two units (or "spreads") of equipment equipped to undertake sustained road construction and rehabilitation activities will be procured by project funds. MOW operators, laborers and foremen, accompanied by a AID-financed PSC road specialist, will "man" the spreads.

Each spread of equipment will be equipped with four dump trucks, two road graders, a roller/compacter, one bulldozer, and miscellaneous support vehicles. Directed by a Grant-funded Road Specialist and an MOW Road Construction Foreman, the spread will be staffed in all positions by existing employees of the MOW, including equipment operators, laborers and drivers.

Roads for reconstruction will be selected on the basis of criteria which will assure that the highest priority for reconstruction treatment will be given to those roads which connect existing communities with paved or otherwise "primary" roads or market places and roads which serve areas with good general agricultural potential. Selection of the actual roads to be reconstructed will be made on the basis of these and other criteria and in consultation with the AID Representative to Belize and the Minister of Works. The spreads will be used for training in and for each of the six Districts.

At the end of the Project and through the process of rebuilding these roads, MOW personnel will be exposed to and have learned proper operating routines, construction standards and practices, equipment maintenance routines and effective job-site management.

2. Road Maintenance Training Unit (MTU)

The MTU will address the MOW's inability to effectively maintain rural access roads. It will institute a regularized approach to District-level rural access road maintenance through reorganization, planning, budgeting, road maintenance equipment procurement, and technical assistance.

The MTU will begin with technical assistance to the Districts and MOW headquarters to lay out a plan for rural road maintenance. This plan, to be linked with the World Bank-funded primary road maintenance training program, will include the identification of roads to be maintained, personnel to be assigned to the MTU, budgetary requirements for operations, equipment needs for the Unit, and official establishment of a road maintenance function within the MOW. Following planning activities, equipment will be procured to outfit the training unit to established requirements. The two Road Specialists from the technical assistance team will provide managerial oversight, technical assistance, and training.

Each of the six District MTUs will have a complement of equipment including one Grant-funded maintenance grader, one Grant-funded small tractor with brush clearing/mowing attachment, one Grant-funded dump truck, and one light truck. Each Unit will also have a roster of MOW personnel including a crew chief, truck drivers, tractor and grader operators, 5 laborers, and assorted hand tools provided by the MOW District Office;

The MTU will follow an operating program and calendar which will specify the location and amount of roads to be maintained. Personnel and equipment will be dedicated to maintenance activities. Ancillary equipment not directly attached to the MTU including tankers, loaders and bulldozers will be provided on an as-needed basis from MOW District shops.

At the end of the Project, all Districts will have road maintenance units that are fully equipped, trained and experienced in routine rural access road maintenance activities. Equally important, the MOW will gain a valuable institutional experience in planning, budgeting for,and managinga scheduled, comprehensive road maintenance service.

3. Management Improvement Component (MIC)

This Project component will provide the MOW with technical assistance to aid them in developing an operations programming and budget planning capability. A Management Specialist, working with the Project Manager, Deputy Project Manager, the Minister, MOW, Permanent Secretary, Works Superintendent, Chief Engineer and a newly created MOW office of planning and budget, will define a framework for a five year plan of operations coupled with a five year projection of capital and operating costs. With this information base, the MOW will be better able to make decisions concerning road development plans, equipment repair and replacement, manpower requirements and costs of operations.

Work to be accomplished includes the definition of a planning framework appropriate for the MOW, training in reporting and data analysis processes, and preparation of the first and second iterations of the Plan. Planning activities would be fully coordinated with the management-focussed activities of the World Bank project, which address those aspects of management that are more oriented toward weekly and monthly operations. In addition, the MIC will prepare a national inventory of rural access roads which will aid in the preparation of the operating plans of the District road maintenance training units.

The Grant-funded Management Specialist will work for a period of two years to design and implement the new management systems, organize the new office of planning and budget, train MOW personnel in data base management, data analysis, planning, programming and budgeting. As counterpart to the AID technical assistance, the MOW will establish, staff and finance the office

of planning and budgeting. With a staff of three professionals and para-professionals, this new office will be made a permanent function within the Ministry's organizational structure. It will house the World Bank-financed microcomputer and take on the responsibilities of data collection and reporting financed initially under that project, thereby assuring a continuing MOW capacity for maintaining an ongoing reporting, programming, budgeting and control capability.

4. Equipment Maintenance Component (EMC)

The EMC will provide MOW District workshops with technical assistance and training to enable them to improve District-level equipment maintenance and repair operations. A Grant-funded Equipment Maintenance Specialist will work with District workshop mechanics and allied tradesmen to develop and implement a preventive maintenance schedule for equipment, train mechanics and operators in first and limited second eschelon repairs, and help to organize the Districts' toolrooms. These activities will help to improve workshop effectiveness, lower repair costs, reduce time spent by equipment on "deadline", and reduce the frequency of equipment "cannabalization.

In addition to technical assistanceand training,the EMC will provide for the procurement of a small amount of shop tools and equipment, such as master mechanic sets, welding equipment, hoists, air compressors and the like to supplement the Districts' limited inventories. Where necessary, training in shop equipment use will be provided.

IV. Project Analysis

A. Technical Analysis

Most of the MOW's existing equipment is of US-made Caterpillar with a sprinkling of British Berford. The Ministry is attempting to standardize its light vehicles around the Ford brand and its heavy equipment around Caterpillar to reduce spare parts problems. Procurement and management of spare parts is a special problem for the MOW. A small amount of technical assistance is being provided under the recent World Bank loan to address this problem through techanical assistance for the development of proper control, storage and retreival systems for the MOW's main parts depot in Belmopan.

According to MOW officials, eighty percent of their equipment fleet is five or more years old and forty percent of the fleet is at least ten years old or older. (The actual age of the fleet may be somewhat younger because the Ministry tends to carry on its books a lot of older equipment which will never run again because of excessive "cannabalization" for spare parts. A current effort to rationalize the fleet by scrapping some of the older pieces

should help to clarify the situation.) Last year MOW purchased a fleet of replacement Seddon-brand dump trucks from the UK to help upgrade their fleet, further standardization around that make and model and take advantage of low cost UK government financing. Currently, they are having a serious problem with long delays for procuring spare parts from England. They express the desire to standardize around US-made equipment because of the relatively easy and rapid access to spare parts.

District-level operations are modest in scope. The main shop in Belmopan is the principal repair facility for the MOW. District shops are generally very poorly equipped with parts, tools and equipment. Mechanics are made to use inappropriate tools and equipment when making repairs because they are not properly supplied for their job and/or tools have been lost or stolen. The World Bank-financed road project will provide a small amount of technical assistance in the area of equipment maintenance. However, this assistance will be focussed on the main shop in Belmopan.

The MOW's responsibilities toward the national road network is total, with all responsibility for building and maintaining primary and rural access roads as well as farm access tracks such as those leading to the sugar cane fields in the northern Districts of Corozal and Orange Walk. They have serious problems with executing their responsibilities because of the limitations on their equipment inventory, the need for training in proper and efficient construction techniques, and the large proportion of substandard road segments in the network. MOW must spend most of its manpower and equipment resources on fixing areas of roads where no drainage was installed, poorly designed and inadequate bridges that wash out with each significant rainfall, shoulders and ditches were left to grow back to brush, and the wear surface was not properly compacted, replenished or otherwise maintained. Almost the entire work-week for a typical District office of MOW is comprised of responding to problems of washed-out road segments, pot holes and flooding which renders the road impassible to all but four wheel drive vehicles. Because their equipment fleet is down for repairs so much of the time, MOW typically can not field more than one spread per District.

The Ministry needs several inputs to help it bring its operations up to the standards dictated by the task. First, they need to improve their equipment fleet. It is old, worn out, and, in many instances, beyond its useful life. Secondly, it needs to overhaul its management systems, particularly with regard to record keeping, equipment repair facilities, budgeting, and internal control. Thirdly, it requires the development and implementation of a work plan for road maintenance and construction for its District offices. At present, they have none. They need technical assistance and training to transfer the proper standards and techniques for construction and maintenance of rural access roads.

This training and technical assistance should not be provided

through the construction of more new roads. At present, they can not adequately maintain their existing network and the addition of more roads would just make the problem with existing roads worse by distracting attention from the fundamental problems of access and egress from existing farming settlements.

B. Administrative Analysis

The Belizean Ministry of Works, the Project's implementing agency, is organized along a mixed functional and geographic structure, with its central office and workshop in the capital city of Belmopan. It is split into Roads, Bridges and Buildings Departments, of which the Roads Department is the most prominent in terms of budget and size. The Ministry is headed by a Minister, Deputy Minister (both elected Representatives with appointments to this post), a Permanent Secretary, a Works Superintendent, and Chief Engineer.

The geographic subdivisions of the MOW include six District offices in Punta Gorda, Dangriga, San Ignacio, Belize City, Orange Walk and Corozal. The following are characteristics of the District offices:

Authority: Each District office has a complement of equipment nominally under its control and between 65 and 85 employees, including clerical workers, mechanics and laborers. District offices have the responsibility to perform first eschelon maintenance on the equipment assigned to them. No commitment to work plans are given or even possible due to a high level of political involvement from Representatives desiring constituent services on a priority basis.

Reporting: District offices submit monthly reports to MOW on manpower, operations of the past month, and status of equipment.

Personnel: Districts have the authority to hire open code (non-civil service) personnel as needs arise and budget permits. They are usually overstaffed in key positions such as equipment operators. Currently, no hiring of additional personnel is allowed by the Ministry, although there is the possibility of shifting of personnel between Districts to fill vacancies.

Controls: Procurement of parts with a cost exceeding Bz$1000 must be approved by the Ministry of Finance in all cases. The process is time consuming and involves a certain amount of "second guessing" on the part of the Ministry of Finance as to the actual need for and/or desirability of parts purchases and equipment rehabilitation. It is not uncommon that shortages of available resources and foreign exchange bar the timely purchase of needed spare parts, leading to the "deadlining" of key equipment pieces for six months and longer.

The Minister of Works has control over work schedules throughout the MOW system. Belize is a small country whose elected

Representatives take very seriously their responsibilities for constituent service. This service extends to the point where political pressure will be effectively placed on District offices to drop scheduled activities such as road rehabilitation and maintenance to perform emergency repairs and new construction in far-flung sites of the Districts. While this form of service is certainly appreciated by the receipients and the respective Representatives, it utterly destroys the capability of the MOW to perform its delegated functions of road construction and maintenance by mincing any work plans that the Ministry might devise. (Solving this problem of scheduling Representatives' requests for constituent service will enable the MOW to control its costs of operation and proceed with rational management planning and resource allocation.)

However, it would appear that even this level of responsiveness is not satisfactory to the Public. Evidence of this fact is seen in the creation of special operations in several of the Districts. The Cayo District has assembled a "Cayo District Grain Unit", and the Belize District has a seperate unit, reporting to the Minister, identified as "Unit A". These units do not represent additional equipment and manpower resources. Rather, they are more of a means of collecting the better equipment into units that can respond to public and political demands. The Units do not actually improve the capability of the District to discharge its responsibilities. Rather, their responsiveness may be enhanced somewhat at a cost to general maintenance functions.

Approaches to addressing this problem would appear to require that the MOW break its cycle of chasing potholes and adopt a regularized work plan which is complemented by an analysis of the cost consequences of decisions to construct, reconstruct, or maintain its rural road system. (At the present time, there is no way that the MOW can quote accurate figures for any of these operations. No cost analysis is used as the basis for decision-making.) The MOW should adopt a five year rolling program whereby it could begin to focus on priorities, forecast budget requirements and prepare itself for lower cost operations in the future. Such a program should include an analysis of future fleet maintenance and replacement requirements for the program's time horizon, required road maintenance expenditures by fiscal year, and projected new construction activities and their costs. Only against this background can the MOW hope to begin to control its costs of operations and begin to render the service it is assigned to provide.

The proposed Project would provide the technical resources and the policy basis for undertaking such a sweeping change to its current process of "management by exception". The Project would, through its technical assistance component, provide the guidance for the preparation of the program. At least some stimulus for implementing the programming process will be provided by the Project's condition precedent to disbursement for equipment. Further, the Project will act as a catalyst for the redrafting of the District offices' organizational charts. This Project, along

with some elements of the World Bank project, have placed emphasis on the importance of organizing and supporting a distinct road maintenance function within the Ministry. In response to discussions with the Minister of Works, the Project Development Team was told that the Ministry would reorganize the District offices into maintenance units in the near future. This Project will reinforce that proposal by inclusion of a covenant in the Project Agreement that assures the formation and continued funding of such a District-level entity.

C. Economic Analysis

1. Summary of Results

Most rural road projects are justified on the basis of an increase in farm income resulting from higher farm gate prices and increased production that follows road improvement, be it a major upgrading from an oxcart path or no path at all to the elimination of bottlenecks and general upgrading of non-all weather roads. These agricultural benefits are important for this project as well. However, as noted in earlier sections, unlike other rural road projects, the immediate impact of this project will be the improvement, at an almost 80% reduction in government expenditure, in the maintenance of the village to market roads currently inefficiently maintained at a high cost by the MOW. Thus, with existing agricultural data sparse and of questionable reliability, the economic analysis applied to this project concentrated on cost savings to the MOW and to transportation rather than on the more usual increase in income arising from increased agricultural production. These cost reductions plus the transportation cost savings to road users (presumably transporting essentially farm products) alone more than justify the project's expenditures. Applying the usual "with" and "without" project cash flow analysis over a twelve year period produced an internal rate of return of 21%. Including production effects obviously would make the results even more robust. Sensitivity analysis was then applied to three key variables producing the original 21% IRR figure.

The sensitivity of the IRR results to changes in these variables was tested by determining how much change was required in a key variable to reduce the IRR to 15% (while all the other variables including the other two key variables were held constant). This sensitivity analysis indicated that the results would still be robust at the 15% IRR level even if: (1) the "without project" road maintenance cost was 25% lower at Bz$ 4100 (thereby reducing the difference between the "without" and "with" project maintenance cost figures and lowering the benefits), or (2) the cost of maintaining the roads as a result of the project (the "with project" case) was more than 50% higher at Bz$ 3400 (again reducing the difference between the "with" and "without" project maintenance cost figures and thus lowering the benefits), or (3) the average daily traffic was about 50% less at 14.5 vehicles per day (thereby lowering the transportation cost savings that could be realized).

Based on the small impact of the above rather large changes in any one of the key variables of the IRR, and with thte realization that not all benefits were quantified, especially increases in agricultural production, the Mission concluded that the project not only would produce at least a 15% IRR, but in fact would most likely produce an IRR considerably larger than 20%. The methodology utilized to obtain the IRR and the detailed results are provided below.

2. Methodology Employed

A. Scope of Project

The project affects all rural access roads in Belize that are in poor enough condition to benefit -- 440 miles serving 28,355 people in 89 villages, or roughly 58% of MOW feeder roads (760.7 miles). Section D below explains how those roads were identified. At the end of the project, the rehabilitation process will have raised most if not all the 440 miles of road to all weather status and will have produced a maintenance capability for keeping the roads at this level in the future.

B. Shadow Prices, Opportunity Costs and Project Length

Shadow prices were not necessary because received prices represent economic costs and benefits with sufficient accuracy. Tradables such as plant and fuel have already been valued at their border prices net of all taxes, since no duty is charged on AID-provided inputs or fuel purchased by MOW. No allowance is needed for the shadow rate of exchange because the GOB incurs no foreign exchange expenditures that are not reimbursable by AID. Although the shadow rate for unskilled labor in Belize may be less than the market wage, the difference appears to be small, and unskilled workers' wages are a small part of project expenditures in any case - less than seven percent during the first three years, assuming that half of local labor is unskilled. There are no studies of shadow wages in Belize. However, the fact that the urban unemployed do not take up farming on virtually free land indicates that their reservation wage is high.

For purposes of the analysis, we have assumed that the opportunity cost of capital is 15%, a figure suggested by the Ministry of Planning.

The project is assumed to last 12 years because that is the economic life of the capital equipment used and because the present value of benefits and costs after 12 years is small enough to be safely ignored.

The usual "with" and "without" project cash flow analysis is used to obtain the incremental benefit and cost figures needed for the internal rate of return.

C. The "Without Project" Case

The analysis assumes that if the project does not take place, MOW will continue to maintain the 440 miles of rural roads, which otherwise would have been improved under this project, by following its present inefficient, high cost practices.

(1). The Direct Maintenance/Rehabilitation Road Costs

As a simplification - because MOW has no regular maintenance program for rural access roads -roads are maintained and reconstructed when they deteriorate to the point of unusability, or when villagers complain loudly enough to their elected representatives. This is very expensive, as Table 2 shows, because every nine years or so roads have to be reconstructed at almost the original cost of construction.

Table 1 shows that rural access roads are initially constructed at an average cost of Bz$30,000 per mile. While the road initially has a good dirt surface, it rapidly deteriorates because it has few or no culverts, poor drainage, and usually no gravel surface. Maintenance after construction is sporadic, at an annual cost of Bz$100 to Bz$500 per mile. Every third year all roads are graded and some material is added (though generally not enough to make up for what has been lost) at a cost of Bz$1000 to Bz$3000 per mile. After three such cycles (nine years), the road is virtually impassable and must be reconstructed at a cost of Bz $28,000/mile, almost the original cost of construction. The whole process is then repeated. These figures lead to an average yearly rehabilitation/maintenance cost figure of Bz$ 3,400-Bz$ 4,111 (the average of the sum of the high and low figures from years 1 through 9 in Table 1.

Table 1. Estimated MOW Expenditures on Rural Access Roads by Type of Road (1983 Bz$/Mile)

Year After Construction		High	Low
0	Construction	30,000	30,000
1	Minor Maint.	500	100
2	" "	500	100
3	Major "	3,000	1,000
4	Minor "	500	100
5	" "	500	100
6	Major "	3,000	1,000
7	Minor "	500	100
8	" "	500	100
9	Reconstruct(1)	28,000	28,000

Source: Mission and MOW

1. Cycle repeats as for years one to nine.

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(2). Total Recurrent (Direct and Indirect) Road Costs (MOW)

In the absence of the necessary financial records, MOW recurrent expenditures on rural roads were estimated by two methods. First,

the Mission assumed that MOW's entire recurrent expenditure on roads - about Bz$ 5.5 million in recent years (see Table 3) - is spread equally over all roads (1143.5 miles) under its jurisdiction. This gave a maintenance cost of Bz$4810 per mile per year, which is certainly a conservative estimate since paved roads, none of which are included among the project's roads, take less maintenance than unpaved. The second method relied on MOW's own estimates for expenditures on rural access roads (Table 2), which gave an average unit cost of Bz$ 3756 per mile per year for each 9 year period. Since this figure is a direct cost only, an allowance for indirect administrative and other overheads must be added. From the reasoning in our first method described above and from Mission etimates of recent total annual road costs of Bz$ 2.2 million for the 300 miles of rural roads currently being serviced, a figure of Bz$ 5,000 was accepted as a reasonable estimate of the "without project" annual total recurrent cost/mile for the roads being considered for this project. The annual "without Project" cost of the 440 miles of road is thus assumed to be Bz$ 2.2 million as shown in Table 7 and listed under MOW. The additional Bz$ 2.42 million in the table for 1988 represents the Mission's estimate of the cost of additional machinery the MOW will need to carry out the current maintenance practices without the project. No salvage value is included because its discounted value at the 12th year would be so small as to have little impact on the final IRR value.

Table 2. Selected Financial Data for MOW Roads
(Millions of Bz$)

	Recurrent Expenditure			Capital Expenditure			
Year	Maint.& Rehab.	Other	Total	Hwy. Const.	Feeder Const.	Other	Total
1977	2.53	0.43	2.96	6.72	1.92	1.12	9.76
1978	3.52	0.56	4.08	8.11	1.24	1.84	11.18
79/80(1)	5.84	0.86	6.70	8.66	1.52	2.94	13.13
80/81	5.74	0.91	6.66	11.34	0.26	4.28	15.88
81/82	5.39	1.13	6.52		0.39(2)		

Source: IBRD and MOW

1. January 1979 to March 1980.
2. Estimated by MOW to continue at roughly Bz$350,000/year.

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(3). Vehicle Operating Costs (VOC)

To obtain an estimate of vehicle operating costs in the "without project" case, the Mission first established theper mile cost of operating a vehicle on the roads to be rehabilitated and then, with the assumption that traffic would increase 3% per year due

to population growth, estimated the amount of vehicle miles to be traveled over the 440 miles of road per year for each year of the project.

First, Table 3 shows that the per-mile costs of operating a vehicle differs by type of vehicle and road condition. On the poor quality roads affected by this project, it was estimated that traffic consists of half pickups and half light (up to five-ton) trucks, for an average vehicle operating cost of Bz $1.177 per mile ((85.6 + 149.8)/2).

Second, the Mission established the average daily traffic volume on the affected roads, from the data set out in Table 4, which is all that is available for Belize's feeder roads. Because one of the criteria for inclusion in this project was that road condition be poor, the Mission equated the roads under the project (440 miles) with the 440 miles rated as "poor" in Table 4. This gave 91 miles with a traffic level of 50 to 100 vehicles (averaged to 75), and 349 with less than 50 vehicles per day (averaged to 15 because of the preponderence of very lightly trafficked roads), giving roughly 4.4 million vehicle miles per year (91 X 75 X 350 X 15 X 365). Because so little is known about traffic volume, it is one of the factors tested by sensitivity analysis later.

At 4.4 million vehicles per year estimated for 1984, at a cost of $1.77/mile, the "without project" vehicle operating cost (VOC) is estimated to be Bz$ 5.179 million. The three per cent annual growth assumption is then applied to this figure to give the values for the remaining years of the analysis period through 1995 as shown in Table 7 where the IRR is calculated.

Table 3. Vehicle Operating Costs (1983 Bz Cents/Mile)

	Condition of Road		
Vehicle Type	Good	Fair	Poor
Automobile	51.2	55.8	60.2
Pickup	72.6	79.0	85.6
Bus	124.4	137.8	151.0
Light Truck	112.7	131.0	149.8
Heavy Truck	204.9	248.5	293.4

Source: IBRD

Table 4. Mileage of Low-Volume Unpaved Feeder Roads,1983

Condition	Traffic Volume (Veh./Day) < 50	50-100	Total
Good	10	6	16
Fair	278	32	310
Poor	350	91	440
Total	638	129	767

D. The "With Project" Case

If the project takes place, roads will be rehabilitated at the rate shown in Table 5. After rehabilitation, they will be maintained on a schedule which will keep them in good condition, also shown in Table 6. By 1988 all 440 miles of the existing poor quality rural access roads will have been reconsructed and will require only routine maintenance, and much of the project equipment will be free to work elsewhere.

Table 5. Road Rehabilitation and Maintenance Schedule Under Project (Miles)

Year	Rehabilitation	Maintenance	Remaining	Total
1984	80	0	360	440
1985	120	80	240	440
1986	120	200	120	440
1987	120	320	0	440
1988	0	440	0	440
1989	0	440	0	440
1990	0	440	0	440
1991	0	440	0	440
1992	0	440	0	440
1993	0	440	0	440
1994	0	440	0	440
1995	0	440	0	440

1. Project Expenditures:

These are shown in Table 6. They consist of four classes: (1) capital equipment for road rehabilitation; (2) recurrent expenditures on rehabilitation - wages, construction materials, fuel and so on; (3) capital equipment for maintenance work, principally six graders; and (4) technical assistance, that is the salaries and associated expenditures of the US advisors.

The capital equipment is used to rehabilitate roads only through the fourth year, therefore, in year 5 we assume it is sold with a salvage value of Bz$ 2.209 million.

Table 6. Project Expenditures by Year (Bz $ X 1000) (1)

Item	1984	1985	1986	Total
For Rehabilitation				
Capital (2)	4418	0	0	4418
Recurrent (3)	1522	1522	1522	4568
For Maintenance				
Capital (4)	2432	0	0	2432
Technical Assistance (5)	1414	976	826	3216
Total	9786	2498	2348	14634

1. All figures exclude inflation since they are in constant Bz dollars, but include 15% contingency.
2. Equipment, shop tools, and shipping.
3. Spares, fuel, local labor, and construction materials.
4. Principally 6 maintenance graders and associated tools.
5. Salaries, in-country travel and administration of project.

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(2). MOW Expenditures:

The MOW expenditures during the first four years include a combination of road rehabilitation and maintenance expenses, with the large increase in 1987 due to the GOB's assumption of the construction cost of the last 120 miles of road. From 1988 on, the costs are those solely for the maintenance of the 440 miles of road at Bz$ 2,000 per mile. The large reduction in maintenance costs is due to: (1) better training, (2) use of better equipment (principally six new maintenance graders), and (3) the adoption of a maintenance schedule that will not allow roads to deteriorate so that reconstruction is necessary.

(3). Vehicle Operating Costs (VOC):

Initially, these will be the same as under the "without project" option, but will decline as road conditions improve, then grow again as traffic increases at an estimated 3% per year. This is based on the same assumptions as were used to estimate vehicle operating costs under the "without project" option, except that, once rehabilitated, roads are assumed to be in good condition, not poor, for an average vehicle operating cost of Bz $0.927. (From Table 3, under "good" column, (72.6 + 112.7)/2). These costs apply to existing traffic only.

4. Increased Agricultural Production

The benefits of increased agricultural production have not been included in the formal analysis of the project because there are insufficient data to quantify them and the project is economically sound without them. Please see the Social Soundness Analysis for other benefits likely to accrue from road rehabilitation.

5. Calculating the Net Benefits and Internal Rate of Return

The net benefits of the project are the reduced cost of road maintenance obtained by increased MOW efficiency. They are obtained in Table 7 by subtracting the lower "with project" costs from the higher "without project" costs. Had increased agricultural production been included in the analysis, the IRR would have been considerably higher than the 21% figure obtained with our truncated approach. Sensitivity analysis was conducted as explained in the following section which provides the Mission with ample evidence to be satisfied that the project will produce an IRR of at least 15% and most likely something in excess of 20%

Table 7. Project Economic Costs and Benefits
(Thousands of 1983 Bz$)

	Without Project		With Project			
Year	MOW	VOC	Project	MOW	VOC	Net Benefit
1984	2200	5179	9786	108	5179	-7694
1985	2200	5334	2498	232	5128	- 324
1986	2200	5494	2348	436	4963	- 53
1987	2200	5659	0	2354	4784	722
1988	4632	5829	-2209	880	4589	7201
1989	2200	6004	0	880	4727	2597
1990	2200	6184	0	880	4869	2635
1991	2200	6369	0	880	5015	2674
1992	2200	6560	0	880	5165	2715
1993	2200	6757	0	880	5320	2757
1994	2200	6960	0	880	5480	2800
1995	2200	7169	0	880	5644	2845

IRR = 21%

1. Project - Rehabilitaion expenditures by AID and MOW during three years of AID's involvement.
2. MOW - Other Ministry of Works costs.
3. VOC - Vehicle Operating Costs borne by road users.

It is this use of reduced costs as benefits that requires the Bz$ 2209 sale of the capital equipment in 1988 in the "with project" case to be listed as a negative figure.

6. Reliability of Results

There is very little likelihood that the Project will have an internal rate of return of less than 15%. This view is based on the effects of the conservative assumptions used in the analysis and on the apparent insensitivity of the results to relatively large changes in key information inputs.

Conservative Assumptions:

The analysis incorporates the following conservative assumptions that tend to depress the IRR:

(1) The benefits of increased agricultural output are omitted.

(2) A 15% contingency factor is built into all estimates of project costs.

(3) The benefits of more comfortable, safer and faster travel by passengers (and the new traffic that might generate) are omitted.

(4) The analysis assumes that only 440 miles will be improved with the resources provided by the Project. In fact, there are an additional 320 miles of feeder road in existence, some of which are also in bad condition. Further, 10-12 miles of rural access roads are added to the national inventory each year. If these were also rehabilitated, the benefits of the Project would be greater.

Sensitivity Analysis: The analysis incorporated three key items of information that were subject to considerable uncertainty. To ensure that the results of the analysis were robust, switching values were calculated for these and shown in Table 8. (The switching value is that value which causes the Project's IRR to equal the hurdle rate (in this case set at 10 and 15 percent)).

Table 8. Switching Values for Key Inputs

Input	Estimated Value Used	Switching Value at: 15%	10%
Cost of maintaining roads without Project (Bz$/mile/year)	5000	4100	3300
Cost of maintaining roads with Project (Bz$/mile/year)	2000	3400	4400
Average daily traffic on Project roads	27.4	14.5	4.9

Table 8 shows that for the Project to have at least a 10% IRR, the current cost of maintenance could be trimmed to as low as Bz$ 3300/mile/year. Further, the cost of maintenance after rehabilitation, estimated at Bz$ 2000/mile/year, need only be less than Bz$ 4400/mile/year. Finally, the average daily traffic on Project roads, estimated at 27.4 vehicles per day, need only exceed 4.9 vehicles per day to assure an IRR of at least 10%.

D. Social Soundness Analysis

1. Overview

Belize's small population of approximately 150,000 is highly diverse in ethnic composition. the largest groups are the largely urban English-speaking Creoles (39.7% of the population), and the mostly rural Spanish-speaking Mestizos, many of whom are of Mayan ancestry (33.1%). Smaller minorities include Black Caribs (of Afro-Indian ancestry, 7.6%), Yucatec and mopan Maya (6.8%), East Indian (2.1%), Kekchi Maya (2.7%), Mennonite (3.3%), and a scattering of Lebanese, North Americans, and Chinese. This complex mix does not break down easily into groups by class, wealth or economic role, and mixed communities are common. The only communities where only one ethnic group is found are the Mennonite settlements and the Indian villages of the far south.

Belize is not a country with a well-developed or integrated rural economy. Outside of the relatively prosperous cane and citrus regions, most production is for subsistence, and a network of rural markets and bulking centers is lacking. Most development efforts have aimed at replacing existing practices with transplanted export sectors rather than developing existing crops building on indigeous knowledge and techniques. Though agriculture has developed slowly, figures from the 1970 and 1980 censuses show that the rural population involved in farming has increased more rapidly than urban population (Table 4), indicating a willingness to move to the countryside despite the lack of good roads and social services.

Table 1. Distribution of Belize Population

	1970	1980	% Change
Belize City	39,050	39,771	+ 2.0
Six Major Towns	23,920	32,946	+ 27.4
Total Urban	62,970	72,717	+ 13.0
Villages	44,351	67,180	+ 34.0
Other Rural *	12,613	5,476	- 56.6
Total Rural	56,946	72,656	+ 22.0

* Includes unrecognized villages and settlements of less than 50 persons.

2. Project Beneficiaries

The target population for this project is distinct in each District of the country. In the northern Corozal and Orange Walk districts, most rural people are Mayan-descended Mestizos, who once practiced milpa farming at a subsistence level, and are now heavily involved inthe mono-crop production of sugar cane which

is locally processed in two large mills. The population of this area has increased rapidly as cane farming has developed, but existing villages have grown rather than new settlements branching off (see Table 2). Farm income income in this area is much higher than elsewhere in the country, but cane farming has stagnated in the last 5 years, and crop diversification will have to occur if incomes are to continue to rise. Most cane farmers own their own land and have invested heavily in mechanized equipment. Communities are served by highways or by feeder roads of generally higher quality than elsewhere in the country, though there are still many problems during the wet season and in outlying areas where land is still available to new farmers. These northern areas are also the location of two large Mennonite communities, where the German-speaking farmers practice intensive mixed farming , producing large surpluses of corn, beans, peanuts and chickens for market.

Belize District, in the central area around Belize City, is mainly populated by Creoles who practice small scale subsistence farming and produce fruits and vegetables for the Belize City market. Most settlements are on poor land along the highway or on rich soils along the Belize and Sibun Rivers, reachable by short feeder roads from the highway. Some cattle ranching is done on larger holdings.

In Cayo District, cattle ranching and mixed farming predominate, with most settlement concentrated along the fertile strip of land in the Belize River valley. Recent immigrants from El Salvador and indigenous Mayas coexist with Spanish-speaking Mestizos, and villages are reached by short feeder roads from the highway, except in the Vaca Plateau region, which is penetrated by several very poor longer roads. There, milpa farming is dominant.

Stann Creek District has a very mixed population of Creoles, with minorities of Mestizos, Mayas and Caribs (the latter concentrated in coastal fishing villages). Outside of the major citrus area in the Stann Creek valley and the Government Banana Project in the South, most farmers practice milpa subsistence farming. In the last few years, a number of new villages have been formed by Mayan farmers from Toledo District in small pockets of arable land along the southern Highway.

The far southern Toledo District is the least developed area of the country, with a population of Mopan and Kekchi Maya in the inland areas, and East Indians and Caribs closer to the coast. In the southern part of the District are 11 Kekchi villages accessible only by foot paths, though the MOW is currently planning roads to them with the assistance from the UK. Population is concentrated around the Mopan village of San Antonio (pop. 1067), and these milpa farmers produce the majority of the country's rice, hogs, and beans despite the poor quality of feeder roads.

Tables 2 and 3 detail the distribution of rural population and settlement changes which have taken place in the last ten years.

Table 2. Distribution of Rural Population

District	Number of Villages 1970	1980	Increase
Corozal	30	31	+ 1
Orange Walk	23	27	+ 4
Belize	28	36	+ 8
Cayo	26	40	+14
Stann Creek	13	32	+19
Toledo	27	44	+17
Total	147	210	+63 (30%)

Table 3. Distribution of Rural Population

	Population					
	Villages		Other Rural*		Mean Village Size	
District	1970	1980	1970	1980	1970	1980
Corozal	10238	15775	631	228	341.3	508.9 +
Orange Walk	9949	14260	1553	191	432.6	528.2 +
Belize	7449	10492	2856	538	266.0	291.4 +
Cayo	8065	11092	3309	3194	310.2	277.3 -
Stann Creek	3273	7180	2783	340	251.8	224.4 -
Toledo	5377	8381	1481	985	199.2	190.5 -
Total	44351	67180	12613	5476	301.7	319.9 +

* Includes unrecognized communities and those with less than 50 persons. Changes reflect new census practices.

It is clear from these figures that rural farming population has increased significantly, as has the number of rural settlements. But the northern and southern halves of the country differ considerably in their form of rural growth. In Corozal, Orange Walk and Belize districts, few new villages have been found, and rural population growth has been accomodated by increasing village size. This is a direct consequence of the better road networks in these districts, which encourage people to stay in the developed areas near the highway rather than pioneer new land away from the road. In the other districts population has grown, but average village size has actually decreased, as that population has dispersed widely in new communities. The existing poor roads do not attract farmers, who instead disperse in search of new (and cheap) lands. While both areas will benefit from road

rehabilitation, the benefits are likely to be of different kinds.

The above figures refer to the total rural population. The proportion of the farm populatio which is presently served by inadequate roads is shown on Table 1 (above) to be 28,355, or 39% of the total rural population. Table 7 breaks down the target group by district, and shows how much presently poor road serves how many people. The variation reflects differences in population concentration, amd should be used to choose priority areas for project activities. In addition to these rural farmers, urban based merchants and wholesalers, as well as rural truckers and merchants, will benefit from the increased flow of agricultural commodities engendered by road improvement.

Table 4. Villages on Poor Roads

District	Number of Villages	Population	Total Poor Road Miles	Persons/ mile
Corozal	9	4864	117.0	41.9
Orange Walk	14	9172	72.0	128.3
Belize	18	3061	73.0	42.5
Cayo	21	3849	69.0	56.6
Stann Creek	12	2811	64.0	44.6
Toledo	15	4590	45.0	104.5
Total	89	28355	440.0	66.0

3. Effects of Road Reconstruction

In Belize farmers have tended to concentrate along the best roads, even if the soils there were poor, because they recognize the many economic and social benefits brought by cheap and regular transportation. Most important of these are the ability to get crops to market on a regular and cheap basis, ability to procure crop inputs when needed, access to medical care, and regular transportation to towns for shopping. Government personnel in agricultural extension, land survey, medicine, and education are extremely reluctant to visit areas with poor roads, and treat posting to inaccessible areas as a form of exile. Faced with expensive and unreliable transportation, farmers in less accessible areas are reluctant to invest time and effort in cash crop production.

An anthropological study which contrasted villages in Toledo district on a major highway with a village on a poor road and one with no road at all found several major changes prompted by improved road access:

-- An increase in cash cropping and disposable income.
-- Growth of rural marketing and trucking by local merchants.
-- Agricultural intensification (shorter fallow cycles).
-- A wider variety of food and cash crops being grown.

-- More wage labor in slack seasons.
-- More intensive competition for land.
-- More frequent visits to town.
-- Increased awareness and participation in national politics.
-- Greater interest in agricultural innovation.
-- Frequent visits by extension officers and other GOB agents.

In the northern districts, where villages are larger and tend to be better served by government services, and where cash crop production is already well established, economic benefits from cheaper transportation along improved roads will be more important than social benefits. Elsewhere, road reconstruction will have immediate social benefits (especially in health and education), short-term economic benefits and long-term land-use benefits. In all cases, road improvement will help attract and hold additional rural population (retarding rural-urban migration) through provision of better services, and will make possible a number of other rural and agricultural development projects.

Previous studies of rural roads have emphasized that economic and social benefits do not 'just happen' when roads are built or improved - extension, credit, and community development programs must also be provided. The GOB and foreign assistance organizations are presently pursuing a number of such projects including coconut rehabilitation, coffee production, small farm loans, livestock and pasture improvement, cacao production, crop loans, rural school improvement and construction, rural water supply, and rural health, in addition to a rural development project aimed specifically at Toledo District. At present, these programs disproportionately benefit villages with good road access; road rehabilitation will allow many more rural residents to participate and benefit. This should halt the emerging trend towards unequal development, which is rapidly dividing rural Belize into rich and poor villages largely according to the quality of their existing roads.

A recurring problem with road construction and improvement projects is that of land tenure. Speculators and wealthy farmers are often able to buy the best land along roadways, forcing poorer farmers into tenancy or marginal lands. Belize has the land tenure legislation necessary to minimize this problem, though the system is not yet adequately implemented or enforced. These laws mandate a higher land tax on undeveloped land (penalizing speculators), and allow small farmers to lease public lands with an option to purchase when development is complete, with preference given to those with usufruct rights. It is recommended that USAID personnel closely monitor changes in land tenure along roads improved through the proposed program, and work closely with District Lands Officers to ensure that survey and leasing programs proceed apace with road rehabilitation.

In the past the MOW has experimented successfully with involving villages in the maintenance of rural roads by giving contracts to and through village councils for specific activities. This

activity has reportedly been curtailed due to budgetary constraints. Involvement of communities in maintenance activities is highly desirable as a means of ensuring regular work and bringing wage income to rural areas. While most Belizean villages have a long tradition of communal maintenance activities on village property, and involvement in road maintenance is therefore socially feasible, it must be stressed that Belize is an under-populated country with no rural unemployment problem. Some compromise between mechanized and labor-based maintenance is therefore desirable; otherwise labor may be drawn away from productive agriculture to work on roads.

4. Road Selection Criteria

For both economic effectiveness and social soundness, the following criteria will be used in selecting specific road segments for rehabilitation:

a. A poor quality road must already exist unless a new road will more efficiently serve the function of the old, in which case a new route can be chosen.
b. The road segment must connect an existing community to an existing highway or adequate feeder road.
c. The area served must have significant agricultural potential based on established land capability analyses.
d. Land along the road must be predominantly in the hands of small holders (less than 200 acres) or in the possession of the government for distribution to small holders.
e. No overriding negative social, environmental or economic impacts must be present.

USAID Belize, consulting with the GOB, will use these criteria in the choice of priority road segments for reconstruction. Criterion C will be further elaborated by Implementation Letter. Annex 7 provides an illustrative format for review of candidate roads.

E. Environmental Analysis

An Initial Environmental Examination, prepared by the Regional Environmental Management Specialist/ Caribbean, presents a detailed discussion of environmental concerns. His recommendation is as follows:

> The proposed project could foster some change with adverse implications if environmental protection measures are not considered and applied to the most practicable extent. However, since the project will be restricted to rehabilitation and improved maintenance of all-weather, gravel roads in areas with existing populations of farmers, land with agricultural capability, and existing, albeit poor road service, minimal negative environmental effects are anticipated. In addition, training of road construction and maintenance personnel with respect to effective methods of drainage and erosion control problems such as stream sedimentation, loss of road-bed material due to sheet erosion, drainage obstruction, will have a positive impact on the Project areas. In view of these predictions, it is recommended that a Negative Determination be approved for the Project.

The Draft Project Authorization contains covenants that (1) require that the Project avoid road construction activities within the confines of officially designated Belizean national parks and forests, whether or not the roads may otherwise meet the criteria for road selection and (2) Mayan ruins or other archaeological sites will not be used as a source of construction material or in other ways destroyed or damaged in the process of implementing this project.

Annex 5 of this document contains the complete IEE. Please refer to it for a detailed synopsis and discussion of project-related environmental concerns.

F. Financial Analysis

The following is the summary budget and financial plan for the project. The costs of the Project covered by the AID foreign exchange portion of the total budget are allocated between construction equipment, shop tools, construction materials, and spare parts (US$ 3,522,710), 194 person-months of technical assistance and training specialists (US$ 1,417,690 including a modest amount of administrative support), and contingency and inflation factors amounting to US$ 459,600 for a total Grant budget of US$ 5,400,000 over the three year life of project.

Counterpart local currency contributions are about evenly split between in-kind costs from the MOW budget of US$ 1,015,000 for local labor, contingencies and inflation and a counterpart contribution from the Belizean Balance of Payments Fund in the

amount of US$ 1,035,000 for fuel and lubricants (purchased locally in Belizean dollars), shipping and transport of the Grant-funded equipment, and contingency and inflation factors. The total local contribution is US$ 2,050,000 or 28% of total project costs.

TABLE 1: SUMMARY COST ESTIMATE AND FINANCIAL PLAN (US$ X 1000)

	AID FX	HOST LC	BOP FUND	TOTAL
TECHNICAL ASSISTANCE	1355.00	.00	.00	1355.00
EQUIPMENT	2585.40	.00	.00	2585.40
SPARE PARTS	347.31	.00	.00	347.31
FUEL/LUBRICANTS	.00	.00	400.00	400.00
SHOP TOOLS	200.00	.00	.00	200.00
SHIPPING/TRANSPORT	.00	.00	470.14	470.14
LOCAL LABOR COSTS	.00	850.00	.00	850.00
CONST. MATERIALS	390.00	.00	.00	390.00
CONTINGENCY	421.16	127.50	129.46	678.12
INFLATION	38.44	37.56	35.40	111.34
ADMIN. EXPENSES	62.69	.00	.00	62.69
TOTAL	5400.00	1015.00	1035.00	7450.00
LOCAL CONTRIBUTION AS A PERCENTAGE OF TOTAL PROJECT COSTS				28%

As shown in Table 2 below, the Project's funds will be disbursed over a period of three years. The bulk of the AID funds (66% or US$ 4,893,720) will be spent in the first year of the Project largely on equipment procurements, technical assistance, construction materials and shop equipment.

Host country local costs will be disbursed over the three years of the Project primarily local labor costs. Approximately 50% of the funds to be drawn from the Balance of Payments local currency account will be used in the first year for shipping of equipment, tools, and construction materials with disbursements over the life of the Project for petroleum products as they are consumed by the Training Units.

Table 2: EXPENDITURE PROJECTION BY FISCAL YEAR (US$ X 1000)

FISCAL YEAR	1984	1985	1986	TOTAL
TECHNICAL ASSISTANCE	600.00	410.00	345.00	1355.00
EQUIPMENT	2585.40	.00	.00	2585.40
SPARE PARTS	115.77	115.77	115.77	347.31
FUEL/LUBRICANTS	133.33	133.33	133.33	400.00
SHOP TOOLS	200.00	.00	.00	200.00
SHIPPING/TRANSPORT	470.14	.00	.00	470.14
LOCAL LABOR COSTS	283.33	283.33	283.33	850.00
CONST. MATERIALS	130.00	130.00	130.00	390.00
CONTINGENCY	462.00	111.37	104.75	678.12
INFLATION	0.00	57.90	53.44	111.34
ADMIN EXPENSES	20.90	20.90	20.90	62.69
TOTAL BY FY	5000.90	1262.60	1186.50	7450.00
PROJECT FUNDS DISBURSED	68%	17%	15%	100%

AID Grant funds will be used to finance foreign currency costs. Local currency costs will be divided between GOB inkind contributions of MOW labor in the CRTU, MTU, MIC and EMC project components. The USAID/GOB balance of payments account local currency generations fund will contribute locally purchased fuels, lubricants, and shipping services for the equipment procured under the Grant.

The above division of costs between sources of funds for the Project appears to be the most appropriate. The Project Development Team reviewed the possibility of drawing on the BOP Fund for local labor expenses. However, in consultation with the MOW, it was decided that the project design would allow the MOW to provide the necessary in-kind local labor support from its current budget. The Project Development Team also felt that, given the ability of the MOW to provide that support from the beginning of the Project, it seems prudent to avoid the potential problems of a "phasing in" of the GOB contribution from GOB Treasury sources. As a result, all recurrent costs related to

local labor resulting from this Project will have been internalized from the beginning.

Recurrent costs are not an issue with either the CRTU or the MTU. Road construction and maintenance are functions within the current MOW structure and budget. While it not possible to forecast with any accuracy the likelihood of financial returns from the Project's investment in the operations, it is the opinion of the Project Development Team that MOW's recurrent costs for road maintenance -- the bulk of the Ministry's costs -- will be reduced substantially by increased efficiency, equipment that is lower in cost to operate, more productive workers, and a cost-focussed work plan.

V. Monitoring and Implementation Plans

A. Project Monitoring

There are several key Project activities which require close monitorship on the part of Project Principals, including the PSC Project Manager, the MOW, and the USAID. They include final preparation and obligation of Project documentation, the clearance of conditions precedent, affirmative responses to all covenants and adherence to the stated schedules for procurement of technical assistance and equipment. Each of these elements must be executed in a timely fashion to assure that the Project maintains its schedule of implementation. Further, although this Project does not require that the MOW and the World Bank Project financed contractors perform precisely as laid out in their plans of implementation, the Mission, through the PSC Project Manager, should monitor its progress, as the successful implementation of that project will provide substantial positive opportunities for joint activities.

The Mission should closely monitor the following:

-- Creation of an MOW road maintenance unit at the Ministry and District levels.

-- Creation of an MOW office of planning and budget.

-- Establishment of the plan and actual structure for construction/rehabilitation units for each District.

-- Final selection of the order of District training activities.

-- Selection of rural access roads to be reconstructed (to assure) compliance with specified criteria).

-- Procurement of equipment and technical assistance to assure that both are brought on-line in a timely manner and in accordance with specifications laid out in the Project Paper.

-- All training and tehnical assistance activities are progressing toward their respective milestones as per schedule.

-- The EMC has developed a preventive maintenance system as well as improved equipment repair procedures for each District shop.

-- The MIC has developed the first iteration of the MOW five year plan by January 1985.

The PSC Project Manager will be responsible for the preparation of quarterly reports to the Mission and to the Minister, MOW.

B. Implementation Schedule

The following is a schedule of implementation for the proposed project which identifies the major milestones for procurement and contracting.

Table 3: Procurement/Contracting Schedule

Item	Date
--- Project Obligation	September 1983
--- Technical Assistance Team Onboard	
-- Project Manager	December 1983
-- Deputy Project Manager	January 1984
-- Maintenance Superintendent	February 1984
-- Road Specialists (2)	February 1984
-- Management Specialist	February 1984
--- Equipment Procurement	
-- Specification Writing Begins	September 1983
-- Procurement Begins	October 1983
-- Delivery of Equipment Complete	March 1984
--- Fuels Procurement Begins	February 1984
--- Const. Materials Procurement Begins	February 1984

Table 4 lays out the major program milestones for the project in terms of activities that will be accomplished by USAID Belize, the MOW and the technical assistance team.

Table 4: Project Implementation Milestones

Item	Date	
--- Establishment of Central and District Maintenance Functions.	November	1983
--- Determination of Order and Priority of Districts and Roads for Reconstruction.	January	1984
--- Rural Access Road Maintenance Training Operations Begins at the District Level.	March	1984
--- Maintenance Superintendent Begins to Operate at District Level Improving District Maintenance Operations.	March	1984
--- Beginning of Rehabilitation Training for Rural Access Roads.	April	1984
--- First 80 miles of Rural Access Road Rehabilitation Training Completed.	January	1985
--- First Iteration of MOW Plan Completed	January	1985
--- Cumulative Total of 200 miles of Rural Access Road Reconstruction Training Completed.	January	1986
--- Cumulative Total of 300 miles of Rural Access Road Reconstruction Training Completed.	December	1986
--- Control of Equipment Turned Over to MOW	December	1986
--- Project Activity Completion Date.	January 1,	1987

C. Procurement Arrangements

1. Technical Assistance

The Mission proposes to use personal service contractors for technical assistance in this Project. In principle, the use of PSCs should be limited to those circumstances where the Mission has the staff capacity to monitor and support the contractors' work and/or where there is a requirement for specialized expertise not needing the backstopping support of a contracting firm. In this case, there is a critical third factor to consider. The bulk of project activities are reasonably straight-forward technical functions, but there is an important component of

institutional strengthening and policy dialogue required to assure project success. This dialogue will require that, at least initially, the Mission be intimately involved in project oversight and management. The PSC vehicle provides the Mission with the most scope and latitude for such involvement.

The technical assistance specialists needed to implement this Project include a Project Manager (US$260,000 fully loaded cost), a Deputy Project Manager (US$ 250,000), an Equipment Maintenance Specialist (US$ 220,000), two Road Specialists (US$ 230,000 each), and a Management Specialist (US$ 165,000). Costs for the technical assistance team would include salaries as well as payment for shipment of household effects, air freight, private vehicle shipment, education allowances, housing, utilities, and a 25% post differential. USAID Belize has made arrangements for a TDY by the Regional Contracting Officer and the LAC Engineer for PSC contract preparation in early October with an expected arrival of the Project Manager on or about December of 1983.

2. Equipment Procurement

Excess Property: The Project Development Team has identified and reserved a number of equipment pieces called for in the Project's procurement plan. In addition to excess property procurement, Table 5 identifies the types, quantities, and prices of the equipment to be procured:

Table 5: Equipment Costs (US$)

NOMENCLATURE	NUMBER	EACH	TOTAL
1. DUMP TRUCKS	14	45000	630000
2. ROAD GRADERS	4	100000	400000
3. ROAD GRADERS	6	101000	606000
4. F.E. LOADERS	2	68800	137600
5. BULLDOZERS	2	184000	368000
6. COMPACTORS *	2	5000	10000
7. FUEL TANKERS	2	25000	50000
8. WATER TANKERS	2	25000	50000
9. 4WD TRUCKS	5	15000	75000
10.LIGHT TRUCKS	6	11000	66000
11.LOW BED TRAILER *	1	20000	20000
12.PRIME MOVER *	1	25000	25000
13.3/4 TON TRUCKS *	2	9000	18000
14.TRACTOR/BRUSH CUTTERS *	6	15000	90000
15.ROCK CRUSHERS *	2	10000	[illegible]000
16.WATER TRAILER *	2	1200	2400
17.FUEL TRAILERS *	2	1200	2400
18.2-WAY RADIOS	5	5000	25000
TOTAL ESTIMATED COSTS			2585400

* EQUIPMENT FROM EXCESS PROPERTY

The equipment procurement process for this Project was examined closely by the Project Development Team. The conclusion is that, with the aid and oversight of the Mission and selected AID/W and AID Regional personnel, the GOB is capable of managing procurement in the field. The TDY assistance of the LAC Chief Engineer will be requested in Mid-October for negotiations with MOW on detailed procurement requirements under Host Country Contract per the provisions of AID Handbook 11, Chapter 3. The MOW will, in consultation with AID, and following the fulfillment of actions required by the Project Agreement's Conditions Precedent, place orders for the specified equipment with local representatives of US manufacturers. Payment will be made in US dollars to the US manufacturers through an AID Direct Letter of Commitment.

VI. Waivers, Conditions and Covenants

A. Waivers

The authorization of this Project Paper will also signify the approval for procurement of the following equipment:

1. Equipment

The MOW has requested that certain of the equipment procured under this Grant be of specific manufacture, thereby requiring a sole source proprietary procurement waiver. The items in that category are as follows:

Table 6: Proprietary Procurement

Make	Type	Model	Number	Total Cost(US$)
Caterpillar	Road Grader	130	4	400,000
Caterpillar	Road Grader	120G	6	606,000
Caterpillar	Bulldozer	D7	2	368,000
Caterpillar	Front End Loader		2	137,600
Ford	Dump Truck	FT8000	14	630,000
Ford	Light Pickup	F100	6	66,000
Ford	4WD Utility	Bronco	5	75,000

The waiver is justified by the following factors:

(a) The MOW currently uses predominately Caterpillar construction equipment. Procurement of Caterpillar-brand heavy equipment will help the MOW in standardizing its fleet around Caterpillar, streamline its parts and tools supplies, and take advantage of their mechanics' and operators' familiarity and experience with the brand.

(b) Caterpillar is the only US-manufactured heavy construction equipment with representation in Belize. The local dealer has an excellent repair and spare parts facility which is well stocked with an inventory of around US$500,000 in spare parts.

(c) The GOB has begun to standardize its truck fleets around the US-manufactured Ford Motor Company line of trucks. In addition to the MOW, the Ministry of Natural Resources and Ministry of Trade and Industry have, for example, upon retirement of trucks of other manufacture, purchased Ford-brand equipment as replacements. The GOB has set this policy based on its experience with local costs, availability of parts and service, and their desire to reduce spare parts and specialized tools inventories to a minimum.

(d) The local Ford dealer is the only US manufacturer's representative to stock spare parts and provide maintenance and repair services.

In the light of the above factors, the Mission requests a waiver for sole source proprietary procurement for Caterpillar and Ford equipment.

2. Shipping

There is no ocean freight service to Belize from the US on US-registered bottoms or by US shipping firms. While one Miami-based shipping firm maintains a biweekly container schedule to Belize, it is incorporated in Grand Cayman. Further, Project procurement will not be made in such a timely and coordinated fashion or of such an extent that it is feasible to hire an entire vessel for a single shipment.

Given these constraints, it will be necessary to grant blanket certification of non-availability of US flag vessels and a waiver to permit payment for shipment on vessels registered in AID Geographic Code 899 countries, subject to reexamination if US flag vessel service becomes available at a later date.

B. Conditions

(1) The Grantee shall assign, for the duration of the Project, MOW personnel to serve as local counterpart to each member of the Grant-funded technical assistance team members.

(2) The Grantee shall, in consultation with AID, prepare and submit for AID approval, a plan for deployment of personnel to participate in the Construction/Rehabilitation Training Unit.

(3) The Grantee shall, in consultation with AID, establish MaintenanceOffices at the District level and prepare a plan for the support of operations of that Maintenance Office within the MOW that assures the continuing maintenance of the roads and bridges repaired, rehabilitated, reconstructed, and/or maintained in the course of this Project. This plan, along with the

organizational design and identification of the financial resources needed for implementation, will be submitted in writing to AID in acceptable form and substance.

(4) The Grantee shall establish and staff, within the MOW, a permanent office of planning and budget as counterpart to the Grant-financed Management Specialist.

C. Special Covenants

The Grantee agrees to the following conditions, except as otherwise agreed in writing with AID:

(1) Roads selected for reconstruction, rehabilitation and/or maintenance under this Project shall be identified by means of criteria given below. Candidate roads, together with a supporting analysis for each, will be submitted in writing to AID, in form and substance acceptable to AID, for AID approval.

a. A poor quality road must already exist unless a new road will more efficiently serve the function of the old, in which case a new route can be chosen.
b. The road segment must connect an existing community to an existing highway or adequate feeder road.
c. The area served must have significant agricultural potential based on established land capability analyses.
d. Land along the road must be predominantly in the hands of small holders (less than 200 acres) or in the possession of the government for distribution to small holders.
e. No overriding negative social, environmental or economic impacts must be present.

(2) The Grantee shall prepare, in advance of construction activities, detailed engineering plans for each road segment to be reconstructed.

(3) The Grantee shall assure the continuing operations of the District Maintenance Units by establishing a routine budget line item for the duration of the Project and beyond.

(4) The Grantee shall assure the continuing operations of the MOW office of planning and budgeting by establishing a routine budget line item for the duration of the Project and beyond.

(5) Roads in and through designated national parks, forests, wildlife reserves, and other recognized ecologically sensitive areas will not be reconstructed with resources from this Grant.

(6) Mayan ruins or other archaeological sites will not be used as a source of construction material or in other ways destroyed or damaged in the process of implementation of this Project. The Commissioner of Archaeology, Ministry of Trade and Industry will assist the Grantee in the identification of appropriate sites for borrow pits, gravel pits and deposits or sources of construction materials.

VII. Evaluation Plan

Because of project implementation in three years, two evaluations are proposed.

The first evaluation, to be conducted in January 1985, would focus on an assessment of progress in "startup" activities, especially those related to meeting the project's schedule of implementation. The evaluation team would comprise the senior MOW project counterpart, the senior member of the project's PSC technical assistance team, the LAC Bureau Chief Engineer, and the USAID Belize Representative. Special attention should be given to the degree that the MOW has implemented the formation of the Maintenance Office function both within headquarters and at the District offices. Secondly, the Evaluation Team should review progress in the implementation of the MOW's office of planning and budget. Finally, the evaluation should examine the extent of collaboration between the various donor activities and suggest project amendments necessary to assure constructive interaction.

The final evaluation would focus on project impact issues defined in the project's logical framework analysis as key End of Project Status (EOPS) items. This evaluation would be independently prepared and funded from the "Contingency" line item.

The Draft CDSS for USAID Belize calls for funding of a possible follow-on road project with the Ministry of Works. The results of these evaluations will be used as guidance to AID in its consideration of future road project funding decisions.

Annexes

1. PID Cable

(Copied from SECSTATE 240755 received 24 August, 1983)

Subject: Access Roads PID

Reference: BELIZE 2643

1. The PID-EQUIVALENT TRANSMITTED IN REF CABLE WAS REVIEWED 23 AUGUST 83. THE PROJECT TEAM IS COMMENDED FOR A CLEAR AND CONCISE DOCUMENT RAPIDLY EXECUTED. PP GUIDANCE FOLLOWS.

2. ECONOMIC AND SOCIAL ANALYSES. THE ECONOMIC ANALYSIS SHOULD EXAMINE THE AVAILABILITY OF OTHER AGRICULTURAL PRODUCTION INPUTS IN THE AREAS SERVED BY PROJECT ACCESS ROADS, AND TAKE THIS INTO ACCOUNT WHEN ESTIMATING THE PRODUCTION INCREASES WHICH MAY BE EXPECTED FROM THE PROJECT. THE SOCIAL ANALYSIS SHOULD DESCRIBE THE SPECTRUM OF BENEFICIARIES IN THE ROAD AREAS, AND SUGGEST A ROAD SELECTION CRITERIA FAVORING SMALL FARMERS WHERE POSSIBLE.

3. COSTS. (A) PROJECT COSTS. THE TOTAL COST ESTIMATE SHOULD MAKE ADEQUATE PROVISION FOR INFLATION AND CONTINGENCIES, AND SHOULD INDICATE THE GOB COUNTERPART VERSUS AID FUNDING. (WE ASSUME THE INTENTION IS FOR AID TO FINANCE THE PRELIMINARY BUDGET FX LINE ITEMS, ABOUT 75 PERCENT OF THE TOTAL PROJECT COST, AND FOR THE GOB TO FINANCE THE LC, ABOUT 25 PERCENT.)

(B) RECURRENT COSTS. RECURRENT COSTS IS A RECURRENT ISSUE. THE PP SHOULD ESTIMATE THE ANNUAL POST-PROJECT RECURRENT COSTS, PROPOSE A FINANCIAL PLAN WHEREBY THE GOB IS COVERING ALL OR CLOSE TO ALL RECURRENT COSTS AT THE END OF THE PROJECT (THE GOB CONTRIBUTION MAY BE PHASED IN OVER THE LOP), AND INCLUDE A COVENANT WHEREBY THE GOB WILL CONTINUE TO BUDGET FOR THESE COSTS AFTER THE PROJECT.

4. PROCUREMENT AND CONTRACTING. THE ROLES OF THE GOB AND AID IN THESE ADMINISTRATIVE PROCESSES SHOULD BE CLEARLY DESCRIBED. NEITHER THE GOB NOR USAID/BELIZE HAVE STAFF VERY EXPERIENCED IN THESE ACTIONS. THE CAPABILITIES OF INTERESTED GOB OFFICES AND A PLAN FOR SUPPORTING AID TDY ASSISTANCE SHOULD BE LAID OUT. DIRECT CONTRACTING BY AID/W MAY BE DESIRABLE, GIVEN THE PROPOSED IMPLEMENTATION SCHEDULE, WHICH SEEMS UNREALISTICALLY BRIEF. CHECKING USG EXCESS PROPERTY STOCKS FPR HEAVY EQUIPMENT ALSO MIGHT LEAD TO COST AND TIME SAVINGS. LAC/DR HAS EXCESS PROPERTY BRIDGES AVAILABLE FOR A LITTLE MORE THAN SHIPPING COST. IN SELECTING TA, THE USE OF A FIRM RATHER THAN A SERIES OF PSCS WOULD LIGHTEN THER MISSION'S OVERSIGHT BURDEN.

5. MOW ORGANIZATION. A CLEAR LINE SHOULD BE ESTABLISHED SEPARATING THE MAINTENANCE AND THE CONSTRUCTION OFFICES. THREE SPECIF STEPS ARE SUGGESTED: (A) THE MOW ORGANIZATION CHART, STAFFING PATTERN, AND ANNUAL BUDGET PROCESS SHOULD ESTABLISH, AND REINFORCE THIS DISTINCTION; (B) MAINTENANCE EQUIPMENT SHOULD BE CLEARLY MARKED AS MAINTENANCE EQUIPMENT, AND NOT UTILIZED FOR OTHER THAN MAINTENANCE ACTIVITIES; AND (C) THE GOB SHOULD

COVENANT TO FUND THE MAINTENANCE OFFICE AS A DISTINCT ENTITY. (WE UNDERSTAND GUATEMALA HAS BEEN PUBLICIZING ITS HIGHWAY MAINTENANCE OPERATION AS A WAY OF BUILDING POPULAR INTEREST AND POLITICAL SUPPORT FOR THIS EXPENDITURE. YOU MIGHT CHECK WITH THE USAID AS TO HOW EFFECTIVE THIS HAS BEEN THERE.)

6. COORDINATION WITH OTHER PROJECTS. THE PP SHOULD SHOW THIS PROJECT WILL NOT DUPLICATE OTHER PROJECTS, AND THAT THE STAFF TRAINING, WORKFORCE, AND NATIONAL BUDGET ELEMENTS WILL NOT INTERFERE WITH THE PROVISIONS OF THESE THREE COMPONENTS TO THIS PROJECT.

7. EVALUATION. IN ADDITION TO THE CUSTOMARY COVERAGE, EVALUATIONS SHOULD LOOK TO THE EXTENT TO WHICH THE MAINTENANCE OFFICE HAS BEEN PRESERVED AS AN OPERATION DISTINCT FROM NEW ROAD CONSTRUCTION.

8. IEE NOT YET RECIEVED.

--- END OF CABLE ---

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Project Title & Number: Rural Access Roads & Bridges 505-0007

Life of Project: From FY 83 to FY 87
Total U.S. Funding $5,400,000
Date Prepared: 12 Sept. 83

PAGE

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: (A-1)	Measures of Goal Achievement: (A-2)	(A-3)	Assumptions for achieving goal targets: (A-4)
To increase Belize's agricultural production through the rehabilitation and maintenance of all-weather rural access roads and bridges.	Increased natl. agricultural output by 10% in real terms between 1984 and 1990.	National accounts data	Agricultural development continues to be sector priority of GOB.

-28 (1-73)
MENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 83 to FY 87
Total U.S. Funding $5,400,000
Date Prepared: 12 Sept. 83

ct Title & Number: Rural Access Roads & Bridges 505-0007

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
ct Purpose: (B-1)	Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)	(B-3)	Assumptions for achieving purpose: (B-4)
crease the capability of the build, maintain and protect ral access road inventory h training, technical ance and equipment procure-	1) Reduced per mile costs for rural road construction. 2) Reduced per mile costs for rural access road maintenance 3) Better planning and budgeting of MOW resources. 4) Proportionately fewer pieces of equipment on "deadline."	1) MOW cost analyses 2) MOW cost analyses 3) Existence of a comprehensive MOW planning, program- 4) MOW equipment situation reports.	1) MOW will assign maintenance operations to a discreet district-level maintenance unit. 2) MOW will create an office of planning and budgeting. 3) MOW will commit its operations to guidance by modern management techniques and planning methods. 4) MOW will develop an equipment management and maintenance system aimed at reduced costs and improved utilization efficiency.

AID 1020-28 (1-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number: Rural Access Roads & Bridges 505-0007

Life of Project:
From FY 83 to FY 87
Total U.S. Funding $5,400,000
Date Prepared: 12 Sept. 83

PAG 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
1) Rehabilitated rural access roads 2) Rural access roads maintained at lower costs. 3) Rural access roads constructed lower costs. 4) Permanent national system of maintenance 5) Office of planning and budget. 6) Training for maintenance. 7) Training for reconstruction	1) 300 miles rebuilt 2) Maintenance costs reduced to $2000 per mile 3) Costs reduced 4) District plans and maintenance units in place 5) MOW five year plan/budget in place 6) Two spreads of equipment operating in all Districts of Belize	1) Field inspections 2) Cost accounting 3) Cost accounting 4) Document review and MOW organizational chart 5) Plan/budget in place and use for forward operations planning 6) Field inspections 7) Field inspections	1) MOW counterparts, employees, and operations in place by March 1984 2) Equipment procured per project plan 3) MOW office of planing and budget established. 4) MOW supports descrete maintenance operation 5) MOW maintenance plan developed

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AID 1020-28 (1-79)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 83 to FY 87
Total U.S. Funding $5,400,000
Date Prepared: 12 Sept. 83

Project Title & Number: Rural Access Roads & Bridges 505-0007

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs: (D-1)	Implementation Target (Type and Quantity) (D-2)	(D-3)	Assumptions for providing inputs: (D-4)
	(US$ x 1,000)	Review of project financed records, vouchers, etc.	Inputs are provided in a timely manner, no unanticipated delays in meeting CPs set forth in project agreement
Technical Assistance	1355.0		
Equipment	2585.4		
Parts	347.31		
Fuel/lubes	400.00		
Shop tools	200.00		
Shipping	470.14		
Local Labor	850.00		
Materials	390.00		
Admin expenses	62.690		
Contingency	678.12		
Inflation	111.34		
Total	7450.0		

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5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBLITY

1. FAA Sec. 481. Has it been determined that the government of the recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully? No

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? No.

3.	FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	No.
4.	FAA Sec. 532(c), 620(a), 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?	No. No. No.
5.	ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.	N/A
6.	FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?	No.

7.	FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC?	No.
8.	FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters? (b) If so, has any deduction required by the Fishermen's Protective Act been made?	
9.	FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more ~~than~~ six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds?	No. No.
10.	FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual "Taking into	Yes, taken into account by the Administrator at time of approval of Agency OYB.

	Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)	
11.	FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?	No.
12.	FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)	Current.
13.	FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or	No.

abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime? No.

14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No. No.

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed No.

Best Available Document

to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti. — N/A

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? — No.

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? — N/A

b. ISDCA of 1981, Sec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.?	N/A
c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Govt. of Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier?	N/A

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

   (a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that amount)?

   By Advice of Program Change forward to Congress September 12, 1983.

   Yes.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,00, will there be

(a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	Yes.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	None Required.
4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See AID Handbook 3 for new guidelines.)	N/A
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	N/A

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	No. This project will have little effect on regional development programs.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	a) Yes, as exports of agricultural products to CARICOM and U.S. markets increase. b) Yes, through training of private equipment operators in rural access road construction activities. c) No. Not applicable in this type of project. d) Yes, through increasing number of farmers with access to markets in Belize. e) Yes, through improved service by extension officers to outlying farm communities. f) No effect anticipated
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	U.S. private sector will participate as source of technical assistance, training and equipment.

9.	FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.	All local currency costs will be financed by host country contributions of cash and in-kind services.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No.
11.	FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes.
12.	FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	No.
13.	FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? Does	Yes.

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the project or program take into consideration the problem of the destruction of tropical forests?

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and

a) Yes, in all production-related activities small and medium farmers in rural Belize will participate fully by better access to local and international markets.

b) No.

otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?	d) This project will have little direct effect on the status of women. e) This project will have little regional effect.
b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?	Yes.
c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?	Yes.
d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activitiy with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	Yes.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character.	No.
f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes.
g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage	The project has been designed to train existing MOW personnel and some private sector contractors in vital public infrastructure development activities. Technical assistance and training will be provided to improve on the rudimentary level of skills and capabilities of the country in road construction and maintenance.

institutional development; and supports civil education and training in skills required for effective participation in governmental processes esential to self-government.

Training and technical assistance are two major project inputs.

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

N/A

c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?

N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political

stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?

c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? N/A

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Please Quote 18/5/83(10)

Office Of The Prime Minister
Belmopan,
Cayo District, Belize
Central America

12 September 1983

Mr. Neboysha R. Brashich
A.I.D. Representative
U.S.A.I.D. Mission to Belize
American Embassy
Belize City

Dear Mr. Brashich,

On behalf of the Government of Belize, I hereby request the Agency for International Development to provide a Grant of Five Million Four Hundred Thousand United States Dollars to the Ministry of Public Works.

This Grant will be used to assist the Ministry of Public Works to build, maintain and protect its rural access road inventory through training, technical assistance and equipment procurement. Ultimately, this effort will result in increased agricultural production in Belize.

My Government welcomes this assistance from A.I.D., and we look forward to an early negotiation of an agreement covering this requested assistance.

Sincerely,

George Price

(GEORGE PRICE)
Prime Minister

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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

LAC/DR-IEE-83-50

ENVIRONMENTAL THRESHOLD DECISION

Project Location	:	Belize
Project Title and Number	:	Rural Access Roads and Bridges 505-0007
Funding	:	$5,400,000
Life of Project	:	Three years, one month
IEE Prepared by	:	James J. Talbot REMS/C USAID/Port au Prince
Recommended Threshold Decision	:	Negative Determination
Bureau Threshold Decision	:	Concur with Recommendation

Copy to	:	Neboysha Brashich AID Representative/Belize
Copy to	:	James Talbot, REMS/C
Copy to	:	Robert Otto, LAC/DR ✓
Copy to	:	IEE File

James S. Hester Date 23 Sept. 1983
James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

INITIAL ENVIRONMENTAL EXAMINATION

PROJECT LOCATION: Belize

PROJECT TITLE: Rural Access Roads and Bridges

FUNDING: FY 83, $3.3 Million Grant

LIFE OF PROJECT: FY 1983-1986

IEE PREPARED BY: James J. Talbot, REMS/C

James J. Talbot
Signature

19 August 1983
Date

ENVIRONMENTAL ACTION RECOMMENDED: Negative Determination

Concurrence:

Nebosha R. Brashich
A.I.D. Representative

August 19, 1983
Date

INITIAL ENVIRONMENTAL EXAMINATION

PROJECT DESCRIPTION

The goal of the Project is to increase Belize's agricultural production through the rehabilitation and maintenance of all-weather (gravel) rural access roads and bridges. The purpose of the Project is to increase the capability of the Government of Belize (GOB) to build, maintain and protect its rural access roads through training, technical assistance and equipment purchase. Four components of the project include: (1) Rural Road Construction/Rehabilitation Training Unit (CRTU); (2) Rural Road Maintenance Training Unit (MTU); Ministry of Works (MOW) Management Improvement Component; and (4) MOW Policy and Program Development Component (PPDC).

The training units will function as both on-the-job training and production modules which will be instructing MOW personnel using existing road sections in need of rehabilitation. Expatriate technical assistance will provide the necessary guidance through all phases of this effort. Roads will be rehabilitated and maintained to modified minimum commercial standards.

SCOPING OF ENVIRONMENTAL ISSUES

Rural access roads have direct and indirect environmental effects. Direct effects are caused by construction/rehabilitation of the road section itself and include: erosion of hillsides where roads are built, siltation of rivers from this erosion, continuous dust production in towns along the road, flooding and erosion near outlets of drainage structures, and loss of prime agricultural lands if existing road alignments are changed. Indirect effects are those occurring in the road influence area once the road has been constructed/improved and include: aggravation of deforestation and soil erosion, and shortened milpa fallow periods leading to declining soil fertility.

The historical record, if one examines worldwide donor-assisted rural access road building/rehabilitation, indicates that indirect effects create more serious environmental problems than do direct effects. Basic causes of such indirect effects are due to more extensive and intensive cultivation and, in extreme cases, to more logging for selected tree species. Increased farming was assisted by roads, certain agricultural price policies, expansion of agricultural services, greater availability of supplies and credit, and increased population growth. A typical trend where population centers are linked by improved roads is that land near the roads (if not previously occupied)

becomes scarce, farmers move up hillsides, more land is cleared without regard to soil capability/land use potential for certain kinds of crops and cropping systems/practices, and even demand for fuelwood increases. In general, these effects can be considered as positive and/or negative. On the positive side, more arable (not necessarily better) land is brought into production; hence, country development goals of food import substitution and greater farmer self-reliance are achieved. On the negative side, certain environmental costs are borne in the long term by deterioration of the agricultural resource base, particularly land, soil and even water. For example, (1) new settlers arrive in an area where improved access exists and find the best lands occupied -- many will be tempted to settle on poorer lands, or (2) current residents could expand land use onto similarly poorer zones where risk of environmental damage is high. In the case of Belize with its tradition of milpa agriculture (slash-burn, long fallow), indirect effects should be carefully scrutinized in zones dominated by Mayans and Mestizo refugee farmers.

Although road candidates have not been conclusively agreed upon with the filing of this IEE, preliminary screening of candidate areas has been done by REMS/C and the PID/PP Team in-country. These areas are summarized in Appendix 1 - Ecological Characteristics of Road Influence Area. In summary, such areas have been selected because of their good agricultural potential (for perennial crops, clean cultivation, pasturage). Protection and production forests and wetlands, wildlife or other critical habitats were avoided.

ANALYSIS OF ENVIRONMENTAL EFFECTS

The proposed project is designed to improve existing secondary roads by rehabilitating the road surface and establishing an effective road maintenance program for such segments. Direct environmental effects of the proposed project will be minimal since (1) new roads/construction will be non-existent (bridges will require new construction and some existing road alignments may need to be modified to some degree), and (2) engineering design criteria will be applied to minimize flooding and erosion hazards along existing alignments. With respect to environmental protection, having a roads project that focuses on appropriate methods of reducing loss of soil resources due to erosion is a desirable effort in Belize.

A comparison of environmental effects <u>with</u> and <u>without</u> the proposed USAID Project is provided to draw attention to the need for improvements in the use of roads to achieve desired development ends related to environmental quality (Table 1). Without

TABLE 1. SUMMARY OF ENVIRONMENTAL EFFECTS WITH AND WITHOUT THE USAID PROPOSED PROJECT

Environmental Effects/Problems	Without Project	With Project
Direct		
Erosion of hillsides Siltation of rivers	GOB continues new road construction w/o maintaining existing roads leads to further environmental deterioration	No new construction, except for bridges and minor alignment changes, on USAID effort
Dust production	Unavoidable due to nature of limestone and sandstone bedrock	Unavoidable for same reason
Flooding/erosion near drainage structures	Improper construction indicated in field reconnaissance; will continue to aggravate environmental problems	Training/maintenance component will focus on proper methods
Loss of agricultural lands with changed/new road alignments	Unavoidable, if GOB program continues emphasis on new road construction only	Insignificant loss of agricultural lands since new construction not emphasized
Loss of critical/wildlife habitat	Same as above	Protection forests, wetlands, other critical habitat excluded
Indirect		
Aggravation of deforestation	Land wardens have access problems to crown lands in many areas	Greater access by land wardens to police illegal logging
Shortening of milpa fallow period	Inappropriate road selection and alignments access many poor/marginal lands to farmers	Improved agricultural services due to year-round access
Soil erosion	Erosion hazard of road influence area not addressed by GOB in road selection	Erosion hazard and land use potential used as criteria in road selection

the Project, the GOB will continue to drive development into undesirable areas such as protection forests or zones prone to flooding with their emphasis on road construction only, not rehabilitation of existing roads. By deflecting development toward improvement of roads in already productive areas or areas where complementary agricultural projects are ongoing (such as the Valley of Peace Project), positive benefits can accrue in an economic, ecologic and social sense.

ENVIRONMENTAL PROTECTION MEASURES

The Project is designed to stimulate development in the agricultural sector by improving existing rural roads to all-weather status for better market access. Since major environmental concerns relate to aggravation of deforestation and soil erosion and shortening of the milpa fallow period due to more extensive and intensive use of lands, special attention should be placed on selection of road candidates for rehabilitation and on monitoring of farming or other land use activities in the road influence area. The following environmental protection measures are suggested to protect primarily soil and forest resources:

1. Proper selection of candidate roads for improvement will mitigate undesirable indirect effects. Use of existing in-country expertise in land use potential is feasible, but may require some external assistance. Use of the USAID Regional Environmental Management Specialist/Caribbean or some similar advisory support program now available to Missions (e.g., S&T Environmental Planning and Management Project) for consultation on road site selection is appropriate.

2. The MOW and Ministry of Natural Resources (MNR) should discuss some liaison effort and eventually plan and design complementary programs in the long term which focus on roads in agriculturally productive areas. Although such complementary programs are outside the scope of the proposed Project, they could form the basis for future development activities by the donor community in Belize. The immediate need would be for a Land Use/Tenure Officer from MNR to liaison with MOW on rural access road projects.

3. Application of engineering design principles/standards to reduce flooding and erosion at appropriate road sections along a candidate road is mandatory. Technical assistance team can inculcate local counterparts to linkages between public works and environmental quality objectives as part of the present program.

RECOMMENDATIONS FOR ENVIRONMENTAL ACTION

The proposed project could foster some change with adverse implications if environmental protection measures are not considered and applied to the most practicable extent. However, since the Project will be restricted to rehabilitation and improved maintenance of all-weather, gravel roads in areas with existing populations of farmers, land with agricultural capability, and existing, albeit poor road service, minimal negative environmental effects are anticipated. In addition, training of road construction and maintenance personnel with respect to effective methods of drainage and erosion control problems such as stream sedimentation, loss of road-bed material due to sheet erosion, drainage obstruction, will have a positive impact on the Project areas. In view of these predictions, it is recommended that a Negative Determination be approved for the Project.

APPENDIX 1. ECOLOGICAL CHARACTERIZATION OF SELECTED ROAD INFLUENCE AREAS

Each road segment is located within a distinct land ecosystem type which has a characteristic set of plant-soil parameters. The main features of selected areas suggested for siting/rehabilitation of rural access roads are summarized. This description is not intended to be comprehensive or to definitively state the final list of roads to be rehabilitated. Instead, they represent those sections selected from preliminary aerial and ground reconnaissance during the period August 16-19, 1983 by REMS/C and the PID/PP Team, and illustrate the emphasis in the USAID approach on selection based on most appropriate lands for agriculture.

Toledo District: Pueblo Viejo-San Antonio Road Segment

- Ecosystem: Toledo Foothills
- Life Zone: Subtropical wet forest
- Existing Land Use: Milpa system dominates land use; long-term fallow of 7-9 years most appropriate; in extreme cases of use, plant formations such as fern thickets develop; under light milpa, Aguacate soils remain productive for decades.
- Soils: Derived from calcareous sandstone and siltstone, friable, medium-depth, texture of sandy-clay loams to sandy loams.
- Slope: Although susceptible to erosion, sandstone weathers rapidly so that vegetative growth can penetrate bed material.
- Appropriate Land Use: Permanent tree crops such as cacao and semi-permanent tree crops, fruit trees; steeper slopes are highly erodible and require protection forest;

Cayo District: San Antonio-Cristo Rey Segment

- Ecosystem: Northern Karst foothills
- Life Zone: Subtropical moist forest
- Geologic formation: limestone foothills (Cretaceous)
- Soils: depth variable, stony in many places; fragmented and dolomitic Iste; many shallow soils and exposed calcareous rocks, majority not affected by erosion; high level of natural fertility.

- Climate: Five spring dry months require water for continuous cropping.

- Land Use: Fire use a problem and escaped fires cause land destruction; milpa with a 3-5 year cycle; steep slopes should remain in protection forest; rolling hills are good for cacao with shade; more gentle relief good for cacao/citrus (better drainage needed) and for fruit production.

Belize-Cayo Districts: Caves Branch-Gracy Rock Branch (Sibun River)

- Ecosystem: Calcareous soils of the northern lowlands

- Life Zone: Subtropical moist forest

- Soils: Complex but, in general, derived from hard Cretaceous limestone, and hard sliceous limestone;

  Sub-Unit A - Some areas of low fertility, poor drainage indicated by Sabal palm, good drainage by hardwoods such as Zanthoxylum, Mahogany and Spondias; some milpa possible;

  Sub-Unit B - Tall forest with good soil fertility, deep soils and good drainage; black clays, suited to tree crops and pastures on gentler slopes;

  Sub-Unit C - Siliceous soils with limestone outcroppings (lowland pine ridge); some alluvial accumulation where farming possible; soils areacidic, heavily leached and of low fertility; some citrus and pasture possible; on non-illuviated soils (sand surface with clay hardpan), if drainage is improved, citrus or other tree crops are possible.

Corozal District: Chunox-Sarteneja Road

- Life Zone: Subtropical dry forest

- Climate: Dry season limited; hence, irrigation needed for continuous cropping.

- Soils: Derived from coral rubble, coralline limestones and beach sands and gravels; well-drained and moderately fertile.

- Land Use: Best for upland rice, pineapple, peanuts and tomatoes which are extensively grown in this area; well suited for deep-rooted fruit trees, milpa (corn, beans and sorghum) appropriate; not well adapted to pasture.

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D C 20523

CERTIFICATION PURSUANT TO SECTION 611 (E) OF THE

FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Neboysha Brashich, the Principal Officer of the Agency for International Development in Belize, having reviewed the Project Paper and having taken into account, among other factors, the maintenance and utilization of Projects in Belize previously financed or assisted by the United States, do hereby certify that in my judgetment the Ministry for Works has both the financial capability and human resources capability to effectively maintain and utilize the proposed Rural Access Roads and Bridges Project.

Neboysha Brashich
USAID Representative to Belize

ILLUSTRATIVE SELECTION CRITERIA

General Category and Overall Weight	Factor	Unit	Quantity	Scale	Weight
Economic Activity (40)	Agricultural Potential Indicator	Qualitative assessment of ag. potential	Good Fair Poor	100 60 30	15
	Degree of Access Improvement	Road condition before improvement	No road (Cat.3) Poor road (" 2) Fair road (" 1)	100 60 20	15
	Complementary Services and planned development activities in the RIA*	Approximate $ cost of planned complementary activities per road kilometer	0-1500	0-100	10
Quality of Life (30)	Population Served	Population in the RIA per km of road	0-2000	0-100	10
	Access to Social Svs.	Improved from no access to any services to access to both primary and secondary services (Level A improvement)	Good Imprvmt.	100	20
		Improved from no access to any services to access to secondary services only (Level B improvement)	Fair Imprvmt.	66	
		Improved from access to secondary services to access to primary services	Poor Improvement	33	
		No Improvement	No Improvement	0	
C. Equity (30)	Existing income Distribution	Farmland distribution	Small farmers own less than 20% of land	0	10
			Small farms own between 20% and 60%	50	
			Small farmers own more than 60%	100	

General Category and Overall Weight	Factor	Unit	Quantity	Scale	Weight
	Distribution of Incremental Income	Fraction of Transport cost savings passed on to users	More than 80% (highly competitive)	100	20
			Between 40% and 80% (competitive)	50	
			Less than 40% (non-competitive)	0	

*RIA = Road Influence Area