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INFRASTRUCTURE ASSESSMENT for the FY 89 COUNTRY DEVELOPMENT STRATEGY STATEMENT for BELIZE

FINAL REPORT

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ABSTRACT

This paper reviews the status of the main infrastructure systems in Belize and suggests approaches to infrastructure assistance for consideration by USAID in preparing its Country Development Strategy Statement for the period 1990-1995.

The paper delineates three strategic approaches which may be pursued separately or in combination. The first approach seeks to address policy and institutional problems which affect infrastructure systems and impede the achievement of national objectives. It gives particular attention to collaboration between USAID and the World Bank in the areas of electric power supply and highway rehabilitation.

The second approach establishes priorities among the areas in which the Mission currently has been rendering assistance to infrastructure systems in Belize. This approach assumes that the resources which the Mission will have available for infrastructure activities will be reduced. It gives particular emphasis to bridge and rural road sub-projects directly related to expanding economic activities and to the possibility of reducing electric power rates.

The third approach presents a list of attractive individual opportunities to improve infrastructure systems in Belize. This approach widens the range of specific possibilities and permits the strongest case to be made for devoting substantial Mission and other donor resources to this important area of activity. Thirty-two opportunities are identified in the fields of telecommunications, electric power, transportation, water and sanitation, industrial estate development, and development agency coordination.

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LIST OF ACRONYMS

AAP	Annual Action Plan
AID	Agency for International Development
BCB	Banana Control Board
BCCI	Belize Chamber of Commerce and Industry
BEB	Belize Electricity Board
BEIPU	Belize Export and Investment Promotion Unit
BMB	Belize Marketing Board
BPA	Belize Port Authority
BSB(I)	Belize Sugar Board (Industry)
BTL	Belize Telecommunications Limited
BTB	Belize Tourist Board
CARE	Cooperative for American Relief Everywhere
CARICOM	Caribbean Community
CBI	Caribbean Basin Initiative
CDB	Caribbean Development Bank
CDC	Commonwealth Development Corporation
CDSS	Country Development Strategy Statement
CGA	Citrus Growers Association
CIDA	Canadian International Development Agency
DA	Direct Assistance
DFC	Development Finance Corporation
EDB(F)	European Development Bank (Fund)
EEC	European Economic Community
GDP	Gross Domestic Product
GNP	Gross National Product
GOB	Government of Belize
IBRD	International Bank for Reconstruction and Development (World Bank)
ISTI	International Science and Technolgoy Institute, Inc.
IMF	Internationial Monetary Fund
MOCIT	Ministry of Commerce, Industry and Tourism
MED	Ministry of Economic Development
METC	Ministry of Electricity, Transport and Communications
MH	Ministry of Health
MLNR	Ministry of Lands and Natural Resources
MTI	Ministry of Trade and Industry
MUCIA	Midwest Universities Consortium for International Activities
MOWH	Ministry of Works and Housing
NRECA	National Rural Electric Cooperative Association

OAS	Organization of American States
ODA	Overseas Development Administration, (U.K.)
OPG	Operational Program Grant
OPIC	Overseas Private Investment Corporation
PC(V)	Peace Corps (Volunteer)
PVO	Private and Voluntary Organization
UNDP	United Nations Development Program
USAID	United States Agency for International Development (Mission)
WASA	Water and Sewerage Authority

EXECUTIVE SUMMARY

This assessment of infrastructure systems in Belize is intended to contribute to a new Country Development Strategy Statement (CDSS) being developed by USAID. The assessment covers: (1) telecommunications; (2) electric power; (3) transportation; (4) water supply and sanitation; and (5) industrial estates. It gives primary attention to the electric power system, the transportation system, and to institutional dimensions of infrastructure development in Belize.

Characteristics of Infrastructure Systems in Belize

Infrastructure systems typically require heavy investments and may be regarded as "natural monopolies". They typically serve a variety of social groups and regions with differing characteristics and interests. Infrastructure organizations in Belize deal in very specific ways with many of the dilemmas that lie at the heart of public policy formulation:

- -- Competition between national objectives of growth and equity;
- -- Tensions between political and techno-economic approaches to planning and decision making;
- -- Competition between the objectives of expanding service and of reducing consumer costs.

The financial performance of infrastructure systems in Belize has had a significant impact on the Government's fiscal position. Their efficiency and cost-effectiveness affects the performance of the rest of the economy. The performance of infrastructure systems has been critically important to stabilization and structural adjustment in Belize.

Belize has a very low population density and has experienced substantial out-migration of talented people. The country's clustered settlement patterns make for relatively high infrastructure costs in rural areas, and tend to favor decentralized technical solutions. Shortages of management and technical skills adversely affect infrastructure organizations in Belize, slowing the rate at which they can grow and improve in efficiency.

In many areas of the country, households, cooperatives, and business establishments have built roads and installed electric power supplies, water supplies, and other elements of infrastructure. Concentration of public infrastructure in areas of higher population density spawns political pressures for wider

geographic distribution of public investment. During a period when foreign financing of infrastructure investment may decline and the country's infrastructure organizations may be increasing their efficiency rather slowly, such political pressures can pose formidable problems.

Belize has adopted economic policies which, on the whole, are outward-looking and enlightened. Prior to 1981, the country experienced an upward trend in economic growth and had a very small external debt. However, the seeds of difficulty were present in cyclical export patterns, escalating government expenditures, and loose monitoring of the finances of key parastatal organizations. In 1981, export prices declined and the country's sugar quota was cut. In 1982, the Mexican peso was devalued, and a sharp decline in Belize's re-export trade with Mexico ensued.

In response to the country's deteriorating fiscal and balance of payments circumstances, the Government tightened budgetary discipline, encouraged expansion and diversification of exports, and sought increased foreign investment. During the past five years, a combination of changed policies, increased foreign aid, industry rationalization, and more favorable external conditions have produced a striking turn-around. However, the improved performance of the economy of Belize seems to be more a rather temporary "economic stabilization" than a fundamental "structural adjustment." Less favorable external conditions and/or a substantial reduction in foreign aid could cause retrogression.

Given the present structure of the national budget, there probably is not much room for increasing public savings through further direct cuts in Central Government expenditures. In the past, assistance provided by AID's ESF funding has generated the counterpart funds which Belize has used to pay its share of investments in infrastructure funded by foreign assistance--particularly investments in its road network. As AID's ESF assistance comes to an end, the country faces a strategic bottleneck in attracting development funds to finance major infrastructure improvements.

Possibilities for overcoming this bottleneck include (1) accelerating improvements in the efficiency of individual systems; (2) encouraging private investment in infrastructure; and (3) relating public and parastatal expenditures for infrastructure directly to the enhancement of production and productivity.

AID Assistance to Infrastructure

In AID's early years, large infrastructure projects represented a major agency focus. Over time, the "bricks and mortar" content

of the program has declined. Rather than having a distinctive rationale of its own, most agency infrastructure activity has been fit into other molds. It has been justified in terms of basic human needs, rural development, institutional development, and other prevailing rationales. For the most part, the Agency has left large infrastructure projects to multilateral institutions and to other bilateral programs. However, AID's current concern with Third World debt problems and the IMF/World Bank policy framework process provides a platform for Mission involvement in the policy issues and institutional development requirements of major infrastructure organizations.

The Belize Mission's principal planning documents (the Country Development Strategy Statement and the Annual Action Plan) have aligned USAID assistance to the Belize Electricity Board with the goal of economic stabilization, its funding of bridges and rural road rehabilitation with the goal of economic growth, and its support of rural water supply and sanitation projects with the goal of equitable distribution of the benefits of growth. The association of each type of infrastructure assistance with a single development objective has the virtue of clarity and simplicity. Nevertheless, each infrastructure system assisted by AID in fact is engaged in balancing multiple goals, including those of stabilization, growth, and equity. The problems and opportunities for infrastructure development in Belize can best be understood in terms of such a balancing process.

A comparative analysis of the Mission's prior Country Development Strategy Statement (April 1984) and the most recent Annual Action Plan (March 1988) suggests that initial emphasis on assistance to the Belize Electricity Board has been replaced by a focus on the Rural Roads Project. Perhaps because of its more operational purpose, the Action Plan also gives less attention to the underlying constraints affecting infrastructure than did the CDSS.

Approach to Infrastructure Strategy

Belize has extensive needs for the construction, rehabilitation, expansion, and improved maintenance of its infrastructure systems. These needs exist in both urban and rural areas. Most needed improvements will be quite expensive. USAID/Belize has not yet formulated a budgetary target or program scope for infrastructure activities which it wishes to pursue in the 1990-1995 period, but its resources obviously will not be unlimited. Given these circumstances, the present infrastructure assessment seeks to:

1. Identify underlying problems affecting infrastructure systems in Belize which impede the achievement of national objectives. This approach places national economic, political, and social concerns at the heart of the Nation's

and the Mission's infrastructure strategy, and tends to focus on policy and institutional solutions.

2. Establish priorities among infrastructure activities on the assumption that the resources which the Mission will have for such activities will be reduced. This approach narrows the range of alternatives and emphasizes those areas in which the Mission has made previous efforts and investments.

3. Present a list of attractive individual opportunities to improve infrastructure systems in Belize. This approach widens the range of specific possibilities and permits the strongest case to be made for allocating substantial Mission resources to infrastructure activities. With a variety of recommendations before it, USAID can select the program scope that fulfills its requirements.

These approaches are by no means mutually exclusive, but, for the sake of clarity, each is addressed separately in the remainder of this Executive Summary.

Addressing Underlying Problems

The infrastructure systems examined in this report face a variety of common problems. Each system also faces distinctive challenges which help to define the kinds of solutions likely to prove effective in enabling them to contribute to national objectives. These may be summarized as follows:

Infrastructure System	Principal Challenges
Telecommunications	-- Providing service reasonably in line with rising international standards and expectations; -- Pioneering the transition from Ministry control to mixed ownership.
Electric Power	-- Making sound choices among system expansion alternatives; -- Determining proper disposition of current financial surpluses.
Transportation Systems	-- Maintaining and upgrading needed facilities with limited resources; -- Coordinating transportation system activities.
Water and Sanitation	-- Preventing health problems in key urban locations; -- Extending water and sanitation services to rural areas.

Industrial Estates	--	Coordinating space expansion with rising demand;
	--	Raising rates to cover costs.

Infrastructure organizations in Belize are engaged in a difficult process of reconciling competing goals of growth, equity, and political responsiveness as they allocate their resources. Rather than becoming directly involved in this process, donors generally have preferred to pick an area of assistance that reflects a single theme -- e.g., major system rehabilitation, rural feeder roads, export facilities, or the like -- and then attempted to persuade the government to give the highest priority to that single theme. On occasion, the Government has found it advantageous to attract a variety of single-theme donor projects and then to spread limited resources among them so that each development institution is kept at least minimally happy. The pattern is often one that gives grease to the squeaking wheel and postpones the process of seeking solutions to fundamental problems.

Institutional and policy issues affecting infrastructure systems in Belize center around (1) donor collaboration: (2) the numbers, coordination, and Ministerial oversight of public utilities and other infrastructure organizations; (3) allocation of resources among urban and rural development requirements; and (4) the role of the private sector in infrastructure development.

International development agencies do not have an organized "Belize Club" in the sense that donor-led arrangements exist for some other countries in the region, such as Grenada and Bolivia. Informal coordination among development institutions on infrastructure and other programs has not been particularly energetic or effective. In early 1988, the Ministry of Economic Development held a donor coordination meeting in an attempt to rectify this situation. It was considered a success and is to be repeated annually. However, the meeting was not able to examine program and project issues in depth.

Where concerns such as goal-selection, donor conditionality, parastatal performance, and government organization are at issue, government-initiated coordination is subject to inherent limitations. If progress is to be made on fundamental issues affecting infrastructure in Belize, closer collaboration among international development agencies, combined with an evolution of the country's political processes and institutions, is in order.

Effective donor coordination is not necessarily best initiated by assembling all interested parties around the table to engage in a multilateral planning process. A conceivable strategy for the Mission would be to work with the World Bank on key issues first and then to involve other institutions as a consensus emerges.

Patterns of national spending on infrastructure systems do not sufficiently reflect national priorities and system optimization requirements. A recent World Bank assessment of the transportation sector found limited capacities to contribute to national objectives, dispersion of responsibility of several ministries over fragments of the transportation system, lack of planning staff, and coordination difficulties, particularly for highways and highway maintenance.

The Belize Electricity Board and the international institutions assisting it are faced with basic issues concerning BEB's objectives, internal efficiency, and institutional responsibilities. These issues deserve collaborative attention as the organization's future investment program is being formulated. They include the size and nature of investment in new facilities, the level of BEB's rate structure, institutional responsibility for rural electrification, and the organizational structure of the electric utility itself. The Water and Sanitation Authority and its parent Ministry face problems balancing the needs for urban system development and financial self-sufficiency against those for rural water and sanitation systems.

The Mission, the Bank, and other institutions could provide support for a joint program of study and action to enable the Government to address fundamental questions of infrastructure organization and policy. These include:

1. Are there too many individual organizations responsible for infrastructure in Belize? Are oversight activities for infrastructure spread among too many Ministries? Are coordinating mechanisms adequate? What practical alternatives are there to the present pattern?

2. Should traditional patterns of Ministerial control over public utilities in Belize be changed? Should Belize have a Public Utilities Commission similar to that which has been set up in Barbados and in other jurisdictions? How can the interests of other government utilities, the business community, and the general public be best protected under the present system? Through what institutional alternatives?

3. Should the privatization process started in BTL be carried further in that organization? Should government ownership in BEB be divested in whole or it part? Is there scope for private investment in new forms of energy generation, such as hydroelectric power? Are there opportunities for privatization in other utility systems?

4. Should private ownership and maintenance of infrastructure be encouraged in rural areas or elsewhere? If so, should the

government offer incentives or assistance? Where private development is undertaken, what arrangements should be made to protect the public interest?

Priorities Among Existing AID Infrastructure Activities

USAID's programs of assistance to the Belize Electricity Board (finance and management), the Ministry of Works (bridges and rural roads), and the Water and Sewer Authority (rural water supply and sanitation) each have shown significant positive results. However, by their very size and nature, the problems of these organizations are not likely to be solved quickly. In each case, extended assistance could reap significant benefits by building on an established base. In the case of BEB, principal objectives should be to move from financial recovery to greater internal efficiency and a sound plan for the future. In the case of the Ministry of Works, one objective should be to build up its capabilities as part of a realistic plan for dealing with the magnitude of the rehabilitation/maintenance problem. In the case of WASA, an important objective should be to sustain and provide a sound organizational base for the existing rural water and sanitation effort.

If the Mission finds it necessary to reduce its funding in the field of infrastructure, attention will inevitably focus on project and program goals. If, in an environment of reduced funding, the goal of economic growth -- particularly short term economic growth -- is given primacy, some revisions in the Mission's approach to each infrastructure agency may be in order. In the case of the highway project, particular attention should be directed to those bridge construction and rural road rehabilitation and maintenance activities which directly serve substantial agriculture, tourism, and manufacturing activities. In the past, rural road selection has tended to balance considerations of regional equity and community development with those of economic development. If funds are cut back, that balance should be reexamined in terms of giving greater attention to economic development.

In the case of BEB, the largest potential for impact on economic growth probably lies in substantial reductions in electric power rates. Consideration of this possibility should probably be timed to coincide with the completion of studies of a full range of technical alternatives for system expansion. There may be a few cases where rural electrification can make a direct and immediate impact on productive activities. However, in many of Belize's lightly populated rural areas, substantial subsidies may be required, economic benefits may be a long time in coming, and justifications for any new programs may have to rest on considerations of equity and long-term development potentials. In the case of rural water supply and sanitation, the impact on productive activity is indirect, if important. As in the case of rural

electrification, however, the basic justification of new activities may have to rest on considerations other than those of short term economic benefits.

Attractive Individual Opportunities

Projects which present attractive opportunities for USAID or other institutions may be summarized as follows:

1. **Telecommunications**: Familiarizing BTL staff with equipment markets in the United States.

Belize Telecommunications Limited (BTL), the country's national telecommunications organization, is currently completing a major expansion utilizing equipment supplied by a U.S. manufacturer. Management wants to learn more about developments in the U.S.telecommunications equipment market. Payment of international travel of BTL's employees would permit BTL to stay abreast of new developments, make wiser equipment choices, and encourage continued purchases of U.S. equipment. The U.S. Department of Commerce and the Trade and Development Program may have a special interest in providing this assistance to BTL.

2. **Telecommunications**: Financing for future BTL system expansions.

Shortly before it undertook its current expansion, BTL discussed financing with the World Bank, but decided on other sources. World Bank or other multilateral financing remains a possibility for future expansions. The U.S. Export-Import Bank is also a possibility.

3. **Electric Power**: Evaluation of USAID Assistance to BEB.

USAID had provided management and financial advisory assistance to the Belize Electricity Board (BEB) as part of the World Bank's first power project, which was undertaken in 1986. This assistance, which has been financed with ESF resources, has never been evaluated. Some form of assessment of the Mission's assistance to BEB is very much in order. USAID could invite the participation of other development institutions in an evaluation of Mission assistance to BEB. Their participation would provide a relatively low-key forum in which to assess the experience of the past and alternatives for the future.

4. **Electric Power**: Policy dialogue with the World Bank and other institutions.

The basic issues of BEB's objectives, internal efficiency, and organizational structure deserve attention from the development institutions supporting BEB, as the utility's future investment program is being formulated. These include the size and nature

of investment in new facilities, the level of BEB's rate structure, institutional responsibility for rural electrification, and the organizational structure of BEB itself. The World Bank currently is de facto leader among organizations providing assistance to BEB. USAID could initiate a policy dialogue at various levels in the World Bank to focus attention on the impact of BEB's performance on Belize's economy. The Mission may wish to consider enlisting the assistance of the Office of Donor Coordination, the PPC/Economic Affairs Office, and LAC Bureau economists in this effort. Conceivably, the policy dialogue should address policy toward infrastructure systems in general, rather than BEB alone. Ultimately, discussions should involve other international development institutions as well.

5. **Electric Power**: Assistance with system expansion planning studies.

The World Bank is presently preparing its Second Power Project. Canadian International Power Services is performing a study of generation, transmission, and distribution alternatives for the future which will be critical to the Second Power Project and to the development of electric power supply in Belize. Limitations on the resources available for this study and omissions from its scope of work may limit its comprehensiveness. If supplemental investigations are in order, AID should consider financing them or encouraging other donors to do so.

6. **Electric Power**: Private sector investment in new power generation facilities.

Technical studies now underway may reveal opportunities for hydroelectric, steam, or other kinds of power generation in Belize suitable for private investment. In Pakistan, AID, the World Bank, and other institutions are collaborating on an approach which encourages private investment in new generation facilities, without changing the institutional status of the distribution system. USAID could support studies of similar opportunities for Belize.

7. **Electric Power**: Building business community advocacy capabilities.

USAID could strengthen the capacity of BCCI and/or BEIPU to analyze the effects of BEB's operating and investment decisions on the business community, and to formulate constructive proposals for change. This increased capacity would be used to increase the effectiveness of business persons on the BEB Board, to make representations to BEB and the Government, and to educate the public. USAID's existing project assistance to BEIPU could be expanded to accomplish this purpose.

8. **Electric Power**: Study of privatization and regulation of electric power generation, transmission, and distribution.

Working with the World Bank through its own policy dialogue process or otherwise, USAID could open the question of changing BEB's institutional role to that of a regulated public utility. Under such a scheme, Government would limit its surveillance to protecting the public's interests in adequate service and fair rates. An arrangement similar to that of BTL could be an intermediate step in this direction. Another approach would be to sell BEB to its customers. As BEB moves toward independence of Government, it will be important for government to acquire technical competence in utility regulation. USAID could assist in this process as well.

9. **Electric Power**: Study of the organization of rural electrification in Belize.

The National Rural Electric Cooperative Association (NRECA) is scheduled to undertake studies of Belize's rural electric power requirements in early 1989, utilizing a demand assessment model. That model has been designed to identify economically viable investments in the smallest of rural communities. USAID should support preparation of an in-depth study to analyze the organization of rural electrification in Belize and recommend institutional reforms, as appropriate.

10. **Transportation**: System-wide road rehabilitation and maintenance evaluation.

The principal focus of past assessments of USAID rehabilitation and road activities understandably has been on rural force account activities. The World Bank and other international development agencies have legitimate concerns about other parts of the road system. In order to encourage movement toward a consensus on system-wide priorities, USAID could incorporate an system-wide assessment as part of its next project evaluation--and invite other agencies to participate in this part of the evaluation.

11. **Transportation**: Equipment leasing service for road equipment.

Both the private and public sectors lack equipment needed to build, rehabilitate and maintain highways and rural roads and rural roads in Belize. In order to relieve this constraint and encourage greater private sector participation in the highway program, consideration could be given by USAID to providing assistance in the development of an equipment leasing service. AID funds could be used to procure major items of support equipment

for the establishment of the equipment leasing service, whereby small local contractors may lease equipment required for performing road work as an alternative to making heavy capital investments which are beyond their present capabilities. The rental rates would include all operating costs, including cost of operators, depreciation, maintenance and repair, spare parts support, overhead, and profit. Such a project would address the fundamental concern, shared by several international development institutions, that Belize lacks the capacity to maintain its road network.

12. Transportation: Extension of the USAID Rural Roads Project.

The Mission's ongoing Rural Roads Project is scheduled to end in April 1991. The services of the management and technical advisor are scheduled to end in March 1990. To assure the success of the program, it is recommended that USAID consider providing the additional financing and technical assistance required to continue the program for an additional three year period. In the absence of a Mission Engineer, the Management Advisor position should be maintained throughout the life of the project. However, to get the most out of the Rural Roads Project and other projects with infrastructure components, the Mission should consider placing a Chief Engineer on its staff.

13. Transportation: Mobile rock crushing equipment.

The quality of road construction and rehabilitation in Belize has suffered from lack of proper building materials. USAID should consider amending the Rural Roads Project to include funds for procurement of two mobile rock crushing plants, with supporting loaders and dump trucks. Alternately, the equipment could be provided under an equipment leasing service loan and leased to MOWH as needed. The crushing plants possibly could be obtained from U.S. Military Excess Property sources. The sooner the equipment is made available to MOWH, the sooner the quality of their work will improve.

14. Transportation: Acceleration of bridge construction.

The Mission's bridge construction program has proceeded more slowly than planned, in part because of shortages of local resources. Additional USAID funding would permit acceleration of bridge construction by contract, using the stock of excess property bridges obtained for MOWH. MOWH would prepare designs and tender documents and monitor the construction.

15. Transportation: Upgrading a road from the Western Highway to Gallon Jug.

The present road from Spanish Lookout or the Valley of Peace to Gallon Jug is a dirt track which is impassable eight months of

the year. If upgraded to an all-weather road, it would open up an area with many farms and good agricultural potential. The road would also provide access to the Mayan ruins, the Chan Chich Hotel and the Bowen farm. A feasibility study and environmental protection plan for the proposed project should be prepared before a decision is made to proceed.

16. Transportation: Rehabilitation of access roads by contract.

Sections of roads not included in the MOWH priority list for the Rural Roads Project which access tourist sites could be identified, and construction performed by private contractors under the guidance/supervision of MOWH. The construction might be funded under the ongoing Sugar Quota Offset Program in the north or in connection with a tourist sector development loan by USAID.

17. Transportation: Tourism road connecting Mayan ruins sites.

USAID should consider supporting GOB involvement in the planned Route-a-Maya, a road which will pass adjacent to the Mayan ruins of several Central American countries and Mexico. The initial requirement is for Government participation in coordination activities. A feasibility study of the Belizean portion of the road will be required as a follow-up.

18. Transportation: Regulatory aspects of private sector port development.

The Belize Port Authority is presently considering private sector proposals to develop land adjacent to existing port facilities at Belize City and to develop a deep water port at Deep Creek. The Mission should consider giving assistance to the Port Authority on issues of public sector policy, regulation, and legal arrangements for port development and/or industrial real estate development within port zones by private sector interests.

19. Transportation: Free trade zone at Belize City Port.

The Belize Free Zone Feasibility Study recently financed by USAID was quite negative in its assessment of the idea of locating an industrial estate on undeveloped land at the Belize City Port. Nevertheless, construction of warehouses and specialized storage and shipping facilities at the Belize City Port for lease under a Free Trade Zone concept remains a possibility. Such a project could be supported by USAID or other donors.

20. Transportation: Feasibility of improved domestic airfields.

While air transport accounts for only a small portion of total exports at present, air freight is considered the mode with the

greatest potential for expansion as non-traditional, perishable, and high-value-for-weight exports increase. There is considerable scope for the improvement of domestic airfields to support tourism, agriculture, and industry. USAID may wish to include a study of domestic airport needs as a component of an agricultural development, tourism development or private sector project. If the results of the study are positive, the private sector may be willing to finance recommended improvements.

21. Water Supply and Sanitation: San Pedro water supply contamination solution.

San Pedro, in Ambergris Caye, is a leading tourist destination. Water for the town is obtained from an aquifer 15 feet beneath the surface. However, salt water is intruding into the source due to increased demand and pumping. Pollution from septic tank effluent is also finding its way into the aquifer. The UNDP representative is preparing a scope of work for a drilling program and Water/Sewerage Master Plan for the Caye. WASA is presently drilling around the Caye, but without success because WASA drill rigs will only go to 150 feet. Discussions with a geologist indicate that rotary rigs which can reach a depth of 1000 feet are needed. WASA has requested assistance from CIDA in financing the Master Plan and drilling. A prompt and satisfactory solution to sanitation and potential water supply contamination problems at Ambergris Caye is of critical importance to the country's tourism development plans, as well as to the people who reside in the area. USAID should monitor progress of efforts to deal with this problem and offer assistance if required.

22. Water Supply and Sanitation: Village Water/Sanitation Project Extension.

WASA also receives assistance from USAID, CARE and UNICEF for a program of well drilling in rural areas. USAID is financing water and sanitation improvements in Belize, San Ignacio and Dangriga Districts. Drilling rigs are owned and crews are paid by the Government of Belize. USAID provided two rigs and the parts to rehabilitate two others. CARE is working in Corozal and Orange Walk Districts. UNICEF is working in the Toledo District. The project includes the drilling of wells and development of springs, pumping to elevated tanks by diesel-powered pumps, and distribution to the houses of each subscriber. The distribution systems are constructed by self-help; the tanks are constructed under contract. In two rural water supplies completed by CARE, voluntary community labor was largely used for tank construction. The work is proceeding well, if slowly. USAID should consider the extension of the Project Completion Date of the ongoing Water/Sanitation Projects for an additional two to three year period, with provision of additional funds necessary to execute the program.

23. <u>Water Supply and Sanitation</u>: Rural water supply and sanitation organization.

The USAID/CARE funded programs are being executed under the general direction of the Ministry of Natural Resources, through WASA. However, no specific local organizational unit within the Ministry or WASA has yet been set up to effectively implement the program. USAID should work with the GOB on setting up and providing sustained funding for a branch of WASA or a separate governmental unit, whose prime responsibility would be to plan, coordinate and implement village-level water and sanitation projects. An advisor should be provided to work with the new unit and with USAID/CARE.

24. <u>Water Supply and Sanitation</u>: Comprehensive water resources assessment

Belize does not have a current nationwide hydrogeological survey, providing data on the location and quality of underground water resources. A comprehensive water resources assessment would provide much-needed data for water supply improvement throughout the country, particularly in rural areas.

25. <u>Water Supply and Sanitation</u>: WASA electricity costs.

WASA is the largest consumer of electric power in Belize. Under BEB's single schedule rate structure, WASA is charged the same rate as private residents. WASA management has been trying to persuade BEB to give WASA a reduced rate, but without success. On the basis of a CIDA study, WASA believes it could produce electric power for itself at a considerable savings. This issue could be examined as part of a USAID-financed rate structure study and/or by providing expert technical assistance to the Government, WASA, and BEB in the course of negotiations between the two utilities.

26. <u>Water Supply and Sanitation</u>: Belize City Water/Sanitation Master Plan and system improvements.

The new water and sewerage systems in Belize City were built on the basis of a study performed in 1979. The new systems have not been designed to serve the areas of the city which have developed since 1979. There is a need to update the original Water and Sewerage Master Plan to take into account present and future water/sanitation requirements of the entire Metropolitan area of Belize City -- and to install the required improvements. This new study should examine the present canal system in the city, which has become something of an open cesspool, and the problem of solid waste disposal. These two problems will constrain the development of the tourist industry in Belize City. WASA is discussing assistance for the Master Plan with CIDA. Presumably, CIDA will be interested in financing the recommended

improvements.

27. Water Supply and Sanitation: Placencia Water/Sanitation Master Plan.

Placencia is a tourism destination whose water and sanitation requirements deserve review. Consideration should be given to developing a Water/Sanitation Master Plan for the Placencia area.

28. Industrial Estates: Coordinated planning for industrial estate and Free Zone development.

AID is currently funding a Belize Free Zone Feasibility Study. There is a possibility that the DFC expansion plans and plans for developing a Free Zone will each assume that they can capture the same limited group of seriously interested investors. The same possibility may exist with respect to plans for developing land adjacent to the Belize City Port. USAID should encourage each activity to take the others' plans seriously into account.

29. Industrial Estates: Financing development of land and utilities.

Should the development of a Free Zone prove feasible, USAID could consider contributing to the financing of land development and/or the installation of its utilities. Such financing also could be provided by other international organizations, such as CIDA.

30. Industrial Estates: Financing factory shells.

The Caribbean Development Bank normally funds the construction of factory shells at publicly owned industrial estates. However, AID has supplied such financing on occasion.

31. Development Agency Coordination: Infrastructure Cluster Evaluation.

International development agency coordination for Belize has not been very energetic or effective, particularly in dealing with infrastructure issues that can divide donors. One way for USAID to contribute to an improved process is to invite other agencies to participate in its own project evaluations (see items 3 and 10 above). An alternative would be to invite their participation in a "cluster" evaluation of all three USAID projects. The advantage of the cluster approach is that it permits examination of common issues (such as rural/urban priorities) in a variety of institutional contexts.

32. Donor Agency Coordination: Joint Study and Action Program.

Institutional and policy issues underlie many of the difficulties Belize has experienced in aligning the performance of its

infrastructure systems with national economic, social, and political objectives. A joint program of study and action could address the proliferation of infrastructure institutions, Ministerial control over utilities, privatization of existing utilities, and the development of private sector infrastructure systems in rural areas.

INFRASTRUCTURE STRATEGY ASSESSMENT

CHAPTER ONE

1.0 INTRODUCTION

1.1 Purpose and Organization of Report

This infrastructure sector assessment is designed to contribute to the Belize Country Development Strategy Statement for the period 1990-1995.

The assessment is presented in four sections. Following this introduction (Chapter 1), Chapter 2 of the report provides a brief overview of the economy, of AID's approach to infrastructure, of donor roles in assisting infrastructure development in Belize, and of the part which assistance to infrastructure systems has played in the program of USAID/Belize. Chapter 3 then discusses five types of infrastructure in Belize, giving particular attention to electric power supply and transportation. The discussion identifies constraints and suggests areas in which USAID initiatives would help to relieve constraints. The final section of the report (Chapter 4) suggests a USAID/Belize infrastructure strategy. This section also contains a summary of program/project opportunities identified earlier in the report.

1.2 Methodology and Framework

Field work for the present assessment was carried out in Belize by Harvey A. Lerner and C. Raymond Douglass of Louis Berger International during December 1988. The team reviewed the Belize Country Development Strategy Statement (April 1984), USAID's current Annual Action Plan, and a number of consulting studies, World Bank reports, and other development planning documents. The study team conducted interviews with persons in AID, the Government of Belize, the private sector, and several development institutions. A draft final report was submitted to USAID/Belize for review shortly before the team's departure during the third week of December. The final report was prepared in Washington in January 1989.

The analysis was carried out within the Framework of USAID's Annual Action Plan which relates USAID objectives to four goals (stabilization, structural reform/economic growth, spreading benefits, and encouraging the development of democratic institutions). Principles of locational economics and public utility analysis also were applied.

1.3 Sources Cited

USAID reviewers of this Final Report should note that it has quoted from documents which might be regarded as not being in the public domain. These are (1) the World Bank Staff Appraisal Report for its Power Development Project (July 17, 1986), the World Bank "Belize Economic Memorandum" (April 21, 1988), and the Belize Free Zone Feasibility Study (November 18, 1988) prepared by The Services Group, Inc. for the Ministry of Economic Development of the Government of Belize. The World Bank documents bear the caption, "For Official Use Only." The cover of the latter document contains the statement, "This report is confidential and intended solely for the use and information of the client to whom it is addressed." Neither document bears a U.S. Government security classification. Other documents used in the preparation of this report that may contain confidential material are Coopers and Lybrands "Report on the Organization of the Belize Electricity Board," and the World Bank "Memorandum and Recommendation...on a Proposed Loan...to Belize for a Second Road Maintenance and Rehabilitation Project" (1988).

CHAPTER TWO

2.0 BACKGROUND

2.1 AID and Infrastructure: A Brief Overview

This assessment focusses on the electric power system, the transportation system, and the institutional dimensions of infrastructure development in Belize. It gives less concentrated attention to the country's telecommunications, water supply, sanitation, and industrial infrastructure. In order to provide a perspective on the analysis and recommendations contained in this report, we start with a brief overview of types of infrastructure systems, of the characteristics of these systems, and of AID's changing approach to infrastructure projects.

a. Definition of Infrastructure

Definitions of infrastructure in developing countries usually include:

- Telecommunications
- Electric power supply and distribution
- Transportation (roads, bridges, ports, and airports)
- Water supply and sanitation
- Industrial estates
- Other common-user systems (particularly those requiring public utility rate regulation and/or heavy investment in real property)

In its broadest sense, the term "infrastructure" can be used to designate virtually any kind of activity or service that supports another. The Five Year Macroeconomic Plan for Belize 1985-1989 distinguishes among physical, social, and "private economic infrastructure." Construction of the Belize City Hospital, sports facilities, and a low income housing program are classified as "social infrastructure", whereas roads, bridges, hydroelectric facilities, and the Belize City water and sewage project are regarded as "physical infrastructure". An export trading company, industrial/export processing zones, and joint ventures with the Belize Electricity Board and the Belize Telecommunications Authority are treated as "private economic infrastructure" by the Macroeconomic Plan.

Each productive sector may have requirements for land, buildings, equipment, utilities, and other services which it regards as "its" infrastructure. Thus the term "tourism infrastructure" may be used to include the availability of experienced guides, suitably maintained points of interest, marinas for leisure boating, an active government tourism agency as well as airports, roads, hotels, and telecommunications systems used by tourists.

Institutions, can, in themselves, be considered as infrastructure. In this assessment, we speak of "organizations responsible for infrastructure activities" (e.g. the Water and Sewerage Authority, Belize Telecommunication, Limited, the Belize Electricity Board) and of "institutions related to infrastructure" (e.g., the mechanics and tradition of Ministerial control; the influence which the representative political process has on infrastructure investment and operations), but we do not regard influential organizations (e.g., the Ministry of Foreign Affairs and Economic Development or the national legislature) as themselves being "infrastructure."

AID sometimes deals with infrastructure systems, projects, and issues as broadly described above, under rubrics other than "infrastructure". Agency activities defined as "rural development," "health and sanitation," "development finance," or "economic stabilization" may turn out to be primarily oriented to infrastructure or at least contain some significant infrastructural elements. This in fact is the case for USAID's program in Belize.

b. Characteristics of Infrastructure Systems

Some kinds of infrastructure systems in developing countries may be regarded as "natural monopolies." However, institutional treatment of this characteristic differs from country to country and system to system according to location, population densities, level of technology, socioeconomic groups served, political traditions, and other factors. Where "natural monopolies" exist, institutional alternatives include direct government ownership/operation (with various combinations of force account operations and contracting to the private sector), operation by government-owned parastatals, operation by public utilities with mixed public and private ownership, cooperative ownership and operation (regulated or unregulated by government), and ownership and operation by the private sector (regulated or unregulated, as the case may be).

Infrastructure systems typically serve a variety of social groups and regions with differing interests and characteristics. Representation of social, political, and economic interests takes place through the nation's political process(operating through government ownership and/or regulation), through the advocacy of economic interests and social objectives by members of the management and Boards of Directors of utility organizations, and through the influence of donors on both of these groups.

By their very nature, infrastructure organizations deal in specific and tangible ways with many of difficulties and dilemmas that lie at the heart of public policy formulation. These include:

-- Competition between national objectives of growth and equity;

-- Tensions between political and techno-economic approaches to planning and decision-making;

-- Competition between the objectives of improving and expanding service and of reducing consumer costs.

-- Reconciliation of short, medium, and long term institutional objectives.

Through their rate structures, utilities can "cross-subsidize" one region or group of customers at the expense of another. Where utilities have under-utilized capacity with declining costs, opportunities exist for achieving economic or social objectives through marginal cost pricing.

Because of their heavy financial impacts and their effects on the performance of the rest of the economy, the financial and operating performance of infrastructure services can be critically important to stabilization and structural adjustment programs in developing countries. AID's private sector program initiatives can be important to infrastructure systems because divestiture, privatization, and contracting of parastatal functions to the private sector represent avenues for increased efficiency.

c. AID's Evolving Approach to Infrastructure

In AID's early years, large infrastructure projects represented a major agency focus. AID's own engineers occupied an important position among the agency's professional cadres. Over time, the infrastructural content of the agency's program has declined. The AID staff has given less attention to the "bricks and mortar" projects and has focussed on institutional development and policy issues. With some notable exceptions, major infrastructure construction and maintenance projects have been left to multilateral donors and to other bilateral donors in recent years.

Currently, Third World debt problems present a platform for AID's involvement in the policy and institutional dimensions of infrastructure. AID's most recent report to Congress emphasizes the Agency's efforts to contribute to the objectives of the Baker Plan and the IMF/World Bank policy framework paper process. The Bank and the Fund have come to realize that infrastructure development can be critical to the success of free-market policy reforms. In our view, that is clearly the case in Belize.

A recent development of great interest is AID's involvement in the design and execution of a project for financing private power generation in Pakistan. That project was developed in close collaboration with the World Bank and will receive multi-donor support. The United States has something of a comparative advantage in the field of decentralized private power generation, derived from technology development and from institutional experience. Should Belize decide to launch major new power generation projects, the approach is one that might be adapted to its circumstances.

2.2 Economic Factors Affecting Infrastructure Systems in Belize

The infrastructure systems in Belize reflect three main influences:

-- settlement and demographic patterns,

-- economic geography, and

-- economic policies and trends.

Each of these influences is discussed briefly below.

2.2.1 Settlement and Demographic Patterns

Belize is a small, sparsely populated country, bounded by Mexico on the north and west, Guatemala on the west and south, and the Caribbean Sea on the east. Its low population density (7.4 persons per square kilometer) is marked by the clustering of more than 50% of the population in eight "urban" centers (2000 persons or more). An additional 40% of the population resides in villages close to these urban centers. Three quarters of the land area of Belize is virtually uninhabited, with a population density of less than one person per square kilometer.

The country's long term birth rate and rates of in-migration are high. In addition, the country has experienced significant in-migration of Central American political and economic refugees in recent years. Nevertheless, out-migration (mainly to the United States) has reduced overall rates of population growth to a base rate of about 2% per year. Emigration of skilled people represents a critical national problem. The growth and productivity of the public and private sectors of the economy are constrained by shortages of managerial and professional skills.

Belize's settlement patterns make for relatively high infrastructure costs, particularly in the less densely populated regions. The recent rapid increases in immigration of refugees has placed a strain on existing infrastructure systems, as on all public services. Shortages of management and technical skills

adversely affect the nation's infrastructure organizations, slowing the rate at which they can grow and improve in efficiency. At the same time, the spatial distribution of the country's population and economic activities may favor decentralized technical solutions and significant private sector institutional involvement in the provision of infrastructure services.

2.2.2 Economic Geography

Figure 1 gives a general map of the country, showing district boundaries and major cities.

Production of sugar -- Belize's principal export -- is located mainly in the northern part of country, near Corozal and Orange Walk. Most citrus for export are produced in the Stann Creek district. Bananas are grown in the southern portion of Stann Creek and the northern part of the Toledo district. Cocoa production has been located principally in the Sibun River area. Rice is grown in the Toledo, Stann Creek and Belize districts.

Commercial fishing is carried out from Belize's off-shore cayes and from fishing villages along the coast. Shrimp farming is a new activity which potentially could be carried out in many locations along the coast. Main tourist locations are the northern and southern cayes and Mayan sites located throughout the country.

A small industrial area and estate is located at Ladyville, between Belize City and the international airport. Plans exist to substantially expand factory shell space in the Ladyville industrial estate during the next three years A free zone is presently under consideration for Belize, with Santa Elena on the Mexican border and Corozal as the leading candidate locations.

Like the population, economic activity is unevenly spread over the land and water surface of surface of Belize. Infrastructure development has tended to reflect the distribution of population and economic activity (particularly export activity), although not necessarily in a optimal way. In general, the Government has placed its heaviest investment in infrastructure systems in Belize City, the capital at Belmopan, the international airport twelve miles north of Belize City, the cities of the sugar production area in the north, and along the routes connecting these points.

In many areas of the country, the private sector (including households, cooperatives, and business establishments) has supplied some investment in roads, electric, water supply, sanitation, and other elements of infrastructure. Concentration of public infrastructure in areas of relatively high population

Figure 1

Belize

District Capital

National Capital

MEXICO

Corozal

New River

COROZAL

CARIBBEAN SEA

Ambergris Cay

Orange Walk

Hick's Cays

ORANGE WALK

Belize River

BELIZE

Belize City

Turneffe Islands

Sibun River

Belmopan

San Ignacio

GUATEMALA

Dangriga

CAYO

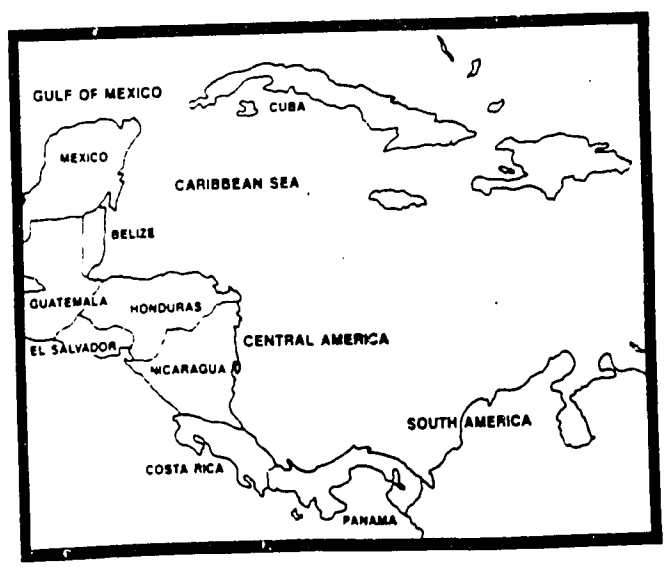
STANN CREEK

Monkey River

TOLEDO

Punta Gorda

GUATEMALA



density and/or important economic activity inevitably feedspolitical pressures to spread infrastructure investment more evenly among regions and rural/urban populations. During a period when foreign financing of infrastructure investment may decline and when increasing productive efficiency remains of critical importance, such pressures pose key problems of public policy and institutional relationships.

2.2.3 Economic Policies and Trends

Belize has a relatively open economy. The country has adopted economic policies which, on the whole, are enlightened and outward-looking. It has had relatively free trade with its major industrialized trading partners -- the United States, Canada, and the United Kingdom -- and with its neighbors. In the past, re-exports to Mexico have been an important foreign exchange earner. Because Belize's own labor force is limited and its wages are relatively high, the availability of the low cost labor pools of nearby countries also has been important to national development. While Belize's policies may be regarded as forward-looking and appropriate to its circumstances, the country's outwardly-oriented economy is vulnerable to developments in external markets which are beyond its control.

During the 1960's and 1970's, Belize exhibited a general upward trend in economic growth punctuated by cyclical fluctuations. Gross Domestic Product was heavily influenced by the performance of exports, particularly exports of sugar. Government fiscal performance also followed the dominant growth pattern. Belize showed a surplus fiscal current account in all but one year in the 1970's. Up to 1980, the country had a very small external debt. Nevertheless, the seeds of difficulty were present in escalating government expenditures and in loose monitoring of the finances of important parastatal organizations. In 1981, export prices declined and Belize's U.S. sugar quota was cut. The country's terms of trade deteriorated rapidly. In 1982, the Mexican peso was devalued and a sharp decline in Belize's re-export trade rapidly ensued. In 1983, real GDP decreased for the first time since 1976. The country's external debt increased and its fiscal condition worsened during this period.

In response, the Government tightened its fiscal discipline, encouraged expansion and diversification of its exports, and sought increased foreign investment. In the past five years, a combination of changed policies (buttressed by IMF, ESF, IBRD, and other donor assistance and conditionality), industry rationalization, and improving external conditions have produced a striking turn-around.

Domestic exports increased from US $72.8 million in 1984 to an estimated US $98.0 million in 1988. In 1984, sugar and molasses represented 46.2 per cent of exports. By 1988, this percentage was down to 33 per cent. Export expansion has been particularly

impressive in the past two years, and seems likely to continue in the immediate future.

The improved performance of the economy of Belize seems more a matter of "stabilization" than of fundamental restructuring. GDP increased from US $193.0 million in 1984 to an estimated US $237.9 million in 1988 (1984 constant dollars), but real GDP per capita increased only slightly during the period. Government finances have improved substantially, but further improvement may be hard to achieve. Interestingly, the electricity and water subsector and the transport and communications subsector each have grown more rapidly in recent years than has total GDP. Less favorable external conditions and/or substantial reductions in foreign aid could cause a retrogression.

About half of the Government's revenues are derived from taxes on foreign trade. Given the present structure of the Government budget, there probably is not much remaining potential for increasing public savings through further direct cuts in central government expenditures. There does appear, however, to be significant potential for increasing the efficiency of public corporations, including those responsible for operating infrastructure systems in Belize.

In the past, assistance provided by AID's ESF funding has generated the counterpart funds which Belize has required to attract foreign assistance for investments in infrastructure--particularly investment in its road network. As AID's ESF funding comes to an end, the country faces a strategic financial bottleneck, a bottleneck which limits its ability to increase the economy's production and productivity through public investment in, and proper maintenance of, infrastructure.

A World Bank Belize Economic Memorandum, written in 1988, concludes that "the central development issue for the next few years is how the Government will obtain external assistance or generate sufficient public savings required as counterpart resources to carry out the Public Sector Investment Program (PSIP) particularly in the area of infrastructure."[1]

Possibilities for overcoming this financial bottleneck to investment in infrastructure include (1) accelerating improvements in the efficiency of individual infrastructure systems; (2) facilitating private investment in infrastructure; and (3) relating public and parastatal expenditures for infrastructure more directly to enhancement of production and productivity. Each of these approaches is embodied in the recommendations contained in this report.

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[1] IBRD, Belize Economic Memorandum, (Summary and Conclusions, Report No. 7178-BEL, April 21, 1988), p. i .

2.3 Infrastructure and USAID's Program for Belize

In this section, we review and examine the prior Country Development Strategy Statement (CDSS), dated April 1984, and the most recent Annual Action Plan (March, 1988).

2.3.1 Country Development Strategy Statement (1984)

The CDSS for FY 1986 focussed on the then-deteriorating current economic performance (reflected in worsening public sector fiscal performance and an overall balance of payments deficit) and structural problems in the Belizean economy. The structural problems were classified under three headings which may be summarized as follows:

(1) Lack of diversification in productive sectors, with disproportionate reliance on the declining fortunes of sugar exports.

(2) A serious fiscal problem, characterized by the absence of current account savings and mismanagement of non-financial public enterprises -- the Belize Electricity Board being a leading offender.

(3) Paucity of productive infrastructure, particularly in the areas of transportation and electric power supply.

The CDSS puts forward a rationale for U.S. assistance based on the premise that:

> The size of the population relative to the natural resource base gives Belize an excellent chance of reaching middle income status within a decade... with a judicious blend of financial support and technical assistance, Belize could attain a high and sustainable rate of growth within this period of time.[2]

For the program period (1984-1990), the CDSS goal was

> ...to attack the constraints to growth with a program that will focus on economic stability, agricultural diversification, export promotion, infrastructure development, and selected human resources development.[3]

In the short term (1984-1985), the goal was to help the Government achieve stability in the fiscal sector. In the long

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[2] USAID, Country Development Strategy Statement FY 1986: Belize (April, 1984), p. 12.

[3] Ibid.

term (1986-1989), the other items in the program were to be emphasized.

A critical short-term objective was to reduce the large losses being registered by a few parastatals, most notably by the Belize Electricity Board:

> Of these eight [non-financial public sector enterprises], three constitute the greatest problem: the Belize Electricity Board (BEB), the Banana Control Board (BCB), and the Belize Marketing Board (BMB)... the electricity system is fragmented, inefficient, and poorly managed... Of these three, the BEB represents perhaps the largest burden on government revenues, accounting for nearly half the operating deficit of all the public sector enterprises. [Emphasis added.][4]

In its assessment of infrastructure, the CDSS painted a generally negative picture:

> There is a good national telephone system, but in all other areas the infrastructure is seriously deficient. Diesel generation supplies power to 60% of the population, but service is expensive and unreliable. The only railroad fell into disuse over two decades ago. There is no natural deep water harbor... the road system is poor, having only a limited network of secondary and access roads.[5]

Although it dealt with infrastructure problems in rather sweeping terms, the CDSS really did not propose to deal with infrastructure on an across-the-board basis[6]. Instead, the USAID program was to concentrate on roads, electric power, and water/sanitation (health).

In the area of transport, the CDSS proposed a continuation of the Rural Access Roads and Bridges Project. The first phase was to create a sustainable institutional capability to construct and maintain rural access roads. The second phase was to give greater emphasis to road construction and maintenance.

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[4] CDSS, op. cit., p. 9.

[5] CDSS, op. cit., p. 11.

[6] What the CDSS did do was to focus on the problems of the three parastatals, the Belize Electricity Board, the Belize Marketing Board, and the Banana Control Board. Of these, only one, BEB, can be considered an "infrastructure organization" in the strict sense of the word.

The CDSS also proposed an $8.0 million Energy Sector Structural Adjustment Loan, tranched over a four-year period. This program would provide additional capital requirements for orderly expansion and modernization of the power system. A National Energy Plan was to be undertaken in 1984. BEB was to be reorganized and a plan for the expansion of generating capacity prepared by the end of 1985. Energy losses were to be reduced by 30 percent; lower costs per unit of output on the order of 20-25 percent per annum were to be realized by the end of 1987.[7]

The treatment of water and sanitation in the CDSS is very brief:

> As the livestock, rural roads/bridges and agricultural diversification components of the Mission's portfolio are being implemented, malaria, water and sanitation control activities will be installed.
>
> ...No significant restructuring of Ministry management units is required, nor are absorptive capacity problems anticipated.[8]

In retrospect, the CDSS assessment of the management structure of WASA may have been somewhat optimistic. Indeed, a deeper analysis of the institutional characteristics of infrastructure organizations in Belize may now be in order.

2.3.2 Annual Action Plan

The Country Strategy Summary in the most recent Annual Action Plan (FY 89-90, March 1988) states that USAID has directed its agriculture and private sector projects towards long-term growth opportunities in the development of sparsely populated agricultural lands and towards the country's significant tourism potential. It also states that health, education, and training projects, while seeking to achieve equity and broad participation in development, "are all oriented to supporting agriculture and private sector activities which lay the basis for long-term growth."[9]

The Strategy Summary refers to infrastructure in connection with two fundamental goals: (1) short term economic stabilization; and

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[7] Subsequently, the World Bank provided a $7.5 million loan to cover part of BEB's investment program. USAID supported a financial and management advisor.

[8] CDSS, op. cit., p. 24.

[9] USAID, Belize Annual Action Plan FY 89-90 (March, 1988), p. 1.

(2) basic structural reforms leading to rapid and sustained economic growth.

With respect to stabilization, the Action Plan states that local currency generated by dollar transfers has financed productive public infrastructure and development projects assisted by USAID and other donors. A main emphasis of the ESF program has been on reducing the drain of public enterprises on the GOB budget accounts, and particularly in the case of the Belize Electricity Board:

> Prior to 1985, the BEB was beset with serious financial problems and received some $4 million annual subsidy from the GOB. The ESF Program is financing a Management and Financial Advisor to assist in improving the BEB's operations. The BEB's financial situation has turned around since 1986 as a result of long-term debt restructuring, retirement of short-term debt indebtedness, reduced losses and unmetered electricity, and improved revenues and collections. BEB had a net operating surplus of $1.9 million in GOB FY 86/87. BEB no longer requires transfers from the GOB and is, in fact, contributing to public sector savings.[10]

The Annual Action Plan lists "Expand and improve the infrastructure" as one of fourteen objectives it establishes for the USAID/Belize program. This objective is placed under the goal "Basic Structural Reforms Leading to Rapid and Sustained Economic Growth:"

> The major USAID activity in expanding and improving infrastructure is the Rural Roads and Bridges Project which directly funds the upgrading of rural roads and bridges essential to improving agricultural production and productivity.[11]

While the Action Plan reports a number of meritorious achievements, it also notes that the Ministry of Works has not been successful in obtaining adequate funding for all-weather bridge crossings and maintenance. MOW is utilizing the Office of Planning and Budget to petition the Ministry of Finance for a larger portion of the GOB budget, but has not yet been successful. Achievements have fallen somewhat short of targets, but are nevertheless significant.

In addition to assistance to the Ministry of Works and the Belize Electricity Board, the Action Plan reports that USAID has

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[10] Action Plan, op. cit., pp. 13-14.

[11] Action Plan, op. cit., p. 3.

assisted the Ministry of Natural Resources in constructing 955 latrines, 42 wells with hand pumps, and two rudimentary water systems. This project, whose objective is to "Improve Health and Health Services," is treated as contributing to the goal of "Wider Distribution of the Benefits of Growth." The water supply and sanitation improvements are not explicitly characterized as "infrastructure," but clearly fall within the definition used in the present assessment.

2.3.3 Commentary on CDSS and Annual Action Plan

In reviewing these two documents, we note the following:

a. Shifting Emphasis Among Particular Infrastructure Systems

The CDSS was prepared some four years prior to the FY 89-90 Action Plan, so it is not surprising that some differences in emphasis exist in the way they deal with infrastructure. In 1984, the problems of the Belize Electricity Board and of electric power supply appeared to be at the center of the CDSS infrastructure target, with rural roads running a distinct, if important, second. In the 1988 Action Plan, the Rural Roads Project is clearly at the center of the target. The past achievements of BEB are noted in the Action Plan, but no agenda or project for the future is described. The project is classified as an ESF stabilization activity, rather than one concerned with structural reform and economic growth. The Action Plan conveys the impression that the project has achieved its purpose and that no further AID involvement is anticipated.

By contrast, the rural road project is presented in the Action Plan as a continuing activity. It has had its difficulties and has learned some hard lessons, but it is treated as a USAID project with a future.

The World Bank and the Caribbean Development Bank became involved in assisting BEB in the period between the writing of CDSS and the writing of the Action Plan. AID became a contributor to this project rather than the principal leader among donors. Thus while it developed the project and has made a significant contribution, the Mission perhaps does not have the level of commitment to BEB that would exist if it were acting as lead development agency.

Whether or not the impression of shifting priorities between electric power and rural roads is accurate, the continuing needs of the electric power supply system in Belize should be addressed in the forthcoming CDSS, if only to indicate that primary responsibility for future assistance will be left to other donors. As suggested elsewhere in this report, continuing involvement in the field of electric power supply deserves the Mission's serious consideration.

b. Incomplete Recognition of the Character of Systemic Infrastructure Constraints

The 1984 CDSS took an essentially optimistic view of Belize's prospects for achieving self-sustaining growth, shared by the Infrastructure Assessment Team. Nevertheless, it recognized that serious obstacles stood in the way of achieving middle income status within a decade: fiscal instability, a narrow productive base and a lack of infrastructure. "These barriers to growth," the CDSS said, "should not be underestimated and are indeed formidable."

The Annual Action Plan seems less cautious than the CDSS, and less aware of underlying systemic constraints.[12] Problems encountered by the Rural Roads Project in obtaining sufficient budgetary allocations are to be resolved by providing a sound and persuasive techno-economic justification for the requested funds. While such an expectation could prove justified, much of the information gathered in this assessment points in another direction. It is conceivable that the public sector or the body politic is not willing and/or able to maintain the existing road network or has come to rely on outside assistance for periodic reconstruction. What may be required is a basic strategy to break a cycle of dependence in which the roads are allowed to deteriorate and then are periodically rehabilitated and rebuilt -- at costs considerably in excess of what would be required for routine maintenance.

Recent favorable economic developments appear to reflect elements of reform and genuine economic restructuring acting in combination with the up-side of externally determined export and donor support cycles. The direction of both of these cycles may reverse themselves. In the meantime, the country and its donors have an opportunity to address its infrastructure problems in a non-crisis atmosphere. In these circumstances, it is important that the up-side of the cycle should not be confused with fundamental change. The underlying deficiencies in Belize's infrastructure systems should be frankly acknowledged and addressed.

In the case of BEB, significant improvements in financial performance and less spectacular advances in service and operations should be given due credit but should not be permitted to obscure important needs for continued reform. Continuing problems include (1) rates so high that they may deter economic development; (2) well-documented deficiencies in system planning; and (3) fundamental problems of organization and staffing.

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12 The CDSS is a statement of strategy while the Action Plan is a more operational document. The difference in tone may arise from functional differences. It also can be argued that a Project Paper is the best place to articulate project strategy.

c. Association of Infrastructure Improvement With a Single Goal

The format of the Action Plan requires that each objective should be primarily identified with a single goal. Thus the 1988 Mission document associates assistance to BEB with "economic stabilization"; rural roads with "economic growth and reform"; and rural water supply and sanitation with "equitable spreading of benefits". Clear identification of projects with a single or dominant program goal promotes clarity in planning and execution, but this practice sometimes can be carried to far. Overly simplistic program and project rationales obscure important characteristics of infrastructure systems and the AID projects which support these systems. In fact, the extent to which the rural roads project serves economic growth objectives (as distinguished from wide sharing of benefits) is an important issue for the future. In fact, USAID's assistance to BEB has had the potential (not yet fully realized) of contributing to economic growth through increased efficiency and reduction/ rationalization of rate structures, as well as by producing a financial surplus and system growth.

A key issue for the future is whether Belize's Water and Sanitation Authority, USAID, and/or other donors together will establish a solid foundation for sustained financial and organizational support for rural water and sanitation systems. The WASA strategy for the future must balance considerations of health and equity with those of financial discipline. Our interviews indicated that reconciling the competing interests of growth, equity, and financial austerity, while accommodating the requirements of a democratic political process, represent central concerns for the managers of several systems. As suggested later in this report, improving the process by which Government and utilities assess and resolve tension among competing goals represents an area in which USAID might make a significant contribution during a period of reduced resource availability.

d. No ESF Evaluation

The Annual Action Plan indicates that no evaluation of the activities supported by ESF funds will be undertaken. We believe that judgement should be reconsidered for two basic reasons:

(1) The recent performance of the economy of Belize has been impressive. In its use of ESF and DA funds, USAID/Belize has contributed to an important achievement which has been little-recognized by the development community -- which in fact is energetically seeking evidence that policy reforms really can work. The Government of Belize and its private sector deserve recognition for their achievements. USAID/Belize deserves credit for its contribution to these achievements. An evaluation of ESF activities could provide an opportunity for appropriate recognition.

(2) While BEB has made significant strides, serious problems remain which are adversely affecting performance in the productive sectors of the Belize economy. It has, in effect, achieved the "economic stabilization" objective of reversing its short term financial losses and of ameliorating the causes of those losses. However, BEB does not appear to have achieved the sound planning, efficient operation, and cost-effective performance which it must have to fulfill is own "structural adjustment" potential and to provide its full contribution to the balanced growth of the economy of Belize. The magnitude of BEB's prospective but as-yet unrealized potentials also deserves attention.

At this juncture, a conventional AID evaluation may or may not be the best form of assessment. Suggestions concerning alternatives are discussed in subsequent sections of this report.

2.4 Donor Assistance to Infrastructure Projects in Belize

The involvement of various international agencies in Belizean development has historically been directed to sectors of particular interest for each organization. In its planning and requests for assistance from the donor community, the Ministry of Economic Development is guided in large part by this historical trend. Consequently, requests for financing of infrastructure related projects are presently directed to donors as follows:

- Main Highways Rehabilitation and Maintenance	IBRD, EEC, British Aid
- Rural Roads Rehabilitation and Maintenance	USAID
- Institutional Development and Training	IBRD, USAID, EEC
- Electric Power Systems	IBRD, USAID, CDB, CDC, British High Commission
- Agricultural Development	USAID, British Aid
- Tourism Development	USAID, EEC
- Airport Facilities	British Aid, CDB
- Port Facilities	CDB, CDC, IBRD
- Medical Facilities	EEC, CDB
- Rural Health	USAID, CDB, CIDA, Rotary Foundation
- Urban Water/Sewerage	CIDA

- Rural Water/Sanitation — USAID, PVOs
- Telecommunications — UNDP

2.4.1 Ongoing and Planned Projects

A summary of ongoing and planned projects/programs of the various donors is as follows:

a. The World Bank

World Bank assistance to Belize includes the following projects/programs:

(1) Support to the MOWH's Phase I Road Maintenance and Rehabilitation Program for the period 1983 - 1987, through institutional assistance and training, supply of equipment and spare parts, upgrading of highways through rehabilitation and drainage improvements, preparation of an Export Transportation Market Plan and provision of advisors in the management/technical fields. The Phase I Program includes:

- Rehabilitation and drainage improvements to 21 miles of paved roads, including
  - San Ignacio - Belmopan entrance (8 miles)
  - Santa Elena - Corozal (10 miles)
  - Haulover Bridge - Airport (3 miles)
- Drainage improvements to about 59 miles of Southern Highway.
- Rehabilitation of 11 bridges.

(2) Phase II of the Road Maintenance and Rehabilitation Project was undertaken by the GOB and IBRD as a follow-up to Phase I to reinforce institutional management and technical improvements to MOWH. Rehabilitation, resealing, and completion of drainage and bridges on main highways are included in the Phase II Project. The program will attempt to involve the private sector in road maintenance activities. The Phase II Program will include:

- Paving of the section San Ignacio - Benque Viejo road (12.5 miles).

- Rehabilitation of Haulover Bridge - Belize City section (2.6 miles).

- Rehabilitation of Belize City Port Access Road.

- Resealing by contract of sections of road totaling 55.7 kms, including

  . Haulover Bridge - Ladyville (5.2 kms)

  . Corozal - Santa Elena (13.7 kms)

  . Belmopan - San Ignacio (36.8 kms)

- Completion of drainage structures on Southern Highway from Big Creek to Crique Negra.

- A controlled road maintenance program on sections of the highway network, including:

  . Northern Highway - Belize City to Santa Elena (152 kms) for a three year period. By contract.

  . Southern Highway - Hummingbird Highway to Reef River (104 kms) for two year period. By contract.

  . Western Highway - Belmopan to San Ignacio (36.8 kms) for a two year period. By force-account.

  . Remainder of the highway network over three year period. By force-account.

(3) The Phase I Power Project includes renovation and expansion of generating facilities, rehabilitation of the existing transmission/distribution system, provision of 17,500 meters for customers, and technical consulting services.

(4) A Phase II study is being undertaken to identify renewable energy sources, i.e., hydro and biomass, and to serve as a basis for additional financing. The CDB and GOB are also involved in the financing of the project and study.

b. <u>The European Economic Community (EEC)</u>

EEC is participating in the Road Maintenance Program through the financing of a 20 kilometer portion of the Hummingbird Highway and construction of five bridges from the Sibun River to Middlesex. It is anticipated that Phase I will be complemented by a Phase II Program for the portion of the Hummingbird Highway from Middlesex to Dangriga under British aid financing.

EEC is also involved in the financing of a new 118 bed hospital in Belize City, to be expanded to 220 beds under a planned Phase

II. They are also providing technical and marketing assistance in the tourism sector and assistance in the refugee relocation and medical assistance field.

c. British Aid

The British aid program related to infrastructure for the next five year period includes rehabilitation of a portion of the Hummingbird Highway (the Stann Creek Valley Road), construction of four bridges on the Southern Highway, and resurfacing of the portion of the Northern Highway from Mile 22 to Corozal.

British Aid also financed a study of the Belize City Airport Expansion Plan, and construction of the recommended facilities. The CDB was also involved in the project.

The Commonwealth Development Corporation (CDC) is expected to finance 50 percent of the estimated $6.0 million cost of constructing the Big Creek Banana port. The remainder of the funds are being provided by the Banana Growers Association.

d. CIDA

The activities of CIDA in Belize have been generally related to the water/sewerage field in Belize City and Belmopan. CIDA financed a water/sewerage master plan in 1979 and the subsequent improvement program. The program included construction of a water treatment plant 17 miles north of Belize City, a transmission line to Belize City with a turnout for Ladyville, a water distribution system serving 8,500 metered clients, construction of two water storage tanks, and technical assistance. The sewerage system includes construction of a collection system, lift stations and outfall line to sewerage lagoons located about four miles west of the city, and discharge to the sea. The Belmopan project included a water treatment plant, a distribution system, and sewerage collection and disposal systems.

WASA and CIDA are presently discussing the need to update the Master Plan to include the present and future water/sewerage requirements of the Belize City Metropolitan area.

e. USAID

Present and planned USAID projects involving some aspects of infrastructure include the following:

(1) The Rural Roads Maintenance and Rehabilitation Project has as its primary goal the improvement and maintenance of rural roads required to stimulate agricultural development in Belize. This is being accomplished through

strengthening the capabilities of the Ministry of Works to rehabilitate and maintain rural access roads and bridges. Under Phase I of the Program (1984 - 87):

- 195 miles of targeted 300 miles of rural roads were reconstructed.
- 4 of 54 targeted bridges were built.
- 30 of 75 targeted shop mechanics and technicians were trained.
- 120 of 150 targeted MOW personnel received on-the-job training in road rehabilitation and maintenance.
- Internal management control system implemented.
- National rural road inventory completed.
- Involvement of the private sector in the rural road program was implemented by contracting some of the work.

(2) The Phase II Program (1988-1991) goals are:

- Rehabilitation of an additional 250 miles of road by two fully equipped rehabilitation units.
- 1000 miles of road to be maintained per year.
- Eight bridges to be constructed.
- Six district level road maintenance units created, equipped and staffed.
- Central and district equipment repair shops and personnel capabilities upgraded.
- Capability developed to rehabilitate 100 miles of rural roads per year.
- Training in management and technical fields to be continued.

(3) The Increased Productivity Through Better Health Project (under USAID) provides for expansion of rural water supply and sanitation coverage in rural communities in three districts: Cayo, Stann Creek and Belize. This involves the drilling of wells, installation of hand pumps, supply of power generators and pumps, construction of water tanks and gravity water distribution systems, and construction of VIP latrines. The target is to complete improvements in 30 villages, with six of these receiving rudimentary water

systems (RWS). The remainder will obtain their water from handpump-driven shallow wells.

(4) The Village Level Water/Sanitation Project (under CARE) performs the same type of work as above but in Corozal and Orange Walk. This project will construct or extend RWSs in seven villages of a total target of 23.

(5) USAID is financing a feasibility study of the possible interconnection of the Mexican and Belize electrical power systems related to the proposed Free Trade Zone.

(6) $1.0 million of ECF funds have been provided to the Ministry of Economic Development to finance feasibility studies for the private sector and international donors.

(7) A contract with a U.S. firm for promotion of Belize as a tourist destination was to be signed in 1988.

(8) Six wildlife refuges/archaeological sites are to be improved during 1989.

(9) Section 416 local currency funds will be used to assist with bridge construction in Orange Walk and Corozal.

2.4.2 Donor Coordination

International development agencies do not have a "donor club" in the sense that such arrangements exist for some other LAC countries such as Grenada and Bolivia. Coordination between development organizations has not been fully effective, and there has been duplication or overlapping of some donor programs. However, in early 1988, the Ministry of Economic Development held a donor coordination meeting in an attempt to rectify this situation. The meeting was considered a success; similar meetings are to be held each year. Some of the participants have noted that the meeting attempted to cover too wide a range of activities so the discussions did not go into sufficient depth. This deficiency could be rectified in some measure by holding follow-up meetings of only those GOB representatives and donors involved in a specific sector, i.e., transportation, electricity, health, during which the specific sector needs can be discussed in depth. Working level managers should attend these meetings. Where public policy and institutional concerns such as privatization, parastatal performance, government organization, and donor conditionality are at issue, government-initiated donor coordination is subject to inherent limitations. There is scope for Mission innovation in this area.

CHAPTER THREE

3.0 INFRASTRUCTURE REVIEW AND RECOMMENDATIONS

This section reviews five "infrastructure systems" in Belize: (1) telecommunications; (2) electric power; (3) transportation; (4) water and sanitation; and (5) industrial estates. In each case, the system is described, its status discussed, the constraints affecting it listed, and possible areas of AID and other donor assistance identified.

3.1 TELECOMMUNICATIONS

3.1.1 System Description

Belize Telecommunications Limited (BTL) presently provides local, national, and international telecommunication services in Belize. Its telephone network consists of 13 main exchanges throughout the country. It presently has a base of approximately 9,500 subscribers. Rural telephone service is provided in 65 of the larger villages. Such rural service may consist of a PBX serving several homes or a single phone in a government center or other accessible location.

BTL leases private circuits for use in voice and data transmission. Most subscriber equipment is rented but there is small market for the sale of equipment. BTL offers telex and public facsimile services at its Belize City and Belmopan Offices.

BTL's plant and equipment include a satellite earth station and equipment located at Belmopan, switching and transmission equipment, cable plant, and subscriber apparatus.

BTL has approximately 300 employees throughout the country, with the majority located in Belize City.

3.1.2 Discussion of System Status

3.1.2.1 Technical Status

A substantial, "Phase I" expansion and modernization program is presently being completed. The system's capacity is being increased to handle 20,000 subscribers. The main items of the program are new digital exchanges at Belize City, Belmopan, Corozal, Orange Walk, Dangriga, and remote line units in Ladyville and San Pedro. This program also provides for new digital transmission links to these exchanges while local underground cables are gradually introduced. The earth station in Belmopan is also being expanded and modernized.

BTL has plans to provide international subscriber dialling and facsimile services on a wider basis in the near future. Expansion of rural service is in prospect. Plans are also being considered to introduce mobile telephony and radio paging. BTL would like to put in package switching next year and completely integrated information services within 2-3 years. Package switching is a form of multiplexing, i.e. using a single channel for multiple transmissions. The technique substantially reduces the cost of data communications, which otherwise would require a full channel. In the long run, the BTL visualizes itself as becoming an information services company.

3.1.2.2 Ownership

There has been a transition in ownership of domestic and international communications and in BTL's relationship to the Government in the last year. Until recently, BTL operated domestic services and services with nearby countries while the British firm, Cable and Wireless, operated most international services. BTL has a history of profitability. However, although wholly owned by the government, Prior to the change of government, the organization did not transfer its profits to Government because Government did not pay its bills. However, that situation reversed itself.

Cable and Wireless' international communications were transferred to BTL at the end of 1987, and shares in the newly merged company were offered to the public in the Spring of 1988. With the merger, BTL started paying taxes to Government (as only Cable and Wireless had done in the past). Government presently holds more than half the shares, and British Telecommunications 25%. The general public holds the remainder.[1]

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[1] We did not attempt to verify data on shares held by the general public or to determine what kinds of shareholders fall within the category "general public". The Draft Final Report for the Belize Free Zone study states:

> Formerly a wholly owned government monopoly, the company has recently undergone a restructuring intended to increase its efficiency through private sector participation. In fact, this privatization has entailed little more than a redistribution of the company's ownership among several government agencies. [page 49]

We suspect that the important issue is less one of the distribution of 25% of the shares than one of effective control. The Government's majority ownership clearly gives it control of BTL. Important questions for the future are (1) will the Government of Belize feel the need to sell more shares to the

3.1.2.3 Financial Performance

BTL's sales rose from slightly over Bz. $11 million in 1985 to nearly $14 million in 1987. Cable and Wireless' international revenues rose from Bz. $9.7 million to Bz. $12 million during the same period. Both organizations showed rising trends in profits over the period. In 1987, BTL's profits were about 42% of revenues or nearly 19% of total assets.

3.1.3 Constraints

BTL has a reputation, not altogether undisputed, for providing good service.[2] Clearly the current implementation of digitalization process has created transitional problems. The assessment team encountered repeated difficulties in making local and international calls from USAID. However, problems and delays in making calls from locations other than the Embassy complex were of a distinctly lower order of magnitude. Presumably, the problem could be located in the Embassy system or in the interface between the Embassy system and BTL.

At the time of LBII's assessment there was suppressed demand for international services. BTL limits incoming calls and outgoing calls are at times difficult to make. As new equipment comes on line during the new year, BTL expects an "impulse jump" in international traffic on the order of 35% in early 1988.

It can be argued that the costs and shortcomings of telecommunications service are a constraint to the economic development of Belize. For a few industries, such as data entry, quality and cost of telecommunications can be crucial. In other cases, there may be adverse psychological effects of delays in completing calls. On occasion, a costly and malfunctioning telecommunications system can exert a negative influence on decisions by tourists and prospective foreign investors -- decisions which are important to the country's economic development.

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public? and (2) will the general public buy them when and if they are offered?

[2] Compare the favorable assessment of the telephone system contained in USAID's 1984 CDSS (quoted in Section 3.4.1 above) with the November, 1988 assessment in the Draft Final Report of the Belize Free Zone Feasibility Study. That study, written before the effects of the current modernization took effect, argues at page 49 that the quality of the system was low and the cost high in many parts of the country by regional standards.

3.1.4 Possible A.I.D. Assistance Areas

BTL's most recent equipment acquisitions have been from Northern Telecommunications, and BTL is currently oriented toward U.S. equipment. One area in which the utility would like to have assistance is in having its staff learn more about developments in the U.S.telecommunications equipment market. Payment of international travel of BTL's employees would permit BTL to stay abreast of new developments, make wiser equipment choices, and encourage purchases of U.S. equipment. From the viewpoint of the United States, the objective would be one of equipment sales (with attendant favorable effects for the U.S. balance of trade) rather than the development of Belize as an end in itself. While this appears to be a type of assistance more closely tied to the objectives of the Trade and Development Program or the Department of Commerce, USAID conceivably could play a facilitating role. Conceivably, the U.S. Export-Import Bank could play a role in financing future BTL equipment expansions.

3.1.5 Prospective Assistance from Other Donors

BTL has received modest amounts of short-term technical, mainly in the areas of international and satellite communications (UNDP funding with ITU as the executing agency). Shortly before it undertook its present expansion, BTL discussed possible financing with the World Bank, but decided that the Bank's review process and international bidding requirement were too cumbersome and would result in unacceptable delays. It financed the expansion through Barclay's Bank and through supplier credits. Although it has some shortcomings from BTL's point of view, World Bank or other multilateral organization financing remains a possibility for future expansions.

3.2 ELECTRIC POWER SUPPLY AND DISTRIBUTION

3.2.1 System description

The Belize Electricity Board (BEB) is a government statutory corporation charged by the GOB with the responsibility for providing the country with electricity. In fact, it provides electric power generated from imported diesel fuel only in the most heavily populated areas of the country and adjacent rural areas. Elsewhere very substantial amounts of electricity are generated by businesses, cooperatives, and families mainly from diesel and gasoline, but at some locations from bagasse, wind, water, and sunlight. Some electric power is received from Mexico at Santa Elena on the northern border of Belize.

BEB has ten diesel generating stations, presently serving eightdistribution areas. Generating stations are located at (1) Belize City, (2) Ladyville, (3) Belmopan, (4) San Ignacio, (5) Corozal, (6) Orange Walk, (7) Dangriga, (8) Punta Gorda, (9) San Pedro, and (10) Caye Caulker. The Belize and Ladyville power stations are connected by two 22-kv lines. Belmopan and San Ignacio are interconnected by a single circuit line. There are firm plans to interconnect Corozal and Orange Walk. The BEB also transmits electricity to some surrounding areas.

In the year 1987/1988, BEB net generation was 78.5 Gigiwatt hours (GWh) of electric power. This figure included net purchases from Mexico. There is no complete census of private generating capacity. However, a study of eleven of the larger private generating installations done by Canadian International Power Services, Inc. in 1988 indicates total installed capacity at these eleven installations of 18,365 Kilowatts. There are numerous small generating installations of less than 100 kw located throughout the country serving small businesses and households, most of them using gasoline or diesel engines. It seems conceivable that electric power generation by organizations and individuals other than BEB could equal or exceed BEB's own annual generation.

BEB budgetted BZ$588,000 in 1987/88 for rural electrification which were not spent; these funds were carried over to 1988/89. Together with the additional Bz$400,000 budgeted for 1988/89, funds available for rural electrification amount to Bz$988,000, plus Government allocated Bz$1.2 million to be spent by March (GOB funds from stamp revenue taxes paid by BEB).

BEB is the largest public utility authority in the country, with 365 employees, operating revenues of Bz. $27.5 million in annual sales, and total assets of Bz. $61.1 million.

3.2.2 Discussion of System Status

3.2.2.1 Technical Status

With the help of the World Bank-led multi-donor funded Power Development Project which started in 1986, the BEB has made progress on overcoming serious technical operating problems. It has increased its system sales from 51.2 MWh in 1985 to 66.6 MWh in 1987/1988. However, the picture was less satisfactory when viewed against expectations concerning improvements in operating efficiency.

Objectives established in 1986 for the World Bank Power Development Project for the fiscal year 1987/1988 compare with actual performance as follows:

	1987/1988 Objective	1987/1988 Actual	Actual versus Target
Market Penetration			
Total MWh Sold	59.9	66.2	Better
Total Customers (000s)	22.1	23.1	Better
Efficiency			
Number of Employees	320	365	Worse
MWh per Employee	187	181	Worse
Customers/Employee	69	63	Worse
Losses*	13.4%	15.6%	Worse

* MWh Sold as a Percentage of Net Generation

It can be seen that while electricity sales and numbers of customers exceeded the World Bank targets, efficiency measures did not meet pre-established objectives. At 15.6%, electricity losses were 2.2 % above target. The work force was 14% larger than projected. Performance on Megawatt hours per employee and customers per employee also failed to meet targets.

The data suggest that while BEB has made some significant improvements, much remains to be done. Most major studies of BEB and of energy supply in Belize carried out in the last decade point to the need for major improvements in BEB's system planning, facilities and equipment, and operating performance.

3.2.2.2 Financial Status

In 1983, the Belize Electricity Board accounted for about half of the operating deficit of all public sector enterprises. The government was required to cover operating deficits as well as contribute to equity. For the year ended March 1984, the losses reached a high of Bz. $8.7 million. By the following year, the accumulated deficit was in excess of Bz. $22.5 million. A serious consequence of the fiscal deficit was to constrain the levels of investment that could be made to expand the coverage and increase the efficiency of electric power supply in Belize.

BEB's financial performance has improved dramatically during the last three years. Net profits were Bz. $1.3 Million in 1985, Bz. $1.3 million in 1986 and $4.7 million in 1987. BEB's financial

recovery may be attributed to (1) an IMF-mandated increase of electric power rates to Bz. $.43 per kilowatt hour delivered to consumers, (2) a reduction in world oil prices, (3) some reductions in losses of electricity, and (4) some improvements in operations.

BEB's financial performance appears to be ahead of the World Bank's performance and monitoring indicators in a some key areas.

	1987/1988 Objective	1987/1988 Actual	Actual versus Target
Rate of Return	4.58	11.07	BETTER
Current Ratio	1.05	3.07	BETTER
Long Term Debt /Total Assets	20.00	23.42	WORSE
Debt Service Ratio	0.70	1.98	BETTER
Nominal Tariff Increase	-4.80%	-4.65%	CLOSE TO TARGET

BEB's financial performance thus has exceeded targets in a number of key areas including rate of return, current ratio, and debt service ratio. However, even with a much improved financial performance, some of the underlying causes of BEB's problems remain in place, masked in large part by a very high rate structure. It is interesting to note that Bank's Appraisal Report for the Power Project forecasted rate increases for all but one year in the period, 1986-1993. Improved rates of return, along with enhancement of power organization's technical capacities, have been traditional objectives of the Bank's projects in Central America. While the Bank certainly has not been an advocate of rate increases beyond those required to sustain targeted levels of financial performance by BEB, neither has it been an active proponent of rate reductions. The Bank has supported improvements in operational efficiency and budgetary discipline, but it may or may not regard BEB's financial and technical progress as convincing evidence that donor intervention in the areas of management and operations is less important than it once was.

There is in fact a wide variety of views within the Bank concerning issues of parastatal performance. They range from the traditional financier's emphasis on the financial self-sufficiency of the organization assisted to the economist's concerns with issues of efficiency in the use of resources and supporting growth within developing economies. These views also range from reluctance to intervene in the areas of organization and management (except in extreme circumstances) to advocacy (in

virtually all circumstances) of "graduating" parastatal utilities to private sources of financing and/or encouraging complete divestiture. Between such polar positions lie many intermediate opinions. In the case of Belize, the Bank's position is unlikely to be fully sorted out until the results of systems planning currently being carried out by Canadian consultants have been evaluated.

3.2.2.3 Organization and Planning

BEB is a state corporation incorporated by an Act of Parliament, and BEB's seven-member Board of Directors is appointed by the Minister of Electricity, Transport, and Communications on behalf of the Government. BEB's Chief Executive Officer is chosen by the Board.

BEB's Board of Directors are responsible for representing the interests of BEB, the Government, and consumers alike. Rate levels and structures are proposed by BEB and approved by the Minister.

Studies of BEB refer to a serious and critically important lack of planning capability in BEB, extending to such areas as facility planning, financial planning, and rate structure review. The Ministry of Electricity, Transport and Communications does not have an energy planning section, nor is this function effectively carried out elsewhere in the government.

In 1984, Robert Nicolait & Associates Ltd. found:

> The major failure of BEB is the inability to devise a program to meet the growing demand for electricity. Inefficient operation and maintenance may result from managerial and technical inadequacies. There is little evidence that studies made by outside agencies have been given more than cursory attention...
>
> Belize's electrical energy requirements are not well defined. The critical issue in energy production is not the availability of energy resources but the manner in which these resources should be employed. The Belize Electricity Board needs to formulate an overall energy strategy to satisfy current and future urban and rural energy requirements.[3]

A study carried out by Coopers & Lybrand carried out in 1988 concluded that the weak institutional framework of BEB has

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[3] Robert Nicolait & Associates Ltd., Belize Country Environmental Profile (Belize City: April, 1984), pp. 109-110.

contributed to a generally low level of performance.[4] Among its findings and conclusions were the following:

-- The existing management structure is inadequate to support a growing organization.

-- The Ministry of Electricity interference seriously reduced the effectiveness of management.

-- The Board has not been supplied with important information on finances and operations.

-- Engineering standards are inadequate.

-- Levels of technical and non-technical losses of electricity are too high.

-- Senior management is inexperienced.

-- There is no planning of any significance at any level of the organization, particularly long term strategic planning.

-- The Transmission and Distribution department is inefficiently and ineffectively organized.

-- The Accounting and Finance department is inefficiently and ineffectively organized.

-- The Personnel/Human Resource department is not organized and structured to provide required training.

-- The purchasing function is handled inefficiently, and there is no coordination between purchasing and stores.

-- Productivity is hampered by because of poor management and planning.[5]

It does appear that BEB carries out some financial and demand forecasting, but staff capabilities in this field do not appear to be far advanced. BEB has plans to retain consultants to make recommendations on the level and structure of its rates in the near future, but it does not seem likely that any fundamental changes in rate structure will be made before a long term engineering and financial plan for system development is put into place.

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[4] Coopers & Lybrand, Report on the Organization of the Belize Electricity Board (Washington, DC: September, 1988), p. 3.

[5] Coopers & Lybrand, op. cit., pp. 6-9.

A Canadian consulting company is presently carrying out studies of generation through renewable energy sources, and transmission systems associated with remote generation locations. Under the World Bank Power project. An important purpose of these studies is to provide a basis for an electric power strategy for the future. BEB and the World Bank are awaiting the outcome of these studies before designing a follow-on project in this area. As noted elsewhere in the present report, there has been some apparent trimming of the scope of work for this planning effort. It remains to be seen whether the final work product will consider the full range of alternatives and analyze the full range of pertinent information which are the hallmarks of sound system and facilities planning.

Coopers & Lybrand proposed an aggressive program for building the competence of the BEB staff, including bringing in foreign personnel funded by foreign assistance where necessary. The BEB Board reportedly has expressed its basic agreement with the findings of the Coopers & Lybrand report. but has indicated its view that implementation should take place over a longer period than envisioned by the consultants. It also indicated its preference for developing the capabilities of its own engineers rather than bringing in foreign technicians.

A review of available studies and information suggests that the roles of the Ministry, the Board, top management, and middle management have not been well defined in theory or in practice, and that many operational problems can be traced to the structure of the organization. Such problems, while varying in their details, are common among public utilities in Belize. BEB's problems appear to reflect its status as a parastatal institution and a national tradition of Ministerial control as well as its own particular circumstances. Conceivably, a change in BEB's institutional status could reduce problems encountered by customers, employees, management, the Board, and the Government alike.

3.2.2.4 Alternate Energy Sources

The sugar estates generate and distribute their own power, generated at two steam plants fueled by bagasse. These plants have an excess capacity of 1 MW which BEB would like to use through a tie-in with the Sugar Estate System. The sugar operation also generates an excess of 60,000 tons of bagasse, which is presently being incinerated. The incinerator could be converted to a steam generating plant at a low cost and produce low cost power. BEB is working on this possibility. The only functioning hydro plant is at Blue Creek where the Mennonites have constructed a low head plant of 35 KW capacity. A wind power is presently used to generate direct current voltage on St. George's Caye. Solar energy is used on very limited scale for water heating.

Besides bagasse as an alternate energy source there are several locations in the Western mountains suitable for hydro power. One site (Vaca Falls) may be developed with a 2 MW mini-hydro plant as a pilot project to replace the diesel units in the Belmopan-San Ignacio area. There might also be the possibility of exporting some power to Guatemalan villages adjacent to the border. This site is capable of supporting an 18 MW plant but the cost would be beyond the resources of the country at this time ($54.0 million). A transmission line to Belize City would cost another $12.0 million.

There are two other sites for large scale impoundments in the Northern Maya Mountains near Double Falls on the Swasey Branch and several sites on the Macal River near Black Rock. Similar sites exist on the Rio On, upper Macal River, Sibun River and Sittee River in Cayo District and on the Rio Grande Sink, Blue Creek and the Bladen Branch in Toledo District.

Combustion of biomass to generate electrical energy is possible when resources such as bagasse, energy cane (a hybrid grass with rapid growth characteristics which accumulates biomass instead of sugar), or wood products are available.

A study of an energy generating plant using wood or lumber products indicated that there is insufficient lumber to keep the plant going over the long run and sawmills or other bio-waste producing activities do not produce enough to assure an adequate supply. However, there have been suggestions that a lumber bed generating plant could be assured a continuing supply of fuel through the planting of fast growing trees.

The use of solar energy, especially by means of photovoltaic cells, has potential to provide power for water pumping and simple lighting and telecommunication in remote villages and on cayes. The use of wind generating devices on the cayes and in coastal areas also could produce enough energy to light homes and run small electrical appliances.

3.2.3 Constraints

On the basis of the studies we have reviewed and the interviews we have conducted, the constraints which continue to affect BEB are significant. They include:

(1) Excessive outages;

(2) Excessive system losses;

(3) Obsolescent plant and equipment;

(4) Dependence on imported petroleum;

(5) Poor maintenance;

(6) Lack of skilled and experienced manpower in management, planning, accounting, and engineering;

(7) Overstaffing of unskilled positions;

(8) Absence of a coherent plan for expanding generating, transmission, and distribution capacities;

(9) Inadequate financial analysis and planning, including lack of a financial reporting system; and

(10) A poorly conceived institutional and regulatory charter.

Of these ten constraints, our judgement is that the last three are the most fundamental and probably the most difficult to address.

3.2.4 Possible A.I.D. Assistance Areas

a. Financial and Organizational Reform

The World Bank's first Belize Power Project (funded by a consortium of the World Bank, CDB and CDC) has six components which include financing of generation facilities, distribution facilities, equipment, training, engineering service, and studies. USAID has provided an experienced financial and management advisor to BEB (formerly a senior executive in an electric utility in Massachusetts) as its contribution to this project.

Coopers & Lybrand reports that BEB decided not to permit the advisor to sit in on management meetings and recommends that BEB reconsider this decision:

> An electric utility operation is a very complex business and it is made more difficult in the Caribbean region by scarce human resources that are available at all levels of management....
>
> We believe that the CEO should reconsider his decision and allow the Financial and Management Advisor to sit in on management meetings on the basis of exposing his senior and middle managers to relevant electric utility experience.[6]

---

[6] Coopers & Lybrand, op. cit., p. 126.

Our own impression is that USAID has provided BEB with a highly capable individual whose manifest strengths as a line manager and public utility top executive and concern with issues of efficiency may have put BEB management on the defensive. This reaction in turn appears to have raised questions about the whether AID and the Bank themselves have a commitment to improving BEB's operational efficiency which extends beyond the elimination of financial losses. From the viewpoint of strategy development, we believe it is important to distinguish among:

(1) the respective roles to be played by, and the support given to, management and financial advisors by BEB, the Bank, and USAID.

(2) the extent to which BEB has made satisfactory progress in achieving efficiency objectives; and

(3) the relationship between the Bank and USAID in dealing with the institutional issues affecting BEB.

The second and third matters are of particular importance to USAID's future infrastructure strategy. It seems quite clear that the short-run "economic stabilization" objectives of assistance to BEB have been met; BEB's financial hemorrhaging has been stanched. It seems equally clear that the full "structural adjustment" potentials of donor assistance to BEB have not been fulfilled.

In the absence of the kind of leverage made possible by substantial ESF funding or full backing of financial and management reform by all major development institutions providing assistance to BEB, it is conceivable that further USAID assistance in this area will be of limited utility. However, the stakes for economic and institutional development of Belize are high enough to justify a sustained effort on USAID's part.

There are at least five ways in which USAID might move toward creating an atmosphere conducive to the adoption of measures that will improve the long-term efficiency of BEB.

First, it could invite the participation of other development institutions in an evaluation of its assistance to BEB. Such participation could provide a relatively low-key forum in which to assess experience of the past and alternatives for the future.

Second, USAID could encourage or initiate a policy dialogue at various levels in the World Bank designed to focus attention on the issues at stake for Belize's economy and for other infrastructure systems. It may wish to consider enlisting the assistance of the Office of Donor Coordination, the PPC/Economic Affairs Office, and LAC Bureau economists in this effort. They

have been concerned with policy implications of AID's relationships with the World Bank and the IMF on economic stabilization and structural adjustment issues. Conceivably, the policy dialogue should address policy toward infrastructure systems on an across-the-board basis, rather than BEB alone.

Third, USAID could strengthen the capacity of BCCI and/or BEIPU to analyze the effects of BEB's operating and investment decisions on the business community, and to formulate constructive proposals for change. This increased capacity would be used to increase the effectiveness of business persons on the BEB Board, to make representations to BEB and the Government, and to educate the public. USAID's existing project assistance to BEIPU could be expanded to accomplish this purpose.

Fourth, working with the World Bank, through its own policy dialogue process, or otherwise, USAID could open the question of changing BEB's institutional role to that of a regulated public utility. Under such a scheme, Government would limit its surveillance to protecting the public's interests in adequate service and fair rates. An arrangement to that of BTL could be an intermediate step in this direction. Another approach would to be sell BEB to its customers. One way to do this would be to set a reasonable level of rates (on the basis of rates achieved in comparable circumstances elsewhere. Any excess which BEB finds it necessary of desirable to charge over such reasonable rates could be treated as payment for purchase of ownership shares. Thus BEB would either have to become more efficient or face a new set of owners. As BEB moves toward independence of government, it will be important for government to acquire technical competence in utility regulation. USAID could assist in this process as well.

Finally, technical studies now underway may reveal opportunities for hydroelectric, steam, or other kinds of power generation suitable for private investment. In this case, USAID could support studies of this possibility. AID/W's Robert Archer, a former LAC energy officer now working on the AID/World Bank private power generation project in Pakistan could be helpful in this regard.

b. Rural Electrification

Of 48 percent of the population of Belize living in rural areas (15,000 families) only 29 percent of them (4,000 families) have access to electrical services.

On the benefit side, rural electrification can:

- Reduce drudgery on the farm and in the home.
- Increase crop yields through irrigation, processing and storage.

- Increase efficiency and labor productivity in agriculture.

- Improve health standards by improving water supply and purification, operation of health-care equipment and refrigeration.

- Improve education and social life through lighting and use of electrically operated learning and entertainment equipment.

- Contribute to national integration through improved telecommunications.

On the cost side, rural electrification can require substantial direct and indirect government subsidies of one kind or another. In sparsely populated areas, in particular, sanguine growth assumptions and long time horizons may be required in order to demonstrate favorable relationships between social benefits and social costs.

There is solid evidence that rural electrification can be viable in at least some rural settings in Belize. There are already a number of rural electric services in Belize based on cooperatives and other community organizations, developed in an ad hoc fashion. However, in some cases, these operations lack resources and information required to optimize selection of energy sources and operations.

Under the Central America Rural Electricity Studies Program (CARES) NRECA surveyed five Central American countries to identify possible rural electrification projects. One component of this project was development of a training program for workers and managers in each country. However, the BEB did not identify a person to receive NRECA training so the program in Belize has not been a great success.

Policy recommendations of NRECA which apply to Belize include:

- Rural electrification requires a strong institutional base, preferably an independent organization with the specific mandate to carry out rural electrification. It should not be tied-down by existing utilities, with their centralized control and financial difficulties, high operating costs and tariffs.

- Decentralization and private sector participation should be the goal in rural electrification programs.

- Design and construction standards should be appropriated to the rural nature of the systems and not be based on urban standards to ensure a least cost solution.

BEB currently is expanding its systems into new rural areas on limited scale. It has assisted remote communities by donating small generating units and by providing technical advice. During FY 87/88 BEB designated Bz. $588,000 for rural electrification. During FY 88/89 Bz. $1.2 million has been earmarked for this purpose. However, the program lacks the kind of thorough techno-economic analysis needed to assure that BEB's investment will be optimized and that scarce resources will not be wasted. In the absence of sound engineering and financial planning, there is evidence that projects are being selected on an ad hoc basis in response to community and political pressures, and not in a orderly, logical, economically sound manner.

It had been anticipated that World Bank-financed studies carried out for BEB by Canadian International Power Services Inc. (CIPS) would provide a comprehensive analysis of the future electric power requirements of the entire nation, including its rural populations, and thus provide a integrated factual foundation for a national electric power strategy and investment program. However, CIPS scope of work apparently was reduced during the course of cost negotiations and it appears that CIPS may not make a full study of the needs of the rural areas.

NRECA is scheduled to undertake studies of Belize's rural electric power requirements in early 1989, utilizing NRECA's demand assessment model. That model has been designed by NRECA to identify economically viable investments in the smallest of rural communities. (Note: USAID has requested NRECA to undertake these studies, but NRECA has not yet made a firm commitment.)

An important common objective for BEB, USAID, the World Bank, and other concerned institutions should be to assure that the data base and analytical frameworks which emerge from the efforts of CIPS and NRECA are reasonably complete, consistent, and unbiased. It would be most unfortunate indeed if minor cost cutting or differences of opinion concerning future institutional arrangements for electric power delivery in Belize were to undermine the credibility of an analytical effort of very great financial and economic importance to the country's future.

A.I.D. should support preparation of an in-depth study to analyze the organization of rural electrification in Belize and recommend institutional reforms, as appropriate. The study should:

- Recommend criteria and standards for rural electrification which may be different from those used for urban systems.

- Recommend guidelines for appropriate roles of the centralized public sector, cooperatives and private sector.

- Recommend the institutional arrangements and responsibilities for the development of rural electrification.

- Recommend specific measures to execute the rural electrification program, giving consideration to tax incentives, credit programs, technical assistance, institutional and policy reforms.

- Integrate rural electrification planning with power sector planning and national economic development policy.

- Provide for data collection and analysis, financial monitoring, pricing policies and regulatory procedures.

- Recommend a comprehensive training program to improve the administration and technical capabilities of persons working in the rural electrification sector.

- Recommend suitable measures for promoting the productive use of electricity in rural areas.

- Recommend that the extent of Belize's participation in the formation and operation of a Central American rural electric institute and benefit from the services to be provided.

- Consider development of local renewable energy sources to serve isolated rural areas with low-cost power.

3.2.5 Prospective Assistance from Other Donors

As noted previously, the World Bank is presently preparing its second power project. Canadian International Power services is performing a study of generation, transmission, and distribution alternatives for the future which will be critical to the second power project and to the development of electric power supply in Belize. Thus it is important that the study should be complete and well done. It is conceivable that limitations on the resources made available for this study and items omitted from its scope of work will limit its comprehensiveness. If so, supplemental investigations should be undertaken. Under such circumstances, AID should consider financing such supplemental investigations or encouraging other donors to do so.

3.3. TRANSPORTATION

The low density of the population in Belize is a major factor in restricting the development of the transportation network. Over

one-third of the population lives in Belize City and another third live in or near the other five district capitals, leaving one-third or some 50,000 persons scattered around a country the size of Massachusetts (8,866 square miles). The six district capitals are joined by a primary network of four main highways with a combined total length of 535 kilometers (332 miles). Access to villages, agricultural production areas, forest camps and other points of interest is via improved or rural feeder roads with a combined total length of 1,537 kilometers (953 miles). There are also about 450 kilometers (280 miles) of urban roads.

3.3.1 Roads

3.3.1.1 System Description

a. Main Highways

The four main highways in Belize, shown in Figure 2, are:

(1) The Northern Highway, connecting Belize City with Corozal, Santa Elena and the Mexican border.

(2) The Western Highway, connecting Belize City with the capital at Belmopan and Benque Viejo on the Guatemalan border.

(3) The Hummingbird Highway, connecting Belmopan with Dangriga on the coast south of Belize City.

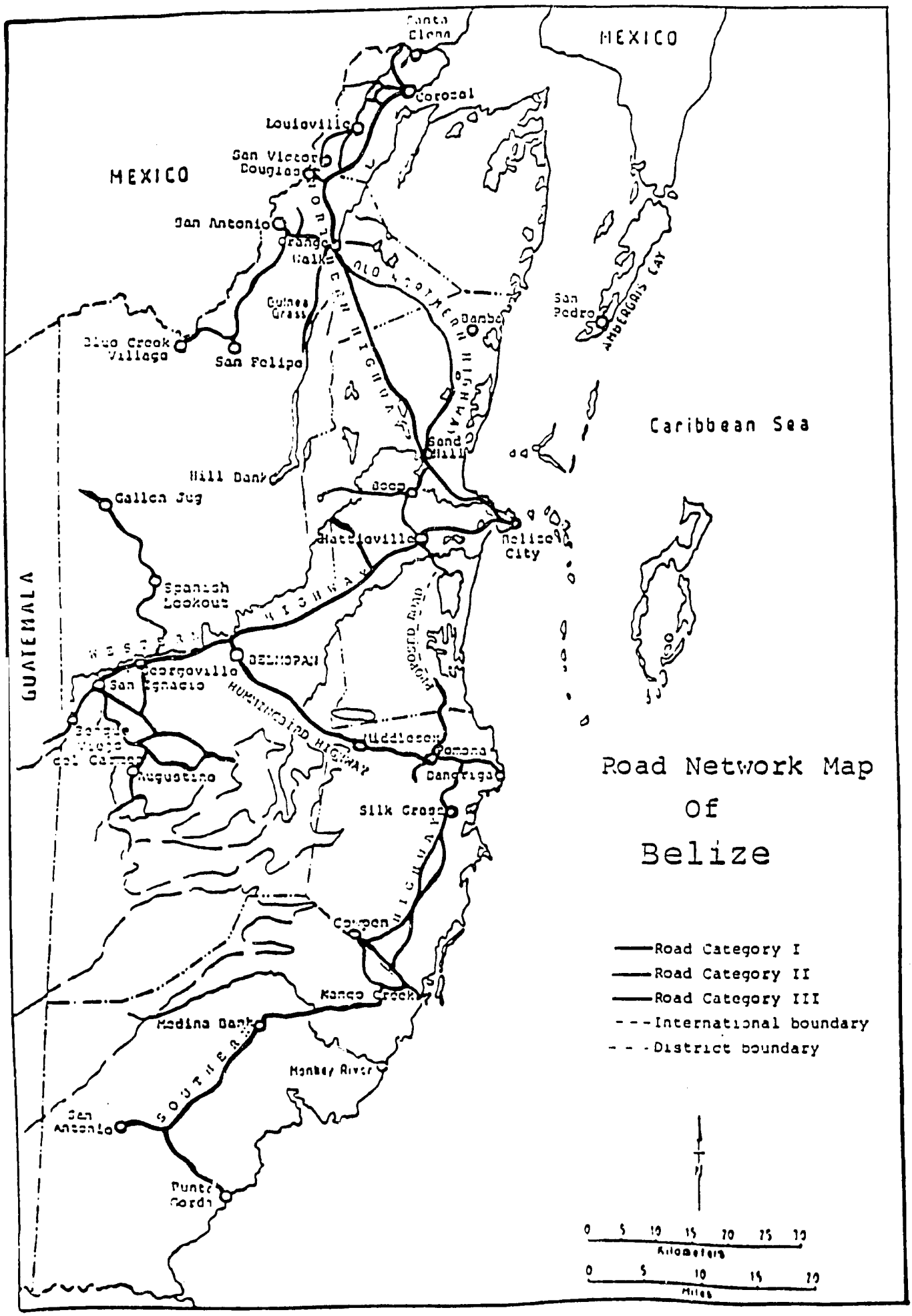
(4) The Southern Highway, connecting with the Hummingbird Highway near Dangriga and proceeding to Punta Gorda on the coast in the southern part of the country.

The Northern Highway has a total length of 93 miles. It is a two lane paved road recently rehabilitated and in good shape - except for the 17 mile section between Ladyville and Belize City. This section is to be improved under the World Bank's new Second Road Maintenance and Rehabilitation Project.

The Western Highway is an 83 mile, two lane paved road recently rehabilitated and in good shape from a point several miles outside of Belize City to Belmopan. The remaining section from Belmopan to the border is to be upgraded under the IBRD project. Several bridges have to be replaced in this section.

The Hummingbird Highway has a total length of 55 miles and passes through the mountains. It is a one lane road in very bad condition. Some sections have been paved at one time but the surface has deteriorated into potholes and loose gravel. Bridges are very narrow. Commitments have been obtained from the EEC and British Aid to rehabilitate the 39 mile section of road from the Sibun River to Dangriga and to replace several of the bridges. Financing has not yet been found for the 16 mile section of road from Belmopan to Sibun River.

Figure 2


MEXICO
MEXICO
GUATEMALA
Caribbean Sea
Santa Elena
Corozal
Louisville
San Victor
Douglas
San Antonio
Orange Walk
Guinea Grass
Blue Creek Village
San Felipe
Hill Bank
Gallon Jug
Spanish Lookout
Belmopan
Georgeville
San Ignacio
Augustine
Middlesex
Dangriga
Silk Grass
Cayon
Kanco Creek
Medina Bank
Monkey River
San Antonio
Punta Gorda
San Pedro
Ambergris Cay
Sand Hill
Boom
Belize City
Hattieville
Road Network Map
Of
Belize
Road Category I
Road Category II
Road Category III
International boundary
District boundary
Kilometers
Miles

The Southern Highway has a length of 101 miles which is subject to frequent flooding. The roadway has enough width for two lane traffic but it has over 50 one-lane timber bridges. IBRD is financing improvements to the drainage and replacing some major bridges, while British Aid is also replacing some bridges.

b. Rural Roads

Rural roads are generally one lane wide with a gravel or earth surface. Most have not been built to any standard and have limited provisions for drainage. Therefore, they are usually impassible during the rainy seasons. The roads were originally built to serve specific purposes, i.e., in the north for access to sugar producing areas, in the Stann Creek area to serve the citrus industry and in the south (Toledo) the banana industry. Others serve as access for general farming and forestry exploitations. Generally the roads in the south are in better condition because the road construction material is better in that area.

The USAID Rural Roads Program seeks to rehabilitate and maintain priority roads to an all-weather standard. This project has had a positive effect on those roads which it has completed. However, it will take many years to complete the renovation of the entire rural road network, and maintenance capabilities are not yet sufficient to maintain it.

Under the USAID rural road project an Office of Planning and Budget was formed in MOWH. This office is responsible for the planning of the project, selecting the roads to be rehabilitated on a priority basis and determining the financial requirements of the GOB.

A road selection process was established which rank-ordered all sections of roads needing rehabilitation by district. Only existing roads were considered and had to meet the following criteria.

- Road sections must connect an agricultural settlement to one of the main highways or existing all-weather roads.

- Road sections which pass through environmentally sensitive areas, including forest preserves, national parks or national preserves are not to be included until an environmental protection plan is prepared.

- Roads must serve agricultural areas where small, family farms are already established or where cooperative, state-owned or private farms employ a substantial number of residual workers.

Rehabilitation of road sections during Phase I of the Project closely followed the agreed-to priorities and Phase II work is currently completing the remaining high priority sections of road in each district. The MOWH is presently studying the rural road network and developing new priority lists for each district.

3.3.1.2 Discussion of System

The responsibility for construction and maintenance of roads lies with the Ministry of Works and Housing. Under the Minister and Permanent Secretary, the Chief Engineer is responsible for the activities of six operating divisions, including a Road Division and a Bridge Division. Although Government spending for roads has increased in recent years, budgetary allocations fall well short of the resources required. Belize is presently dependent on international development agencies for assistance in rebuilding, improving, and maintaining its roads to a significant degree. Collaboration among international development agencies and in combination with an evolution of the country's political processes will be required in order to alter a chronic imbalance in internal resource allocation.

Agricultural development and private sector development are two of the USAID/Belize priorities. The rural road program contributes to meeting both of these goals by providing all-weather access roads to agricultural productior areas, and involving the private sector in the program.

The MOWH has done a good job of rehabilitating and maintaining roads and building bridges by force-account under Phase I of the program, and is expected to further improve their performance under Phase II. The private sector is also involved in the USAID bridge building program.

MOWH plans to use the two road rehabilitation brigades equipped and trained under Phase I to continue the rehabilitation of priority roads in Corozal and Orange Walk Districts during the first year of the Phase II project, Belize and Cayo Districts the second year and Stann Creek and Toledo the third year. Roads which are not included in the three year USAID program will be rehabilitated in later years. Routine maintenance of rehabilitated road sections will be performed by the Road Maintenance Units being established and equipped in each district.

MOWH feels that the USAID Phase II project provides them with an excellent inventory of basic road construction and maintenance equipment and spare parts support, but does not provide some urgently needed specialized items and an insufficient number of other items. Specifically mentioned are two mobile rock crushing units to be assigned to the road rehabilitation brigades.

It is felt that the crushers and supporting dump trucks and loaders are needed to permit production of road base and surfacing materials which will meet the gradation specifications required to provide the best possible road base and surface for the rehabilitation and for periodic recharging of the road surface. Roads which are constructed to a high standard will require less routine maintenance and MOWH will not have to come in and rehabilitate the same section of road in a few years.

The only commercial rock crushing facility in Belize is located at about Mile 22 on the Western Highway. A cubic yard of material purchased at the quarry is about Bz. $40. This cost is excessive for rural road construction. The location of the quarry and long haul distances also rule out use of the quarry. The MOWH estimates that with mobile rock crushing units they could produce the required aggregate at a cost of Bz. $10./cu. yd. and move the plants to near the work sites to minimize the haul distance.

Another important factor in the rehabilitation of the roads is providing for proper drainage. At present the drainage is being placed more or less by instinct. What is needed to prevent costly washouts is a drainage study of each section on which to base the road elevation, drainage system and placement of drainage structures.

MOWH feels that local contractors cannot do a good job on road construction and maintenance at present, as they do not have adequate experience, equipment or financial resources. However, the MOWH is limited on the amount of force-account work it can undertake at any one time so when that limit is reached the only way additional work can be accomplished is by contract. MOWH does have the capability of preparing designs and tender documents for contract work.

Several contacts mentioned that rural roads constructed by Mennonite contractors were well built and maintained and were built at a low cost. The suggestion was made that these contractors be offered the chance to tender on any road construction or maintenance project. During a field trip it was noted that an important reason that the Mennonite constructed and maintained roads are superior to those worked on by the MOWH is the high quality material used in the construction.

As an aid to accelerating rehabilitation of the rural road network and increasing participation of the private sector some consideration should be given to the establishment of an Equipment Leasing Service.

In the United States and other developed countries, it is possible for construction contractors to lease or rent specialized high cost items of equipment rather than buy them.

Ownership remains with the lessor, but the lessee has possession and full use of the equipment. Reasons for renting or leasing are:

(1) To take advantage of using newer, more productive machines.

(2) No major capital investment or down payment required.

(3) If found unsuitable for the job or if no longer needed the equipment can be returned to lessor.

(4) Maintenance costs are reduced by use of newer equipment.

(5) Maintenance and repairs are performed by the lessor.

3.3.1.3 Constraints

The major constraints to development noted by almost all persons interviewed and in most of the reports or studies reviewed is the lack of year-round access to agricultural production and industrial areas and markets. Inland attractions, especially Mayan sites, which are currently being widely promoted in the U.S. and Europe, are presently served by dirt tracks if at all. Access roads to tourist sites are critical to complement the major thrust being given to development of the tourism sector by the GOB and several donors. Construction of penetration roads into new areas with agricultural or industrial potential is also needed to develop the areas.

The current Agricultural Development Strategy Statement states that "The most valuable resource of Belize is the land. If this resource is to be developed to its potential and contribute to the economic growth of the country the GOB must provide for physical access to the land. All-weather roads are essential for the movement of inputs required to support profitable agriculture, forestry, aquaculture and mariculture activities and outputs must be able to move to market at competitive costs."

Due to the low density of population and low volume of traffic in Belize it is difficult to justify expanding the present road network on an economic basis. However, some expansion may be justified on the basis of need to accommodate development in other sectors, or for social reasons, i.e., opening of new areas for settlement by the recent wave of refugees. The ongoing program of feeder road construction funded by USAID under the Sugar Quota Offset Program is a possible source of funds for construction of roads adjacent to the sugar areas of Orange Walk. Attempts should be made to locate any new roads in areas which have a combination of development possibilities, i.e., agriculture or lumber exploitation along a road to a tourist site.

While some large farmers or agri-businesses have developed a basic road system within the limits of their property, access to the property normally should be the responsibility of the Government. Once a reliable road exists for access to the large farms or industries, development of lands adjacent to the access road by small farmers is likely to take place.

Mention was made by several persons that a good road to Gallon Jug from the Belmopan area would serve to stimulate both agricultural development by opening up the area and tourism by providing easier road access to the Mayan ruins and hotel being developed by Barry Bowen near Gallon Jug. An environmental assessment study and protection plan is needed in order to assure that ecological, archeological, and other important environmental concerns are taken into account.

Belize has limited road maintenance resources and has experienced difficulty in maintaining its existing network. Assistance directed toward expanding maintenance and rehabilitation capabilities deserve high priority.

3.3.1.4 Possible USAID Assistance Areas

A synthesis of the information gathered from field trips, interviews and review of documents, and an awareness of the interests and funding limitations of the USAID program, dictate a conservative approach to the identification of possible new USAID initiatives in the road transport field. With the above in mind the Infrastructure Assessment Team suggests the following possibilities:

a. Equipment Leasing Service

Both the private and public sectors lack equipment needed to build, rehabilitate and maintain highways and rural roads and rural roads in Belize. In order to relieve this constraint and encourage greater private sector participation in the highway program, consideration could be given by USAID to providing assistance in the development of an Equipment Leasing Service.

A.I.D. funds could be used to procure major items of support equipment for the establishment of the Equipment Leasing Service, whereby small local contractors may lease equipment required for performing road work as an alternative to making heavy capital investments which are beyond their present capabilities. The rental rates would include all operating costs, including operators, depreciation, maintenance and repair, spare parts support, overhead and profit.

Although financial assistance would be provided for the first two years of the program, it is anticipated that the leasing

operation would be self supporting by the end of that period. The service could be a semi-autonomous entity within the MOWH, but would be managed privately under contract, with management assistance to be provided by A.I.D. during the two year start-up period. At some point the Leasing Service should be privatized.

b. Extension of Rural Roads Project

The ongoing Rural Roads Project, as revised by Amendment 4 to the original Loan Agreement, is scheduled to end on April 30, 1991. The services of the management and technical advisor is scheduled to end in March 1990. Based on past experience with rural road maintenance type projects, assessment team members feel that it would be a mistake for the USAID to bring assistance to an end as presently scheduled. To assure the success of the program it is recommended that USAID consider providing the additional financing and technical assistance required to continue the program for an additional three year period. In the absence of a Mission Engineer, the Management Advisor should remain through the life of the project. However, to get the most out of the Rural Roads Project and other projects with an infrastructure component, the Mission should consider placing a Chief Engineer on its staff.

c. Mobile Rock Crushing Equipment

The quality of road construction and rehabilitation in Belize has suffered from lack of proper building materials. AID should consider amending Phase II of the Rural Roads Project to include funds for procurement of two Mobile Rock Crushing Plants, with supporting loaders and dump trucks. Alternately, the equipment could be provided under an Equipment Leasing Service loan and leased to MOWH as needed. Attempts should be made to obtain the crushing plants from U.S. Military Excess Property sources. The sooner the equipment is made available to MOWH the sooner the quality of their work will improve.

d. Acceleration of Bridge Construction

The Mission's bridge construction program has proceeded more slowly than planned, in part because of shortages of local resources. Additional USAID funding could be provided to permit acceleration of bridge construction by contract, using the stock of excess property bridges obtained for MOWH. MOWH would prepare designs and tender documents and monitor the construction.

e. Upgrading of Road to Gallon Jug

The present road from Spanish Lookout or Valley of Peace to Gallon Jug is a dirt track which is impassable eight months of the year. If upgraded to an all-weather road, it would open up

an area with many farms and good agricultural potential. The road would also provide access to the Mayan ruins, the Chan Chich Hotel and the Bowen farm. A feasibility study and environmental protection plan for the proposed project should be prepared before a decision is made to proceed.

f. Rehabilitation of Access Roads by Contract

In conjunction with the above mentioned Equipment Leasing Service, sections of roads accessing tourist sites not included in the MOWH priority list could be identified and construction performed by private contractors under the guidance/supervision of MOWH. The construction might be funded under the ongoing Sugar Quota Reduction Fund in the north or in connection a tourist sector development loan by USAID.

g. Route-a-Maya

USAID should consider supporting coordination for the GOB involvement in the planned Route-a-Maya, a road which will pass adjacent to the Mayan ruins of several Central American countries and Mexico. A feasibility study of the Belizean portion of the road will be required as a follow-up.

3.3.1.5 Prospective Assistance from Other Donors

Other road projects of interest to various of the persons interviewed, which could be considered by other donor agencies were:

(1) Rehabilitation to two lane standards and paving of 16 mile section of Hummingbird Highway from Sibun River to Belmopan, and providing needed bridges.

(2) Rehabilitation and paving of 1.5 mile section of Western Highway between San Ignacio and the Guatemalan border, with bridge at Hocksworth.

(3) Surfacing of the Southern Highway between the Dangriga cut-off and Punta Gorda.

(4) Construction of Belize City bypass road with bridge between Hattieville on the Western Highway and the Northern Highway near Burrell Boom.

(5) Construction of new coastal road between Belize City and Gales Point in Stann Creek District.

(6) Rehabilitation or construction of access roads to Mayan Ruins at Caracol, Lamanai, Lubaantum and Nim Li Punit. The old Northern Highway and access to the Mayan ruins at Altun Ha also need to be upgraded.

3.3.2 Ports

3.3.2.1 System Description

The Port Authority is a semi-autonomous agency under the Ministry of Transport. It is responsible for all ports and navigational aids in the country. Major ports are:

- Belize City (18 ft. draft)
- Dangriga (19.5 ft. draft)

The dock at Belize City Port is 218 feet wide with space for one container or general cargo ship to tie up alongside and a Roll-on Roll-off ship or barge to occupy space at a ramp. The dock was not designed to have dockside cranes so all loading/unloading operations are handled by mobile cranes. The Port Authority has one 35 ton mobile crane but usually leases cranes from one of two private firms; Belize Engineering, with a 115 ton crane and other 30 ton or 60 ton cranes, and Locust Equipment Co., with a 140 ton unit plus other smaller cranes. The deep draft ships of Carol Lines anchor offshore and use their hoists to load and unload lighters. Locust is negotiating for lease of one of the undeveloped lots adjacent to the port for crane and trailer storage.

Belize City handles an average of four ships/week. The ships stay from 12-24 hours each visit. Dangriga handles mainly citrus concentrate with about two ships/month during citrus season. The citrus is converted to concentrate at a plant 12 miles west of Dangriga on the Hummingbird Highway.

The Port Commissioner would like to see the Belize City Port deepened to 24 to 28 feet to permit ships presently being loaded/unloaded by lighter to come alongside the dock. However, although the quantity of goods being shipped from the port has increased, the same shallow draft type of vessels are being used so there is no justification for the dredging at this time.

The Port Commissioner stated that the greatest problem is the lack of a proper access road to the port. The present access road is in terrible condition with its narrow width, insufficient drainage, surface and subsurface failures.

The port is surrounded by swamps and the present working area is not large enough to facilitate movement of traffic and storage of containers and trucks. A plan exists to reclaim an area of swamp sufficient for 24 lots of about 200 ft. x 200 ft. each for lease to firms desiring to locate at the port. At present one of the lots is being filled for construction of an additional operational area for the Port Authority. Negotiations are being

held with an agricultural development group for lease of several of the lots (20 acres) for construction of one or more cold storage warehouses. However, the group wants to build their own jetty and service their own ships rather than use the existing facilities and the Port Authority is not in favor of this.

The Board of Directors of the Port Authority is composed of 10 persons, one of whom is from the Ministry of Transport, while the other nine are from the private sector. The Minister of Transport names the private sector members and serves as Chairman of the Authority. He votes in the case of ties. The Port Authority has good relations with the local dock workers union.

3.3.2.2 Discussion of System Status

Tonnage handled by the Authority at the Belize City Port has increased in recent years, from 86 thousand tons in 1984/5 to 126 thousand tons in 1987/8. In 1984/5, the Port Authority had an operating loss of Bz. $91 thousand on revenues of Bz. $3.9 million. In 1985/6 the operating loss increased to Bz. $271 thousand on revenues of Bz. $4.3 million. However, in 1986/7 the Port Authority there was a significant turnaround: an operating profit of Bz. $868 thousand on revenues of Bz. $5.2 million.

An in-depth Export Transportation Master Plan was prepared in 1985 by a U.S. consultant under Phase I of The World Bank financed Road Maintenance and Rehabilitation Project. The study examined the port situation in depth and concluded that none of 33 possible port projects studied could be economically justified and the funds could be better spent on upgrading the highway system. The GOB has accepted these findings.

Since the study was completed, however, Belize's banana production was privatized and banana exports have expanded rapidly. The private sector in the Big Creek area has initiated action to obtain 50 percent of the financing from CDC for construction of a deep water port. Cost of the new port is estimated at $6.0 million. The new port is scheduled to be constructed at Big Creek to permit export of bananas directly to market (Britain) rather than having them barged to Honduras for transhipment. The port is expected to have a depth of 25 feet, although this point is still in discussion. Lumber coming out of the Toledo District could also be shipped from this port as well as citrus concentrate, although this would then require a new concentrate plant near the port.

3.3.2.3 Constraints

One of the present constraints to port operations, the access road to the port, is to be reconstructed as a part of the Phase II World Bank Road Maintenance and Rehabilitation Project. The other major constraint is the reclamation of the swampy area

around the port and construction of a solid platform for development of port facilities such as warehouses, refrigerated storage, parking for trailers and container storage. Extension of electricity, water, sewerage and telecommunications would also be required.

The present plan of the Port Authority is to lease the undeveloped lots to businesses willing to invest in their development. However, as in the present case with an interested party, the Port Authority may not agree to lease one or more of the lots if the intended lessors plans do not fit in the overall development of the port. By providing a completed platform and utilities, the Port Authority could have more control of the port development.

3.3.2.4 Possible A.I.D. Assistance Areas

The Mission could consider including the port authority in a general study of the organization and structure of public utilities in Belize. It also could consider giving assistance to the Port Authority on issues of public sector policy, regulation, and legal arrangements where port development and/or industrial real estate development within port zones may be undertaken by private sector interests.

3.3.2.5 Prospective Assistance from Other Donors

The Belize Free Zone Feasibility Study financed by USAID was rather negative in its assessment of the idea of locating an industrial estate on undeveloped land at the Belize City Port.[7] Nevertheless, construction of warehouses and specialized storage and shipping facilities at the Belize City Port for lease under a Free Trade Zone concept remains a possibility. Such a project conceivably could be supported by other donors or indeed by USAID.

3.3.3 Airports

3.3.3.1 System Description

Belize has one international airport located about 12 miles north of Belize City. Five airlines provide passenger service from Belize City to international destinations. These are Eastern, Continental, TACA, Tan/Sahsa and Challenge. There are direct flights to U.S. cities of Miami, New Orleans and Houston and to several Central American destinations. Most air cargo entering and leaving Belize is carried in the cargo holds of the

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[7] The Services Group, Inc., Belize Free Zone Feasibility Study: Market and Labor Demand Analysis, (Arlington, Viginia: November 16, 1988), pp. 66-67.

international passenger carriers. However, as the number of tourists and business passengers increase there will be less space for cargo and eventually cargo only planes may have to be introduced.

Construction is presently underway on the expansion of the Belize City Airport, financed by British Aid and the CDB. The improvements include replacement of the existing passenger terminal with a modern facility twice its size. The expansion is scheduled for completion in 1990.

In addition to the International Airport there are 10 or 11 Municipal Airstrips serving the larger population centers. Several local firms provide small plane service to regional and domestic airfields. Some large farmers have also constructed airstrips on their land to permit all weather access to the farms. Gallon Jug has an excellent private airfield from which arriving tourists will be flown to the Chan Chich Hotel.

3.3.3.2 Discussion of System Status

While air transport in Belize accounts for only a small portion of total exports at present, air freight is considered to be the mode with the greatest potential for the future as non-traditional, perishable and high cost exports increase.

Advantages of air freight for exports are:

(1) Belize City is the closest Central American Airport to the U.S.

(2) Freight charges are the lowest in the Central American region.

(3) The is no national airline so there are no conflicts in route allocation.

There is no commercial airport on the Belize side of the border near the planned Free Trade Zone at Santa Elena but one exists at Chetumal, 14 miles away on the Mexican side. At some point, the possibility of using this airport for export of manufactured goods may be considered as an alternate to trucking the goods to the Belize City Airport.

Various persons contacted by the infrastructure team mentioned development or upgrading of the domestic air transport network as an incentive to agricultural or industrial development, mariculture and tourism development. Specifically mentioned were:

- Construction or improvement of airfields and supporting facilities in Placentia, Cayo and Caye Caulker for tourism reasons and transport of mariculture products.

- Construction of airstrips near Mayan ruins otherwise inaccessible by road for tourism -- specifically mentioned were the ruins at Caracol.

- Airstrips in or adjacent to agricultural production and agro-industrial areas for rapid transport of high value and perishable goods to the Belize City Airport for export. Some of these areas are isolated during the rainy season.

3.3.3.3 Constraints

Constraints that can be identified in the air transport sector in Belize involve the lack of adequate airfields in some of the rural areas to permit year round egress and exit of agricultural goods and tourists.

3.3.3.4 Possible USAID Assistance Areas

USAID may wish to include a study of domestic airport needs as part of an agricultural development, tourism development or private sector project which it undertakes. If the results of the study are positive the private sector might well be willing to finance recommended improvements.

3.3.3.5 Prospective Assistance from Other Donors

British Aid is expected to continue to work with the Airport Authority on the further development of the Belize City International Airport. It should give consideration to funding plans for the development of a national air transport network.

3.4 Water Supply and Sanitation

3.4.1 System Description

The Water and Sewerage Authority (WASA) has responsibility for the supply and distribution of potable water and the disposal of sewerage in the principal cities and towns in the country. Systems presently owned and operated by WASA include:

Belize City - Water treatment plant, water system and sewerage system.

Corozal - Water only, sewerage to individual septic tanks.

Orange Walk - Water only, sewerage to individual septic tanks.

San Ignacio - Water only, sewerage to individual septic

Benque Viejo del Carmen - Water only, sewerage to individual septic tanks.

Dangriga - Water only, sewerage to individual septic tanks.

Punta Gorda - Water only, sewerage to individual septic tanks.

San Pedro/Ambergris Caye - Water only, sewerage to individual septic tanks.

Burrell Boom and Hattieville - Water only, sewerage to individual septic tanks.

All water systems, whether from wells or surface sources, are chlorinated.

WASA is in the final stages of implementing a CIDA loan for improvements to the Water and Sewerage systems of Belize City. Construction of the water system is essential complete and the sewerage collection and disposal system is well along, with full completion scheduled for 1989. WASA is awaiting some lift pumps which are to be installed at two stations in February/March, 1989.

The water system consists of:

- A 2.0 million gallon per day (MGD) water treatment plant located 17 miles North of the city adjacent to the Belize River.
- A 10 inch diameter transmission line to Belize City, with a turnout for Ladyville.
- A water distribution system serving 8500 metered clients.
- New fiber glass treated storage tanks.

The plant takes water from the river, clarifies and filters it, adds chemicals and chlorine. The city system is now receiving water which is completely potable.

The sewer system includes:

- Collection system to lift stations.
- Outfall to lagoons about four miles west of the city.

- Aerobiotic treatment through two lagoons and discharge to sea.

WASA also receives assistance from USAID, CARE and UNICEF for a program of well drilling in rural areas. USAID is financing water and sanitation improvements in Belize, Cayo and Stann Creek Districts. Drilling rigs are owned and crews are paid by the Government of Belize. USAID provided two rigs and the parts to rehabilitate two others. CARE is working in Corozal and Orange Walk Districts and UNICEF in Toledo District. The project includes the drilling of wells and development of springs, pumping to elevated tanks by diesel-powered pumps and distribution to the houses of each subscriber. The distribution systems are constructed by self-help; the tanks are constructed under contract. In two rural water supplies completed by CARE, voluntary community labor was largely used for tank construction.

The villages selected must have a population of at least 250 persons, indicate their desire to participate in the program and their intent to properly operate and maintain the system. Water is delivered to each property and charged as follows:

- Bz. $ 5/month - to property line
- Bz. $ 7/month - to kitchen of house
- Bz. $ 10/month - to other locations in house

Operations and Maintenance Manuals have been prepared by advisors and copies provided to two villages in Orange Walk and Corozal which have completed water systems. The completed systems have been maintained as required in these two villages.

Activities under CARE's Project started in August, 1984, and to date two village systems have been completed. An additional five water systems will be rehabilitated. The system in San Antonio in Orange Walk has been operating for almost a year to date without problems. More than enough money has been collected to pay for the operation and maintenance. Santa Clara has been operating only a few months but had a problem with a defective diesel generator. Pending replacement of the generator by the supplier the community organization is using a gasoline powered unit whose operating costs are much higher than the diesel unit. As a result, the set rates for water are too low to pay the higher operating costs, and the villages may ask water users to pay additional amounts to keep the system going.

The USAID/GOB Program started in March 1985. It will provide systems in a minimum of six villages, more if possible. Work is proceeding in two villages: Georgeville in Cayo District and Silk Grass in Stann Creek District. USAID is supplying one rotary drilling rig capable of drilling to 500 feet and one cable rig

with a 150 foot drilling depth, and the services of a long-term advisor. Spare parts to repair other rigs are also being provided.

In addition to the Water Systems, a program of construction of ventilated improved pits (VIP) latrines and hand pumps is included. Each village receiving water must construct the latrines before or during construction of the water system.

The Project Assistance Completion Date is presently scheduled for March 1989. However, five of the water systems will not have been completed by that date. An extension of the project completion date and additional funds will be needed to complete the program.

3.4.2 Discussion of System Status

WASA is under the jurisdiction of the Ministry of Natural Resources. The Board of Directors is composed of the following:

- Chairman, who is an engineer.
- Deputy Chairman, Mayor of Belize City.
- Representative of Ministry of Finance
- Representatives of various districts, one of whom is an engineer.

The Board takes an active role in the monitoring and direction of WASA.

WASA is required to be financially self-sufficient by law, but, prior to 1987, the authority had a history of poor financial performance. In 1988, there were major changes in staff and management. For the fiscal year ending in March 1988 there was a small deficit. At the mid-point of the present fiscal year, there is a positive cash flow, which is expected to further improve by March 1989.

WASA tariffs are based on a scale of costs per quantity of water used, with the unit costs increasing with increased usage. Sewer rates are calculated at 20% of water cost. Once a water/sewer zone is formed the residents of the zone cannot dig their own wells or use a separate system, except where it existed prior to the establishment of the zone. The cost of water delivered by tank truck is the same as water delivered by pipe.

WASA prepares the systems design and design changes itself, but most new work is performed by contractors. WASA prepares tender documents and monitors the construction. Occasionally, some work is performed by force-account. WASA has well drilling capability

and does drilling around the country both for itself and for others when its workload permits. The Mennonite community also does drilling for others.

WASA provides maintenance and repair to all major systems. Villages take care of the distribution systems, normal operation and maintenance but WASA gets involved in repair of major elements of the village systems.

3.4.3 Constraints

Construction of the new water and sewerage systems in Belize City has been based on a study performed in 1979. However, the new systems were not designed to serve the areas of the city which have developed since 1979.

WASA is discussing with CIDA the need to update the original Water and Sewerage Master Plan to take into account present and future water/sanitation requirements of the entire Metropolitan area of Belize City. This includes the area North to Ladyville and out the Western Highway about 7 miles. Sewage disposal is especially critical in the Bella Vista section and New University north of town between Belize City and Ladyville.

It is hoped that this new study will include consideration of a solution to the present canal system in the city, which has become something of an open cesspool, and the problem of solid waste disposal. These two problems are sure to operate as a constraint to development of the tourist industry in Belize City.

Resolution of the water/sewerage problem at San Pedro is another priority of WASA at the present time. Water for the town is obtained from a fresh water aquifer about 15 feet down. However, due to the increasing demand and pumping salt water is intruding. Also, pollution from septic tank effluent is finding its way into the aquifer. A similar situation is rapidly developing in Placencia.

A UNDP representative arrived in Belize in mid December 1988 to work with WASA on the development of the terms of reference for a consulting firm to perform a complete water/sewerage master plan for Ambergris Caye, including a drilling program to find a deep well source. WASA is presently drilling to various depths at various locations around the Caye to try to find a source of fresh water, but without success to date. The drill rigs they are using will only go to 150 feet. Discussions with a geologist indicates they should obtain a rotary drill rig capable of going to 1000 feet. Assistance in financing the Master Plan Study and drilling has been requested of CIDA.

WASA is the largest consumer of electric power in the country. Under BEB unitary rate structure, WASA is charged the same rate as private residents. WASA management has been trying to persuade BEB to give WASA a reduced rate, but without success. On the basis of a CIDA study, WASA believes it could produce electric power for itself at a considerable savings on the BEB rates.

The USAID/CARE funded programs are being executed under the general direction of the Ministry of Natural Resources, through WASA. However, no specific local organizational unit within the Ministry or WASA has yet been set up to effectively implement the program.

3.4.4 Possible USAID Assistance Areas

a. A prompt and satisfactory solution to sanitation and potential water supply contamination problems at Ambergris Caye is of critical importance to the country's tourism development plans as well as to the people of the area. USAID should monitor progress of efforts to deal with this problem and offer assistance if required.

b. The ongoing USAID and CARE Village Water/Sanitation Projects are proceeding well, if slowly. USAID should consider the extension of the Project Completion Date of the ongoing W/S Projects for an additional 2-3 year period, with provision of additional funds necessary to execute the program.

c. USAID should work with the GOB on setting up and providing sustained funding for a branch of WASA or a separate governmental unit, whose prime responsibility would be to plan, coordinate and implement village-level water and sanitation projects. An advisor should be provided to work with the new unit and USAID/CARE.

d. Belize does not have a current nationwide hydrogeological survey, providing data on the location and quality of underground water resources. A comprehensive water resources assessment would provide much-needed data for water supply improvement throughout the country, particularly in rural areas.

e. On the basis of a CIDA study, WASA believes it could produce electric power for itself at less cost than it pays to the Belize Electricity Board. This issue could be examined as part of a USAID-financed rate structure study and/or by providing expert technical assistance to the Government, WASA, and BEB in the course of negotiations between the two utilities.

3.4.5 Prospective Assistance from Other Donors

a. The preparation of a new Water/Sanitation Master Plan for Metropolitan Belize City and financing of the recommended works falls within the field of interest/activity of CIDA.

b. Development of a Water/Sanitation Master Plan for San Pedro and Ambergris Caye also falls in CIDA's sector and should be left to them. However, as noted above, USAID should be prepared to render assistance if timely solutions are not made in dealing with urgent sanitation problems in San Pedro.

c. Consideration should be given to developing a Water/Sanitation Master Plan for the Placencia area.

3.5 Industrial Estates

3.5.1 Sector Description

The Development Finance Corporation (DFC) operates an industrial estate at Ladyville, between the international airport and Belize City. The Estate occupies 8.5 acres. There are presently three factory shells in the estate housing a furniture factory, a garment factory, and a work shop. Each of these shells is 6000 square feet in area. The estate provides factory space, water, power, sanitary services and security for an annual rental of Bz. $3.00 per square foot.

The Ladyville Estate does not operate as a free zone. Its occupants are entitled to the same investment incentives as those who set up operations outside the estate. With the permission of the government, foreign investors are allowed to own land and buildings in Belize. However, they must provide the government with a feasibility study showing that such an arrangement would benefit Belize. A number of investors have set up in of their own choice under such arrangements.

3.5.2 Discussion of Sector Status

The existing factory shells at the Ladyville Estate are currently filled. The DFC has a Bz. $4.2 million line of credit from the Caribbean Development Bank to finance new factory shell construction. Three new shells (18,000 square feet) will be constructed, starting in January, 1989. Two additional shells are expected to be built before the end of the year and three more in the following year. The eight planned shells represent a total of 48,000 square feet of additional factory space, and will fill up the estate.

The DFC believes that it has lost investors to other countries in the Caribbean because factory space was not available when they expressed interest. It attributes non-availability to the CDB's conservative policies on providing financing for new shells. DFC believes these CDB policies will be softened in the near future.

DFC's present rental rate of Bz. $3.00 per square foot covers only its debt service. The rate will be doubled to Bz. $6.00 in January to cover its costs of operating the estate. The estate land is owned by the Government of Belize. No charges for use of the land itself have been considered in establishing the new higher rental rates.

Free zone status is a possibility for the Ladyville estate in the future.

3.5.3 Constraints

The constraints applying to industrial estates and location of industries in Belize include:

1. Limitations of transportation, telecommunications, electric power, water, and sanitation services.

2. The costs of these services.

3. Lack of available factory shells and timely factory shell financing.

4. Limitations of the labor supply, nation-wide and in the Ladyville area.

3.5.4 Possible USAID Assistance Areas

AID is currently funding a Belize Free Zone Feasibility Study. Should the development of a free zone prove feasible, USAID could consider contributing to the financing of land development and/or the installation of its utilities.

There is a possibility that the DFC expansion plans and plans for developing a Free Zone will each assume that they can capture the same limited group of seriously interested investors. USAID should encourage each activity to take the other's plans seriously into account.

3.5.5 Prospective Assistance from other Donors

The Caribbean Development Bank normally funds the construction of factory shells at publicly owned industrial estates. However, AID has provided such financing on occasion. Bilateral donors, such as the CIDA, are potential sources of funding for industrial estate construction.

CHAPTER FOUR

4.0 RECOMMENDED INFRASTRUCTURE STRATEGIES

The master strategy articulated in the Mission's most recent Action Plan focuses on the opportunities presented by the nation's lightly populated agricultural areas and by tourism. Lightly populated areas of Belize presently are not well served by infrastructure. Many infrastructure system improvements also are needed in urban areas of Belize. There are wide vistas indeed for the construction, rehabilitation, expansion, and improved maintenance of infrastructure throughout the nation.

Most infrastructure systems are capital intensive, expensive to install, and relatively costly to maintain and operate. This is particularly true in rural areas. USAID/Belize has not yet formulated a budgetary target or program scope for infrastructure activities which it wishes to pursue in the 1990-1995 period, but its resources obviously will not be unlimited. Given these circumstances, there are three ways in which the present infrastructure assessment can contribute to USAID's CDSS. It can:

1. Address underlying problems affecting infrastructure systems in Belize which impede the achievement of national objectives. Such an approach places national economic, political, and social concerns at the heart of the Nation's and the Mission's infrastructure strategy. This approach tends to focus on policy and institutional reforms.

2. Establish priorities among infrastructure activities on the assumption that the resources which the Mission will have for such activities will be reduced. This approach narrows the range of alternatives and emphasizes those areas in which the Mission has made previous efforts and investments.

3. Present a list of attractive individual opportunities to improve infrastructure systems in Belize. This approach widens the range of specific possibilities and permits the strongest case to be made for allocating substantial Mission resources to infrastructure activities. With a variety of recommendations before it, USAID can select the program scope that fulfills its requirements.

These approaches certainly can be combined. However, for the sake of clarity, each is addressed separately in the remainder of this Chapter. Subsection 4.1 below identifies a number of problems faced by infrastructure systems in Belize which impede the attainment of national objectives. It also suggests some ways

in which USAID could contribute to their solution. Subsection 4.2 deals with priorities among the three areas in which the Mission has been active in the past: rural roads, rural water supply, and electric power supply. Finally, subsection 4.3 provides a summary of individual recommendations made in this report.

4.1 Institutional and Policy Dimensions of Fundamental Infrastructure Problems

4.1.1 Some Problem Areas Common to Infrastructure Systems in Belize

Most of the infrastructure systems examined in this report have the following problems in common:

- Creation of credible, comprehensive, technically competent long-term plans for system expansion and maintenance;
- Efficient organization of people and equipment;
- Provision of cost-effective service;
- Allocation of resources among urban-oriented major subsystems and rural-oriented minor subsystems;
- Techno-economic decision-making in a political environment;
- Adaptation of institutional structures to requirements for efficiency, service, and financial self-sufficiency; and
- Coordination of assistance provided by multiple international development institutions.

Of these common problems, perhaps the most fundamental are lack of physical system planning and institutional adaptability. Belize lacks a national physical plan; urban areas are in need of master plans; individual infrastructure organizations lack the data and resources to make long term physical development plans. The tradition of close Ministerial control of public utilities may not be well-suited to the needs of some of these organizations. BTL, the utility which has had the most ostensible technical and financial success, has started to move away from the traditional pattern. It may be appropriate for others to follow. On the other hand, it is conceivable that transportation functions should be overseen by a single ministry, and that controls should be tighter rather than looser than at present.

4.1.2 Challenges Faced by Individual Systems

Each of the individual infrastructure systems reviewed in Chapter Three faces distinctive challenges which help to define the kinds of solutions likely to prove effective in enabling them to contribute to national objectives. Some of these distinctive challenges are summarized in the following tabulation:

Infrastructure System		Principal Challenges
Telecommunications	--	Providing service reasonably in line with rising international standards and expectations;
	--	Pioneering the transition from Ministry control to mixed ownership.
Electric Power	--	Making sound choices among system expansion alternatives;
	--	Determining proper disposition of current financial surpluses.
Transportation Systems	--	Maintaining and upgrading needed facilities with limited resources;
	--	Coordinating transportation system activities.
Water and Sanitation	--	Preventing health problems in key urban locations;
	--	Extending water and sanitation services to rural areas.
Industrial Estates	--	Coordinating space expansion with rising demand;
	--	Raising rates to cover costs.

4.1.3 Implementing National Priorities

Patterns of national spending on infrastructure systems do not sufficiently reflect national priorities and system optimization requirements. A recent World Bank summary document states:

> For the transport sector in general, and highways in particular, to contribute to the strategies and objectives of the Government, issues related to maintenance management and funding, institutional transport coordination and training need to be addressed. Data collection and procedures for managing highway maintenance programming and implementation were started under the already completed first Bank project,

> but the system does not integrate, nor permit evaluation of maintenance planning, budgeting and execution, nor has it been fully adapted to local conditions. Maintenance funding remains insufficient and MOW's limited capacity is strained by force account efforts placed on feeder road rehabilitation. The Government is aware of the potential inefficiencies arising from the present dispersion of responsibility of several ministries over fragments of the transport system, and from the lack of sufficient qualified staff, particularly in transport planning and highway maintenance.[1]

In its brief review, LBII's Infrastructure Assessment Team witnessed problems of lack of system integration and balance. For example, in a single morning, team members traveled the road from Belmopan to Belize City, and then visited the Belize City Port. The Belmopan/Belize City highway was in very good condition within a few miles of Belize City. Traffic on this road was light, reflecting a very modest amount of economic activity generated by its hinterland. By contrast, the road leading to the Belize City Port was congested and in very poor condition.

There are a number of plausible explanations for the contrast between the low volume (good condition) and high volume (poor condition) routes, including the time-phasing of foreign aid, the assignment of responsibility to the Belize City municipal government for maintaining the road to the port, and perhaps a showcase role for the Belmopan-Belize City road. Similar anomalies exist in many countries, developing and industrialized alike. However, Belize's top priority is increasing exports, and the relative status of the two roads did not reflect this priority. Behind the unbalanced allocation of investment and maintenance effort lies an imperfectly functioning pattern of institutional relationships, which does not assure that first things really come first.

4.1.4 Influence of Donor Assistance Patterns

It can be argued that patterns of donor assistance have made it more difficult for the Government to implement its infrastructure priorities in a consistent way. The reference to the "MOW's limited capacity"..."strained by force account efforts placed on

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[1] The World Bank, Memorandum and Recommendation of the President of the International Bank for Reconstruction and Development to the Executive Directors on a Proposed Loan in an Amount Equivalent to U.S. $5.6 million to Belize for a Second Road Maintenance and Rehabilitation Project (Report No. P-4725-BEL, May 11, 1988), p. 1.

feeder road rehabilitation" in the passage quoted above can be read as a plea to the Government to give more attention to the purposes of the Bank's program of assistance, and less to other programs. However, it can also be regarded as a persuasive case for donor consensus on a realistic national strategy on road building and maintenance. Such a national strategy could be built on solid agreement within the Government and among the donors on planning and operational priorities, and on a reasonable schedule for moving the country toward self-sufficiency in road construction and maintenance. AID and World Bank project documents recognize that the country is presently dependent on international development agencies for assistance in rebuilding, improving, and maintaining its roads and that the Government is not allocating the magnitudes of budgetary resources to roads which are needed to attain self-sufficiency.

Fundamental problems of this kind are by no means limited to the transportation system in Belize. The Belize Electricity Board and the international institutions assisting it are faced with basic issues concerning BEB's objectives, internal efficiency, and institutional responsibilities. They include the size and nature of investment in new facilities, the level of BEB's rates, institutional responsibility for rural electrification, and the organizational structure of the electric utility itself. These issues deserve collaborative attention by the Government, the Bank, AID, and other development agencies as the organization's future investment program is being formulated.

The Water and Sanitation Authority has looked to CIDA for assistance with major projects and to USAID and voluntary agencies for assistance with rural systems. However, the interests of urban system development and financial self-sufficiency are driving forces currently ascendant within WASA.

Infrastructure organizations in Belize face the difficult process of reconciling competing goals of growth, equity, and political responsiveness as they allocate their resources. Rather than becoming directly involved in this process, donors generally have preferred to pick an area of assistance that reflects a single theme -- e.g., major system rehabilitation, rural feeder roads, export facilities, or the like. Donors have then attempted to persuade the Government to give the highest priority to that single theme. On occasion, the Government has found it advantageous to attract a variety of single-theme donor projects and then to spread limited resources among their projects in such a way that each development institution is kept at least minimally happy. The pattern is often one that gives grease to the squeaking wheel and postpones the process of seeking solutions to fundamental problems.

4.1.5 Coming to Grips with Institutional and Policy Issues

Institutional and policy issues affecting infrastructure systems in Belize center around (1) donor collaboration; (2) the numbers, coordination, and Ministerial oversight of public utilities and other infrastructure organizations; (3) allocation of resources among urban and rural development; and (4) the role of the private sector in infrastructure development.

International development agencies do not have an organized "Belize Club" in the sense that donor-led arrangements exist for some other countries in the region, such as Grenada and Bolivia. Informal coordination among development institutions on infrastructure and other programs has not been particularly energetic or effective. In early 1988, the Ministry of Economic Development held a donor coordination meeting in an attempt to rectify this situation. It was considered a success and is to be repeated annually. However, the meeting was not able to examine program and project issues in depth.

Where concerns such as goal-selection, donor conditionality, parastatal performance, and government organization are at issue, government-initiated coordination is subject to inherent limitations. If progress is to be made on fundamental issues affecting infrastructure in Belize, closer collaboration among international development agencies, in combination with an evolution of the country's political processes and institutions, is in order.

Effective donor coordination is not necessarily best initiated by assembling all interested parties around the table to engage in a multilateral planning process.[2] A conceivable strategy for the Mission would be to work with the World Bank on key issues first, and then involve other institutions as a consensus emerges. A simple beginning would be to involve Bank personnel formally or informally in Mission evaluations of USAID's Rural Roads Project and its assistance to the Belize Electricity Board. An

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[2] The IMF/World Bank policy framework paper process is a case in point. Two institutions (the International Monetary Fund and the World Bank) work with governments of developing countries in formulating short and medium-term policies and programs for economic stabilization and structural adjustment. Other international development institutions then "buy in" to the policies and programs thus formulated. The process probably could be improved by involving bilateral donors at an earlier stage and by encouraging more assertiveness on their part. But, fundamentally, the process works.

alternative would be to schedule a "cluster evaluation" of Mission infrastructure projects (USAID assistance to MOWH, BEB, and WASA) in which Bank personnel could participate. The Mission may wish to seek AID/Washington assistance in establishing and maintaining formal contacts with the World Bank's LA3 Country Department and with its Infrastructure and Energy Operations Division. Once a collaborative program of action starts to take shape, CDB, CIDA, British Aid, and other development institutions could be involved.

The USAID Mission, the World Bank, and conceivably other institutions could provide support for a joint program of study and action to enable the Government to address fundamental questions of infrastructure organization and policy. These include:

1. Are there too many individual organizations responsible for infrastructure in Belize? Are oversight activities for infrastructure spread among too many Ministries? Are coordinating mechanisms adequate? What practical alternatives to the present pattern exist?

2. Should traditional patterns of Ministerial control over public utilities in Belize be changed? Should Belize have a Public Utilities Commission similar to that which has been set up in Barbados and in other jurisdictions? How can the interests of (a) other government utilities, (b) the business community, and (c) the general public be best protected under the present system? Through what institutional alternatives?

3. Should the privatization process started in BTL be carried further in that organization? Should government ownership in BEB be divested in whole or it part? Is there scope for private investment in new forms of energy generation, such as hydro-electric power? Are there opportunities for privatization in other utility systems?

4. Should private ownership and maintenance of infrastructure be encouraged in rural areas or elsewhere? If so, should the Government offer incentives or assistance? Where private development is undertaken, what arrangements should be made to protect the public interest?

4.2 Priorities in the Case of Reduced Resource Availability

USAID's assistance to the Belize Electricity Board (finance and management), the Ministry of Works (bridges and rural roads), and the Water and Sewer Authority (rural water supply and sanitation) each have shown significant positive results. However, by their very size and nature, the problems of these organizations are not likely to be solved quickly. In each case, extended assistance could harvest significant benefits by building on an established

base. In the case of BEB, principal objectives should be to move from financial recovery to greater internal efficiency and a sound plan for the future. In the case of the Ministry of Works one objective should be to build up its capabilities as part of a realistic plan for dealing with the magnitude of the rehabilitation/maintenance problem. In the case of WASA, an important objective should be to sustain and provide a sound organizational base for the existing rural water and sanitation effort.

If the Mission finds it necessary to reduce its funding in the field of infrastructure, attention will inevitably focus on project and program goals. If, in an environment of reduced funding, the goal of economic growth -- particularly short term economic growth -- is given primacy, some revisions in the Mission's approach to each infrastructure agency may be in order. In the case of the highway project, particular attention should be directed to those bridge construction and rural road rehabilitation and maintenance activities which directly serve substantial agriculture, tourism, and manufacturing activities. In the past, rural road selection has tended to balance considerations of regional equity and community development with those of economic development. If funds are cut back, that balance should be reexamined in terms of giving greater attention to economic development.

In the case of BEB, the largest potential for impact on economic growth probably lies in substantial reductions in electric power rates. Consideration of this possibility should probably be timed to coincide with the completion of studies of a full range of technical alternatives for system expansion. There may be a few cases where rural electrification can make a direct and immediate impact on productive activities. However, in many of Belize's lightly populated rural areas, substantial subsidies may be required, economic benefits may be a long time in coming, and justifications for any new program justifications may have to rest on considerations of equity and of long-term development potentials.

In the case of rural water supply and sanitation, the impact on productive activity is indirect, if important. As in the case of rural electrification, however, the basic justification of new activities may have to rest on considerations other than those of short term economic benefits.

4.3 Summary of Project Assistance Areas

This subsection provides a comprehensive list of areas of assistance identified in the present and previous sections of this report. The list includes projects and activities that may be suitable for AID, for other agencies of the United States Government, and for other international development institutions.

1. **Telecommunications**: Familiarizing BTL staff with equipment markets in the United States.

Belize Telecommunications Limited (BTL), the country's national telecommunications organization, is currently completing a major expansion utilizing equipment supplied by a U.S. manufacturer. Management wants to learn more about developments in the U.S.telecommunications equipment market. Payment of international travel of BTL's employees would permit BTL to stay abreast of new developments, make wiser equipment choices, and encourage continued purchases of U.S. equipment. The U.S. Department of Commerce and the Trade and Development Program may have a special interest in providing this assistance to BTL.

2. **Telecommunications**: Financing for future BTL system expansions.

Shortly before it undertook its current expansion, BTL discussed financing with the World Bank, but decided on other sources. World Bank or other multilateral financing remains a possibility for future expansions. The U.S. Export-Import Bank is also a possibility.

3. **Electric Power**: Evaluation of USAID Assistance to BEB.

USAID had provided management and financial advisory assistance to the Belize Electricity Board (BEB) as part of the World Bank's first power project, which was undertaken in 1986. This assistance, which has been financed with ESF resources, has never been evaluated. Some form of assessment of the Mission's assistance to BEB is very much in order. USAID could invite the participation of other development institutions in an evaluation of Mission assistance to BEB. Their participation would provide a relatively low-key forum in which to assess the experience of the past and alternatives for the future.

4. **Electric Power**: Policy dialogue with the World Bank and other institutions.

The basic issues of BEB's objectives, internal efficiency, and organizational structure deserve attention from the development institutions supporting BEB, as the utility's future investment program is being formulated. These include the size and nature of investment in new facilities, the level of BEB's rate structure, institutional responsibility for rural electrification, and the organizational structure of BEB itself. The World Bank currently is de facto leader among organizations providing assistance to BEB. USAID could initiate a policy dialogue at various levels in the World Bank to focus attention on the impact of BEB's performance on Belize's economy. The Mission may wish to consider enlisting the assistance of the Office of Donor Coordination, the PPC/Economic Affairs Office,

and LAC Bureau economists in this effort. Conceivably, the policy dialogue should address policy toward infrastructure systems in general, rather than BEB alone. Ultimately, discussions should involve other international development institutions as well.

5. Electric Power: Assistance with system expansion planning studies.

The World Bank is presently preparing its Second Power Project. Canadian International Power Services is performing a study of generation, transmission, and distribution alternatives for the future which will be critical to the Second Power Project and to the development of electric power supply in Belize. Limitations on the resources available for this study and omissions from its scope of work may limit its comprehensiveness. If supplemental investigations are in order, AID should consider financing them or encouraging other donors to do so.

6. Electric Power: Private sector investment in new power generation facilities.

Technical studies now underway may reveal opportunities for hydroelectric, steam, or other kinds of power generation in Belize suitable for private investment. In Pakistan, AID, the World Bank, and other institutions are collaborating on an approach which encourages private investment in new generation facilities, without changing the institutional status of the distribution system. USAID could support studies of similar opportunities for Belize.

7. Electric Power: Building business community advocacy capabilities.

USAID could strengthen the capacity of BCCI and/or BEIPU to analyze the effects of BEB's operating and investment decisions on the business community, and to formulate constructive proposals for change. This increased capacity would be used to increase the effectiveness of business persons on the BEB Board, to make representations to BEB and the Government, and to educate the public. USAID's existing project assistance to BEIPU could be expanded to accomplish this purpose.

8. Electric Power: Study of privatization and regulation of electric power generation, transmission, and distribution.

Working with the World Bank through its own policy dialogue process or otherwise, USAID could open the question of changing BEB's institutional role to that of a regulated public utility. Under such a scheme, Government would limit its surveillance to protecting the public's interests in adequate service and fair

rates. An arrangement similar to that of BTL could be an intermediate step in this direction. Another approach would be to sell BEB to its customers. As BEB moves toward independence of Government, it will be important for government to acquire technical competence in utility regulation. USAID could assist in this process as well.

9. Electric Power: Study of the organization of rural electrification in Belize.

The National Rural Electric Cooperative Association (NRECA) is scheduled to undertake studies of Belize's rural electric power requirements in early 1989, utilizing a demand assessment model. That model has been designed to identify economically viable investments in the smallest of rural communities. USAID should support preparation of an in-depth study to analyze the organization of rural electrification in Belize and recommend institutional reforms, as appropriate.

10. Transportation: System-wide road rehabilitation and maintenance evaluation.

The principal focus of past assessments of USAID rehabilitation and road activities understandably has been on rural force account activities. The World Bank and other international development agencies have legitimate concerns about other parts of the road system. In order to encourage movement toward a consensus on system-wide priorities, USAID could incorporate an system-wide assessment as part of its next project evaluation--and invite other agencies to participate in this part of the evaluation.

11. Transportation: Equipment leasing service for road equipment.

Both the private and public sectors lack equipment needed to build, rehabilitate and maintain highways and rural roads and rural roads in Belize. In order to relieve this constraint and encourage greater private sector participation in the highway program, consideration could be given by USAID to providing assistance in the development of an equipment leasing service. AID funds could be used to procure major items of support equipment for the establishment of the equipment leasing service, whereby small local contractors may lease equipment required for performing road work as an alternative to making heavy capital investments which are beyond their present capabilities. The rental rates would include all operating costs, including cost of operators, depreciation, maintenance and repair, spare parts support, overhead, and profit. Such a project would address the fundamental concern, shared by several international development institutions, that Belize lacks the capacity to maintain its road network.

12. Transportation: Extension of the USAID Rural Roads Project.

The Mission's ongoing Rural Roads Project is scheduled to end in April 1991. The services of the management and technical advisor are scheduled to end in March 1990. To assure the success of the program, it is recommended that USAID consider providing the additional financing and technical assistance required to continue the program for an additional three year period. In the absence of a Mission Engineer, the Management Advisor position should be maintained throughout the life of the project. However, to get the most out of the Rural Roads Project and other projects with infrastructure components, the Mission should consider placing a Chief Engineer on its staff.

13. Transportation: Mobile rock crushing equipment.

The quality of road construction and rehabilitation in Belize has suffered from lack of proper building materials. USAID should consider amending the Rural Roads Project to include funds for procurement of two mobile rock crushing plants, with supporting loaders and dump trucks. Alternately, the equipment could be provided under an equipment leasing service loan and leased to MOWH as needed. The crushing plants possibly could be obtained from U.S. Military Excess Property sources. The sooner the equipment is made available to MOWH, the sooner the quality of their work will improve.

14. Transportation: Acceleration of bridge construction.

The Mission's bridge construction program has proceeded more slowly than planned, in part because of shortages of local resources. Additional USAID funding would permit acceleration of bridge construction by contract, using the stock of excess property bridges obtained for MOWH. MOWH would prepare designs and tender documents and monitor the construction.

15. Transportation: Upgrading a road from the Western Highway to Gallon Jug.

The present road from Spanish Lookout or the Valley of Peace to Gallon Jug is a dirt track which is impassable eight months of the year. If upgraded to an all-weather road, it would open up an area with many farms and good agricultural potential. The road would also provide access to the Mayan ruins, the Chan Chich Hotel and the Bowen farm. A feasibility study and environmental protection plan for the proposed project should be prepared before a decision is made to proceed.

16. Transportation: Rehabilitation of access roads by contract.

Sections of roads not included in the MOWH priority list for the Rural Roads Project which access tourist sites could be

identified, and construction performed by private contractors under the guidance/supervision of MOWH. The construction might be funded under the ongoing Sugar Quota Offset Program in the north or in connection with a tourist sector development loan by USAID.

17. Transportation: Tourism road connecting Mayan ruins sites.

USAID should consider supporting GOB involvement in the planned Route-a-Maya, a road which will pass adjacent to the Mayan ruins of several Central American countries and Mexico. The initial requirement is for Government participation in coordination activities. A feasibility study of the Belizean portion of the road will be required as a follow-up.

18. Transportation: Regulatory aspects of private sector port development.

The Belize Port Authority is presently considering private sector proposals to develop land adjacent to existing port facilities at Belize City and to develop a deep water port at Deep Creek. The Mission should consider giving assistance to the Port Authority on issues of public sector policy, regulation, and legal arrangements for port development and/or industrial real estate development within port zones by private sector interests.

19. Transportation: Free trade zone at Belize City Port.

The Belize Free Zone Feasibility Study recently financed by USAID was quite negative in its assessment of the idea of locating an industrial estate on undeveloped land at the Belize City Port. Nevertheless, construction of warehouses and specialized storage and shipping facilities at the Belize City Port for lease under a Free Trade Zone concept remains a possibility. Such a project could be supported by USAID or other donors.

20. Transportation: Feasibility of improved domestic airfields.

While air transport accounts for only a small portion of total exports at present, air freight is considered the mode with the greatest potential for expansion as non-traditional, perishable, and high-value-for-weight exports increase. There is considerable scope for the improvement of domestic airfields to support tourism, agriculture, and industry. USAID may wish to include a study of domestic airport needs as a component of an agricultural development, tourism development or private sector project. If the results of the study are positive, the private sector may be willing to finance recommended improvements.

21. <u>Water Supply and Sanitation</u>: San Pedro water supply contamination solution.

San Pedro, in Ambergris Caye, is a leading tourist destination. Water for the town is obtained from an aquifer 15 feet beneath the surface. However, salt water is intruding into the source due to increased demand and pumping. Pollution from septic tank effluent is also finding its way into the aquifer. The UNDP representative is preparing a scope of work for a drilling program and Water/Sewerage Master Plan for the Caye. WASA is presently drilling around the Caye, but without success because WASA drill rigs will only go to 150 feet. Discussions with a geologist indicate that rotary rigs which can reach a depth of 1000 feet are needed. WASA has requested assistance from CIDA in financing the Master Plan and drilling. A prompt and satisfactory solution to sanitation and potential water supply contamination problems at Ambergris Caye is of critical importance to the country's tourism development plans, as well as to the people who reside in the area. USAID should monitor progress of efforts to deal with this problem and offer assistance if required.

22. <u>Water Supply and Sanitation</u>: Village Water/Sanitation Project Extension.

WASA also receives assistance from USAID, CARE and UNICEF for a program of well drilling in rural areas. USAID is financing water and sanitation improvements in Belize, San Ignacio and Dangriga Districts. Drilling rigs are owned and crews are paid by the Government of Belize. USAID provided two rigs and the parts to rehabilitate two others. CARE is working in Corozal and Orange Walk Districts. UNICEF is working in the Toledo District. The project includes the drilling of wells and development of springs, pumping to elevated tanks by diesel-powered pumps, and distribution to the houses of each subscriber. The distribution systems are constructed by self-help; the tanks are constructed under contract. In two rural water supplies completed by CARE, voluntary community labor was largely used for tank construction. The work is proceeding well, if slowly. USAID should consider the extension of the Project Completion Date of the ongoing Water/Sanitation Projects for an additional two to three year period, with provision of additional funds necessary to execute the program.

23. <u>Water Supply and Sanitation</u>: Rural water supply and sanitation organization.

The USAID/CARE funded programs are being executed under the general direction of the Ministry of Natural Resources, through WASA. However, no specific local organizational unit within the Ministry or WASA has yet been set up to effectively implement the program. USAID should work with the GOB on setting up and providing sustained funding for a branch of WASA or a separate gov-

ernmental unit, whose prime responsibility would be to plan, coordinate and implement village-level water and sanitation projects. An advisor should be provided to work with the new unit and with USAID/CARE.

24. Water Supply and Sanitation: Comprehensive water resources assessment

Belize does not have a current nationwide hydrogeological survey, providing data on the location and quality of underground water resources. A comprehensive water resources assessment would provide much-needed data for water supply improvement throughout the country, particularly in rural areas.

25. Water Supply and Sanitation: WASA electricity costs.

WASA is the largest consumer of electric power in Belize. Under BEB's single schedule rate structure, WASA is charged the same rate as private residents. WASA management has been trying to persuade BEB to give WASA a reduced rate, but without success. On the basis of a CIDA study, WASA believes it could produce electric power for itself at a considerable savings. This issue could be examined as part of a USAID-financed rate structure study and/or by providing expert technical assistance to the Government, WASA, and BEB in the course of negotiations between the two utilities.

26. Water Supply and Sanitation: Belize City Water/Sanitation Master Plan and system improvements.

The new water and sewerage systems in Belize City were built on the basis of a study performed in 1979. The new systems have not been designed to serve the areas of the city which have developed since 1979. There is a need to update the original Water and Sewerage Master Plan to take into account present and future water/sanitation requirements of the entire Metropolitan area of Belize City -- and to install the required improvements. This new study should examine the present canal system in the city, which has become something of an open cesspool, and the problem of solid waste disposal. These two problems will constrain the development of the tourist industry in Belize City. WASA is discussing assistance for the Master Plan with CIDA. Presumably, CIDA will be interested in financing the recommended improvements.

27. Water Supply and Sanitation: Placencia Water/Sanitation Master Plan.

Placencia is a tourism destination whose water and sanitation requirements deserve review. Consideration should be given to developing a Water/Sanitation Master Plan for the Placencia area.

28. **Industrial Estates**: Coordinated planning for industrial estate and Free Zone development.

AID is currently funding a Belize Free Zone Feasibility Study. There is a possibility that the DFC expansion plans and plans for developing a Free Zone will each assume that they can capture the same limited group of seriously interested investors. The same possibility may exist with respect to plans for developing land adjacent to the Belize City Port. USAID should encourage each activity to take the others' plans seriously into account.

29. **Industrial Estates**: Financing development of land and utilities.

Should the development of a Free Zone prove feasible, USAID could consider contributing to the financing of land development and/or the installation of its utilities. Such financing also could be provided by other international organizations, such as CIDA.

30. **Industrial Estates**: Financing factory shells.

The Caribbean Development Bank normally funds the construction of factory shells at publicly owned industrial estates. However, AID has supplied such financing on occasion.

31. **Development Agency Coordination**: Infrastructure Cluster Evaluation.

International development agency coordination for Belize has not been very energetic or effective, particularly in dealing with infrastructure issues that can divide donors. One way for USAID to contribute to an improved process is to invite other agencies to participate in its own project evaluations (see items 3 and 10 above). An alternative would be to invite their participation in a "cluster" evaluation of all three USAID projects. The advantage of the cluster approach is that it permits examination of common issues (such as rural/urban priorities) in a variety of institutional contexts.

32. **Donor Agency Coordination**: Joint Study and Action Program.

Institutional and policy issues underlie many of the difficulties Belize has experienced in aligning the performance of its infrastructure systems with national economic, social, and political objectives. A joint program of study and action could address the proliferation of infrastructure institutions, Ministerial control over utilities, privatization of existing utilities, and the development of private sector infrastructure systems in rural areas.

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This report was written by Harvey A. Lerner and C. Raymond Douglass. Mr. Lerner served as Team Leader. He was principal author of Chapters One, Two and Four of the report and of sections of Chapter Three dealing with telecommunications, electric power, and industrial estates. He also wrote the Executive Summary. Mr. Douglas wrote sections of Chapter Three on roads, ports, and airports and on water and transportation. He also was principal author of the section of Chapter Two on donor assistance to infrastructure projects in Belize.

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