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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

Proposal and Recommendations
For the Review of the
Development Loan Committee

625-614
625-H-001
A.I.D.

Reference Center
Room 1656 NS

MALI - Highway Development: Road Maintenance Equipment

AID-DLC/P-1069/1

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MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

SUBJECT: Mali - Highway Development: Road Maintenance Equipment

Attached for your review are the recommendations for deobligation of \$5.75 million of a \$9.0 million loan made to the Government of Mali to assist in improving a major element of its basic transport infrastructure. This leaves a balance of \$3.25 million.

No meeting is scheduled for this proposal. However, please advise us of your concurrence as early as possible but no later than March 24, 1976. If you are a voting member a poll sheet has been enclosed for your response.

DEVELOPMENT LOAN COMMITTEE
OFFICE OF DEVELOPMENT PROGRAM REVIEW

Attachments:
Summary and Recommendations
Project Analysis
Attachments 1 & 2

TABLE OF CONTENTS

	<u>PAGE</u>
PART I. <u>SUMMARY AND RECOMMENDATIONS</u>	1
1. BORROWER	1
2. LOAN AMOUNT	1
3. TERMS	1
4. TOTAL COST OF THE PROJECT	1
5. PROJECT DESCRIPTION	1
6. PURPOSE OF THE LOAN AMENDMENT	2
7. COUNTRY TEAM VIEW	2
8. SUMMARY FINDINGS AND RECOMMENDATIONS	2
PART II. <u>PROJECT BACKGROUND AND DETAILED DESCRIPTION</u>	3
A. BACKGROUND	3
B. PROJECT DESCRIPTION	7
1. PROPRIETARY PROCUREMENT	9
2. OTHER PROCUREMENT	11
3. SPARE PARTS	11
PART III. <u>PROJECT ANALYSES</u>	12
A. TECHNICAL ANALYSIS	12
B. FINANCIAL ANALYSIS AND PLAN	14
1. FINANCIAL ANALYSIS	14
2. FINANCIAL PLAN	16
C. ECONOMIC ASSESSMENT	17
PART IV. <u>IMPLEMENTATION PLAN AND SCHEDULE</u>	19
ATTACHMENTS:	
1. LOGICAL FRAME WORK MATRIX	
2. 611(E) CERTIFICATION	

I. SUMMARY AND RECOMMENDATIONS

1. Borrower: GOVERNMENT OF THE REPUBLIC OF MALI
2. Original Loan Amount: \$9.00 million
Amount of Loan Amended: \$3.25 million
To be deobligated: \$5.75 million
3. Terms:
 - a. Maturity: Forty (40) years including a 10-year grace period;
 - b. Interest: Two percent per annum during the grace period, and three percent thereafter;
 - c. Repayment: Interest and principal payable in U.S. dollars.
4. Total Cost of the Project: \$3.25 million
5. Project Description:

The Mali Highway Development project was originally envisioned as a multi-donor effort to assist the Government of Mali (GOM) improve a major element of its basic road transport infrastructure. This included assistance to improve the Government's capability to maintain effectively and utilize this system. The project was to use A.I.D. loan financing for the reconstruction of the 155 kilometers Bamako-Bougouni road which runs southeast from the capital city of Bamako to the town of Bougouni. Up to \$2.0 million in road maintenance equipment was included as an essential element of the project.

The IBRD, through its soft loan window, the International Development Association (IDA) was to provide financing for the reconstruction of the 233 kilometers Faladie-Segou trunk road running northeast from Bamako; detailed engineering required for improvement and/or reconstruction of the 120 kilometers road from Bamako to Kolokani; engineering supervision during reconstruction of the Bamako-Bougouni and Faladie-Segou roads, technical assistance to the Directorate of Public Works (DPW) for road maintenance and feeder road improvement; and procurement of heavy equipment.

The IDA has continued its portion of the project through its first and second (supplemental) highway development credits approved in 1970 and 1973 (amended June 1975). A third highway development credit was approved in December 1975 to provide for follow-up activities in the improvement of road maintenance and of agricultural feeder roads.

It is herein proposed that the AID portion be reduced to support of the highway maintenance capabilities of the DPW through providing financing only for heavy equipment, spare parts and technical assistance. This equipment and technical assistance will allow the DPW to maintain better the existing road networks and, at a minimum, do repairs on the major arteries originally proposed for reconstruction.

6. Purpose of the Loan Amendment:

To provide the necessary funds for heavy equipment purchasing, spare parts and technical assistance. The remainder of the original loan will be deobligated.

7. Country Team View:

The American Embassy Bamako, CDO/Bamako and REDSO/WA have endorsed the reduced/restructured project.

8. Summary Findings and Recommendation:

This project assistance has been through consideration, approval and reconsiderations for over three years. After several exchanges as to what the project scope should be, the Government of Mali has concurred in a reduction to include only procurement of equipment, spare parts and technical assistance. DPW will be able to utilize this equipment effectively in its six regional maintenance yards and the equipment fits its current equipment patterns. There is a need for technical assistance in maintenance of the equipment and road repair which DPW has requested in discussions during the preparation of this paper.

It is therefore recommended that AID amend the project to provide only financing of necessary equipment and technical assistance to improve the highway maintenance capabilities of the Government of Mali, Directorate of Public Works.

Project Development Committee:

Laurance Bond, Project Design Officer;
William Niese, Engineer;
James Phippard, Legal Advisor.

II. PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. Background

The Mali Highway Development project originally was envisioned as a multi-donor effort to assist the GOM to improve a major element of its basic road transport infrastructure and improve the GOM capability to maintain and utilize this system effectively. Specifically, the project in its entirety was to consist of the reconstruction of two major trunk roads originating at Bamako; engineering supervision during construction; continuation of an ongoing IDA financing highway maintenance and feeder road improvement program, including technical assistance; supply of highway maintenance equipment; and detailed engineering required for improvement and/or reconstruction of the 120 km. road from Bamako to Kolokani. The AID portion of the total project consisted of the reconstruction of a major 155 km. trunk road running south from the capital of Bamako to the town of Bougouni and the funding of U.S. road maintenance equipment.

The roads to have been reconstructed under this project represent two of Mali's major land transport routes. The roads radiate from Bamako to Bougouni and Segou with the first 7 km. from Bamako to Faladie being common to both roads. The Faladie-Bougouni section serves the cultivated region to the south and forms part of an important international link with the Ivory Coast. The Faladie-Segou section links the capital with the cotton producing areas around Segou and comprises part of the only all-weather link with Mopti, the gateway to the Niger River Basin. The Bougouni section also serves the new international airport at Senou, 12 km south of Bamako.

In 1966, the IBRD through the International Development Association (IDA) entered into a major program to assist the GOM to rehabilitate and modernize its railway system. One of the indirect results of this program was the recommendation for a country-wide survey of Mali's land transport system. The survey was undertaken with the IBRD as executing agency for

the UNDP and was completed in 1969. Acting upon the recommendations of the survey report, the World Bank authorized its first highway maintenance program in Mali in 1970. This program included the improvement of approximately 1,540 kilometers of agricultural feeder roads and pre-investment studies for the rehabilitation of Mali's two main trunk roads, the Bamako-Segou and the Bamako-Bougouni roads. The feasibility studies of these two roads were undertaken by the Canadian consulting firm of KEZ International and completed in February 1972. In September 1972, based upon the favorable results of these studies, the GOM requested AID and IDA assistance in financing rehabilitation of the Bamako-Bougouni roads, and continued assistance in improving its highway maintenance program. An IDA credit was signed in the summer of 1973.

An AID loan in the amount of \$9.0 million was authorized on February 27, 1973 and the loan agreement signed on June 7, 1973. This loan provided not only for the rehabilitation of the Bamako-Bougouni road, but also up to \$2.0 million in road maintenance equipment for the GOM's road maintenance department. This procurement, however, was to be provided for only after the actual cost of reconstructing the road was known.

AID was advised on May 30, 1973 of the decision of the Government of Mali nad IDA to employ the services of the Louis Berger consulting firm to review the design specifications and make changes to them. This review process delayed the issuance of invitations for bid from the originally scheduled July 1973 to February 15, 1974.

A month before the bid documents were issued, the full impact of the drastic increase in the price of petroleum and petroleum related products was felt. This unexpected increase in the cost of petroleum products greatly influenced construction costs worldwide since the bulk of major construction items consist of either petroleum derivatives or require petroleum in their processing. With transportation costs directly related to the price of fuel, the problem was further exacerbated for land-locked countries such as Mali.

The KEZ cost estimate, as accepted in December 1972, for the IDA-financed Faladie-Segou road was \$7.6 million. Actual bids from the five European firms bidding on the project in June 1974 were:

1. ABU	\$11,811,094
2. Groupe UDEC	12,628,576
3. Groupe Lefebvre	13,304,434
4. SATOM	14,078,498
5. BOURDIN	14,274,290

ABU was awarded the contract with the IDA anticipating an ultimate contract price \$4.0 million in excess of the accepted bid as a result of contingencies and escalation clauses.

At the time of the original Capital Assistance Paper in late 1972/early 1973, the KEZ estimate for construction of the Bamako-Bougouni road was \$7.4 million. This included engineering supervision and an escalation/contingency factor. The AID funding requirement for construction only (as IDA was to finance the engineering supervision) was \$6.8 million. Only two bids were received from five prequalified American firms which were invited to submit bids. These two bids, opened August 15, 1974, were:

Grove International, New York	\$25,702,535
A. Pizzagali, Vermont	18,731,202

By reducing the standards of the road surface and increasing the mobilization-advance payment, the GOM was able to get an informal agreement with Pizzagali to negotiate their bid down to about \$16.7 million. This was still \$9.9 million more than the late 1972 estimate and \$7.7 million more than total loan availabilities.

Factors Affecting Cost Increases

The original AID loan of \$9.0 million was authorized on February 27, 1973 and the Loan Agreement was signed June 1, 1973. The amount of this loan was based on cost estimates provided in February 1972 by the consultants, KEZ International. In late May 1973 AID was advised by IDA that the KEZ work was to be selectively reviewed by the Louis Berger consulting firm. In addition to the work performed by Berger for the GOM and IDA, Berger was retained by AID in May-June 1974 to

reevaluate the KEZ \$6.7 million cost estimate for the Bamako-Bougouni road in light of world wide inflationary trends and most importantly, the effects of increased costs of petroleum related construction costs in West Africa. The result of the Berger study submitted to REDSO/WA in June 1974 was a revised cost estimate of \$12,000,000 for the road construction. As shown above, the lowest responsive bids received on both the Bamako-Bougouni and Faladie-Segou roads were considerably higher than anticipated when the consultants made their cost estimates. It was then discovered that the Berger \$12.0 million cost estimate was erroneously based on estimated unit costs of local firms already established in West Africa. They did not take into consideration that U.S. firms would set higher standards based on practices common to the U.S., and have higher start-up costs to move personnel and materials to Mali for the first time.

In addition to the low cost estimates, there were numerous delays encountered during the bidding period. Following AID's review of the documents in February/March 1974, seven addenda were issued which finally necessitated the extension of the bid opening date to August 15, 1974 to allow bidders sufficient time to revise their calculations and bids. One potential bidder reportedly decided against additional expenditure for preparation of tender documents after addendum No. 6 was issued in July.

One of the two remaining contractors, GROVE International of New York submitted, what the consultants Louis Berger called a "courtesy tender". By cable to the Director of Public Works of Mali, GROVE offered a reduction of their \$25,702,535 bid by \$4,500,000 due to the reinstatement of mobilization costs by addendum No. 6. Their "across the board" reduction of \$4,500,000 still did not reduce their bid by a sufficient amount to consider their offer as competitive; additionally, the consultants felt that it would be "virtually impossible to analyze the unit prices of GROVE International as their unit prices are grossly inflated. Therefore this tender was not considered as a truly valid and reasonable offer, and hence it was disregarded for further consideration".

In November and December 1974, a loan amendment paper was prepared for \$9.7 million. This amendment was meant to cover the \$7.7 million cost overrun and \$2.0 million for escalation

and contingencies. Equipment and spare parts were not to be part of the loan, but recommended for possible grant financing. This proposed increase in the loan resulted in a considerable controversy. After providing the required Congressional notification, AID found there was considerable Congressional opposition to the proposed additional financing. Both the House and Senate Appropriations Sub-Committees for Foreign Operations considered holding hearings on the proposed increase.

During this entire period, Pizzagali extended their bid validity date twice, to seven months after the bids had been opened (to March 13, 1975). Nevertheless, after several months, Congressional and other objections to the loan increase were not removed. AID and the GOM then agreed to reduce the project to reconstruction of the approximately 15 kilometers of road between Bamako and the airport road, and repair of bridges and culverts, and reinstate equipment procurement.

Several delays ensued as attempts were made to define the project scope and negotiate a contract for redesign of the road and make an update of costs. As the delays continued, costs skyrocketed to an estimated \$500,000 per kilometer. It was finally decided, in November 1975, to remove construction from consideration. The loan will now provide financing for procurement of badly needed equipment and spare parts for highway maintenance only, with some technical assistance.

B. Project Description

This loan amendment, to reduce project scope, will provide the Government of Mali, Directorate of Public Works, Division of Bridges and Roads, a means to strengthen and improve highway maintenance capabilities. The equipment to be procured will replace and/or augment equipment in the equipment brigades of the six regions of Mali. Providing this equipment, spare parts for this and existing equipment, and requisite training will assist the GOM improve its road network through better maintenance.

The equipment to be provided includes:

- 3 Bulldozers, Caterpillar D6 or equivalent;
- 9 Motorgraders, Caterpillar 120G or equivalent;
- 3 Wheel loaders, Caterpillar 930 or equivalent;

- 3 Pneumatic tire roller, (US equivalent to the French Alberet 15 ton roller);
- 2 Truck tractors with winch and 50 ton low-bed equipment trailer;
- 1 Forklift with 3 ton capacity, Caterpillar T-60 or equivalent;
- 2 Mechanics trucks, 3/4 ton pick-ups with service body and auxiliary equipment;
- 7 concrete mixers;
- 6 water pumps;
- 20 tool sets;
- Miscellaneous minor equipment.

The dozers, motorgraders, wheel loaders and pneumatic tire roller will all require training of operators and mechanics. This can best be done by the manufacturers either at their manufacturing plants or at training centers established for this purpose. Recognizing this, it will be a requirement of the suppliers to be able to provide or have access to such training facilities.

In addition to the training of mechanics and operators, it is proposed to include up to 6 man-months of consulting services for technical assistance to the road maintenance crews. Observations by project team members have revealed certain deficiencies in road repair techniques. The technical assistance herein proposed is aimed at providing periodic opportunities to correct these deficiencies. This technical assistance will require an engineer who knows road equipment and construction and is willing to spend time in the various regions traveling with the road maintenance crews.

This technical assistance and training is in recognition of the need to improve the DPW operation and maintenance of equipment and improvement of the maintenance carried out by road maintenance crews. It was not part of the original loan approved in February 1973 which was primarily concerned with road construction. Though not considered critical to the project, it will extend the capabilities of the DPW in road maintenance, the life of the equipment and provide an important adjunct to the assistance being provided under the IDA's third highway credit.

Under its third highway credit, the World Bank (IDA) is providing assistance to the DPW for feeder road improvement and backlog maintenance as part of its overall package. The equipment being

procured under this project will complement the effort to remove the maintenance backlog. It will provide the badly needed spare parts to get deadlined equipment operating, and the additional equipment to expand the maintenance program. The Bank is providing consulting services to assist the DPW in developing and implementing a strong maintenance program. In addition, the Bank is also assisting the DPW equipment maintenance program by providing equipment for regional maintenance workshops. With the spare parts being provided under this loan and the equipped maintenance yards, there is reasonable expectation that the equipment procured will be effectively utilized and have an acceptable deadline rate.

1. Proprietary Procurement

The success of the project, to a large extent, will be determined by the efficiency with which it is implemented and the degree of standardization which can be built into GOM's present road maintenance operations. The Directorate for Public Works currently has 15 bulldozers, 15 wheel loaders and 23 motorgraders. Except for thirteen wheel loaders this equipment is Caterpillar and part of this project is to procure necessary spare parts for this equipment.

Caterpillar has an authorized dealer in Bamako which is a branch of a regional dealership, based in Abidjan, Ivory Coast, which services all of French-speaking West Africa. This dealer maintains an inventory of spare parts and provides other servicing, including special maintenance servicing after sales. Backstopping by the main organization in Abidjan includes facilities for the training of equipment operators and mechanics. This training is all provided as a service to the customer. The only requirements placed on the customer are that the customer pay for transportation to the training facility and provide subsistence for those who are sent. Provision is made in this loan amendment to support such training.

Purchasing equipment that has an active dealership located in Mali will provide reasonable assurance of better spare parts back-up and general maintenance support. Equipment that has active dealer support is more likely to remain productive throughout its expected normal operating life. If one recognizes that it is the function of AID to develop a self-sufficiency within developing countries - regardless of the type of assistance being provided - it is important that this self-sufficiency be fostered at every opportunity.

As stated above, the degree of standardization that can be built into the GOM's heavy maintenance program can go a long way to determining the success of this project. The Directorate of Public Works recognized this and has insisted that whatever equipment is purchased be of the same manufacture as that of the items already in its inventory. The DPW has already expressed a preference for Caterpillar equipment as demonstrated by the fact that most of its heavy equipment on hand is Caterpillar.

It is the further hope of the GOM to standardize its equipment around Caterpillar as they have already established that after-sales servicing and maintenance assistance is readily available. The AID project team and the GOM have confirmed this service and maintenance availability and the willingness of the local dealer to continue to provide and expand it. A.I.D. Handbook 11, "Country Contracting", Chapter 3, "Procurement of Equipment and Materials", Section 309, para. 3, states: "Proprietary procurement for which AID has determined that, in order to assure the interchangeability or standardization of equipment, or because of special design requirements, or for any similar reason, purchase of a commodity by reference to a particular specific trade name, or designation is necessary (emphasis added)". In this case the GOM DPW wishes to standardize its equipment, be assured of spare parts and servicing and maintenance assistance. These three considerations satisfy the requirements of Handbook 11, Chapter 3, Section 309 on waivers. It is therefore recommended that proprietary procurement of those items that Caterpillar can provide, and are already in the DPW inventory, be authorized along with this loan agreement. The local dealer is prepared to provide, and has the ability to provide, necessary spare parts and servicing back-up.

It is also recommended that proprietary procurement be authorized for the wheel loaders from Allis Chalmers. As is the case with Caterpillar, this will provide standardization around a manufacturer of which the DPW has a significant number of pieces of equipment. There is also a dealer located in Bamako who can provide spare parts and servicing back-up. This procurement meets the same test of meeting the requirements outlined above for proprietary procurement of Caterpillar equipment.

2. Other Procurement

The remaining equipment will follow normal A.I.D. equipment procurement procedures. Advertisement will include Bamako, Mali, Dakar, Senegal, and Abidjan, Ivory Coast, as well as the U.S. through the Commerce Business Party and the A.I.D. Small Business Office. The design team has investigated dealers of American equipment in these three cities and is of the opinion that a large part of the remaining equipment (which will be of U.S. manufacture) can be procured through these dealers. If a dealer in Bamako is successful it will be required to provide the U.S. ready access to spare parts and/or after sales servicing. Dealers in Abidjan and Dakar (as well as any other vendors) will be required to provide after sales servicing requirements and spare parts in Bamako as part of a successful bid. By doing so this will further encourage dealers to improve their capabilities and willingness for servicing American equipment.

3. Spare Parts

Spare parts are critical to the deadline rate of all equipment. Currently, the Directorate of Public Works has a shortage of spare parts and has an exceedingly high deadline rate on its equipment as a whole. The Director General has estimated that the DPW has been getting from 57 percent to 75 percent actual utilization of its equipment.

To provide relief for this problem, the first procurement (immediately upon satisfaction of Conditions Precedent) will be for spare parts. The DPW has developed a list of spare parts needs which will be reviewed and approved by A.I.D. before procurement proceeds. The equipment for which spare parts will be procured includes 43 pieces of Caterpillar equipment (13 Bulldozers, 28 Motor-graders) and 13 pieces of Allis-Chalmers equipment (all wheel loaders). Because the equipment is specific, the spare parts will have to have proprietary procurement (this procurement meets the requirements of A.I.D. Handbook 11, Chapter 3, "Country Contracting - Procurement of Equipment and Materials", Section 309: "Waivers"). There are also dealers available in Bamako through which this procurement could be handled as the DPW has already begun to try and establish a working relationship with them.

It is recommended that the remaining spare parts be procured on an as needed basis off the shelves of the local dealers. This remaining procurement will amount to between \$200 thousand and \$800,000 (or 18.5 - 24.6 per cent of the revised loan amount). This procedure will eliminate the need to purchase an arbitrary spare parts list for the new equipment nor to face the problems of warehousing and inventory control that accompany such purchases. Handbook 11, Chapter 3, Attachment 3H, provides that "commodities which are normally imported, and kept in stock in the form in which imported for sale to meet a general demand are deemed to be of borrower country source and origin for purpose of eligibility of financing, provided:

"1. They have been imported from the United States or another eligible source country for commercial resale, as indicated by the implementing documents.

"2. That if they have been imported from a country not included in the authorized geographic source area, but from a country included in AID Geographic Code 935, the total invoice value of any single transaction does not exceed the local currency equivalent of \$2,500."

Because of the nature of the spare parts for heavy equipment (which are expensive if major parts are involved) it is recommended that the value limitation be raised to \$25,000, as provided for in attachment 3H.

The establishment of spare parts requirements has generally followed a rule of thumb: 15-20 percent of the replacement value of the equipment on hand is needed for spare parts. The IBRD has established that the Directorate of Public Works has been maintaining a spare parts inventory of only 3-6 percent. In consultations with the DPW and A.I.D., the IBRD has recommended that this inventory be brought up to requisite standards. While the spare parts are not to be purchased all at once, the amount provided for parts procurement will establish a 15-20 percent standard.

III. PROJECT ANALYSES

A. Technical Analysis

This project includes procurement, and related to that procurement, training in the use of highway maintenance equipment. It is intended to assist the GOM in maintaining its highways. The equipment will be purchased for, and utilized by, the Ministry of Transportation and Public Works, Directorate of Public Works. DPW has been extensively reorganized over the past five years, and the responsibility for highway administration is shared among several divisions, each under the direct control of the Director General of Public Works. The DPW staff includes about 20 Malian engineering graduates, 60 trained technicians and 1,500 workers with varying degrees of skill and training.

Highway maintenance is carried out by the Directorate of Public Works, Roads and Bridges Division as assisted by its six regional and seven field subdivisions. Road maintenance is carried out both manually (for potholes, patching and ditching) and mechanically (using equipment for reshaping and reloading gravel surfaces, leveling and resealing pavements).

The Highway Equipment Pool Division of the DPW maintains the equipment and vehicle fleet. It has a central workshop in Bamako and smaller workshops in the thirteen regional and field subdivisions.

Technical assistance for strengthening the organization of the DPW and training of its staff has been provided by the World Bank (IDA) under its first two highway projects. This assistance is to continue under the recently approved third IDA highway credit. One result of this technical assistance is that the highway maintenance facilities in Mali have been dramatically improved. A complete heavy base maintenance and rebuild shop, fully equipped with machinery and tools and a large parts warehouse and training facilities exist in Bamako. In each outlying region there is a field maintenance shop capable of providing appropriate field maintenance and supply support throughout each of the six administrative regions.

The Directorate of Public Works has its current equipment deployed in each of the six administrative regions of Mali as follows:

Region 1 (Kayes)

2 bulldozers, 2 wheel loaders, 7 motor graders, 12 six cubic meter dump trucks, 16 four cubic meter dump trucks, 12 tank trucks, and two water pumps.

Region 2 (Bamako)

2 bulldozers, 4 wheel loaders, 5 motor graders, 13 six cubic meter dump trucks, 7 four cubic meter dump trucks, 5 tank trucks and 2 water pumps.

Region 3 (Sikasso)

2 bulldozers, 2 wheel loaders, 5 motor graders, 15 six cubic meter dump trucks, 5 four cubic meter dump trucks, 5 tank trucks and 1 water pump.

Region 4 (Segou)

2 bulldozers, 2 wheel loaders, 2 motor graders, 10 six cubic meter dump trucks, 3 four cubic meter dump trucks and 2 tank trucks.

Region 5 (Mopti)

2 bulldozers, 3 wheel loaders, 3 motor graders, 10 six cubic meter dump trucks, 5 four cubic meter dump trucks, and 6 tank trucks.

Region 6 (Gao)

3 bulldozers, 2 wheel loaders, 6 motor graders, 13 six cubic meter dump trucks, 7 four cubic meter dump trucks, and 7 tank trucks.

The equipment being provided under this loan will supplement and/or replace some of the existing equipment listed above. The need for this equipment and the list detailed in Section II.B were jointly determined by A.I.D., the IBRD and the GOM Directorate of Public Works. With the addition of this equipment the DOW, Roads and Bridges Division will be provided the additional means for eliminating a substantial backlog of periodic maintenance over the next three years. DPW is prepared to receive this equipment and to commence with work on the maintenance backlog. During the first and second highway projects of the World Bank, the DPW established an accounting and inventory system to keep up-to-date records on the condition, utilization and maintenance of all equipment. In addition, there was training for all levels of the road maintenance staff. It can be concluded that the equipment is timely and will be effectively utilized.

This project will not produce a significant direct environmental impact, since it involves the procurement of road maintenance equipment which will be used in maintaining Mali's road network. The equipment will be used to reshape and regrade the roads and improve parallel drainage. Therefore, the effects of this project on the local environment will be minimal. In some cases the effects will be beneficial since improved road maintenance lessens the erosion effects of poor drainage and reduces local bypasses of poor roads. In some areas these bypasses tend to create a web of parallel roads precluding the use of such land for other purposes. The equipment selected for procurement includes oil-derivative fuel-burning engines, but they will be equipped with normal pollution control devices required under U.S. Legislation at the time of manufacture.

B. Financial Analysis and Plan

1. Financial Analysis

The Directorate of Public Works had an ordinary operational budget of FM 872,000,000 (\$1,745,000) in CY 1973, FM 709,000,000 (\$1,418,000) in CY 1974 and FM 771,000,000 (\$1,713,000) in CY 1975. The budget for calendar year 1976 is

anticipated to be FM 650,000,000 (\$1,444,000) supplemented by an IDA credit of FM 450,000,000 (\$1,000,000) most of which is earmarked for commodities such as bitumen for a total budget of FM 1,100,000,000 (\$2,444,000).

Road users contribute to Government revenues through specific taxes on fuel and lubricants, ad valorem import duties on vehicles, equipment and spare parts, and annual vehicle registration charges. Revenues from the fuel tax are deposited directly into a Road Fund, which is an independent account in a local bank used to finance road maintenance and construction activities as well as the Directorate of Public Works overhead. This Road Fund is administered by the Director General of Public Works. Other road user taxes go into the general budget.

In the 1971-74 period, total expenditures on road maintenance and administration represented about four percent of current budgetary resources including the Road Fund, and total highway expenditures about 16 percent. Should the GOM decide to proceed with an ambitious road investment, it would be heavily reliant on as yet unsecured external financing. Nevertheless, the rising cost of maintaining an expanding network would likely cause the GOM to experience substantial difficulty in financing future highway expenditures.

The IDA, in its analysis for its third highway project found that the resources, for normal maintenance of the existing transport network, were rapidly approaching what could reasonably be set aside in the GOM's current budget as a recurrent appropriation. This was quite apart from the possibility of additional maintenance arising from a further expansion of the road network. It is quite apparent then, that if further expansion of the road network is envisioned, the Government will have to find additional highway revenues by increasing fuel taxes or earmarking more or all user taxes for highway purposes.

As part of an approach to finding a solution to the growing financial constraints, the IDA was able to get agreement on two major points related to road maintenance. First, the GOM has agreed to keep a separate accounting system for all road maintenance expenditures, and to establish a system of accounts related to different road categories as an initial step towards performance budgeting. Secondly, the Government has agreed to meet all maintenance requirements out of Road Fund resources before allocating funds for road construction work.

2. Financial Plan

The financial plan for the project is outlined below by category and fiscal year of expenditures:

	<u>FY 76</u>	<u>FY 77</u>	<u>FY 78</u>	<u>FY 79</u>
Equipment	\$1,550,000	-	-	-
Spare Parts	500,000	\$200,000	\$200,000	\$200,000
Training	30,000	30,000	30,000	-
Consulting Services	-	30,000	30,000	-
Escalation	350,000	30,000	35,000	40,000
Total	<u>\$2,420,000</u>	<u>\$290,000</u>	<u>\$295,000</u>	<u>\$240,000</u>

The estimate for the cost of the equipment to be procured is based on quotations from dealers of the major pieces to be procured, as of January 1976. Dealers have also quoted inflation as averaging 1.5 percent per month compounded over the past six months for equipment being delivered to West Africa. The spare parts estimates are based on approximately 20 percent of the cost for spare parts of the new equipment procured in FY 76. The initial large procurement of spare parts projected for FY 76 is to build up the spare parts inventory of the DPW for equipment on hand.

As noted in Section II.B.3, it is recommended that spare parts be purchased from a local dealer on an as needed basis. Though a rule of thumb percentage was used in deriving the spare parts sum, it is not recommended that these amounts be spent in one lump sum for a predetermined list of spare parts. It is rather recommended that letters of credit be established in the names of local dealers of this equipment to provide for procurement of spare parts on an as needed basis. This procedure will assure the DPW a continuing relationship with local dealers and the dealers will have an incentive to maintain adequate stocks of spare parts for the equipment in the country. It will also relieve the DPW of a need to maintain an overly warehouse with the concurrent need of **detailed inventory control**. It is, of

course, recognized that where an adequate dealer is not on hand locally (or in Dakar or Abidjan) for some equipment the requisite spare parts will have to be procured in advance.

C. Economic Assessment

The project addresses a high priority need of the transport sector, a continued and accelerated development within the DPW of a viable maintenance capability. This will permit better maintenance with some rehabilitation of Mali's existing road network. The savings in vehicle operating costs which should result from the improved maintenance of the roads can release considerable funds for investment in other sectors of the economy.

Mali has 13,200 kilometers of roads which are classified as national, regional or local, according to the importance of traffic carried and the centers they serve. About 3,300 kilometers are all-weather roads of which about half are paved and half gravelled. The remainder of the network consists of unengineered earth roads or tracks which are often impassable during the rainy season. Highest priorities in the highway sector are the maintenance and selective rehabilitation of paved and gravelled roads, as well as maintenance and improvement of earth roads and tracks serving agricultural areas.

World Bank estimates and DPW figures show the following user costs for various classes of roads in Mali:

Vehicle Operating Costs Per Kilometer (in Malian Francs)

<u>Class of Road</u>	<u>Passenger Car</u>	<u>Average Truck</u>
Well Maintained Paved Road	45	114
Paved Road which needs patching	49	132
Paved road which needs resealing	53	140
Paved road which needs resurfacing	55	142
Improved Feeder road	n.a.	201
Paved road which needs reconstruction or on unimproved earth track	100	287

According to 1974 counts, traffic volumes average 135 vehicles per day (vpd) on paved roads, 34 vpd on gravel surfaces, and about 10 vpd on earth roads and tracks. Trucks account for about 45% of total traffic, indicating the importance of road freight transport. Most trucks have a loading capacity of between 6 and 10 tons and are generally used to collect produce in the rural areas. In addition, some heavy trucks and combination tractor/trailers are used for long-distance transport.

Turcking organizations are many, and range from a large cooperative to individual owners. The Union Nationale des Cooperatives des Transporteurs Routiers (UNCTR) is a cooperative consisting of some 550 vehicle owners; the Compagine Malienne des Transports Routiers (CMTR) is a state-owned company with 250 vehicles of which 58 are buses for passenger transport. There are also a number of companies which have about 10-30 trucks, and many independent small firms with a single vehicle up to about farm trucks.

With this spread of vehicle ownership, it is expected that a reasonable portion of the reduction in transport costs can be passed on to Malian producers and consumers. Thus, the user savings can have positive spread effects which should effect more than just increased income or increased savings for road users.

Expenditures on improved road maintenance may be viewed in terms of various trade-offs: (1) road maintenance costs versus vehicle operating costs, (2) road maintenance costs versus construction or reconstruction costs, (3) present maintenance costs versus future maintenance costs. An improvement in the DPW's maintenance program could result in net economic benefits to Mali from:

- (1) savings to road users in vehicle operating costs,
- (2) savings in capital expenditures to the extent that improved maintenance results in delaying required investment in highway reconstruction or upgrading, (3) reduction in the cost of regular and periodic maintenance as a result of greater efficiency of operation, (4) greater overall transport efficiency if roads can be kept passable for longer periods during the year, and
- (5) a potential for opening more roads, thus improving transport access if, in fact, greater overall efficiency is achieved in the maintenance program.

IV. IMPLEMENTATION PLAN AND SCHEDULE

The implementation for this project involves only finalizing the equipment list and ordering equipment from vendors. It is anticipated the following schedule can be adhered to throughout the life of the project:

Loan Amendment Paper in Washington	Feb. 15, 1976
Amendment Authorized	March 15, 1976
Loan Agreement negotiated and signed	May 1, 1976
Equipment list finalized by category and estimated cost	May 1, 1976
Initial Conditions Precedent met	June 15, 1976
IFB prepared approval and advertised	June 30, 1976
GOM requests for financing	June 30, 1976
L/COMMS issued	July 1, 1976
Spare parts and Proprietary Procurement Ordered	July 1, 1976
Letters of Credit established	August 1, 1976
Bids received	Sept. 15, 1976
First operators and mechanics group in training* ...	Sept. 1976
Bids evaluated and contracts awarded	Oct. 15, 1976
Final Conditions Precedent	Oct. 15, 1976
GOM Requests for Financing	Oct. 15, 1976
Spare Parts beging arriving	Nov. 1976

Letters of Credit established Nov. 15, 1976
First major equipmat arrives March 1977
First Road Maintenance Consultant March 1977
Second operators and mechanics group in training* .. March 1977
Third operators and mechanics group in training* ... Sept. 1977
Remainder major equipment arrives Oct. 1977
Second Road Maintenance Consultant March 1978
Final disbursements (for spare parts)
..... March 30, 1979

*Depends on the maunfacturer's (or representative) schedule
for providing training.

NARRATIVE SUMMARY

Sector Goal:

To establish a reliable land transport infrastructure in Mali which can provide support necessary to meet the multi-purpose demands of the Mali Development Plan.

Project Purpose:

To provide the GOM with a quantity of appropriate highway equipment material to improve the road maintenance capabilities of the DPW's six regional maintenance centers.

Outputs:

1. Equipped regional road maintenance centers at Kayes, Bamako, Sikasso, Segou Mopti and Gao.
2. Heavy equipment mechanics and operators trained to repair, maintain and operate road maintenance equipment, both existing and to be purchased, at the above six regional road maintenance centers.

Inputs:

1. US-AID to provide funding for spare parts equal to approximately 15% of the value of equipment (existing and new).
2. US-AID to provide funding for 3 bulldozers, 9 motorgraders, 3 wheel loaders, 3 pneumatic tire rollers, 2 truck tractors with low-bed trailers, 2 mechanics trucks, 7 concrete mixers, 6 water pumps, 20 tool sets and miscellaneous other minor equipment.
3. Six manmonths of consulting services for technical assistance to road maintenance crews.
4. Training for operators and mechanics of heavy equipment.

OBJECTIVELY VERIFIABLE INDICATORS

Means of Goal Achievement:

Malian highways are usable for vehicular traffic during all seasons. (Note: Some roads are not all-weather and are not built to be functional during the wet season.)

End of Project Status:

1. Six regional centers fully staffed with technicians trained in the maintenance and operation of highway equipment.
2. Six regional centers equipped with sufficient equipment and spare parts to keep highways operational as planned.

Magnitude of Outputs:

1. Existing 56 pieces of heavy equipment operational 75% of the time.
2. 20 pieces of additional heavy equipment in place by October 1977.
3. \$1.1 million spare parts procured and in place expeditiously.
4. At least 3 mechanics from each center trained by October 1977.
5. At least 6 equipment operators from each center trained by October 1977.

Implementation Targets:

- | | |
|------------------------|----------------------------------|
| 1. Commodities | \$2.74 million |
| a. Spare parts | \$1.1 mil. |
| b. New equip. | \$1.64 mil. |
| c. Consulting Services | |
| | 1 mm = \$10,00 x 6 = .06 million |
| 2. Escalation | .45 million |
| Total | \$3.25 million |

FRAME WORK

MEANS OF VERIFICATION

Verification of Goal:

DPW report of road conditions.

Verification of Purpose:

Monthly reports of DPW activities at each center.

Verification of Outputs:

1. Inventory of equipment (new and old) at each center.
2. Physical presence of trained mechanics at each center.
3. Physical presence of trained operators at each center.

IMPORTANT ASSUMPTIONS

Assumptions for Achieving Goal Targets:

1. That the present and projected system is adequate, if maintained to permit a balanced growth for the country.
2. That development activity demands in areas not served by the present road network will be executed by the GOM with or without donor assistance.

Assumptions for Achieving Purpose:

1. That 6 centers are sufficient to serve the country.
2. That DPW has capacity to absorb and use equipment.
3. That roads can be maintained without major reconstruction.
4. That GOM can support personnel and operating costs.

Assumptions for Achieving Outputs:

1. That appropriate equipment and spares can be expeditiously procured.
2. That qualified and appropriate personnel and available for training.
3. That people trained are actually stationed at centers.

Assumptions for Achieving Inputs:

1. That GOM provides adequate budget for DPW.
2. That DPW provides people for training.
3. That consultant can be recruited.
4. That equipment suppliers are capable of providing equipment in timely manner.

C E R T I F I C A T I O N

MALI: HIGHWAY LOAN 625-H-007

PROJECT PAPER AMENDMENT: HIGHWAY MAINTENANCE EQUIPMENT

Certification pursuant to Section 611(E) of the Foreign Assistance Act of 1961, as amended.

I, Ronald Levin, principal A.I.D. Officer in the Republic of Mali, do hereby certify that in my judgement the Republic of Mali will have the financial capability and the human resources capability to implement, maintain and utilize effectively the subject project. This certification takes into consideration the requirements placed on the Republic of Mali to maintain and utilize other projects previously financed or assisted by the United States.

This judgement is based on (1) the fact that the Government has given a high priority to the construction and maintenance of the road network as an essential element in its development plan; and (2) past performance in successfully maintaining and utilizing assistance provided under other A.I.D. projects.



Ronald D. Levin
Country Development Officer

Date: February 4, 1976

LOAN AMENDMENT AUTHORIZATION
A.I.D. Loan No. 625-H-007
Provided from: Development Loan Funds
Mali: Highway Development Road Main-
tenance Equipment

Pursuant to the authority vested in the Administrator of the Agency for International Development by the Foreign Assistance Act of 1961, as amended, (the "Act"), and delegations of authority issued thereunder, I hereby authorize an amendment to the above-captioned loan to the Government of Mali (the "Borrower"), which was established under Part I, Chapter 2, Title I, the Development Loan Fund, reducing the amount of said loan from Nine Million Dollars (\$9,000,000) to Three Million Two Hundred and Fifty Thousand Dollars (\$3,250,000). The amended loan shall be used to assist in financing the foreign exchange and local currency costs involved in procurement of road maintenance equipment, and spare parts, and technical assistance for the training of equipment operators and mechanics and for consulting services to road maintenance crews.

The loan amendment is subject to the following terms and conditions:

1. Interest Rate and Terms of Repayment. The Borrower shall repay the loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement of the loan, including a grace period of not to exceed ten (10) years. The Borrower shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the loan at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter, on the outstanding

disbursed balance of the loan and any unpaid interest accrued thereon.

2. Source and Origin.

(a) Except as hereinafter provided, goods and services financed under the loan shall have their source and origin in countries included in Code 941 of the A.I.D. Geographic Code Book.

(b) Consulting services, the road maintenance equipment, and not less than \$300,000 of spare parts procured under the loan shall have their source and origin in the United States.

(c) Spare parts, and related services, in an amount not in excess of \$800,000 having their source and origin in Mali may be procured under the loan.

(d) Based upon the justification set forth in the Project Paper and Action Memorandum to the Administrator, the invoice limitation on single transactions involving shelf items imported from countries included in Code 935 of the A.I.D. Geographic Code Book, as prescribed in paragraph 11B.3 of Chapter 11 of Handbook 15, is hereby increased from \$2,500 to \$25,000.

(e) Based upon the justification in the Project Paper, I hereby determine that in order to assure interchangeability and standardization, equipment and spare parts may be procured under this loan, without competitive bidding, from Caterpillar Tractor Company and Allis-Chalmers.

3. The loan amendment shall be subject to such other terms and conditions as A.I.D. may deem advisable.

Administrator

Date