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PROJECT PERFORMANCE AUDIT REPORT
NIGERIA HIGHWAY REHABILITATION PROJECT (LOAN 640-UNI)

January 3, 1977

Operations Evaluation Department

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PROJECT PERFORMANCE AUDIT REPORT

NIGERIA HIGHWAY REHABILITATION PROJECT (LOAN 640-UNI)

PREFACE

This is a report on a performance audit of the Nigeria Highway Rehabilitation Project, for which Loan 640-UNI of October 1969 to the Federal Republic of Nigeria for US\$10.6 million was closed fully disbursed in October 1974. It is based on: information in the attached Project Completion Report (PCR), prepared by the Western Africa Regional Office; a review of Bank files; and a September 1975 mission. Background information was acquired through discussions with: Bank staff; officials of the Federal Ministry of Works and Housing (FMWH) in Lagos; and, at the officials' suggestion, consultants from Scott Wilson Kirkpatrick and Partners (SWKP) (United Kingdom) in Lagos and London. The cooperation of these parties is gratefully acknowledged.

In the memorandum, the "Project Results" section summarizes the PCR and presents new material regarding the project objective, changes in project components, delays in project completion, and consultants' supervision of the work. In addition, the "Aspects of Interest" section expands on the lack of speedy project implementation and of agreement between the Government and Bank about studies under the project. Finally, the Bank's supervision of the project, not discussed in the PCR, is assessed and conclusions about the project experience are recorded.

PROJECT PERFORMANCE AUDIT REPORT BASIC DATA SHEET

NIGERIA HIGHWAY REHABILITATION PROJECT (LOAN 640-UNI)

KEY PROJECT DATA

<u>Item</u>	<u>Appraisal Expectation</u>	<u>Actual</u>
Total Project Cost (US\$ million)	17.1	24.2
Overrun (%)	-	42 ^{/1}
Loan Amount (US\$ million)	-	10.6
Disbursed)	-	10.6
Repaid) as of October 31, 1976	-	2.5
Outstanding)	-	8.1
Date Physical Components Completed	Mid-1971	Mid-1974
Proportion Completed by Above Date (%)	100	142
Proportion of Time Underrun or Overrun (%)	-	200
Economic Rate of Return (%)	2 Sections: 1) 15-42	28
	2) 9-27	44

OTHER PROJECT DATA

<u>Item</u>	<u>Original Plan</u>	<u>Revisions</u>	<u>Actual or Est. Actual</u>
First Mention in Files	-	-	1/6/69
Negotiations	8/69	-	8/6-14/69
Board Approval	9/69	10/7/69	10/7/69
Loan Agreement	11/6/69	-	11/6/69
Effectiveness	3/1/70 ^{/2}	4/1/70, 6/1/70, 7/1/70, and 8/1/70	7/31/70
Closing Date	6/30/72	6/30/73 and 7/1/74	10/74 ^{/3}
Borrower		Federal Republic of Nigeria	
Executing Agency		Federal Ministry of Works and Housing	
Fiscal Year of Borrower			4/1-3/31

MISSION DATA

<u>Item</u>	<u>Month, Year</u>	<u>No. of Weeks ^{/4}</u>	<u>No. of Persons</u>	<u>Manweeks ^{/5}</u>	<u>Date of Full Report</u>
Identification	11-12/68	3	1	3	1/69
Appraisal	2-3/69	3	2	6	9/69
Total		6		9	
Supervision I	11-12/69	3	2	6	1/70
Supervision II	3/70	n.a.	1	n.a.	5/70
Supervision III	5-6/70	3	2	6	8/70
Supervision IV	8-9/70	4	2	8	11/70
Supervision V	8/71	3	1	3	10/71
Supervision VI	2/72	1	2	2	4/72
Supervision VII	6/72	1	2	2	6/72
Supervision VIII	6/74	1	1	1	7/74
Supervision IX	11/75	n.a.	4	n.a.	1/75
Total		n.a.		n.a.	

COUNTRY EXCHANGE RATES

Name of Currency	Nigerian naira (₦) ^{/5}
Year: 1969-71 (December)	Exchange Rate: N1 = US\$1.40
1971 (December)-1973	N1 = US\$1.52
1974	N1 = US\$1.59

- ^{/1} As the US dollar was devalued, the cost overrun in that currency is larger than in Nigerian naira.
- ^{/2} As shown in Loan Agreement.
- ^{/3} Final disbursement date.
- ^{/4} The number of 5-day weeks shown in the mission report plus travel time.
- ^{/5} Number of weeks times number of persons.
- ^{/6} The currency of Nigeria, the naira (₦), was introduced on January 1, 1973. Before then, the currency was the Nigerian pound (Np). The conversion rate established was Np1 = N2. All monetary amounts in this report have been converted to and are reflected in naira.

PROJECT PERFORMANCE AUDIT REPORT

NIGERIA HIGHWAY REHABILITATION PROJECT (LOAN 640-UNI)

Highlights

Speedy rehabilitation of two road sections which had been seriously damaged by the beginning of the 1967-70 civil war was intended under this project. Despite prompt and flexible project processing, the start of work was delayed considerably because the procedures to achieve timely loan effectiveness and early contract award were not fully understood. Meanwhile, some road sections deteriorated extensively and rehabilitation was no longer possible. As a result of the high cost of new construction, which had become necessary, the project scope was reduced. Ultimately, less than half of the road length originally included in the project was built satisfactorily despite technical problems during application of the surfacing. This took twice the time expected and cost nearly double the estimate. Nevertheless, the project contributed to smoother flows of exports and foodstuffs. Studies of future roadworks included in this project also suffered from lack of understanding between the Government and the Bank.

The following points may be of particular interest:

Flexible approach of Bank to project processing (paras. 8, 9 and 40);

Delays in loan effectiveness and misunderstandings regarding contract award procedures (paras. 10-16);

Increase in construction costs and need to reduce project scope (paras. 17 and 39 and PCR, paras. 3.06-3.14);

Porosity problems with the surfacing (paras. 19-22 and PCR, paras. 3.03-3.05); and

Different approach of Government and Bank to selection, priority, and evaluation of major highway projects (paras. 33 and 34).

PROJECT PERFORMANCE AUDIT MEMORANDUM

NIGERIA HIGHWAY REHABILITATION PROJECT (LOAN 640-UNI)

I. Project Results

1. The Bank Group's sixth transport lending operation to Nigeria, under Loan 640-UNI of November 1969, provided US\$10.6 million for emergency rehabilitation of the Lagos-Ode Remo-Ibadan-Oyo-Ilorin section (175 mi) of the Lagos-Daura (Niger border) Road (Route A1) and the Lagos-Ewekoro section (29 mi) of the Lagos-Ibadan Road (Route A9) (PCR Maps 1 and 2). By 1968, the end of the first year of a civil war, these sections had been seriously damaged as a result of high traffic, heavy loadings, inadequate maintenance, and record rains. Speedy rehabilitation was considered imperative to keep export traffic moving through the port of Lagos and maintain unrestricted exchange of foodstuffs between surplus and deficit areas.^{1/} The project also included consulting services for preparatory work and supervision of rehabilitation, detailed engineering of a new Lagos-Ibadan Road (70 mi) (PCR Map 4), and feasibility and preliminary engineering studies of a new or improved Ibadan-Daura Road and of the Numan and Yola crossings of the Benue River.

2. The project's components were revised four times -- before appraisal, at appraisal, before presentation to the Bank's Board of Executive Directors, and during implementation. Rehabilitation of the Ilorin-Jebba section of Route A1 was deleted from the project proposal before appraisal because the Government decided to rehabilitate this high priority section without waiting for Bank action. At appraisal, studies of seven bridges and maintenance consultants' services were deleted, detailed engineering was reduced from 590 mi of roads to only 70 mi consisting of a new Lagos-Ibadan Road, and studies of the Ibadan-Daura Road and crossings of the Benue River at Numan and Yola were added. Rehabilitation of nine bridges leading to the war zone was deleted from the proposal before Board presentation. Finally, during implementation, the Ode Remo-Ibadan and Lagos-Ewekoro sections were dropped from the project. The former section was dropped because of a change from rehabilitation to intensified maintenance and the latter because of poor contractor performance. In addition, the study of the Benue River crossings was deleted and incorporated into a larger study under the Fifth Highway Project (Loan 838-UNI of June 1972 for US\$26.3 million).

3. Speedy rehabilitation (para. 1) did not materialize despite the Bank's attempts to save time by allowing detailed engineering to be started and tendering undertaken before loan signature and tenderers to be qualified after tendering. Problems related to the Federal Government's legal opinion

^{1/} "Appraisal of the Highway Rehabilitation Project Nigeria", Report No. PTR-27a, September 10, 1969.

caused a four-month delay before the loan could become effective in July 1970. Also, administrative difficulties prevented the Government from awarding contracts until October 1970, nearly a year later than expected. Consequently, repairs did not start in earnest until October 1971, two years behind schedule.

4. As a result of these delays, roads which were seriously damaged at appraisal had almost completely deteriorated in certain areas by the time work began. Subbase and base, completely eroded in some sections, had to be replaced and porosity problems with penetration and bituminous macadam surfacing had to be corrected. Only about 40% of the road length included in the project was constructed satisfactorily, rather than rehabilitated, by June 1974, about three years later than expected at appraisal and one year later than provided in a revised schedule. The lack of speedy project implementation is one aspect of interest arising from this project (paras. 8-22).

5. In regard to the non-physical project components, preparatory work and supervision were carried out satisfactorily despite an arrangement similar to that under the Apapa Road Project (Loan 426-UNI of September 1965 for US\$17.5 million)^{1/} whereby the consultants did not have full supervision responsibility. Although this arrangement was detrimental to project implementation under the Apapa Road Project, no noticeable adverse effects occurred under the Highway Rehabilitation Project because the consultant had a principal resident engineer on each contract working under FMWH's chief resident engineer. Detailed engineering of the Lagos-Ibadan Road and the feasibility study and preliminary engineering of the Ibadan-Daura Road were finished satisfactorily. However, the Government and the Bank were unable to agree on certain aspects related to these studies; this fact constitutes the second interesting aspect emanating from this project (paras. 23-37).

6. The total project cost was N 15.9 million (US\$24.2 million) compared with the appraisal estimate of N 12.2 million (US\$17.1 million). The appraisal estimate included N 26,316 (US\$40,000) of retroactive financing for detailed engineering of the Lagos-Ilorin section to cover payments between April 1969, when design started, and October 10, 1969, when the loan was signed. The N 3.7 million (US\$7.1 million) overrun (30%)^{2/} is the result of balancing the N 4.1 million (US\$7.5 million) overrun for the roadworks with the N 0.4 million (US\$0.4 million) underrun for the consulting services. The cost of roadworks increased 78%, and the major factors responsible were the additional work required to bring the road to an acceptable service level

^{1/} Project Performance Audit Report No. 1229 of July 13, 1976.

^{2/} Due to devaluation of the US dollar, the cost overrun is larger in that currency than in local currency.

and higher prices resulting from the delay in contract award. The expenditure for consulting services was 21% less than anticipated because the Benue River crossings' study was deleted from the project.

7. The audit rate of return (PCR, paras. 1.08 and 4.13) on the completed Lagos-Ode Remo section is about 28%, or within the 15%-42% range expected at appraisal, and on the completed Ibadan-Oyo-Ilorin section is about 44%, or above the 9%-27% appraisal range. These rates of return materialized because the extended economic life and higher than expected vehicle operating cost savings resulting from the change in project concept from rehabilitation to construction offset lower than expected traffic in the opening year^{1/} and higher than expected construction costs (PCR, Tables 4, 5, and 6).

II. Aspects of Interest

A. Lack of Speedy Project Implementation

8. In late 1969, the Federal Government conveyed to the Bank the urgent need for rehabilitation of the Lagos-Jebba and Lagos-Ewekoro Roads to keep traffic moving (para. 1). However, a civil war was raging and the Bank was at the time unwilling to process the project.^{2/} The Government's view about project processing was that the Bank should reconsider its position periodically since warfare was occurring in less than 1% of the country, continued economic development of the other 99% was vital, and the end of combat was unforeseeable.

9. Because of the doubtful availability of Bank support, the Government initiated immediate rehabilitation of the high priority Ilorin-Jebba section. This demonstration of the importance assigned to the project by the Government caused the Bank to reexamine the project proposal. As a result, the Government and the Bank agreed to delete works on nine bridges leading to the war zone. In addition, the Bank suggested that, in view of the urgent need to rehabilitate the roads remaining in the proposal, detailed engineering should be started and tendering undertaken before loan signature and tenderers qualified after tendering. The project was presented to the Board in October 1969, earlier than expected in view of the still on-going war and only a year after identification, because of the Bank's flexibility of approach.

^{1/} Traffic on the Lagos-Ode Remo section will drop even more as a result of diversion to the new Lagos-Ibadan Expressway, which is expected to open in 1977, but the section will remain justified. Traffic on the Ibadan-Oyo-Ilorin section is expected to increase gradually since this section will not be affected by the new Expressway.

^{2/} Two other projects, the Kainji Multipurpose Supplement (Loan 572-UNI of November 1968 for US\$14.5 million) and the Nigerian Industrial Development Bank (Loan 588-UNI of February 1969 for US\$6 million), had been prepared before the war and presented to the Executive Directors during the war.

10. Despite the rapid processing of the project within the Bank, speedy implementation by the Government failed to materialize. Aside from taking four months longer than scheduled to fulfill the requirements to make the loan effective, the Government took nearly a year longer than expected to award contracts because of administrative difficulties in the FMWH, as explained subsequently. Because of the delays in awarding contracts and hence in starting rehabilitation, the prices of contract works rose, forcing a reduction in project scope. Also, technical problems occurred related to attempts to restore some road sections which had extensively deteriorated beyond the serious damage existing at appraisal.

11. In regard to contract award, the Bank seems to have assumed that because the Government stated that rehabilitation of the project roads was vitally important to the economy it would meet the schedule proposed for tendering in May/June 1969 so that construction could begin in the 1969 dry season (after October/November). In fact, the Government did advertise the project works in April, although the advertisement mistakenly requested tenders to be submitted by May. Tendering did not take place as scheduled, for reasons not specified in the files, and the Bank seems to have devoted little attention to this aspect between June and December when it was pre-occupied with processing negotiations, presentation to the Executive Directors, and effectiveness.

12. The Government prepared tender documents in the summer of 1969 but did not submit them to the Bank for approval, as specified in the loan agreement which had not yet been signed but had been discussed during the August loan negotiations. In October, the Government issued the unapproved tender documents to firms which had responded to an advertisement and also sent copies to the Bank.

13. As regards the tender documents, a misunderstanding occurred between the Government and the Bank about the form in which the performance guarantee was to be supplied because the loan agreement stated that either a 10% Bank guarantee or a 100% performance bond would be allowed, while an August 1969 Bank letter indicated that both forms would be allowed. This was apparently taken to mean that both forms were required, and the Government so specified in the tender documents. When the first Bank supervision mission in December discovered this situation, it advised the Government that the two forms were alternatives and only one was necessary. Perhaps this misunderstanding, which added an unnecessary difficulty to the already protracted tendering process, could have been avoided if the Government had submitted the documents to the Bank for prior approval, or if the Bank had been more vigilant when it received the copies in October.

14. The December supervision mission was not informed of any problems that would prevent contract award in the December 1969-March 1970 period during which contractors were bound by their bids. But another supervision mission in March learned that, except for two tenders which the contractors agreed to honor until May, tenders had expired without contract award. The Government failed to take advantage of this extension and informed the Bank that it would initiate a second round of tendering. After that round, it would try to award contracts promptly so that construction could start during the 1970 dry season.

15. The Bank does not seem to have tried to determine exactly what administrative difficulties had caused the Government to fail to award contracts in the first round. But it did send a third supervision mission in June to look into events related to the second round of tendering. This mission found that the Government had issued invitations to tender only to contractors then registered in Nigeria. Apparently, the Government thought that since this practice had been accepted under the Transport Rehabilitation Project (Loan 694-UNI of June 1970 for US\$25 million)^{1/} it would be accepted for the Highway Rehabilitation Project. For the previously evaluated Apapa Road Project, international competitive bidding procedures had not been required under the loan agreement but had been applied successfully. The mission supervising the Highway Rehabilitation Project insisted that only the international competitive bidding procedures specified in the loan agreement were now acceptable and that the tender period should be extended until August to allow for this modification. This misunderstanding was unfortunate because it further delayed the already prolonged tendering process.

16. The delays and misunderstandings related to contract award led the June 1970 supervision mission to state that it had "serious doubts as to the urgency expressed by the Government when requesting the loan."^{2/} This caused the Bank to consider whether to defer further highway appraisals or to notify the head of Government about the situation. No action in either regard seems to have been taken, possibly because contracts finally were awarded in October (about a year later than expected) while the Bank was still deliberating whether to take action. Mobilization for construction began in the spring of 1971, but work was not fully geared up until the dry season that year, two years later than originally expected.

17. One consequence of the Government's delay in awarding contracts was that tenders for the second round showed prices 25% higher than in the first round. This was due to a general increase in demand for contractors' services to assist in reconstruction after the end of the civil war in January 1970. Because of financial constraints resulting from the civil war, the Government could not provide the additional funds necessary to cover the higher prices and had to reduce the scope of the project. Therefore, it decided to limit work on the Ode Remo-Ibadan section to intensified maintenance. This decision was appropriate in view of the country's overall economic priorities. The Government and the Bank agreed to delete this section from the project (PCR para. 3.08).

1/ International competitive bidding procedures were waived because of the urgency and nature (rehabilitation of very small, disconnected road sections) of the work involved as well as the presence in Nigeria of many foreign contractors who were already repairing war damage and were available for additional work.

2/ Full Supervision Report, August 14, 1970.

18. Another consequence of the delay was that the Lagos-Ode Remo and Ibadan-Oyo-Ilorin sections, whose condition was badly damaged when appraised, were now extensively deteriorated. In some areas, the pavement structure had disappeared completely and appropriate specifications had to be provided for a new subbase and base.

19. Penetration macadam had been chosen to surface these sections because of its apparent suitability for the repairs originally required. However, penetration macadam was actually used on only the Lagos-Ode Remo section and bituminous macadam was used on the Ibadan-Oyo-Ilorin section without price change at the suggestion of the contractor who previously had difficulties with penetration macadam.

20. On the Lagos-Ode Remo section, unseasonable rainfall in January 1972 during laying of the penetration macadam permeated the base and subbase. When heavy traffic used the saturated pavement, rutting, heaving, and disintegration occurred. Therefore, a Bank mission in February 1972 suggested abandoning further arbitrary selection of specifications and taking advantage of the 1972 rainy season, when paving had to be suspended anyway, to carry out a new rational design based on results of special field and laboratory tests. In May 1972, amended specifications for future work were provided to correct the problems. Thus the concept of quick, short-term rehabilitation, pending opening of the parallel Lagos-Ibadan Road, was abandoned and a considerably more expensive solution adopted, involving construction of new subbase and base with bituminous macadam so that an acceptable service level could be attained.

21. On the Ibadan-Oyo-Ilorin section, similar porosity problems from unseasonable rain occurred despite the change from penetration macadam to bituminous macadam surfacing. But, in this case, repairs by patching, re-excavation to subgrade level, back-filling, compaction to formation level with laterite, and surfacing with bituminous macadam keyed with a single surface treatment and a thin layer of hot-rolled sand asphalt succeeded in achieving an acceptable service level.

22. It is not possible to state categorically whether penetration or bituminous macadam were appropriate choices for surfacing. If contracts had been awarded expeditiously so that repairs could have started during the dry season of 1969, it is possible that satisfactory results would have been achieved through application of either of these surfacings over the existing subbase and base. However, because repairs were delayed, necessitating provision of new subbase and base, and because unseasonable rain during laying permeated the exposed surfacing before it was keyed with a single surface treatment, both penetration and bituminous macadam produced unsatisfactory results.

B. Lack of Agreement between the Government and Bank about Studies Carried Out Under the Project

23. Events which transpired in relation to the Lagos-Ibadan and Ibadan-Daura Road studies suggest that communications were insufficient between the Government and the Bank. The confusion and delay which resulted were a consequence of actions, or their lack, by both parties. On the one hand, the Government adopted inflexible positions which precluded compromise with the Bank. The aftermath of a civil war and possible political considerations might have contributed to this attitude; its consequences for the project were, nevertheless, unhappy. On the other hand, the Bank changed its positions several times in its search for accommodations which would allow participation in Nigeria's rapid reconstruction effort.^{1/}

(a) Detailed Engineering of the Lagos-Ibadan Road

24. A new road between Lagos and Ibadan was to be constructed as part of a proposed sixth highway project, for Bank support in FY73. Preparation by consultants of detailed engineering for four lanes (dual carriageways) and tender documents for initial construction of only two lanes (single carriage-way) was included in the Highway Rehabilitation Project (PCR, paras. 3.20-3.22).^{2/} However, the Government issued instructions that tender documents should be prepared for initial construction of four lanes when it employed consultants for this work in late 1970. In August 1971, the Government informed the Bank that, based on the consultants' economic analysis, it wished to construct a four-lane road between Lagos and Ibadan. This decision may have been based on the strategic importance of a viable north-south link capable of handling large traffic volumes safely; there is, however, nothing on record to support this assumption. The Bank's immediate reaction, possibly based on awareness of competing demands for Nigeria's limited resources for reconstruction following the June 1967-January 1970 civil war, was that the economic case for the Government's construction proposal was highly doubtful.

^{1/} The extent of the Bank's interest in participating in Nigeria's reconstruction effort is demonstrated by its appointment of a Transport Specialist who was stationed in Lagos between May 1972 and December 1974.

^{2/} The feasibility study for this road had been carried out under the Apapa Road Project and had recommended construction of a two-lane road along a new alignment. Detailed engineering of about 20 mi had also been included in the project. But as engineering of the whole length was desired, partial engineering was deleted from the Apapa Road Project and full engineering for the total length included in the Highway Rehabilitation Project. Because construction of two additional lanes was expected to be required for the southern half of the road by 1972, and due to cost considerations, the engineering was to be done for a four-lane road.

25. Discussions between the Government and the Bank on whether a four-lane road should straightaway be constructed throughout took place, without agreement, between August 1971 and December 1972. During this period, the Government pressed the Bank to proceed with appraisal of the proposed sixth highway project, which included construction of the Lagos-Ibadan Road as a component. Although detailed engineering of this road had not been completed, the Bank decided to mount a mission to appraise the entire project because it was anxious to assist in Nigeria's reconstruction effort and because it felt that its own economic analysis could show whether initial construction of four lanes throughout was justified. During appraisal, the Government informed the Bank that it had a political commitment to construct a four-lane road by mid-1976 and intended to obtain finance elsewhere if the Bank could not participate.

26. To determine the most economic construction design for the Lagos-Ibadan Road, the mission analyzed several alternatives. The analysis showed that, for opening in 1976, construction of four lanes for the Lagos-Shagamu and Odo Ono-Ibadan sections was economically justified while construction of four lanes for the Shagamu-Odo Ono section was not. So that all facts would be available to reach a final decision, the mission asked the Government to have the consultants update the economic analysis, as provided for in their contract.

27. In March 1973, discussions were held within the Bank to assess whether, in light of the findings of the appraisal mission, support could be provided for construction of a four-lane road between Lagos and Ibadan. Concern was expressed that support for such construction, which the Bank's own economic analysis did not justify, would be tantamount to helping Nigeria spend its resources uneconomically. In addition, avoidance of any action which might negatively affect Nigeria's borrowing in capital markets was considered to be desirable.

28. The Bank's conclusion was that, if the Government would accept splitting the road into three sections, support could be provided for either: (i) four-lane construction for the Lagos-Shagamu and Odo Ono-Ibadan sections and two-lane construction for the Shagamu-Odo Ono section, or (ii) four-lane construction for the Lagos-Shagamu section only, with the rest of the length to be financed by the Government. In notifying the Government of its new position, the Bank stressed that if initial construction of four lanes throughout was still wanted, it would not be able to provide support for this road but would consider other economically justified roads.

29. The Government asked the Bank to allow it to keep its options open until the updated economic analysis was available. The analysis, submitted in May 1973, recommended construction between 1973 and 1974 of a four-lane road between Lagos and Ibadan for opening by 1976. It also noted that this recommendation was being made, despite 1981 being the optimum opening year for the third and fourth lanes in the middle section between Shagamu and Odo Ono, because the economic loss from earlier construction would be small. The analysis revealed that construction of the rest of the road was properly timed.

30. Upon review of this analysis, the Bank's finding was that construction of two lanes between Lagos and Ibadan for opening by 1976 was economically feasible, construction of two additional lanes for the Lagos-Shagamu and Odo Ono-Ibadan sections for opening in 1976 was marginally or fully justified, and construction of four lanes for the Shagamu-Odo Ono section was premature, with optimum opening year 1981. The Bank based this conclusion on standard procedures of evaluation for the consultants' benefit-cost analysis, including incremental investment analysis. The evaluation was supported by a comparison of highway capacities and expected traffic flows, which demonstrated that two lanes for the Shagamu-Odo Ono section would provide sufficient capacity until the early 1980s.

31. When tenders received for the four lanes^{1/} were opened in July 1973, the combined lowest sum for the entire road proved to be 130% higher than the preliminary cost estimate which the Bank had received from the Government based on the original economic analysis. As a result, the Bank reverted to its position, based on the feasibility study of the road, that two lanes should be constructed initially throughout.

32. The Government, however, maintained that four lanes should be constructed and, in November 1973, the Bank through its Resident Mission in Nigeria declined participation in financing. Subsequently, the Government inquired about the Bank's position with regard to the Lagos-Ibadan Road. The Bank reiterated its position, as reflected in para. 28 of this report. It also stated that tenders received made it clear that project costs would be much higher than estimates made at the time of appraisal and that no new traffic data had been produced which would greatly change the calculation of benefits. No direct reference was made to the effect of the cost increase on the economic justification for construction of four lanes between Lagos and Shagamu, which the Bank had offered to finance separately (para. 28). The Government subsequently pressed the Bank to continue processing the sixth highway project proposal, excluding the Lagos-Ibadan Road,^{2/} and the Bank sent a mission to Nigeria in December 1973 to complete the appraisal. But the Government informed the mission that appraisal of this proposal was to be discontinued because of the Government's policy decision to stop seeking loans for certain sectors, including transport.

33. A development which had a significant effect on the Lagos-Ibadan Road was a high level Government decision, which became policy in the September 1972-73 period, to speed up implementation of the highway investment program. Because of this decision, the FMWH became committed to a set of predetermined, rigid physical standards and procedures for federal highway construction which eliminated economic analysis. This represented a difference in approach with the Bank regarding selection, priority, and evaluation of major highway projects, including the Lagos-Ibadan Road.

^{1/} The Government informed the Bank that it intended to seek tenders for initial construction of four lanes; it did not request the Bank's agreement.

^{2/} The road is now being constructed as a four-lane expressway and opening is scheduled for 1977.

34. The lack of agreement between the Government and the Bank regarding construction of the Lagos-Ibadan Road was unfortunate. The consequent stalemate proved costly for Nigeria in terms of loan funds foregone and for the Bank in terms of poor relations with its Borrower. Perhaps this situation could have been avoided if the Government had informed the Bank in time that it was politically committed to construct the Lagos-Ibadan Road in four lanes throughout regardless of the economic viability of the design. This would have made it easier for the Bank to state its position clearly.

(b) Feasibility Study of the Ibadan-Daura Road

35. Two issues arose regarding this study: (i) Government's failure to fulfill its agreement with the Bank to follow procedures for employing consultants as specified in the "Uses of Consultants by the World Bank and its Borrowers", and (ii) Government's decision to build a bridge across the Niger River at Jebba, which resulted in a substantial reduction in the scope of the study.

36. The FMWH had agreed to follow the Bank's guidelines on the "Uses of Consultants", which specify that the Borrower and Bank should collaborate in: preparing terms of reference which state a study's objectives; outlining the scope of work and defining each major task; and summarizing the data, facilities, and services which the Borrower could provide. The FMWH also had agreed to follow the "Uses of Consultants" procedure whereby a list of firms experienced in the subject studies would be drawn up, their capabilities studied in detail, four or five firms invited to submit proposals, and the firm with the best proposal to fulfill the terms of reference selected. Instead, the Government prepared terms of reference, which were not submitted to the Bank for review, and invited priced proposals for the study. Upon the Bank's intervention, the FMWH announced that prices should be omitted but proposals submitted anyway. Only two proposals were received. Afterwards, the FMWH stated that the advertisement was meant to call for firms to express interest only and that the advertisement had been wrongly worded. Therefore, the FMWH started the procedures once more, and finally selected a firm which completed the study satisfactorily.

37. Concurrently with the invitation to consultants for proposals to carry out the feasibility study of the Ibadan-Daura Road, the FMWH invited proposals for studies of a bridge crossing the Niger River at Jebba, which the Federal Executive Council had directed the FMWH to carry out on a "design and construct" basis. This was unsettling to the Bank, which had considered that a major issue for the feasibility study of the Ibadan-Daura Road was determination of the best site for the Niger River crossing (not necessarily at Jebba). The Bank pointed out to the Government that planning and constructing a new bridge at Jebba would preempt the options available for the feasibility study, predetermine the alignment of the proposed Ibadan-Daura Road, and thus greatly reduce the value of the study as originally contemplated. The Government, however, decided to go ahead with its own plan.

III. Bank Supervision of Project Progress

38. Supervision of this project's progress took place during nine missions between 1969 and 1975. Major staff efforts were expended in 1970, when three missions were mounted to look into the delays in contract awards, and in 1972, when two missions were made concerning the road surfacing problems. These concentrations seem to have been appropriate. One of the 1972 missions was especially worthwhile as it convinced the FMWH to resolve the surfacing problems on the Lagos-Ode Remo section by redesign rather than change in specifications.

IV. Conclusions

39. Less than half of the length of the roads originally included in the Highway Rehabilitation Project was eventually constructed satisfactorily rather than rehabilitated, as expected at appraisal. Although the work took about twice the time anticipated to complete and cost nearly twice the estimate, it was economically justified.

40. Under this project, the Bank reacted rapidly to the Government's request for emergency financial assistance and suggested "shortcuts" which should have expedited implementation of the roadworks involved. Unfortunately, any time savings resulting from the shortcuts were erased by the Government's lack of urgency in awarding contracts for the roadworks.

41. In conclusion, it seems appropriate to observe that some of the problems which occurred under the Highway Rehabilitation Project may have been related to the ongoing Tribunal of Inquiry which was investigating improprieties under the previously evaluated Apapa Road Project as well as to resultant changes in key FMWH personnel.

NIGERIALOAN 640-UNI - HIGHWAY REHABILITATIONPROJECT COMPLETION REPORTPROJECT DATA

Borrower:	Federal Government of Nigeria
Beneficiary:	Federal Government of Nigeria
Executing Agency:	Federal Ministry of Works and Housing (FMWH)
Amount of Loan:	US\$10.6 million
Amount Disbursed:	US\$10.6 million
Date of Loan Agreement:	November 6, 1969
Effective Date:	
Original Estimate	March 1, 1970
Postponements	April 1, 1970, June 1, 1970
Actual	July 31, 1970
Closing Date:	
Original	June 30, 1972
Revised	June 30, 1973
Final Disbursement:	October 1974
Interest Rate:	7%
Service Charge:	3/4 of 1%
Amortization:	December 15, 1972-December 15, 1984
Period of Grace:	3 years
Terms of Loan:	25 years
Completion Date:	
Original Estimate	October 31, 1971
Actual	December 1973
Exchange Rates:	Prior to December 20, 1971: N1.00 = US\$1.40 ^{1/} December 20, 1971-April 1, 1974: N1.00 = US\$1.52 N1.00 = 100 Kobo
Appraisal Report Number:	PTR-27a
Appraisal Report Date:	September 10, 1969
Appraisal Mission Date:	February/March 1969
Negotiations:	August 6-14, 1969

^{1/} At time of Appraisal Report the Nigerian currency was N1.00 = US\$2.80, or N1.00 = US\$1.40. Unless otherwise noted, this exchange rate is used throughout the report.

Supervision Missions Dates:	Number of Bank Staff:
November 18-December 5, 1969	2
March 1970	1
May 28-June 11, 1970	2
August 31-September 24, 1970	2
August 3-18, 1971	1
February 5-6, 1972	2
June 7-9, 1972	2
June 27, 1974	1
November 25, 1974	4

ACRONYMS

AADT:	Average Annual Daily Traffic
BOQ:	Bill of Quantities
CRE:	Chief Resident Engineer
FMWH:	Federal Ministry Works and Housing
SWKP:	Scott, Wilson, Kirkpatrick & Partners
VPD :	Vehicles per Day
VOC:	Vehicle Operating Costs

Western Africa Region
Highways Division
March 31, 1976

NIGERIA

LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

I. SUMMARY AND CONCLUSIONS

A. Summary

1.01 The transport sector of Nigeria was placed under severe strain as a result of major political disturbances beginning in 1966 and culminating in the civil war (July 1967-January 1970). Previously congested highways were required to carry increasing traffic which caused an additional burden for the already inadequate road maintenance. Heavy rains in 1968 nearly slowed traffic to a standstill in the important Lagos-Kano corridor.

1.02 The Government recognized the seriousness of this situation and began preparation of a general transport system rehabilitation and development program. Major emphasis was placed on rehabilitation of two important roads in the Lagos-Kano corridor, Lagos-Ode Remo-Ibadan-Oyo-Ilorin and Lagos-Ewekoro. In late 1968 a Bank economic mission which visited Nigeria confirmed the priority of rehabilitation of these sections and identified a project including rehabilitation of these two sections as well as detailed engineering for a new Lagos-Ibadan expressway and studies of other high priority road sections.

1.03 The project which was appraised in early 1969 included the rehabilitation of about 200 miles of trunk roads and preinvestment studies. Consultant services to assist the Federal Ministry of Works and Housing in preparing detailed engineering and construction supervision for the road sections to be rehabilitated were added to the project on the suggestion of the Bank.

1.04 By the time construction was to begin it became evident, however, that the pavement of the road sections to be rehabilitated was further disintegrated than originally anticipated, and that major reconstruction was necessary. In view of this, the Government also proposed improvements in the horizontal and vertical alignments not originally contemplated, as well as strengthening of the pavement.

1.05 In June 1974, construction work was completed satisfactorily on three contracts (Lagos-Ode Remo, Ibadan-Oyo and Oyo-Ilorin) totalling 136 miles of road and a contract for bridges on these road sections. The contract Lagos-Ewekoro was terminated for unsatisfactory performance on the part of the contractor and this section was dropped from the project, as well as the Ode Remo-Ibadan section, for which the Government intended to provide intensified maintenance. The roads and bridges constructed under the project are in satisfactory condition.

1.06 Technical assistance to FMWH for preparation of the detailed engineering and bidding documents and for construction supervision of

the Lagos-Ilorin Road was provided by the consultants, Scott Wilson Kirkpatrick and Partners (SWKP, UK). They were also responsible for the detailed engineering and economic analysis of the Lagos-Ibadan Expressway. Louis Berger (US) in association with Obi Obembe and Associates (Nigeria), undertook a feasibility study of the Ibadan-Daura Road and identified four highway sections for which detailed engineering was completed. Consulting services were satisfactorily completed within anticipated time limits.

1.07 Estimated costs at time of appraisal and approximate final costs (the latter excluding the two highway sections deleted from the project) are as follows (see also Table 1):

	<u>Appraisal Estimate</u>		<u>Final Costs</u>	
	<u>(Incl. Contingencies)</u>		<u>(Incl. Contingencies)</u>	
	<u>N. Mil.</u>	<u>US\$ Mil.</u>	<u>N. Mil.</u>	<u>US\$ Mil.</u>
Consultant Services	1.9	2.7	1.5	2.3
Civil Works	8.8	11.3	14.4	21.9
Contingencies	<u>2.2</u>	<u>3.1</u>	<u>-</u>	<u>-</u>
TOTAL	<u><u>N12.9</u></u>	<u><u>\$17.1</u></u>	<u><u>N15.9</u></u>	<u><u>\$24.2</u></u>

The cost increase is due to the changes from road rehabilitation to reconstruction including a stronger pavement, and higher prices caused by the delay in execution. The latter affected the costs by requiring about 30% more funds; the other cost increase is due to the additional works. The Government provided the necessary funds for the additional work. By agreement with the Government all Loan funds were finally disbursed against construction costs with Government covering all costs of consulting services. The Loan amount of US\$10.6 million represented about 50% of the estimated total construction costs.

1.08 At time of appraisal, estimates of economic rates of return for the road sections were based on various estimated economic life spans and on the assumption that only rehabilitation works would be carried out. Appraisal estimates in both standards and costs were exceeded. However, vehicle operation cost savings also exceeded appraisal forecasts. Although not strictly comparable, the following table shows the estimated return at the time of appraisal and re-evaluated return based on current information on costs, economic life and traffic development (see Table 4):

<u>Road Sections</u>	<u>Economic Rate of Return</u>	
	<u>Appraisal</u>	<u>January 1976</u>
	<u>(%)</u>	<u>(%)</u>
Lagos-Ode Remo	15 - 42	28
Ibadan-Oyo-Ilorin	9 - 27	44

B. Conclusions

1.09 The economic data were not available in sufficient detail at appraisal to permit now more than a general review of the economic rates of return. The re-evaluation based on the revised scope of work shows that the changes from rehabilitation to reconstruction were justified, regardless of the construction of the new Lagos-Ibadan Expressway.

1.10 The Bank reacted with reasonable alacrity to the country's need for urgent road rehabilitation in the aftermath of the civil war. Although the original concept of the project was largely overtaken by events, the re-evaluation of the project as executed confirms its validity. By and large, the project achieved its main objectives, namely to improve conditions on trunk roads of vital importance, to keep export traffic moving, and to maintain unrestricted exchange of foodstuffs between some surplus and some deficit areas of the country.

2. THE PROJECT

A. General Description

2.01 The project as appraised included:

(a) Rehabilitation of roads:

(i) rehabilitation of 204 mi of Routes A-1 (Lagos-Ode Remo-Ibadan-Oyo-Ilorin) and A-9 (Lagos-Ewekoro); and

(ii) consulting services to assist FMWH in preparing and supervising (i) above.

(b) Detailed engineering of a new Lagos-Ibadan Expressway (70 mi); and

(c) Studies:

(i) a feasibility study, including preliminary engineering, of an improved road connection between Ibadan and Daura, including the crossing of the Niger River; and

(ii) a preliminary study of the improvement of Benue River crossings at Numan and Yola^{1/}.

B. Design Standards

2.02 Design standards included in Schedule 5 of the Loan Agreement (see Annex I) were generally adhered to. However, because of inadequate results with penetration macadam, the pavement design was changed to provide for increased strength and better resistance to weather conditions. The Government also directed that the contract documents for the Lagos-Ibadan Expressway should provide for the simultaneous construction of all four lanes rather than initially only one 24-foot carriageway as specified in Schedule 5 of the Loan Agreement.

C. Cost Estimates

2.03 The appraisal estimate for rehabilitation work was ₦8.10 million (US\$11.3 million) plus quantity and price contingencies of 20% and 5% respectively (₦10.2 million or US\$14.3 million total). Of the total, ₦6.2 million (US\$8.6 million) was estimated to be in foreign exchange.

^{1/} Item (c)(ii), Studies for Benue River Crossings, was later incorporated into a larger study for the Ikoman-Ogoja-Katsina-Ala-Maiduguri Road, included in the Fifth Highway Project (Loan 838-UNI). Bridges over the Benue River at Numan and Yola are now part of a FMWH design-and-construct contract.

Consulting services, including supervision of construction, detailed engineering of the Lagos-Ibadan road and feasibility studies, were estimated at N1.9 million (US\$2.7 million) plus price contingency of 5% (N2.0 million or US\$2.8 million). Of the total, N1.4 million (US\$2.0 million) was allowed for foreign exchange (Table 1). The Appraisal Report contemplated the Loan covering about 60% of the cost of the civil works and 70% of the cost for all consulting services.

3. PROJECT IMPLEMENTATION AND EXECUTION

A. Construction Works

3.01 To expedite the construction work in view of the rapidly deteriorating condition of the project roads, construction contracts were awarded prior to completion of detailed designs and full bills of quantities. Tendering for the rehabilitation work was done on the basis of preliminary designs and estimated quantities prepared by FMWH and reviewed and updated by SWKP.

3.02 In early 1970, bids were initially requested from contractors who expressed an interest in response to local advertising and announcements sent to all Embassies and High Commissions in Lagos. After bid review was extended beyond the validity date, the Government advised the Bank in May 1970, that tenders had either been withdrawn, or would be rejected and the project items re-bid. New tenders were then called in June 1970. At the Bank's urging notification was given to Embassies and High Commissions, similar to the previous bidding procedure. Contracts were finally awarded, with Bank concurrence, in early 1971. Final design work and bills of quantities were not ready until much later. The bridge construction contract was awarded in July 1971 on the basis of reasonably complete designs and specifications.

3.03 The lapse of time between the initial decision by Government to undertake rehabilitation work and the award of construction contracts resulted in most of the road sections reaching such an advanced stage of deterioration that full reconstruction was necessary. This, and the need to improve the pavement design (para.3.05), resulted in major re-engineering and, ultimately, comprehensive improvements in alignment which would not be included in the rehabilitation concept.

3.04 Originally penetration macadam was chosen to pave the roads, on the assumption that existing courses would remain in place and the penetration macadam could be overlaid. The attempts to lay this course over the old base and sub-base during the rainy season resulted in conditions incompatible with the use of penetration macadam. The water penetrated the base and sub-base with resultant failures. Consequently the design was altered to provide for a new crushed rock base with a hot-rolled asphalt surface course. This proved satisfactory.

3.05 The decision to change from rehabilitation to reconstruction, including the change in pavement design, took place after contracts had been awarded. Although both changes would, in any case, have resulted in increased costs, the increases would have been less if the changes had been included in the original bidding documents. The Bank recognized, however, the urgency to improve the conditions of the project roads, and was flexible enough to waive normal requirements on project preparation. It also approved changes that were apparently necessitated by field conditions during works execution.

Lagos-Ode Remo Section (40 mi) - Contract No. 1169

3.06 Originally this road was 42 mi long but it was reduced by 2 mi at the Lagos end to accommodate the proposed Lagos-Ibadan Expressway. The contract amounting to about ₦2.67 million (US\$3.74 million) was awarded to contractor Dumez (France). The change in pavement design resulted in the adoption of an 11-inch gravel base and sub-base with 3+1/2 inches of hot rolled asphalt as surface course in place of the originally specified penetration macadam. The revised specification was satisfactory and produced an acceptable pavement with a non-porous surface. Construction was completed in June 1974. The final cost was ₦6.02 million (US\$8.43 million) (Table 2). Cost overruns were due to:

- i) Additional works including realignments at three locations to ease sharp curves and steep grades at a cost of about ₦1.97 million (US\$2.76 million);
- ii) improved maintenance for 36 mi of existing road between Ode Remo and Ibadan at a cost of about ₦281,600 (US\$0.39 million); and
- iii) contractor's claim for repair of damaged sections, where penetration macadam was laid prior to specification changes and for rate increases due to extended contract period at a cost as outlined before.

3.07 Dumez' claims amounted to ₦1.5 million (US\$2.1 million) for stopping and then repairing the penetration macadam work, including 30% extra on all unit rates for work carried out from January 1973. The final cost includes ₦1.1 million (US\$1.5 million) covering extra payments recommended by the Chief Resident Engineer in settlement of the contractor's claims and considering 21% extra on unit rates for the same period.

Ode Remo - Ibadan Section (37 mi)

3.08 Escalating costs made it necessary to concentrate construction effort for the Lagos-Ilorin Road on the most seriously damaged sections. Because of the planned construction of the future Lagos-Ibadan Expressway on a new alignment, the Government deleted major rehabilitation work on the Ode Remo - Ibadan section and substituted "intensified maintenance". Very little work has apparently been done even to the reduced scale contemplated although this section continues to be subjected to heavy traffic. A subsequent consultant's report recommended that the final 11 mi into Ibadan should be fully reconstructed despite construction of the new Expressway.

Ibadan-Oyo Section (31 mi)-Contract No.1170

3.09 The contract was awarded in the tender sum of ₦1.78 million (US\$2.50 million) to Solel Boneh (Israel). Penetration macadam was originally specified (as in Contract 1169) but the contractor opted to construct the road with pre-coated bituminous macadam without price change. Some initial

difficulties were experienced with the pavement, again due to rainwater penetrating the base and sub-base as in the Lagos-Ode Remo Section, and the consultants recommended that the pavement specifications be amended to provide pre-coated chippings to key the macadam course and 1-1/2 inches of asphalt.

3.10 Contract change orders were also issued to provide for widening of a small bridge and for protective and drainage works where the road passed through small townships.

3.11 The final cost was ₦3.09 million (US\$4.33 million) and work was satisfactorily completed in June 1973 (Table 2).

Oyo-Ilorin Section (65 mi) - Contract No. 1171

3.12 The contractor, Solel Boneh, carried out reconstruction to the same revised specifications as for Ibadan-Oyo section. The original contract price (including provision for hot-rolled asphalt) was ₦3.7 million (US\$5.2 million). Changes in specifications and additional work including a by-pass in Ilorin brought the final cost to ₦4.8 million (US\$6.7 million) (Table 2). Work was satisfactorily completed in December 1973.

Lagos-Ewekoro Section (29 mi) - Contract No. 1172

3.13 This section was originally included in the Bank-assisted project. A construction contract was awarded in February 1971 but in March 1974 it was terminated for poor performance with less than half of the work completed. After extended discussions between the Bank and the Government no Bank funds were used for the project. The section was later reconstructed under an FMWH-funded contract.

Bridges at Lagos-Ikorodu Road - Contract No. 1187

3.14 The construction contract called for construction of four new bridges and a large box culvert on the Lagos-Ikorodu road. The original contract, let in July 1971, was for the amount of ₦0.5 million (US\$0.7 million). Final cost, after settlement of claims, was also ₦0.5 million (US\$0.7 million) (Table 2). Work was satisfactorily completed in February 1973, slightly ahead of schedule.

Contractor Performance

3.15 Contractor's performance on the road contracts was satisfactory except on the Lagos-Ewekoro road where poor performance brought about the cancellation of the construction contract and, in the end, deletion of the section from the project. The bridge contractor performed well, completing his work within the contractual time limits and below the total bid price.

B. Consultants' Services

Ibadan-Daura Feasibility Study and Preliminary Engineering

3.16 An interim report was produced in October 1972 by joint venture consultants, Louis Berger, Inc. (USA) and Obi Obambe and Associates (Nigeria). A contract was awarded to Berger in February 1972 to carry out studies. It identified the following road sections which appeared to be economically justified:

i)	Ibadan-Oyo	28 miles
ii)	Ilorin-Bode Sadu	42 "
iii)	Bokani-Tegina	61 "
iv)	Zaria-Makurdi	23 "
v)	Katsina Turnoff-Kunya-Kongolam	80 "

3.17 The recommendations were reviewed during discussions between FMWH, the Bank and consultants in March 1973. It was agreed to combine the survey work of the final stage of the original study with that required under detailed engineering for all sections except Ibadan-Oyo which was omitted because of its inclusion in the rehabilitation program.

3.18 Terms of reference for the detailed engineering, to include updating of economic analysis, were agreed by the Bank, FMWH and the consultants in July 1973. The consultants were requested to give their highest priority to completion of Katsina Turnoff-Kongolam section as it was being considered for inclusion in a proposed Sixth Highway Project. Detailed engineering of the four road sections was completed under the Fifth Highway Project (Loan 838-UNI). The consultants' performance was satisfactory.

3.19 In April 1973 FMWH told the consultants to discontinue their study of the Niger River crossing at Jebba as it had been decided that a new bridge would be built on a "design and construct" basis, with Government funds. A ₦15.9 million (US\$24.2 million) contract was signed with Julius Berger AG (Federal Republic of Germany) in June 1974 for construction of a four-lane bridge. Construction is expected to be completed in June 1977.

Lagos-Ibadan Expressway Detailed Engineering and Economic Analysis

3.20 The project provided for design of a four-lane divided highway between Lagos and Ibadan, with contract (bidding) documents to be prepared for phased construction. In 1970 the Government, however, instructed the consultants (SWKP) to prepare the bidding documents on the basis of initial construction to four-lane standards throughout. Discussions between the Government and the Bank over this issue continued during the design period and the updating of the economic analysis.

3.21 The consultants (SWKP) substantially completed the final engineering design in February 1973. A Bank mission reviewed the documents during March 1973 and gave comments to FMWH. The consultants conducted traffic counts to update their economic analysis, which was completed in May 1973.

The analysis gave SWKP's assessment of incremental economic rates of return and first year benefits resulting from construction in sections, first constructing two lanes and then adding another two.

3.22 The Bank commented to FMWH on the updated economic analysis in May 1973. The revised economic analysis was reportedly completed in August 1973, that is, after July 30, when bids were opened for the three contracts into which the expressway construction had been divided. The Government is carrying out the construction of the expressway without external financing. The consultants' performance was, in general, satisfactory considering the complexity of the task.

Construction Supervision

3.23 FMWH had primary responsibility for supervision of construction, with advisory services furnished by the consultant (SWKP). No major problem arose from this arrangement, though an exceptionally good cooperation between the Government appointed Chief Resident Engineer and the consultants' team was required to execute effective construction supervision. The consultant prepared the detailed specifications and bidding documents. A penetration macadam pavement, as initially proposed by the consultant, might normally have been satisfactory. However, the advanced state of deterioration of the project roads when work finally started combined with the attempt to carry out construction during the rainy season resulted in unsatisfactory construction. Hindsight suggests that an earlier determination to alter the pavement design would have been appropriate and have avoided some extra construction work and consequent cost.

C. Principal Covenants

3.24 The Federal Republic of Nigeria agreed to:

- (a) Reclassify its trunk highways and assign responsibility for the operation of such highways to appropriate Government agencies, in consultation with the Bank and in the light of the Trunk Road Study of 1968 (Loan Agreement, Sec. 5.02) (see para. 3.25);
- (b) arrange for the rehabilitation of the Ilorin-Jebba road to be completed no later than the Lagos-Ilorin section, included in the project (Loan Agreement, Sec. 5.04) (see para. 3.26);
- (c) take such steps as shall be reasonably required to ensure that the dimensions and axle loads of vehicles using the Federal highway system, and especially the project road sections, are consistent with the structural and geometric design standards used, and that the legal limits imposed on vehicle dimensions and axle loads in accordance with such standards are duly observed (see para. 3.27).

3.25 State Governments' comments on proposed new Federal Highway Regulations were received and agreed by the Federal Executive Council and approved by the Supreme Military Council.

3.26 Rehabilitation of the Ilorin-Jebba road section was completed satisfactorily in June 1970, prior to completion of work on the Lagos-Ilorin sections as required by the Loan covenants.

3.27 Existing legislation for vehicle dimensions and axle loads is not effectively enforced, except marginally in the Western and North Central States. In April 1972 on Contract 1169 (Lagos-Ode Remo Road Section) consultants (SWKP) recorded the following:

- i) 258 out of 1,434 axles (18%) exceeded 22,000 lb axle loading;
- ii) 13% of weighed vehicles were heavier than 40 tons gross weight; and
- iii) 55.6 tons gross weight was the heaviest vehicle weighed.

D. Disbursements

3.28 Total contract payments for the three road sections and the bridges amounted to N14.4 million (US\$20.2 million). The full loan amount of US\$10.6 million was disbursed as of October 1974, all for Category II (Civil Works). At the request of Government loan funds originally allocated for Category I (Consultant Services) and Category III (Unallocated) were re-allocated to the Civil Works Category (see Tables 1 and 3).

4. ECONOMIC RE-EVALUATION

A. General

4.01 The project has been re-evaluated using available updated figures and information. However, lack of background data for the computation of economic return in the Appraisal Report made the economic re-evaluation and comparison more difficult. Finally, during the six-year period from the original appraisal until completion, (1969-1975) the value of Nigerian currency changed several times.

4.02 Final cost of rehabilitation/reconstruction on the sections of the Lagos-Ilorin Road differs substantially from Appraisal Report estimates. The difference can be explained partially by the change in the scope of works and partly by inflation (para. 4.06). Nevertheless, the re-evaluated economic returns fit basically in the broad range set up by the Appraisal Report since savings in vehicle operating costs are higher than originally estimated (due to the change from rehabilitation to reconstruction) and economic life of new works has been substantially extended.

B. Background

4.03 The project road, Lagos-Ilorin is part of the most important land corridor in Nigeria, Lagos-Kano, which links the largest urban centers of the country with major agricultural producing areas. The road is the major route for export/import flows to and from the Port of Lagos as the railway share in the traffic continues to decline.

4.04 In the past seven years, export/import traffic flow by road grew rapidly, increasing to about 2.5 million tons or 75% over the 1967/68 volume. Nearly all export/import traffic is now handled by road. This situation is illustrated in the following Table:

	<u>(thousand tons)</u>		<u>% of Total Rail and Road Movement to and from the Port</u>	
	<u>Imports</u>	<u>Exports</u>	<u>Imports</u>	<u>Exports</u>
1967/68	636	771	68	56
1970/71	1,329	775	85	68
1974/75	2,125	333	95	97

C. Construction Costs

4.05 The actual cost (net of taxes) for constructing the Lagos-Ode Remo and the Ibadan-Oyo-Ilorin roads (136 miles) under the project totalled ₦11.2 million (US\$15.7 million) compared with ₦5.6 million (US\$7.8 million) including supervision and contingencies estimated in the Appraisal Report (Table 4). Construction expenditures (net of tax) were distributed in the economic re-analysis over the years 1971-1974.

4.06 Contracts were awarded in early 1971 instead of late 1969 as originally assumed. The works were completed by June 1974, three years later than anticipated. The Government provided the additional funds for the increased costs resulting from the delayed execution and additional work. Inflation impact for the period 1971-74 was probably similar to the change in consumer prices which rose in Nigeria about 30% at that time. Additional work increased the cost for the Lagos-Ode Remo road by about 100% and for the Ibadan-Oyo-Ilorin road by about 40%.

D. Traffic Forecast

4.07 In the 1965-73 period, the average annual daily traffic (AADT) on the Lagos-Ilorin road was growing at about 6.5%. In 1975^{1/} the AADT on the Lagos-Ode Remo Section was about 6,400 vpd and tapered down to about 2,750 vpd on the Ibadan-Ilorin Section (Table 5). However, because of the expected completion of the new Lagos-Ibadan Expressway in 1977, traffic on the first two sections will be substantially reduced. Under a conservative assumption based on available origin/destination surveys, it could be reasonably assumed that at least 1,000 vpd will be retained on the old road in 1977.

4.08 The Appraisal Report estimated an annual traffic growth of 5% on the Lagos-Ilorin road (see Table 5). Although the actual traffic growth appears to be slightly higher in 1965-73, the economic re-evaluation was conservatively based on the traffic growth of 5% per annum beginning in 1977 for Lagos-Ode Remo Sections (40 mi). Traffic growth on the old road is expected to slow down upon completion of the new expressway.

4.09 Traffic composition on the project's routes varies on different road sections. According to 1972/73 counts, 50% was light and heavy trucks and buses, 30% was cars, and 20% was vans and minibuses.

E. Vehicle Operating Costs

4.10 Vehicle operating costs (voc) savings used in the reassessment of the economic analysis are based on the comprehensive 1973 SWKP study "Road Vehicle Operating Costs in Nigeria". New unit savings in voc are higher than those used in the Appraisal Report. They take into account the savings between different road improvement standards (i.e., reconstructed ve rehabilitated) and additional cost increases occurring from 1968 for vehicles, tires, fuel, oil and spare parts. Depending on the traffic service level, unit savings in voc range between Kobo 2.45 and 4.92 per mile (Table 6).

F. Benefits of the Project

4.11 The project produced quantifiable and non-quantifiable benefits. In the re-analysis, as in the Appraisal Report, the major quantifiable benefits considered in the analysis were savings in vehicle operating costs.

^{1/} The first year of operation - benefits.

Road maintenance costs are expected to remain about the same before and after completion of the project. No accident cost savings have been included in the analysis. An added project benefit is attributable to the project road providing a service not available from an alternate mode. The railway's inability, as noted in the Appraisal Report, to accept all traffic available continues to place heavy demands on road transport along the Lagos-Ilorin axis (and on to Kano). As in the Appraisal Report, these benefits have not been included in the rate-of-return calculations.

4.12 As non-quantifiable benefits, the project eased traffic flows on a section of the Lagos-Kano corridor with a resulting positive impact on road transport of export/import commodities to and from the Port of Lagos. In addition, numerous truck and car owners benefit directly from reduced voc together with passengers and consumers who benefit indirectly by a delay of likely increases in transport fares.

G. Economic Return

4.13 The recomputed economic return of the Lagos-Ode Remo and Ibadan-Oyo-Ilorin sections indicate that the increased amount of works initiated by the Government was justified. The return on the Lagos-Ode Remo section fits the range of economic returns estimated by the Appraisal Report, while the return for the Ibadan-Ilorin section surpasses the range, despite substantial changes. Unfortunately, the details of the original calculation are not known (Table 4). As emphasized before, re-evaluation of the changed project is not fully comparable with the original project analysis. On the basis of actual project cost, latest available traffic figures, current vehicle operating cost estimates and assumption of a 20-year economic life of the project (Appraisal Report estimated 4 - 10 years) the project is estimated to be yielding a 28% return on the Lagos-Ode Remo section, and a 44% return on the Ibadan-Ilorin section. The returns are slightly lower when a 20% decrease in benefits is assumed (Table 4). Substantially higher costs for construction were offset by higher unit savings in voc, extended economic life and high initial AADT.

NIGERIA

LOAN 640-UNI - HIGHWAY REHABILITATION PROJECT

PROJECT COMPLETION REPORT

COSTS AND BANK PARTICIPATION IN DISBURSEMENTS

(in US\$ & Naira million)

Category	Appraisal Estimate		Final Costs			Original Allocation of Loan Proceeds	Actual Disbursements
	N	US\$	N	US\$ ^{1/}		US\$	US\$
Consultant Services	1.9	2.7	1.5	2.3 (2.2)		1.9	- ^{2/}
Civil Works	8.1	11.3	14.4 ^{3/}	21.9 ^{3/} (21.6)		6.8	10.6
Unallocated	2.2	3.1	-	-	-	1.9	-
TOTAL	<u>12.2</u>	<u>17.1</u>	<u>15.9</u>	<u>24.2</u> (<u>23.8</u>)		<u>10.6</u>	<u>10.6</u>

^{1/} Figures in brackets are calculated with an exchange rate of N1.00 = US\$1.50 which is the estimated average rate during project execution.

^{2/} The Government did not wish to be reimbursed for the foreign exchange cost of the consulting services.

^{3/} Rehabilitation of road sections Lagos-Ewekoro (29 mi) and Ode Remo-Ibadan (37 mi) as well as two miles of the Lagos-Ode Remo road were deleted.

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LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

CONSTRUCTION WORKS CONTRACTS

CONTRACT NO.	1169	1170	1171	1187	TOTALS
ROAD SECTION	LAGOS-ODE REMO	IBADAN-OYO	OYO-ILORIN	LAGOS-IKORODU-BRIDGES	
MILES	40	31	65	-	136
CONTRACTOR	DUMEZ	SOLEL BONEH	SOLEL BONEH	NIGERIA C & F LTD	
DATE OF CONTRACT	MARCH 13, 1971	JANUARY 16, 1971	JANUARY 16, 1971	JULY 13, 1971	
ORDER TO COMMENCE	JUNE 1, 1971	MAY 1, 1971	MAY 1, 1971	OCTOBER 1, 1971	
ORIGINAL COMPLETION DUE	JUNE 1, 1973	JANUARY 1, 1973	JUNE 1, 1973	MARCH 1, 1973	
REVISED COMPLETION DUE	JUNE 1, 1974	JANUARY 31, 1974	APRIL 30, 1974	FEBRUARY 16, 1973	
ORIGINAL CONTRACT SUM (N)	2,668,918	1,778,983	3,679,280	502,818	8,630,000
REVISED CONTRACT SUM (N)	5,569,918	2,442,983 ^{2/}	4,799,280	502,818	13,315,000
TOTAL VALUE CERTIFIED WORKS	4,509,882	2,925,237 ^{2/}	4,506,913	451,186	12,393,218
AT DATE	JUNE 6, 1974	MARCH 11, 1974	JUNE 8, 1974	APRIL 24, 1974	JUNE 8, 1974
AS % ORIGINAL CONTRACT SUM	169%	164%	122%	90%	144%
AS % REVISED CONTRACT SUM	81%	120%	94%	90%	93%
DEDUCT RETENTION (N)	(150,000)	(100,000)	(100,000)	(44,116)	(394,116)
ADD PLANT ADVANCE (N)	140,000	-	-	-	140,000
ADD MATERIALS ON SITE (N)	-	-	-	-	-
ADD VARIATION MATERIALS (N)	260,827	10,962	45,510	2,156	319,455
ADD VARIATION LABOUR (N)	96,448	47,645	87,906	4,080	236,079
ADD REPAYMENT RETENTION (N)	43,812	50,000	55,000	22,058	165,870
ADD DAYWORKS (N)	23,130 ^{1/}	-	-	-	23,130
ADD ADVANCES ON CLADS (N)	1,100,000 ^{1/}	-	153,868	408	1,254,276
TOTAL EXPENDITURE (6/74) (N)	6,024,099	2,933,844	4,744,197	435,772	14,137,912
FINAL COST (million) (N)	6,024,	3,092	4,799	0,505	14,420
AS % ORIGINAL CONTRACT SUM	226%	171%	130%	100%	167%
AS % REVISED CONTRACT SUM	106%	127%	100%	100%	108%

^{1/} Claims for change of design and increased unit rates due to extended contract period.
^{2/} Includes Ilorin town works and bypass.

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LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

SCHEDULE OF DISBURSEMENTS

IBRD FISCAL YEAR AND SEMESTER	ACCUMULATED DISBURSEMENTS US\$ MILLION		ACTUAL DISBURSEMENTS AS A PERCENTAGE OF APPRAISAL (UP TO FINAL SEMESTER)
	ACTUAL TOTAL DISBURSEMENTS	APPRAISAL ESTIMATE a/	
<u>1969/70</u>			
1st			
2nd		0.2	
<u>1970/71</u>			
1st			
2nd		6.0	
<u>1971/72</u>			
1st	0.0		
2nd	2.1	10.2	20%
<u>1972/73</u>			
1st	2.1		20%
2nd	2.1	10.6	20%
<u>1973/74</u>			
1st	2.1		20%
2nd	8.3		78%
<u>1974/75</u>			
1st	10.6		100%

Closing Dates: 6/30/72 originally, extended to 6/30/73.

a/ Appraisal Report did not contain semi-annual figures.

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LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

Economic Rate of Return

Road Section	Miles	^{1/} Economic Cost (in N '000)		Economic Life of Project Works (In Years)		Economic Return (In %)	
		Appraisal Estimate	Actual	Appraisal Rehabilitation	Actual Reconstruction	Appraisal Estimate ^{3/}	Final Estimate ^{4/}
Lagos- Ode Remo	^{2/} 40	2,000	4,910	4 - 6	20	15-42	22 - 28
Ibadan-Oyo- Ilorin	96	3,700	6,260	6 -10	20	9-27	38 - 44
Total	136	5,700	11,170				

^{1/} Total Cost, excluding taxes, which represent about 18% of total cost.

^{2/} The length of the first road section was reduced by 2 miles from appraisal estimate.

^{3/} Depending of the length of economic life and on "low" or "high" savings in voc.

^{4/} Lower returns correspond to alternative where the benefits were reduced by 20%.

Source: IBRD/IDA Report No. PTR-27a, Appraisal of a Highway Rehabilitation Project, Nigeria, September 10, 1969.

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LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

Average Annual Daily Traffic on Lagos-Ilorin Road, 1965-1985

(vehicles per day)

	<u>Lagos- Ode Remo (40 mi)</u>	<u>Ibadan-Oyo- Ilorin (96 mi)</u>
1965	3,700	1,500
1967 ^{1/}	4,000	1,300
1972	-	2,350
1973	5,950	-
1975	6,400 (7,000) ^{2/}	2,750 (3,000) ^{2/}
1977 ^{3/}	940	3,170
1980	1,090	3,940
1985	1,410	5,640

^{1/} + ^{2/} Appraisal estimate.

^{3/} Estimated retained traffic on old Lagos-Ibadan Road after the new expressway is opened for traffic in 1977.

Source: IBRD/IDA Report No. PTR-27a, Appraisal of a Highway Rehabilitation Project, Nigeria, September 10, 1969.

Counts by the Federal Ministry of Works and Housing, 1965, 1972 and 1973 figures.

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LOAN 640-UNI - HIGHWAY REHABILITATION

PROJECT COMPLETION REPORT

Vehicle Operating Cost - Unit Savings
(Kobo/mile)*

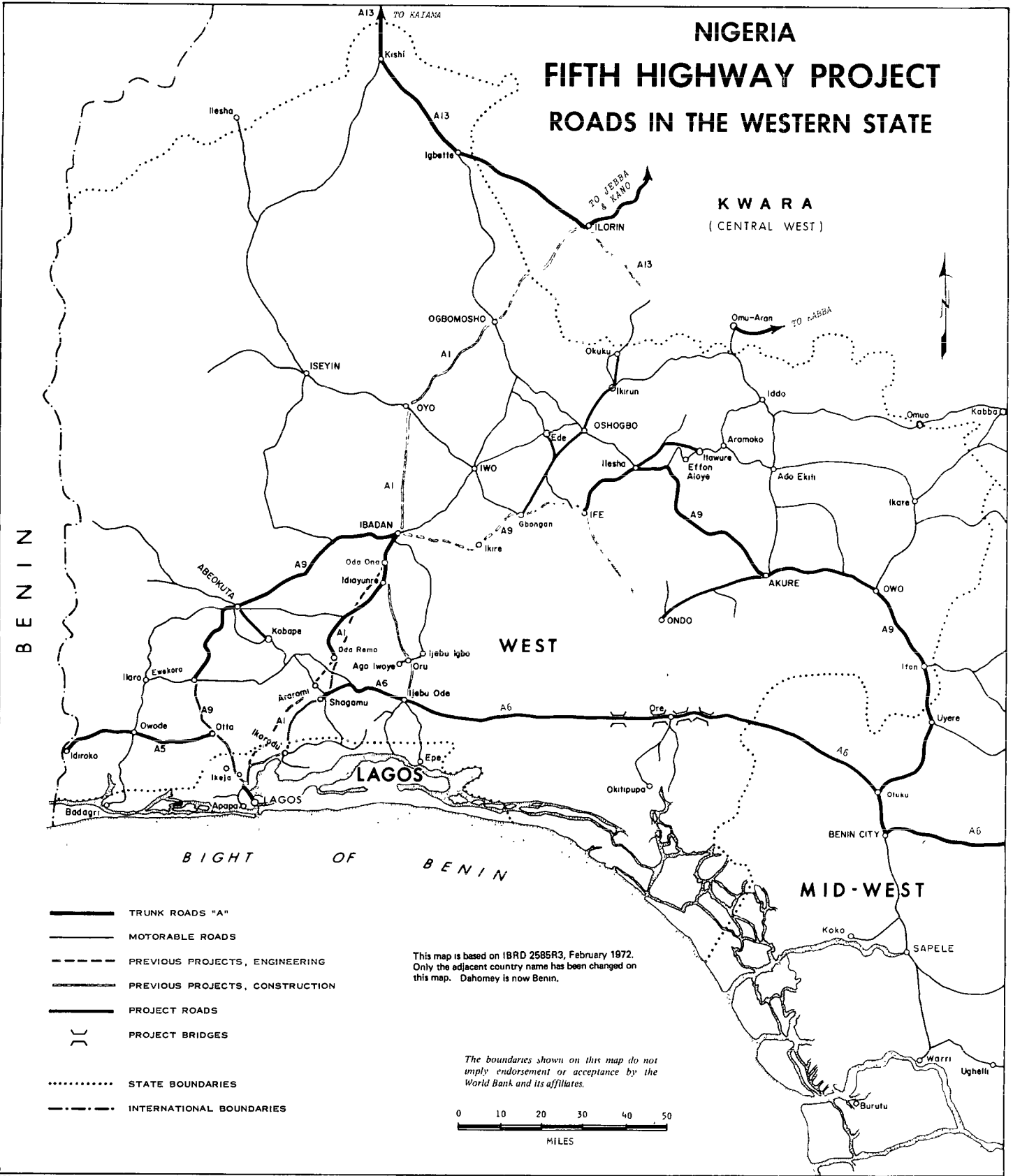
<u>Road Section</u>	<u>Appraisal Estimate</u>		<u>1973 Estimate</u>
	<u>"Low"</u>	<u>"High"</u>	
Lagos-Ode Remo, and Ode Remo-Ibadan	1.0	1.4)	2.45 - 4.92 ^{/1}
Ibadan- Oyo-Ilorin	1.5	2.0)	

/1 Depending on traffic service level; operating costs in Kobo/mile at Service Level A = 8.75; B = 9.24; C = 10.0; D = 11.22 and E = 13.67.

* ₦ 1.00 = 100 Kobo

Source: Road Vehicle Operating Costs in Nigeria, 1973, SWKP.

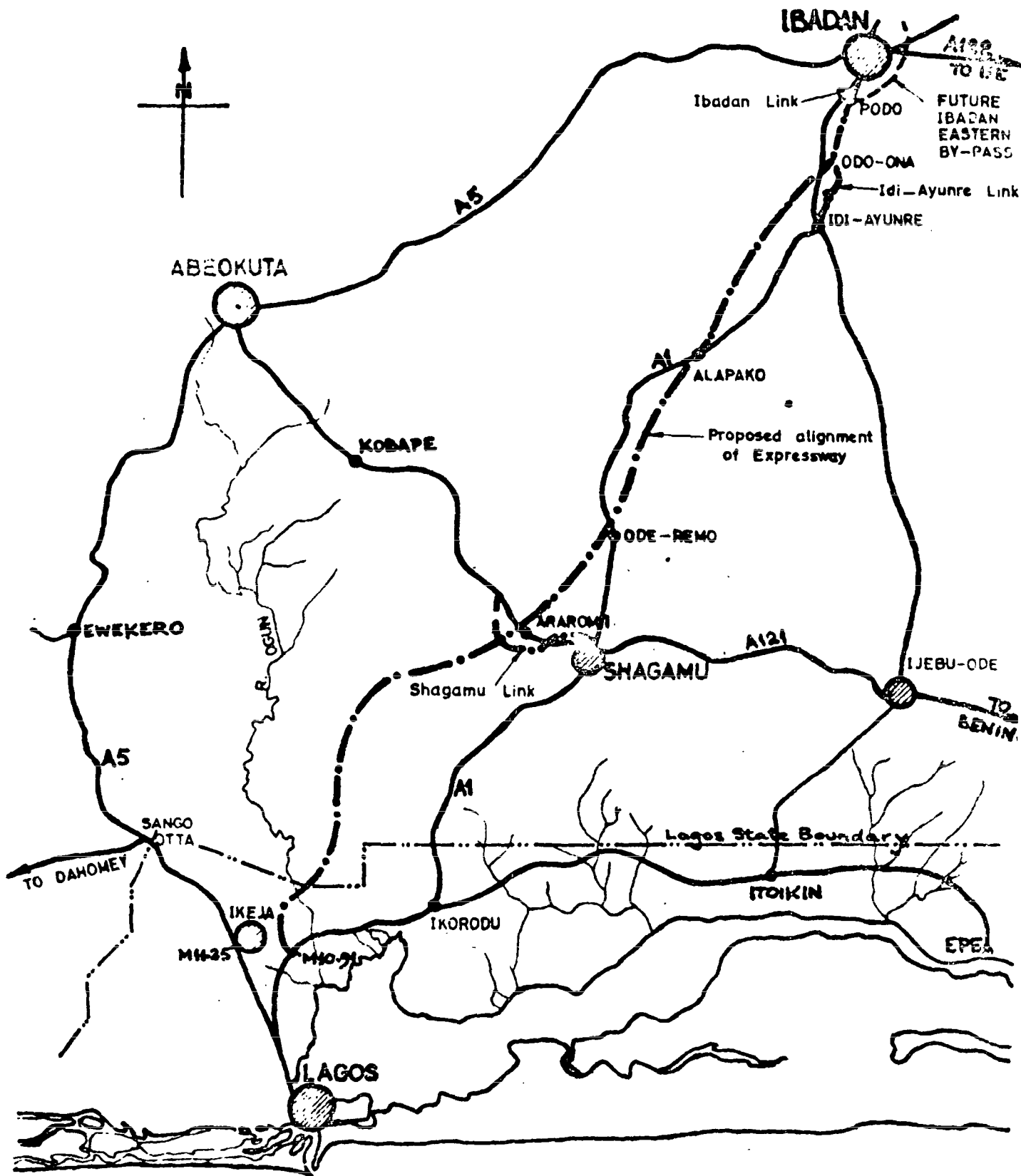
NIGERIA FIFTH HIGHWAY PROJECT ROADS IN THE WESTERN STATE





**FEDERAL REPUBLIC OF
NIGERIA**

- LEGEND**
- INTERNATIONAL BOUNDARY
 - STATE BOUNDARY
 - STATE CAPITALS



PROPOSED ALIGNMENT - LAGOS-IBADAN EXPRESSWAY