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PROJECT PERFORMANCE AUDIT REPORT

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

June 13, 1978

Operations Evaluation Department

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ABBREVIATIONS

AADT	- Annual Average Daily Traffic
ABU	- Allgemeine Bau-Union (Wahmann A.B.U.)
KfW	- Kreditanstalt für Wiederaufbau
LTS	- Land Transport Survey
MOW	- Ministry of Works
OA/N	- Ove Arup/Nedeco
RJA	- Roy Jorgensen Associates
UNDP	- United Nations Development Program
WA	- W. Wahmann-Allg. Bau Union (ABU)
WDT	- Walter-Davies-Techsult
vpd	- vehicles per day

PROJECT PERFORMANCE AUDIT REPORT

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

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PROJECT PERFORMANCE AUDIT REPORT

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

Preface

This report presents a performance audit of the Sierra Leone First Highway Project for which Loan 710-SL and Credit 218-SL for US\$3.7 million and US\$3.5 million respectively were fully disbursed in June 1975. A supplemental loan for US\$2.3 million was fully disbursed in February 1976. The memorandum is based on the attached Project Completion Report (PCR) prepared by the Bank's Western Africa Regional Office, discussions with Bank staff, review of project files, and the minutes of the Board of Executive Directors' meeting which considered the project.

A visit to Sierra Leone was undertaken by OED staff in November 1977 and various issues relating to the project were discussed with the Ministry of Works, UNDP staff, consultants and contractors. The valuable assistance provided by the Ministry of Works is gratefully acknowledged. The draft audit was sent to the Government for comments in the normal course; however, no comments were received.

On the basis described above, the audit accepts the principal conclusions of the PCR. However, it expands on the delays in bidding, some of the effects of the technical assistance package, the impact of an inadequate feasibility study for an urban road and the effects of phasing out Sierra Leone's railway.

PROJECT PERFORMANCE AUDIT BASIC DATA SHEET

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

KEY PROJECT DATA

<u>Item</u>	<u>Appraisal Expectation</u>	<u>Actual or Re-Estimate</u>
Total Project Cost (US\$ million)	11.4	13.8 ^{/a}
Overrun (%)	-	21
Loan Amount (US\$ million)	-	3.7
Credit Amount (US\$ million)	-	3.5
Supplemental Loan	-	2.3
Disbursed)	-	9.7 ^{/b}
Repaid) as of 12/31/77	-	.3
Outstanding)	-	9.4
Date Physical Components Completed	6/30/74	12/75
Proportion Completed by Above Date	60	100
Proportion of Time Overrun (%)	-	37
Economic Rate of Return (%)	21	25

OTHER PROJECT DATA

<u>Item</u>	<u>Original Plan</u>	<u>Revisions</u>	<u>Actual or Re-Estimate</u>
First Mention in Files	-	-	11/26/65
Negotiations	-	-	8/12-14/70
Board Approval	-	-	10/27/70
Loan/Credit Agreement	-	-	10/29/70
Supplemental Loan	-	-	1/13/75
Effectiveness	2/01/71	-	2/12/71
Closing Date	6/30/75	-	2/05/76
Borrower		Government of Sierra Leone	
Executing Agency		Ministry of Works	
Fiscal Year of Borrower		July 1 - June 30	
Follow-on Project Name		Proposed Second Highway Project	

MISSION DATA

<u>Item</u>	<u>Month/ Year</u>	<u>No. of Weeks</u>	<u>No. of Persons</u>	<u>Manweeks</u>	<u>Date of Full Report</u>
Preappraisal	11-12/68	1.2	3	3.6	12/68
Appraisal	2-3/70	3.8	4	15.2	10/12/70
Subtotal		5.0		18.8	
Supervision I	11/71	1.5	4	6	1/17/72
Supervision II	5/72	2.5	2	5	6/06/72
Supervision III	6/72	1	1	1	6/30/72
Supervision IV	7/72	1	1	1	8/02/72
Supervision V	11/72	1	1	1	12/27/72
Supervision VI	6/73	2	2	4	8/17/74
Supervision VII	6/74	2	1	2	8/09/74
Supervision VIII	6/75	1	1	1	7/23/75
Supervision IX	10/75	1	1	1	10/15/75
Supervision X	12/75	1	1	1	12/18/75
Supervision XI ^{/c}	6/76	2.3	3	7	8/03/76
Subtotal		16.3		30	

COUNTRY EXCHANGE RATES

Name of Currency (Abbreviation)	Leone (Le)
Appraisal Year Average (1970)	Exchange Rate: US\$1 = Le 0.83
Intervening Years Average (1971 - 1974)	US\$1 = Le 0.82
Completion Year (1977)	US\$1 = Le 1.16

^{/a} A small amount of UNDP funds has not been disbursed.

^{/b} Includes exchange adjustment of US\$0.2 million after devaluation of US dollar.

^{/c} Includes preappraisal of the proposed Second Highway Project.

PROJECT PERFORMANCE AUDIT REPORT

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

Highlights

The purpose of the project was to assist Sierra Leone's change-over from an uneconomic railway transport to a road-based transport system. The main part of the project, the construction of the Bo-Kenema Highway, was to enable the phasing out of the railway. The project also included feasibility studies and detailed engineering for additional roads, technical assistance to reorganize and strengthen the highway maintenance unit of the Ministry of Works, and procurement of maintenance equipment and parts.

Project components were completed three years later than expected with a cost overrun of 21%. The overrun in time was mainly caused by difficulty in bidding and awarding contracts, slow equipment delivery and additions to the project, while cost overruns resulted from the underestimation of unit costs, currency realignment and expansion of the project's scope. Despite the cost increase, the economic return on the project is satisfactory due to higher benefits which resulted from increased motor fuel prices.

In addition to the cost and time overruns, the project encountered problems of: slow implementation of maintenance programs (paras. 14-16, 25 and PCR, paras. 3.25, 3.35-3.37, 4.11-4.12); lack of economic justification for an urban road after detailed engineering was completed (paras. 17-19, 27 and PCR, paras. 3.29-3.34); and the timing of phasing out of a railway, which resulted in isolation of some communities (paras. 20-22 and 26).

Other points of interest are:

- desirability of an outside review of cost estimates before inviting bids when the Borrower and Bank consider them to be too low (paras. 6-7, 10, 24 and PCR, paras. 3.04-3.09);
- success of a management-type contract under particular conditions (paras. 6-9, 24 and PCR, paras. 3.10-3.17); and
- success of a training program adapted to local socio-cultural conditions (para. 25).

PROJECT PERFORMANCE AUDIT MEMORANDUM

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

I. Project Results

1. The First Highway Project was supported by Loan 710-SL and Credit 218-SL for US\$3.7 million and US\$3.5 million, respectively, which were signed in October 1970 and a supplemental loan for US\$2.3 million which was signed in January 1975. The project, which cost US\$11.4 million, was divided into two parts. Part I, financed by the Bank/IDA, consisted of construction of the Bo-Kenema Road (43 mi), retroactive financing for the detailed engineering of this road and the rural section of the Freetown-Waterloo Road (18 mi) and purchase of maintenance equipment (PCR, para. 2.01). Part II, financed by the UNDP with the Bank as executing agency, consisted of feasibility and detailed engineering of the urban section of the Freetown-Waterloo Road (Coastal Road, 5 mi) and technical assistance for highway maintenance and organizational improvements within the Ministry of Works (MOW) (PCR, Maps 1 and 2). The technical assistance program was essential to successfully implement the Bank/IDA share of the project. Although this was the first highway project, the Bank Group has been involved in Sierra Leone's transport sector since 1966 when it served as executing agency for the Land Transport Survey (LTS) which was financed by UNDP. The survey, which recommended that the Sierra Leone Railway (SLR) be phased out, formulated a highway program and prepared feasibility studies which have provided a basis for this project.

2. Project components were completed by January 1977, almost three years beyond the appraisal forecast. Construction of the Bo-Kenema Road was completed in December 1975, a year and a half later than expected at appraisal. The delay resulted mainly from the long time it took to award a contract for construction when the lowest bid proved to be 66% over the appraisal estimate resulting in another round of bidding and design alterations to reduce costs. Also, the dismantling of the railway was delayed and the contractor experienced equipment shortages in 1973 and 1974, further delaying construction work (PCR, para. 3.17). All maintenance equipment was delivered by July 1976, about two and a half years beyond the appraisal forecast because of bidding difficulties (PCR, paras. 3.20-3.23). Disbursements initially lagged because of delays in awarding contracts for construction and equipment but later caught up with the appraisal schedule (Graph 1). The technical assistance program was completed in 1976, three years later than forecast, because of delay in awarding the contract and because the program was expanded to include a four-year maintenance plan and a training program. The feasibility study of the Coastal Road was completed in 1974 and detailed engineering in early 1977; again delays were caused by slowness in selecting the consultant and by the need to undertake additional work in both instances (PCR, paras. 3.28-3.30, 3.32-3.33).

3. The final cost of the project of US\$13.8 million (Le 16.2 million) represents an overrun of 21% above the appraisal estimate of US\$11.4 million (Le 9.6 million) (PCR, Table 1). Although the design standard of the Bo-Kenema Road was lowered, the cost per mile of US\$237,000 was still about 45% higher than the appraisal estimate of US\$163,000 per mile. About half of the

overrun is due to underestimation of unit costs in the final engineering, a condition which MOW and the Bank had suspected. The remaining overrun is attributed to currency realignment -- particularly of the Deutschemark in which about 65% of the cost was paid -- and to price increases which might have been partially avoided if work had begun on schedule (PCR, para. 3.17). These two factors were also responsible for a 6% increase in the cost of consultants' supervision and an 11% increase for maintenance equipment. As a result, the Bank made a supplementary loan of US\$2.3 million on January 13, 1975 to cover this cost increase. The cost of technical assistance was overrun by 36% because the consultants' services were extended and their program expanded. The cost of feasibility and engineering studies of the Coastal Road was 12% below the estimate because the design standard was lowered after the feasibility study was completed, reducing the amount of engineering work.

4. At appraisal, the estimated rate of return for the Bo-Kenema Road which replaced both the railway and a 61 mile poorly-aligned route, was 21%. The reestimated rate of return is 25% in spite of a 45% cost overrun and slightly lower traffic than forecast. The higher return is mainly the result of fuel price increases (PCR, paras. 4.02-4.10).

5. At appraisal, the benefit/cost ratio expected from investment in equipment (Bank-financed) and warehouses and depots (Government-financed) was 1.23. According to the PCR, the maintenance achievements were disappointing. The work completed was actually reconstruction rather than maintenance - 27 miles of laterite roads were improved to asphalt standards and an additional 20 mi of earthworks undertaken - while routine and periodic maintenance was neglected so that the appraisal expectation of resurfacing of 195 mi of paved roads and paving of 65 mi of gravel roads, was not achieved. The effectiveness of equipment was low because of shortage of funds and because it was diverted for use by other Government agencies. Warehouses and depots were not constructed also as a result of shortage of funds. The re-estimated benefit/cost ratio is 1.19 when discounted at 12% because costs were lowered by the exclusion of warehouses and depots and benefits raised by the increase in the road network and rise in oil prices (PCR, paras. 4.11-4.15).

II. Aspects of Interest

1. Bo-Kenema Road Bidding Delays and the Management Contract

6. Construction of the Bo-Kenema Road was substantially delayed because bids proved to be much higher than expected requiring a reexamination of costs and negotiation of a management-type contract with the low bidders. The MOW and the Bank had been concerned with the quality of the cost estimates contained in the detailed engineering, on which the appraisal was based. It was felt that costs had been underestimated and that current political conditions would likely increase the bid prices. The only recent experience with international competitive bidding in Sierra Leone, on the Taiama-Bo Road, had resulted in two bids which were so high that MOW had rejected them (PCR, paras. 3.01-3.04). In view of this, the consultants had been asked to review their estimates and as a result, the estimates were increased by 27%; an additional 12% increase was agreed upon at negotiations.

7. But in spite of these precautions, the lowest bid of Le 9.6 million received in March 1971, after negotiations, was 66% higher than the revised estimate of Le 5.8 million (excluding contingencies). The Bank therefore hired another consultant, specialized in cost estimation, to review the costs. This consultant's report, completed in March 1972, confirmed that cost estimates were low, that the bids reflected current construction prices and that rebidding would not reduce the cost. It recommended that a contract be negotiated (PCR, paras. 3.05-3.08) and on this basis, MOW and the Bank met with bidders and consultants to discuss various types of contracts and ways to economize costs.
 8. The outcome of these discussions was to award a "management contract" to the lowest bidder with a target cost of Le 8.3 million, 43% over the appraisal estimate. This arrangement required the contractor to supply management and equipment, the latter to be paid for on the basis of unit operating costs, and MOW to supply labor and materials. Most of the cost reduction of Le 1 million over the original bid, resulted from the decision to lower design standards replacing concrete bridges with steel ones, and moving the road alignment designed on top of an existing road, to the side, permitting traffic flow during construction and avoiding the cost of replacing most of the 27 existing bridges with temporary structures (PCR, para. 3.11).
 9. In this case, the management contract worked well. It included a penalty clause where the contractor would pay 25% of any unjustified overruns up to Le 200,000, and a bonus clause where the contractor would receive 25% of any direct cost savings. It also required that the contractor provide management and equipment for as long as needed without compensation if delays in completion were his fault.
 10. An additional cause of delay was that, at the Bank's suggestion, prequalification of contractors was deferred until the projects composition was firmer. The Government's view is that Bank involvement in the project delayed it by two and a half years, as a result of the time taken by the Bank to prepare and appraise the project, the prequalification delay and the delay occasioned in connection with the bidding and award of the contract. Although the time taken to prepare the project does not seem to have been unnecessarily long and the suggestion to postpone prequalifications was reasonable as another road might well have been financed, it does seem that a review of the cost estimates by a specialized consultant should have been undertaken earlier since at the time both the Bank and the MOW suspected that the estimates were unduly low.
2. The Technical Assistance Package
11. The technical assistance component of this project financed by the UNDP with the Bank as executing agency, provided consultants' services to improve MOW's maintenance organization, prepare and implement programs for maintenance, provide on-the-job maintenance training and improve financial and personnel policies. The consultants' terms of reference were later broadened to include a Four-Year Highway Maintenance Plan which would provide a basis for a Second Highway Project now under consideration, and an audio-visual training program.

12. Achievements include the establishment of a Maintenance Division under the direction of an Executive Maintenance Engineer, organization of the Mechanical Division, and preparation of maintenance manuals. Reporting and accounting systems and work programs and budget requests were prepared. The salary structure was reviewed and the maintenance plan developed. The audio-visual training program was particularly successful.

13. This program was designed to train mechanics, drivers and workmen, in equipment servicing and repair and in maintenance work methods. It consisted of ten audio-visual courses using film slides and cassette tapes. The slides were made in Sierra Leone illustrating local conditions and technologies, while oral material was translated into Krio -- the lingua franca. Each slide program was followed by simple classroom exercises. The exercises used pictograms and were done orally as most participants were illiterate (e.g., Annex 1). Field trips were then made to apply what had been learned in the classroom and the audio-visual sessions were repeated as refreshers to groups later on. The cost of the program was relatively low and, therefore, it was possible to replicate it in the Area Offices. The success of this program, in contrast to earlier formal, classroom courses given in English, is rooted in its simplicity, its consideration of local conditions and its use of technologies adapted to them.

14. Achievement in implementing the maintenance program, however, was less successful and only a small amount of maintenance work was actually undertaken (para. 5). The utilization of equipment financed by the Bank was low as a result of shortage of funds for fuel, oil, lubricant and spares, for although MOW was able to increase the recurrent maintenance budget as recommended, a major portion was spent on personnel costs (61%-75%) (Annex 2). Equipment was also diverted for use by other Government agencies, and there was little continuity in the Maintenance Division as staff preferred to work in other areas such as new construction, a factor which impeded the consultants' task of providing on-the-job training. Furthermore, although accounting and budgeting procedures were implemented at Headquarters, they were not implemented in the Area Offices, making it impossible to control funds for maintenance.

15. Another important factor which hampered maintenance was that the MOW had considerable difficulty in attracting and keeping engineering and management staff. The consultants recommended that salaries be increased so as to make them competitive with the private sector but it was not possible to do this as MOW's personnel is under the jurisdiction of the Civil Service Commission. As a consequence, field supervision was inadequate and it was possible to fill only three of eight positions in the Area Offices. Moreover, when accounting staff trained by the consultants transferred to higher paying jobs outside MOW, it was difficult to get the Ministry of Finance to replace them due to other priorities.

16. The difficulties in implementing the maintenance program reflect the fiscal and organizational constraints within which MOW must operate. This project also illustrates the need to secure commitments from other Government agencies whose actions affect MOW's objectives as in the case of equipment diversion. Finally, it illustrates the difficulties of getting qualified

engineering staff to work on maintenance in developing countries. The Government and the Bank have frankly discussed the maintenance experience under the First Highway Project. Under the proposed Second Highway Project, administrative and financial measures will be taken to help resolve these earlier difficulties.

3. The Coastal Road

17. The Freetown-Waterloo Road was one of five roads identified, in 1966, by the Land Transport Survey (LTS), as necessary to complement phasing out the railway. Consisting of an urban section (the Coastal Road, 5 mi) and a rural section (15 mi), it was accorded the highest priority of the roads and was also Government's most important project. It was dropped from the First Highway Project, however, when engineering of the rural section revealed that costs were greater than expected, reducing the rate of return to below that of the other roads and that the alignment selected crossed a swampy area and required further study. To avoid delaying the First Highway Project, the Bank offered to finance instead the Bo-Kenema Road which now had the highest rate of return and to act as executing agency for studies of the Freetown-Waterloo Road so that construction could be considered in a Second Highway Project. Although construction of the rural section was begun in 1974, financed by Kreditanstalt fur Wiederaufbau (KfW) and recently completed, the more heavily trafficked urban section has not been built.

18. The feasibility study of the urban section was not begun until 1972 because of MOW's delay of about a year in approving the consultants' terms of reference. In commenting on the consultants' interim report the Bank pointed out the importance of the urban implications such as traffic control, land use, parking facilities, environmental effects and the economic development pattern of the city which had not previously received much attention. When the final report, in January 1974, did recommend a 4-ln limited access highway, the Bank took the view that these urban aspects of the proposal had not been sufficiently explored. However, the Government was insistent in its view that this project was its highest priority road project and had been since it was first proposed in 1966. Following a brief urban study of Freetown by a Bank consultant, the Bank offered to proceed with a two-lane highway with the idea that the necessary studies could be carried out and two more lanes added if they turned out to be justified. This suggestion was put forward even though the feasibility study did not indicate clearly the project's economic justification and there was a question about the reliability of the cost estimates and the treatment of the network analysis. Because of these concerns, the Bank warned the Government that the urban section would have to be justified as an economically viable project once the detailed engineering was completed. The Bank expected that the change in the road's design concept would help provide the justification. In fact, when the detailed engineering was completed in May 1976, it was found that the 2-ln road would cost Le 21 million or quadruple the amount estimated in the feasibility. The increase in cost was due mainly to inadequate costing of works in the feasibility study and also to price escalation of about 66% between 1972 and 1976. With the increase in costs, the project did not show a satisfactory rate of return and could not meet the Bank's criteria for economic justification. Thus, the Bank was not prepared to include it in the proposed Second Highway Project.

19. The Government was acutely disappointed by this decision and by the long delay in carrying out the studies (about six years), during which much MOW staff time was devoted, only to find out in the end that the Bank did not consider that the road was justified. It considers that the Bank should either have rejected the project because of its urban implications long before or else insisted on adequate urban studies at an earlier time. The problem lies with the inadequate feasibility study preceding detailed engineering. In retrospect, it would have been desirable if the feasibility study had been more thoroughly reviewed, particularly considering recent cost experience on the Bo-Kenema Road in 1971/72, and if earlier consideration had been given to the transport problem in its broader urban context.

4. Phasing out the Railway

20. The Land Transport Survey (LTS) examined the feasibility of rehabilitating the Government-owned Sierra Leone Railway. The railway consisted of a single-track system (2'6" gauge) between Freetown and Pendembu (the Main Line, 228 mi) and Bauya to Makeni (the Branch Line, 83 mi) (See Map). LTS found that the railway operated at a deficit of Le 1.1 million annually due to overstaffing (personnel expenditures in 1967/68 were almost three times as high as total revenue), inadequately trained personnel, poor communications and traffic control, operation of the Branch Line in spite of inadequate traffic and use of unsuitable locomotives. Moreover, rail traffic had been declining for a number of years due to increased road competition in areas where roads were available. According to LTS, even if it were possible to resolve the railway's inefficiencies, transport costs would still be three times as great as those by road. LTS recommended that the railway be closed down as road sections were built to replace it. This would entail construction of about 200 mi of roads (the Bo-Kenema Road was one of the five roads) and also construction of some feeder roads. The Bank also favored phasing out the railway and, moreover, insisted that it could not consider a project for road construction as long as the Government subsidized the railway since this might prevent it from meeting the local cost of a road project. The Bank, therefore, pressed for dismantling the railway as soon as possible and a covenant of the First Highway Project confirmed that the railway would be removed by 1972.

21. While the decision to phase out the railway seems to have been a correct long-term decision, it may have been implemented too rapidly. No study to determine an optimum time schedule to close the railway was made and when the Branch Line between Bauya and Yonibana was removed, it left many small towns with no means of transport. Also, while plans to construct feeder roads linking the towns of Mabang, Bradford and Rotifunk were made, it was not possible to do this right away, with the result that these towns which were connected by earth tracks, were left without adequate transport for their crops for some time.

22. The MOW points out that, although the 200 miles of road which the LTS recommended were needed to replace the railway have now been built, they have been financed largely by other lenders. The Bank, itself, financed only the 43-mile Bo-Kenema Road and while it did not commit itself to finance all 200 mi, Government considers it might have financed more than it did. This is partly the consequence of an interruption of lending to Sierra Leone for country reasons. The proposed Second Highway Project, which was appraised in October 1977, has again been delayed on country grounds.

III. Conclusions

23. The First Highway Project was completed with a three-year delay and 21% cost overrun. Nonetheless the rate of return on construction and the benefit/cost ratio for maintenance are satisfactory and the project has contributed to maintenance organization and provided a good road link between Bo and Kenema.

24. Some delay on construction of this road might have been avoided had the Bank recommended a review of the cost estimates by a specialized consultant at an earlier date in view of the consensus that costs were too low and the fact that experience with international competitive bidding in Sierra Leone was sparse. Undertaking construction through a management-type contract, while not generally advocated by the Bank, turned out well given the circumstances in this instance.

25. The project's achievements in maintenance were less than hoped for because recurrent expenditures were not spent on maintenance work, because equipment was diverted for use by other Government agencies and because maintenance was subordinated in most instances to construction. Improvement in maintenance organization was deferred due to MOW's fiscal, organizational and personnel constraints. This experience indicates the importance of involvement of other Government agencies whose actions influence the program's outcome. On-the-job training for maintenance work was unsuccessful because engineering staff preferred construction work; however, the audio-visual training program was a success because it was adapted to local socio-cultural conditions. Furthermore, because of its comparatively low cost, it was possible to replicate the training in Area Offices in Sierra Leone.

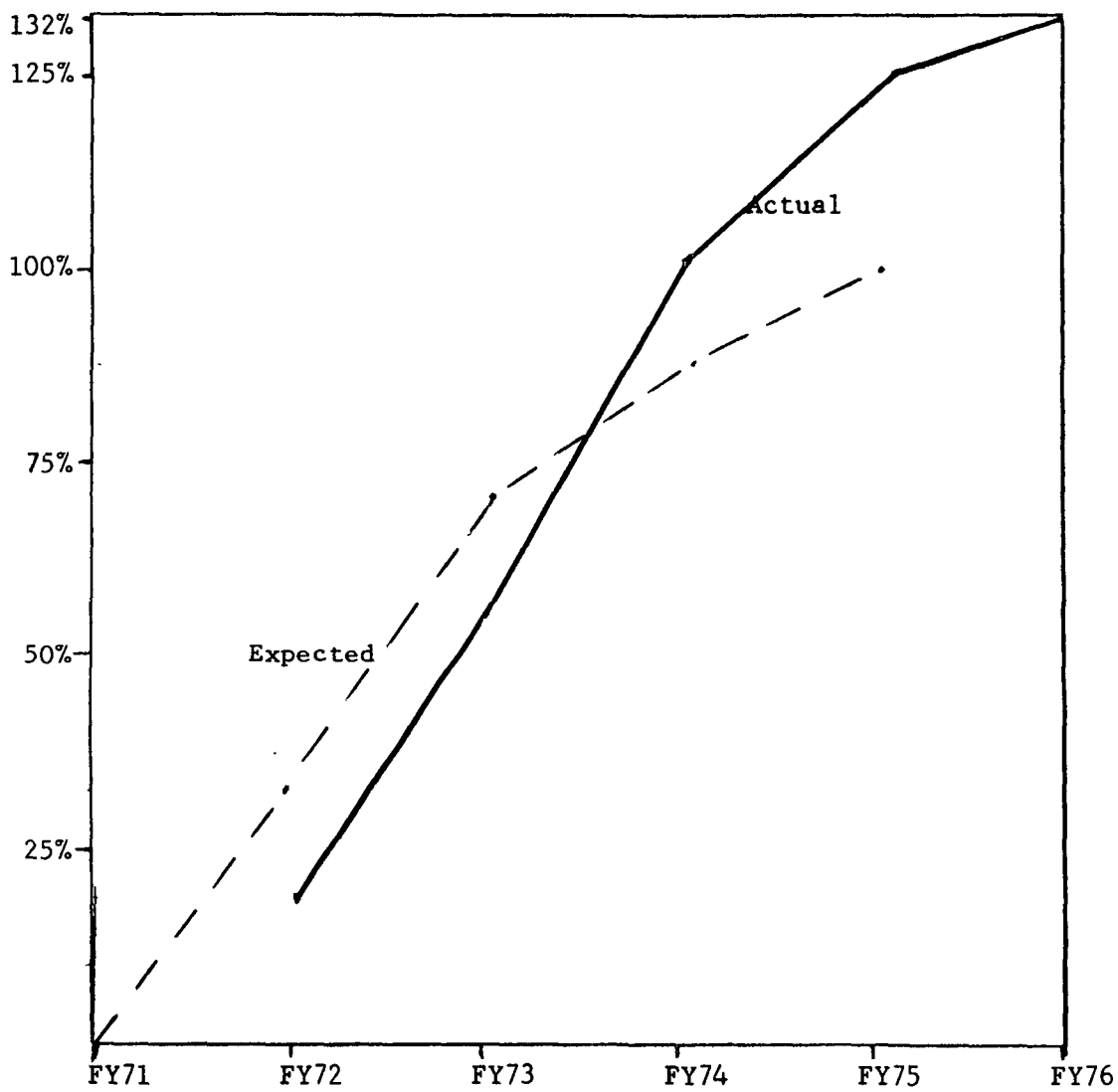
26. In retrospect it appears that the dismantling of the railway was not undertaken in a phased way, the implications for local transport were not thoroughly reviewed and as a result some communities were left without means of transport for some time. The Government considers the Bank responsible for the disruption and adverse economic impact which the premature phasing out of the railway had on some communities in the Moyamba area.

27. Despite the Bank's reservations about the feasibility study of the urban section of the Freetown-Waterloo Road, it agreed to proceed with detailed engineering even though the project's economic justification was not established. In retrospect, this was a mistake because when the detailed engineering was completed, it showed that the cost would be so high that the project did not meet the Bank's criteria for economic justification. This experience with the urban section also reinforces the importance of identifying land use patterns and allowing for urban implications of roads such as this one.

PROJECT PERFORMANCE AUDIT MEMORANDUM

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

Actual and Expected Disbursements

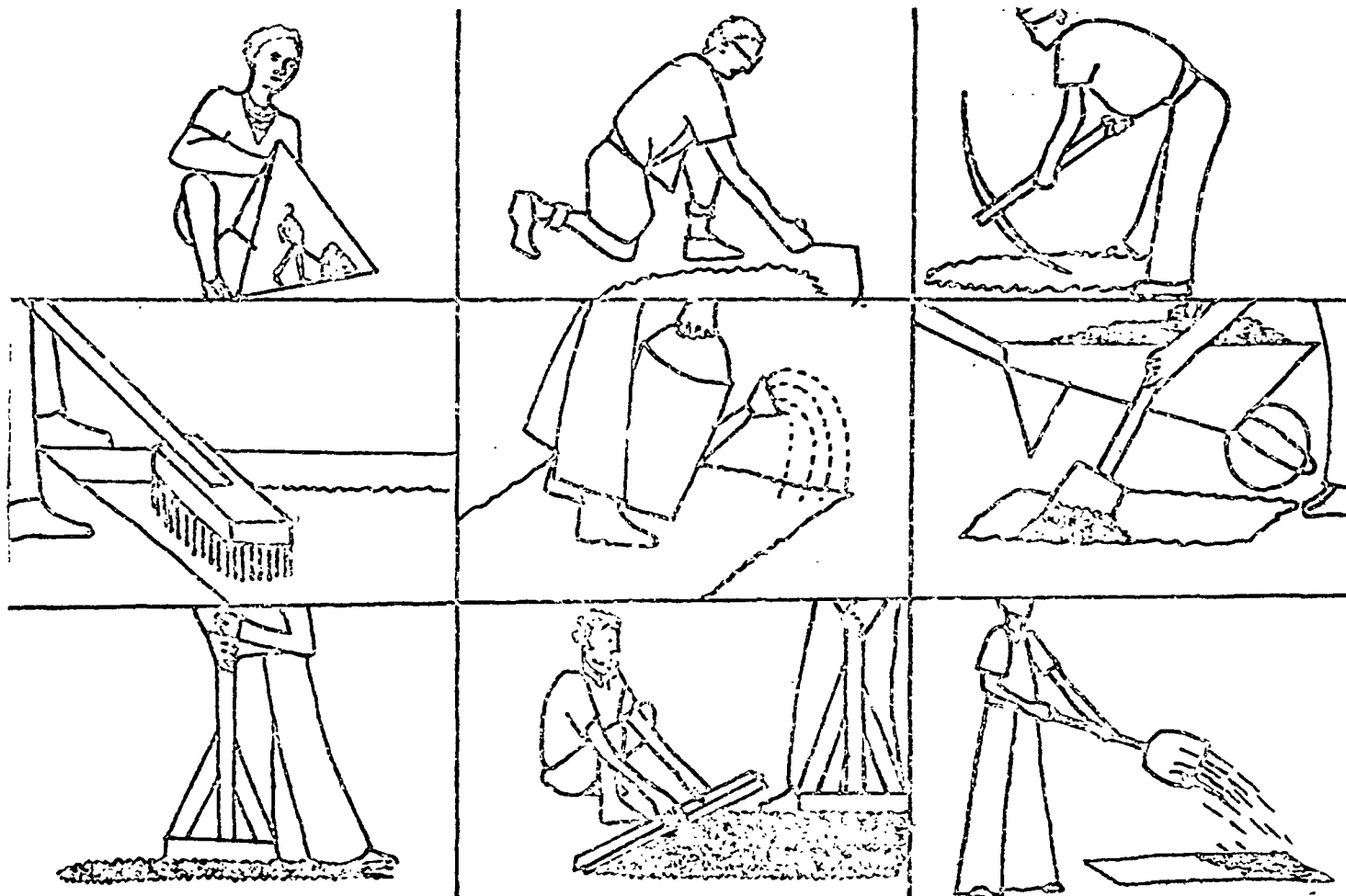


PROJECT PERFORMANCE AUDIT MEMORANDUM

SIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

Sample Exercise Given to Workmen After Viewing
Audio Visual Course on Pothole Patching - MOW

- Steps to follow in pothole patching:



- The steps are placed out of sequence and must be properly ordered.

PROJECT PERFORMANCE AUDIT MEMORANDUMSIERRA LEONE FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)Recurrent Expenditures on Highway Maintenance
(Leone '000)

<u>Year</u>	<u>Appraisal Expectation</u>	<u>Actual</u>	<u>Estimated Wages as a % of Actual</u>	<u>Estimated Materials and Fuel as a % of Actual</u>
1971/72	1,379	1,768	61	18
1972/73	1,451	2,115	68	19
1973/74	1,504	3,067	65	14
1974/75	1,547	3,364	62	17
1975/76	1,752	3,201	69	14
1976/77	-	3,736	70	13
1977/78	-	4,481	75	13

Source: Appraisal Reports of First Highway Project and
Second Highway Project.

SIERRA LEONE

FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218-SL)

PROJECT COMPLETION REPORT

I. INTRODUCTION

1.01 The purpose of the First Highway Project was to assist Sierra Leone's changeover from phasing out an uneconomic railway, to a road-based transport system. In addition to construction of the Bo-Kenema Highway, an important link in the road replacing the former railway line, the project provided feasibility studies and detailed engineering for another high-priority highway, the Freetown-Waterloo Road (both rural and urban sections). As well, technical assistance was to be provided to reorganize and strengthen the highway maintenance unit of the Ministry of Works (MOW). MOW was to execute a highway maintenance program which would, with appropriate increases in capital and current expenditures, gradually improve road conditions to reasonable standards and thereby reduce vehicle operating costs. The project was the Bank Group's first in Sierra Leone's transport sector, and its second involvement after acting as executing agency for the UNDP-financed Land Transport Survey (LTS). The recommendations of this report by Italconsult (Italy) for the phasing out of the railway and reorganization of the Ministry of Works, and its selection of Bo-Kenema and Freetown-Waterloo as important road links, were the basis of the First Highway Project.

1.02 In October 1977, IDA appraised a proposed Second Highway Project. It would include a four-year highway maintenance and improvement program, following from the highway maintenance components of the First Highway Project. Processing of the proposed project has been halted on country economic grounds.

II. PROJECT PREPARATION AND APPRAISAL

A. General Description

2.01 The project consisted of:

Part I: Items financed by the Bank/IDA:

- (a) construction of the Bo-Kenema road (43 miles) with two-lane bituminous paving, including supervision by consultants;
- (b) detailed engineering by consultants for the Bo-Kenema road (43 miles), and the Freetown-Waterloo Road, rural section (18 miles);
- (c) purchase of mechanical equipment and spare parts for highway maintenance; and

Part II: Items financed by UNDP, with the Bank as executing agency:

- (d) feasibility study and detailed engineering by consultants of the Freetown-Waterloo road, urban section (5 miles);
- (e) technical assistance by consultants, for the reorganization of the Highway Division of the Ministry of Works (MOW) and the improvement of highway maintenance operations.

The project was to be completed by June 30, 1974.

2.02 Particular covenants in the Credit Agreement required that the Borrower:

- (a) maintain records, reflecting sound accounting practices, to follow the progress of the project (section 4.01);
- (b) cause highway network to be properly maintained and provide as needed all necessary funds, facilities, services and other resources (section 4.02a);
- (c) take steps to limit dimensions and axle-loads (section 4.02b);
- (d) review and revise Road Traffic Regulations before December 31, 1971 (section 4.02c);
- (e) collect and record such technical, economic and financial information as reasonably required for highway sector planning (section 4.02d);
- (f) review level and structure of road user charges (section 4.02e);
- (g) cease operations of Sierra Leone Railway by December 31, 1972 (section 4.03 according to the timetable in Schedule 6 of the Credit Agreement).

The Bo-Kenema Road

2.03 Providing a more direct route between the second and third largest towns in Sierra Leone, the Bo-Kenema road (43 miles) replaced a section of the Sierra Leone Railway and completed the main trunk road between Freetown and Kenema. The road passes through an important agricultural area, where coffee, manioc and bananas are grown. The new alignment is parallel to

the former Sierra Leone Railway replacing a narrow, poorly drained route which was badly aligned and difficult to maintain. It is 18 miles shorter than the old, roundabout road route via Koribundu. Feasibility studies were undertaken by Italconsult under the Land Transport Survey, and the Bank agreed to retroactively finance detailed engineering to enable the proposed construction project to be prepared quickly.

The Freetown-Waterloo Road

2.04 The rural section of the Freetown-Waterloo road carries heavy traffic from rural hinterland to the outskirts of Freetown, whose port handles most of Sierra Leone's imports and exports. KfW financed its construction, which was completed in mid-1977. The LTS also proposed, but did not examine, the feasibility of two urban sections of the road. The proposed Coastal Road East (Map 2) passed from the eastern outskirts of the city past the port and on a causeway along the coast into the Central Business District, while the projected Coastal Road West would have connected the downtown area with the high-income western suburbs and the Atlantic coast. The two urban sections of the road were to be examined, and alternative locations for constructing a new road considered. The consultants employed in the UNDP-financed part of the project were to update the study of the rural section and integrate it with their study of the urban section, for which detailed engineering was to be undertaken if construction were shown to be economically justified. At the time of appraisal, construction of the urban section appeared necessary because of heavy traffic, and also to obtain optimum benefits from the improvement of the rural section.

Technical Assistance

2.05 Technical assistance was to be provided to the MOW to implement the reorganization of the Ministry recommended by the LTS. The difficulties revealed by the Italconsult report, chiefly concerning highway maintenance, were to be remedied by the following measures:

- (i) increasing the engineering staff, mainly in the MOW field offices;
- (ii) improving the field organization for highway maintenance;
- (iii) improving financial control by setting up specific budget subheads and accounts for roads (separating them from those for other activities of the Ministry), and their subdivision into items for maintenance (routine, periodic and special), minor improvements and construction;
- (iv) preparing and executing detailed programs for highway maintenance and increasing budgetary provisions to finance them;

- (v) replacing worn-out mechanical equipment and improving mechanical workshops and road maintenance depots;
- (vi) setting up an "Equipment Pool" to improve the management and utilization of mechanical equipment belonging to the Ministry of Works, including the financing of repairs and replacement from funds derived from hire charges; and
- (vii) providing technical assistance to the MOW.

Mechanical Equipment for Highway Maintenance

2.06 The project also financed mechanical equipment and spare parts to replace the then-existing equipment, which was in very poor condition and beyond its economic life.

B. Cost Estimates and Financing

2.07 At the time of appraisal, total project costs, including contingencies, were estimated as follows:

	<u>US\$ Million</u>
<u>Part I: Financed by the Bank/IDA</u>	10.0
1. Construction of Bo-Kenema Road	7.0
2. Consultants' services for:	
(a) supervision	
(b) detailed engineering of Bo-Kenema and Freetown-Waterloo road (rural)	1.4
3. Purchase of Mechanical Equipment for Highway Maintenance	1.6
<u>Part II: Items financed by UNDP</u>	1.4
4. Consultants' services for:	
(a) feasibility study and detailed engineering	0.65
(b) Technical Assistance	<u>0.75</u>
<u>Total Project Cost</u>	11.4
=====	====

2.08 The project was financed by a Loan of US\$3.7 million and a Credit of US\$3.5 million, to cover the total estimated foreign cost of Part I of the project of US\$7.2 million. UNDP agreed to help finance the foreign cost of Part II of the project, US\$1.0 million, having made an advance allocation of US\$250,000 to pay for expenditures through June 1971, when the Government's application for financing the balance was to be considered. The remaining US\$3.2 million in local costs were to be met by the Government, and no difficulties were expected in making adequate provision in the budget. The Government also agreed (para. 6.03) to a schedule of minimum recurrent budgetary allocations for highway maintenance totalling Le 6.9 million (US\$8.3 million), and Le 3.0 million (US\$3.6 million) for investments during project execution. This was to extend from budget year 1970/71 to budget year 1974/75.

2.09 The appraisal cost estimate was based on an exchange rate of US\$1 = Le 0.833 and estimated construction costs for the Bo-Kenema road were prepared by Italconsult and updated by the appraisal mission. On January 13, 1975 to compensate for currency realignments (US\$1.5 million), inflation, and quantity variation, the Board approved a Supplementary Loan of US\$2.3 million, approximately 65% of the cost overrun, to complete the project. The Agreement amending the Loan Agreement was signed January 20, 1975, and became effective February 27, 1975.

III. PROJECT IMPLEMENTATION AND COST

A. Construction of the Bo-Kenema Road

3.01 Letters inviting applications for prequalification by contractors were issued March 14, 1969 by the Government, which hoped to begin construction by October 1969. In view of the lack of adequate technical documentation, the Bank advised the Government to await appraisal of the project before inviting contractors to apply for prequalification; accordingly, the contractors who had previously applied were invited again in April 1970 to obtain further details of the project by May 31, 1970. Before Board presentation, the Bank approved the proposed prequalification of 11 of the 14 applicants on October 2, 1970; one further applicant was prequalified after their joint venture proposal was confirmed. A draft of the letter inviting bids was approved, with minor amendments, by the Bank and the Government by early 1971. By indicating "no objection" to the changes proposed by the Ministry of Works, the Bank accidentally approved the deletion of the section for public opening of bids, being unfamiliar with the local practice of the Central Tender Board, which met in private. Italconsult, (Italy), which had prepared the bidding documents under contract to the Bank, did not change this section however, noting in their bid evaluation report that the opening of bids by the Central Tender Board had been in private, contrary to the bid invitation letter approved by the Bank.

3.02 Bids were opened on March 29, 1971. After repeated requests for the completed bid evaluation and recommended award, the Bank was informed in early June 1971 that the five bids received for construction of the Bo-Kenema Road ranged from Le 7.997 million (US\$9.6 million) to Le 9.116 million (US\$10.9 million) compared to the appraisal estimate, including 10% quantity contingencies, of Le 5.28 million (US\$6.4 million). The Government requested early negotiations with a view to increasing the Bank's participation in the project. The lowest tenderer, the joint venture of W. Wahmann Allg. Bau Union (ABU), Germany, had included in their tender three conditions: (a) requesting conversion of 70% of payments to foreign exchange (the tender documents and Credit Agreement provided only 60%), (b) using a rate of exchange higher than the existing floating rate, and (c) declining to pay compensation or royalties for quarried materials. Correcting for these elements, Italconsult estimated, would add about Le 400,000 to the bid, making it approximately the same as that of Société Française de Travaux Publics, which had posed no conditions. These two lowest bids were both about 62% higher than the appraisal estimate including contingencies for quantities.

3.03 Italconsult recommended that the Government either attempt to negotiate with Wahmann-ABU, the lowest evaluated bidder, or reject all bids. The consultants considered a substantially lower price, either by negotiations or by rebidding, unlikely in view of the special risk for contractors due to Sierra Leone's political situation, to which they attributed the unexpectedly high bids.

3.04 The Government, maintaining that they had pointed out during negotiations 1/ that the cost estimate and the portion of the loan to cover the foreign cost of the Bo-Kenema road were too low, immediately proposed negotiations with the Bank to increase the amount of the loan to cover the overrun. The Government also firmly upheld their right to open the bids in private, as they had instructed Italconsult to incorporate into the bidding documents.

3.05 The Government accepted, after about 6 weeks delay, the Bank's July 1971 offer to hire consultants at Bank expense to review the reasons for the high bids. They were to recommend within three months whether to negotiate with bidders on the basis of their findings or to cancel all bids and rebid with modifications to the design standards of the road. These consultants were also to prepare revised detailed cost estimates built up from their analysis of costs of inputs of labor, materials, etc. and to make recommendations as to how costs might be updated. The

1/ Cost estimates for the Bo-Kenema road made at the time of appraisal were increased by \$600,000 during negotiations, in view of the lowest acceptable tenders received by the Government for similar roads after the return of the appraisal mission.

consultants, Jacobs Associates (USA), visited Sierra Leone in early November 1971, only about six weeks before the twice-extended two lowest bids were to expire. By late November, the Government was complaining about what they considered the embarrassing delay in the start of construction, and the risk of additional cost increases. The parallel difficulties with procurement of highway maintenance equipment (para. 3.21) aggravated the deteriorating relations between the Government and the Bank.

3.06 In late December 1971, the Bank advised the Government to attempt to get another three-month extension of the two lowest bids, or to let the bids lapse and await the Jacobs report. Production of Jacobs' final report was delayed until March 1972, early drafts being judged as unsatisfactory by the Bank for their failure to analyse the unit prices and explain the differences between Italconsult's estimate and the bids that were received.

3.07 In the course of their study, the Bank asked Jacobs to consider a management contract approach to the construction, with the firm providing job organization and the Government providing all equipment, materials and supplies. The principal objective of this contractual arrangement was to reduce the cost of contractors' risks as the Government would assume all financial risk. Consultants Crown Agents (UK) who were using this method to build the Taiama-Bo road had suggested such an arrangement after Jacobs had begun their enquiry.

3.08 The main conclusions of the Jacobs' report were that:

- (i) the Italconsult estimate in February 1970 should have been 52% higher, about Le 7.3 million (US\$8.8 million), without giving reasons;
- (ii) the tenders which had been received reflected current contract prices for constructing the Bo-Kenema road;
- (iii) that rebidding would not likely accomplish any significant price reduction; and
- (iv) that by constructing the road by force account with Crown Agents management, construction costs might be reduced to between Le 6.1 million and Le 6.4 million.

The report recommended negotiation with either the two lowest bidders to attempt to achieve a lower contract price, or with Crown Agents for construction by force account.

3.09 In March 1972, after the Bank agreed with Jacobs' recommendations, the Government reluctantly agreed to invite the two lowest bidders and Crown Agents to submit management-type contracts on a cost-plus and fixed fee basis, but without clearly defined terms of reference approved by the Bank. The management proposals were received April 19, 1972. The Government informed the five previous bidders on May 18, 1972 that none of the original offers had been accepted.

3.10 While the proposals were being evaluated, the Bank expressed concern internally over the use of the management-type contract, since the value of the estimates used in bid comparison could be considered questionable. In the absence of a substantial and fairly regular volume of competitive tendering, the estimate of unit prices was felt not likely to be reliable enough to avoid high errors or uncertainty in the final price. Consequently, evaluation of management-type offers was difficult.

3.11 The results of the bid were cabled to the Bank by Italconsult on July 17, 1972. Italconsult recommended that the award be made to Crown Agents, whose estimate of Le 6,933,490 was about Le 73,300 lower than Wahmann-ABU's proposal. The latter, however, incorporated a bonus-penalty clause as an incentive mechanism in the contract. The consultants recommended Crown Agents' proposal, notwithstanding that they had substituted a signed letter of intent in place of the official form of proposal and had made in the letter several clarifications of the bidding documents. Design changes agreed with a Bank mission, the Government, consultants and the three bidders during the bid preparation period had reduced the original estimated cost of the road by about Le 1 million. 1/ It is significant that these design changes account fully for the reduction in contract cost, and that had these changes been made earlier, it would not have been necessary to do a second round of bidding.

3.12 The Government, however, did not consider Crown Agents' proposal more economical, disagreeing firmly with Italconsult's recommendation. They strongly insisted that Wahmann-ABU be awarded the contract since the Crown Agents had not submitted the official form of proposal and had presented, in their view, an unacceptable interpretation of the contract conditions. A Bank mission agreed in the field to this latter point, and also learned that the Government was firm in its decision to disqualify the lowest bid by Crown Agents.

1/ They were: use of steel girders rather than prestressed concrete in large bridges; standardization of small bridges; small changes in the alignment to use existing bridges; redesign of culverts; and use of a crushed stone rather than cement stabilized gravel base.

3.13 Italconsult maintained its view, in spite of pressure from the Government, that Crown Agents should be retained. They felt that the contingencies should not constitute an element of the bid comparison, that Crown Agents' letter was a legally binding instrument, and that their proposal was the most economic and should be accepted by the Government.

3.14 To resolve this impasse, the Bank sent a mission to Sierra Leone to investigate the situation. Since the estimated vehicle operating cost savings had increased by 15%, and traffic had increased, the projected economic rate of return remained satisfactory at about 20%, even with the higher cost. The Government remained confident that the work could be satisfactorily completed by Wahmann-ABU, at the price stated, with the bonus-penalty incentive the contractor had offered. The Government also wished to retain Walter-Davies (Germany/Sierra Leone), rather than Italconsult as supervising engineers.

3.15 On August 4, 1972 the Bank informed the Government that it would offer no objection to the award of the management contract to Wahmann-ABU, even though the Bank did not agree with the Government's arguments as an acceptable legal basis for disqualification of Crown Agents. But since the cost difference was small and only for an estimate, the Bank apparently accepted the importance the Government placed on the incentive of a bonus, and the protection of a penalty, in WA's bid. The Bank also felt that insistence on Crown Agents might cause the Government to cancel construction of the Bo-Kenema road, since the decision to award to WA was apparently very firm.

3.16 Steps were taken in July 1972 to prepare a request for supplementary financing to meet the cost overrun, including drafting a President's Report and an amendment to the Loan Agreement. The Government was confident that the project could be executed within the target cost, and financed by allocating the full unallocated US\$1.0 million in the loan to construction category. This would maintain the 65% disbursement rate (about US\$4.8 million) for construction cost of about US\$7.4 million. The Italconsult estimate on quantities already had a contingency built in, and the Bank decided to accept the margin in the new estimate of construction cost. The Bank, therefore, did not act immediately on supplementary financing, communicating that it would be prepared to consider increasing the loan should substantial price or quantity increases occur during construction. The Board was informed of these actions.

3.17 The contract with Wahmann-ABU was signed August 8, 1972, and construction began on October 16, 1972. Adjusted target costs at beginning of construction were Le 6,610,980 (US\$8,267,000). Project execution proceeded relatively smoothly, despite long rainy seasons in 1973 and 1974. The slow dismantling of the railway between Bo and

Kenema, caused by an apparent shortage of traction power, also slightly hindered construction, especially of bridges, as did breakdowns and shortages of contractor equipment in late 1973 and early 1974. Railway dismantling near Bo was completed in January 1974, removing impediments to construction. On March 4, 1974, the joint venture was dissolved, with ABU assuming all obligations. This change did not apparently affect execution of the project. Reflecting the impact of world-wide inflation and currency fluctuations, analysis of the monthly report for September-October 1974 projected an overall cost increase of 32% due to increases in costs of material and fuels, wages, slightly higher overall quantities and other unspecified increases in costs, as well as realignment of currencies, particularly the Deutschemark in which about 65% of the cost was to be paid. Currency fluctuations contributed to about 2/3 of the price escalation, about US\$1.5 million, while price increases were estimated to account for about US\$0.8 million of the overall project cost overrun of US\$2.3 million.

3.18 With a cost overrun for the entire project estimated at US\$2.7 million, the loan and credit having been fully disbursed by mid-November 1974, the Board approved on January 13, 1975 a Supplementary loan of US\$2.3 million to complete the project.

3.19 The Bo-Kenema Road was accepted and officially opened on December 13, 1975. The final price of constructing the road was Le 8,530,501.51 (US\$10.1 million), of which about 51% was foreign cost. A small penalty payment, Le 65,083, by the contractor resulted from a slight increase in total direct costs (fuel, labor, materials) above the target amount that would have been allowed by actual increases in the cost of inputs. Despite the cost overrun, the Bo-Kenema Road can be considered to have been successfully implemented. Sections of the road were opened to traffic during construction to consolidate the first coat of surface dressing. The quality of the work is good, and the performance of the contractor and the supervising consultants was satisfactory. No special problems were experienced with construction by the management contract.

B. Procurement of Highway Maintenance Equipment

3.20 With the Bank's agreement to the format of the ad, the Government advertised in November 1970 for highway maintenance equipment to be financed from the Loan/Credit. Bidding documents were not first submitted to the Bank for approval and the Bank had not even been informed that tenders had been invited. The recommendation for award was not sent to the Bank until August 4, 1971, by which time an extended bid validity period had expired (originally three months with a three-month extension). Since no supporting data were supplied, after several attempts to obtain from the Government complete details of their evaluation, the Bank sent a mission to Sierra Leone in early November 1971 for this purpose. The mission learned that the Government had apparently restricted their

evaluation to the only two suppliers who had tendered for all items of equipment. For reasons of standardization, the recommended award had been made to Henschel Export (Germany) whose prices were substantially higher than those of other bidders. In addition, the supplier had no service organization or spare parts supply in the country for the several different equipment makes proposed.

3.21 The Bank informed the Government December 15, 1971 that it could not accept the award recommendation, since the methods used in arriving at the award did not conform with the Bank's procurement guidelines. The total cost of the proposed award was substantially higher than several other qualified bids. The so-called standardization using a single supplier was not relevant for the different types of equipment covered in the bids, and should have been applied only to individual types of equipment, giving important consideration to the make and type of equipment on hand. The danger of establishing a monopoly with a supplier for future purchases was a matter of concern within the Bank.

3.22 The Bank offered to assist with guidance in re-doing the evaluation if the Government could obtain further extensions of bid validity, using a point system evaluation procedure to take account of the price and relevant technical criteria. The Government, however, elected to retender, deferring new bid invitations until Jorgensen Associates, the UNDP-financed consultants helping with highway administration, could assist in preparation and evaluation of new bids.

3.23 Bids were accordingly advertised in December 1972, due January 31, 1973. Bid opening was in private in accordance with the practice of the Central Tender Board, with the knowledge of the Bank, and with a consultants' representative present at the Bank's request. Bids were awarded as recommended by the consultants and accepted by the Government and the Bank. Road equipment valued at about US\$1.5 million was delivered between November 1973 and June 1974.

3.24 Contracts for shop equipment, spare parts and tools were awarded in April 1973, but the last pieces of shop equipment were not delivered until May 1976. At the supervision mission of July 1976 some equipment for the Area Engineers had still not been installed and put into service.

3.25 Because of problems in the organization, management, and financing of the maintenance unit of the Ministry of Works (para. 5.08), physical results from the highway maintenance component were disappointing. The three heavy remedial maintenance units, operating near Moyanba, Lungi and Kenema, completed in two years only about 27 miles of high standard improvement projects and about 20 additional miles of earthworks. The works executed were concentrated and heavier than what would normally be considered appropriate for a maintenance program. Equipment control and field supervision during execution were poor, with material frequently diverted to other uses, while the shortage of fuel and spare parts often left equipment idle.

C. Feasibility Studies and Detailed Engineering

3.26 The Bank agreed to finance retroactively US\$350,000, the cost of detailed engineering of the Bo-Kenema road and the rural section of the Freetown-Waterloo road. This work, the former by Italconsult and the latter by Walter-Davies, had been commented on by the Bank in 1968-1970, before the Bank decided to include in the project only the Bo-Kenema road with its higher economic rate of return.

3.27 A feasibility study of the urban section of the Freetown-Waterloo road was included in the project since relief of traffic congestion in downtown Freetown appeared necessary at the time of appraisal. Such construction was also felt necessary to obtain optimum benefits from the rural section. Detailed engineering of the urban section, which became known as the Freetown Coastal Road, would be financed if the feasibility study indicated that construction would be economically justified. The feasibility studies were to be financed by UNDP.

3.28 In its role as executing agency for UNDP, the Bank prepared terms of reference for the feasibility study, and a suggested list of consultants was prepared by the Bank and sent to the Government in December 1970. The Government suggested some minor changes in the TOR and amendments to the list only in August 1971. The Bank prepared new lists of consultants and invited proposals in December 1971. In February 1972, a contract was negotiated with Ove Arup/Nedeco (OA/N), UK/Netherlands, for the feasibility study. The contract became effective in May 1972 after the Government signed the UNDP Project Document.

3.29 The Final Report of the feasibility study failed to incorporate a number of reservations expressed by the Bank and the Government on the urban road, in their comments on the Interim and Draft Final Reports, in particular:

- (a) the Bank objected to the land use assumptions implicit in the report, particularly in the absence of a land use and development plan for the Freetown peninsula;
- (b) the network analysis technique used
 - (i) did not adequately disaggregate benefits by trip purpose;
 - (ii) did not treat the port area with its special travel characteristics as a separate traffic generator, and

- (iii) assumed a direct connection between the port and downtown Freetown, which the preliminary highway design did not permit. There was no explicit consideration of benefits without travel time savings;

In addition, the July 1976 preappraisal mission found that the traffic counts with which OA/N had obtained prima facie justification and done preliminary design appear to have been about twice counts taken later.

3.30 Because of concern within the Bank over the urban implications of the Coastal Road, as well as the Government's strong desire to quickly process the proposed Second Highway Project, a Bank mission, including a consultant urban expert, visited Freetown in June 1974 to review the situation. To conform with the Bank's developing urban policy, and also to accommodate the wishes of the Government, who were negotiating with KfW for the financing of construction of the 18-mile rural section 1/, the Bank agreed to proceed with final engineering of a version of the Coastal Road with lower design standards, expecting that this change in the road's design concept would strengthen the economic justification of the urban section. At the Bank's suggestion designs were to be prepared for a four-lane facility from Fisher Lane to the port (1 1/2 miles) and a two-lane highway from the port to downtown Freetown 2/, and a shortened four-lane Western Distributor toward the high income western suburbs and the touristic Atlantic coast. Traffic management measures to improve traffic flow on the existing streets in the Clock Tower area were also included. The Bank had realized that the artificial separation of the project, into a rural and an urban section, merely to accommodate the two prospective sources of finance, could create problems in the phasing and execution of the works, and their economic justification. Hence, the Bank had warned the Government in February 1974 that this split would mean that the urban section, with a relatively high estimated unit cost of US\$1.5 million/mile, would have to be justified by itself as a viable project. The Government reluctantly accepted the lowering of design standards and pressed for an early start of the detailed engineering. Because their proposed DM26 million loan would allow construction only as far as Fisher Lane, 1 1/2 miles short of the port, KfW was also satisfied with this split into rural and urban sections.

1/ During these discussions, the Bank learned that KfW might make financing of the urban section a condition for their loan for the rural section. This covenant never materialized.

2/ Design standards were reduced in anticipation of the results of a proposed urban study, which would consider the justification of this section, in light of its urban impact.

3.31 At the Government's suggestion, the Bank did not invite proposals from several firms for the detailed engineering of the Freetown Coastal Road. Instead, the Bank invited only one firm, Walter-Davies-Techsult (WDT) (Germany/Sierra Leone), to prepare an offer, since participants Walter-Davies had satisfactorily prepared the engineering for the rural section and the construction supervision of the Bo-Kenema road. The Bank proposed that the joint venture do the final engineering, the two Sierra Leonean firms working under the leadership of their German partner.

3.32 Work on the final engineering was delayed by two factors. First, the Government attempted to commission Davies-Techsult in December 1974 without the German partner the Bank felt necessary to assure that the work would be satisfactorily executed. ^{1/} After the Government agreed in mid-May 1975 to the Bank's position that the three firms should be jointly engaged, a protocol of association satisfactory to the Bank was not drawn up until November 1975. Secondly, although work began in November, a delay in payment of the Government's counterpart contribution, on which the payments by UNDP were contingent, delayed effectiveness of WDT's contract until early March 1976.

3.33 WDT's draft final report was received in late May 1976 and commented on by members of the preappraisal mission of July 1976. The report required extensive revisions, especially to the proposals for traffic management on existing streets. The traffic management proposals were unsatisfactory, largely because the local partners in the joint venture worked independently of their foreign partner but did not have adequate staff for this work. The final report was received by the Bank in January 1977 with few of the Bank's suggested improvements and modifications incorporated. The Bank requested that major changes be made before the documents could be considered complete, but decided to request that other changes be offered as variants in the tender documents.

3.34 Despite modifications to the project's concept, the cost estimate based on detailed engineering was US\$21 million, leaving the economic justification weak. The Bank's 1976 proposal to build only the short section of the Coastal Road to link the Freetown-Waterloo Road to the urban network, and the port received Government agreement in principle in April 1977. ^{2/} But relations over the transport sector in Sierra Leone remain strained, largely over the Bank's decision not to finance this urban road, to which the Government attaches high priority.

^{1/} It should be noted that only the Bank, as executing agency for this UNDP project, could engage consultants. The Government wanted to hire only local firms.

^{2/} During the appraisal of the proposed Second Highway Project in October 1977, Bank staff met with KfW to supply technical and economic information on the 4500-foot section of the Coastal Road to the port. KfW indicated that they would finance it; hence it was dropped from the proposed project.

D. Technical Assistance for Highway Maintenance

3.35 Consultants Roy Jorgensen Associates (RJA), USA, were selected by the Bank, executing agency for the UNDP project, in January 1972 from among three firms. Their team arrived in Freetown in mid-April 1972. After assisting in the preparation and evaluation of bids for highway maintenance equipment, they began their investigation of the management, personnel, and financial policies of the Ministry of Works. In its evaluation of the three competing proposals for this technical assistance, the Bank had noted in January 1972 that RJA's team and proposal were heavily management-oriented, and lacked practical field experience. The MOW complaint that the consultants had been too desk-bound, at project completion in late 1976 appears, then, justified. Not only were field maintenance accomplishments disappointing, but most of the proposed major organizational reforms were not implemented, lying either outside the legal authority of the Ministry of Works (e.g., accounting, staff remuneration) or while within the purview of MOW, extremely difficult to implement (e.g., material control, personnel reduction). Delivery of new highway maintenance equipment was delayed until March 1974, and continuing financial problems and poor control deprived highway maintenance field operations of necessary materials and supplies.

3.36 At the mid-term review, it was agreed that the consultants would prepare a proposal for a four-year highway maintenance program, including comprehensive training of Highway Department personnel, as part of the proposed Second Highway Project. The preparation of this program was not in their original terms of reference. It was agreed after the June 1974 supervision mission to drop the training component for road foreman under the First Highway Project. At the Government's suggestion, however, a consultant training expert financed by an extension to the UNDP project visited Freetown in the spring of 1976. He prepared a set of ten short audio-visual courses to instruct road field crews in minor field activities (e.g., pothole patching). The Government, which is pleased with this material, began to implement these courses in the Area Workshops in August 1976.

3.37 The Bank felt that the Roy Jorgensen Associates June 1976 Final Report, which proposed a Four-Year Maintenance Program, paid insufficient attention to the fiscal and organizational constraints that will continue to hamper highway maintenance. This is contrary to the Bank's request that the final recommendations take these constraints into account and recommend the technical and managerial measures necessary for success. The Bank made detailed and lengthy comments at the Draft Final Report stage but the Final Report had several technical shortcomings, notably the treatment of the details of the field operations, costing, and economic evaluation.

IV. ECONOMIC RE-EVALUATION

A. Vehicle Operating Costs

4.01 Vehicle operating costs used in the re-evaluation are based on data obtained from consultants Jorgensen Associates and adjusted by a supervision/pre-appraisal mission in July 1976. They reflect the realignment in relative prices and the inflation which began in 1973, and have been deflated to 1974 prices by the Sierra Leone consumer price index (the only one available) to make them comparable to the construction costs (see para. 4.09). Table 3 illustrates that operating costs for all types of vehicles have increased, some by over 100%, since the 1970 appraisal estimate.

B. The Bo-Kenema Road

4.02 The project provided for the construction of the 43 mile Bo-Kenema road, a new primary highway, with two lane bituminous paving (para. 2.02). With the closure of the railway, the Bo-Kenema road was the last section to be completed of the country's main trunk highway between Freetown and Kenema. The road serves an area which previously relied on the Sierra Leone Railway (SLR). The zone of influence has a population of 500,000 people, dependent on the export of diamonds and agricultural products for their livelihood. The area produces nearly all Sierra Leone's cocoa and coffee exports, 20% of palm kernel exports, and timber for domestic use. The project road replaces the railway and a 61-mile, poorly-aligned route between Bo and Kenema, and serves the villages along the disused railway alignment.

4.03 The economic justification of the road at appraisal was based on projected road traffic on the assumption that the railway would be closed. Benefits accrued from the expected reduction in vehicle operating costs, both from an 18-mile reduction in distance over the old, roundabout road route, and the change from gravel to paved standard on this route, and from lower road maintenance costs. Traffic forecasts, derived from consultants' estimates, were based on past trends, origin and destination studies, and projections of per capita income and the production of goods and services in the road's zone of influence. The economic analysis, however, excluded benefits in the agricultural sector, as well as benefits from time savings for drivers and passengers, greater travel comfort, and possible reductions in inventory needs. The 1969 traffic forecast of 400 vpd took into account generated and diverted traffic under the assumption that the road had been built and the railway closed. For later years, traffic growth was assumed to decline from about 10% p.a. in the first 10 years to about 7% in the last ten years of the economic life of the project.

4.04 The without-project case at appraisal assumed that existing road traffic and that generated by closing the railway would use the 61-mile laterite route via Koribundu in the absence of the new Bo-Kenema road. Engineering and economic studies had shown that the project road would be a better alternative than improving the existing route because most traffic on the existing road was through traffic for Bo and Kenema. Villages formerly served by the railway would also benefit from a high standard highway, replacing existing low standard feeder roads. The questionable aspect of the appraisal ERR calculation is the assumption that the old laterite road would have sustained the existing and generated road traffic for twenty years without reconstruction or improvements. The effect of omitting the costs of avoided reconstruction from the benefits at appraisal was to underestimate the ERR. With the 1969 base traffic count of 400 vpd high traffic growth assumptions, an engineered gravel road along the Bo-Kenema alignment would not have been a realistic next best alternative either, since for a road with 27 new bridges and major earthworks, paving was a small portion of the total cost. Similarly, a comparison with the railway would have been inappropriate in view of the decision to close the antiquated and inefficiently run SLR.

4.05 The savings in maintenance costs were derived by comparing the costs for properly maintaining the new paved road with the assumed cost of properly maintaining the long laterite route it replaced. This standard assumption appears rather optimistic, in view of the history of poor maintenance performance on Sierra Leone's highways.

4.06 At appraisal, the expected return assuming a 20 year economic life for the Bo-Kenema road was estimated to range between 18 and 24% under assumptions $\pm 5\%$ in construction costs and $\pm 10\%$ in voc savings. A wider range of construction cost increases might have been tested. This was apparently not felt necessary, despite the limited experience in construction costs in Sierra Leone and the apparently low contingencies in the cost estimate, because more uncertainty was attached to the traffic forecasts which had been estimated before the railway had ceased operations. Informal reassessment of the economic return at the time of Board presentation of the supplementary financing in early 1975 placed it at about the same 21% most probable estimate as at appraisal. Despite the large increase in construction costs, it was claimed a parallel increase in benefits left the economic rate of return unchanged.

4.07 Actual construction costs for the Bo-Kenema road totalled Le 9,042,522 (about US\$10.9 million), including supervision and less the Le 65,083 (US\$72,200) penalty payment by the contractor. This compares to an appraisal estimate including contingencies of Le 6.4 million (US\$7.6 million). The 1970 appraisal estimates were based on Italconsult's estimates on the basis of quantities calculated after detailed engineering, and of unit prices obtained for similar contracts

awarded after international bidding in 1967, adjusted for cost increases to early 1970. As previously discussed (para. 3.08), consultants concluded after the first abortive round of bidding that the Italconsult estimates were somewhat low. The contingency allowances (10% price, 10% quantity) proved to be inadequate after the unforeseen relative price changes which began after the increases in oil prices in late 1973, which seriously affected Sierra Leone, and with the realignment of currencies in 1972-74. Had it been possible to avoid the delays at the start of the project, the full impact of these price increases might have been avoided. But with the major elements of construction occurring in 1974, price increases seriously affected the cost, while the change in relative prices destroyed the appraisal assumption of 4% p.a. inflation for both local and foreign costs during the 2 1/2 year construction period. Quantity variations after amendments to the designs (para. 3.11) accounted for only about 8% of the increase in the costs related to quantities executed at fixed unit rates. Other expenses were reimbursed according to actual costs incurred: these were adjusted during the contract to reflect price increases for goods, services and wages. Expenditures for the project were distributed over the four year period, late 1972 - late 1975 in the ratio 6:28:41:25, reflecting the late start in the project, the cost increases in 1974, and the compression of work into four dry seasons rather than five.

4.08 The latest available traffic counts for the Bo-Kenema road were taken in June 1975 by the consultants supervising construction. Total two-way AADT was 620 vpd: 285 passenger cars, 145 light vans and land rovers, and 190 trucks, buses and tankers. Reliable figures for traffic growth in Sierra Leone are not available. Traffic growth since the 1969 study on which appraisal was based appears to have been less than the 10% p.a. assumed in the appraisal report.

4.09 Nevertheless, the estimated ex-post rate of return (EERR) was found to be a satisfactory 25%, taking the most conservative case that future traffic growth would be zero. If traffic growth continues for the first ten years of the road's life at the 6 1/2% p.a. observed from the 1969 baseline estimate of 400 vpd, dropping to 4% thereafter, the EERR increases to 31%. Under both of these cases the first year benefit is 28 - 29%, indicating that construction of this road was timely or overdue. Eleven per cent of total benefits result from fuel savings, while reduced depreciation accounts for 44%.

4.10 Despite the reservations expressed in paragraph 4.04 concerning the appropriateness of the "without project" case, the same methodology has been followed as at appraisal in the absence of a more suitable assumption. Inclusion of benefits from avoiding the cost of deferred reconstruction of the existing 61-mile route would improve the rate of return. The construction costs have been converted to 1974 Leones, with the cost of fuel in 1974 and 1975 (about Le 1,850,000) left in current Leones, and other costs adjusted by the consumer price index to reflect the change in relative prices as a result of the petroleum price increase in late 1973. Thus both construction costs and voc savings (benefits) were expressed in constant terms reflecting the same relative prices. Consultants' estimates for savings in maintenance costs were also admitted to the benefit stream, assuming that adequate routine and periodic maintenance would have been performed on both roads, with reballasting of the old road every two years and resurfacing of the new one every six. Since no data are available on agricultural production in the area of influence of the road, benefits from increased crop output have not been considered.

C. Highway Maintenance

4.11 The recommended program for improving maintenance was to include an increase in recurrent maintenance expenditures and investment in workshops and depots (to be financed by the Government) as well as the equipment to be financed by the Bank Group. This combination of resources was expected to yield considerable savings in vehicle operating costs - from 10% on paved roads to 28% on gravel roads - for the estimated seven-year life of the equipment, and help prevent further deterioration of the road network. The appraisal report asserted that the US\$1.5 million of new equipment could enable highway maintenance to be carried out at an adequate level which in retrospect seems optimistic.

4.12 However, these relative savings were not realized. The effectiveness of the new equipment was low, since the recurrent expenditures essential for the operation of this equipment, and set out in the Credit Agreement, were concentrated on wages, while essential fuel and materials were cut back, diverted to other uses or not purchased at all. Maintenance operations were diverted to high standard improvement works rather than periodic and routine maintenance (para. 3.25). Management problems and poor control also limited physical achievements in field maintenance. An additional complication was that the MOW responsibility for highway maintenance was extended from 1,400 miles in 1970 to a network of nearly 2,500 miles in 1976 without providing funds for the extended network. ^{1/} As Table 3 illustrates, this combination of adverse circumstances had reduced the relative vehicle operating cost savings (in current prices)

^{1/} 1,780 miles of laterite roads with ADT less than 50 have not been included since they are more properly described as tracks than as part of the national network, and they receive little maintenance.

to about 6 1/2% on paved roads and about 5% on laterite roads, compared to the without project case assumed. 1/

4.13 The economic re-evaluation makes several assumptions in addition to using the voc figures referred in paragraph 4.01. First, the without-project alternative has been assumed as a 2,500 mile network, passable, but entirely in fair or poor condition, the project being credited with the existing network condition. Second, capital investment has been limited to the equipment financed by the Bank Group, since financial problems prevented the Government from investing in new workshops or depots. Third, as at appraisal, no benefits through deferred or reduced reconstruction costs have been counted, since it is unlikely that the present maintenance efforts would result in measurable savings. Fourth, an average economic life for the equipment of five years will be assumed, compared to seven at appraisal, since some equipment has already worn out, some has been diverted to other uses, and much lies idle for lack of fuel or spare parts. Fifth, incremental recurrent maintenance expenditures have been conservatively assumed to be the recorded expenditures, less the Le 0.8 million estimated at appraisal as the 1968/69 base, even though the mix of these expenditures (para. 4.12) was not appropriate or effective, and the proportion that actually was spent on maintenance is unclear.^{2/} Sixth, for 1973 and 1974, the economic re-evaluation assumes that full efficiency and hence the full level of voc savings on the network was not reached. The large jump in benefits shortly after the project began resulted when oil prices, and consequently the voc savings, increased dramatically in 1974, not through any significant impact of the program. Lastly, the past trend of a drop in the real value of recurrent expenditures (about 25% p.a. in the past two years) is assumed to similarly reduce the real value of the benefits for the remaining life of the project.

4.14 Under these assumptions, Table 4 shows that the estimated ex-post benefit cost ratio (EEBCR) for the maintenance activities is 1.19 when discounted at 12%. This compares to the BCR of 1.23 at appraisal. This result should be interpreted with some caution. The EEBCR may be too optimistic, as it largely results from the assumption of the without-project case, thus overstating the economic benefits. The assumption that the voc savings will decrease during the remaining life of the equipment, as less and less can be used to maintain the highway network, may offset this to some extent. Despite the rather

1/ In the absence of a suitable deflator, it was not possible to express 1970 and 1976 estimates of voc savings in Leones/veh. mile of the same year.

2/ Estimated at Le 3,870,000 in 1976.

disappointing relative savings (5 to 6 1/2% ex-post compared to 10 - 28% at appraisal), the benefits increased as a result of the increase in the length of the network and the large absolute increase in unit voc savings after the rise in oil prices. But the relative impact of fuel savings is not major, accounting for only 7 to 20% of the total voc savings by type of vehicle, and only about 11% of total benefits. The reduction in capital expenditures also improved the EEBCR.

4.15 The use of an economic rate of return was not considered appropriate in the project evaluation, since a rate of return calculation for highway maintenance is too sensitive to the timing of the cost and benefit streams. It also does not capture the aspect of the results of a program as compared to inputs allocated to it. In this case it is significant that the EEBCR dropped so little despite generally unsatisfactory road maintenance performance. In addition to the difficulties noted above in measuring costs and benefits, the increase in the length of the network to 2,500 miles, with the less-than-anticipated capital expenditure, combined to produce this result. Assuming that the costs and benefits were measured appropriately the economic worth of the project would undoubtedly have been greater had the capital investments and recurrent expenditures been used more efficiently.

V. INSTITUTIONAL DEVELOPMENT

5.01 The Credit Agreement contained a number of special covenants related to the strengthening of the highway sector and necessary for the successful execution of the project (para. 2.02). Achievement of the objectives of these covenants was only partial, for various reasons.

5.02 With the help of the highway organization consultants, Jorgensen Associates, the Government implemented a semi-annual system of traffic counts. Financial and technical records still remain unsatisfactory, and planning mechanisms for maintenance, improvements, and extensions of the highway system still remain below the requisite level. The reorganization of the MOW, while substantially effected on paper, did not apparently involve the financial, accounting and personnel policy changes recommended by Italconsult to improve the efficiency of highway maintenance organization (Section 4.04). The Government's commitment to these reforms remains to be tested.

5.03 The Ministry of Works pointed out in August 1971 that the financial and managerial reforms implied in the Italconsult study, to which the Government had agreed at negotiations, were likely incompatible with Government accounting rules, which were under the sole jurisdiction of the Auditor-General. Hence, little use was made of the planning and control possibilities offered by the programming and budgeting systems the consultants tried to introduce. Records reflecting consistently applied sound accounting practices were not regularly maintained. This has been a difficulty in other Government organizations (Section 4.01 of the Credit Agreement). The lack of adequate funding and management staff made the agreed allocations for highway maintenance, set out in Annex V of the Credit Agreement, difficult to honor, since the failure to implement accounting reforms until 1974-75 (rather than by July 1, 1971) meant that maintenance allocations and expenditures by the Ministry of Works could not be separately identified. In the absence of financial control systems, it was difficult to insure application of these funds to specified uses.

5.04 The global expenditures on highway maintenance specified in the Credit Agreement were apparently exceeded during the execution of the project, but disproportionate spending on wages and inadequate allocations for materials and supplies made the effectiveness of these expenditures low. While the Ministry of Works complained of inadequate funding for highway maintenance, its overall spending each year during project execution exceeded its authorized estimates.

5.05 Closing of railway operations was delayed beyond the date of December 31, 1972 set forth in Section 4.03 and Schedule 6 of the Credit Agreement. In August 1973, the Bank warned that continuing railway operations threatened to hinder construction of the Bo-Kenema road since the project crossed the railway at six points. Dismantling had not been completed by July 1976, and an annual subsidy of over Le 1 million (thought to be largely for pensions) was paid into the 1976-77 budget. There is no record that the Government followed advice from British experts on a retraining scheme for displaced railway workers.

5.06 The generality of the covenants requiring adequate maintenance of the highway system and financial and organizational changes did not facilitate enforcement of their implementation in the absence of tests to monitor progress toward the goals implicit in the covenants and the project. The specific covenants were little better respected.

5.07 The Road Traffic Regulations were apparently not reviewed, as stated in the Credit Agreement (Section 4.02(b)) and there is no obvious enforcement of axle-load restrictions. The Bank's records do not show that the level and structure of road user charges was reviewed (Section 4.02(e)).

5.08 At the 1974 mid-term UNDP review, as well as toward the end of the project, erosion of the Government's interest in and commitment to the highway maintenance program as conceived became increasingly evident, as output lagged and attention turned to road improvements and, more importantly, to the Coastal Road. This contributed to inadequate budgetary control, leading to low emphasis on acknowledged maintenance priorities, poor allocation of resources, and poor productivity.

VI. ROLE OF THE BANK GROUP

6.01 The Bank delayed appraisal of the project until satisfactory final engineering for the Bo-Kenema Road, and reports on highway maintenance and on the mechanism of railway closure had been received from Italconsult. The Government was greatly concerned over these delays, but the Bank insisted, that before appraisal, the transport sector as a whole had to be examined. The objective of the project, to assist the transition to a road-based transport system, was appropriate. But during supervision, the Bank's attention had to focus first on the cost overrun for the Bo-Kenema road and then on the issues of the Freetown-Waterloo road and the proposed Second Highway Project, at the expense of the technical assistance and institutional development motives, implicit in the conception of the project, which could have had the greatest long-term impact.

6.02 The project was infrequently supervised by the Bank during execution. While bids were being invited for road construction and the highway maintenance equipment, there were only two supervision missions, both in reaction to major problems, the first only nine months after project effectiveness. Project execution was also briefly reviewed by Programs staff during their missions. However, the infrequent supervision during the first two years of the project, until mid-1972 when problems had become very serious, combined with the Government's unfamiliarity with Bank procedures, led to problems in procurement (para. 3.20).

6.03 After road construction had been started and equipment ordered, supervision did not intensify during the crucial phase of the technical assistance, feasibility studies and final engineering. The project was supervised only once each year from June 1973 to June 1975, while the technical assistance for highway maintenance was being executed. Letters to the Government reporting supervision mission's findings on the problems that were apparently developing do not in retrospect appear strong enough to emphasize the Bank's growing concern over inadequate recurrent budget allocations and poor financial control (para. 5.03, 6.08), slow dismantling of the railway (para. 3.17), declining interest in improved highway maintenance, and non-observance of special covenants. As Sierra Leone's economic situation deteriorated in 1975, the Bank decided that preparation of the proposed Second Highway Project, which followed from the detailed

engineering of the Coastal Road, should not divert staff from other projects. Hence, potentially important supervisions during the preparation of the final report on highway maintenance and detailed engineering for the Coastal Road were foregone, and the Bank had to recommend major changes in the draft documents when they were received in spring 1976 (para. 3.33 and 3.36).

6.04 By not rejecting the feasibility study for the Coastal Road, the Bank found itself committed, in the Government's view, to financing the construction as part of the proposed Second Highway Project. Only with difficulty did the Bank withdraw from this perceived commitment in July 1976. After a thorough review of the situation by an urban expert, and lengthy discussions with the Government it appeared that the feasibility study was not sound enough basis for decision-making, and that in the absence of more detailed information on economic justification, technical problems, costs and urban implications the Bank should not have, in spite of Government's insistence, proceeded with detailed engineering.

6.05 The Bank's involvement with the Coastal Road reflects an unfortunate set of circumstances. Having decided during preparation of the First Highway Project to drop the Freetown-Waterloo Road, which had initially been proposed, because the Bo-Kenema Road was found just prior to appraisal to have a higher rate of return, the Bank was strongly urged by the Government to hasten processing of the Coastal Road, which was its highest priority project. In view of construction complications and questions about the urban impact at that time, the Bank made the correct decision to include UNDP-financed studies in the project, but might have followed the preparation of the reports more closely than it did.

6.06 While the Ove Arup/Nedeco feasibility study was being executed in 1972 and 1973, land-use planning was becoming a central and important element in the state-of-the-art of urban transport planning. By early 1974, then, when the draft report was ready, its rather casual treatment of urban land-use issues 1/ no longer fully corresponded to the increasing importance the planning profession attached to land-use issues in urban transport. Recognizing this developing problem, the Bank hired an urban consultant to visit Freetown in June 1974. His recommendation, the two lane Coastal Road with provision for expansion to four, was admitted to be a compromise, which the Government very reluctantly accepted.

1/ Freetown did not have, and still lacks, an urban plan.

6.07 Paralleling the change in the state-of-the art was the evolution of the Bank's urban policy. An urban transport policy statement was issued May 9, 1973: It advocated restraint of the private automobile, provision of adequate public transport, and land-use coordination to reduce urban transport needs. During the execution of the feasibility study, the Bank made some attempts to take these principles into account, such as by omitting benefits from travel-time savings. But when the report was completed, clearly it did not and could not correspond to the Bank's still-changing urban policy, which had been released when the study was half complete. The Bank's urban transport Sector Policy Paper, which elaborated these principles, was not published until May 1975, but the Region nevertheless sought and received senior management approval in August 1974 for continuing to process the Coastal Road component, at the reduced scale agreed with the Government during the June mission. When the Bank decided in July 1976 to propose financing only a short connection of the road from the end of the rural section to the port (corresponding to the need that had always been claimed to facilitate transport of Sierra Leone's agricultural exports), the Government was displeased at this decision. They felt that the Bank was committed to including this component in the proposed Second Highway Project.

6.08 The Bank worked mainly with the executing agency, the Ministry of Works, during supervision. Even though it was acknowledged as early as 1974 that the budgetary cuts by the Ministry of Finance were jeopardizing the highway maintenance program, little attempt was made either by the Bank or by MOW to work more closely with the controllers in Finance to explain the objectives of the project, demonstrate the repercussions of continued cuts, and seek stricter accounting practices.

VII. CONCLUSIONS AND LESSONS LEARNED

7.01 An important project after the closure of the railway, the Bo-Kenema Road was satisfactorily completed for about 145 percent of the appraisal cost estimate and 123 percent of the target cost on which the contract was signed. The increases in cost during construction were largely unavoidable, due to inflation, the petroleum price increase and currency realignment. But greater scrutiny might have been exercised during appraisal before accepting cost estimates updated from 1967 costs. The impact of Sierra Leone's political situation in causing the first high round of bidding is difficult to assess, but the possible reduction in cost by transferring risk to the client and by design changes should have been investigated earlier. Had, for example, the Le 1 million savings from design changes (para. 3.11) been incorporated in the first bidding in 1971, it might have been possible then to reallocate the entire US\$1 million unallocated category, construction could have started one year earlier, the full brunt of price increases might have been avoided, and less supplementary financing required. This would also have avoided the disagreement over the bid evaluation and award of the management-type contract (para. 3.15). Construction of the Bo-Kenema road on a cost-plus-fixed-fee basis with a bonus-penalty clause worked well, however.

7.02 The highway maintenance activities and reorganization of the Ministry of Works could potentially have had the greatest sector impact and could have assisted the changeover to a highway-based transport system. More frequent Bank review of the adequacy of expenditures and their management might have persuaded the Ministry of Finance to provide more realistic funding arrangements for maintenance operations. On the organizational side, the Bank should have agreed at negotiations with the Government on a schedule of actions to be taken to implement the budgeting and management systems Italconsult had recommended and the UNDP-financed consultants were to help put into effect, in order to clarify the legal authority of the agencies for the proposed actions. Training should have received more attention during project execution to improve the technical and managerial quality of maintenance operations.

7.03 The project's technical objective, "to initiate adequate maintenance operations on the highway network," and the associated covenants, might have been better enforced with quantified physical targets, stipulated in the project. Even with financial problems, 27 miles of high standard improvements, and insufficient routine and periodic maintenance operations, is an unsatisfactory achievement. The technical assistance should have emphasized technical skills or engineering principles to help establish a strong base for future highway sector activities. The Government and the Bank agree that technical assistance in future projects should have greater practical orientation, emphasizing field training and physical achievements in highway maintenance.

7.04 Bank staff constraints limited the frequency and intensity of project supervision. Monitoring institutional development was not possible, with supervision only once each year once the construction of the Bo-Kenema road had begun, and preparation of the proposed Second Highway Project received closer attention than the on-going project. If the maintenance activities had been more carefully monitored, preparation of the Second Project might have been easier and more timely. More frequent supervision in 1975 and 1976 might have improved the quality of the consultants' study on highway maintenance and the detailed engineering of the Coastal Road. In the latter case, a supervision mission while the designs were being prepared might have discovered earlier that the foreign partner, on which the Bank had insisted to ensure that the final product was of satisfactory technical quality, was not in full control of the work produced by the local consultant partners. The premises on which the technical assistance and engineering were based -- namely, that management reforms would lead to better highway maintenance, and that the Coastal Road would solve Freetown's traffic congestion -- should have been critically examined earlier. For the Bank, the June 1974 mission, which worked out the compromise design for the Coastal Road, (para. 6.06) would have been the most appropriate time to do so, and to check the traffic counts (para. 3.29)

and other assumptions on which economic justification was to be based, before detailed engineering was authorized. As the ultimate user of the study, the Government's prior review of the description of local conditions would also have assisted the Bank in exercising its responsibility as executing agency for the UNDP technical assistance, and avoided problems later when the data and assumptions on which the conclusions of the studies were based were examined and found lacking.

7.05 Had the Bank wished to apply sanctions in case of default on covenants, it is not clear that any were available. Suspension of disbursements would have affected only the contractor and equipment suppliers. Preparation and appraisal of the proposed Second Highway Project was delayed anyway for over a year in 1974-75 by disagreement over the hiring of consultants (para. 3.32) and again in 1976-77 by failure to agree on the reformulated scope of the follow-on project. But since general country economic difficulties were the main impediment to the preparation of the Second Project, it could be argued that the financial and administrative problems which plagued the First Highway Project were as much a reflection of the general country situation as related to the project itself. Hence, in this project, even the application of project-related sanctions would not have improved performance.

7.06 Future projects in Sierra Leone should have specific covenants more directed to the execution of the project or to achieving reasonable sector development objectives. This would help to improve country relations, particularly with MOW. Since covenants related to and necessary for project execution, such as properly-kept accounts, would also have a more obvious rationale, they would be more likely to be observed without repeated reminders. Collection of data for planning, however valuable, which are not going to be used for lack of skilled personnel, is a poor use of time. Data requirements in future projects should be limited to figures which the Government can use effectively.

June 27, 1977

SIERRA LEONE: FIRST HIGHWAY PROJECT: LOAN 710/CREDIT 218

PROJECT COMPLETION REPORT

Actual and Expected Cost of the Project

Project Component	Actual Cost			Contract Amount ^{1/}	BANK/IDA Disbursements	Appraisal Estimate of Cost ^{2/}			Actual Cost as a Proportion of		BANK/IDA Disbursements
	Local	Foreign	Total ^{3/}	'000 US\$ Equivalent (1)	'000 US\$ Equivalent (2)	Local	Foreign	Total	Appraisal ^{3/} estimate of cost	Contract amount	as proportion of total cost
	'000 Leones	'000 US\$	'000 US\$ Equivalent (1)			Million Leones	Million US\$	Million US\$ Equivalent (4)	% 1:4x100	% 1:2x100	% 3:1x100
Part I (Items financed by the Bank/IDA)											
Construction of Bo-Kenema Road	4,951	5,077	10,179	8,269 ^{4/}	7,302	2.0	4.6	7.0	145	123	72
Construction Supervision	320	365	747	1,020	365	0.1	0.5	0.7	106	73	49
Detailed Engineering	-	400	400	400	400	0.2	0.5	0.7	57	100	100
Purchase of Highway Maintenance Equipment	-	1,434	1,434	1,434	1,434	-	1.6	1.6	89	100	100
Subtotal	5,271	7,276	12,260	11,123	9,500	2.3	7.3	10.0	129	115	74
Part II: (Items financed by UNDP)											
Feasibility study (Freetown-Waterloo Road)	30	222	252	270	)					93	
Detailed Engineering ^{5/} Freetown Coastal Road	209	114	323	365	)	0.2	0.45	0.65	88	88	
Technical Assistance for Highway Organization and Maintenance ^{5/}	134	856	990	1,022	)	0.2	0.55	0.75	136	97	
Subtotal	373	1,192	1,565	1,657		0.4	1.00	1.40	112	94	
Total			<u>13,825</u>			<u>2.6</u>	<u>8.2</u>	<u>11.4</u>	<u>121</u>		

^{1/} Using US\$ equivalents at time of contract signature.

^{2/} Includes contingencies.

^{3/} Using exchange rate US\$=Le 0.833 for appraisal estimate of costs, and yearly average exchange rates over construction period.

^{4/} Target cost, August 1972, under management contract.

^{5/} At April 19, 1977. Not yet fully disbursed.

SIERRA LEONE: FIRST HIGHWAY PROJECT (LOAN 710/CREDIT 218)

PROJECT COMPLETION REPORT

Actual and Expected Project Implementation

<u>Project Component</u>	<u>Contractor/ Consultant and Nationality</u>	<u>Dates of</u>							
		<u>Bid Receipt</u>		<u>Contract Award</u>		<u>Beginning of Work</u>		<u>Completion of Work</u>	
		<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual</u>	<u>Expected</u>
<u>Part I (financed by the Bank Group)</u>									
<u>Bo-Kenema Road</u>									
Construction	Wahmann-Abu (Germany)	April 1972	Feb. 1971	Aug. 1972	Feb. 1971	Oct. 1972	March 1971	Oct. 1975	June 1974
Construction Supervision	Walter-Davies (Ger./Sierra Leone)			Aug. 1972	Feb. 1971	Oct. 1972	March 1971	Dec. 1975	Sept. 1973
Procurement of Highway Maintenance Equipment	various	Jan. 1973	Feb. 1971	April 1973	May 1971	Nov. 1973	Dec. 1971	July 1976	Oct. 1974
Detailed Engineering	Italconsult (Italy) (Walter-Davies) (Ger./Sierra Leone)			(retroactively financed)		Feb. 1968		Oct. 1970	
<u>Part II (financed by UNDP)</u>									
Technical assistance for highway maintenance	Roy Jorgensen Assoc. (USA)	Dec. 1971		Feb. 1972		April 1972		Oct. 1976	June 1/ 1976
<u>Freetown-Coastal Road</u>									
Feasibility Study	Ove Arup/Nedeco (UK/Neth.)	Jan. 1972		Feb. 1972		May 1972	March 1972	Feb. 1974	Feb. 1974
Detailed Engineering	Walter-Davies (Ger./Sierra Leone)	Sept. 1975	Sept. 1974	May 1975	Dec. 1974	Nov. 1975	Jan. 1975	Jan. 1977	Sept. 1976

1/ Extended from original April 1975 closing date, by contract addition of June 1975.

SIERRA LEONE: FIRST HIGHWAY PROJECT: LOAN 710/CREDIT 218

PROJECT COMPLETION REPORT

Vehicle Operating Costs (Net of taxes)
(Current Le cents/mile)^{1/}

	<u>Bo-Kenema Road</u>				<u>Highway Maintenance Project</u>							
	<u>Bo-Kenema Road (43 miles)</u>		<u>Existing Road (61 miles)</u>		<u>Paved Roads</u>				<u>Laterite Roads</u>			
	<u>1970</u>	<u>1976</u>	<u>1970</u>	<u>1976 2/</u>	<u>Without-Project</u>		<u>With-Project</u>		<u>Without-Project</u>		<u>With Project</u>	
	<u>1970</u>	<u>1976</u>	<u>1970</u>	<u>1976 2/</u>	<u>1970 4/</u>	<u>1976 5/</u>	<u>1970</u>	<u>1976 6/</u>	<u>1970</u>	<u>1976 5/</u>	<u>1970 4/</u>	<u>1976 6/</u>
Passenger Cars	5.35	14.84	9.65	24.77	5.90	16.07	5.35	14.99	11.00	27.09	8.30	25.84
Land Rovers	8.95	22.33 3/	13.00	35.50 3/	9.85	25.69 3/	8.95	24.13 3/	14.00	42.3 3/	11.95	40.01 3/
Light Vans	9.20		14.90		10.10		9.20		16.55		13.25	
Trucks and Buses	9.40	67.35	15.50	99.94	10.35	59.68	9.40	56.17	17.50	98.94	13.45	94.01
Tankers and Heavy Trucks	12.20		20.60		13.40		12.20		24.00		17.30	

- ^{1/} In the absence of a suitable deflator, it has not been possible to express voc at appraisal and 1976 voc in Leones of the same year. Economic re-evaluation uses 1976 Leones deflated to 1974.
^{2/} VOC for a laterite road in fair condition have been used for comparison.
^{3/} Based on 20% Land Rovers, 80% light vans.
^{4/} At 1968/69 Level of Expenditure estimated at appraisal.
^{5/} Assumption that entire laterite network would now be passable, but in poor condition, while portions of paved network now in good condition would be only fair.
^{6/} VOC based on network conditions, July 1976.

Source: 1970: Appraisal Report
 1976: Consultants Jorgensen Associates, Bank Mission

Table 4

SIERRA LEONE: FIRST HIGHWAY PROJECT: LOAN 710/CREDIT 218

PROJECT COMPLETION REPORT

Economic Re-Evaluation

A. <u>Bo-Kenema Road</u>	<u>Cars</u>	<u>Light Trucks and Vans</u>	<u>Heavy Vehicles</u>
Without project	0.2477	0.355	0.994
With project	0.1484	0.2233	0.6735
Saving (1976 prices)	0.9933	0.1317	0.3259
Saving (1974 prices)	0.6699	0.0888	0.2198

Distribution of Benefits (%)

	46% <u>Cars</u>	23% <u>Light Trucks and Vans</u>	31% <u>Heavy Vehicles</u>
Shorter Distance	<u>13</u>	<u>9</u>	<u>33</u>
Higher Standards	<u>12</u>	<u>8</u>	<u>25</u>
	25	17	58

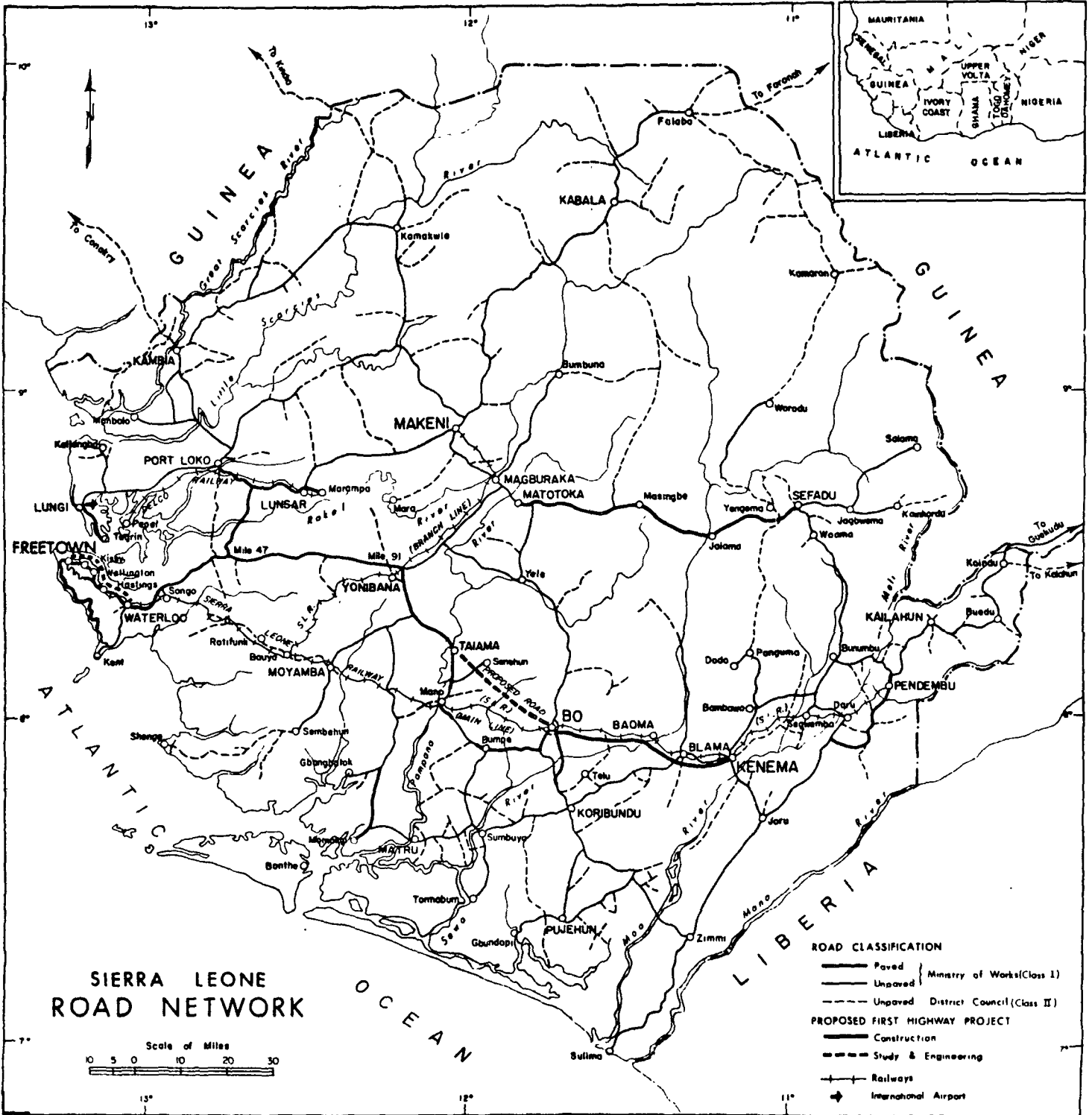
Estimated Ex-Post RR 25%
Appraisal ERR 21% (18-24%)

B. Highway Maintenance

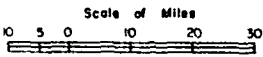
'000 1974 Leones

	<u>Capital Costs</u>	<u>Incremental Recurrent Expenditures</u>	<u>Vehicle Operating Cost Savings</u>
1973	979	2,027	800
1974	1,053	2,421	2,700
1975		1,882	3,800
1976		1,348	3,870
1977		1,350	2,900
1978		1,350	2,176
1979		1,350	1,632

EEBCR (12%): 1.19
Appraisal BCR: 1.23



SIERRA LEONE ROAD NETWORK



- ROAD CLASSIFICATION**
- Paved (Ministry of Works Class I)
 - - - Unpaved (Ministry of Works Class II)
 - - - Unpaved District Council (Class II)
- PROPOSED FIRST HIGHWAY PROJECT**
- Construction
 - - - Study & Engineering
- +— Railways
- ✈ International Airport

SIERRA LEONE

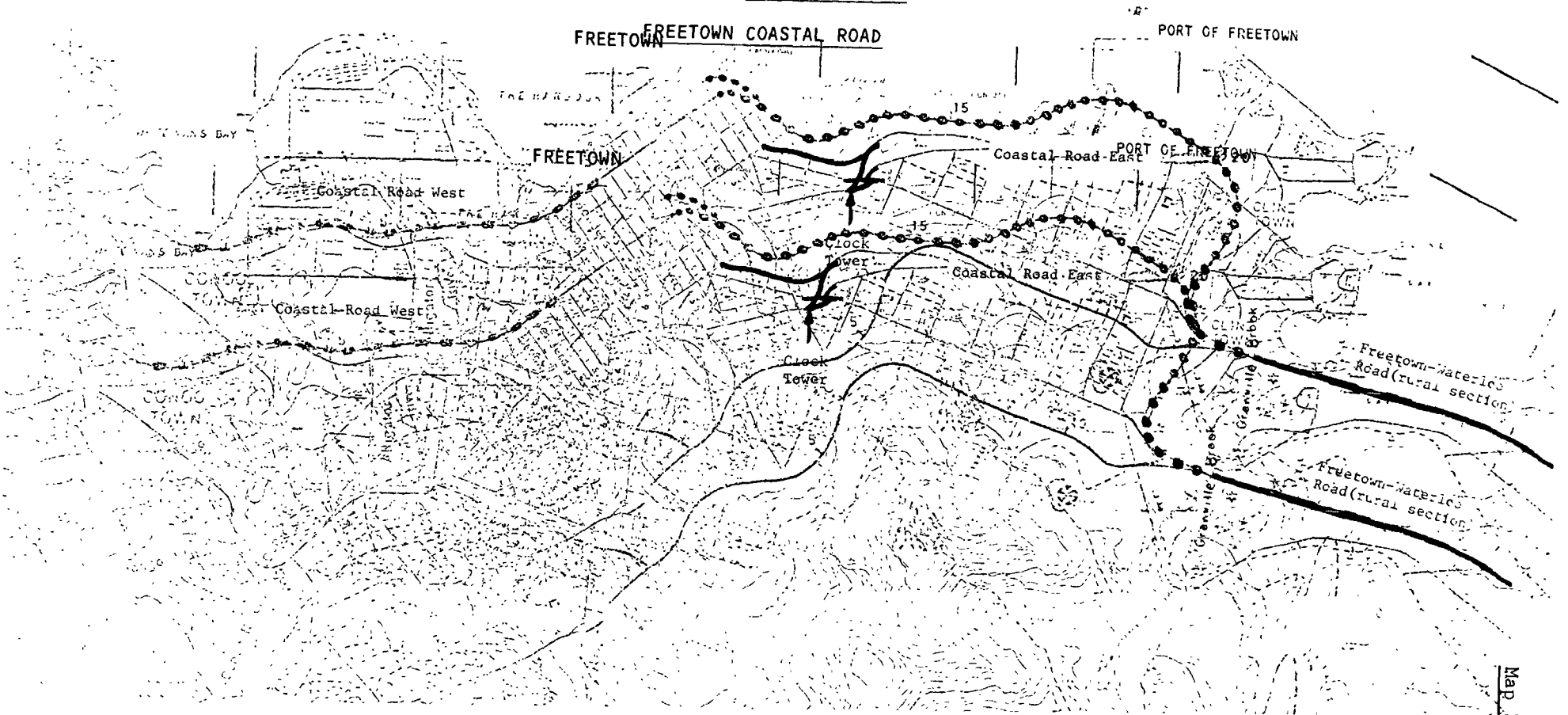
FIRST HIGHWAY PROJECT: LOAN 710/CREDIT 218-SL

PROJECT COMPLETION REPORT

SIERRA LEONE
FREETOWN COASTAL ROAD

FIRST HIGHWAY PROJECT: LOAN 710/CREDIT 218-SL

PROJECT COMPLETION REPORT



Map 2