CONFIDENTIAL

Report No. 641

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PERFORMANCE AUDIT REPORT

ON

HONDURAS NORTH ROAD PROJECT

(LOAN 400-HO/CREDIT 71-HO)

February 20, 1975

Operations Evaluation Department

PROJECT DATA

	Credit 71-HO	Loan 400-HO
Amount	US$3.5 million	US$6.0 million
Amount Disbursed	US$3.5 million	US$6.0 million
Date of Agreement	February 2, 1965	February 2, 1965
Date of Effectiveness	February 1, 1966	February 1, 1966
Original Closing Date	December 31, 1968	December 31, 1970
Final Closing Date	June 30, 1969	December 31, 1972
Date of Final Disbursement	March 1969	February 1973
First Supervision Report	November 30, 1965	November 30, 1965
Final Supervision Report	January 5, 1973	January 5, 1973

PREFACE

The North Road in Honduras was partially financed by IDA Credit 71-HO and IBRD Loan 400-HO. The credit was fully disbursed in March 1969 and the loan in February 1973. The purpose of this performance audit report is to assess the extent to which the original project objectives were met and to analyze the role of the Bank in meeting these objectives.

The audit is based on Bank correspondence and supervision reports, the quarterly construction progress reports prepared by the consultants, a brief completion report prepared in July 1973 by the Latin America and Caribbean Regional Office, the comparative highway evaluation study prepared by the Operations Evaluation Department, the Stanford Research Institute's A Ten-Year Highway Program for Honduras prepared in 1962, and discussions with Bank staff.

No visit to Honduras was made in connection with this report.

Currency Equivalents: Honduras Lempira (L)

L 2.00 = US$1.00

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SUMMARY

On February 2, 1965, the Bank approved a joint loan/credit in the amounts of US$6.0 million (IBRD) and US$3.5 million (IDA) to provide part of the foreign exchange required to construct the principal central portion of the North Road in Honduras, the backbone to the country's transportation system. The loan/credit was the fourth project approved by the Bank for highway development in Honduras.

The total cost of the project was estimated at US$23.6 million. Of this amount, the Bank and the Inter-American Development Bank (IDB) were each contributing 40%, and the Government was supplying the remaining 20% from its own resources.

The project entailed construction of a 202-km, two-lane highway linking Rio del Hombre and Potrerillos. The road continued from these points southward to Tegucigalpa and northward to San Pedro Sula providing an important connection between the capital and the country's major industrial city. At the time of appraisal there was a narrow, winding gravel road between these centers, and it would have been difficult and uneconomical to upgrade it.

The North Road Project was judged to be vital to the development of the highway network. In the ten-year highway program prepared by the Stanford Research Institute (SRI) in 1962, the North Road was considered as one of Honduras' principal arteries and "..... the key route in the development of a highway network." It was also an important road for Honduras' overall development because of the regions it joined. It passes through one of the country's most productive agricultural zones, Comayagua, and three of the most populated departments. It also links Tegucigalpa with the largest seaport, Puerto Cortes, in the north.

At appraisal a difficult choice had to be made between two alternative possible alignments for the road. Only one of these alignments had been engineered at that time and this was the alignment which was selected. When further investigation led the consultant engineers and then the Government to favor a modification of the alignment which had been discarded at appraisal, the Bank showed reluctance to accept a change but eventually told the Government it was ready to be convinced by appropriate studies and finally accepted the change. The realignment reduced the length of the road from 202 km to 185 km.

The realignment and the additional engineering required, and climatic difficulties and some unforeseen soil problems, delayed completion of the project by about one and a half years to mid-1971, but the whole job, including engineering, was completed for US$25.7 million equivalent, less than 9% above original cost estimates (excluding any addition, possible but not now likely, from settlement of an outstanding claim by one of the contractors).

Driving time between Tegucigalpa and San Pedro Sula has been approximately halved (to 3.5 hours by car, for example) as expected at appraisal and traffic has grown much faster than projected, exceeding the 700 vehicles per day projected by the Bank for 1972 by some 50% and continuing to grow fast. Growth of bus and pick-up traffic and of trailer traffic has been particularly fast.

The relatively small construction cost overrun and more significant delay in project completion are more than outweighed in economic assessment by the much more rapid than expected growth of traffic, so that recalculation of the economic rate of return along the lines used in the appraisal report would yield a return higher than the 20% then estimated.

The Government undertook a number of commitments, in connection with the Loan and Credit Agreements, mainly to improve highway maintenance, administration and planning, and road transport regulation. The Government fulfilled most of these commitments, if not quite as thoroughly and fully as originally envisaged, particularly with regard to maintenance and vehicle weight regulation, but the Bank's urging of effort on these various matters appears to have been constructive and useful.

By mid-1970 the Bank felt that the supervision missions it had been able to send to this project had been too infrequent (one about every nine months on average), and it is probably true that somewhat closer touch with the project would have enabled the Bank to respond more quickly to the proposal to change the alignment and to follow more closely the work of the consultants and the Government's action on loan commitments. This could have somewhat reduced the delays in accomplishment of the project and perhaps have brought faster progress on the improvement of maintenance operations.

PROJECT PERFORMANCE AUDIT REPORT

HONDURAS: NORTH ROAD PROJECT (LOAN 400-HO/CREDIT 71-HO)

Background

Prior to 1965 the Bank had made three loans to assist in the development of Honduras' highway network, its most important and extensive transport system. The first helped establish a maintenance organization. Highway maintenance was a weak link in the Government's highway program; thus this loan (135-HO of 1955) was of considerable importance if the road network was to be expanded. The second loan (195-HO of 1958) helped finance construction on three highways and preparation of final designs for extending one of these by about 100 km. The third commitment (Credit 1-HO of 1961) contributed to further highway construction, continuation of the maintenance program and a planning survey of Honduras' highway system. This survey was prepared by the Stanford Research Institute (SRI) and has been instrumental in preparing further highway projects. The Bank's continuing effort in institution building under these loans and subsequent ones has resulted in noticeable improvements in the capability of the Highways Department for planning, executing and maintaining roads.

The Government requested the Bank to finance a fourth project, reconstruction of its most important highway, the North Road, in February 1964. The design and final engineering of this road between Zambrano and Potrerillos (see map) was prepared by Brown & Root Overseas, Inc. and financed by the IDB. Their report was transmitted to the Bank in August 1964. After studying it, the Bank concluded that updated traffic counts and traffic forecasts were missing and that analyses of economic benefits were inadequate. Some questions were also raised over the alignment of the road. The Bank requested that these points be clarified.

The consultants prepared a supplementary report, containing the information requested by the Bank which was found to be acceptable. An appraisal mission was sent to Honduras in September 1964.

The mission encountered a problem with regard to choice of the alignment of the road section between Comayagua and Potrerillos, as there were two alternatives. One route which had been engineered in the feasibility study would pass through the Humuya Valley linking Comayagua, La Libertad and Potrerillos. The other route passed west of Siguatepeque, linking Comayagua, Taulabe, La Guama, Yojoa and Potrerillos. It followed the existing road closely and, although it had been studied by Upham, Porter-Urquhart Associated, it had never been engineered. The estimated cost of constructing the Siguatepeque route, including engineering, was L 29.3 million. The cost of the Humuya Valley route was L 31.9 million.

The appraisal mission considered the choice between the two routes close. Moreover, the Bank was not in a strong position to recommend realignment via Siguatepeque which would require additional engineering. The Humuya Valley route was eventually selected because it had been recommended by the SRI and because the Government preferred this route since it was already engineered and it considered the development potential of the region through which it passed to be greater. Another reason for preferring this alignment was that the IDB (co-financer in the project) had provided funds for the feasibility study.

The overall conclusion of the appraisal mission was that the project would have a high rate of return of 20%. Negotiations were held in January 1965. Important major points raised during negotiations were the reduction of design standards which the Bank had felt to be too high, the use of consultants to prepare the final engineering of a 10 km section between Rio del Hombre and Zambrano, measures to ensure improved highway planning and administrative practices, and increasing budgetary allocations for the maintenance organization.

The Loan and Credit Agreements were signed on February 2, 1965.

Project Description

The North Road Project included construction of a 202-km, two-lane paved highway between Rio del Hombre and Potrerillos, construction of a bridge over the Ulua River north of Potrerillos, consultant services for the supervision of these works, and detailed engineering of the 10 km section between Rio del Hombre and Zambrano. Road segments between Rio del Hombre and Tegucigalpa and between Potrerillos and San Pedro Sula were being improved with Government resources at the time of appraisal.

The North Road is the most important highway in Honduras; it is the most heavily travelled road in the country and the most strategically located. It provides the two principal industrial and manufacturing centers, Tegucigalpa and San Pedro Sula, with access to the south and to the largest port, Puerto Cortes, located in the north. It passes through three of Honduras' most populated departments (Comayagua, Francisco Morazan and Cortes), and serves one-quarter of the country's farmland and a zone with large potential for agricultural development. At appraisal, the highway was also considered important in connection with Central American economic integration.

The cost of the project was US$23.6 million equivalent, including contingencies. The Government had requested IDA financing and asked the Bank and IDA to meet 80% of the costs (i.e. the foreign exchange component of 60% of project costs plus half the local cost component). The Bank agreed to provide IDA funds but it shared the proposed 80% external contribution to project costs about equally with the IDB, which provided resources on soft terms through its Fund for Special Operations.

The Bank's Loan Agreement provided US$6.0 million with a grace period of six years repayable over 25 years. The Credit Agreement provided US$3.5 million, to be amortized over a period of fifty years. It was agreed that IDA funds would be disbursed first to ease the repayment burden on the Borrower. The Government also undertook certain commitments, outlined as special covenants in supplementary letters dated February 2, 1965. As regards highway maintenance, the Government would increase budget allocations (including a separate item for equipment renewal); maintain supplies and spare parts; ensure the proper use of crews and equipment; use contractors wherever practical, and implement, update and strengthen cost accounting. To improve highway operation the Government undertook to: establish a mobile highway patrol to enforce traffic regulations, establish wayside stations to weigh trucks, and intensify programs aimed at improving highway signalling. To improve highway administration the Government proposed to increase the authority and responsibility of the Planning Unit within the Ministry of Communications and Public Works, and to ensure continuity of operation of the Highways Department by establishing a civil service system for professional staff.

When the loan was negotiated, the Bank felt the design standards should be modified for mountainous regions as the shoulder and pavement widths were wider than necessary. Reduction of the standards would entail a saving probably of US$1.0 million. The Government agreed to the modification in a supplementary letter.

Project Implementation and Costs

Major construction on the North Road was completed and the road opened to traffic in July 1971, a year and a half behind schedule. The delay represents 37% of total time allowed for the project. There were five reasons for the delay: 1) administrative setbacks, 2) realignment of the road, 3) inclement weather conditions, 4) poor soil conditions, and 5) poor performance by some of the contractors.

The first delay occurred because the effectiveness of the project was postponed until February 1, 1966, approximately a year from the date the loan was signed. The postponement was a consequence of three factors. First, the effectiveness of the IDB's loan, a condition precedent to effectiveness of the loan and credit, was delayed as the Government failed to submit requisite documents. Second, the Bank and IDB were concerned because the Government which ratified the loans was replaced by a new Government raising legal questions about the binding nature of the authorization; a study of the situation showed the contract was indeed binding. Third, and overlapping with the other hindrances, was the slowness with which the new Government engaged the consultants. The delay in effectiveness meant construction work did not begin in November 1965 as scheduled but rather in late 1966.

The second reason for delay resulted from the realignment of the road between Comayagua and Potrerillos, which necessitated additional engineering. Consequently, the call for bids was postponed by about a year. The consultants, Brown & Root, S.A., suggested in early 1966 that the road be rerouted to follow a modification of the Siguatepeque alignment considered at appraisal. This new alternative route would avoid rugged mountainous terrain crossed by the original route. Although the Bank and IDA first rejected the proposal, on the basis of the decisions reached at appraisal, the consultants eventually persuaded the Government of their point of view, and the Government, at first facing rejection again by the Bank and IDB, finally requested a meeting on the subject with the lenders in late 1966. In January 1967 the Bank agreed to consider realignment provided an adequate justification for it was made. The consultants prepared a report supporting the new alignment on the following grounds: 1) The proposed Siguatepeque route closely followed the existing road linking substantial population centers and the electrical power plant near Lake Yojoa. The existing road would have to be maintained because of these factors even if the Humuya Valley route were chosen; 2) If the Siguatepeque route were selected, traffic could be diverted to portions of the existing route while the new road was constructed whereas the entire Humuya Valley route (145 km) would have to be completed before it could be opened; 3) The Humuya Valley route was expected to open a potentially important agricultural region but the SRI report stated insufficient data existed to quantify the benefits which might be derived from such development; 4) SRI had recommended the Humuya Valley route prior to engineering, and their assumption that it would be more favorable in respect of rise and fall turned out to be inaccurate; 5) The original cost estimate of the Humuya Valley route was L 29.3 million. When the terrain was restudied in 1967, the revised costs exceeded this estimate by over 35%. The Siguatepeque route could still be constructed within the original cost framework of the project.

The Bank agreed in May/June 1967 to the rerouting of the North Road, thus reducing construction from 202 km to 185 km. The agreement was later formalized in September.

A supervision mission in August 1967 concluded that in spite of delays the North Road Project would be completed in 1970 as scheduled. By the end of 1967 all contracts had been awarded and 30% of the construction completed. During 1968 and 1969, however, extremely heavy rains washed out portions of the road and a hurricane hit sections between the coastal plain and Lake Yojoa causing considerable damage. According to supervision reports, the damage was magnified by soil instability which had been overlooked when the consultants worked on the realignment. The repairs which had to be made on damaged sections were extensive and it was recognized that to adequately complete them another dry season would be needed.

The inclement weather and difficult soil conditions also affected the already poor performance of two contractors on the last two sections of the road. Both firms were poorly organized. One went bankrupt and was taken over by their bonding company. Work speeded up and apparently no further action was required. The work of the other was unsatisfactory and the consultants complained they did not follow instructions. A six-km section of bituminous surfacing applied during the rainy season washed out. They were asked to replace it, but since their equipment had been shipped out of the country they were reluctant to do so. A settlement was reached which released the firm from an obligation to complete the repairs but withheld US$100,000 of their retention payments which would be paid to another contractor to complete them.

The consultants gave considerable attention to training Honduran engineers which is greatly to their credit. As a result several small national engineering firms opened.

The Government in general met its obligations under the special covenants of the Loan and Credit Agreements although perhaps not as thoroughly as originally envisioned. Design standards were reduced. The Government increased the budget allocations for highway maintenance and maintenance equipment to an extent considered adequate by the Bank:

	(L millions)
1965	3.5
1968	5.0
1969	7.0
1970	6.0 (plus 6.0 for equipment)

The Government established a career civil service and the highway patrol, and it increased the authority of the Planning Unit. Progress was made in road signalling, but less in maintaining the weighing stations or enforcing traffic regulations. Maintenance did improve, but it appears this was still a major problem when the road was completed.

The most recent available cost estimate (of December 31, 1971) for the North Road reconstruction, including detailed engineering, is L 51.33 million (US$25.7 million), about 9% above the original estimate:

Construction Costs of the North Road
(L millions)

	Appraisal Estimate	Actual December 31, 1971
Construction	38.70	45.17
Right of Way	1.00	0.20
Engineering and Supervision	3.20	5.50
Contingencies	4.30	0.46
Subtotal	47.20	51.33
IDB Inspection*	none	0.05
Studies (Refinancing IDB Loan 12/SF-HO)*	none	1.34
Total	47.20	52.72

* Added by IDB after the Bank's loan was signed. L 50,000 covered inspection not included as supervision. L 1.34 was an extension of a previous loan to refinance highway studies.

Final actual costs are not available as the Government has not settled an additional claim suit by one of the contractors. This contractor submitted a statement concluding the works performed exceeded the contract amount of US$6.5 million by US$5.0 million. The consultants, Brown & Root, S.A., studied the report on behalf of the Government, and decided the claim was unfounded. The contractor has continued to seek further settlement. Although costs might change, this seems unlikely as the contractor did not have an arbitration clause in his contract and the Government has refused to recognize his claims.

The increase in costs is accounted for by the realignment and redesign of part of the road and the delays in the construction schedule due particularly to bad weather and poor soil conditions.

Economic Justification

The economic justification for the North Road presented in the appraisal report was based on savings in transport costs. It was anticipated that vehicle operating costs would be cut in half /1 and traffic

/1 It is not possible to calculate the actual reduction as the methodology used at appraisal and the detailed technical characteristics of the road before and after improvement are not available.

along the road would increase from 350 vehicles in 1962 to 700 in 1972, implying an annual rate of growth of 7.5%. The SRI's traffic projections were somewhat higher, increasing from 350 vehicles per day in 1962 to 800 by 1972; the annual rate of growth is 10%. The Bank lowered their estimate as it considered that SRI's extrapolations were based on too few traffic counts.

The actual traffic increase is greater than expected by the Bank or SRI, as seen in Annex 1 and 2. The annual rate of growth from 1964 to 1970 is between 12 and 17% depending upon the station chosen. After the road opened in 1971 traffic increased by 48% over the previous year. The increase is attributed to passenger traffic which is not surprising as the improvements on the road encouraged the use of cars and buses. Traffic since 1971 has grown at a rate of 13% per annum.

Justification for the North Road Project also included benefits which were not quantified. For instance, larger more efficient vehicles could not use the Old North Road because it was narrow and winding. Today they use the road, increasing the effective load carried and the running speed. Truck traffic from 1964 to 1970 grew at some 10-14% per annum (depending on the station used) while in 1971 there was about a 20% increase in truck traffic over the previous year. The use of the road by heavy trailers has quintupled from 5 to 9 per day in 1964 to 35 in 1971. The information available for 1974 shows a substantial increase in the number of trailers in relation to 1971.

Another expected benefit from the road's improvement was savings in travel time. On the old road it took seven hours by auto (10 by vehicles of other types) to travel between Tegucigalpa and San Pedro Sula. The project was expected to cut driving time from seven to four hours for autos and from ten to six for other vehicles. Actual driving time is three and a half hours by auto and six hours for trucks.

The project has clearly been economically worthwhile. Construction costs increased relatively slightly over appraisal estimates, and benefits were somewhat delayed by the prolonged construction period, but traffic has grown much faster than expected, and a recalculation of the return to investment, along the lines used in the appraisal report, would yield a figure higher than the 20% originally estimated.

Role of the Bank

The Bank's original decision to favor the Humuya Valley route over the one passing close to Siguatepeque appears to have been correct in light of the information which was available during appraisal and the fact the two partners in the project, the IDB and the Government, both approved this route. After the loan was signed, the situation changed; based on

new information the Siguatepeque route was a better choice. The Bank might have reduced delays by agreeing to consider realignment when the Government first asked it to, stipulating that the Government should prepare a well-documented case, at their own expense for changing the route. The consultants could have continued to work on the portions of the road not under consideration. The realignment of the North Road after the loan was in effect was an intelligent change in view of the increased costs of the approved route and because engineering and other factors on the realigned section proved to be more favorable.

The performance of the consultants was generally very good but they appear to have made some misjudgements in the soil surveys on the Siguatepeque alignment, which caused delays and contributed to the cost overruns. The consultants maintain they were under pressure from the lending agencies and the Government to hurry the project, so consequently did not perform as thoroughly as they would have liked. The Bank could have remained in closer contact with them; it expressed the view in mid-1970 that supervision missions (about one every nine months on average between signing of the loan/credit in February 1965 and June 1970) had been infrequent, and between June 1970 and July 1971, when the road was completed, there were three supervision missions, or an average of one every four months.

The role which the Bank has played in the dispute between the Government and the contractor who submitted very large claims appears to have been prudent. While the Bank has reviewed the situation from time to time, discussed it with the Government and the contractor, and expressed hope for a rapid settlement, it has successfully maintained the view it will not act as arbitrator and that the settlement reached should be made between the parties involved.

The Bank's loan covenants and supplementary letters, and its role in urging their fulfillment, appear to have been generally useful. More support for maintenance was obtained and some improvement was made although there was not much follow-up in the early years of the project. The Bank was not successful in getting the Government to meet its obligations of maintaining weighing stations and enforcing traffic regulations. But on the other items stressed more progress was made.

Conclusions

The North Road Project was successful, meeting its objectives of providing a good-quality highway linking important regions of the country, generating savings in road user costs and reducing driving time. Indications are that the ex post rate of return is higher than estimated because traffic growth is greater than expected and cost overruns were small. The change in alignment after the loan was signed appears to have been a wise decision, and implementation of the project went fairly smoothly. The Bank's broader advice and loan conditions have been useful. More frequent supervision in the early years would probably have been useful in enabling the Bank to respond more quickly when the change in alignment was suggested and to follow more closely the adequacy of the consultants' work and the Borrower's fulfillment of the maintenance covenants.

ANNEX 1

TRAFFIC COUNTS ON THE NORTH ROAD
kilometer 56

	Cars	Buses and pick-ups	Trucks	Trailers	Total
1964	82	48	120	5	255
1966	66	60	134	14	274
1969	160	191	231	24	606
1970	173	218	243	27	661
1971	325	334	287	34	980
1972	385	368	300	46	1,099

Traffic counts for some years are not available.

ANNEX 2

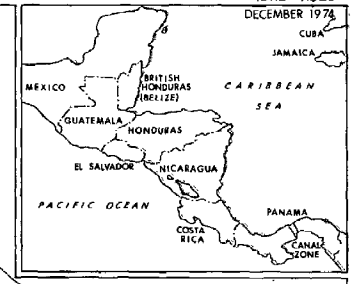
TRAFFIC COUNTS ON THE NORTH ROAD
kilometer 149

	Cars	Buses and pick-ups	Trucks	Trailers	Total
1964	75	49	155	9	288
1968	34	120	173	9	336
1969	36	131	214	18	399
1970	64	169	271	30	534
1971	174	280	308	36	798
1974	236	389	436	86	1,147

Traffic counts for some years are not available.

IBRD 11328

DECEMBER 1974



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates

HONDURAS

THE NORTH ROAD PROJECT

- Actual North Road Project
- North Road Project
- Roads Financed by Bank before 1965
- National Capital
- Towns
- Bituminous Surfaced Roads
- Gravel/Earth Roads
- Railways
- Rivers
- Departmental Boundaries
- International Boundaries

0 25 50 75 100 KILOMETERS