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**PROJECT COMPLETION REPORT**

**HAITI FIFTH TRANSPORT PROJECT**

**(CREDIT 807-HA)**

**March 12, 1984**

**Latin America and the Caribbean  
Regional Office**

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HAITI

FIFTH TRANSPORT PROJECT (CREDIT 807-HA)

PROJECT COMPLETION REPORT

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MAP

IBRD N° 13293-R (PCR) - Haiti - Fifth Transport Project

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PREFACE

The following is a Project Completion Report on the Haiti Fifth Transport Project, for which Credit 807-HA, in the amount of US\$15.0 million, was approved by the Executive Directors on May 18, 1978. The Credit is 99% disbursed and the remaining funds are expected to be disbursed by the estimated closing date of June 30, 1983.

This Completion Report was prepared by the Bank's Latin America and the Caribbean Regional Office and is based on information obtained from the files of LAC Information Center, Minutes of the Board Meeting, Appraisal and Supervision Reports, information gathered by the Bank staff completion missions that visited Haiti in September and October of 1982, and from a final report prepared by the Autorite Portuaire National on the port element of the project.

In accordance with the revised procedures for project performance audit reporting, this Project Completion Report was read by the Operations Evaluation Department (OED) but the project was not audited by OED staff. The draft report was sent to the Borrower for comments; however, none were received.

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BASIC DATA SHEETS

Key Project Data

<u>Item</u>	<u>Original Plan</u>	<u>Actual</u>
Total Project Cost (US\$million)	20.47	20.80
Overrun (%)	-	-
Loan Amount (US\$million)	15.00	15.00
Disbursement (4/22/83)	15.00	14.82
Economic Rate of Return (Hwy.Component) <u>1/</u>	24.00	21.00
Economic Rate of Return (Port Component) <u>2/</u>	13.00	8.00
Date Physical Components Completed	06-30-81	04-82
Financial Performance	-	good
Institutional Performance	-	fair
Proportion of Time Overrun (%)	-	28

Other Project Data

First Mentioned in Files	-	02-15-76
Appraisal	-	10-77
Negotiations	-	04-78
Board Approval	04-78	05-18-78
Credit Agreement Date	-	06-09-78
Effectiveness Date	08-15-78	09-26-78
Closing Date	12-13-81	06-30-83
Borrower	Republic of Haiti	
Executing Agencies	Autorite Portuaire Nationale and Secretairerie d'Etat des Travaux Publics, Transports et Communication	
Fiscal Year of the Borrower	10-01 - 09-30	
Follow-on Projects		
Name	Sixth Highway Project	
Credit Number	1220-HA	
Amount (US\$million)	14.0	
Credit Agreement	04-27-82	
Name	Port Development Project	
Credit Number	1121-HA	
Amount (US\$million)	11.0	
Credit Agreement	04-13-81	

1/ Excluding Marche Leon Road

2/ Excluding Port-de-Paix

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MISSION DATA <sup>1/</sup>

<u>Type</u>	<u>Sent by</u>	<u>Month/Year</u>	<u>N° of Weeks</u>	<u>N° of Persons</u>	<u>Manweeks</u>	<u>Date of Report</u>
Identification	LCPHW	03-01-76	1	2	2	not in full
Preparation	LCPHW	02-08-77	1.1/2	3	4-1/2	03-01-77
Preparation	LCPHW-LCPPR	04-11-77	1	3	3	04-29-77
Preparation	LCPHW-LCPPR	06-20-77	1.1/2	2	5	07-06-77
Preparation	LCPPR	08-22-77	1	2	2	09-12-77
Appraisal	LCPHW-LCPPR	10-14-77	3	6	13-1/2 <sup>2/</sup>	05-04-78
Supervision	LCPPR	06-05-78	1	1	2	07-15-78
Supervision	LCPHW	07-24-78	2	1	2	09-28-78
Supervision	LCPPR	08-24-78	1/2	1	-	09-14-78
Supervision	LCPPR	10-29-78	1	2	2	12,29-78
Supervision	LCPHW	01-15-79	1	1	1	04-06-79
Supervision	LCPPR	04-01-79	1/2	2	1	04-19-79
Supervision	LCPHW	06-18-79	1	1	1	07-06-79
Supervision	LCPPR	07-22-79	1	3	3	08-23-79
Supervision	LCPPR	12-21-79	1	3	3	01-09-80
Supervision	LCPHW	01-09-80	1	2	2	02-19-80
Supervision	LCPPR	03-10-80	1	1	1	04-14-80
Supervision	LCPHW	04-21-80	1	3	3	05-05-80
Supervision	LCPPR	04-27-80	1	2	2	06-23-80
Supervision	LCPPR	07-14-80	2	3	6	07-31-80
Supervision	LCPPR	09-29-80	1	3	3	10-17-80
Supervision	LCPHW	09-10-80	1	1	1	10-30-80
Supervision	LCPPR	12-22-80	1	2	2	01-23-81
Supervision	LCPHW	01-29-80	2	2	4	02-12-81
Supervision	LCPPR	03-23-81	1	2	2	04-30-81
Supervision	LCPPR	06-22-81	1	2	2	07-17-81
Supervision	LCPHW	06-01-81	2	2	4	08-14-81
Supervision	LCPPR	08-27-81	1/2	2	1	09-04-81
Supervision	LCPPR	11-15-81	1	4	4	12-11-81
Supervision	LCPPR	03-19-82	1	2	2	04-28-82
Supervision	LCPHW	05-10-82	1	1	1	06-04-82
Supervision	LCPPR	07-19-82	1	2	2	08-27-82
Completion	LCPHW	09-21-82	1	1	1	10-28-82
Completion	LCPPR	10-18-82	1/2	3	1-1/2	11-03-82

Total Supervision Effort

	<u>FY1978</u>	<u>FY1979</u>	<u>FY1980</u>	<u>FY1981</u>	<u>FY1982</u>	<u>FY1983 (December)</u>
Staff weeks	4.7	19.6	20.3	14.6	10.4	7.9

<sup>1/</sup> Most of these missions included work for the preparation and supervision of Credit 1121-HA and Credit 1220-HA.

<sup>2/</sup> Not all members of the appraisal mission stayed in Haiti for three weeks.

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HIGHLIGHTS

The Fifth Transport Project (Credit 807-HA) achieved its main objectives of upgrading 54 km of roads in the Northern Plain Area, replacing two bridges and improving three pilot coastal shipping ports to test the capability of the Port-au-Prince Authority (APP) of extending its role to the smaller ports.

The Project was implemented at a total cost in line with the appraisal estimate (para 4.01) and with a time overrun of about a year, caused mainly by the delays in (a) completing the construction of the ports (para 3.08) and (b) upgrading the Limonade-Trou du Nord Road Section (para 3.05).

The economic reevaluation confirms the probable viability of most of the road and bridge works included in the project (para 5.04). However, in the case of the three ports, a meaningful economic reevaluation can take place only when the whole system of coastal shipping ports being developed under Credit 1121-HA is in place and related support services to the merchant fleet become effective (para 5.05).

The Project Completion Report identifies, as a lesson to be learned from this project, the need for tight supervision of project implementation (para 8.02), since most of the road construction deficiencies (para 3.04) could have been avoided by timely intervention of the consultants in charge of the supervision (para 3.07).

## HAITI

### FIFTH TRANSPORT PROJECT (CREDIT 807-HA)

#### PROJECT COMPLETION REPORT

##### I. INTRODUCTION

1.01 Haiti's island location, its rugged terrain, its dominant coastline, the dispersion of its agricultural production and the importance of its capital city, Port-au-Prince, are of particular significance to its transport sector. In external trade, about 98% of Haiti's freight tonnage is moved by sea, with the balance by air or over land to the Dominican Republic. Up to the 1950s, a significant amount of Haiti's exports moved directly through a number of small coastal ports. As international shipping patterns changed, encouraging centralization, Port-au-Prince became the major international shipping center, handling 90% of the country's general cargo imports and exports. While important tonnages are also handled at specialized private terminals elsewhere (e.g., bauxite, petroleum products, cement and wheat), the concentration of general cargo trade at one port has a major impact on internal transport demand. International passenger traffic is now by air, and by tourist ships, which bring important numbers of one-day visitors, mostly to Port-au-Prince and Cap-Haitien.

1.02 Internal transport moves primarily by land and is largely concentrated on a few recently reconstructed primary roads which form the backbone of the transport system. Coastal shipping accounts for 18% of domestic freight tonnage and 10% of domestic passenger movements. Domestic air travel is light, primarily serving tourists and a limited local market of Government officials and business. Haiti's road network deteriorated drastically during the 1960s because road maintenance was neglected; as a result, provincial centers became isolated from one another and from the capital. Since 1971, the Government has recognized the importance of transport to the level of economic activity and has undertaken the reconstruction of the basic road network.

1.03 Bank Group involvement in Haiti's transport sector began with a Bank Highway Maintenance and Rehabilitation Project (Loan 141-HA, US\$2.6 million, 1956) which involved about 1,000 km of roads. The second operation (Credit 32-HA, US\$350,000, 1962) was an Interim Highway Project to complete works undertaken in the first project. The third and fourth operations (Credit 478-HA, US\$10 million, 1974 and Credit 556-HA, US\$20 million, 1975) included a UNDP-financed National Transport Study, reconstruction of the Northern Road and rehabilitation of major bridges. The subject of this completion report, the Fifth Transport Credit, has been followed by two ongoing transport projects: the Port Development Project (Credit 1121-HA, US\$11 million, 1981) for the construction of port facilities at Cap Haitien and the construction and rehabilitation of terminal facilities in seven coastal shipping ports; and the Sixth Highway Project (Credit 1220-HA,

US\$14 million, 1982) for the rehabilitation and strengthening of 100 km of the Northern Road, the rehabilitation of 57 bridges and various drainage structures, and technical assistance for institution-building in the subsector.

1.04 This completion report is based on information obtained from the files of the LAC Information Center, Minutes of the Board Meeting, Appraisal and Supervision reports for Credit 807-HA, consultant's reports, information gathered by completion missions that visited Haiti in September and October of 1982, and a final report prepared by the Autorite Portuaire National on the port element of the project.

## II. PROJECT PREPARATION, APPRAISAL AND NEGOTIATIONS

2.01 The elements of the road and bridge components of the Fifth Transport Project (Map IBRD 13293R (PCR)) were selected from a priority list established by Haiti's 1977 National Transport Study (NTS) <sup>1/</sup>. This list included: (a) the rehabilitation and upgrading of the road network serving the northern plain east of Cap-Haitien (50 km) as it supported ongoing agricultural development projects; (b) improvement of the first 23 km of the road to Port de Paix (from Carrefour Joffre, on the Northern Road, to Gros Morne) to support the Trois Rivieres Valley development; and (c) improvement of roads linking secondary ports with their immediate hinterland in the framework of a program for the development of coastal shipping.

2.02 A French-Haitian joint venture of consultant firms was retained on February 1977 under the Fourth Highway Project (Credit 556-HA) to carry out feasibility studies for the Northern Plain roads (54 km), the Gros Morne road (23 km) and the access roads to the ports of Jeremie and Port de Paix (3.9 km). The study, completed in September 1977, provided the basis to determine the length and scope of the economically justified improvements. Upgrading of 54 km of roads in the Northern Plain area, together with the replacement of the Trois Rivieres Bridge on the road to Gros Morne and upgrading of the first section of the access road to Jeremie, was retained in the project. In September 1977, the scope of the study was extended to include economic assessment and engineering for the reconstruction of the Hyppolite Bridge, which collapsed in August 1972 <sup>2/</sup>. The high incidence of bridge failures and the critical importance of river crossings in maintaining access to regions and rural communities prompted inclusion under the project of a study for the preparation of a countrywide program for bridge reconstruction and rehabilitation.

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<sup>1/</sup> The Study, financed by a UNDP grant (US\$600,000), was carried out by US consultants during the period 1975-1977, with the Bank acting as executing agency.

<sup>2/</sup> Completed in mid-1978, after appraisal.



2.03 The study also concluded that projected volumes of traffic in coastal shipping would justify investment in port improvements and in modernization of the fleet; to accommodate the expected traffic, it proposed the improvement of port facilities at 19 coastal locations. As a result of discussions of the study's findings and recommendations between the Government and the Bank in February 1977, it was agreed to proceed with a pilot project in coastal shipping port development to test APP<sup>3/</sup> capability of extending its role to the smaller ports. Port-au-Prince, Jeremie, and Port-de-Paix were selected for initial terminal improvement since they were considered to be of key importance to the future development of coastal shipping.

2.04 To prepare the pilot ports component of the project, the Government retained the same firm that prepared the feasibility studies for the Northern Plain roads (para 2.02) for an engineering and economic study. A US firm was contracted for an organization and financial study to provide recommendations on (a) the institutional arrangements to be made by APP for implementation and operation of ports included in the project and (b) the structure and level of user charges for the port terminals. Financing for these studies was provided under the Fourth Highway Project (Credit 556-HA). It was also decided that the project would include management advisory services to APP to provide assistance in the implementation of recommendations made in the above-mentioned organization and financial study, as well as a Coastal Shipping Development Study leading to the identification and preparation of future port projects, the definition of the coastal shipping fleet development best suited for conditions prevailing in Haiti, and a feasibility study for an international port terminal at Cap-Haitien.

2.05 The project was appraised in October 1977. Since the appraisal mission's recommendations did not differ substantially from the approach agreed within the Bank prior to appraisal, no Decision Meeting was held, and a combined Issues Paper/Decision Memorandum was issued on December 16, 1977. It highlighted the following:

- (a) Transport Investment Policy: the Government had not fully complied with the covenants of Credit 556-HA calling for the formulation of a transport investment plan for the period 1977-1981, although a de facto plan existed as a result of international and bilateral agencies following the recommendations of the NTS concerning investment priorities. It was agreed that, during negotiations, the Government should undertake to prepare and adopt, after consultation with the Association, a five-year transport investment program for the period 1979-1983, and should update the program annually. This was later translated into covenants in the Credit Agreement.

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<sup>3/</sup> Autorite Portuaire Port-au-Prince, later converted to the Autorite Portuaire Nationale (APN).

(b) Financial Plan for Coastal Shipping Ports: since most of the population of the rural areas to be served by coastal shipping under the pilot project were at the absolute poverty level, it was felt important to charge users, as a starting point, only enough to cover operation and maintenance costs. It was therefore agreed that IDA accept rate structures based on such minimum requirements, provided that (i) the Government would give a one-time equity contribution for the construction of the coastal shipping ports during 1978-1979 and (ii) port charges would be revised annually to keep in line with inflation. It was decided that the obligations of APP should be defined in a Project Agreement and that the Government of Haiti should have a Supplementary Agreement with APP, providing for on-lending of credit amounts at 0.75% interest for a period of 25 years, including a six-year grace period.

2.06 Negotiations were conducted in Washington between the 5th and the 14th of April, 1978, and a credit of US\$15 million equivalent was approved by the Executive Directors on May 18, 1978.

2.07 The different project elements and their estimated costs as given in the Appraisal Report were:

	US\$ Millions		Total	Foreign Exchange Component (%)
	Local	Foreign		
<b>A. Roads and Bridges</b>				
(a) Civil Works	3.22	8.29	11.51	72
(b) Supervision	.19	.75	.94	80
Sub-total	3.41	9.04	12.45	
(c) Pre-investment Studies	.10	.40	.50	80
(d) Base Cost	3.51	9.44	12.95	
<b>B. Ports and Coastal Shipping</b>				
(a) Civil Works	.74	1.90	2.64	72
(b) Engineering and Supervision	.10	.38	.48	80
Sub-total	.84	2.28	3.12	
(c) Pre-investment Studies	.22	.88	1.10	80
(d) Technical Assistance	.06	.23	.29	80
(e) Base Costs	1.12	3.39	4.51	
<b>C. Contingencies</b>				
(a) Physical, Roads (7% A(a))	.25	.66	.91	72
(b) Physical, Ports (15% B(a))	.11	.29	.40	72
(c) Price Escalation	.48	1.22	1.70	72
Sub-total	.84	2.17	3.01	
Total	5.47	15.00	20.47	73

The project was expected to be completed by June 30, 1981, and the Credit Closing Date was set at December 31, 1981.

### III. PROJECT IMPLEMENTATION

#### Roads and Bridges

3.01 Works for roads and bridges were divided into four lots as follows:

- I. North Plain Roads <sup>4/</sup>
- II. Trois Rivieres Bridge
- III. Marche Leon Access Road
- IV. Hyppolite Bridge

Bids were received on November 15, 1978, and awards to the lowest bidders were announced on December 15, 1978. Lots I, II and IV were awarded to a French contractor, while Lot III was awarded to a local firm. The Government elected not to use the 15% preference for local firms. Contracts for civil works were signed on January 19, 1979, and notice to proceed was given on February 5, 1979.

3.02 At the time of appraisal, a paved road was foreseen on the entire 54 km comprising Lot I. However, because of past experience with high contract costs in Haiti, bids included a provision for an alternative design for gravel surface on the Limonade-Trou du Nord road section (10 km), in case the cost of paving the entire 54 km would exceed the amount of funds available for the upgrading of Lot I. Contractors' bid prices were below appraisal estimates, and, in July 1979, the Government requested, and IDA agreed, to the paving of the 10-km road section. A contract's clause however, allowed the contractor to renegotiate unit prices should the variance of quantities exceed 15%. Since there was an increase in quantities on the work performed on Lots I, II, and IV, the work on the Limonade-Trou du Nord section would exceed the 15% limit, and the contractor insisted that unit prices be revised for the entire contract. TPTC <sup>5/</sup> did not agree to

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4/ Lot I included originally the following road sections:

- (a) Cap-Haitien-Carrefour La Mort (7.3 km)
- (b) Carrefour La Mort-Limonade (7.0 km)
- (c) Limonade-Trou du Nord (13.0 km)
- (d) Carrefour La Morte-Barriere Battante (9.0 km)
- (e) Barriere Battante-Grande Riviere du Nord (11.3 km)
- (f) Barriere Battante-Milot (2.8 km)
- (g) Plain du Nord-Northern Road (3.5 km)

5/ Ministry of Public Works, Transportation and Communications.

renegotiate the basic contract's unit prices for work already done and decided to invite new bids for the construction of the Limonade-Trou du Nord road section, which became Lot V.

3.03 Construction of Lots I, II and IV was completed and provisionally accepted by the Government at various dates between March and August 1980, averaging about one month behind schedule. The slight delays were mostly related to heavy rains during March 1979 and the ensuing changes in drainage design prompted by those rains <sup>6/</sup>. Final acceptance of the lots was due one year after their provisional acceptance. In April 1982, the Government gave final acceptance for Lot IV but declined to accept Lots I and II until the contractor had carried out the necessary repairs to pavement, shoulders and other road appurtenances in compliance with his contractual obligations. The contractor complied, and the Government will give final acceptance for both lots on May 31, 1983. The total cost of upgrading the 41 km of the Northern Plain roads included in Lot I was US\$6,303,285, or US\$153,787 per km. The total costs of replacing the Trois Rivieres Bridge (Lot II) and the Hyppolite Bridge (Lot IV) were US\$1,067,319 and US\$1,410,092 respectively.

3.04 Lot III was completed and provisionally accepted by the Government in July 1980, with almost two months delay due to the heavy rains of March 1979 (para 3.03) and to increased earthwork quantities because the road was widened from 5.0 m to 6.0 m. The final cost of this element of the project was US\$1,466,370 (US\$114,560 per km).

3.05 Construction of Lot V (Limonade-Trou du Nord) was contracted by the Government with a US-Haitian consortium on August 13, 1980. The contractor was given authorization to proceed on August 21, 1980, with completion of works scheduled for March 1981. Works were provisionally accepted by the Government in April 1982, a year later than expected, and final acceptance will be given on May 27, 1983. Delays were due to the contractor's late mobilization, requests by TPTC to modify some original drainage designs and tardy approval of proposed work order changes by the supervision consultants, difficulties with customs clearances, and problems with the delivery of bitumen by oil companies. The final cost of this road section was US\$2,080,000 (US\$148,571 per km).

3.06 The final cost of the roads and bridges elements of the project was US\$12.40 million, or 7% below the appraisal estimate of US\$13.34 million (including physical and price contingencies). The savings brought about by the improvement of the Northern Plain roads, at a cost of 14% below the appraisal estimate of US\$9,561,800, and the replacement of the Hyppolite Bridge, at a final cost of 46% below the appraisal estimate of US\$2,063,500,

6/ These included (i) raising of portions of the road grade at some locations and construction of additional culverts, and (ii) the construction of two bridges and a box culvert on the road connecting the Trois Rivieres Bridge to the North Road, at points where traffic was interrupted due to flooding.

were partly offset by the cost overruns experienced by the replacement of the Trois Rivières Bridge and the improvement of the Marche Leon access road. In the case of the Trois Rivières Bridge, the final cost was 7% above the appraisal estimate of US\$1,000,200, while, for the Marche Leon access road, the widening of the road bed (para 3.04) resulted in a final cost 105% above the appraisal estimate of US\$714,500.

3.07 Construction supervision was carried out by a joint venture of French-Haitian consultants supported by TPTC's Construction Service and National Laboratory staff. The consultants provided both off-site and on-the-job training to the local engineers and technical support staff assigned to the project. Overall performance of the supervision team was below expectations. Had the foreign consultants spent more time on the project site, many of the construction deficiencies (para 3.03) could have been avoided by timely intervention. The final cost of supervision was US\$1.4 million, 16% more than estimated at appraisal. It represents 9% of the total cost of the civil works. The cost of supervision, although reasonable, was higher than estimated at appraisal, largely because the consultants services had to be extended until the completion of Lot V (para 3.05).

#### Coastal Ports

3.08 Contracts for the construction of the three pilot ports were awarded to the lowest bidder, a firm from the Dominican Republic. Civil works started in March 1979, three months behind schedule (mainly because of slow legal procedures in contract awards) and were satisfactorily completed between January 1981 and January 1982, an average of a year after appraisal estimate of June 1980. The reasons for the delays in construction were:

- (a) hurricane damages in the Dominican Republic and in Haiti which affected the contractor's performance;
- (b) serious delays in granting of permission to use dynamite in quarries, which caused total stoppage of construction of the Port of Jeremie for several weeks;
- (c) problems between the contractor and his trucking subcontractor; and
- (d) supplementary construction at the Port of Jeremie.

3.09 The design of the original construction contract for the Port of Jeremie assumed a maximum wave height of 1.5 m. Subsequent observations estimated waves of 2.0 m, and, on that basis, the firm in charge of the supervision recommended changes in the design of the slope protection. A separate contract was negotiated with the firm already in charge of the ports construction to carry out the supplementary works at an estimated cost of about US\$400,000. Works were completed in October 1981. Supplementary financing was provided by Credit 1121-HA.

3.10 Total cost of construction (excluding engineering) of the three coastal ports was US\$3,997,228, or 19% above the appraisal estimate of US\$3,349,000. The higher cost resulted principally from the supplementary works carried out in the Port of Jeremie (para 3.09) and from additional works required to repair Port de Paix after a slope failure.

#### Coastal Shipping Study

3.11 Concurrently with the initiation of terminal development at the three pilot ports, a two-phase Coastal Shipping Development Study (CSDS) was undertaken, as part of the project, to assist the Government in defining a program for development of Haiti's coastal shipping system in the next decade. A US firm was retained to carry out the study. During 1979, Phase I of the CSDS, for which the Bank acted as UNDP's executing agency, reviewed all existing coastal ports and fleet operations, prepared traffic projections and developed and evaluated alternative systems solutions. This operation resulted in recommendations to support the development of a regularly scheduled service by modernized motor vessels among 11 coastal ports (the three pilot ports, Cap-Haitien and seven others) and to supplement the motorized service by improved feeder services of conventional sailboats to and from smaller communities. The total cost of this phase of the Study was US\$160,000.

3.12 Phase II of the CSDS, financed by IDA, was initiated in late 1979 and completed in September 1980 at a cost in line with the appraisal estimate of US\$500,000. It consisted of preliminary engineering designs, economic analysis and financial forecasts for port terminal developments at the following Ports : Gonaives, Anse a Galets, Baraderes, Corail, Anse d'Hainault, Port-a-Piment and Les Cayes. This phase of the CSDS provided the basis for appraisal of the coastal shipping ports component of Credit 1121-HA.

#### Cap-Haitien Port Study

3.13 The project also included financing for the preparation of a long-range port development plan for Cap-Haitien and a feasibility study for the first phase of the recommended construction. To undertake this work, APN selected a French consulting firm, which, in 1979, surveyed existing conditions, assessed alternative development schemes and recommended a program of port improvements, which was discussed with representatives of the local community and APN officials. Upon general agreement regarding the recommended ports development program, the consultants prepared preliminary engineering designs, economic and financial analysis and a final report on the next stage of port development, which constitutes the major part of the project financed under Credit 1121-HA. The final cost of the study was US\$545,722, or 9% below the appraisal estimate of US\$600,000.

### Management Advisory Services to APN

3.14 The same consultants who carried out the CSDS were retained to provide Management Advisory Services to APN. The main objective of the Services was to assist APN in adopting the various recommendations of the "Organization and Financial Study" - March 1978 (financed under Credit 556-HA) for the management and operation of the coastal shipping ports and, particularly, to design appropriate accounting, budgeting and management procedures.

3.15 The consultants commenced their work in February 1979 and were expected to complete their assignment in August 1980. Their services were extended until February 1981, mainly because training of personnel in the newly designed system was postponed so that it could immediately precede the opening of the pilot ports. The two-month long training program, attended by twelve APN employees, was completed in December 1980. To prepare the trainees for the actual work on the coastal services, the activities were practical-situation-oriented. Then, operation of the pilot ports and of the Coastal Ports Department was simulated for a three month period, and the trainees were exposed to different work phases. The program was successful: in addition to the training aspect, it demonstrated that the new procedures are soundly designed and that the various new manuals suitably assist staff in the administration of the coastal services. The final cost of this technical assistance was US\$285,000 compared with the appraisal estimate of US\$290,000.

3.16 Different accounting systems are used in Port-au-Prince and in Cap-Haitien. Since the accounting system developed under the Management Advisory Services for the coastal shipping pilot ports is expected to provide more meaningful information for management control, the system is being extended to other coastal shipping ports being constructed under the Port Development Project (Credit 1121-HA) as they become operational under APN's jurisdiction. Credit 1121-HA provides financing for a variety of technical assistance services required by APN in the development of its program.

### Bridge Rehabilitation Program

3.17 The project financed an engineering/economic study to review the problem of bridges and structures in Haiti and to recommend a five-year program for the rehabilitation and repairs of the existing bridges and the construction of new bridges, box culverts and concrete fords. The study was carried out by a German consulting firm which started work in June 1980 and presented its draft report in January 1981. A total of some 350 different drainage structures, of which 100 were bridges, were inspected and evaluated. Only 19 bridges were found in good condition; 31 required minor repairs and 35 intensive repairs; 15 bridges needed to be replaced. The study, completed at a total cost of US\$665,000, served to identify the program being carried out under the Sixth Highway Project (Credit 1220-HA).

### Pavement Rehabilitation and Strengthening Program

3.18 Preparation of a Pavement Rehabilitation and Strengthening Program was carried out by a French-Haitian joint venture that was contracted on

December 15, 1980. The consultants prepared a detailed technical economic study on some 553 km of paved roads, including the Northern Road (Port-au-Prince to Cap-Haitien, 250 km), the Southern Road (Port-au-Prince to Cayes, 180 km); the Jacmel Road (connecting the Southern Road to Jacmel, 43 km), the Mirabalais Road (connecting Mirabalais to Port-au-Prince, 50 km) and the Ganthier Road from (Croix de Bouquets to Fond Parisien, 29 km). The study was completed on May 25, 1981 at a total cost of US\$303,000 and served as the basis for the ongoing Sixth Highway Project. Total cost for both the Bridge Rehabilitation (para 3.16) and the Pavement Rehabilitation and Strengthening Studies was US\$968,000 or 94% above the appraisal estimate of US\$500,000. The higher-than-expected final cost was mainly due to the fact that final engineering of the subprojects selected to be financed under Credit 1220-HA was carried out as part of these studies; this had not been envisaged at the time of appraisal.

#### IV. COST ESTIMATES AND DISBURSEMENTS

4.01 A summary comparison between appraisal estimates and final costs is shown in Table 1. The final total cost of the project was US\$20.8 million, about 2% over the appraisal estimate of US\$20.47 million, including contingencies. The substantial cost overruns in the engineering and supervision of the civil works as well as in the pre-investment studies for roads and bridges, due to the expanded scope of work, were mostly offset by the 10% below appraisal estimate of the final cost of the civil works on road and bridges.

4.02 The allocation of credit funds was revised once, as shown in the following tabulation, to distribute the unallocated funds among the different credit categories.

<u>Category</u>	<u>Original Allocation</u>	<u>4/10/81</u>
<u>Part A of the Project</u>		
(1) Civil works, roads and bridges	8,820,000	8,820,000
(2) Consultants' services	1,290,000	1,900,000
<u>Part B of the Project</u>		
(3) Phase II of coastal shipping Study	400,000	600,000
<u>Part C of the Project</u>		
(4) Civil Works, coastal shipping ports	2,190,000	2,310,000
(5) Engineering and supervision	380,000	600,000
(6) Management advisory services	230,000	230,000
(7) Consultants' services	480,000	540,000
<u>Part A, B, and C of the Project</u>		
Unallocated	<u>1,210,000</u>	<u>-</u>
Total	<u>15,000,000</u>	<u>15,000,000</u>



4.03 As shown below, disbursement lagged behind appraisal estimates from the start, mainly because of delays in constructing the ports. Disbursements against civil works and consultants' services, originally set at 72% and 80% respectively, were changed to 60% at the time of loan funds reallocation to permit the Bank participation until project completion. The Closing Date was extended three times, from the original of December 31, 1981 to June 30, 1982, then to December 31, 1982, and finally to June 30, 1983.

<u>IDA</u> <u>Fiscal</u> <u>Year</u>	<u>Appraisal Estimate</u>		<u>Actual</u>	
	<u>Amount</u>	<u>% of</u> <u>Total</u>	<u>Amount</u>	<u>% of</u> <u>Appraisal Estimate</u>
1979	4.2	28	2.0	48
1980	12.7	85	8.5	67
1981	14.8	99	13.2	89
1982	15.0	100	14.3	95
1983	-	-	14.8 <sup>7/</sup>	-

## V. ECONOMIC EVALUATION

### Roads and Bridges

5.01 The ex-post economic evaluation of the roads and bridges in the project is based on the methodology used at the time of appraisal. It comprises an analysis of quantifiable benefits, including savings in vehicle operating costs, reduced travel distance, savings in road maintenance cost and users' time savings (estimated separately). Benefits were calculated on the basis of the latest available vehicle operating costs for Haiti and base year traffic counts carried out in December, 1982 by the Secretariat of Public Works, Transport and Communications. Because of the Secretariat's budgetary difficulties, recent traffic counts on the Marche Leon access road and the Trois Riviere Bridge could not be obtained <sup>8/</sup>.

5.02 An estimation of the probable economic merits of the Trois Riviere Bridge was carried out using traffic counts taken on the Gonaives-Gros Morne road during mid-1981 for the appraisal of the Sixth Highway Project. However, no data were available for the reevaluation of the 12.8-km Marche Leon access road. Because of its isolated location, the gathering of data on agricultural production in the area of influence of the road represented a task beyond the Ministry's present capabilities.

<sup>7/</sup> As of April 22, 1983, about US\$183,000 of credit funds were still undisbursed.

<sup>8/</sup> The adequacy of the Ministry's collection of traffic data is being addressed under the Sixth Highway Project. At negotiations of Credit 1121-HA, the Government agreed to carry out traffic counts thrice annually on selected points nationwide, and locally when requested.

5.03 Table 2 summarizes the principal indicators of the economic evaluation. Average annual traffic growth during the period 1979-1982 --except for Carrefour La Mort-Limonade, Carrefour-La Morte-Barriere Battante and the Hypolite Bridge-- was less than expected at appraisal. Projected traffic growth for the economic reevaluation, therefore, was estimated using more conservative rates, except in the case of the Cap-Haitien-Carrefour La Mort road section, where planned improvements to the Port of Cap-Haitien will most likely help the traffic growth expected at the time of appraisal to materialize. The underlying assumption for the still substantial projected traffic growth is that it is starting from a very low base, and, since Haiti is experiencing an important shift from animal to motor vehicle transport which is taking place even with the decline of economic activity in the last two years, projections based solely on the income elasticity of demand for transport would be inappropriate.

5.04 As shown in Table 2, the reestimated IRRs confirm the probable economic viability of the subprojects, except for the Plain du Nord-Northern Road Section, for which a first year benefit of about 6% suggests that the improvement of that road might have been premature. The results of the economic reevaluation of the Carrefour-La Mort-Barriere Battante, Barriere Battante-Grand Riviere du Nord, and Barriere Battante-Milot require some qualifications. For these three road sections, only aggregated cost figures were available; pro-rating costs on the basis of kilometers probably underestimates the cost of the Barriere Battante-Milot road section and overestimates the cost of the other two subprojects. The use of actual economic costs for each road section would most likely reduce the IRR of Barriere-Battante-Milot and increase that of Carrefour la Mort-Barriere Battante and Barriere Battante-Grand Riviere du Nord.

#### Coastal Shipping Ports

5.05 The objectives of the coastal shipping ports component of the project were stated as "the modernization of three coastal ports and related institutional measures as an initial step to develop more fully the potential of coastal shipping" (para 5.01 of SAR). In view of APN's success in expanding its role to the three pilot ports and, through the ongoing work under Credit 1121-HA, to eight additional ports, it appears that these objectives have been met. The success or failure of the longer range objective to develop a coastal shipping system for Haiti can be evaluated only after the eleven ports financed under Credit 1121-HA have been completed and related support services to the merchant fleet have become effective. Therefore, a meaningful evaluation of the economic impact of coastal shipping development in Haiti should take place not earlier than 1986.

5.06 For the purpose of this report, a quantified evaluation of the coastal ports component of the project was carried out, based, as in the project appraisal, on the following expected benefits:

- (a) difference in cargo handling cost;
- (b) improved protection to ships and cargo;
- (c) improved passenger handling;
- (d) reduced transit time for cargo (Jeremie); and
- (e) reduced road distance to city center (Port-au-Prince).

The analysis was performed only for the ports of Jeremie and Port-au-Prince since the available data were insufficient for evaluating the Port-de-Paix subproject. The economic reevaluation of the ports of Jeremie and Port-au-Prince yielded estimated IRRs of 9% and 7% respectively, versus appraisal estimates of 13% and 13.7%. These estimates, however, should not be regarded as firm since the data base from which they were derived is very weak. Although coastal traffic in the last two years seem to have experienced a downturn, recorded traffic substantially underestimates actual traffic, possibly by as much as 50%. Furthermore, as discussed in paragraph 5.05, these ports should be evaluated as part of an integrated coastal shipping program at a later date.

## VI. PERFORMANCE OF THE BORROWER AND EXECUTING AGENCY

6.01 The performance of the Borrower in relation to the compliance of the covenants included in the Credit and Project Agreements has been mixed. As obligated by those Agreements, the Borrower:

- (a) prepared, and is implementing, a program of work in connection with transport planning (Section 4.02 of the Credit Agreement);
- (b) adopted a revised program for investment in the transport sector for the period 1981-1982 and developed a five-year plan for 1981-1986 (Section 4.03 of the Credit Agreement);
- (c) provided adequate maintenance of the North Road (financed under Credits 478-HA and 556-HA) and implemented the annual physical work program for road maintenance for 1977-1981. A 1982-1986 maintenance program was prepared by TPTC and reviewed by the Association (Section 4.04 (a) and (b) of the Credit Agreement); and
- (d) revalued the fixed assets of APN and furnished the latter's annual budgets for the Association's comments (Section 4.03 and 4.05 of the Project Agreement).

6.02 What follows discusses those covenants, compliance with which is still pending:

Section 3.02 (d) of the Credit Agreement: "The Borrower shall make available to the APN promptly as needed the equivalent of US\$1,100,000 in the form of equity and the equivalent of US\$120,000 as a grant for the carrying out of the ports element of the project".

The Borrower, because of financial difficulties did not make the funds available to APN as intended. This, together with APN's inability to collect some client's debts on time and the Government's further appropriation of some of the port revenues, has resulted in a serious cash deficiency that increased APN's bank overdraft and the consequent increase in interest payments.

Section 4.05 of the Credit Agreement: "The Borrower shall take all measures necessary to ensure at all times the enforcement of regulations requiring that the dimensions and axle loads of the vehicles using its roads not exceed limits consistent with the structural and geometric design standards of such roads..."

Compliance with this covenant is expected to be realized under the Sixth Highway Project (Credit 1220-HA). The ongoing program has been hampered by frequent breakdowns of weighbridge equipment. Replacement of old equipment is being financed by the Association under Credit 1220-HA. A new law defining levels of fines for overloaded vehicles was enacted in December 1982.

Section 4.06 (c) of the Credit Agreement..."ensure that the charges collected by APN from the operation of the ports included in part C of the Project remain adequate to achieve the working and operating ratios specified in Section 4.06 of the Project Agreement..."

An analysis of coastal shipping tariffs is to be initiated as soon as some experience has been gained in the operation of the three pilot ports; data on these ports are being collected, but it is still too early to draw specific conclusions about the impact of user charges on port usage. APN's records reveal that the present income from the three pilot ports (plus the existing terminal of Cite Simone) barely covers APN's operating cost, but questions have been raised on the accuracy of tonnage and passenger records being kept.

Section 4.04 of the Project Agreement: "The APN shall promptly establish and maintain cost accounting procedures satisfactory to the Association."

Under IDA Credit 1121-HA, consultancy assistance was provided to develop uniform accounting systems for APN's entire operation. As part of the consultants' work, cost accounting will be further developed to ensure that cost center related information, budget comparison, etc., become a tool of port management to analyze and direct port operations. The consultants, who began work on November 16, 1981, have now installed the new system.

Section 4.08 of the Project Agreement: "Ensure that the charges collected by the APN remain adequate to earn an annual rate of return of at least 6%."

An average tariff increase of about 8%, based on a consultants' tariff study completed in 1981, was put into effect in January 1982. However, the covenant's objective of earning a 6% rate of return on average net assets was not attained in 1982 because of the late application of the new tariffs and the considerable shortfall in import traffic. The 1983 budget addresses this problem both through cost-cutting measures and a possible further adjustment in tariffs. However, tariff increases are encountering rising criticism from vessels' operators.

6.03 APN, as Executing Agency for the coastal shipping port components of Credit 807-HA and Credit 1121-HA, has established a new department for this purpose and is expanding its staff to meet the needs of this function. In its performance of all work related to the hiring of consultants and construction contractors for this project, APN has been effective and diligent, in accordance with the requirements of the Project Agreement.

#### VII. ROLE OF THE BANK

7.01 The Bank played an active role in the identification and preparation of the project through its review of, and comments on, the National Transport Study as well as through the financing of the necessary economic and engineering studies under the Fourth Highway Project. The scope and size of the project were well within the capabilities of the executing agencies, and completion times allowed for the various project elements were reasonable.

7.02 Throughout project implementation, the Bank showed an understanding of the economic and political difficulties inherent in the compliance with major covenants relating to the ports' financial performance in the context of a deepening economic recession. However, in the case of the Borrower's failure to make the equity and grant funds available to APN as originally envisaged, the Bank might have taken firmer action, especially since there was a follow-on port development project.

#### VIII. CONCLUSIONS

8.01 The Fifth Transport Project was successfully completed with a one-year time overrun and at a cost only slightly above that expected at appraisal. Although the ex-post economic evaluation of most of the road components of the project confirms its justification, the analysis of the coastal shipping ports element is still preliminary and should be repeated at a later time. Furthermore, data collection should be substantially improved if the results of such analysis are to be kept within a reasonable margin of error. The technical assistance elements of the project were well selected and resulted in two follow-on Bank-financed projects, as well as in a substantial improvement in APN's budgetary reporting.

8.02 Probably the only lesson to be learned from this project is the need for more intensive supervision of project implementation. In the case of the road component, several kilometers of road were treated with poor quality bitumen. On-site supervision could have detected the problem from the beginning, before it became widespread. However, at one time, no Bank missions for the road component visited the project for one year. A closer Bank supervision would have prompted closer supervision by the consultants in charge of supervising the civil works.

HAITI

FIFTH TRANSPORT PROJECT (CREDIT 807-HA)

PROJECT COMPLETION REPORT

Project Cost  
(US\$ Million)

	<u>Appraisal</u> <u>Estimates</u> <sup>1/</sup>	<u>Final</u> <u>Cost</u>	<u>%</u> <u>Variation</u>
<u>A. Roads and Bridges</u>			
a. Civil Works	13.34	12.40	- 7
b. Supervision	1.21	1.40	+ 16
c. Pre-Investment Studies	<u>.55</u>	<u>.97</u>	<u>+ 76</u>
Sub-total	<u>15.10</u>	<u>14.77</u>	<u>- 2</u>
<u>B. Ports and Coastal Shipping</u>			
a. Civil Works	3.30	3.89	+ 18
b. Engineering and Supervision	.53	.81	+ 52
c. Pre-Investment Studies and Technical Assistance	<u>1.52</u>	<u>1.33</u>	<u>- 13</u>
Sub-total	<u>5.34</u>	<u>6.03</u>	<u>+ 13</u>
Total	<u>20.45</u>	<u>20.80</u>	<u>+ 2%</u>

1/ Including physical contingencies

HAITI

FIFTH TRANSPORT PROJECT (CREDIT 807-HA)

PROJECT COMPLETION REPORT

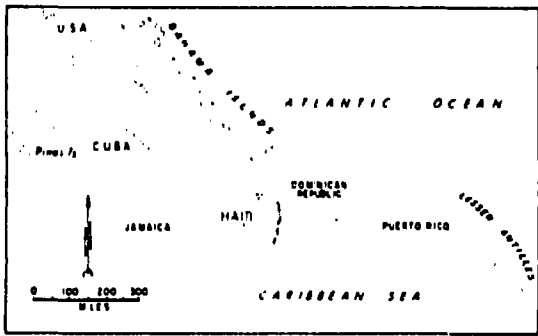
Economic Indicators

	Appraisal Projected Traffic Growth p.a. <u>1979-1998</u>	AADT <sup>1/</sup> <u>1982</u>	Actual Traffic Growth p.a. <u>1979-1982</u>	PCR Project- ed Traffic Growth p.a. <u>1982-1998</u>	% Change between Appraisal and Actual Econ.Costs	Appraisal <sup>2/</sup> IRR	PCR <sup>2/</sup> IRR
Cap Hatien Carre- four-La Mort (7.3 km)	9.8	966	3.5	0.0	0	42-37	22-20
Carrefour-La Mort- Limonade (7.0 km)	9.3	546	17.7	8.0	+ 1	17-16	15-14
Limonade-Trou du Nord (13.0 km)	9.4	173	7.0	6.5	- 17.6	14-13	13-11
Carrefour-La Mort- Barriere-Battante (9 km)	10.3	420	16.2	10.0	+ 1.3	23-21	24-22
Barriere Battante- Grande Riv.du Nord (11.3 km)	8.5	120	8.6	8.0	+ 1.3	15-14	10-09
Barriere Battante Milot (2.8 km)	10.5	154	- 2.9	6.0	+ 1.3	14-10	29-28
Plain du Nord- Northern Road (3.5 km)	8.9	127	0	5.0	- 1	18-16	07-06
Hypolite Bridge (60 m)	10.0	1,198	15.7	10.0	- 3.3	41	97
Trois Riv.Bridge (150 m)	8.5	119	0	4.0	+ 1	above 100	40 <sup>3/</sup>

<sup>1/</sup>Average annual daily traffic

<sup>2/</sup>Higher figures include benefits from time savings.

<sup>3/</sup>This estimated rate of return corresponds to the scenario in which the existing bridge would have collapsed in 1981 if the bridge replacement would have not taken place.

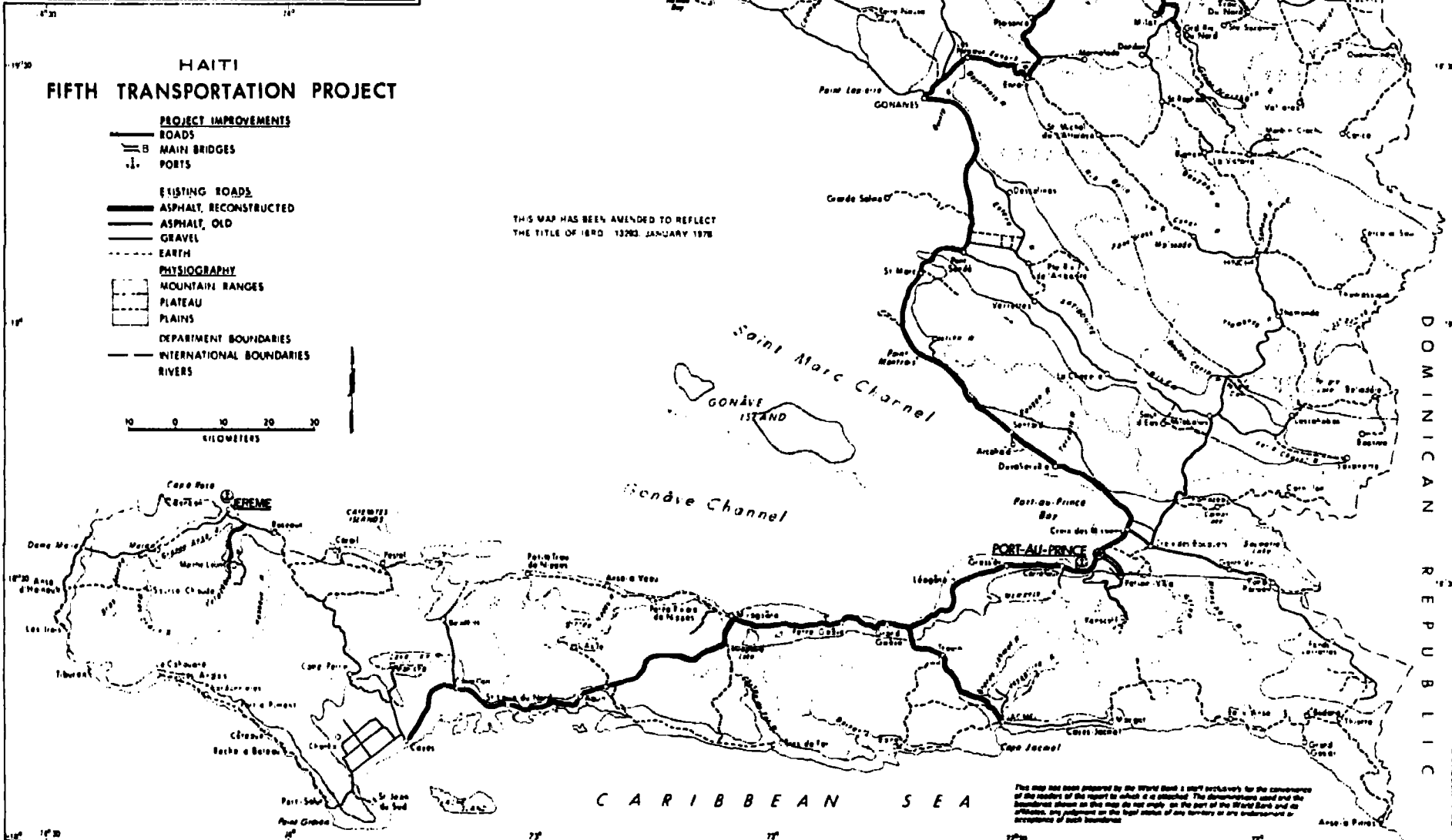


# HAITI FIFTH TRANSPORTATION PROJECT

- PROJECT IMPROVEMENTS**
- ROADS
  - MAIN BRIDGES
  - PORTS
- EXISTING ROADS**
- ASPHALT, RECONSTRUCTED
  - ASPHALT, OLD
  - GRAVEL
  - EARTH
- PHYSIOGRAPHY**
- MOUNTAIN RANGES
  - PLATEAU
  - PLAINS
- DEPARTMENT BOUNDARIES
- INTERNATIONAL BOUNDARIES
- RIVERS



THIS MAP HAS BEEN AMENDED TO REFLECT  
THE TITLE OF IERD 13293, JANUARY 1978



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