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UNCLASSIFIED

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

CARIBBEAN REGIONAL

PROJECT PAPER

DOMINICA ROAD REHABILITATION

AID/AC/P-108

Project Number: 538-0076

UNCLASSIFIED

**PROJECT DATA SHEET**

[A] C = Change  
D = Delete

3

**2. COUNTRY/ENTITY**  
Regional Development Office/Caribbean

**3. PROJECT NUMBER**  
538-0076

**4. BUREAU/OFFICE**  
Latin America and the Caribbean (LAC) [05]

**5. PROJECT TITLE (maximum 40 characters)**  
Dominica Road Rehabilitation

**6. PROJECT ASSISTANCE COMPLETION DATE (PACD)**  
MM DD YY  
08 30 85

**7. ESTIMATED DATE OF OBLIGATION**  
(Under "B:" below, enter 1, 2, 3, or 4)  
A. Initial FY [82] B. Quarter [4] C. Final FY [85]

**8. COSTS (\$000 OR EQUIVALENT \$1 = EC\$2.7)**

A. FUNDING SOURCE	FIRST FY 82			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	( 9,600 )	( )	( 9,600 )	( 9,600 )	( )	( 9,600 )
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S.						
1.						
2.						
Host Country		300				300
Other Donor(s)						
<b>TOTALS</b>	9,600	300	9,600	9,600		9,900

**9. SCHEDULE OF AID FUNDING (\$000)**

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECIL CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ESF	701	821		0		9,600		9,600	
(2)									
(3)									
(4)									
<b>TOTALS</b>				0		9,600		9,600	

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

061

**11. SECONDARY PURPOSE CODES**

133

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

A. Code

BF

LAB

B. Amount

80%

30%

**13. PROJECT PURPOSE (maximum 480 characters)**

To provide dependable access from Dominica's capital and major port to the agricultural areas of central and eastern Dominica and the international airport.

**14. SCHEDULED EVALUATIONS**

Interim MM YY MM YY Final MM YY  
08 85

**15. SOURCE/ORIGIN OF GOODS AND SERVICES**

000  941  Local  Other (Specify)

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

**17. APPROVED BY**

Signature: *William B. Wheeler*  
Name: William B. Wheeler  
Director

Date Signed MM DD YY  
18 11 82

**18. DATE DOCUMENT RECEIVED IN AID/V, OR FOR AID WITHDRAWALS, DATE OF DISTRIBUTION**

MM DD YY

PROJECT AUTHORIZATION

Name of Country : . Dominica, W.I.  
Name of Project : Dominica Road Rehabilitation  
Number of Project: . 538-0076

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Dominica Road Rehabilitation project for Dominica, involving planned obligations of not to exceed Nine Million Six Hundred Thousand United States Dollars (\$9,600,000) in grant ("Grant") funds over a forty month period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.
2. The project ("Project") consists of the reconstruction of the existing 30.5 miles of road from the capital city of Roseau to Hatton Garden, via Layou and Pont Cassé. This will include replacement of two existing single lane bridges: the Hillsborough Bridge and the Canefield Bridge.
3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate:

a. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Project Agreement, shall have their source and origin in the United States and Dominica, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project Agreement shall, except as A.I.D. may otherwise agree in writing be financed only on flag vessels of the United States.



Mission Director  
Regional Development Office/Caribbean

24 Aug 1982

Date

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# DOMINICA ROAD REHABILITATION

## PROJECT PAPER

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DOMINICA ROAD REHABILITATION

PROJECT PAPER

I. SUMMARY

Adverse weather conditions, including the devastation by hurricanes in 1979 and 1980, coupled with the effects of inadequate pavement design, drainage and poor maintenance have contributed to the severe deterioration of Dominica's road network. A major effort is needed to rehabilitate the existing road network and to establish a comprehensive road maintenance program to ensure adequate maintenance in the future.

As part of a coordinated multi-donor assistance program led by the World Bank, the Regional Development Office/Caribbean (RDO/C) proposes to finance the rehabilitation of the trunk road which connects Dominica's capital and principal seaport, Roseau, on the country's south-western coast, to the north-east coast. The road transverses important agricultural areas in central Dominica and is the main route to Dominica's international airport. This road is the most important road rehabilitation project identified by the Government of Dominica and is essential for the expansion of its agricultural sector.

The proposed project is the first significant bilateral activity proposed by RDO/C outside of the framework of disaster assistance. While the project is a major departure from our current regional program, the development circumstances in Dominica are such that immediate and effective assistance must be provided as rapidly as possible to permit the country to re-establish its economic productivity. The rehabilitation program is of the highest priority to the Government of Dominica and will yield substantial returns to the economy.

Beyond its economic importance, the proposed project is a clear demonstration of the support of the U.S. Government for the Government of Prime Minister Eugenia Charles. That Government, with the backing of the Caribbean Group for Cooperation in Economic Development, is taking positive and difficult steps to further the economic development of Dominica. Her Government's support for the expansion of private sector investment and undertakings to control government spending in response to Dominica's economic difficulties require our support. The project also would provide tangible evidence of the U.S. Government's concern for the Eastern Caribbean as part of the Caribbean Basin Initiative.

The total cost of the project is estimated to be \$9.6 million which includes construction and engineering services. In recognition of the political benefits of the proposed project as well as the tight financial situation of the Government of Dominica, RDO/C strongly recommends that Economic Support Funds be utilized.

## II. BACKGROUND

### A. Economic Setting

Dominica is the least developed of all the Eastern Caribbean states. With a per capita income of approximately \$800, an unemployment rate which is currently estimated at 23 percent, and extreme difficulties imposed by its rugged topography and climactic conditions, Dominica faces severe constraints which must be overcome to achieve reasonable rates of growth.

Agriculture is by far the most important sector, accounting for over 30 percent of GDP and employing 30 percent of the labor force. Almost 8,000 small farmers with average land holdings of less than three acres produce most of the agricultural output. Bananas, for which a guaranteed market exists in the United Kingdom, account for roughly 50 percent of exports while coconuts and their by-products contribute 6 percent. Grapefruit and limes and related products, which were seriously affected by the hurricanes of the last two years, have in the past been significant sources of foreign exchange. The large size of the agricultural sector also means that the country is vulnerable to weather and external factors. For instance, hurricanes all but destroyed the banana crop in 1979-80. Despite these problems, Dominica has no lack of arable land and has abundant rainfall. Therefore, its agricultural potential is significant (see the Map of Agricultural Economic Activity in Dominica, page 3).

Manufacturing, primarily agriculturally based, contributes roughly 5 percent of GDP. The most important operation is the production of soap, primarily from coconuts. Soap and related exports have been increasing rapidly in importance accounting for roughly 30 percent of total exports in 1980, a figure that will decline with the resuscitation of the banana industry. In the past, lime juice production also was significant; however, the operation, always marginal, was pushed over the edge by the recent hurricanes. The Government is now striving to revive the industry by establishing a new company in which it will share ownership with private concerns.

Assembly and enclave industries are in their infancies in Dominica. The Industrial Development Corporation has ambitious plans for the promotion of assembly-type industries in Dominica. A real concern, however, is the underdeveloped state of Dominica's basic infrastructure, compared to that in neighboring Windward Islands.

Tourism is of less importance, accounting for one percent of GDP and 20 percent of foreign exchange earnings. Hurricanes and related adverse publicity have caused arrivals to decline almost 50 percent over the last two years. Although large-scale, traditional tourism development is hindered by a lack of sand beaches and relatively limited accessibility by air, some potential may exist for the industry through the exploitation of the island's spectacular mountain scenery.

Although Dominica's considerable hydroelectric and timber resources have meant that it has been relatively less affected by the recent massive OPEC price hikes, economic development within the country has been hampered by a lack of foreign exchange. These foreign exchange difficulties have been exacerbated by high external transport costs and a lack of access to private capital. The country has traditionally reported large trade deficits. Primarily responsible for these deficits are the substantial food and manufactured good imports required to maintain current standards of living.

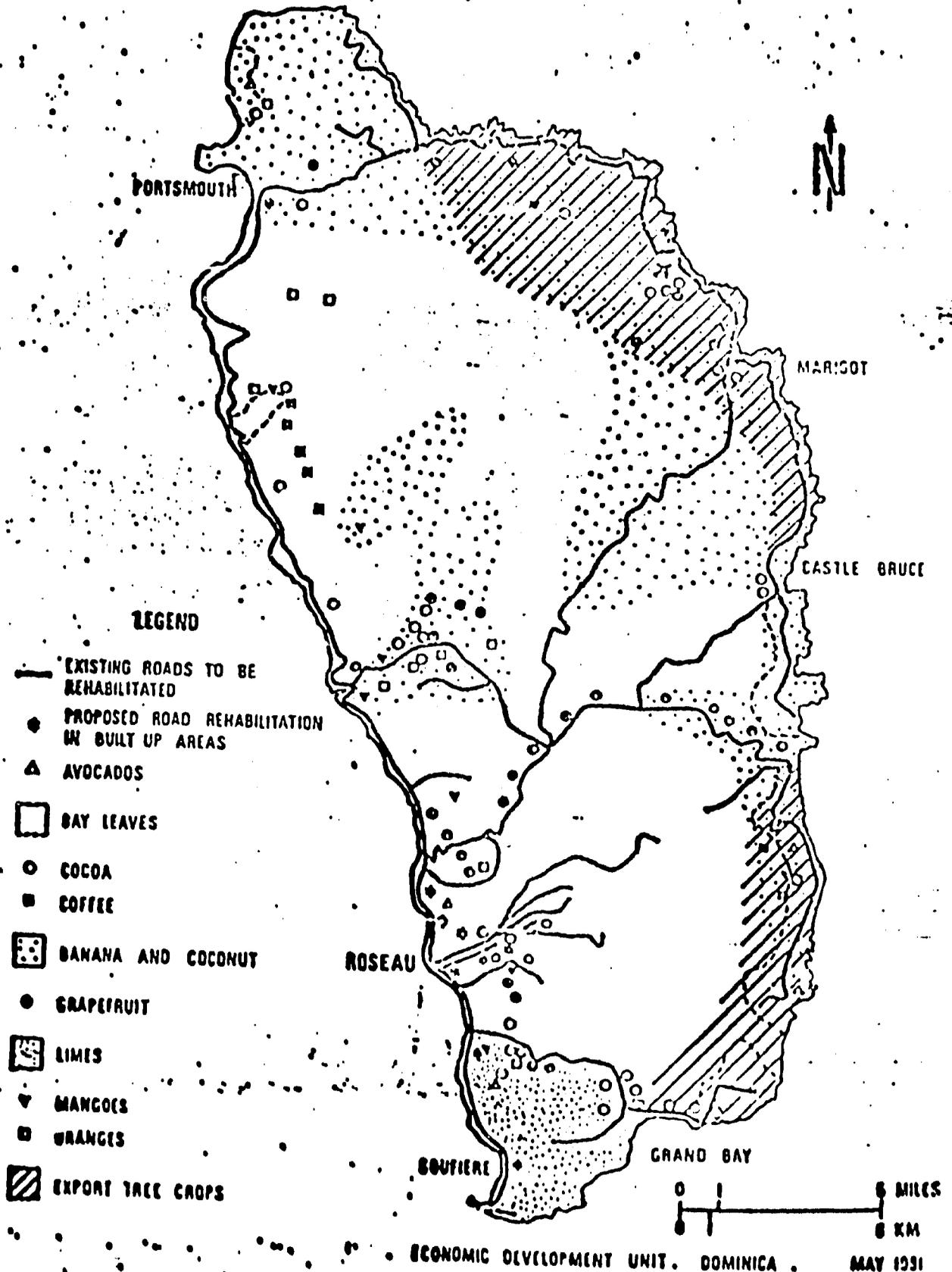
## B. Performance

The 1960s were characterized by economic diversification; a coconut processing factory was established and tourism although starting from a small base, expanded 20 percent each year. High levels of construction activity helped reduce the unemployment rate to about 8 percent. In the early 1970s, however, the economy turned down. By 1972, disease and unrealistically administered prices had caused banana production to begin a steady decline, and three years later output was 50 percent lower than in 1968. Moreover, the domestic agricultural sector was unable to satisfy consumption requirements, and food imports began to rise rapidly. Reductions in budget subsidies from the U.K. dramatized the structural weaknesses of the public finances. These adverse developments were exacerbated by the quadrupling of oil prices in 1973-74, which dramatically increased import prices. During this period, two large commercial enterprises, a logging and sawmill operation and a garment factory, ceased operations.

Recovery began in 1975. Real GDP increased by roughly 4 percent annually in 1976-78 compared with an estimated 3-5 percent annual decline in the preceding four years. The recovery resulted, in part, from strong gains in the production of export crops, particularly bananas and citrus. Bananas benefitted from the WINBAN Banana Development Program which emphasized improved crop husbandry, including more intensive use of fertilizers and other inputs. Industrial output also increased due to the entry of some new firms and a major expansion of the coconut processing industry. Tourism picked up with the general improvement in the world economy. On the other hand, according to unofficial estimates, the recovery had no significant impact on the unemployment rate, which had more than doubled from 8 percent in 1970 to 18 percent in 1975. Government finances also weakened because of a sizeable jump in the wage and salary bill. As a consequence, infrastructural improvement, especially roads, were neglected.

Hurricanes David and Frederick in 1979 and 1980's. Hurricane Allen halted development progress. Hurricane David wiped out completely the banana and citrus crops, uprooted or defoliated 80 percent of the coconut trees, disrupted the electrical system, damaged most tourist facilities, and destroyed 13 percent of all housing structures. As a result of the hurricane damage, real GDP fell 8 percent in 1979 and rose one percent in 1980. During 1979-80, the country's public finances were further strained by a large increase in civil servants' salaries ranging from 50 to 120 percent. While these increases were the first since 1973 and basically adjusted pay levels to increases in the cost of

# DOMINICA: ECONOMIC ACTIVITIES IN RELATION TO PROPOSED ROAD REHABILITATION PROGRAMME



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living over the period, the increased wage bill was a significant burden on government financing. Dominica's international finances also weakened; the current account deficit of \$29 million in 1980 resulted in the current account deficit as a proportion of GDP rising to 51 percent. In addition, financial difficulties arising from the hurricanes have meant that the road system, already in a state of bad repair, has worsened further. This in turn has had a serious negative impact on agricultural production.

On taking office in June 1980, the Government of Prime Minister Charles was faced with a grave economic and political situation typified by a climate of uncertainty, political unrest, shattered economic infrastructure, and limited resources with which to respond to these problems. A clear economic and political program was essential to avoid a breakdown of the economy and potentially disruptive political events.

The Government of Ms. Charles has taken a number of steps to reverse the deterioration of the economy and stimulate expanded production and employment. The most significant policy reforms have been in the area of public finance and control of expenditures. In the past, the Government has not had sufficient resources to maintain the economic infrastructure, especially the existing transportation system. Ms. Charles' first step was to sever the automatic link between inflation and wage increases; the Government promised to make the retroactive pay increases approved by the previous Government in exchange for an agreement from the Civil Servants Association to settle for 10 percent increases annually in 1982-84.

To support this decision, the Government negotiated an \$11 million EFF agreement with the IMF. The agreement, in addition to funding these retroactive pay increases, has mobilized significant amounts of external assistance through promotion of donor confidence in the future viability of the Dominican economy. Under the IMF agreement, whose lynchpin is the requirement that Dominica strengthens its public finances, the country has initiated a number of fiscal reforms. Consequently, the public finances were stronger than had been anticipated last fiscal year. This fiscal year, Dominica is holding current expenditure increases to 10 percent, while additional revenue generating measures will enable domestic revenue to rise by at least 27 percent.

In the past, the most significant structural difficulties in the public finances have been (a) the transfers by the Dominican treasury to the public enterprises and (b) the significant wage component in the total expenditures. Some progress has been made in limiting transfers to the public enterprises. For instance, last fiscal year these transfers were less than half of the previous fiscal year's total. On the other hand, expenditures for civil servants' wages still remain high. In this year's budget, they continue to comprise roughly 60 percent of current expenditures.

With an eye to raising production and exports, the country also has rank-ordered investment projects, presenting lists to external donors. In addition, it has established an Economic Development Unit to

strengthen its investment planning, implementation, and monitoring capability. In agriculture, the country intends to offer lands for sale to small farmers on a "controlled freehold" basis while integrated rural community development schemes are planned for several estates. Moreover, intensive discussions are under way with external donors to restructure the banana industry which is encountering severe financial difficulties.

In the area of industrial development, Ms. Charles has placed the Industrial Development Corporation under the leadership of the private sector and actively sought increased foreign and domestic private sector investment. Prior to the Ms. Charles' Government, most businessmen in Dominica found the prevailing atmosphere to be distinctly antibusiness. This had to do with the social, political, and industrial unrest during the five years or so leading up to mid-1980. Government attitudes were either unclear or perceived to be hostile and there was an underlying lack of confidence in the economic management capacity of the Government. The strong leadership and economic policies of the current Government have caused a dramatic improvement in the investment climate in Dominica and revitalized the commitment of the private sector to Dominica's development and their key role in the process.

These reforms, as well as a sharp recovery in banana production in the wake of the recent hurricanes, resulted in an improved economic performance in 1981. Real growth increased and inflation was down to 10 percent. Moreover, (a) the country's endowments including abundant water, cheap labor, beautiful mountains, large forest reserves, substantial hydrologic potential, and good port facilities, (b) the recent construction of a small airstrip just outside Roseau, and (c) the establishment of 11 small manufacturing operations that will utilize roughly a total of 350 people augurs well for the future. On the negative side, however, wage increases granted in the private sector continue to be excessive; progress on the capital expenditures program has been slow; and the domestic banana industry is experiencing acute financial difficulties. These difficulties result in part from the strengthening of the U.S. dollar to which Dominica's currency - The East Caribbean dollar - is pegged, vis-a-vis the pound sterling - the currency in which bananas are purchased. A consortium of external donors, however, is discussing the possibility of helping out the banana industry. Any assistance would be predicated on massive restructuring of the industry.

C. Relationship of the Proposed Project to the Economy.

Rehabilitation of the road network in Dominica is essential to the recovery of overall economic production for a number of reasons. First, the largely agricultural nature of the economy requires a reasonable transportation system to move inputs to the farm level and to market farm production. Currently, the road system cannot be relied upon to carry goods due to landslides and surface failures and transportation costs are an inordinate share of production costs.

Second, until the major road segments are brought up to a reasonable overall standard, the Government cannot afford to provide necessary routine maintenance and repair. The fiscal constraints of the

EFF agreement are such that recurrent maintenance costs must be kept within reasonable limits.

Finally, the overall burden on the economy of extremely high user costs for transportation inhibits economic growth.

### III. PROJECT RATIONALE AND STRATEGY

#### A. Road Transportation Network and Its Impact on Development

The road system in Dominica prior to the Hurricanes David and Allen had deteriorated to such an extent that it threatened to undermine the agricultural base of the economy. A number of factors contributed to its deterioration, including the physical environment and construction and maintenance problems.

Three environmental factors significantly influence the road system: population pattern, topography and rainfall. Dominica's road system serves a population of approximately 83,000 people scattered primarily along the coast in about 80 villages and towns, while the interior of the island is only sparsely populated. The capital city of Roseau in the south is the only significantly urban center on the island. The scattered population creates demands for relatively long stretches of road with extremely low traffic volumes. Second, the island terrain is very rugged, with steep slopes characterizing much of the interior and coast. Finally, high average rainfall, including very heavy storms, creates serious problems. Steep slopes with silty or clayey material cause frequent landslides and drainage problems are common.

These natural conditions create an environment which requires that initial construction be of good quality and that maintenance be efficient and dependable if the road system is to be maintained at a reasonable level. Unfortunately, neither consideration has been fulfilled in Dominica. The major roads, built before the mid-1950's, are generally narrow with very poor horizontal alignment. Paved roadway widths vary from eight to twenty-four feet along all the routes. Pavement deformations are widespread, with many drainage structures that are not functional.

The deterioration in the overall road system was exacerbated as a result of Hurricanes David and Allen. While damage to the network and bridges directly caused by the hurricanes was not severe, the effect was to strain the inadequate maintenance budget beyond its ability to cope with demand.

If the Dominican economy is to recover fully from the effects of the hurricane and register positive real growth rates in the future, the road network must be rehabilitated. Gradually, segments of the country are becoming inaccessible during parts of the year with agricultural areas cut off from markets.

To prevent continued deterioration of the road network, a large scale effort is needed to: (a) bring key road segments up to a condition in which they can be maintained on a routine basis; (b) improve or rebuild a limited number of feeder roads; (c) expand and upgrade Dominica's road maintenance capability; and (d) provide planning and project coordination/implementation capability within the Government of Dominica.

B. Response of the Donor Community

The Government of Dominica has made a significant effort to improve road maintenance in the last year. However, it has neither the manpower nor the financial resources to undertake the massive rehabilitation effort which is urgently needed. Therefore, it has approached a number of international, regional, and bilateral donors to assist in the effort.

In January 1981, a meeting of the donor community was held to facilitate and coordinate assistance to Dominica's road rehabilitation efforts. At the meeting donors described plans to provide assistance to Dominica but due to the large amount of assistance required, the World Bank was requested to take an active role to develop an overall road rehabilitation program involving identification of priority activities and a road maintenance program.

At the urging of traditional donors, the World Bank agreed to lead the informal donor consortium. A World Bank Mission reviewed the situation in Dominica in October 1981 and a donor coordinating meeting was held in Barbados in early November. As a result, an overall framework has been proposed to implement a rehabilitation/construction program which under the terms of the World Bank Agreement, will be coordinated by a Steering Committee composed of Ministry and donor agency representatives. The program includes specific assistance to the Government of Dominica to improve its road maintenance capability, the reconstruction of major road segments and bridges, and construction of agricultural feeder roads.

It is within this multi-donor framework that the Government of Dominica has requested AID to finance a critical aspect of the overall program: the Roseau-Hatton Garden Road rehabilitation. This road carries the highest traffic volume in Dominica and is considered the most critical link of the nine priority roads identified for donor financing.

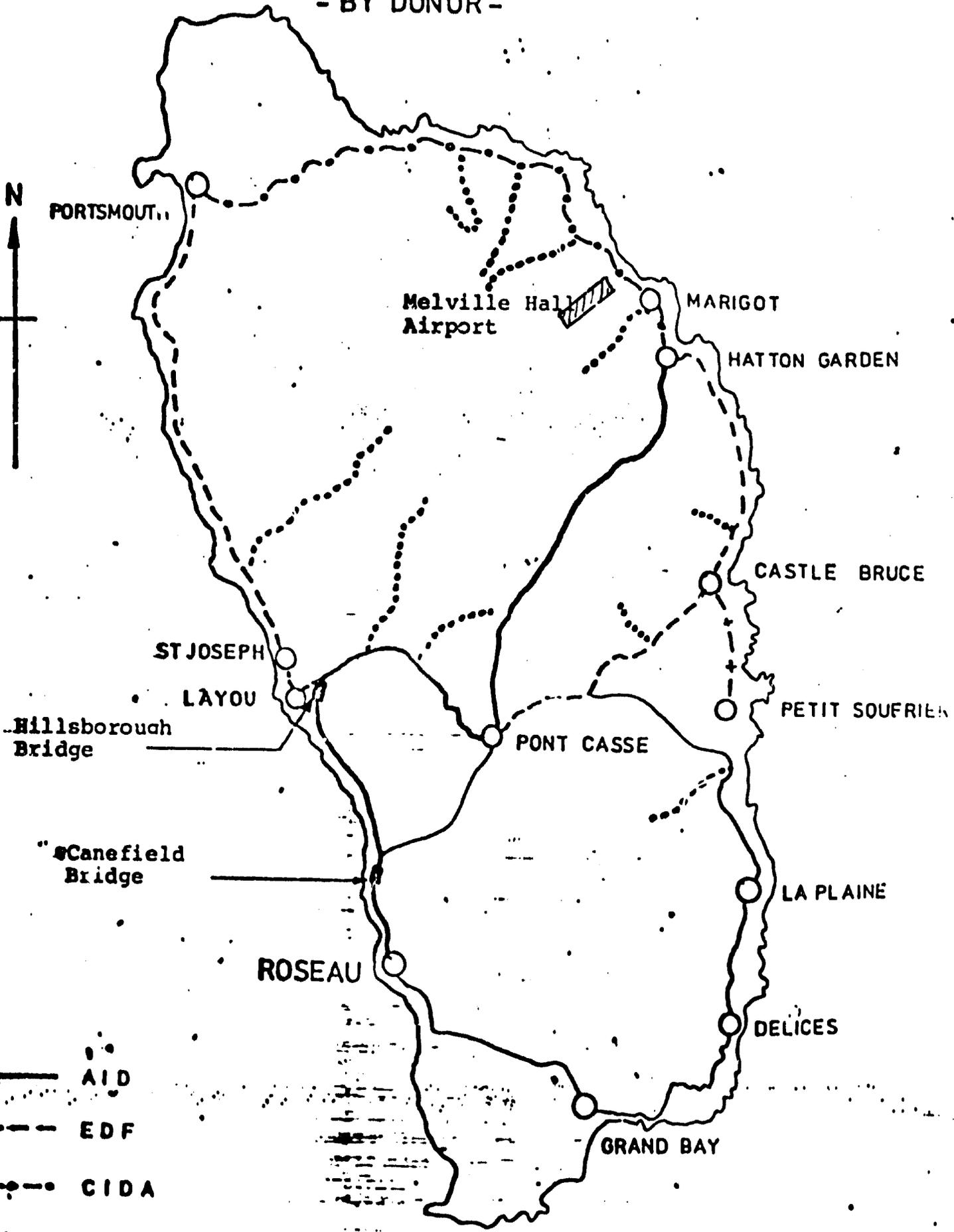
Section V and the map on page 10 describe other donor participation in the project.

C. Mission Strategy

The Mission's long-term strategy continues to support regional cooperation and the development of regional solutions to problems among the states of the English-speaking Caribbean. However, as discussed in our FY 83 CDSS, ABS, and Congressional Presentation, to serve our developmental and political objectives in the Eastern Caribbean, our regional assistance program must be supplemented and supported by targeted bilateral assistance. An exclusively regional program will not allow us to assist selectively those governments that are most committed to democratic forms of government, equitable social and economic development, and the essential role of free enterprise in the development process.

# DOMINICA ROAD REHABILITATION PROGRAM - BY DONOR -

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- E D F
- C I D A
- I L O
- C D B
- O T H E R M A I N R O A D S

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The major developmental objective of moving to a balanced regional/bilateral strategy is to increase the immediate impact of our assistance program in areas which cannot be as effectively influenced by a regional program. The major political objectives are to target our assistance more carefully and to significantly increase the visibility of our development assistance in the region.

The overall strategy for a bilateral assistance program is to focus our assistance in two major areas of concern - rural development and energy - in specific projects which combine the development of a policy framework which encourages development within the sector and selected investments to promote its growth.

While fully supportive of our overall objectives in terms of bilateral assistance, the Dominica Road Rehabilitation project responds to a unique bilateral opportunity to make a significant development contribution to Dominica and to support the policies of the current Government.

As noted in the Background section, Dominica is serious about and committed to getting its economy moving on a sound basis. The Chairman's Report on the Fourth Meeting of the Caribbean Group for Cooperation in Economic Development, held last June in Washington, D.C. reflects the strong support of the donor community, including the IMF and the World Bank, for the performance of the Government of Ms. Charles. Of particular importance from our perspective are the steps taken to strengthen public finances and to stimulate private investment.

However, the transportation bottleneck is severely inhibiting both the expansion of private investment and the rehabilitation of Dominica's agricultural sector. The physical environment in Dominica and the recent hurricanes have created an overwhelming burden for Dominica in terms of infrastructure rehabilitation.

The road rehabilitation program, of which the USAID Roseau to Hatton Garden work is a part, will undoubtedly stimulate the Dominica economy. The question that arises is whether the stimulation will be excessive. That is, will the road reconstruction work provide a strong inflationary impulse, thereby destabilizing the country's fragile economy? The estimated total cost of the road rehabilitation program is roughly \$36 million, including \$9.6 million for the USAID segment. Estimating that the program will be spread over 4 years and that no more than half of the total expenditures are spent on Dominican goods and services, the stimulus would amount at most \$4.5 million a year or an estimated 8 percent of the country's GDP. While the stimulus is indeed significant and some sectors of the economy may come under some strain, the stimulus is not excessive. Moreover, in light of the projected benefits of the overall program--especially the reduction in youth unemployment, the risks appear to be well worth the undertaking.

In addition to the economic importance, the proposed project would be a clear demonstration of the support of the United States for the Government of Dominica. It would contribute significantly to our political interests in the area as a tangible component of the Caribbean Basin Initiative. Finally, it would illustrate in measurable terms that we are prepared to assist those governments which are committed to democratic rule and a free enterprise economy.

The proposed project, however, should not be seen as the first in a series of ad hoc large-scale infrastructure projects which we will propose for bilateral projects. The Dominica situation is unique both politically and in development terms. The Governments of the region recognize Dominica's particular circumstances resulting from extensive hurricane damage.

#### IV. PROJECT DESCRIPTION

##### A. Goal and Purpose

The goal of the project is to increase per capita income and economic productivity in Dominica. The sub-goal is to establish and maintain a viable primary and secondary road transportation network. The project purpose is to provide dependable access from Dominica's capital and major port to the agricultural areas of central and eastern Dominica and the International airport.

##### B. Project Objectives

To achieve the project purpose, the following major objectives are envisioned:

1. Rehabilitate the existing high priority road from Hatton Garden to Roseau;
2. Replace two single-lane bridges along the Layou-Roseau segment which are in danger of structural failure;
3. Participate with other donors in a road rehabilitation and maintenance coordinating group to assure that activities which are necessary to achieve the project purpose (but not financed under the project) are completed on a timely basis.

##### C. Detailed Project Description

###### 1. Existing Road Conditions

The proposed project consists of reconstruction of an existing 30.5 miles (49.4 kms) of road from the capital city of Roseau to Hatton Garden (see page 10 for a map of the project route). Two routes were considered for the project: Roseau-Layou-Pont Casse-Hatton Garden and Roseau-Canefield-Pont Casse-Hatton Garden.

The shortest route to Hatton Garden is via Canefield and Pont Casse. However, current traffic volume along this route is very low and road rehabilitation requirements are extensive. The road is characterized by poor alignment and many areas of extremely narrow roadbed width. Because of the mountainous terrain, widening the road would be extremely costly. Therefore, the longer route via Layou was selected as the least cost alternative in absolute terms and the one yielding the most significant economic return.

The Roseau-Hatton Garden road was originally constructed in the early 1950s. While limited resurfacing has been done primarily along the Roseau-Layou segment, the road overall has never received the maintenance and/or periodic resurfacing normally required to maintain an adequate roadway. While the Ministry of Communications and Works does perform some patchwork and drainage maintenance almost constantly, their

efforts cannot keep pace with the rapid deterioration of the surface, base, nor restore the drainage facilities. The road is subjected to severe weather conditions, including an average annual rainfall of 175 inches. In addition to the direct damage inflicted by the recent hurricanes, there was significant defoliation of the mountains surrounding parts of the road between Layou Hatton Garden. With the loss of soil cover, the river has been more prone to flooding and twice in May-June washed over a stretch of the road in the Layou area, flooding out an agricultural station. While efforts are currently underway to replant coconut and other trees in this area, and much regrowth will occur naturally, the section of road between Layou and Hatton Garden is certain to be exposed to extremely wet weather conditions - whether rainfall or flooding - and the necessity for reconstructing the road with a pavement design providing protection from water penetration cannot be understated.

A road study and field survey conducted by the joint venture engineering firm of Curran/Lebron Associates (June 15, 1982) confirmed that the road is not constructed to any geometric design standard. The pavement is generally a conglomeration of penetration macadam, bituminous surface treatments and cold patches on a base which varies from a fill conglomerate to soil cement of a variety of thicknesses. Preliminary borings showed no uniformity in either base material or thickness. Reoccurring pot holes and serious edge ravelling caused by improper drainage typify the wearing surface.

Roadway width varies from as little as 9 feet to as much as 40 feet, though most averages between 12 and 16 feet. The terrain traversed by the road is so rugged and mountainous that it forced construction of narrow roadways with numerous curves having sight distances approaching zero, and very short curve radii. In the Pont Casse-Hatton Garden section, which is particularly mountainous, the curves are so sharp that drivers must slow to a near halt and sound their horns for safety.

Other typical problems include sections of road which have settled markedly, failed culverts which result in washouts, and embankment erosion in areas where the road parallels rivers and streams. Additionally, there are some fifteen active slide zones in the Hatton Garden and Layou Bridge segment, which are frequently triggered by heavy rainstorms and bring road traffic to a halt.

The road contains about 34 bridges, almost all of concrete with an average width of 14 feet and a length of 20 to 40 feet. Except for two steel bridges, which are seriously deteriorated and unsafe, the remainder are basically sound although they all need varying amounts of repair or maintenance. The two unsafe bridges, i.e. the Hillsborough Bridge over the Layou River and the Canefield Bridge over the Boeri River, were constructed in 1902 and 1899 respectively and have exceeded their useful life. The abutments of these bridges are still in good condition but suffer from serious corrosion. A structural investigation conducted by the British Crown Agents a few years ago reported reductions of the cross-sectional areas of bridge members due to corrosion by as much as 70% and overstress under HS-20 loading of certain members by as

much as 400%. Both bridges are in such a hazardous condition that they should be closed to traffic until replaced, but this would virtually stop all road transportation north of Roseau.

Problems with the pavement can generally be attributed to improper drainage. In some areas the road crosses natural draws which do not have any culverts; in others the existing culverts are undersized or the inlets improperly designed. The entire road from Roseau to Hatton Garden has about 246 culverts, most of which are 24 inch concrete pipes averaging 14 feet in length. There are about 4 box-type concrete culverts. At present, some 40 to 50 percent of these culverts are not functioning properly because of vegetation growth, and siltation and headwall damage.

The grades of the road generally appear to fall within acceptable maximums for the varying topography traversed, i.e., level, hilly and mountainous. The maximum grade is 20%, which is acceptable in view of the terrain and traffic volume.

## 2. Proposed Reconstruction Work

### a. Overall Design Considerations

Because the rugged topography in the project area largely dictates the existing alignment of the Roseau - Hatton Garden roadway, the proposed project will focus on restoration activities. These are intended to provide: an adequate drainage system, a long-lasting roadway wearing surface, repair of embankment failures and critical slide-prone areas, roadway embankment erosion protection where critical, and widening of the roadway at extremely under-designed curves. Reconstruction of the road to a more acceptable geometric standard is prohibitive in terms of cost and low economic return; substantial land acquisition would be required as well as extensive earthwork along the entire route and the widening of all existing bridges and culverts.

The proposed design is in accordance with the strategy formulated at a meeting held in November, 1981 to coordinate all Government and donor activities in the Dominica Road Maintenance and Rehabilitation Program (see Annex E). In discussing reconstruction the participants stressed the following:

With regard to engineering standards, care should be taken in developing technical solutions which emphasize pavement strengthening and drainage improvements, and minimize geometrical improvements and widening of the existing roadway. These solutions should take due account of safety of road users and the limited recurrent maintenance resources available."

The selection of a pavement design was based on the need to provide a strengthened, long lasting road structure and at the same time one which would require minimum maintenance. In consideration of these needs it was decided that a 2 inch asphaltic concrete surface would be used: while the capital cost is higher than that of a bituminous penetration macadem or surface treatments, water penetration, subsequent

base and sub-base failures, and annual maintenance needs are substantially reduced. The proposed work described below is considered the most appropriate in order to substantially improve the condition of this important transportation link and at the same time reduce maintenance needs to levels which are within the capacity of the MCWT to address. Detailed cost estimates are shown in Annex F.

#### b. Project Road Segments

The project is divided into three sections based on traffic volume and existing road conditions. (See Map, page 8A).

##### Section 1: Hatton Garden-Pont Casse

This 14.5 mile section traverses very rugged terrain and has an average traffic volume of about 363 vehicles per day. It is the most deteriorated of the three sections due to extensive surface failures and patching, and eight areas of roadway embankment failures which continue to recure. The existing roadway width varies from 9 feet to 18 feet.

This section will be improved by widening the pavement to a minimum 12 feet, with 3 feet shoulders and vee-shaped or trapezoidal drainage ditches as possible. It is expected that the width of the shoulders will have to vary somewhat in order to maintain proper drainage and avoid earth cuts along very steep (many almost vertical) side slopes. The existing roadway will be scarified and reshaped with additional base course material, and paved with 2 inches of asphaltic concrete. The shoulders will be sealed with a single bituminous surface treatment. Critical embankment failures will be repaired, seventeen additional drainage culverts will be placed, and areas where serious river-bank erosion has already started to undermine the road will be protected with gabion. Existing culverts will be repaired as required and a small number of curves which exist for no apparent reason will be straightened out where flat terrain permits minimal least costly earthwork. While there are many slide-prone cut slopes in this section and bridges which need minor maintenance, no work is proposed on these items. Cut slope failure is highly dependent on rainfall and, like bridge maintenance, is considered a recurring problem to be dealt with by the Ministry of Communications and Works.

##### Section 2: Pont Casse-Layou (Hillsborough Bridge)

The Pont Casse-Layou section is approximately 7.7 miles and carries an average daily traffic volume of some 500 vehicles. It has a varying roadway width of 12, 16 and 18 feet. The proposed project will reconstruct the paved road to a minimum 16 feet in width with 1.5 feet shoulders and vee-shaped or trapezoidal ditches where possible. The existing roadway will be scarified and reshaped with additional base course material and a 2 inch asphaltic concrete pavement will be constructed. Shoulders will be sealed with a single bituminous surface treatment. The existing drainage culverts appear to be generally adequate on this section but they need to be cleaned and about half of

them require headwall reconstruction. Several areas where the Layout River has undermined the road will be protected with gabion. While various sight distances need correction, they are not included in the project because of the high cost of the earthwork required.

### Section 3: Roseau-Layout (Hillsborough Bridge)

The third section of the road, approximately 8.3 miles long, carries the heaviest average daily traffic volume in Dominica, 1700 vehicles per day. It consists of variable roadway widths, mostly 16 to 24 feet, but with some stretches up to 40 feet wide. The road passes through various coastal villages where it can neither be widened nor re-routed because the buildings occupy a narrow strip of land bounded by the sea on one side and rising mountains on the other. The two deteriorated single-lane, steel-truss bridges at Hillsborough and Canefield are located in this section and will be replaced with single-lane Bailey Bridges. The Hillsborough Bridge would be a new or excess property Bailey Bridge whereas the Canefield bridge would be constructed with used bailey bridging to be made available by the Ministry of Communications and Works.

It is proposed to reconstruct this road section with a maximum 18 feet roadway width and 1.5 feet shoulders. The existing drainage culverts appear generally adequate; thus drainage improvements will primarily include vee-shaped side drains, clearing of existing culverts and repair of headwalls. The existing road surface will be scarified and reshaped with additional base coarse material and will be repaved with a 2 inch asphaltic concrete surface. The shoulders will be sealed with a single bituminous surface treatment.

### 3. Design Alternatives and Costs

The selection of the asphaltic concrete pavement design is based primarily on the findings and recommendations of the Curran/Lebron Associates Study. (A copy of their complete report is filed with LAC/DR). The study included a cost analysis of five different alternatives of which asphaltic concrete is considered the best technical solution in terms of initial capital cost, low annual maintenance cost requirement and ability to withstand deterioration of the roadway structure in the event of less than adequate maintenance. An asphaltic concrete surface can be expected to provide a very good riding surface and long term protection against water penetration at the level of financing provided.

The Curran report recommended a 4-inch asphaltic concrete surface design. However, due to the excessive cost and limited availability of project funds, the RDO/C General Engineering Advisor re-evaluated pavement alternatives and possible areas for design and construction cost reductions in terms of limiting rehabilitation activity and costs to critical road needs. The re-evaluation resulted in the selection of a 2-inch asphaltic concrete pavement design based on its capital cost and the subsequent ability of the Government to maintain the road.

The capital cost of asphaltic concrete surface is higher than a double bituminous surface treatment or a bituminous macadam surface, but the annual maintenance cost of asphaltic concrete is about 42% of double surface treatment and 61% of penetration macadam. The double bituminous surface treatment is not recommended primarily because of its high maintenance requirement and greater susceptibility to deterioration generated by heavy rainfall, if adequate maintenance is not provided

The cost estimate for reconstruction of the entire roadway with a 2 inch asphaltic concrete surface, including a 20% contingency factor, is as follows: (See details in Annex F).

AID-Financed Costs

Section A: Hatton Garden - Pont Casse	US\$2,969,966
Section B: Pont Casse - Layou	1,625,102
Section C: Layou - Roseau	1,561,104
* Hillsborough Bridge	765,000
Canefield Bridge	<u>253,750</u>
CONSTRUCTION COST TOTAL	US\$7,174,922
Escalation - 5%	358,745
Engineering - 6%	<u>452,020</u>
Sub-Total	7,985,687
Contingency - 20%	<u>1,614,313</u>
<u>GRAND TOTAL</u>	US\$9,600,000 =====

The proposed project will include financing for the three road sections between Hatton Garden and Roseau plus the two bridge replacements.

\*Note: If the Hillsborough bailey bridging can be obtained through Excess Property, the actual cost would be reduced by about \$300,000.

4. Final Design and Construction Work

The final design and supervision of road work and actual construction will be limited to U.S. source and origin resources. Both the engineering services and construction contracts will be handled by the Ministry of Communications and Works which has demonstrated its contracting capability both in previous AID projects and in its recent negotiation of a consultant contract under the IBRD road program. Various ILO advisors in Dominica can assist the Ministry with certain aspects of consultant negotiations, and RDO/C can provide guidance as needed on satisfying AID contracting requirements. The IBRD will provide technical assistance to the Ministry in contracting and monitoring the construction contract.

A review of construction logistics indicates that the contractor will have to import all the equipment required to carry out project activities, including the asphalt plant. Because of the heavy rain conditions in Dominica, most construction work will have to be scheduled for the dry season (February through July), and cost estimates have included allowances for loss of time due to the inclement weather. Some operations will require strict traffic control or road closings for short periods of time, but should not prove to be major disruptions. Traffic will have to be re-routed in certain embankment failure areas on the Pont Casse-Hatton Garden segment, and an allowance in the cost estimate is also made for this. Several satisfactory quarry sources are available for base materials and the most suitable locations for quarry operations will be determined during final road work design. A 24 month construction period is planned to include two full dry seasons.

**D. Project Management and Donor Contribution**

The proposed USAID funded project is a part of a major 1982-1985 Dominica Road Maintenance and Rehabilitation Program. The terms of reference and plans for such a program were discussed in a multi-donor meeting with the Government of Dominica on November 2 and 3, 1981. (See Minutes of the Meeting in Annex E). Other donors participating in Dominica's road program include the Canadian International Development Agency (CIDA), the European Economic Community (EEC) through the EDF, the Caribbean Development Bank (CDB), the OPEC Fund for International Development (OPEC), the British Development Division (BDD), and the International Bank for Reconstruction and Development (IBRD). Donor activities will be coordinated by a Steering Committee composed of representatives from the Ministry of Communications and Works, the Program Management Unit (formed under the provisions of the World Bank road project agreement), and the participating donor agencies. The Steering Committee will provide an additional mechanism for USAID to monitor project activities.

The Road Maintenance and Rehabilitation Program for Dominica includes:

1. The rehabilitation of 14 bridges and 141 miles of main roads. This includes the repair and rehabilitation of:

- a. Hatton Garden-Roseau road segment - proposed to be funded by USAID.
- b. Portsmouth-Hatton Garden road segment - CIDA grant funds.
- c. Castle Bruce-Hatton Garden and Pont Casse-Castle Bruce road segments - EDF grant funds.
- d. Portsmouth-Layou road segment - insurance funds from EDF construction damaged by Hurricane David.
- e. Roseau-Pointe Michel, Loubiere-Grand Bay and Bois Diable-La Plaine road segments - IBRD/OPEC grant funds.

2. The improvement and construction of 27 miles of feeder roads and reconstruction of the Roseau-East Bridge with CDB loan funds (West German funds).

3. A four year, IBRD funded road equipment maintenance program which will provide for the planning and execution of routine, periodic maintenance of the Dominica road network. The IBRD project was signed in May and is now operational. The maintenance program includes:

- a. Intensive road patching and drainage restoration for about 320 kms. of roads;
- b. Procurement of road maintenance equipment, vehicles and spare parts; and
- c. Improvements and reorganization of the MCW's central road maintenance workshop - this includes BDD technical advisor assistance.

4. Technical assistance by a consulting firm funded by IBRD, to staff a Program Management Unit which:

- a. Assists the MCW in executing the Program, particularly in coordinating the activities of external donors;
- b. Prepares and implements annual maintenance programs, including organizing and supervising the extensive patching and drainage restoration program, as well as provide maintenance training; and
- c. Designs and supervises the rehabilitation of the Roseau-Pointe Michel, Loubiere-Grand Bay and Bois Diable-La Plaine road sections to be funded by the IBRD/OPEC.

The IBRD agreement also provides that the Government of Dominica maintain its highway network at all times according to sound technical standards, and ensure that its annual budgetary allocations for road maintenance are sufficient for the purpose, based on detailed cost estimates prepared annually.

5. The International Labor Organization (ILO) has provided technical assistance and equipment for labor intensive repairs on the Castle Bruce-Petite Soufriere road which was recently completed. It is expected that the ILO will continue to provide assistance in construction of labor-intensive forestry roads.

The total cost of the above Road Maintenance and Rehabilitation program is in the order of \$30 million, including the Government of Dominica's contribution. The CDB funded projects have already begun and the final design for the CIDA and EDF road rehabilitation projects is underway. The Government of Dominica has completed negotiations with a U.S. engineering firm for the IBRD funded project activities and the contracting and commencement of that work should start soon. Except for the maintenance work, all road rehabilitation is to be done by contract. Contractors are expected to import the equipment required for the respective jobs.

While it would be preferable and less costly for most, if not all, the contract work to be undertaken by one contractor, it does not appear feasible given that each donor's funds are tied to particular sources. However, possibilities in this area will be examined by USAID.

as the program is implemented. There is sufficient local labor available in Dominica, augmented by contractor technical staff, operators and equipment maintenance personnel, to implement the projects. Adequate Port and Storage facilities exist at Roseau for the off-loading and storage for construction materials and fuel, oil and lubricants for construction equipment. Common fill and tarrish for road construction are freely available in Dominica.

In order to assure continued coordination of donor activities within the Road Maintenance and Rehabilitation Program and the establishment of an efficient maintenance program and capability within the MCW, a Steering Committee, made up of MCW and participating donor representatives, will be formed and meet periodically to provide a forum for review of problems and progress.

The Government of Dominica's contribution towards the total multi-donor program is estimated at \$4 million, which includes administrative and recurrent maintenance costs. Based on a review conducted by the IBRD, revenues from road user charges are more than sufficient to cover maintenance expenditures. While road user revenues in the past have not been earmarked for road expenditures, under the recent agreement with IBRD, the Government is committed to increase its road maintenance budget. It is expected that the MCW's capability to plan and implement road maintenance will be substantially improved under the Road Maintenance and Rehabilitation Program. The use of available resources will be improved, and with increases in the maintenance budget, the MCW should be able to properly maintain the road network after the rehabilitation program is completed.

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#### E. Policy Dialogue

A policy dialogue involving the donor community and Dominica has been on-going since the establishment of the Caribbean Group for Cooperation in Economic Development in 1978. The Caribbean Group is a World Bank-led consultative mechanism whose primary focus is economic policy dialogue.

A critical overall policy step on the part of the Government of Dominica with the support of the Caribbean Group was the signing of an economic stabilization agreement with the IMF. So far, Dominica has been adhering to the agreement, introducing a number of key fiscal reforms. In addition to the fiscal reforms, the country among other moves, (a) has rank-ordered investment projects, (b) has established an Economic Development Unit to strengthen and monitor investment activities, (c) has placed the Industrial Development Corporation under the leadership of the private sector in an effort to encourage private sector activity, and (d) will be implementing land tenure reforms. These self-help measures through promotion of donor confidence in the future viability of the country's economy have helped mobilize significant amounts of external assistance for the country.

In light of the self-help measures that the Dominica Government was undertaking, background discussions for this project were initiated at an ad hoc meeting of the Caribbean Group in December 1980. At the December meeting, Dominica presented a shopping list of needs, stressing, in particular, the urgency of assistance for rehabilitation of the country's primary road network. At the urging of RDO/C, the World Bank was requested at the meeting to take the lead in coordinating Dominica's road rehabilitation program. In view of Dominica's

efforts to get its economic house in order, especially the strengthening of the public finances, RDO/C supported Dominica's request for road assistance but within a multi-donor framework; in the absence of such a framework, donor assistance would not be coordinated and linkages between Dominica's overall economic performance and the road rehabilitation program would not be established.

At the meeting, a recommendation also was tendered that representatives of the various donor organizations meet and review ongoing and proposed assistance for the road program. The Canadian International Development Agency (CIDA) agreed to host such a meeting. The follow-up meeting was convened in late January 1981 at which ongoing and planned donor activity was reviewed. In light of the ambitious program required to rehabilitate the country's road system, all donors agreed that the IBRD should take the lead in coordinating the program. In June 1981 at the annual meeting of the Caribbean Group, Ms. Charles reiterated that a comprehensive road rehabilitation program was her government's highest priority. In addition, the IBRD indicated that it would consider providing funds for road rehabilitation. The IBRD through its soft loan affiliate, IDA, has since taken the lead in organizing an informal donor consortium, an effort that culminated in a \$40 million donor program, including a \$5 million IDA contribution.

In addition to supporting Dominica's reform program, the project promises to have a significant positive impact on the country's future economic management. The bilateral program which will be established in Dominica by this project will increase our ability to raise our views on broad policy issues concerning Dominica in the context of the Caribbean Group as well as in the implementation of the Caribbean Basin Initiative. The U.S. will become a major bilateral player in Dominica and our role in policy dialogue will be enhanced accordingly.

In project-specific terms, it is clear that critical to the project's ultimate success is the provision of requisite maintenance on the part of the Dominican government. We have noted that the revenues derived from motor vehicle operations have been increasing significantly in recent years. In part, this is a consequence of the country's EFF agreement with the IMF through which tax administration has been tightened. Moreover, revenues generated from motor vehicle operations, although not earmarked, are now sufficient to cover current maintenance requirements. However, as future maintenance requirements will increase significantly because of the ambitious multi-donor, IBRD-led road rehabilitation program, we will need assurances that maintenance will be undertaken. Hence, we will engage in a policy dialogue with the Dominica government. Issues that will be raised are possible earmarking of motor vehicle contributions, and the placement of a ceiling on current expenditures. At least over the near term, we expect the IMF through the EFF agreement to play a key supportive role.

V. PROJECT ANALYSIS

A. Technical Design

1. Considerations

The preliminary design for the reconstruction project is based on a recent study conducted by the engineering firm joint venture of Curran/Lebron Associates (Report dated June 15, 1982). The findings and recommendations were based on a general strategy of reconstructing the Roseau-Hatton Garden road at minimum cost while providing a long-lasting, low recurring maintenance roadway surface, and also took into consideration the following:-

- The project will consist of required improvements to the road drainage system, and pavement reconstruction;
- Changes in alignment will be made only where costs involved are minor;
- The unsafe Hillsborough and Canefield bridges are to be replaced with Bailey bridges or some other low-cost solution;
- Excavation will be kept to the minimum required to widen the roadway structure sufficiently to accept the following minimum paved surface widths:

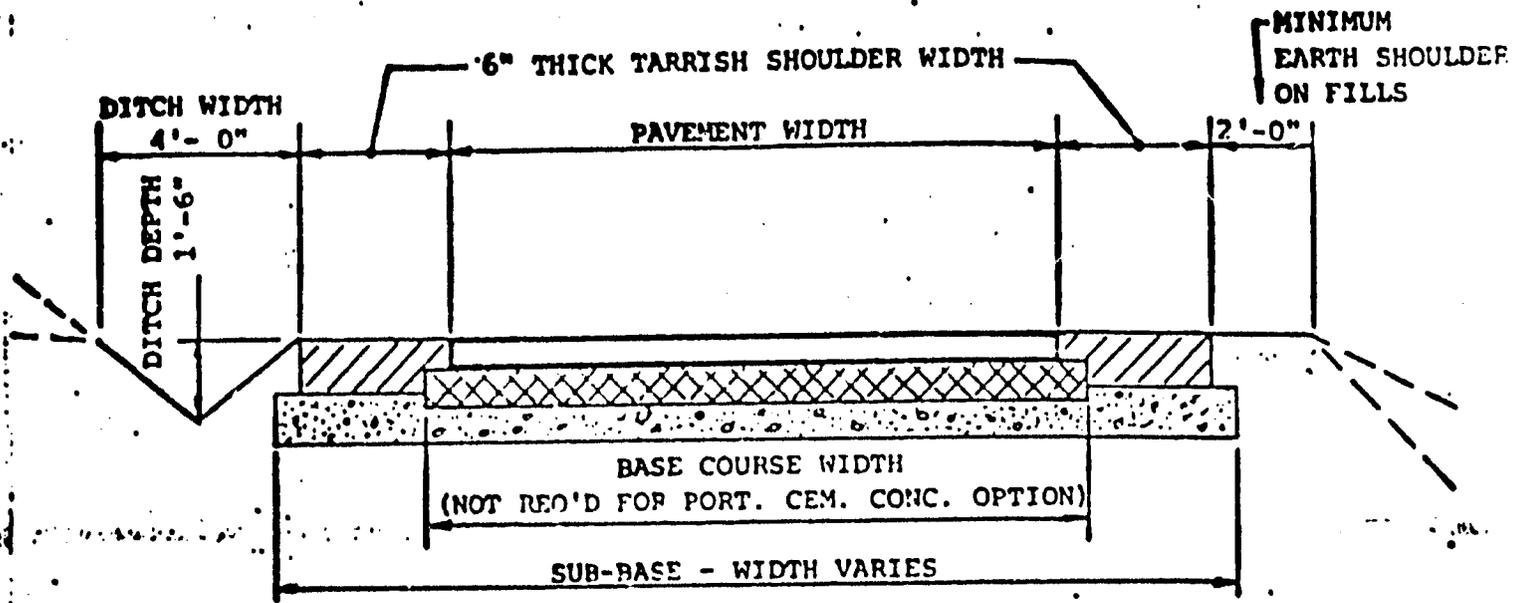
Hatton Garden-Pont Casse	12 feet
Pont Casse-Layou (Hillsborough Bridge)	16 feet
Layou-Roseau	13 feet
- Existing bridges will not be widened and culverts will not be lengthened;
- No excavation will be done solely for the purpose of improving sight distances.

The study included (i) a compass field survey of the Roseau-Layou-Pont Casse-Hatton Garden Road to determine location, alignment, cross-sections and critical features; (ii) an origin - destination traffic survey to characterize and quantify airport-generated traffic; (iii) soil tests to provide data for preliminary road design and construction; and (iv) preliminary designs, and capital and recurring maintenance cost estimates for five pavement alternatives. The proposed typical road cross-section is shown in Figure 1.

2. Alternatives

Taking into consideration data from the Curran report, new soil test results, and possible changes in the work recommended by Curran, the following four best pavement designs and cost estimates were identified:

**FIGURE 1**



**TYPICAL PAVEMENT CROSS SECTION**

	Segment A Hatton Garden to <u>Pont Casse</u>	Segment B Pont Casse to <u>Hillsborough Bridge</u>	Segment C Hillsborough Bridge to <u>Roseau</u>
Pavement Width	12'-0"	16'-0"	18'-0"
Shoulder Width	3'-0"	1'-6"	1'-6"
Base Course Width	14'-0"	18'-0"	20'-0"

20a

<u>Design Alternative</u>	<u>Capital Cost* Estimate</u>	<u>Average Annual Maintenance Cost Estimate (Present Costs)</u>
1. a) Portland Cement concrete from Layou to Hatton Garden	\$12.2 Million	\$190,000
b) Bituminous Penetration Macadam from Layou to Roseau (Includes Single Surface Treatment on Shoulders from Layou to Roseau)		
2. 4" Asphaltic Concrete on entire Road (Single Surface Treatment on Shoulders included)	\$11.7 Million	\$170,000
3. a. 2" Asphaltic Concrete from Pont Casse to Roseau (with Bituminous Base Stabilization).	\$10.7 Million	\$330,000
b. Double Surface Treatment on Pont Casse to Hatton Garden (Single Surface Treatment on Shoulders; entire road)		
4. 2" Asphaltic Concrete with Tarrish Base on entire road (Single Surface Treatment on Shoulders)	\$9.6 Million	\$230,000

\* Costs include two bailey bridges, engineering, 5% escalation and 20% contingency on all alternatives.

Reconstruction of the entire road with a double bituminous surface treatment wearing surface would have the lowest capital costs (approximately \$6.9 million), but would require some \$400,000 annually to maintain. Because of the extremely great maintenance burden this would place on the Government of Dominica, this alternative was rejected.

The above cost estimates incorporate the following modifications and cost reductions in the rehabilitation work proposed in the Curran Report:

(a) Of the 21 road sections which the Report recommends be protected by gabion, some eight sections (nearly 50% of the gabion) can be deleted. Gabion work is proposed only for those areas where embankment failures have occurred or where erosion is imminent.

(b) The Curran report identifies eight roadway embankment failures of which six require special attention in design and

construction. Most are not readily visible except upon close inspection. The proposed project would exclude major efforts to repair Failures No. 7 and 8 from the scope of the road rehabilitation work. Based on a more recent inspection, Failure No. 8 does not appear to require any special attention. Failure No. 7 would be too costly to correct completely as recommended in the Report; instead only minor side-slope cuts will be carried out so as to improve the approaches to this slide-prone area.

(c) The Curran Report (page 15) states that the sub-grade CBR value of sample A (worst case) is 3%. New test results show that the CBR is actually 15-19%. Assuming that the overall average roadway sub-grade CBR will be in the same range or better, the base coarse depths recommended by the Curran Report can be reduced applying the AASHTO recommended roadway structure design using sub-grade CBR values and expected vehicle traffic load.

(d) The Curran Report includes a "miscellaneous" cost item which could include sight-distance improvements, bridge maintenance, etc. As this type of work is not proposed under the project, the miscellaneous cost item has been omitted.

### 3. Selected Design

The 2-inch asphaltic concrete alternative was selected for the project based on least capital cost and the Governments' ability to be able to provide adequate maintenance after reconstruction is completed.

The level of construction proposed does not include the improvements necessary to bring the road to any acceptable geometric design standard; the existing alignment would remain the same. Reconstruction will include minor widening of the roadway of up to three feet at critical curves only, and with adequate superelevation. Preliminary estimated drainage improvements, initial roadway embankment slope protection and need for lined ditches are as follows:

	<u>Hatton Garden- Pont Casse</u>	<u>Pont Casse-Layou</u>	<u>Layou-Roseau</u>
Gabion Slope Protection (cubic meters)	836	1,371	293
New Culverts (Number)	17	2	3

Concrete Lined Ditches (linear Feet)	3,450	1,520	5,914
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The pavement design is based on scarification of the present roadway surface, re-shaping and re-compacting the existing material for use as a sub-base. Select material will be used to provide 3 foot shoulders on the Hatton Garden Pont Casse segment and 1.5 foot shoulders on the balance of the road. The shoulders will be sealed with a single surface bituminous treatment. Adequate Road-side drainage ditches will also be provided and existing culverts will be repaired as required. Based on preliminary soil test data and projected traffic, the following additional base-course thicknesses (using select material) would be required:

From Hatton Garden to Layou	-	4 inches
From Layou to Roseau	-	6 inches

The Curran Report confirms availability of adequate borrow material for the project.

Except for the Hillsborough and Canefield bridges which are seriously deteriorated and considered unsafe, no other bridge work is planned. Numerous bridges require varying degrees of repair and maintenance, but these activities will be addressed by the Ministry of Works under their normal maintenance program. The Hillsborough and Canefield bridges will be replaced with double-single Bailey bridges, a least cost alternative, and modified in the field as appropriate.

#### B. Economic Analysis

To examine the feasibility of the rehabilitation of the Roseau to Hatton Garden road, economic costs and benefits were identified to compute the project's rate of return (IRR). The costs include two components: (a) the actual costs involved in the rehabilitation and (b) maintenance required to keep the road in good repair, once rehabilitated. These economic costs, however, will diverge from financial costs. To the extent that labor will be drawn away from the ranks of the unemployed and underemployed, financial costs for labor will overstate economic costs.

Benefits consist of user costs savings and economic production gains. User costs savings have two components: (a) the reduction in operating costs of vehicles as a result of the rehabilitation of the road and (b) the value of time saved for drivers and passengers resulting from the improvement of the road. Production gains include the positive impact that the improved road would have on Dominica's economic output, e.g., currently substantial losses from spoilage of bananas are incurred due to the disrepair of the road and presumably this project would remedy this situation as well as have a favorable impact on tourism, which also has been discouraged by the deteriorated state of the road.

To compute the project's economic rate of return, the road was divided into three segments--Roseau to Layou, Layou to Pont Casse, and Pont Casse to Hatton Garden. The divisions were made based on the differences in physical condition and traffic volumes of the three segments. The heavily traveled Roseau to Layou segment is in better condition than the other two. Both the Layou to Pont Casse and Pont Casse to Hatton Garden portions, which have lower traffic volumes, have deteriorated badly, and are the segments where most of the damage from transportation of bananas occurs. The disrepair has also had a negative effect on tourism. The proposed rehabilitation would result in sharply lower vehicle travel times between all points on this road.

A rate of return of 18 percent was computed for the Roseau-Layou stretch; 30 percent for Layou-Pont Casse portion; 20 percent for Pont Casse-Hatton Garden portion (see Annex G for the methodology used to calculate the rates of return). Consequently, these data would suggest that the project is economically viable.

### C. Institutional Analysis

The Ministry of Communications, Works and Tourism is responsible for the formulation and implementation of transport policy in coordination with the Economic Development Unit, and for all activities related to the national road network. This includes the responsibility for overseeing the Government's 1982-85 Road Rehabilitation and Maintenance Program (to which the AID project will contribute).

In terms of administration, the Chief Technical Officer (CTO) of the MCWT is responsible for the construction and maintenance of the road system through a Roads and Equipment Division. He is also responsible for the Building and Electrical Division. In addition to the CTO and Deputy CTO, there are three engineers, one BDD Technical Advisor, one engineering assistant, four road superintendents, twelve road supervisors and four time keepers. Present assignments are: one engineer to the UN/ILO project, one engineer who is assigned to a proposed energy unit, one engineer part-time on Buildings and one British VSO on general duties whose official assignment expires in August 1982. Another engineer is expected to be appointed shortly but will be assigned to the CDB feeder roads project to which the Deputy CTO is already assigned.

After several discussions with the CTO, and the Minister of Communications and Works, a detailed plan to incorporate an experienced Project Engineer/Manager into the AID financed project was defined.

Through the auspices of the Commonwealth Fund for Technical Cooperation two commonwealth engineers have been recently assigned to the CTO's office. One will be assigned to assist the USAID program, thereby providing assurance of technical transfer of management skills as well as the continuity of contract approvals and other project certification requirements. The new staffing pattern for the USAID Road Program Office is illustrated in the following figure:

Project Management for USAID Program

Chief Project Officer  
1 - Road Supt. District level  
1 - Road Engineer  
1 - Accountant, Senior  
2 - Sec'ty's

The Chief Project Officer for the USAID road program will report directly to the CTO. Managerial linkage will flow from the CTO's office directly through the Project Manager's Office for AID's program to the selected U.S. A&E Consultant.

Once construction is underway the approval for construction payment will be through established letters of credit (via l/comms) with approval and certification passing directly through the A&E to Project Management, AID Roads, CTO and RDO/C.

\* See Organizational Chart page 25(a).

The soils and materials testing laboratory with two technicians is also under the direct responsibility of the CTO.

Road maintenance is divided into four districts. Each district is headed by a Roads Superintendent who is assisted by three Road Supervisors. Labor required by the district offices is hired on a temporary basis according to needs and availability of funds.

The MCW's equipment is administered in a central pool and is hired out to Government Agencies at established rates. This Equipment Hire Fund Scheme is under the supervision of a Mechanical Superintendent assisted by one Assistant Mechanical Superintendent and two Shop Supervisors. The fleet consists of 130 units of which about 96 are considered operational. Utilization and availability of equipment is low due to the lack of proper maintenance on equipment, spare parts, and low productivity and technical capacity.

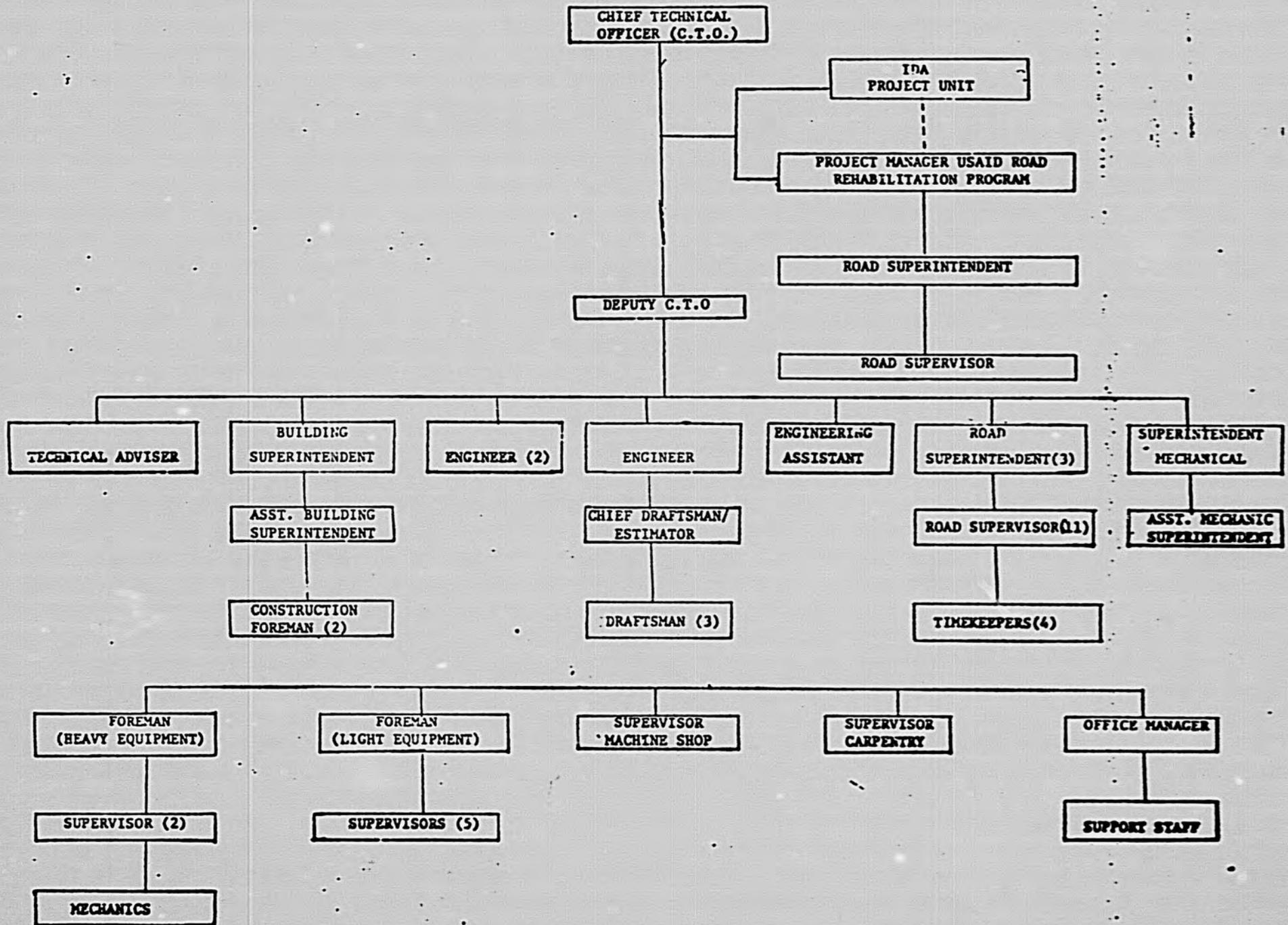
Financing

The Government's road maintenance expenditures are budgeted annually. Budget estimates versus actual funding provided for the past four years of maintenance of roads and bridges are as follows:

	<u>Budgeted</u>	<u>Provided</u>
1981-1982	EC\$2,435,000	EC\$1,500,000 (Est.)
1980-1981	EC\$3,003,610	Undetermined
1979-1980	EC\$3,075,522	Undetermined
1978-1979	EC\$1,596,553	EC\$1,500,000

These amounts include the Public Works Department overhead costs such as travelling allowances, field offices, etc. The

DOMINICA  
 USAID ROAD REHABILITATION PROGRAM  
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-25 (a)-

current amount provided for maintenance is low, especially in the recent past when most of the resources were used for emergency repair of storm damages in lieu of periodic maintenance.

### Maintenance and Planning

Maintenance operations are especially difficult in Dominica because of the adverse natural conditions, rugged terrain, soil conditions and heavy rainfall. There has been no established annual work program and the uncertainty in the amount of financial resources being budgeted has resulted in an adhoc approach to maintenance. The lack of funds and equipment has made preventative maintenance impossible and resulted in an increasing maintenance backlog. Even when repair attempts are made, frequently the same techniques are applied regardless of whether the cause is a simple surface damage or complete roadway structure disintegration.

Administration and cost accounting of maintenance operations are also inadequate due to the small technical staff and work overload. It should be noted that the senior staff is considered quite competent, but that the never-ending and growing backlog of work and lack of personnel to take on the added responsibilities, put them in a position of simply "putting out fires", without time to plan properly.

Maintenance capabilities should greatly improve, however, with the manpower and financial assistance program being undertaken with the IBRD. The World Bank agreement provides that the Ministry establish a Program Management Unit to coordinate the national Road Maintenance and Rehabilitation Program and staff it with a senior engineer, a highway maintenance engineer, a highway maintenance superintendent and an accountant. The World Bank will provide up to 160 man months of technical assistance to the MCWT for engineering planning and supervision of the road rehabilitation and maintenance program, including maintenance staff training. Some 22 units of road maintenance equipment and vehicles and spare parts will be financed, and under the terms of the agreement, the GOD is committed to provide the MCWT with the budget necessary to carry out an adequate road maintenance program.

The World Bank and BDD programs will provide the wide range of technical assistance, training and equipment needed to improve the maintenance and planning capacity of the MCWT. This, together with the GOD's commitment of adequate budget support for road maintenance, (EC\$3,500,000 for 1982-83), should insure the MCWT's institutional capacity to carry out the AID road rehabilitation project and to maintain the road following project completion. (Estimated annual maintenance cost of the Roseau-Hatton Garden Road is \$230,000). In addition, the BDD is providing three specialists in the management of equipment, inventory and accounting, and maintenance, and will finance some improvements in the central workshop.

Of special concern to the government of Dominica and USAID was the overwhelming maintenance expenditures required as part of the

massive ongoing multi-donor effort to rehabilitate and rebuild the deteriorated road network. In addition to the proposed USAID Roseau-Hatton Garden program, other segments include Portsmouth-Hatton Garden (CIDA); Portsmouth-Layou, Castle Bruce-Hatton Garden and Pont Casse-Castle Bruce (EDF); Roseau-Loubriere-Point Michel, Loubriere-Grand Bay, and Bois Diable-Rosalie-La Plaine (IDA/OPEC); La Plaine-Delue, Point Michel-Scott's Head, and Grand Bay-Petit Savanne. Using as a rough guide the maintenance expenditures that we have estimated on our Roseau-Hatton Garden program, the project maintenance expenditures required for the rehabilitation program in 1981 dollars EC\$3.1 million annually. These required expenditures, which match the government expenditure for maintenance in fiscal year 1980/81, are indeed significant.

In recent years, government expenditures for maintenance have been expanding sharply (see Table on Page 28). Also, the Ministry of Communications, Works and Tourism (MCW) adopted in late 1981 the Road Maintenance and Rehabilitation Program for 1982-85. That program along with the road maintenance project, described above, is being developed by the International Development Association will assist the government's maintenance efforts. Moreover, motor vehicle contributions, including import duty and tax on fuel, tyres, spare parts, motor vehicles and vehicle registration and license fees help finance road maintenance, and these contributions also expanded sharply in fiscal year 1980/81. Of special note, the required expenditures of EC\$3.1 million annually represent a small portion of the country's GDP--under three percent.

**ROAD MAINTENANCE AND REHABILITATION PROJECT**  
**Highway Expenditures and Road User Contributions**  
1976/77 - 1980/81  
(Million EC\$)

<u>A. Expenditures on Roads</u>	<u>1976/77</u>	<u>1977/78</u>	<u>1978/79</u>	<u>1979/80</u>	<u>1980/81</u>
Capital	1.72	0.39	0.11	1.76	N/A
Maintenance	<u>1.17</u>	<u>1.08</u>	<u>1.60</u>	<u>4.44</u>	<u>3.0</u>
	2.89	1.47	1.71	6.20	3.0
<b>B. Motor Vehicle Contributions<sup>1/</sup></b>					
Import Duty and Tax on:					
Fuel	0.91	0.95	1.02	0.75	1.72
Tyres and Spare Parts	0.24	0.36	0.36	0.19	0.56
Motor Vehicles	0.22	0.42	0.74	0.52	1.83
Vehicle Registration and License Fees	0.23	0.21	0.36	0.56	0.60 <sup>2/</sup>
<b>TOTAL:</b>	<u>1.60</u>	<u>1.94</u>	<u>2.48</u>	<u>2.02</u>	<u>4.71</u>

Further, to enhance the overall impact of this project, discussions with the Ministry of Communications & Works will continue to center around the re-distribution of user fees, for the maintenance of highway and highway maintenance equipment. As indicated above, continued emphasis on re-allocation of user charges, through the auspices of the Donor Steering Committee, will be used to insure that a continued financial support of IDA Highway maintenance support program, and the USAID, EDF and CIDA, road rehabilitation efforts are maintained throughout their useful lives.

It is further envisioned that the U.S. Engineering Consultant will provide, handbooks for maintenance of the roads, including such things as gutter and culvert maintenance instructions, and asphaltic concrete patch and repair techniques.

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<sup>1/</sup> Calendar year

<sup>2/</sup> Estimate

**D. Social Soundness Analysis**

Current population estimates for Dominica are weak due to difficulties in obtaining accurate 1981 population census information. Population estimates based on demographic projections from earlier censuses indicate that there should be a total of some 83,000 persons in 1981. Of this total population, approximately one-half is under the age of 15 years. The effects of such a high proportion of young people include greater dependency on adult income earners, high public sector expenditures, and a large proportional increase in the needs for new employment opportunities. In addition, the labor market is characterized by occupational multiplicity or employment in several different jobs during the course of a year, not always in the same sector.

In order to address the under-employment and un-employment, and the movement in and out of various jobs is the need to bring idle and under utilized land into production, strengthen public sector institutions, and stimulate private enterprise. A vital link in the country development scheme is reliable, efficient transportation among the major population and strategic centers.

The completion of this road rehabilitation project will provide one such link while expanding the roadside activities of smaller village based economies, sprinkled along this heavily travelled route.

Since this road services the area from the Melville Hall International Airport across the center of the island to the capital, it will yield direct benefits to those who derive their livelihood from roadside services and to those furnishing transportation stemming from improved access to markets, places of employment and social services. The road traverses through an area of Dominica which is characterized by mountainous terrain and narrow river valleys, but is agriculturally active in banana and coconut cultivation. Along the western portion of the road, citrus and cocoa production can also be found. While the central region is sparsely populated, the direct beneficiaries would be both the large and small-scale farmers who will be able to increase the efficiency of their operations and increase their return on labor and management by taking advantage of more reliable means of transportation with fewer losses from spoilage and damage. At the same time, the backhand transport system will increase small farmer access to agricultural service institutions and distributors of farm inputs. According to the economic analysis, an economic rate of return for the central portion, Layou - Pont Casse, of the road is 30 percent and 20 percent for the Pont Casse - Hatton Garden portion where most of the agricultural land is located.

Overall, rehabilitation of this road segment should have a favorable impact on all users of the road. Not only will there be immediate employment generated by the labor-intensive reconstruction activities, but long-term increased accessibility and savings for the population in general.

Women in Development

Of the estimated 81,000 people in Dominica, approximately 54,000 are women. Furthermore, it is estimated that 40 percent of all households are headed by women and that this number may be increasing. While males may contribute to the income of the family, the women assumes the economic responsibility for the welfare of her family. Given that generally, women earn lower wages and that many female small-farm operators are underemployed, the increased obility as a direct result of this road rehabilitation project should improve the access women have to health, education, and recreational services, as well as employment related opportunities.

**E. Environmental Concerns**

The approved Initial Environmental Examination (IEE) recommended a Negative Determination. The project is rehabilitation rather than new construction and no long-term negative environmental impact is attributable to the project. Environmental problems associated with the construction work itself will be contained and of short duration.

The road reconstruction will be designed and constructed in accordance with the following approved environmental considerations:

- a) Drainage design should reduce erosion potential along the road and will be improved using normal flow patterns.
- b) The construction contract will include clauses requiring the contractor to leave quarries environmentally sound.

**VI. FINANCIAL ANALYSIS**

**A. Summary Financial Plan**

The estimated total cost of rehabilitating the entire Roseau-Hatton Garden road, including replacement of both the Hillsborough and Canefield bridges, is \$9,900,000.

USAID proposes to Grant-finance construction of the Hatton Garden-Roseau portion of the road and replacement of the Hillsborough bridge at an estimated cost of \$9,600,000. The Government of Dominica will finance replacement of the Canefield Bridge using Bailey bridging on-hand at an estimated cost of \$300,000. (See Annex F for details).

The project is proposed to be disbursed over a 36-month period. It is estimated that the process of contracting engineering services, finalizing designs, and completing the bidding and contracting for construction will take approximately 11 months. Construction can be completed in 24 months, which would include two full dry seasons.

**Summary Cost Estimate and Financial Plan**  
**All Years (\$000)**

	<u>AID</u>	<u>GOD</u>	<u>TOTAL</u>
1. Road Rehabilitation	6,464	-	6,464
2. Bridge Replacement	1,027	300	1,327
3. Supervision, Engineering Design	469		469
4. Contingency	<u>1,640</u>		<u>1,640</u>
TOTAL	<u>9,600</u>	<u>300</u>	<u>9,900</u>

**B. Recurring Costs**

The MCWT's annual budget of \$1.3 million is considered adequate for the estimated annual road maintenance costs of its road network, including the project road. The maintenance cost for the 2 inch asphaltic concrete pavement design financed under the project is considerably lower than the double bituminous surface pavement alternative, which had been considered on the basis of its lower capital cost, and well within the financial resources allocated for road maintenance.

**VII**      PROJECT IMPLEMENTATION

**A.**      Schedule of Major Events

A schedule was compiled under a modified PERT system (see page 32(a)).

Under this schedule, a system of short listing, and eventual "Bid opening" would be accomplished in Wash. D.C. utilizing the Embassy of Dominica, and the LAC/Engineering Office. In this event, the Ministry of Communications & Works has agreed that in order to save time and circumvent the extraordinary slow mail system between Dominica and Barbados, the project could save almost 2-months of communications time and allow construction to start in the middle of the dry season.

Also it is envisioned that a small sub-contract will be let prior to the A&E firms selection to hire about 100 bush cutters to clear the vegetation from the side-slope to facilitate rapid X-sectional surveys once the A&E firm has been selected. These bush cutters crews provide an accelerating factor, plus an immediate response to provide much needed employment prior to the actual project start-up.

<u>Activity</u>	<u>Completion Date</u>	<u>Primary Responsibility</u>
1. Advertise for Pre-qualification of Consultants	07/15/82	GOD/RDO/C
2. Sign Grant Agreement	08/15/82	GOD/RDO/C
3. Receive Consultant Pre-qualification Information/ Short List and Send Requests for Proposals to Selected Firms	10/07/82	GOD/RDO/C
4. Receive Proposals Consultant Selected	11/21/82	GOD
	12/15/82	GOD/RDO/C

	<u>Completion Date</u>	<u>Primary Responsibility</u>
5.	Advertise for Pre- qualification of Con- struction Contractors Negotiate, Sign Con- sultant Contract	12/01/82 RDO/C
6.	Final Design/Bid Documents Prepared Con- struction Contractors Prequalified	01/01/83 GOD/RDO/C
7.	Request Bids for Con- struction	03/01/83 Consultant
8.	Receive Construction Bids	02/07/83 GOD/RDO/C
9.	Award/Sign Contract Con- struction Completed	03/07/83 GOD
10.	Project Evaluation	04/21/83 GOD
		05/21/83 GOD
		06/07/85 Contractor
		08/07/85 Consultant - AID/W TDY

**B. Covenants**

Except as AID may otherwise agree in writing, the Grantee covenants to: (1) obtain rights of way to lands where road construction and rehabilitation activities will take place under the Project; (2) make available Government owned land or "borrow areas" necessary to supply aggregate material, required for road reconstruction activities under the Project.

OFFICE OF THE PRIME MINISTER  
CABINET SECRETARIAT

Telegrams: External, Dominica.  
Telex 613 EXT. DO  
Reference: P. 611 17/9

GOVERNMENT HEADQUARTERS,  
ROSEAU,  
COMMONWEALTH OF DOMINICA,  
WEST INDIES.

28th June, 1932.

Mr. William B. Wheeler,  
Director,  
United States Agency for International  
Development,  
Regional Development Office/Caribbean,  
P.O. Box 302,  
Bridgetown,  
BARBADOS

Dear Mr. Wheeler:

This letter is to request, formally, grant assistance for the reconstruction of the Roseau-Hatton Garden road.

ACTION	INFO
<input checked="" type="checkbox"/>	DISCUSSIONS
DIR	<input checked="" type="checkbox"/> A MAJOR
A/D/11	<input checked="" type="checkbox"/> TION PROGRAMME
PROG	ALREADY COMMITTED
ECON	TO PROVIDE ASSISTANCE
COMT	THE REQUESTED
RLA	US AID ASSISTANCE
CDO	FOR RECONSTRUCTION
ACIRI	OF THE ROSEAU-HATTON
EDUC	GARDEN ROAD IS A VERY
W/TS	IMPORTANT COMPONENT
JAO	OF THE PROPOSED
DU: 07/12/32	PROGRAMME.
TAKEN	
SIGN:	

As you are aware, we have been holding discussions with you and your staff and other donors for a major co-ordinated road maintenance and rehabilitation programme to which the EDF, CIDA and IBRD are already committed to provide assistance. The requested US AID assistance for reconstruction of the Roseau-Hatton Garden road is a very important component of the proposed programme.

The programme will assist us towards establishing and maintaining a viable primary and secondary road transportation network, and the Roseau-Hatton Garden project in particular will provide dependable and least recurring cost access from the capital and major port to the agricultural areas of central and eastern Dominica and the international airport. The importance of an improved road network in Dominica cannot be overstressed as being essential to our economic development.

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We therefore look forward to finalizing details of USAID's possible participation in and successful completion of the programme.

Yours sincerely,



M. EUGENIA CHARLES  
PRIME MINISTER

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P 151843Z JAN 82  
FM SECSTATE WASHDC  
TO AMEMBASSY BRIDGETOWN PRIORITY 5056  
BT  
UNCLAS STATE 010630

ANNEX B

AIDAC

E.O. 12065: N/A

TAGS:

JAN 13 1982

SUBJECT: DOMINICA ROAD REHABILITATION PROGRAM

1. SUMMARY - THE DAEC REVIEWED AND APPROVED IN PRINCIPLE THE SUBJECT PID ON JANUARY 8, 1982, SUBJECT TO RESOLUTION OF THE LARGER POLICY QUESTION OF RDO/C INVOLVEMENT IN BILATERAL PROGRAMS IN THE EASTERN CARIBBEAN. ONCE RESOLVED, THE MISSION WILL BE ADVISED AND, IF APPROPRIATE, AUTHORIZED TO PROCEED WITH INTENSIVE REVIEW (IR). IN DEVELOPING THE PP, A NUMBER OF POINTS, DISCUSSED BELOW, SHOULD BE ADDRESSED. END SUMMARY.
2. CARIBBEAN REGIONAL STRATEGY. AS DISCUSSED AT THE DAEC, THE PROPOSED PROJECT REPRESENTS A DEPARTURE FROM THE EXISTING STRATEGY BEING PURSUED BY THE RDO/C IN THE EASTERN CARIBBEAN, WHICH HAS BASICALLY PROVIDED A.I.D. ASSISTANCE TO RECIPIENT COUNTRIES THROUGH REGIONAL INSTITUTIONS. THE A/AID WILL BE REVIEWING THE ISSUE OF WHETHER TO PROVIDE BILATERAL ASSISTANCE TO THE EASTERN CARIBBEAN SOMETIME IN MID-JANUARY. FINAL APPROVAL TO PROCEED WITH IR WILL AWAIT THE OUTCOME OF THAT REVIEW.
3. ROAD MAINTENANCE. GIVEN THE DIFFICULT FISCAL PROBLEMS FACING THE GOVERNMENT OF DOMINICA (GOD); AND THE IMPORTANCE OF ADEQUATE MAINTENANCE TO THE SURVIVAL OF ROADS AND BRIDGES TO BE FINANCED BY A.I.D., THE MISSION SHOULD: A; INCLUDE A CP TO INITIAL DISBURSEMENT TO ENSURE THAT THE PROPOSED PROJECT DOES NOT GO FORWARD UNTIL THE IBRD MAINTENANCE PROJECT IS OPERATIONAL. B; INCLUDE A COVENANT TO ENSURE THAT THE GOD PROVIDES ADEQUATE FUNDS FROM ITS BUDGET TO PROVIDE FOR MAINTENANCE OF THE A.I.D.-FINANCED ROADS AND BRIDGES, AND C, EXAMINE THE POSSIBILITY OF IMPOSING USERS FEES OR EMPLOYING OTHER MECHANISMS TO HELP ENSURE THAT ADEQUATE RESOURCES ARE AVAILABLE FOR ROAD MAINTENANCE, AND D; ACTIVELY ENCOURAGE THE FORMATION OF A DONOR COORDINATING MECHANISM FOR THE PURPOSE OF ENHANCING COORDINATION OF DONOR ROAD ACTIVITIES IN DOMINICA AND MONITORING DEVELOPMENT OF GOD MAINTENANCE PROGRAM.
4. ROAD PROJECT FINANCING. BUREAU AGREES THAT PROPOSED PROJECT SHOULD BE GRANT FINANCED USING ESF FUNDS. PP SHOULD INCLUDE FULL RATIONALE, EMPHASIZING QUOTE SPECIAL CASE END QUOTE JUSTIFICATION OUTLINED BY DIRECTOR RDO/C A DAEC MEETING. FOR USING THESE FUNDS IN DOMINICA. DURING IR, MISSION SHOULD ATTEMPT TO DEVELOP SOME COUNTERPART CONTRIBUTION, IN CASH OR IN KIND, FROM THE GOD FOR THE PRIMARY PURPOSE OF INCREASING THE GOD'S IDENTIFICATION WITH AND COMMITMENT TO THE PROJECT. IN THIS REGARD, MISSION MAY WISH TO EXPLORE POSSIBILITY OF PACKAGING IBRD MAINTENANCE PROJECT TOGETHER WITH THE PROPOSED PROJECT SO THAT GOD MAINTENANCE BUDGET AND PERSONNEL COSTS CAN BE COUNTED.
5. CONSTRUCTION CONTRACT. FOR NOT ONLY POLICY BUT POLITICAL REASONS I.E., MAINTAINING U.S. IDENTIFICATION WITH ROADS TO BE FINANCED BY USG), MISSION SHOULD ATTEMPT TO STAY WITHIN EXISTING REGULATIONS WHICH REQUIRE, ABSENT WAIVER, PROCUREMENT

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OF SERVICES FROM A.I.D- GEOGRAPHIC CODE 000 U.S.,  
WHEN GRANT FUNDS ARE PROVIDED. IF DURING IR IT IS  
DETERMINED THAT U.S. FIRMS ARE UNLIKELY TO BID ON THE  
CONSTRUCTION WORKS TO BE FINANCED BY A.I.D., THEN A  
JUSTIFICATION FOR WAIVER TO CODE 941 OR 935 FOR  
PROCUREMENT OF CONSTRUCTION SERVICES SHOULD BE  
INCLUDED IN THE PP.

6. PP APPROVAL DOCUMENTATION. GIVEN THE SPECIAL  
NATURE OF THE PROPOSED PROJECT, THE PP SHOULD BE  
SUBMITTED FOR BUREAU REVIEW AND APPROVAL.

7. FYI: ALL LAC MISSION PID APPROVALS ARE NOW  
SUBJECT TO BUREAU REVALIDATION IF THE POST-PID PROJECT  
DEVELOPMENT PROCESS EXTENDS BEYOND ONE YEAR. STOESEL

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CERTIFICATION PURSUANT TO SECTION 611(e) OF THE  
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, William B. Wheeler, as Director of the Agency for International Development Regional Development Office/Caribbean having taken into account, among other things, the maintenance and utilization of projects in the Caribbean region previously financed or assisted by the United States, do hereby certify that in my judgement Dominica has both the financial capacity and the human resources capability to effectively utilize and maintain goods and services procured under the proposed capital assistance grant project entitled Dominica Road Rehabilitation.

This judgement is based upon the implementation record of AID-financed projects in Dominica and the quality of the planning which has gone into this new project.

(Signed) William B. Wheeler  
William B. Wheeler  
Director

(Date) 15 August 1982

**PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK**

**ANNEX D**  
 Life of Project:  
 From FY 82 to FY 84  
 Total U.S. Funding 38.6 M  
 Date Prepared: \_\_\_\_\_

**Project Title & Number: Dominica Road Rehabilitation, 538-0076**

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																												
<p><u>Program or Sector Goal: The broader objective to which this project contributes:</u></p> <p>To increase per capita income in Dominica.</p>	<p><u>Measures of Goal Achievement:</u></p> <p>Increase in productivity of population served by project area.</p>	<p>Annual statistical Government of Dominica data.</p>	<p><u>Assumptions for achieving goal targets:</u></p> <ul style="list-style-type: none"> <li>. Government will remain stable and pursue economic growth.</li> <li>. No major weather disaster.</li> </ul>																												
<p><u>Project Purpose:</u></p> <p>To provide dependable access from Dominica's capital and major port to the agricultural areas of central and eastern Dominica and the international airport.</p>	<p><u>Conditions that will indicate purpose has been achieved: End of project status.</u></p> <ul style="list-style-type: none"> <li>. Increased vehicular transport on project road.</li> <li>. Increased movement of agricultural goods.</li> <li>. Decreased travel time from Roseau to airport.</li> </ul>	<ul style="list-style-type: none"> <li>. Ministry of Communications, and Works reports.</li> <li>. World Bank reports.</li> <li>. Project evaluation.</li> </ul>	<p><u>Assumptions for achieving purpose:</u></p> <ul style="list-style-type: none"> <li>. Continued Government of Dominica budgetary support of road program.</li> <li>. Implementation of IERD road maintenance activities.</li> <li>. A well maintained road is essential for job creation and income growth in the economy.</li> </ul>																												
<p><u>Outputs:</u></p> <p>Reconstruction of Roseau - Hatten Garden Road.</p>	<p><u>Magnitude of Outputs: By 1984:</u></p> <ul style="list-style-type: none"> <li>. 30.5 miles of primary road rehabilitation.</li> <li>. Reconstruction/repair of drainage system servicing road.</li> <li>. 2 bridges replaced.</li> </ul>	<ul style="list-style-type: none"> <li>. Ministry of Communications and Works reports.</li> <li>. Field inspections.</li> <li>. Project evaluation.</li> </ul>	<p><u>Assumptions for achieving outputs:</u></p> <ul style="list-style-type: none"> <li>. Adequate pool of construction laborers is available.</li> <li>. Materials will be available within time and cost limits.</li> </ul>																												
<p><u>Inputs:</u></p> <ol style="list-style-type: none"> <li>1. Road Rehabilitation</li> <li>2. Bridge Replacement</li> <li>3. Supervision, Engineering Design</li> <li>4. Contingency</li> </ol>	<p><u>Implementation Target (Type and Quantity):</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th colspan="3" style="text-align: center;">All Years (\$000)</th> </tr> <tr> <th></th> <th style="text-align: center;">AID</th> <th style="text-align: center;">GOD</th> <th style="text-align: center;">TOTAL</th> </tr> </thead> <tbody> <tr> <td></td> <td style="text-align: center;">6,464</td> <td style="text-align: center;">-</td> <td style="text-align: center;">6,464</td> </tr> <tr> <td></td> <td style="text-align: center;">1,070</td> <td style="text-align: center;">257</td> <td style="text-align: center;">1,327</td> </tr> <tr> <td></td> <td style="text-align: center;">452</td> <td style="text-align: center;">17</td> <td style="text-align: center;">469</td> </tr> <tr> <td></td> <td style="text-align: center;"><u>1,614</u></td> <td style="text-align: center;"><u>26</u></td> <td style="text-align: center;"><u>1,640</u></td> </tr> <tr> <td style="text-align: right;"><b>TOTAL</b></td> <td style="text-align: center;"><u>9,600</u></td> <td style="text-align: center;"><u>300</u></td> <td style="text-align: center;"><u>9,900</u></td> </tr> </tbody> </table>		All Years (\$000)				AID	GOD	TOTAL		6,464	-	6,464		1,070	257	1,327		452	17	469		<u>1,614</u>	<u>26</u>	<u>1,640</u>	<b>TOTAL</b>	<u>9,600</u>	<u>300</u>	<u>9,900</u>	<ul style="list-style-type: none"> <li>. USAID disbursement records.</li> <li>. Ministry of Communications and Works records.</li> </ul>	<p><u>Assumptions for providing inputs:</u></p> <ul style="list-style-type: none"> <li>. AID funds available as planned.</li> <li>. Government of Dominica provides adequate budget support.</li> </ul>
	All Years (\$000)																														
	AID	GOD	TOTAL																												
	6,464	-	6,464																												
	1,070	257	1,327																												
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DOMINICA EMERGENCY ROAD PROGRAM

SUMMARY STATEMENT

Meeting of Nov. 2/3, 1981, CDB Headquarters, Barbados

I. BACKGROUND AND OBJECTIVES

Extreme weather conditions, including the devastating effects of hurricanes in 1979 and 1980, coupled with the effects of inadequate pavement design, drainage and poor maintenance, have contributed to the severe deterioration of Dominica's road network. A major effort towards road rehabilitation and the establishment of a comprehensive road maintenance program is urgently required to restore the network and to ensure adequate maintenance in the future. To this end, the Government of Dominica has requested financing from a number of sources, several of which have demonstrated interest in participating in a program designed to address these problems. In addition, the Government has requested IDA assistance in obtaining financing from other external sources for the uncommitted sub-projects in such a program. This program was discussed in meetings attended by representatives of UNDP, CIDA, EDF, USAID, CDB, IDA, and the Government on November 2 and 3, 1981 in Barbados. Generally, the meeting's participants were in agreement with the following principles:

- (a) Contributions should be made within the context of a coherent program, made up of high priority elements, which would provide for the build up of road and equipment maintenance capability, and for the rehabilitation of roads and bridges (Section II).
- (b) The Ministry of Communications, Works and Tourism (MCWT) is the Executing Agency, responsible for coordination of the Program. A project Unit, with proposed IDA financing would, inter alia, assist the MCWT in this coordination, and act in an advisory capacity to the Ministry (Section III).

4(1)

- (c) Capital costs for the Program should be fully financed from external sources, with the Government applying its contribution to recurrent maintenance activities. If necessary, IDA would use its offices to help the Government secure local counterpart financing from other external sources.
- (d) It is the Government's preference that rehabilitation works be undertaken by contract in order to free MCWT's resources for maintenance.
- (e) With regard to engineering standards, care should be taken in developing technical solutions which emphasize pavement strengthening and drainage improvements, and minimize geometrical improvements and widening of the existing roadway. These solutions should take due account of safety of road users and the limited recurrent maintenance resources available.

## II. DEFINITION OF A PHASE I PROGRAM 1982 - 85

A tentative Phase I Road Rehabilitation and Maintenance Program for 1982 - 85 has been identified by the IDA appraisal team based on the Government's list of priority roads (Annex ). It is subject to modifications after further discussions to be held between the Government and IDA, and reflects "best estimates" of timing on the part of CIDA and EDF.

## III. ROLE OF THE PROJECT UNIT

A Project Unit, staffed by selected consultants selected by MCWT and by MCWT counterpart staff, would:

- (a) Prepare detailed engineering and tender documents for road sections to be rehabilitated under the IDA sub-project. It may prepare engineering for other roads sections which could be financed by any contributor;

- (b) Supervise works on IDA financed road sections;
- (c) Prepare and implement a four year maintenance program which would provide for a systematic approach to the planning, programming and execution of equipment and road maintenance, and strengthen the MCWT's capacity to continue providing adequate maintenance after the completion of technical assistance. Included in the Unit's tasks would be the establishment of a cost accounting system for maintenance. The Unit would collaborate with the Advisors being financed by the British Development Division (e.g., mechanical engineer, mechanical superintendent, store advisor);
- (d) Assist MCWT in developing road and bridges classification and standards;
- (e) Act as advisor to the MCWT, which would coordinate the activities of other contributing agencies participating in the Phase I Program, providing liaison with the supervisory consultants for the various road rehabilitation sub-projects. Areas for coordination include:
  - (i) sources, quantities and supply of quarry materials;
  - (ii) supply, storage and port access for other materials;
  - (iii) local equipment and haulage availability;
  - (iv) local labour force availability;
  - (v) road signs and markings;
  - (vi) facilitation of permits, licenses, importation, taxation;
  - (vii) receipt and analysis of Monthly Progress Reports for each sub-project.

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**IV. STEERING COMMITTEE**

The idea of establishing a Steering Committee was discussed. The purpose of the Committee would be to provide a forum for the discussion of progress of the works, problems and their resolutions. The Committee would be made up of representatives of the MCWT, contributing agencies and the Project Unit. The Committee would meet at regular intervals (say every six months).

**V. OTHER ISSUES**

It was agreed that special attention should be given to the following problem areas:

- (a) Finding a solution to the provision of local quarry materials and equipment (e.g., crusher, asphalt material, mixing and laying, haulage) in the most efficient manner in order to minimize all project costs and reduce costly overlapping;
  - (b) Timing of project works where feasible so that contractors already on the ground could tender for works to be financed with untied funds, thus encouraging as wide a response as possible towards the objective of minimizing overall costs;
  - (c) Determining the scope for developing the local contracting industry during the course of the Phase I Program;
  - (d) Reconciling pavement width and sight distance with acceptable safety standards for traffic and pedestrians; where technically and economically feasible pave widths would be increased to a maximum of 18 ft.; bearing in mind the principles stated in Section 1 (e).
  - (e) Developing training courses for MCWT staff and the local contracting industry.
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Representatives of Funding/Donor AgenciesAttending Meeting of November 2/3, 1981

J. Sonderberg	Technical Advisor, E.E
J. Free	C.I.D.A.
D. Steinberg	C.I.D.A.
Z. Lakew	U.N.D.P.
A. Sundermann	U.S.A.I.D. (Engineer)
W.B. Wheeler	U.S.A.I.D.
Peter P.W. Morris	World Bank
Katerine Sierrra	World Bank
Dawn Elvis	World Bank
M. C. Doctrove	Dominica
Cary Harris	Dominica
Vernon Martin	Dominica
Anthony Alleyne	CDB
E. Valmonte	CDB
W. Lawrence	CDB
M. St. Rose	CDB

PHASE I PROGRAM 1982 - 85

<u>Sub Project</u>	<u>Financing Source</u>	<u>Miles</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>
<u>Road and Bridge Rehabilitation Program</u>							
1. Portsmouth-Hatton Garden	CIDA	23.2		.....	_____		
2. Portsmouth-Layou; Castle Bruce-Hatton Garden	EDF	) 30.0)		.....	_____		
3. Pont Casse-Castle Bruce	EDF	)					
4. Roseau-Loubiere-Point Michele		6.2			.....	_____	
5. Roseau-Layou-Pont Casse-Hatton Garden	USAID <sup>1/</sup>	) 30.5)		.....	_____		
6. Loubiere-Grand Bay	IDA	7.0)			.....	_____	
7. Bois Drable-Rosalie-La Pliene		) 11.9)					
8. La Pleine-Delice		7.0)					
9. Point Michele-Soctts Head		) 4.0)			.....	_____	
10. Feeder Road Program	CDB	27.0	.....	_____			
11. Bridges (Roseau East Bridge)	CDB						

Road Maintenance Program

Project Unit/Technical Assistance

..... \_\_\_\_\_

Intensive Patching Program

Execution of Supervised Maintenance

\_\_\_\_\_  
\_\_\_\_\_

<sup>1/</sup> Government has formally requested assistance from USAID regarding Hatton Garden-Layou-Roseau road rehabilitation.

Source: IDA

JULY 1982

..... Selection of Consultants; Prep. Engineering; Letting Contracts  
 \_\_\_\_\_ Execution of Works

CONSTRUCTION COST ESTIMATESSummary of Construction Costs

Section A: Hatton Garden - Pont Casse		US\$2,909,966
Section B: Pont Casse - Layou		1,625,102
Section C: Layou - Roseau		1,561,104
* Hillsborough Bridge		765,000
* Canefield Bridge		253,750
		<hr/>
CONSTRUCTION COST TOTAL		US\$7,174,922
Escalation	5%	358,745
Engineering	6%	452,020
		<hr/>
	Sub-Total	7,985,687
Contingency	20%	1,614,313
		<hr/>
<u>GRAND TOTAL</u>		<u>US\$9,600,000</u>

\* NOTE: Estimate is based on replacing the Hillborough Bridge with components purchased from sources other than AID Excess Property, and replacement of the Canefield Bridge by the Bailey Bridge components removed from the Roseau East Bridge. A possible reduction in cost of US\$300,000 can be obtained if Bailey Bridge Components from AID Excess Property are available for replacement of the Hillsborough Bridge.

Section A: Hatton Garden - Pont Casse: 14.5 Miles

Mobilization	Item	US\$ 128,301
Clearing and Grubbing	61,716 sq. ft.	7,870
Bulk Excavation	118,244 cu. yds.	360,613
Ditch Excavation	10,627 lin. ft.	22,163
Culverts	17 each	
Lined Ditches	3,450 lin. ft.	187,620
Handtrimming	122,919 lin. ft.	72,997
Scarification and Reshaping	153,222 sq. yds.	45,062
Base Course	23,121 cu. yds.	340,002
Asphaltic Concrete	102,080 sq. yds.	1,580,967
Gabion Retaining Walls	836 cu. yds.	147,556
Single Surface Treatment	51,074 sq. yds.	225,313
	<b>Sub-Total</b>	<b>3,118,464</b>
Engineering 5%		187,108
	<b>Sub-Total</b>	<b>3,305,572</b>
Contingency 20%		664,428
<b>SECTION A CONSTRUCTION COST</b> *****		<b>US\$3,970,000</b> *****

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Section B: Pont Casse - Layout: 7.7 Miles

<b>Mobilization</b>	<b>Item</b>	<b>US\$</b>	<b>84,975</b>
<b>Clearing and Grubbing</b>	83,483 sq. ft.		3,660
<b>Bulk Excavation</b>	17,957 cu. yds.		182,026
<b>Ditch Excavation</b>	33,053 lin. ft.		8,499
<b>Culverts</b>	2 each		
<b>Lined Ditches</b>	1,520 lin. ft.		57,432
<b>Handtrimming</b>	50,382 lin. ft.		39,685
<b>Scarification and Reshaping</b>	86,167 sq. yds.		33,461
<b>Base Course</b>	20,088 cu. yds.		130,949
<b>Asphaltic Concrete</b>	72,277 sq. yds.		857,085
<b>Gabion Retaining Walls</b>	1,371 cu. yds.		247,253
<b>Single Surface Treatment</b>	13,605 sq. yds.		61,332
		<b>Sub-Total</b>	<b>1,706,357</b>
<b>Engineering 6%</b>			102,382
		<b>Sub-Total</b>	<b>1,808,739</b>
<b>Contingency 20%</b>			366,261
<b>SECTION B CONSTRUCTION COST</b>			<b>US\$2,175,000</b>
*****			*****

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Section C: Layou - Roseau: 8.3 Miles

Mobilization	Item	US\$	74,712
Clearing and Grubbing	21,254 sq. ft.		2,176
Bulk Excavation	7,057 cu. yds.		48,387
Ditch Excavation	37,064 lin. ft.		11,216
Culverts	3 each		
Lined Ditches	5,914 lin. ft.		130,031
Handtrimming	88,574 lin. ft.		42,712
Scarification and Reshaping	103,336 sq. yds.		39,546
Base Course	24,245 cu. yds.		252,589
Asphaltic Concrete	87,648 sq. yds.		919,624
Gabion Retaining Walls	293 cu. yds.		52,256
Single Surface Treatment	14,762 sq. yds.		65,910
		Sub-Total	1,639,159
Engineering 6%			98,349
		Sub-Total	1,737,508
Contingency 20%			352,492
<b>SECTION C CONSTRUCTION COST</b>		<b>US\$</b>	<b>2,090,000</b>
*****		*****	*****

BRIDGES

Hillsborough Bridge

		US\$612,000
Contractor Overhead and Profit	25%	<u>153,000</u>
	Sub-Total	765,000
Escalation	5%	<u>38,250</u>
	Sub-Total	803,250
Engineering	6%	<u>48,195</u>
	Sub-Total	851,445
Contingency	20%	<u>172,647</u>
<u>HILLSBOROUGH BRIDGE CONSTRUCTION COST</u>		<u>\$1,024,092</u>

Canefield Bridge

		US\$302,000
Contractor Overhead and Profit	25%	<u>50,750</u>
	Sub-Total	253,750
Escalation	5%	<u>12,687</u>
	Sub-Total	266,437
Engineering	6%	<u>15,986</u>
	Sub-Total	282,424
Contingency	20.7%	<u>58,484</u>
<u>CANEFIELD BRIDGE CONSTRUCTION COST</u>		<u>\$340,908</u>

Bridges Total - US\$1,365,000

Maintenance Cost on 2" A.C. Surface

<u>Year</u>	<u>Section A</u>	<u>Section B</u>	<u>Section C</u>
3	US\$ 68,592	US\$ 36,390	US\$ 39,423
4	68,592	36,390	39,423
5	81,099	43,025	46,611
6	81,099	43,025	46,611
7	81,099	43,025	46,611
8	81,099	43,025	46,611
9	475,000	252,000	273,000
10	68,592	36,390	39,423
11	68,592	36,390	39,423
12	81,099	43,025	46,611
13	81,099	43,025	46,611
14	81,099	43,025	46,611
15	81,099	43,025	46,611
16	475,000	252,000	273,000
17	68,592	36,390	39,423
18	68,592	36,390	39,423
19	81,099	43,025	46,611
20	81,099	43,025	46,611
<b>TOTAL</b>	<b>\$2,172,542</b>	<b>\$1,152,590</b>	<b>\$1,248,648</b>
<b>AVERAGE</b>	<b>\$108,627/year</b>	<b>\$57,630/year</b>	<b>\$62,432/year</b>

Average annual cost per year, all sections

\$228,689

## ECONOMIC ANALYSIS CALCULATIONS

### Methodology

To examine the economic feasibility of the rehabilitation of Dominica's Roseau to Hatton Garden road, costs and benefits were identified to compute the project's economic rate of return (IRR). Since we are calculating a real rate of return, all costs and benefits are quoted in 1981 East Caribbean (EC) dollar terms. A 20 year pay out period was used even though benefits and costs will undoubtedly be incurred outside that period.

In assessing the Project's feasibility, the Roseau-Hatton Garden road was subdivided into three segments: Roseau to Layou, Layou to Pont Casse, and Pont Casse to Hatton Garden. For each of the segments, costs and benefits were computed and a rate of return calculated. This subdivision was done due to the different physical condition and traffic volumes of the three segments. The heavily traveled Roseau to Layou segment is in better condition than the other two segments. The Layou to Pont Casse and Pont Casse to Hatton Garden portions have lower traffic volumes, but have deteriorated badly and are the segments where most of the damage to transported bananas occurs. The disrepair of these two sections has had a negative impact on tourism. Repair and rehabilitation of these roadway sections would sharply lower travel time and also provide a smoother riding surface.

### 1. Benefits

Benefits from the road rehabilitation program were computed in two main areas--user costs savings and economic production gains. Of course, the road program will produce other benefits, including improvement in the government's finances, and social benefits such as better access to schools, more prompt medical and emergency services, greater accessibility to cultural and civic events, and improved living conditions. However, these other benefits are considerably less important and are more difficult to quantify; hence, they will be excluded from economic analysis.

#### a. User Savings

User savings have two components (a) the reduction in operating costs of vehicles as a result of the rehabilitation of the road and (b) the value of time saved for drivers and passengers resulting from the improved road. User savings are generally the most significant benefit obtained from road rehabilitation activities and we would expect Dominica to reap substantial savings in this area from the proposed project. A lack of budgetary resources for required road maintenance exacerbated by the hurricane damage of the past couple of years has caused a sharp deterioration in the condition of the Roseau-Hatton Garden road, thereby increasing sharply vehicle maintenance costs. Moreover, the disrepair has increased substantially the time that it takes to travel between Roseau to Hatton Garden.

The reduction in operating costs is based on upgrading the road from its present state to a Class I roadway. Class I roads have good riding surfaces capable of handling traffic moving at 30 miles per hour. The Roseau to Layou segment (now a Class II road) has a fair riding surface and can handle

20 miles-per hour traffic, while the Layou-Pont Casse and Pont Casse-Hatton Garden portions (Class III roads) are badly deteriorated and able to handle 15 miles-per-hour traffic at best. Consequently, the greatest reductions in operating costs per vehicle would occur on the Layou-Pont Casse and Pont Casse-Hatton Garden segments. An IBRD study has provided data for each segment on operating costs for the road now and once improved, disaggregated by vehicle type.

<u>Road Segment</u>	<u>Vehicle Operating Costs</u>		
	<u>Current Operating Cost</u> <u>(EC\$ per mile <sup>1/</sup>)</u>	<u>After Project Operating Costs</u> <u>(EC\$ per mile)</u>	<u>Operating Cost Savings</u> <u>(Percent)</u>
<u>Roseau to Layou</u>			
Cars and pick-ups	0.71	0.55	23
Buses	0.97	0.75	23
Trucks	2.29	1.79	22
<u>Layou to Pont Casse</u>			
Cars and pick-ups	0.98	0.55	44
Buses	1.51	0.75	50
Trucks	3.75	1.79	52
<u>Pont Casse to Hatton Garden</u>			
Cars and pick-ups	0.98	0.55	44
Buses	1.51	0.75	50
Trucks	3.75	1.79	52

<sup>1/</sup>U.S. \$1.00 = EC\$2.70

Since operating costs data are provided in terms of EC dollars per mile, vehicle operating costs savings also depend on the length of the road. The entire Roseau-Hatton Garden road is 30.5 miles long, with the three segments as follows:

Roseau to Layou (8.3 miles); Layou to Pont Casse (7.7 miles); and Pont Casse to Hatton Garden (14.5 miles).

Lastly, operating costs savings depend on the volume and make-up of traffic. Clearly, the greater the volume of traffic the greater the savings, while savings would increase as the proportion of cars, buses and trucks (in ascending order) in total traffic counts rose. Data on volume and type of traffic come from traffic counts carried out this year by the consultancy firm of Curran/Lebron Associates.

<u>Road Segment</u>	<u>Average Daily Traffic Count</u>
<u>Roseau to Layou</u>	<u>1700</u>
Cars and pick-ups (percent)	66%
Buses (percent)	15
Trucks (percent)	19

diverted traffic would produce an additional one time only 3 percent increase in traffic on the Layou-Pont Casse portion.

#### b. Production Gains

We would anticipate that this road program would have significant impact on production in Dominica. The country has been incurring substantial losses from spoilage of bananas transported over the road. In some instances, the disrepair of the road has caused farmers to fail to even market their produce. Hence, total agricultural output should increase with the rehabilitation of the road. Moreover, the road program also should give a boost to tourism, which has been discouraged by the arduous two hour journey between the international airport and Roseau. As a conservative estimate of these production gains, we shall use the value of banana spoilage arising from the poor state of the road. These gains will be attributed only to the Layou-Pont Casse and Pont Casse-Hatton Garden segments, as they have the most serious deterioration and result in the most damage to bananas transported over the road. Estimates of banana spoilage arising from poor road conditions range from 10 to 30 percent of all production. Banana sales for 1981 have been estimated at EC\$22.7 million. Of total production, 30 percent is grown in the area served by the Layou-Pont Casse and Pont Casse-Hatton Garden road sections. Consequently, using a conservative spoilage rate of 10 percent and an allocation formula based on the length of each segment, we obtained in annual yearly gains of EC\$238,400 on the Layou-Pont Casse segment and EC\$442,700 on the Pont Casse-Hatton Garden section.

#### 2. Costs

In specifying economic costs, we assume that, for the most part, economic costs are identical to financial costs. Labor costs, however, are an important exception. If the labor used on the project were drawn from the ranks of the unemployed and underemployed, equating the financial costs of labor with economic costs would significantly overstate economic costs. Currently, Dominica's unemployment rate is running at nearly 23 percent, with the rate considerably higher for youths. This suggests that the economic costs of using labor are sharply lower than financial costs. As a percent of total costs, labor costs range from 15 percent on the Pont Casse-Hatton Garden segment to 18 percent for the Roseau-Layou portion. To be on the conservative side, we assume that half the labor would be drawn away from the ranks of the unemployed and underemployed. Consequently, half the labor costs were deducted from financial costs to derive economic costs.

<u>Layou to Pont Casse</u>	<u>500</u>
Cars and Pick-ups (percent)	60
Buses (percent)	9
Trucks (percent)	31
<u>Pont Casse to Hatton Garden</u>	<u>363</u>
Cars and Pick-ups (percent)	68
Buses (percent)	7
Trucks (percent)	25

Time savings depend on a number of factors including current state of the road, road length, volume and type of traffic, and the value of time spent traveling on the road. We expect the rehabilitation of the road to reduce the overall time of the journey between Roseau and Hatton Garden by roughly 30 minutes, including 5 minutes on the Roseau to Layou segment, 10 minutes on the Layou-Pont Casse portion, and 15 minutes on the Pont Casse to Hatton Garden stretch. Time will be valued at Dominica's average wage rate of EC\$3.75 per hour. Not all the time that will be saved by users of the road, however, should be labeled as user savings. For instance, some of the time spent by drivers of cars and pick-ups and passengers of the buses should be classified as leisure time. Moreover, some of the individuals may not be gainfully employed. Consequently, we will consider as user savings 50 percent of the time saved by individuals using cars and pick-ups and buses. Trucks have a driver and footmen and on average, pick-up two passengers along the way. The truck driver and footmen's time will be valued at EC\$3.75 while the time of the two passengers, like the individuals using cars, pick-ups and buses, would be valued at half rate. For cars and pick-ups, we project an average load of two persons, including 1.5 for cars and 2.5 for pick-ups. We are assuming that each bus, on average, will carry 13 persons since buses with load capacities of 22 and 32 persons operate in Dominica and that, to be on the conservative side, each bus is only half full.

We would expect future use of the road to expand for several reasons. First, we would expect traffic to increase naturally as a result of expected growth trends in, for example, population, national income, and regional growth. Second, we also would expect the road to generate traffic; that is, people who did not find it convenient to make the trip on the old road may find it convenient to do so once it is improved. Third, some traffic should be diverted to the road from other roads or forms of transportation.

Because of anticipated growth in the country and region, we are expecting traffic to increase on all segments of the road by at least 3 percent a year. We also are projecting that additional traffic would be generated only on the Layou-Pont Casse and Pont Casse-Hatton Garden segments. <sup>1/</sup> "Diverted" traffic would only be significant for the Layou to Pont Casse segment. This section also accommodate traffic from an alternative route between Pont Casse and Roseau which has been recently closed as a result of landslides and will be extremely difficult to repair. Therefore

<sup>1/</sup> Consumer surplus theory suggests that generated traffic be valued at only half the rate of "normal growth" and "diverted" traffic.

PONT CASSE TO HATTON GARDEN SEGMENT:  
ECONOMIC COSTS AND BENEFITS  
(1981 E.C. DOLLARS)

<u>Years</u>	<u>COSTS</u>		<u>BENEFITS</u>		
	<u>Actual Construction</u>	<u>Maintenance</u>	<u>User Cost Savings</u> <u>Vehicle</u>	<u>Time</u>	<u>Production Gains</u>
1983	4,949,395*	-	-	-	-
1984	4,949,395*	-	-	-	-
1985		185,198	1,601,428	234,144	442,700
1986		185,198	1,673,492	244,680	442,700
1987		218,967	1,723,697	252,021	442,700
1988		218,967	1,775,408	259,582	442,700
1989		218,967	1,828,670	267,369	442,700
1990		218,967	1,883,530	275,390	442,700
1991		1,282,500	1,940,036	283,652	442,700
1992		185,198	1,998,237	292,161	442,700
1993		185,198	2,058,154	300,926	442,700
1994		218,967	2,119,930	369,954	442,700
1995		218,967	2,183,528	319,253	442,700
1996		218,967	2,249,034	328,830	442,700
1997		218,967	2,316,505	338,695	442,700
1998		1,282,500	2,386,000	348,856	442,700
1999		185,198	2,457,580	359,322	442,700
2000		185,198	2,531,307	370,101	442,700
2001		218,967	2,607,246	381,204	442,700
2002		218,967	2,685,464	392,640	442,700

\* Because of our treatment of labor costs, financial costs would be larger.

ROSEAU TO LAYOU SEGMENT (INCLUDING BRIDGES):  
ECONOMIC COSTS AND BENEFITS  
(1981 E.C. DOLLARS)

<u>Years</u>	<u>COSTS</u>		<u>BENEFITS</u>	
	<u>Actual Construction</u>	<u>Maintenance</u>	<u>User Cost Savings</u> <u>Vehicle</u>	<u>Time</u>
1983	4,513,286*	-	-	-
1984	4,513,286*	-	-	-
1985		106,442	1,220,406	410,461
1986		106,442	1,257,015	442,775
1987		125,850	1,294,726	435,458
1988		125,850	1,333,567	448,522
1989		125,850	1,373,574	461,978
1990		125,850	1,414,782	475,837
1991		737,100	1,457,225	490,112
1992		106,442	1,500,942	504,815
1993		106,442	1,545,970	519,960
1994		125,850	1,592,349	535,559
1995		125,850	1,640,120	551,625
1996		125,850	1,689,323	568,174
1997		125,850	1,740,003	585,219
1998		737,100	1,792,203	602,776
1999		106,442	1,845,969	620,859
2000	-----	106,442	1,901,348	639,485
2001		125,850	1,958,389	658,670
2002	-----	125,850	2,017,140	678,430

\*Because of our treatment of labor costs, financial costs would be larger.

**LAYOU TO PONT CASSE SEGMENT:  
ECONOMIC COSTS AND BENEFITS  
(1981 E.C. DOLLARS)**

<u>Years</u>	<u>COSTS</u>		<u>BENEFITS</u>		
	<u>Actual Con- struction</u>	<u>Maintenance</u>	<u>User Cost Savings</u> <u>Vehicle</u>	<u>Time</u>	<u>Production Gains</u>
1983	2,666,115*	-	-	-	-
1984	2,666,115*	-	-	-	-
1985		98,253	1,308,526	246,067	238,400
1986		98,253	1,406,665	264,522	238,400
1987		116,167	1,448,865	272,458	238,400
1988		116,167	1,492,331	280,631	238,400
1989		116,167	1,537,101	289,050	238,400
1990		116,167	1,583,214	297,722	238,400
1991		680,400	1,630,711	306,654	238,400
1992		98,235	1,679,632	315,853	238,400
1993		98,253	1,730,021	325,329	238,400
1994		116,167	1,781,922	335,089	238,400
1995		116,167	1,835,379	345,141	238,400
1996		116,167	1,890,441	355,495	238,400
1997		116,167	1,947,154	366,160	238,400
1998		680,400	2,005,569	377,145	238,400
1999		98,253	2,065,736	388,460	238,400
2000		98,253	2,127,708	400,113	238,400
2001		116,167	2,191,539	412,117	238,400
2002		116,167	2,257,285	424,480	238,400

\*Because of our treatment of labor costs, financial costs would be larger.

## 5C(2) - PROJECT CHECKLIST (STATUTORY)

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

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

### A. GENERAL CRITERIA FOR PROJECT

- |   |   |
|---|---|
| <p>1. <u>FY 79 App. Act Unnumbered; Faa Sec. 653(b); Sec. 634A.</u> (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure)?</p> | <p>A Congressional Notification has been forwarded to congress.</p> |
| <p>2. <u>FAA Sec. 611(a) (1).</u> Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?</p>   | <p>Yes.</p>   |
| <p>3. <u>FAA Sec. 611(a) (2).</u> If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?</p>  | <p>No further legislative action is required.</p>                   |
| <p>4. <u>FAA Sec. 611(b); FY 79 App. Act Sec. 101.</u> If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and</p>  | <p>N/A</p>  |

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Related Land Resources dated  
October 25, 1973?

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? Yes.
6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. This project is not susceptible of execution as part of a regional program.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. The project will rehabilitate a key section of the country's national road network and, as such, will directly support a, b, d and e.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). U.S. goods and services will be used in the project as appropriate.

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9. AA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services. **The host country is providing staff, equipment and related support for the project.**
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? **No.**
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? **Yes.**
12. FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? **N/A**

**B. FUNDING CRITERIA FOR PROJECT**

**1. Development Assistance Project Criteria**

- a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development **N/A**

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by extending access to economy at local level, increasing labor-intensive production and the use appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

- b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source).

N/A

(1) (103) for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; (103A) if for agricultural research, is full account taken of needs of small farmers;

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(2) (104) for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(3) (105) for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) (106) for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(i) Technical cooperation and development, especially with U.S. private and voluntary, or regional and international development organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

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(iv) reconstruction after natural or manmade disaster;

(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

- c. (107) is appropriate effort placed on use of appropriate technology? N/A
- d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)? N/A
- e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? N/A
- f. FAA Sec. 201(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes N/A

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the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.

- g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth? N/A

2. Development Assistance Project Criteria (Loans Only)

- a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects. N/A

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

3. Project Criteria Solely for Economic Support Fund

- a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? Yes.

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