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STAFF APPRAISAL REPORT

KENYA

NAIROBI-MOMBASA ROAD REHABILITATION PROJECT

NOVEMBER 8, 1995

Energy and Infrastructure Operations Division
Eastern Africa Department

CURRENCY EQUIVALENTS

Currency unit	=	Kenya Shilling (K Sh)
US$ 1.00	=	K Sh 55.00 (As of October 1995)
K Sh 1.00	=	US$0.02
K Sh 20.00	=	K£ 1.0

WEIGHTS AND MEASURES

Metric System

GLOSSARY OF ABBREVIATIONS

ASYCUDA	Automated System for Customs Data
CSE	Chief Superintending Engineer
EARC	East African Railways Corporation
ESA	Equivalent Standard Axle
EU	European Union
GOK	Government of Kenya
HDM	Highway Design Model
HMMS	Highway Maintenance Management System
ICB	International Competitive Bidding
IDA	International Development Association
KA	Kenya Airways
KNSL	Kenya National Shipping Line
KPA	Kenya Ports Authority
KR	Kenya Railways Corporation
KWS	Kenya Wildlife Service
LCB	Local Competitive Bidding
MOPWH	Ministry of Public Works and Housing
MOTC	Ministry of Transport and Communications
MRP	Minor Roads Programme
ODA	Overseas Development Administration, United Kingdom
PER	Public Expenditure Review
PFP	Policy Framework Paper
PPF	Project Preparation Facility
RARP	Rural Access Roads Programme
RMI	Road Maintenance Initiative
RTIM	Road Transport Investment Model
RWI	Road Works Inspectorate
SDR	Special Drawing Rights
SE	Superintending Engineer
SOE	Statement of Expenditures
SSA	Sub-Sahara Africa
SSE	Senior Superintending Engineer

GOVERNMENT FISCAL YEAR

July 1 - June 30

KENYA

NAIROBI - MOMBASA ROAD REHABILITATION PROJECT

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This report is based on the findings of a mission which visited Kenya June 20 - July 15, 1994. The mission was led by Mr. Simon Thomas (Senior Transport Economist) and included Mr. C. Hoban (Highway Engineer), Mr. W. Matthey (Consultant Maintenance Engineer) and Mr. R. Hammond (Consultant Design Engineer). Mr. B. Becq (AF1EI) was the Lead Advisor and Mr. C. Queiroz (EC3IV) was the peer reviewer. Ms. M.C. Li provided secretarial support. Messrs. S. Weissman and J. Adams are the Division Chief and Director, respectively for the operation.

ANNEXES

KENYA

NAIROBI - MOMBASA ROAD REHABILITATION PROJECT

CREDIT AND PROJECT SUMMARY

Borrower:	The Republic of Kenya
Implementing Agency:	Ministry of Public Works and Housing
Beneficiary:	Not applicable
Poverty:	Not applicable
Amount:	SDR 34.0 million (US$50.0 million equivalent)
Terms:	Standard IDA terms with 40 years maturity
Financing Plan:	See Para. 3.17
Net Present Value:	US$138 million at 12% discount rate, ERR 43.9% (Mtito Andei - Bachuma Gate Section, 43% of project cost); The Sultan Hamud - Mtito Andei Section is expected to generate similar economic benefits, see Para. 5.12
Staff Appraisal Report:	Report No. 13798-KE
Map:	IBRD No. 26642
Project ID	KE-PA-35691

1. TRANSPORT SECTOR

A. THE KENYAN TRANSPORT SYSTEM

1.1 Kenya's transport system is characteristic of countries in Sub-Saharan Africa (SSA). The infrastructure consists of: a single commercial seaport, at Mombasa; a single-track rail network consisting of a mainline and a few branch lines; a pipeline connecting the port to the capital, Nairobi; and a classified road network of approximately 63,000 km which is typical of a SSA country with Kenya's size, population and income. There are, however, two international airports, at Nairobi and Mombasa, which reflect the importance of tourism to the economy, and the pipeline has been extended further inland to both Eldoret and Kisumu. The public sector currently owns and operates the port, railway, airports, national airline and pipeline, while the private sector dominates road transport and general aviation. Transport activity is concentrated along the Northern Corridor which connects Mombasa, Nairobi, and the Ugandan border. This corridor is both Kenya's primary transport artery and a major sea-access route for the landlocked countries and regions of East and Central Africa (Uganda, Rwanda, Burundi, Kivu Province of Zaire, and Southern Sudan).

1.2 The transport sector has changed very significantly since Independence; most notably with the development of the road network and the decline in the role of rail transport. A major program of road investment has expanded the network of paved roads from just over 1,800 km in 1963 to over 8,600 km and this, combined with the introduction of much heavier commercial vehicles, has substantially reduced road transport costs. During the mid 1970's, the overall market for rail transport was reduced by the decline in the volume of Ugandan transit traffic and, in the late 1970's, by the opening of the oil pipeline.

1.3 Rail remains an important mode for long distance freight along Kenya's main transport corridor. KR operates passenger services from Nairobi to Mombasa, Kisumu and Malaba and between Voi and Taveta, and between Kisumu and Butere. KR is popularly perceived as having an important share in the passenger market but its actual role is small. Kenya Airways operates regular domestic flights from Nairobi to Mombasa, Malindi and Kisumu and a small, independent company has recently established a limited scheduled service. In addition, Kenya has an active charter and general aviation sector. Overall, bus and mini-bus (matatu) transport dominate the fare-paying passenger transport market.

1.4 The Kenya Ports Authority (KPA) is responsible for both ports and marine affairs. There was no growth in the total tonnage handled at Mombasa, during the 1980's, but the type of cargo changed significantly. Mombasa port has major importance for the landlocked countries of the region (Uganda, Rwanda, Burundi and the Kivu province of Zaire) but transit traffic only accounts for about 12 percent of total port traffic.

B. ROLE OF TRANSPORT IN THE ECONOMY

1.5 The transport system is essential for the domestic economy and is also an important source of foreign exchange; transit traffic probably generates annual earnings of, at least, US$80 - 95 million. Until the mid/late 1980's, transport was not a major constraint to economic growth. Infrastructure was expanded to meet new demands, for example the construction of the container facilities at Mombasa and Nairobi, and Kenya enjoyed a higher standard of infrastructure and lower transport costs than most countries in the region. The road transport industry is competitive and relatively efficient, and replaced KR as the major long distance transport mode.

1.6 The transport system is now beginning to be perceived as a serious impediment to economic growth. In the recent private sector assessment[1] inadequate road conditions were often cited as a significant problem. Marketing of highly perishable commodities such as milk, and vegetables has become a major problem in some areas during the rainy season. The decline in rail capacity has begun to impede the export of low-value bulk commodities, such as soda ash, which are highly sensitive to transport costs. Even more critical are, however, the constraints that the present transport system will impose on the future growth and diversification of production and exports.

1.7 The prospects for expanding Kenya's traditional exports are limited and future growth must be largely led by the development of non-traditional exports, particularly manufactures. Kenya's land transport system is inadequate to support such growth. If Kenya is to succeed in highly competitive markets, it must have the low-cost, high quality transport access to markets that its competitors already enjoy. KR should be the main bulk freight transport mode to/from Mombasa but its capacity has declined, its tariffs have risen and its service is poor. Road transport is a realistic alternative to rail for most commodities and a more critical constraint is Kenya's interface with international shipping, Port charges at Mombasa are high, the level of service is low and the delays to imports, especially containers, are considerable. Just-in-time management and rapid market response, based on sea transport, are simply not possible with the present transport system. Air-freight can be a partial substitute, but the costs are high and horticultural products already fill available export cargo space.

1.8 The pivotal transport position of Kenya within East-Central Africa is threatened by growing competition from the "Central Corridor" routes radiating from Dar es Salaam. The preference for Dar es Salaam results partly from lower port tariffs but more significant are the less costly and cumbersome transit procedures. Kenya still retains significant cost advantages for some transit traffic but these will be increasingly eroded by the on-going rehabilitation of Tanzania's infrastructure.

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[1] Tapping Kenya's Potential: A Private Sector Development Strategy, 1993

C. TRANSPORT INFRASTRUCTURE AND INDUSTRY

Roads and Road Transport

1.9 Roads and road transport are crucial to land transport, and thus social and economic development, in Kenya:

- Trucks account for almost 100 percent of short distance collection/delivery transport.
- In recent years, road transport has become the primary mode for long distance freight transport.
- Public passenger transport is dominated by bus and matatu.

The road sector is Kenya's largest investment and is described in detail in Section II.

Air Transport and Civil Aviation

1.10 Air transport has great economic importance for Kenya, serving both the tourist and horticultural sectors. The role of Nairobi as a regional passenger hub declined in the 1980's but tourism substantially increased Kenyan traffic. Air freight roughly doubled during the 1980's to over 55,000 tonnes, with exports accounting for over 70 percent of the total tonnage. Mombasa handles some scheduled international passenger flights as well as tourist charter flights and a major investment project is underway. There are also scheduled domestic flights to airports at Kisumu and Malindi.

1.11 Kenya is served by many of the major international airlines and Kenya Airways (KA) faces intense competition on the more profitable market segments. KA faces little competition on domestic routes although its monopoly has been removed. KA is being restructured, with the assistance of a management contract, prior to privatization which is expected in 1996.

Ports and Maritime Transport

1.12 Mombasa is Kenya's only international seaport although there are rudimentary port facilities at Kilifi, Lamu, Malindi, and Shimoni. Mombasa has 16 deep water general cargo and container berths, oil tankers are handled at the Kipevu and Shimanzi terminals and there are privately operated bulk handling facilities for coal, clinker and cement at Mbaraki and English Point. The three berth container terminal was developed during the early 1980's and should have an annual capacity of, at least, 250,000 TEU. With the containerization of general cargo traffic, Mombasa should have sufficient berth and storage capacity for several years. The total tonnage of traffic handled at Mombasa has shown little consistent growth for a number of years, but there have been significant changes in the composition of the cargo handled as shown in Table I.1. The recent growth in traffic, during a period of slow growth/stagnation in the Kenyan economy, has resulted from the bulk import of food aid for the region.

Table I.1: Mombasa Port Traffic 1980-92
(million tonnes)

	Dry Cargo	*Bulk Oils*	*Total*	*Containers 000' TEU*
1980	3.4	4.1	7.5	30
1984	3.5	3.0	6.5	103
1988	3.5	3.2	6.7	111
1990	4.1	3.4	7.5	136
1992	4.5	3.4	7.9	135

Source: KPA Annual Bulletin of Statistics

1.13 While the port of Mombasa has the facilities to handle present and future traffic, operational problems generate a level of port service which is a major constraint to the development and diversification of the Kenyan economy. Inadequate performance results from: poor equipment availability and reliability; inadequate maintenance of the port infrastructure; lack of management systems; inadequately motivated management and workers; and, until recently, the shortage of foreign exchange to purchase spare parts. The Kenya Ports Authority (KPA) which manages Mombasa Port is designated as one of the five 'Strategic Parastatals" which are to be immediately restructured (Para. 1.27). The KPA also owns and operates the rail-served inland container depots (ICD) at Nairobi and Kisumu and is completing a further ICD at Eldoret. Containers can be consigned to these ICDs and moved by rail without customs documentation. All containers moved by road have to be either cleared at Mombasa or have to travel under specific custom bonds. In addition, many transit containers are classified as 'sensitive' when moved by road and are supposed to travel in convoy, under police escort.

1.14 Mombasa is served by both Conference and independent liner services such as CMB and Messina. The Kenya National Shipping Line (KPA is the major shareholder) was established in 1991. KNSL has no vessels and charters container slots on Conference services; the company is not profitable. There is still some dhow traffic along the coast and to/from the Gulf but the volume of cargo carried is insignificant in comparison to conventional shipping. The dhow traffic is handled at the 'old port' in Mombasa town.

Rail Transport

1.15 Kenya Railways Corporation (KR) is a wholly government owned parastatal. Until the early 1970's, the railway dominated long-distance freight transport along the main transport routes: Mombasa - Nairobi - Malaba, and Nakuru - Kisumu. Rail, for example, carried over 95 percent of Uganda's 1.5 million tonnes of external trade in 1971. During the 1970's, with the increasing problems within EARC and Uganda, the railway lost a major part of the transit market to road but was still able to increase its domestic freight traffic, despite the opening of the Mombasa-Nairobi pipeline. KR's total freight traffic increased until the early 1980's but then, with increasing problems of locomotive availability and reliability and intense competition from road transport, a decline started which has continued with little interruption, Table I.2.

Table I.2: Kenya Railways Traffic
(million)

	Tonnes	*Tonne-kms*	*Passengers*
1980	4.3	2300	2.6
1984	3.6	2000	1.7
1988	3.1	1700	3.9
1990	3.5	2000	3.0
1992	3.1	1800	2.6
1993	2.5	1400	2.4

Source: KR

1.16 The consequent increase in heavily overloaded trucks has had a severe impact on Kenya's road network which was constructed on the basis that long distance freight would be carried by rail. If the locomotive constraint was removed, KR could increase its freight traffic to about 4 million tonnes, attracting about 1 million tonnes from the Nairobi-Mombasa road. KR's share of the freight market is capacity rather than demand constrained.

1.17 Donor assistance has helped KR to become more commercial and to achieve tariff autonomy but has had little impact on physical performance. The need for fundamental change is evident and restructuring is being assisted by the Parastatal Reform and Privatization Project Cr. 2440-KE. KR has leased mainline locomotives from South Africa to alleviate the motive power shortage and is planning to contract out locomotive maintenance to specialist suppliers. While the recent performance of KR has been bleak, the experience has modified management attitudes and increased acceptance of the need for radical change. Successful restructuring should enable KR to recapture freight traffic but a very substantial volume of road freight will remain.

1.18 While KR is primarily a freight railway, it does also provide passenger services: daily services from Nairobi to Kisumu and Mombasa, two services a week to Malaba and a weekly international service to Kampala, services along the Taveta and Butere branch lines and a rudimentary commuter service in Nairobi. KR's share of the passenger market is, however, very small and the service is very unprofitable. Under the parastatal reform program Government will either allow KR to close these services or provide specific compensation.

Pipeline

1.19 The state-owned Kenya Pipeline Company operates the pipelines. The extensions to Eldoret and Kisumu are now fully operational and there should be a significant reduction in road and rail freight traffic on the transport corridors to the west of Nairobi. The extension of the pipeline to Kampala has also been discussed with Uganda. The Mombasa-Nairobi section of the pipeline was opened in the late 1970's and its rehabilitation is now required. The extensions of the pipeline have helped to persuade the Government to enforce the volumetric limits on oil tankers which were originally gazetted in 1991. The pipeline extensions will only eliminate some of the overloading problem as fuel oil and bitumen cannot be transported through the pipeline. KR intends, however, to convert its light oil tanker wagons to handle heavy oils.

Inter-Modal Distribution of Traffic

1.20 Along most of the Northern Transport Corridor, road and rail run alongside. The Corridor is, however, a single route only between Mombasa and Nakuru, thereafter the corridor bifurcates with one branch running to the Ugandan Border at Malaba and the other running to Kisumu. At Kisumu the road/rail routes diverge: The road route continues to the Ugandan border at Busia, while rail wagons cross Lake Victoria by ferry. During the 1980's, a third road route developed with transit vehicles, for Rwanda and Burundi, crossing into Tanzania at Isebania.

1.21 Table I.3 provides indicative estimates of long distance freight along the Corridor. Overall, trucks carry about twice the volume of rail freight.

Table I.3: Transport Corridor - Freight Flows (million tonnes)

	Rail	*Road*	*Pipeline*
Mombasa - Nairobi	2.0	3.7	1.5
Nairobi - Eldoret	1.1	2.2	NA
Nairobi - Kisumu	0.5	1.6	NA

Source: KR, MOWPH and mission estimates

1.22 Data on passenger movements along the Corridor are limited. A recent study of KR's passenger services estimated the passenger transport capacities on the Nairobi-Mombasa route shown in Table I.4.

Table I.4: Public Passenger Transport Capacity: Nairobi-Mombasa (seats per day)

	First Class[2]	*Second Class*	*Economy*	*Total*
Rail	100	170	240	510
Air	670			670
Bus		120	2000	2120
Total	**770**	**290**	**2240**	**3300**

Source: KR Passenger Services Study, SwedeRail

1.23 Government regulation of the transport sector is minimal and market forces are the basis for traffic allocation (the pipeline had a monopoly, prior to liberalization in 1994). The distribution of traffic is distorted, however, by KR's non-commercial policies; operating unprofitable passenger services while turning away profitable freight traffic. Efficient traffic allocation in a competitive environment depends on efficient taxation/cost recovery within the sector. Road-user charges, designed to cover attributable road damage costs, were introduced in the early 1980's but they have not been systematically updated. Since the last major study of transport taxation, road tolls were introduced and the tax exemption of KR removed. In July 1994, the domestic road tolls were replaced by a road maintenance levy on the pump price of gasoline and diesel. With these changes,

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[2] The passenger classes reflect levels of quality/service and not necessarily tariff categories

it is no longer certain whether taxation in the sector promotes "fair" competition. The issue of transport taxation will be studied under the proposed Third Highway Sector Project.

D. Critical Transport Issues in Kenya

1.24 Transport conditions are deteriorating and transport system is increasingly a major constraint to economic and social development in Kenya. There are three critical issues:

(i) Deteriorating road conditions: The road system is Kenya's largest investment and, if valued on a quasi-commercial basis, a declining asset. The Ministry of Public Works and Housing has attempted to maintain the network but preference for new construction, inadequate budgetary allocations, and inappropriate employment policies have resulted in insufficient routine and periodic maintenance. Conditions are discussed in detail in Section II.

(ii) Inadequately performing parastatals: Both KR and KPA provide low quality service at unnecessarily high cost. KPA generates a considerable cash surplus through high tariffs rather than high productivity. KR has commercial autonomy but its rates are limited by competition from road transport. Although rates have increased and expenditure has been held below the rate of inflation, KR's financial position has deteriorated and it no longer services its debts or adequately maintains its assets. The poor financial position of KR is the inevitable consequence of the decline in traffic. KA's financial situation was also poor and a major financial restructuring was undertaken, as a necessary condition for privatization.

(iii) Uncompetitive external trade-transport system: The inadequate service of KPA and KR is exacerbated by complex customs procedures. It takes 27 separate operations, checks and processes to clear an import consignment through Customs. Customs procedures combine with port and land transport problems to produce average container delays at Mombasa of about 20 days. The Government is taking steps to restructure all three organizations.

E. Bank Strategy

1.25 The Bank has been assisting the transport sector since before Independence. The critical issues are being addressed through policy dialogue, under the Policy Framework Paper, and proposed lending operations.

Deteriorating Road Conditions

1.26 The Bank's on-going and proposed assistance to the inter-urban and rural road sectors is discussed in Sections II and III, and the lessons of recent involvement in the sector are summarized later in this Section (Paras. 1.30 - 1.33). The inadequate level of routine and periodic maintenance described in Section II applies equally to urban roads. In Nairobi, traffic congestion exacerbates the situation. In response to these urban transport problems, the Ministry of Local Government

and IDA are preparing a large Urban Transport Project which will rehabilitate key road networks in 26 urban areas, strengthen the very weak (or non-existent) institutional capacity for road maintenance, and address traffic congestion in Nairobi.

Transport Parastatals

1.27 The radical transformation of the public sector is central to the Bank's macro-economic and sector policies in Kenya. The size, inefficiency and financial performance of the public sector have been increasingly recognized as major causes of Kenya's low economic growth in recent years. The Government has launched the comprehensive reform program which was outlined in the Policy Paper on Public Enterprises and Privatization, July 1, 1993. The reforms will rationalize public enterprise operations, reduce public subsidies, improve governance and the regulatory environment, and remove preferential treatment. Strategic enterprises will be restructured, while the remaining 207 non-strategic enterprises will be either privatized or liquidated.

1.28 The Bank is supporting reform through the Parastatal Reform and Privatization TA Project (Cr. 2440-KE). The importance attached to the policies and actions agreed within this project are reflected in key agreements in the PFP. Technical assistance is being provided under the project to assist with the implementation of major restructuring plans for five key strategic parastatals, including KR and KPA. The crucial importance of major improvement to operational efficiency at Mombasa Port has been recognized by GOK. The modalities for the management of the container terminal by a major international operator are now being explored. KA is not considered a strategic parastatal and will be privatized.

Competitive External Trade-Transport Sector

1.29 IDA has assisted Kenya with the development of its external trade sector through policy dialogue and the Export Development Credit (Cr. 2197-KE) which funded the infrastructure for the export processing zone at Athi River, near Nairobi. Limited specific assistance has, so far, been given to creating efficient import/export trade-transport systems although this was the primary objective of the proposed Transport Corridor Project which included port, rail and customs' components. Customs reform and the improvement of customs procedures are important features of the PFP agreements and some action is being taken on those aspects which impact on transport/trade efficiency. An independent assessment, by Bank-funded consultants, was made of the on-going Customs computerization program and this recommended that the program be abandoned and the ASYCUDA system introduced. The Cross Border Initiative and the Great Lakes Corridor Study will provide the opportunity for further dialogue.

F. Previous Bank Group Involvement in the Kenya Road Sector

1.30 Since 1960, the Bank group has undertaken a total of 12 projects in the Kenya Road Sector (Annex 5). During the 1960's and 1970's IDA supported Government objectives in the road sector through a variety of project designs:

- Creation of a well integrated network of national and regional roads (First and Second Highway Projects).

- Rural roads for specific agricultural programs (Agricultural Development, Tea Roads, Sugar Roads and Rural Access Roads Projects).

- Projects combining main road construction with rural road development (Third, Fourth and Fifth Highway Projects).

- The Highway Maintenance Project was designed to strengthen the maintenance organization and help finance the implementation of a large maintenance program.

According to the Project Completion Reports, these projects were, on the whole, completed satisfactorily and their principal objectives - reduced vehicle operating costs and improved rural accessibility - were achieved, at least, in the short term. The projects experienced implementation delays, cost overruns and their economic returns were generally below the appraisal estimates.

1.31 During the 1970's the agencies responsible for the road sector were strengthened, the Roads Department had demonstrated its capacity and the Government had established appropriate objectives and policies for the sector under the Fourth Transport Plan. The Bank therefore agreed to a Highway Sector Project to support the implementation of the Government's Highway Sector Plan. The slower than anticipated economic growth during the plan period resulted in lower than agreed Government funding for maintenance and construction. There were even greater shortfalls in the physical implementation of the plan, especially within the maintenance program. It was concluded, however, that the experience did not invalidate the sector lending approach - sector policies and objectives were sound, only their implementation required improvement. The sector lending approach was consequently continued.

1.32 The Second Highway Sector Project was prepared in 1984 with the objective of helping to finance the last four years of the Government's Fifth Highway Sector Plan (FY 1984-1988). The project's estimated cost totaled US$152.2 million and to be funded by a US$50 million IBRD loan (LN. 2409-KE), a SDR 37.8 million IDA credit (CR. SF17-KE) and the equivalent of US$53.7 million in local funding. The Bank Group's participation in the funding of the Plan was expected to reseal 2,800 km, regravel 1,500 km, strengthen 220 km and pave 245 km. In addition, assistance was to be provided for road maintenance equipment, road building materials, and consultants' services to assist the Ministry in improving highway and maintenance planning. The Project became effective on 26 September 1986, but implementation was very slow mainly as the result of the Government's inability to allocate sufficient counterpart funding to allow the Roads Department to utilize the Bank Group's funds. In August 1987, the Government proposed a reduction in the scope of the works and a reduction in the level of required counterpart funding. A substantial revision of the Project was agreed and the loan component (LN 2409-KE) was reduced to US$5.0 million and the disbursement percentage increased.

1.33 The closing date of the Project was extended by two years to 31 December 1993, and the project succeeded in implementing the revised project objectives: resealing 537 km, regravelling 558 km by small domestic contractors trained under the Project, paving 56 km, strengthening 29 km of the Mombasa-Nairobi road, provision of road maintenance equipment, purchase of bitumen for locally funded resealing projects, and the provision of technical assistance for the introduction of improved maintenance and equipment planning. Throughout the project, the shortage of local funding was a critical issue, restricting the scope of work and delaying payments to contractors.

While the revised project components were successfully implemented, the overall objectives of the Highway Plan were not attained and the continued inadequacy of maintenance funding on the network largely offset the benefits of improvements on specific links. It is clear from the implementation of this project that much greater emphasis had to be given to the issue of long-term sustainability in the sector and this critically depends on the generation of adequate local funding for road maintenance. The final audit report has been submitted by the Government.

G. RATIONALE FOR IDA INVOLVEMENT

1.34 The Bank has played a leading role in the development of the road sector since before Independence and has maintained a continuous dialogue with Government on appropriate strategies for the sector. Work is now under way to develop a new strategic plan for the sector which will have as its principal objective the attainment of sustainability through local resource financing of adequate routine and periodic maintenance. Donor funding will then concentrate on the improvement of the network rather than remedying the effects of inadequate maintenance. To achieve sustainability, however, will require substantial assistance to remove the backlog of periodic maintenance, strengthening and rehabilitation work that has developed. Further assistance by the Bank, within an agreed strategy for the sector, will help mobilize other donors to maintain or extend their funding to the sector. The improvement of the Nairobi-Mombasa Road would provide high profile endorsement of an agreed strategy for the sector. A Letter of Sector Policy was submitted by the Government (Annex 8) and the draft Strategic Plan was submitted by the Government. Government approval of the agreed final Strategic Plan would be a **condition of credit effectiveness**.

1.35 The rehabilitation and strengthening of the Nairobi-Mombasa road is also vital to provide the quality of infrastructure necessary to support Kenya's overall economic strategy, a strategy which has been strongly endorsed by the Bank. If Kenya is to succeed in an export oriented growth policy, based on the development of the manufacturing and other non-traditional activities, rapid, reliable and low cost communications between the production areas, in Nairobi and Western Kenya, and the port of Mombasa is essential. The railway system could provide an economical mode of transport for lower value, time insensitive products but road transport is essential for other commodities. The Nairobi-Mombasa road is one of the most heavily trafficked routes in Kenya and requires substantial reconstruction, widening and strengthening. Without this project, the condition of the road is expected to deteriorate very substantially and will consume an increasing proportion of the maintenance budget as MOPWH attempts to maintain a road which has exceeded its design life.

2. THE KENYAN ROAD SECTOR

A. PRESENT INFRASTRUCTURE

Network Size

2.1 The Kenyan economy is dependent on roads and road transport. Even if the proposed restructuring of Kenya Railways fully succeeds, roads and road transport will remain Kenya's primary transport system. In view of the importance of the sector, the priority given to the development of the road infrastructure since Independence is not exceptional and is similar to most SSA countries. High priority was attached to the improvement of the main road network and the network of paved roads has increased from about 1,800 km, at Independence, to over 8,600 km in 1994. In addition to upgrading the main road network, a series of projects have extended and improved rural access roads in the most densely populated and agriculturally important areas of the country. Currently, Kenya has a classified road network, under the responsibility of the Ministry of Public Works and Housing, of just over 63,000 km, Table II.1.

Table II.1: Kenya Classified Road Network 1993

Road Class	*Bitumen*	*Gravel* [1]	*Earth*	*Total*
International Trunk (A)	2,667	783	241	3,691
National Trunk (B)	1,403	821	524	2,748
Primary (C)	2,503	3,292	2,160	7,955
Secondary (D)	1,171	6,128	3,921	11,220
Minor and Special (E)	878	15,069	21,559	37,507
Total Network	8,621	26,092	28,406	63,120

Source: MOPWH

2.2 In addition to the classified road network, there are estimated to be about 85,000 km of urban streets, and unclassified roads and tracks. Various agencies are nominally responsible for the unclassified road network; municipalities, county councils and the Kenya Wildlife Service. With certain exceptions, the responsible agencies have been unable to maintain the unclassified network and, though information is extremely limited, the conditions on most of this network are thought to be very bad and many of the unclassified roads may no longer be motorable.

2.3 While most investment has been directed to upgrading the main road network, there has also been a significant expansion in the coverage of the classified rural road network through the special crop-oriented programs (tea, sugar and wheat roads) and the rural access road program (RARP). RARP was commenced in the early 1970's with the intention of constructing a very extensive network of all-weather rural access roads, using labor-intensive construction methods. The full objective of the program (about 14,000 km of rural roads) was not realized but over 8,000 km of rural road were constructed. The roads under RARP have subsequently been maintained under the Minor Roads Programme (MRP) which has extended the labor-intensive approach to the improvement of existing minor roads. Overall, there are now over 12,000 km of rural road which have been improved and are

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[1] Inadequate re-gravelling may have reduced some roads, classified as gravel, to earth

now maintained under MRP. Through the RARP and MRP programs, Kenya has become an important innovator in labor-based road construction and maintenance techniques.

Network Condition

2.4 While there may be small areas with insufficient density of classified roads, coverage of the network is generally adequate to support the present types/level of economic activity in Kenya; roads are concentrated in areas of high population and economic activity. The primary problem in the Kenya road sector is not the quantity but the quality of the network. The inadequate quality of the network is the consequence of two rather different factors:

- Road conditions on most paved and unpaved roads have deteriorated significantly through a lack of maintenance and, on the main paved network, the overloading of vehicles.

- Traffic growth has resulted in a substantial network of unpaved roads carrying traffic levels sufficient to justify paved roads; about 2500 km of unpaved road carry over 200 vehicles per day.

2.5 Operating conditions are inadequate on large sections of the network and the situation is deteriorating. A visual inspection of the paved network in 1989/90 indicated that 32 percent of the network was in good condition, 39 percent in fair condition (requiring some periodic maintenance) and 28 percent in poor condition (substantial amount of failure requiring major work). In 1993 the visual inspection classified only 12 percent in good condition, 42 percent in fair condition and 46 percent in poor/critical condition. With the exception of the roads being improved/maintained under the donor-assisted Minor Roads Program, the situation is probably even more critical on the unpaved road network although condition survey data are lacking. It is known, however that funds for periodic maintenance of the unpaved network have been extremely limited (in the period 1987-1992, less than 3,000 km were regravelled, compared to a requirement of about 20,000 km) and even routine maintenance is not fully undertaken.

2.6 On some roads, the deterioration has resulted from inadequate design and/or construction standards. The shift in long distance heavy freight transport from rail to road clearly had a major impact along the main corridors. Major investment has been necessary, along most of the Northern Corridor, to raise pavement standards to meet present traffic loadings. Several attempts have been made to control vehicle overloading through the introduction of fixed weigh bridges and then, when these proved unsuccessful, through random checks using mobile weigh bridges (supported through the Second Highway Sector Project). These attempts have, up to now, not proved very successful and have either been suspended or operated under rules which make enforcement ineffective. There was also an attempt, in 1991, to limit tanker axle-loads by restricting the permissible volumetric size of tanks but enforcement of the gazetted regulations was delayed to allow tranporters time to adjust. The EU has funded the installation of automatic traffic data collection systems which should provide evidence of whether enforcement has had any measurable impact; these data collection systems should become operational in the near future. The recent evidence on overloading is not encouraging. The extension of the pipeline to both Kisumu and Eldoret should significantly reduce traffic loadings on part of the main road network, but will have no direct impact on the Nairobi-Mombasa road unless KR can capture a higher share of the heavy oil market, by converting its redundant light oil tanker wagons.

2.7 Inadequate road maintenance has been a significant problem for most of the last thirty years. In 1968, the road network was found to be deteriorating, partly because of vehicle overloading, but mainly because road maintenance by the local authorities was inadequate. To improve the situation, central Government assumed responsibility for the maintenance for the entire classified road network. Road maintenance improved considerably until 1975 when insufficient funding began to result in substantial cutbacks in both periodic (resealing and regravelling) and routine maintenance. The First Highway Sector Project had, as one of its objectives, support for the road maintenance sector but underfunding continued (Para. 1.31). The Second Highway Sector was expected to reduce the backlog of periodic maintenance but the achievements of the project were well below the initial objectives (Para. 1.32).

2.8 The expansion of the network has intensified the problem of inadequate maintenance funding. In the early 1980's, road tolls were introduced on the main paved network to supplement regular budgetary funding. While the toll revenue provided funds outside the normal budget (in 1992/93 K Sh 326 million was collected in toll revenue and used for periodic maintenance and strengthening of the main paved road system), the net increase in funding was limited as the normal budgetary allocations, in real terms, declined. Recent expenditure in the sector is shown in Table II.2

Table II.2: Expenditure on the Classified Road Network (K Sh million)

	FY 88/89	*FY89/90*	*FY90/91*	*FY91/92*	*FY92/93 Estimate*	*FY93/94 Estimate*
Recurrent						
Wages/overheads	334	312	324	346	416	548
Maintenance	134	150	184	216	244	928
Toll revenue	130	216	282	328	326	296
Total	598	678	790	890	986	1772
(Constant prices)	(598)	(597)	(600)	(570)	(503)	(549)
Development						
GOK	1062	988	892	708	1042	974
Donors	876	778	994	978	1596	1456
Total	1938	1766	1886	1686	2638	2430
(Constant prices)	(1938)	(1554)	(1433)	(1079)	(1345)	(753)
Total	2536	2444	2676	2576	3624	4202
(Constant prices)	(2536)	(2151)	(2034)	(1649)	(1848)	(1303)

Source: GOK and Intech Associates

2.9 Under the Fifth Highway Plan, which was the basis of the Second Highway Sector Project, recurrent expenditure in FY89 should have been approximately double the actual level. This provides an indication of the inadequacy of maintenance funding. Development expenditure in FY89 was almost exactly equal, in real terms, to the Plan's requirement. Recurrent expenditure does not, however, equate exactly with maintenance expenditure as some donor funding for maintenance is included within the Development Estimates. Overall, however, there has been a significant reduction in maintenance funding since the 1970's and a major fall in total road expenditure in recent years. The extent of underfunding of road maintenance in Kenya is not known with total precision, but it is very considerable. A consultant study for the recent PER estimated that total annual spending by MOPWH on the maintenance and rehabilitation of the network was K Sh 1.72 billion (this included

maintenance components within improvement projects). The consultants estimated that adequate road maintenance for a rehabilitated and rationalized classified road network would cost in the order of K Sh 4.70 billion. Several other estimates indicate rather higher funding needs and K Sh 6 billion is a reasonably robust estimate of maintenance requirements for the entire classified road network.

2.10 The present level of maintenance funding cannot even be optimally allocated as a high proportion of the recurrent budget is needed to pay a large workforce of permanent laborers who cannot be productive because there are insufficient funds to provide the complementary materials, tools and transport. The estimates of road maintenance needs have been made on the assumption that the road network is maintainable. Unfortunately, neglect over many years has resulted in much of the network deteriorating to the point where rehabilitation is necessary before maintenance is possible. Full rehabilitation of the system, to conventional standards, has been costed very approximately at K Sh 36 billion.

B. Road Transport and Traffic Flows

2.11 The vehicle fleet has grown consistently and is now estimated to total over 330,000 vehicles (excluding motorcycles and special purpose vehicles), Table II.3. The rapid growth in the bus fleet (mainly mini-buses) reflects the substantial rise in the population and increased personal mobility. The road freight sector has shown the slowest growth and this is perhaps surprising, given the growth in the economy and the increasing importance of the trucking sector for long distance freight movement. The increase in the paved road network should have allowed more intensive utilization of commercial vehicles and there has been significantly faster growth in the heaviest truck segment, as reflected by the growth in the number of trailers (associated with heavy trucks).

Table II.3: Road Vehicle Fleet 1972 - 1992
('000 vehicles)

	1972	1976	1980	1984	1988	1992	Annual Growth Trend (%)
Car	76	100	113	122	141	171	3.9
Pick-up	34	45	56	65	78	96	5.4
Bus	3	5	5	7	11	16	8.2
Truck	17	21	24	25	30	35	3.5
Trailer	5	9	11	11	13	15	4.9
Total	135	180	209	230	273	333	4.4

Source: MOTC

2.12 Traffic flows are concentrated on the main paved trunk road system; approximately 10 percent of the total network, carries over 60 percent of total vehicle-km and almost 90 percent of heavy truck-kms, Table II.4. Light and medium goods vehicles are more widely distributed over the network. Light goods vehicles (pick-ups) appear as the most intensively used vehicle, accounting for over 50 percent of total vehicle-km while forming less than 30 percent of the total fleet.

Table II.4: Traffic Distribution by Road and Vehicle Type (Percent Distribution)

Road Category	*Percent of Network*	*Cars*	*Light Goods*	*Medium Goods*	*Heavy Goods*	*Buses*	*Total Traffic*
Trunk	10	74	55	59	87	77	62
Primary	13	16	23	23	9	16	20
Secondary	18	5	9	9	1	6	8
Minor	59	5	14	9	3	2	10
All Roads	100	100	100	100	100	100	100
Percent of vehicle fleet		54	30	6	5	5	100
Percent of vehicle-kms		21	51	18	5	5	100

Source: MOWPH and MOTC

2.13 The road freight industry is privately owned and operates with little effective government regulation. There are no entry restrictions nor official capacity licensing. Tariffs are not regulated and the influence that Government implicitly exercised through retail price-controls has now been eliminated. While there are a few large trucking companies, normally specializing in long distance trucking, most trucking enterprises are very small. The sector is very competitive and tariffs adjust rapidly to market conditions, e.g. backhaul rates from the Western Kenya are very low and trucking rates rose very quickly in response to the interruption to rail traffic in early 1993. Tariffs are kept low through overloading which has been a persistent problem. A combination of competitive pressure and weak enforcement encourages truckers to carry the payload which maximizes private profits. Kenyan regulations allow 10 tonnes on a single axle, 16 tonnes on a tandem axle, and 24 tonnes on a triple axle. The gross vehicle weight of a six axle truck combination, meeting the legal axle load limits, should not exceed about 47 tonnes but such vehicles can physically operate with a payload of well over 40 tonnes (a recent survey intercepted one vehicle with a gross vehicle weight of 74 tons, equivalent to a payload of over 50 tonnes). As legal loading would restrict the payload to under 30 tonnes, the incentive to overload is enormous.

2.14 The bus industry is predominantly operated by the private sector although the Nyayo Bus Corporation is state owned. Two large bus companies, operating in Nairobi and Mombasa are owned by an international company with minority municipal participation. The main increase in passenger transport has been provided by mini-buses (matatus) which were legalized in the early 1970's. The mini-buses provide both urban and inter-urban services and operate under little effective government control or regulation, except over the size of the vehicles. There is, however, some self-regulation through informal cartels within the sector.

2.15 In some countries the road transport industry is hampered by over-regulation. In Kenya, the problem is almost the reverse. There is little effective enforcement of regulations relating to vehicle condition, vehicle loading and driving standards. The road accident rate in Kenya, as in many SSA countries, is very high, at least 20 times higher than in Europe and North America, and approximately 3 people die in road accidents every day. While poor road conditions may be a factor in some cases, human behavior is thought to be responsible for over 80 percent of all road accidents; excessive speed, vehicle overloading, and careless pedestrians are all significant contributors to the high accident rates.

C. THE MINISTRY OF PUBLIC WORKS AND HOUSING

Organization

2.16 The Ministry is responsible for the construction, rehabilitation and maintenance of the classified road network. The Roads Department, under the Chief Engineer (Roads), is primarily responsible for the classified road sector although a separate department is responsible for the provision and maintenance of the road construction and maintenance equipment, and the Materials Department provides soil testing and pavement design. The Roads Department has recently been re-organized with separate maintenance branches being created for paved and unpaved roads. The special projects for unpaved roads, such as the Minor Roads Program, the Culvert, Bridge and Gravelling Programme, and the Market Development Program, have all been placed under the Unpaved Maintenance Branch. Planning, previously a separate division, has been incorporated into the Roads Department which is now responsible for all road maintenance and investment planning.

2.17 The Roads Department has increasingly recognized that it is faced with considerable problems, both financial and organizational, in discharging its responsibilities to the road network:

- Inadequate funding for road maintenance
- Excess staff in the lower grades in comparison with the funding available for complementary inputs, resulting in very low labor productivity
- Inadequate availability of maintenance equipment and transport
- Inadequate salary structure to recruit, retain and motivate high-level engineers
- Inadequate road inventory condition information and maintenance planning systems
- Inadequate O&M resources to utilize fully staff in the Materials and Design Branches

2.18 Kenya is one of the countries working with the Sub-Saharan Africa Transport Program's Road Maintenance Initiative (RMI) to remedy the pervasive problem of inadequate maintenance. A major RMI seminar was held in Kenya, during 1992, to examine the problems of the road maintenance and to identify possible solutions. Government has already acted to increase the level of road maintenance funding with the Road Maintenance Levy Fund (Para. 2.24) and a major institutional study of the entire road sector has been initiated. The institutional study will be completed in mid 1996.

Activities of the Roads Department

2.19 Over a number of years, there has been a shift toward the use of the private sector for the implementation of road works. Major construction contracts have always been undertaken by contract and most periodic maintenance of paved roads is now contracted out, although the Ministry still maintains some resealing units. A relatively large domestic contracting sector has developed and the upgrading and strengthening projects funded by the Second Highway Sector Project were undertaken by Kenya-based contractors. Routine maintenance of the paved road network is still undertaken by MOPWH.

2.20 Extensive programs of rural road construction and improvement have been undertaken by the Ministry using both labor and equipment intensive methods. Until recently, these programs were implemented entirely by the Ministry, although often using casual rather than permanently employed labor. Recently, pilot projects have used contractors to undertake labor-intensive gravelling. IDA also funded, under the Second Highway Sector Project, contract re-gravelling using equipment-intensive methods; this funding included the training of medium sized contractors for such activities. Routine maintenance of the unpaved network is presently implemented by two quite distinct systems:

(a) Minor Roads Program Network: for those roads constructed/improved under RARP and MRP, routine maintenance is undertaken by the lengthman system. Individuals are contracted to maintain, on average, 1.5 km of road with the work expected to occupy about three days per week. The lengthman system has been introduced on about 12,000 km of unpaved road, over 20 percent of the unpaved network.

(b) Other Unpaved Roads: for those unpaved roads outside the MRP network, routine maintenance is nominally performed by the district based road camps and by MOPWH graders. The funding for road maintenance is so limited, however, that maintenance is negligible on much of the network. This gives rise to the anomaly that well maintained minor and rural access roads connect with almost impassable secondary (D) and sometimes primary (C) roads and, on occasion, RARP/MRP roads have effectively taken the place of 'higher category' roads and carry traffic levels well above their design standard.

2.21 Maintenance planning is assisted by the Highway Maintenance Management System (HMMS) which is a computer based system containing the complete inventory of the classified road network, traffic levels, geometric and surface conditions. The system is designed to prioritize road maintenance expenditure and to determine the distribution of available funds on the basis of district needs. The inventory information is now rather dated, however, and the level of funding is so low that the usefulness of the system is questionable. The system does provide a rational means of allocating funds between districts but, in establishing priorities, HMMS has the weakness that traffic plays an insignificant role. For much of the network, funds are allocated from headquarters but their use is prioritized at the district level. HMMS also determines maintenance costs for the unpaved network on the basis of equipment-intensive maintenance, including full re-gravelling, which will no longer be appropriate when the Roads 2000 strategy is implemented (Para. 2.26). Other maintenance management systems have been developed under the MRP and MOPWH needs now to review its planning methods and integrate them into a coherent system. The proposed project will assist MOPWH in this review.

2.22 The Roads Department also includes the Construction Branch, responsible for the administration of contracts for major construction, and a Design Branch.

D. Strategy for the Sector

2.23 MOPWH clearly recognizes that major changes are required in the financing, planning and execution of activities in the sector, if the condition of the classified network is to be raised and maintained to the level necessary for sustained economic development. The Ministry is moving

toward a new strategy for the sector and several of the key components have already been identified and implementation initiated.

Maintenance Funding

2.24 A maintenance funding plan for FY96 and a schedule of future funding for maintenance of the road sector through FY2000 was agreed. Increased funding for maintenance of the network is essential and MOPWH has realized that sufficient funding is unlikely to be provided from the regular budget and that potential donor funding for maintenance is both limited and, in the longer term, inappropriate. New sources of revenue, outside the regular budget, must therefore be identified and utilized. The crop Cess (a levy on crop sales) could provide some funding for rural roads but it would not be sufficient for the entire network and more substantial funding is necessary. The road user, as the main beneficiary of improved roads, is the most obvious source of revenue for rehabilitating and maintaining the road network and the most convenient means of collecting such revenue is through fuel sales. In order to raise the revenue required for funding the maintenance of the road network a **Road Maintenance Levy Fund** was enacted in late 1993, and introduced in June, 1994. The fund derives its revenue from a levy on the sales of diesel and gasoline and the charges levied on foreign registered transit vehicles. The Levy fund has replaced the system of road tolls.

2.25 The eventual size of the Levy Fund, required for full maintenance funding, has not yet been determined. The present modalities for the Fund's operation appear satisfactory but the details are still evolving. Although the Fund forms part of the recurrent budget, payments are made directly to MOPWH by Customs on a weekly basis. It has also been agreed that an annual report will be prepared on the use of the Fund. The initial level of the Fund, generated by a K Sh 1.5/liter levy on gasoline and K Sh 1.0/liter on diesel, is well below requirements and agreement has been reached with Government on the progressive increase in overall funding until sustainable maintenance funding is reached by 2000. The level of the levy was increased by K Sh 0.5/liter in the June 1995 Budget. To fund maintenance of the classified road network solely through the Fund would require a levy of approximately K Sh 6.0/liter on all automotive fuels. To help ensure cost-effective maintenance, the project will assist MOPWH to establish a Road Works Inspectorate (RWI) to monitor the implementation and quality of the maintenance undertaken. Its proposed organization, powers and functions were agreed during negotiations; establishment, including the appointment of the senior superintending engineer and, at least, two superintending engineers, will be a **condition of credit effectiveness**.

The Roads 2000 Strategy

2.26 Kenya has been a pioneer in the region for the construction and maintenance of unpaved rural roads using labor-intensive techniques. The projects have been successful but their approach does not provide a complete solution to the rural road problem:

- They do not provide a sustainable rural road network, rather a series of improved and maintained links within the network.
- The cost of full road rehabilitation, even using appropriate techniques, is too high to apply throughout the network.
- Some unpaved roads carry too much traffic to be maintained by lengthmen.

- In some parts of Kenya, the population is too low to make lengthman maintenance feasible.

- Full gravelling/re-gravelling of unpaved roads is becoming increasingly difficult and costly, in some areas of Kenya, as suitable natural gravel is being exhausted.

2.27 The Ministry, within the on-going MRP, has developed a new strategy for the unpaved road network which takes into account the problems and constraints, outlined above, and offers the prospect of a major improvement over the present system. The strategy is based on the following principles:

- all classified roads in a district are brought up to a maintainable standard.

- spot improvement/partial rehabilitation is used. Major increases in condition and accessibility can be cost-effectively achieved with spot improvements. Gravelling is confined to major problem areas.

- on higher trafficked roads, the lengthman system is supplemented by intermediate equipment, essentially tractor-towed graders.

- tractor-towed grader teams will maintain unpaved roads in areas of low population density.

The strategy has been termed Roads 2000 because the Ministry would like to implement the system in all districts by the year 2000. The approach has been successfully implemented in two districts and the Ministry is seeking funds to extend its application. The costs of Roads 2000 are substantially lower than conventional rehabilitation but full implementation of the strategy will still cost about US$165 million with annual recurrent costs of US$25 million.

Institutional Strategy

2.28 The Ministry recognizes that major changes/modifications to the present institutional framework for the implementation of road activities would be desirable and has initiated a study to define a framework more adapted to future needs (Para. 2.18). Natural attrition has already significantly reduced the excess work force in the lower grades, assisted by the GOK's early retirement policy introduced in 1994. Further reductions in staffing levels are expected as part of the restructuring of MOPWH, initiated under the Civil Service Reform Program.

Strategic Plan for the Road Sector

2.29 The potential expenditure demands of Kenya's classified road network on Government's resources are immense:

- Rehabilitation of large parts of the network.

- Full maintenance of the network.

- Removing the backlog in periodic maintenance.

- Strengthening key sections of the main road network.

- Upgrading heavily trafficked unpaved roads.
- Provision of all-weather access to all districts/major centers.

The Ministry prepared, in 1991, a program of required rehabilitation and improvement projects but it is clear that its magnitude makes it unlikely that the full program can be implemented in the near future and thus prioritization of the program is critical. It is also essential that the prioritization takes place within an overall strategy which will achieve financial sustainability in order that future donor funding can be directed toward the expansion and upgrading of the network rather than to maintenance and rehabilitating the consequences of neglected maintenance. MOPWH, assisted by PPF funding for the proposed Third Highway Sector Project, has consequently been preparing a Strategic Plan for the Sector which encompasses the needs/priorities for the classified road network, covering maintenance, rehabilitation and improvement. Agreement has been reached on the draft Strategic Plan.

2.30 The Strategic Plan not only indicates what should be implemented in the sector but also how it should be implemented. MOPWH faces a number of important policy issues in implementing its future strategy, including the relative roles of force account and contract work in the sector, and the persistent problem of the provision and maintenance of road construction and maintenance equipment. The benefits of utilizing the private sector in the road sector have been accepted for major construction and periodic maintenance projects. It is also accepted that there may be substantial advantages in further extending the use of the private sector but the use of the private sector for smaller projects, such as road rehabilitation under the Roads 2000 Strategy, and for routine maintenance, especially on the paved road network remains largely untested in Kenya. The project will assist MOPWH with the development of pilot routine maintenance contracts and their evaluation through a program of 'structured learning'. The Preparatory work for the Strategic Plan thus included policy studies to assist the MOPWH in determining its future approach to the delivery of activities in the sector. The Strategy will provide the basis for future IDA road sector lending through the Third Highway Sector Project.

3. THE PROJECT

A. IDENTIFICATION AND PREPARATION

3.1 The proposed project was identified and prepared during the course of dialogue with MOPWH on the preparation of the Strategic Plan for the Road Sector and the development of the Third Highway Sector Project. It was agreed that the Mombasa - Nairobi Road plays such a crucial role in Kenya's overall transport and economic system that its rehabilitation and/or strengthening would receive very high, if not the highest priority in any conceivable strategy for the sector. In these circumstances, it was appropriate to advance the project, especially as the European Union (EU) indicated strong interest in financing a section of the required road reconstruction thus offering the opportunity for a coordinated approach to the entire road. Assistance for the Nairobi-Mombasa road still required, however, agreement between IDA and the Government on the Strategic Plan for the Road Sector.

3.2 The project was pre-appraised in February, 1994, and appraised in June, 1994. The Materials Department of MOPWH undertook the detailed material testing for the project and the Design Branch of the Roads Department prepared the detailed designs. In view of the importance of the road and the need to minimize the risk of premature failure, an independent design and risk review was undertaken of the detailed design. The EU are appointing consultants to undertake the detailed design of the road section to be reconstructed.

B. OBJECTIVES

3.3 The proposed project will support Kenya's efforts to rehabilitate and strengthen its main road network. The most immediate objective of the project is to safeguard the only feasible road connection between the port of Mombasa and the main areas of economic activity in Kenya. The condition of the road already causes major operating problems and, if the road continues to deteriorate, severe constraints to Kenya's export-oriented growth strategy will develop. The project will significantly reduce present and future vehicle operating costs, journey times and improve traffic safety. The project will also encourage private sector involvement in the maintenance of infrastructure, strengthen monitoring/control of road maintenance activities and provide basic institutional support for road maintenance planning.

3.4 The project is designed to reconstruct and strengthen the Mombasa road in order to provide economic operating conditions along Kenya's main road link to the sea for a design life of 15 years.

C. PROJECT DESCRIPTION

3.5 The present road, of just under 500 km, is two lane except for the dual carriageway between the center of Nairobi and Jomo Kenyatta International Airport. The road was mainly constructed during the late 1960's and 1970's although some sections date back to the 1950's. Much of the road was thus designed and constructed when Kenya Railways was the dominant mode for long distance, bulk freight transport. With the major shift of freight from rail to road (transit traffic in the 1970's

and domestic traffic in the 1980's and 1990's), the Nairobi-Mombasa Road has carried traffic well above its design level.

Road Inventory

3.6 The width of the pavement is either 7 meter or 6 meter, depending on the section. Along much of the 6 meter sections, damage to the road edges has effectively reduced the pavement width to 5.5 meter or less. Since construction, the road has been resealed and some sections have been strengthened with 50 mm asphalt overlays. Approximately 30 km of the road, between the Machakos turn-off and Ulu (Km 27 - 46), were reconstructed under the Second Highway Sector Project and opened in 1992/93. A status summary of the Nairobi-Mombasa road is provided in Table III.1.

Table III.1: Nairobi-Mombasa Road

Road Section (km)	*Year Opened*	*Pavement Width*	*Past Intervention*	*Roughness mm/km*	*Road Condition/ Proposed Intervention*
Nairobi O - 12	1978	Dual	Overlay 1993	2251	Maintenance
12 - 27	1975	7.0m	Overlay 1993	2284	Maintenance Future dual carriage way
27 - 46	1956	7.0m	Overlay ongoing	2284/4552[1]	Maintenance Possible future dual carriage way
46 - 77	1993	7.0m	Reconstructed	2233	Some rutting, shoulder cracking Maintenance
77 - 103	1977	7.0m	Resealed	3240	**Climbing lanes badly rutted** **Reconstruct climbing lanes**
103 - 238	1967	5.5 - 6.0m	Major patching	3970	**Major pavement failures** **Reconstruct and widen to 7m**
238 - 367	1967	5.0 - 6.0m	Reseal some overlay	3109	**Major edge failures** **Strengthen and widen to 7m**
367 - 393	1964	5.0 - 6.0m	Reseal	3520	**Major edge failures** **Strengthen and widen to 7m**
393 - 462	1970	7.0m	Reseal	3269	Maintenance
462 - 484	1954	7.0m	Overlay	N.A	Maintenance
484 - 492 Mombasa	1953	7.0m	Overlay	N.A	Condition deteriorating Possible future dual carriage way

Source: MOPWH

3.7 At the present time, the most badly deteriorated section of the road is the 135 km between Sultan Hamud and Mtito Andei (Km 103 - 238) which has failed badly along much of its length. The deterioration of the section became most obvious following the heavy rains and closure of the rail link to Mombasa in early 1993, when much of the road surface broke up. A major maintenance effort has patched and resealed the failed sections but this work, while improving operating conditions, only provided a very temporary solution and the road failed again during December, 1994. In general, pavement conditions on the Nairobi-bound lane are significantly poorer than on the Mombasa-bound lane, reflecting the impact of heavily loaded freight vehicles moving inland from the port. Unless the section from Mtito Andei to Bachuma Gate (Km 238 - 393) is strengthened in the near future, it will also fail in a similar fashion.

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[1] 2284 mm/km overlay, 4550 mm/km for road waiting for overlay

3.8 The Nairobi-Mombasa road carries in excess of 1,000 commercial vehicles daily, including about 600 heavy commercial vehicles with three or more axles. The average axle-loads of commercial vehicles, operating along the road have generally increased since the late 1970's, Table III.2.

Table III.2: Average Equivalent Standard Axles per Loaded Vehicle Westbound Vehicles

Period	*Medium Truck 2 axles*	*Heavy Truck 3+ axles*	*Tanker 3+ axles*	*Bus*
1977 - 1980	1.5	9.7	21.4	1.0
1981 - 1984	1.2	10.8	16.0	0.8
1985 - 1988	1.7	11.6	16.0	0.8
1989 - 1991	2.1	13.4	13.9	1.6

Source: Materials Department, MOPWH

3.9 Petroleum tankers are the exception to the general trend but this may be due to the phasing out of old vehicles which, while nominally having tandem rear axles, concentrated the vehicle weight on a single rear axle. The most recent axle-load survey (1994) indicated significantly higher ESA's for 2 axle trucks (3.4 ESA/vehicle) but no significant increases for larger trucks. On the basis of the traffic flows and the most recent estimates of average vehicle loading, the Mombasa - Nairobi lane annually carries well over 1.0 million ESAs. If this level of traffic is maintained, a design life of 15 years would require pavement construction for over 20 million ESAs in a single direction.

Project Components

3.10 **Reconstruction/strengthening of the Nairobi-Mombasa road:** The Nairobi-Mombasa road can be split into six separate sections, each requiring a different level of intervention to safeguard operating conditions:

- Km 0 - 77 (Nairobi - Ulu): the road is in reasonable condition and only requires full routine and periodic maintenance.

- Km 77 - 103 (Ulu - Sultan Hamud): reconstruction of the badly rutted climbing lanes on the westbound lane is required, together with maintenance of the section. The EU is undertaking a study of the causes of the rutting which affects the asphalt concrete wearing course but not the pavement base. The reconstruction of the climbing lanes will be undertaken by MOPWH using either a modified asphalt mix or concrete block paving which has been successfully used on the Mombasa causeway.

- Km 103 - 238 (Sultan Hamud - Mtito Andei): this section will be reconstructed along its existing alignment. In addition to reconstruction, the road will be widened to 7 meters, with 2 meter sealed shoulders. The funding for the improvement of this section is expected to be provided by the EU.

- Km 238 - 393 (Mtito Andei - Bachuma Gate): this section will be widened to 7 meters with 2 meter shoulders, and strengthened for a 15 year design life. It is proposed that IDA would fund the foreign exchange component of the costs for this section of the road.

- Km 393 - 484 (Bachuma Gate - Mazeras): the pavement of this section does not require any immediate strengthening and well executed routine and periodic maintenance should be sufficient for the next five years. It is proposed that, under the Project, the routine maintenance of this section is contracted to the private sector.

- Km 484 - 492 (Mazeras - Mombasa): MOWPH is considering improvement options for this section, including the construction of a dual carriageway.

3.11 **Pilot Routine Maintenance Contracts:** The use of private contractors for periodic maintenance is well established in Kenya and MOPWH considers that contracting could also play a valuable role in routine maintenance. Before making such a major policy change, however, the MOPWH wants to test the approach to determine its practicality and potential benefits. It is proposed, therefore, that the routine maintenance of three sections of the Northern Corridor road route, including Km 393 - 484 of the Nairobi-Mombasa road, will be contracted out to the private sector as a pilot exercise to demonstrate the benefits of the more extensive use of private maintenance contracting. The maintenance of these sections will be contracted for a total of four years, but through two year contracts in order to allow the contract terms and conditions to be modified on the basis of operational experience. The outline contracts were provided prior to negotiations. The performance of the private sector will be compared to public sector contracts with provincial re-sealing units on a further two sections of the Corridor. The component is more fully outlined in Annex 1. It is proposed that IDA would fund 50 percent of the contracts, broadly equivalent to the foreign exchange costs. Any periodic resealing works required on the sections will be undertaken under normal MOPWH financing and contracting arrangements.

3.12 It is proposed that the pilot maintenance contracts and the force account sections will be monitored by an independent research institution within a 'structured learning' framework. The draft TORs for performance monitoring were agreed during negotiations. The research institution will monitor the maintenance expenditure, the quantity and quality of work undertaken, the modalities of the contracting arrangements and the overall impact of the maintenance regimes on pavement conditions. It is expected that amendments will be made to the contract arrangements during the four year period as a result of the structured learning results.

3.13 **Road Works Inspectorate:** The monitoring and control of road maintenance is weak. The problems are particularly acute for roads outside the main paved network and the Minor Roads Program; the funds are provided by the center but work is planned and executed at the District level. The Districts are supposed to report maintenance activities to the Roads Department in Nairobi, but it is clear that reporting is inadequate. The problems of ensuring adequate control and cost-effective maintenance will become more acute with the increase in the level of funding. It is clear to MOPWH that this weakness must be remedied if maintenance funding is to be further increased. The project will thus assist to establish a Road Works Inspectorate within the Roads Department. The Inspectorate will be located within the Design Branch and will thus be independent of both the paved and unpaved maintenance branches. The Inspectorate will have full access to information in Nairobi and the districts and its reports will be submitted to the Permanent Secretary with copies to the Chief Engineer (Roads) and the officers involved with the works inspected. An annual report of the Inspectorate's activities will be prepared. A fuller outline of the proposed Inspectorate is provided in Annex 2.

3.14 **Institutional Support:** MOPWH is embarking on new activities with the introduction of routine maintenance contracts for paved roads and the establishment of the Road Works Inspectorate to undertake technical performance reviews. Support for these activities will be provided through a twinning arrangement with an external road agency. Possible twinning partners have been identified and the initial twinning phase will funded through the PPF. The twinning arrangement will combine technical advice and training within Kenya for both supervision of maintenance contracts and the establishment of the Road Works Inspectorate, with training in the twinning agency.

3.15 In addition to the twinning arrangement, institutional support is proposed to strengthen the basic tools used within the Roads Department for maintenance and investment planning. IDA assistance will thus be provided to produce an updated and rationalized inventory and condition survey of the classified road network. Consultants will be commissioned to assist MOPWH to determine the type and detail of road inventory and condition data required for each category of classified road, and the system needed for the collection and periodic updating of the data. The system will emphasize the Ministry's priorities, sustainability by restricting regular data collection to the minimum, and the involvement of the provincial/district engineers whose support is essential. It is expected that the new inventory for the paved road network will form the basis for introducing a pavement management system in the future. IDA would also assist with the production of updated maps of the classified road network. It is also proposed that limited technical assistance would be provided to rationalize the maintenance planning systems, including HMMS, which are presently used, taking into account the adoption of the Roads 2000 strategy for unpaved roads. It will also provide technical assistance for the preparation of future projects.

D. COST ESTIMATES

3.16 The total Project Cost, including physical and price contingencies, but net of taxes and duties, is estimated at US$122.0 million with a foreign exchange component of US$96.5 million as shown in Table III.3.

Table III.3: Project Cost Estimates
(US$ million)

Component Description	*Local*	*Foreign*	*Total*	*% Foreign*	*% Total Base Cost*
A. Reconstruction/strengthening of Nairobi-Mombasa Road					
Civil Works:					
Km 103 - 238	9.2	36.7	45.9	80	46
Km 238 - 393	8.2	32.9	41.1	80	41
Supervision:					
Km 103 - 238	0.3	1.7	2.0	85	2
Km 238 - 393	0.4	2.2	2.6	85	3
Sub-Total Nairobi-Mombasa Road	**18.1**	**73.5**	**91.6**	**80**	**91**
B. Road Maintenance Strengthening					
Pilot Maintenance Contracts	2.5	2.6	5.1	50	5
Structured Learning	0.1	0.3	0.4	85	*
Sub-Total Maintenance Strengthening	**2.6**	**2.9**	**5.5**	**53**	**5**
C. Institutional Support					
Road Inspectorate	0.0	0.1	0.1	100	*
Other Institutional Support	0.2	3.0	3.2	93	3
Sub-Total Institutional Support	**0.2**	**3.1**	**3.3**	**93**	**3**
BASE COST	**20.9**	**79.5**	**100.4**	**79**	**100**
Physical Contingencies	2.0	7.2	9.2	78	9
Price Contingencies	2.6	9.8	12.4	79	12
PROJECT COST (net of taxes and duties)	**25.5**	**96.5**	**122.0**	**79**	**122**

Note: Taxes and duties are estimated at US$ 10.2 million

The estimates are based on the unit-prices of successful MOWPH tenders awarded for major roadworks in 1993, updated to present price levels. Price contingencies have been calculated on an average annual international inflation rate of 2.6 percent. This inflation rate has been used for both foreign and domestic costs as it has been assumed that any differences between domestic and international price inflation will be offset by equivalent adjustments in Kenya's foreign exchange rate. Physical contingencies of 10 percent have been added to the base cost of civil works and other physical inputs. Price and physical contingencies total US$21.6 million, 18 percent of the total project cost.

E. FINANCING

3.17 IDA's contribution will be US$50.0 million, or 41 percent of the total project cost net of taxes. The European Community has expressed interest in financing the civil works on the section Km 103 - 238, the cost of which has been preliminarily estimated at the equivalent of US$58.8 million, 48 percent of the total project cost. The Government of Kenya will finance the remaining costs, the equivalent of US$13.2 million or 11 percent of the total cost. The details of the financing plan are shown in Table III.4.

Table III.4: Financing Plan (US$ million)

Project Component	*IDA*	*Other*	*GOK*	*Total*	*% IDA*
A. Reconstruction/strengthening Nairobi-Mombasa Road	42.8	58.8	10.0	111.6	38
B. Road Maintenance Strengthening	3.5	0.0	3.2	6.7	54
C. Institutional Support	3.7	0.0	0.0	3.7	100
Total Project	**50.0**	**58.8**	**13.2**[2]	**122.0**	**41**

F. ENVIRONMENTAL IMPACT

3.18 The project is expected to have a largely neutral impact on the environment. The IDA component will rehabilitate/strengthen an existing paved road along its existing alignment. There will be no re-alignment although, along two short sections totaling about 3.5 km, the road will be raised by 0.5 - 1.0 meter. The project passes between or alongside National Parks and particular attention has been given to eliminate or minimize adverse effects during construction. A full environmental mitigation plan for the civil works has been developed by the MOPWH in collaboration with the Kenya Wildlife Service which is responsible for the National Parks. The principal environmental impacts and the mitigation proposed are outlined below:

Environmental Impacts During Construction

- temporary deviations on unpaved roads will be necessary, creating dust and reducing vehicle speeds: *the contract documents will limit the length of detours in operation at any one time and require that the deviations are watered.*

- Construction materials will be quarried and transported to the construction sites: *the contract documents will specify that the quarries shall be backfilled, as far as possible, to their original state after gravel extraction to prevent environmental degradation and the congregation of wild animals searching for water. Haulage routes within the National Parks will be minimized and routes will be watered if necessary.*

- *No blasting shall be carried out within or near the National Parks*

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[2] GOK will also provide US$10.2 million in duties and taxes, the GOK component only refers to the IDA project

- Drainage improvements will increase water flow from drainage structures. *Soil erosion will be avoided by putting in place proper erosion control especially at steep gradients. Particular attention will be given to the impact of changed drainage patterns on the railway track which is generally downstream of the road.*

- *No labor camps, asphalt plants or machinery units will be located within the park region. Spillages of oil, fuel and other materials will be avoided/removed. The contract documents will specify the clean up of camps, plant sites etc.*

- *The Ministry, contractor and supervising consultants will liaise with the Kenya Wildlife Service at all times when working within the National Parks.*

Environmental Impacts Following Construction

- Road safety will be improved by the road widening and provision of wider shoulders, bus bays and lorry stops.

- Reduced generation of dust, from vehicles passing over failed sections or using the unpaved shoulders.

4. PROJECT IMPLEMENTATION

A. INSTITUTIONAL RESPONSIBILITIES

4.1 The Ministry of Public Works and Housing will be responsible for executing the project. MOPWH has been receiving Bank assistance for many years and is fully conversant with Bank procedures. Each of the project components will be implemented by a separate branch of the Roads Department under the overall control and supervision of the Chief Engineer (Roads).

4.2 **Reconstruction/widening**: Major construction/rehabilitation contracts are the responsibility of the Construction Branch. The civil works will be implemented by large contractors who will have been pre-qualified as having the capacity to undertake major works. Consultants will be used to supervise the donor funded reconstruction and strengthening works. MOPWH gives very high priority to the safeguarding of the Nairobi-Mombasa Road and the works are expected to be completed within a five year period. The time schedule for implementation of the project is based on civil works commencing in the first quarter of FY97. The time schedule is considered realistic as the draft pre-qualification and tender documents were provided at negotiations and will be issued following Board approval.

4.3 **Road Maintenance Strengthening**: The Paved Roads Branch of the Roads Department will implement this component of the project. Assistance to the Branch will be provided by both the twinning agency and the research institute undertaking the structured learning assignment. The first round of two year maintenance contracts are expected to be awarded during the third quarter of FY96. It is expected that detailed modifications may be made to the terms and conditions of maintenance contracts during the second year, on the basis of the results of the structured learning component. These modified contracts will then form the basis for the award of a second round of contracts in FY98.

4.4 **Road Works Inspectorate**: The Inspectorate will be created within the Design and Inspection Branch of the Roads Department. The Inspectorate will led by a Senior Superintending Engineer (SSE) under the Chief Superintending Engineer (Design and Inspectorate). The Inspectorate will be assisted in its establishment by the twinning partner. The creation of the Inspectorate is being assisted through Project Preparation Funds.

4.5 **Institutional Support**: Direct responsibility for the implementation of the institutional support to the Roads Department will be taken by the RMI Coordinator who is currently the Chief Superintending Engineer (Construction). The Chief Engineer (Roads) is expected to play a leading role in liaison with the twinning road agency and in determining its program of activities and support.

B. PROCUREMENT

4.6 Procurement arrangements for the project are detailed in Table IV.1.

Table IV.1: Procurement (US$ million)

Project Element *Total Cost**	*Procurement Method*				
	ICB	*LCB*	*Other*	*NBF*	*Total Cost*
A. Civil Works					
Nairobi-Mombasa Road	50.0 (39.5)			56.5	106.5 (39.5)
Routine Maintenance		6.2 (3.5)			6.2 (3.5)
B. Goods			0.4 (0.4)		0.4 (0.4)
C. T.A. & Consultants Services					
Consulting Services			5.3 (5.3)	2.3	7.6 (5.3)
Training			0.3 (0.3)		0.3 (0.3)
Studies			0.4 (0.4)		0.4 (0.4)
D. Repayment of PPF			0.6 (0.6)		0.6 (0.6)
TOTAL	**50.0 (39.5)**	**6.2 (3.5)**	**7.0 (7.0)**	**58.8**	**122.0 (50.0)**

Note: Figures in parenthesis are the respective amounts financed by IDA

* Including contingencies

4.7 Procurement under the credit would cover the cost of civil works, goods and consultants' services for technical assistance, studies and training (net of taxes).

Civil Works: The contract for strengthening and widening Km 238 -393 of the Nairobi-Mombasa Road will be awarded on the basis of International Competitive Bidding (ICB) with prequalification using IDA Guidelines and Bank Standard Bidding Documents for large works, modified to meet project needs. For Km 103 - 238, procurement will follow the funding agency's rules.

Individual road maintenance contracts may not be of interest to international bidders because (i) their value will be small; (ii) works are scattered geographically and over time; (iii) the works are labor intensive; and, (iv) local availability of small contractors ensures adequacy of competition. In view of these factors, procurement for the pilot maintenance contracts will follow Local Competitive Bidding (LCB) procedures, acceptable to IDA. This would include advertising the works, public opening of bids, clearly stated evaluation criteria and award to the lowest evaluated bidders. Foreign bidders, if interested, would not be precluded from participation. Assurances to this effect have been obtained and all LCB documents would be subject to prior review by IDA.

Goods: The small packages of vehicles, goods and equipment will be procured under international shopping.

Consultancy Services: IDA financed consultancy services will be hired in accordance with IDA Guidelines for the Selection of Consultants. Consultants, for the supervision of the reconstruction of the Sultan Hamud - Mtito Andei section of the Nairobi-Mombasa Road (Km 103 - 238), will be appointed by the co-financing agency. Draft TOR for all major consultant contracts to be financed by the Credit were discussed and agreed at appraisal. Training programs will be based on clearly stated TOR and selection criteria.

4.8 All IDA financed contracts above US$100,000 would be subject to prior review, as would all consultancy contracts, with individuals, above US$50,000. More than 85 percent of the credit will be subject to prior review.

C. DISBURSEMENT

4.9 Overall, 41 percent of the total project cost will be covered by the proposed Credit. For individual project components, assisted by the IDA, the Credit will be disbursed as in Table IV.2.

Table IV.2: IDA Disbursement Categories

Disbursement Category	*IDA Amount (US$ million)*	*% of Expenditure to be financed*
Civil Works:		
Widening/strengthening Km 238 -393	33.46	100% Foreign expenditures
Pilot Maintenance Contracts	2.66	50%
Consultant Services and Studies	5.42	100%
Goods	0.33	100% of foreign expenditures and 80% of local expenditures
Training	0.05	100%
PPF Advance	0.60	Amount due
Unallocated	7.48	
Total IDA	**50.00**	

4.10 The project is expected to be completed by September 30, 2001, and the Credit Closing Date will be March 31, 2002. An estimated schedule of disbursement of the proceeds from the Credit is set out in Table IV.3. All disbursements will be fully documented to the satisfaction of the Association. Payments against contracts for goods and civil works for amounts less than US$100,000, and for all training, will be disbursed under Statements of Expenditure (SOE). Documents verifying expenditures under the SOE procedures will retained for review by IDA supervision missions. To facilitate the availability of funds for the Project, a Special Account would be established and maintained on terms and conditions satisfactory to IDA. An initial deposit of US$1,500,000 will be replenished on the basis of satisfactory documentary evidence, provided to IDA, of eligible payments made from the account for goods and services required for the Project.

Table IV.3: Estimated Schedule of Disbursement (US$ million)

Fiscal Year Ending	*Disbursement (US$ million)*	*Cumulative Disbursement (US$ million)*	*Cumulative Disbursement (%)*
Fiscal Year 96			
June 30, 1996	1.8	1.8	4
Fiscal Year 97			
December 31, 1996	6.1	7.9	16
June 30, 1997	6.1	14.0	28
Fiscal Year 98			
December 31, 1997	5.9	19.9	40
June 30, 1998	5.9	25.8	52
Fiscal Year 99			
December 31, 1998	5.9	31.7	63
June 30, 1999	4.8	36.5	73
Fiscal Year 2000			
December 31, 1999	2.7	39.2	78
June 30, 2000	2.7	41.9	84
Fiscal Year 01			
December 31, 2000	2.7	44.6	89
June 30, 2001	2.7	47.3	95
Fiscal Year 02			
December 31, 2001	2.7	50.0	100

D. Reporting and Auditing

4.11 Project accounts will be maintained by the Ministry of Public Works and Supplies for each component of the project. For the Project the auditor will furnish the Association with certified copies of the Project's financial statement for each year and a report of such scope and in such detail as the Association shall have requested.

4.12 The audit provided by the auditor will make specific reference to the special accounts operation and to expenditures made under the SOE procedures and will express a separate opinion on these matters. The audited project accounts will be sent to the IDA not later than six months after the end of the fiscal year. During negotiations, assurances were given that auditing of the project accounts would be carried out by independent auditors satisfactory to IDA.

4.13 The implementing agency, the Roads Department, MOPWH, will be responsible for overall Project reporting and will provide:

(a) By January 1, of each year the audit report on the Project Accounts, including Special Account and SOEs, for the previous fiscal year;

(b) Quarterly progress reports and completion reports on all Project components;

(c) Quarterly and annual reports of the consultants monitoring the maintenance contracts;

(d) All reports produced by the consultants assisting MOPWH to update the road inventory and HMMS; and

(e) The annual reports of the Road Works Inspectorate and the Road Maintenance Levy Fund.

E. MONITORING AND SUPERVISION

4.14 Regular supervision of the project will be undertaken in accordance with the supervision plan outlined in Annex 3. In the event that the proposed Third Highway Sector Project is approved and implemented, it is expected that the supervision plans will be merged to ensure efficient and cost-effective utilization of IDA resources. Annual meetings will be held with the Government to discuss and agree the consistency of the road sector program with the Strategic Plan for the Sector.

4.15 A comprehensive mid-term review of the proposed Project is crucial in view of the introduction of the routine maintenance contracts and the Road Works Inspectorate. The mid-term review will:

- assess progress on the major construction contracts
- undertake an in-depth review of the technical and financial experience derived from the private sector maintenance contract and agree the modifications to the modalities for the second round of maintenance contracts
- review the progress achieved toward the full funding of road maintenance needs
- review the implementation of the Strategic Plan
- assess the effectiveness of the Road Works Inspectorate and changes in its role/functions that are necessary to achieve its objectives.

4.16 It was agreed that a mid-term review covering the areas in para. 4.15 will be carried out jointly with IDA no later than December 31, 1998. The Government shall prepare an evaluation report and submit it to IDA at least one month before the mid-term review. The Project is expected to be completed by September 30, 2001.

5. ECONOMIC EVALUATION

A. GENERAL

5.1 The strengthening and widening of the Nairobi - Mombasa road will substantially improve road transport operations on the primary transport link between Kenya's main production/consumption areas and the port of Mombasa. The project will provide the quality of road link which is critical if Kenya is to succeed in its policy of economic growth and diversification. Improving the capacity of the parallel rail system is important for low value and bulk freight but rehabilitation and strengthening of the road route is essential for the movement of higher value and time-sensitive commodities. Severe road transport operating problems were generated during early 1993 when a significant part of the Sultan Hamud - Mtito Andei section failed. Without the project, much of the rest of the road will inevitably fail in the relatively near future, as the design life of the road has already been exceeded very considerably.

5.2 The Project will also assist in strengthening road maintenance activities in Kenya which is one of the critical elements to developing a sustainable road system. The private sector will be introduced into the routine maintenance of the main paved network and basic maintenance planning information and systems will be updated and upgraded.

B. TRAFFIC FLOWS: NAIROBI-MOMBASA ROAD

5.3 While the Nairobi-Mombasa road may not have the highest traffic flow in Kenya, in terms of total traffic flow, it is certainly the most heavily trafficked road. The available evidence suggests that the average daily flow of heavy commercial vehicles (three or more axles) increased from about 200, in the early 1980's, to around 450 in the mid-1980's and to almost 600 vehicles in the early 1990's. In the Nairobi direction almost 100 percent of the heavy commercial vehicles are loaded (overloaded) and about 50 percent of trucks are loaded in the Mombasa direction. The best estimates of average daily traffic, on the sections outside the immediate urban and peri-urban areas of Nairobi and Mombasa, obtained from the most recent traffic surveys, are summarized in Table V.1.

Table V.1: Nairobi-Mombasa Road
(Average Daily Traffic)

Road Section	*Km*	*Cars*	*Light Goods*	*Medium Goods*	*Heavy Goods*	*Bus*	*Total Traffic*
Athi River - Machakos T.O	27 - 46	790	790	740	610	170	3100
- Hunters Lodge	46 - 159	280	530	210	590	100	1710
- Mtito Andei	159 - 238	270	410	220	590	80	1570
- Voi	238 - 337	250	380	220	590	90	1530
- Mariakani	337 - 462	280	410	270	590	130	1680
- Miritini	462 - 484	330	680	340	590	120	2060

Source: MOPWH and Mission estimates

C. ECONOMIC ANALYSIS

Introduction

5.4 The methodology used by MOPWH to appraise the economic benefits of road projects was not changed from the early 1970's to 1994. The Transport and Road Research Laboratory (TRRL) devised, in the early 1970's, a manual method based on their vehicle operating cost research in Kenya (the basis of their Road Transport Investment Model, RTIM). The inputs for this manual method were periodically updated but there was no attempt to improve the analytical techniques nor to adopt computerized design/evaluation models such as RTIM or the Highway Design Model (HDM). The results of the manual analysis undertaken by MOWPH were often suspect, generating extremely high rates of economic return.

5.5 MOPWH was conscious of the limitations of its planning and evaluation tools and requested IDA, through the PPF for the proposed Third Highway Sector Project, to install HDM-III and provide training in its use. The installation and training is on-going, but progress was rather delayed by the almost total lack of computer literacy among many of MOPWH's engineers and economists. The appraisal of the proposed Nairobi-Mombasa Road Rehabilitation Project was taken as the main case study for the training program. The analysis was subsequently agreed with IDA.

Economic Analysis: Mtito Andei - Bachuma Gate

5.6 In concept, the economic analysis of the proposed project is relatively straightforward; the principal benefits are generated by the change in vehicle operating costs, resulting from the improvement in pavement conditions. Benefits increase over time as the condition of the pavement will deteriorate if the project is not undertaken. There are also likely to be road maintenance cost savings as, without the project, MOPWH would have to undertake frequent and substantial emergency patching and resealing programs, similar to the program of early 1993.

5.7 One of the main objectives of the project is to widen the road to an adequate level for the volume and type of traffic. HDMIII is not, however, well equipped to estimate the economic benefits from the widening of the road from 6 meter (often reduced to less than 5.5 meter) to 7 meter with 2 meter shoulders. It is, however, accepted that the design standards of the road are substandard for the present volume and distribution of traffic and the road is perceived as being highly dangerous, especially at night. The likely benefits from the widening are:

- Reduction in vehicle operating costs as vehicles no longer have to use either the shoulders or the very rough pavement edges when passing or overtaking
- Reduction of pavement deterioration as the flow of heavy vehicles is no longer concentrated in the center and edges of the carriageway.
- Reduction in pavement edge damage, and thus reduced road maintenance costs.

- Improved road safety, especially at night when many of the heaviest vehicles use the road and vehicles are often parked, without lights, on the carriageway because there are no shoulders.

5.8 To provide an indication of the level of likely benefit from the investment in the improvement of the Mtito Andei - Bachuma Gate section, a cost-benefit analysis was undertaken using HDMIII. The analysis concentrated entirely on the effect of the improvement of pavement condition/strength on vehicle operating costs and maintenance costs and made no assessment of ; (i) the specific impact of the pavement widening; (ii) the economic benefits from reduced vehicle accidents; nor (iii) the impact on overall economic development of a major deterioration in Kenya's main link to the sea. The results of the analysis are thus likely to underestimate significantly the overall benefits of the investment.

5.9 The results of the analysis indicates that the proposed investment in the improvement of the Mtito Andei - Bachuma Gate section is well justified and should be implemented as a matter of priority, Table V.2. The full analysis is provided in Annex 6. The proposed improvement was assessed not against the 'do-nothing' scenario of present maintenance levels but against a scenario of full maintenance. This analysis was made as the 'do-nothing' would not keep the road in a operational condition over the life of the proposed investment and is not, therefore, a realistic alternative.

Table V.2: Mtito Andei - Bachuma Gate Improvement: Economic Analysis

Benefits of Proposed Investment

FYRR (%)	*NPV (US$ million)*	*ERR (%)*
20.6	138.2	43.9

The First Year Rate of Return (FYRR) is often used as a guide to the optimum timing of transport projects. A FYRR of 20.6%, well above the assumed opportunity cost of capital (12%), indicates the benefit of early project implementation. The very high rate of economic return is generated by the inadequacy of the existing pavement strength in relation to traffic loading. The project was also compared with a minimum investment scenario of an immediate overlay, costing K Sh 530 million (US$11.3 million). The incremental analysis indicated an ERR of 23.4% for the additional project investment, without including the significant maintenance, operating and safety benefits of the wider pavement and shoulders. Sensitivity analysis was undertaken to assess the possible impact of changes in construction costs, a substantial improvement in Kenya Railways freight capacity, and very slow economic growth. The results of this analysis, reported in Annex 6, demonstrate that the economic viability of project is not affected by plausible changes to the underlying parameters and assumptions.

Accident Analysis: Mtito Andei - Bachuma Gate

5.10 Road safety is a major problem in Kenya, accounting for an average of 2,000 deaths a year. Police accident records for this section of road indicate that fatalities doubled in the period 1989 - 1993. In 1993, 48 people were killed, 108 seriously injured and 200 slightly

injured. The accident records indicate that about 63 percent of the accidents were due to mechanical failure (tires or wheels), driver error, loss of control or bad road surface conditions (potholes, edge failure etc.). Excess speed and loss of control, due to road conditions, were found to be primary accident factors although, along one stretch, collision with wild animals was reported.

5.11 A detailed analysis of the location of accidents was undertaken and a number of specific blackspots were identified for particular remedial action, especially the provision of more road signs indicating bridges, hazard signs, and speed limits. At several of these blackspots the pavement has been eroded to 5.5 meter and the road shoulders are damaged. In these locations, vehicles brushing against each other, while passing, is a significant cause of accidents (approximately 20 percent). The pavement widening and improved surface condition should eliminate significant causes of accidents but, in view of driving standards and a possible increase in vehicle speed, it would be unwise to quantify the overall value of accident cost savings.

Economic Analysis: Sultan Hamud - Mtito Andei

5.12 The EU is financing a full feasibility of the section, along with the detailed engineering design. In view of the total failure of the road along certain parts of this section during the rainy seasons of recent years, a very high economic rate of return is expected. A preliminary analysis suggests that the economic benefits of reconstructing this section will be as least as high as those for the Mtito Andei - Bachuma Gate section, with a FYRR of over 20%, and probably much higher.

Economic Analysis of Other Project Components

5.13 The other components of the project are extremely important for the development of adequate and sustainable road maintenance in Kenya and, though the benefits are difficult to quantify, there is very little doubt that the assistance is justified. Experience elsewhere, has suggested that the introduction of routine maintenance under contract can reduce costs by 20 percent or more. Experience also suggests that, when both contract and force account maintenance is used, the productivity of force account maintenance increases substantially. Such experience is not universal, however, and the likely cost savings in the Kenyan environment will not be known until the completion of the pilot project.

Poverty Impact

5.14 The project will have only a marginal direct impact on poverty although some unskilled employment will be created during the construction period. The project will, however, have a very substantial and pervasive indirect impact on poverty through its facilitation of faster economic growth and export diversification by safeguarding the quality of Kenya's primary access route to the sea.

D. PROJECT RISKS AND SUSTAINABILITY

5.15 Previous Bank assisted projects in the Kenya road sector have generally achieved their physical objectives and there is little doubt that the proposed project will result in a major improvement to operating conditions on the Nairobi-Mombasa road. The main problem with previous investments has been that either the improvements have not been sustained and the benefits have been progressively reduced by subsequent inadequate road maintenance, or that inadequate maintenance has resulted in effective disinvestment elsewhere in the network. There is, at the present time, increasing recognition of the critical need for road maintenance, reflected in the introduction of the Road Maintenance Levy Fund, but it is possible that this priority may change, Government will find other funding needs and road maintenance will again receive inadequate funding. This would be unlikely to affect the Nairobi-Mombasa Road as badly as other roads, as MOPWH has generally concentrated its available maintenance resources on the core paved network (as shown by the previous use of its toll funds). The overall effect would be, however, a further decline in the general condition of the classified network.

5.16 This project must be viewed within the context of the Strategic Plan for the Sector and the proposed Third Highway Sector Project. Progressively increasing funding for road maintenance has been agreed with Government as part of preparation for this project and is detailed in its Letter of Sector Policy, Annex 8. Further support to the sector, through the proposed the Highway Sector Project, will be linked to the achievement of these agreed funding levels and Government's demonstrated commitment to the Strategy. There is general agreement among other major donors to support the road sector, through the Strategy, and to link their support to increased road maintenance as dissatisfaction with under-funding of road maintenance is widespread. There is now increased cooperation among donors with a donor coordinator, funded by the EU, which offers very positive encouragement for this approach.

5.17 The undertaking of technical performance reviews by the Road Works Inspectorate is a new concept for MOPWH and its success cannot be guaranteed. The maintenance audit, both financial and technical, associated with the Minor Roads Program has, however, been successful and has been extended to all districts associated with MRP irrespective of whether supported by donor or GOK funding. While there can be no guarantee that the Inspectorate will succeed, increased awareness of the need to ensure the cost effective use of maintenance funding, by both GOK and donors, will provide an important constituency of support. The Twinning arrangement will assist in the initial establishment of the Inspectorate and the periodic visits of the Twinning partner will help to ensure quality control, identify the effectiveness of the unit and pinpoint any changes required. The role and effectiveness of the Inspectorate will be a key item at the Mid-Term Review and it is almost inevitable that it will feature as a major item at the annual Road Donors meeting held with MOPWH.

6. AGREEMENTS REACHED

A. AGREEMENTS REACHED DURING NEGOTIATIONS

6.1 At negotiations, agreement was reached on:

(a) The carrying out of a mid-term review of the project by December 31, 1998 (para. 4.16).

(b) Submission of annual reports on the Road Maintenance Levy Fund and the Road Works Inspectorate (paras. 2.25, 3.13 and 4.13(e)).

(c) Establishment of a Special Account (para. 4.10).

(d) Tender documents, including suitable environment protection measures, for the strengthening/widening works (para. 4.2).

(e) Contents of the Letter of Sector Policy (para. 1.34).

(f) Annual discussion and agreement on consistency of the road program with the Strategic Plan (para. 4.14).

(g) The Borrower to have the Project Accounts, including Special Account and SOEs, audited by independent auditors satisfactory to IDA and the reports sent to IDA within six months of the end of the fiscal year (paras. 4.11 and 4.12).

B. CONDITIONS OF EFFECTIVENESS

6.2 The following actions will be required for project effectiveness:

(a) Establishment of the Road Works Inspectorate, including appointment of the SSE and at least 2 SEs in a manner acceptable to IDA (para. 2.25).

(b) Approval by the Borrower of the Strategic Plan for the Roads Sector (para. 1.34).

C. RECOMMENDATION

6.3 Based on the above assurances and agreements, the Project is suitable for a Credit to the Republic of Kenya of SDR 34.0 million (US$50.0 million equivalent) on standard IDA terms with forty years maturity, including ten years of grace.

ROUTINE MAINTENANCE CONTRACTS

COMPONENT DESCRIPTION

Contract Sections and Costs

1. The use of private contractors to undertake the routine maintenance of paved roads in Kenya has not been previously attempted, although private contractors have been used extensively to undertake periodic maintenance. The Ministry of Public Works and Housing believes that the approach could assist to provide the level and quality of road maintenance required, but wishes to have the benefits of the approach demonstrated and to determine the optimal terms and conditions for such contracts prior to a major shift from force account to contract maintenance. In common with road agencies in many other countries, MOPWH believes that a role may still exist for force account maintenance units, if such units are provided with the resources and incentives required for high productivity, especially for rapid response to emergency situations.

2. To test the contract approach and its benefits vis-à-vis force account maintenance a pilot contract maintenance component has been proposed for inclusion in the Nairobi-Mombasa Road Rehabilitation Project. Five road sections have been identified on the Northern Corridor route to be included in the pilot project. These sections cover a fairly broad spectrum of paved roads in Kenya, although all are in relatively good condition and will not require periodic maintenance or rehabilitation within the proposed contract period. All the sections are located along the Northern Corridor and thus traffic flows, especially of heavy trucks, are high. It is proposed that routine maintenance on three of the sections will be contracted out to the private sector while maintenance on the other two sections will be undertaken by force account, utilizing the Provincial resealing units. The details of the sections are summarized below:

Road Section	*Road No.*	*Km*	*Road Width (meter)*	*Maintenance Proposed*
Malaba - Turbo	A104	94	7	Force account
Turbo - Timboroa	A104	94	7	Contract
Longonot T.O. - Westlands	A104	56	7 + Dual	Contract
Westlands - Machakos T.O.	A104/A109	50	7 + Dual	Force account
Bachuma Gate - Mazeras	A109	80	7	Contract

While all the sections are in reasonably good condition it is expected that maintenance demand will vary from section to section, especially for such important activities as pothole repair and shoulder maintenance.

3. It is proposed that this pilot maintenance project will be undertaken over a four year period. The initial contracts will only have a two year duration, however, as it is expected that modifications in the contracts may be necessary to take into account the lessons gained from the first contracts. The base maintenance costs (before price and physical contingencies) for each of the sections are summarized below:

Road Maintenance Costs
(K Sh million)

Road Section	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Total*
Malaba - Turbo	12.9	8.6	9.5	10.3	41.3
Turbo - Timboroa	18.4	12.3	12.3	13.5	56.5
Longonot T.O. - Westlands	15.2	10.2	11.2	12.3	48.9
Westlands - Machakos T.O.	7.8	5.2	6.2	6.8	26.0
Bachuma Gate - Mazeras	23.5	15.7	15.7	17.3	72.2

The higher maintenance costs in the first year of the contracts reflects the costs of remedying previous neglect of routine maintenance, particularly on the road shoulders.

Contract Terms

4. Routine maintenance contracting, except for the simple lengthman system, has not been undertaken in Kenya and thus no standard contract documents are available. MOPWH currently uses FIDIC IV but the contracts will be based on the Bank's standard bidding documents for smaller works, modified to meet the requirements of routine maintenance. A short Technical Assistance assignment is being provided through the PPF to assist MOPWH draw up detailed tender documents for each of the sections.

5. The tender documents will contain an estimated Bill of Quantities which will be the basis of tender evaluation. Payments for some of the items will be based on the maintenance of certain features (e.g. vegetation control, culvert cleaning etc.) over a specified period of time, while for other activities, such as pothole patching, payment will be based on the quantity of actual work performed.

Contract Supervision

6. The contracts will be supervised by the Provincial Engineers (Paved Roads) supported by the technical advisers of the Twinning road agency. The Provincial Engineers will be responsible for detailing the work required during each period and for certifying that the work is satisfactorily carried out.

Contract Monitoring

7. If MOPWH is to obtain maximum benefit from this pilot project, it is essential that the contracts are closely monitored in a manner by which the greatest learning can be obtained and applied as the basis for future MOPWH policy. The monitoring should be undertaken by an institution which is independent of the implementation and supervision of the actual contracts. It is, therefore, proposed to select an independent research institution to carry out the monitoring over the four year period of the pilot project. The research institution will be expected to undertake the following activities:

- Review the private sector and equivalent force account contracts and assess the scope of works for adequacy and comprehensiveness;
- Review and compare the quantity and quality of the work output
- Review and compare the funding and disbursements procedures
- Review and compare the supervision and procedures for issuing work instructions
- Review and compare the resources and technologies employed to execute the maintenance works
- Analyze the costs (labor, equipment, materials and overheads) of the two delivery systems
- Identify factors (contractual, financial, managerial and supervisory) affecting delivery of both systems and recommend remedies to identified problems, including modifications to contracts terms and conditions.

8. The monitoring assignment will consist of an initial baseline survey of the condition of the road sections and establishment of the relevant mechanisms to determine the full costs of the force account operations, especially a realistic overhead element. Following the initial survey the assignment would be limited to periodic monitoring of conditions, inspection of works in progress, compilation of relevant data, preparation of reports and discussions with MOPWH. In view of the nature of the assignment, it is expected that the research institution would, if not Kenyan, liaise with a local institution to collect much of the field data. Quarterly and annual reports would be produced by the monitoring team and would form the basis for subsequent modifications to the pilot, particularly when the second round of contracts are awarded for Years 3 and 4.

ROAD WORKS INSPECTORATE

COMPONENT DESCRIPTION

Objectives

1. The Roads Department has recognized the need to establish an inspectorate within the Ministry to inspect road works during both construction and maintenance to ensure efficiency, cost effectiveness and accountability in all aspects of the Road Department's activities. The Inspectorate will be empowered to review road activities at all levels of the Ministry's organization: Headquarters, Provincial and District Level.

Duties

2. The duties of the Inspectorate will include, but are not limited to the following:

- Examine and report on procurement practices, employed within the Ministry of Works and Housing to award road construction, rehabilitation and maintenance contracts;
- Undertake technical audits on selected road work activities, both force account and contract, to determine the quality and cost-effectiveness of the work, adherence to specifications and work/design plans, the administrative procedures employed, and the quality of supervision;
- Examine and report on the adherence by Provincial and District Roads organizations to agreed work programs and the quality of work implementation;
- Identify impediments to productivity and advise on actions required to improve the efficiency and cost-effectiveness of road works undertaken in Kenya and their management; and
- Prepare an annual report on the Inspectorate's activities on the above.

Powers of the Inspectorate

3. In the exercise of its duties the Inspectorate shall, in liaison with the Chief Engineer (Roads), have free access, upon request, to the following:

- Any Ministry of Public Works and Housing office or works site;
- Any relevant open, confidential or secret information held in the Ministry's Headquarters, Provincial or District offices, including reviews of contracts and procurement;

- Test results and, if necessary, testing facilities and equipment through the Material Department of the Ministry.

Organization and Staffing

4. The Inspectorate will be located within the Roads Department. The Inspectorate will be functionally headed by the Chief Superintending Engineer (Design and Inspectorate) and will thus be independent of the Paved Roads, Unpaved Roads and Construction Branches or any other Branch of the Roads Department which are actively involved in the implementation or supervision of road works, either construction or maintenance.

5. For the purposes of its day-to-day activities the Inspectorate will be headed by a senior Superintending Engineer, SSE (RWI). Under the SSE (RWI) there will be, at least, two experienced Superintending Engineers (SE) and relevant support staff.

Reporting

6. All reports of the Inspectorate will be made to the Permanent Secretary, Ministry of Public Works and Housing with copies to the Chief Engineer (Roads) and the officers responsible for the works or activity inspected.

External Training and Support

7. It is recognized that the effective implementation of the Inspectorate will not be without difficulties as it could be interpreted, by those affected, as an internal policing function. Training of the inspectors will thus be necessary in an environment in which performance auditing has become an accepted part of the road agency function. The training and support necessary for the establishment of the Inspectorate could thus not be efficiently met by conventional consultants. A twinning arrangement is, therefore, proposed with a foreign road agency which already operates within a performance auditing environment. The twinning partner would train the Inspectorate engineers within its own organization and provide short-term technical experts to assist in the initial establishment of the Inspectorate. The twinning partner would then make periodic follow-up visits to monitor the work of the Inspectorate, assess the quality of the work, and work with the Inspectorate to overcome any problems encountered.

SUPERVISION STRATEGY AND STAFF INPUT

BORROWERS CONTRIBUTION TO SUPERVISION

1. The Borrower's supervision activities would be carried out by the Ministry of Public Works and Housing. The supervisory functions would involve the following:

(a) Submission to IDA of quarterly progress reports on all Project components;

(b) Submission to IDA of all consultants' reports produced in connection with Project activities;

(c) The audits of project accounts, the Special Account and Statement of Expenditures will be sent to IDA within six months of the close of each fiscal year;

(d) By June 30, 1998, MOPWH will provide to IDA, for its approval, a plan for carrying out a Mid-Term Review by December 31, 1998 in consultation with IDA. Thereafter, Government will promptly take all actions recommended as a result of the review that are required to achieve project objectives; and

(e) MOPWH will be responsible for coordinating arrangements for Bank supervision missions and for providing information required by missions.

Bank Supervision

2. In addition to the regular supervision missions to be carried out by IDA, in accordance with the schedule set out below, IDA staff would spend time at Headquarters dealing with correspondence, reviewing and approving procurement documents, disbursement requests, quarterly reports and audited accounts. The amount of time required for supervision of the project in Washington is estimated to be as follows:

Project Year 1	3 staffweeks
Year 2	6 staffweeks
Year 3	4 staffweeks
Year 4	3 staffweeks
Year 5	3 staffweeks
Year 6	3 staffweeks

Five staffweeks will be also required for the mid-term review with an additional five staffweeks involved in the final supervision and preparation of the Implementation Completion Report.

SUPERVISION MISSION PLAN

Fiscal Year	*Approximate Date*	*Activity*	*Expected Skills*	*Staff Input (weeks)*
FY 1995/96	April 1996	Launch Mission	Road Engineer Maintenance Specialist Procurement Specialist	7.0
FY 1996/97*	October 1996	Supervision Mission	Road Engineer Maintenance Specialist	6.0
	March 1997	Supervision Mission	Road Engineer	2.0
FY 1997/98*	October 1997	Supervision Mission	Road Engineer	2.0
	May 1998	Supervision Mission	Road Engineer Maintenance Specialist	4.0
FY 1998/99*	December 1998	Mid-Term Review	Road Engineer Maintenance Specialist Transport Economist	7.0
	June 1999	Supervision Mission	Road Engineer	2.0
FY 1999/00*	December 2000	Supervision Mission	Road Engineer Maintenance Specialist	4.0
	June 2000	Supervision Mission	Road Engineer	2.0
FY 2000/01*	December 2000	Supervision Mission	Road Engineer	2.0
FY 2001/02*	July 2001	Preparation Mission for ICR	Road Engineer Economist	6.0

* Missions will be combined with proposed Third Highway Sector Project

ANNEX 4

SUMMARY OF MONITORING INDICATORS FOR THE PROJECT

Major Activities	Expected Impact	Indicator of Achievement of Project Objectives	Timing Target
Widening/Strengthening of Mtito Andei-Bachuma Gate Nairobi-Mombasa Road	Substantial improvement in road conditions: Reduced vehicle operating costs Improved road safety	Tender evaluation Tender award Completion of construction	July 1996 Sep 1996 Dec 1999
Road Maintenance Strengthening	Improved delivery of routine road maintenance Increased participation of private sector	Baseline monitoring Award first-round contracts Revised contract conditions Award second-round contracts: increased no. of bids MOPWH adoption of contract maintenance strategy	Apr 1996 July 1996 Jan 1998 July 1998 Dec 1998
Road Works Inspectorate	Cost-effective road maintenance Cost and performance accountability	Establishment of Inspectorate First Annual Report Reduction in unit maintenance costs/improved quality	Apr 1996 Oct 1997 End 1998
Other Institutional Support	Improved maintenance and investment planning within MOPWH	Completion of road inventory Introduction of revised maintenance planning and budget allocation system	Dec 1997 Jan 1998

PREVIOUS WORLD BANK ASSISTANCE TO THE ROAD SECTOR

Loan Year	*Credit No.*	*Amount (US$ million)*	*Project Components*	*Date Completed*
1960	Ln. 256-KE	5.6	Feeder Roads (910km)	1964
1965	Cr. 70-KE	4.5	Trunk Roads (315km)	1969
1965	Cr. 77-KE	3.0	Tea Roads (1,400km)	1970
1967	Cr. 104-KE	5.3	Sugar Roads (820 km)	1971
1968	Cr. 120-KE	10.7	Trunk Roads (460km)	1972
1969	Ln. 639-KE	23.5	Trunk Roads (172km) Feeder Roads (810km) Settlement Roads (650km)	1975
1970	Cr. 224-KE	12.6	Highway Maintenance Project	1979
1972	Cr. 276-KE	22.0	Trunk Roads (71km) Feeder Roads (1153km) Settlement Roads (429km)	1979
1973	Ln. 932-KE	29.0	Dual carriageway (12km) Feeder Roads (603km)	1981
1976	Ln. 1305-KE Cr. 651-KE	8.0	Rural Access Road Program	1985
1979	Ln. 1684-KE	90.0	First Highway Sector Project	1987
1984	Ln. 2409-KE SF-017-KE	90.0*	Second Highway Sector Project	1993

* Restructured in 1987 to US$ 45 million

ECONOMIC EVALUATION: MTITO ANDEI - BACHUMA GATE

Economic costs: K Sh million										
Year	*Project Capital Costs*	***Costs without Project***				***Costs with Project***				**NET ECONOMIC BENEFITS**
		Road Maintenance	*Vehicle Operation*	*Journey Time*	*Total*	*Road Maintenance*	*Vehicle Operation*	*Journey Time*	*Total*	
1996	393.0									-393.0
1997	983.0									-983.0
1998	599.0									-599.0
1999		122.0	3001.0	357.0	3480.0	18.0	2625.0	343.0	2986.0	494.0
2000		430.0	3425.0	381.0	4236.0	18.0	2800.0	360.0	3178.0	1058.0
2001		329.0	3789.0	409.0	4527.0	18.0	2988.0	378.0	3384.0	1143.0
2002		321.0	4215.0	442.0	4978.0	18.0	3189.0	398.0	3605.0	1373.0
2003		197.0	4701.0	481.0	5379.0	18.0	3404.0	419.0	3841.0	1538.0
2004		196.0	5266.0	528.0	5990.0	18.0	3634.0	441.0	4093.0	1897.0
2005		248.0	5867.0	578.0	6693.0	18.0	3880.0	463.0	4361.0	2332.0
2006		211.0	6474.0	627.0	7312.0	66.0	4143.0	487.0	4696.0	2616.0
2007		231.0	7074.0	676.0	7981.0	570.0	4412.0	513.0	5495.0	2486.0
2008		244.0	7631.0	719.0	8594.0	18.0	4567.0	538.0	5123.0	3471.0
2009		204.0	8171.0	759.0	9134.0	18.0	4877.0	566.0	5461.0	3673.0
2010		298.0	8716.0	800.0	9814.0	18.0	5208.0	596.0	5822.0	3992.0
2011		190.0	9283.0	842.0	10315.0	18.0	5563.0	627.0	6208.0	4107.0
2012		248.0	9897.0	886.0	11031.0	18.0	5942.0	659.0	6619.0	4412.0
2013		251.0	10544.0	933.0	11728.0	18.0	6349.0	694.0	7061.0	4667.0

	NPV (12%)	IRR (%)	FYRR (%)
K Sh mn	8291	43.9	20.6
US$ mn	138.2		

ANNEX 6
Page 1 of 4

ECONOMIC ANALYSIS

MTITO ANDEI - BACHUMA GATE

Base Case

The base case analysis, shown in Table 1, is based on the assumption of full routine maintenance being undertaken on the existing road, with all potholes and cracking patched. The economic returns from the investment are very high:

Net Present Value (12%): US$138.2 million
Economic Rate of Return: 43.9%

The maintenance undertaken cannot prevent a substantial increase in the roughness of the road and consequently unit vehicle operating costs rise considerably. By the year 2002, or thereabouts, the roughness on the road has increased to such an extent that the pavement can be considered as having failed completely. In view of the fact that the road would not be allowed to fail completely, the analysis is really a question of not whether major intervention is required but when the intervention should take place. The First Year Rate of Return (FYRR) of 20.6% indicates that the proposed intervention should be undertaken as soon as possible.

A more detailed economic analysis indicates that each of the sub-sections of the road are justified for improvement, Table 2.

Table 2: Economic Analysis by Road Section: Base Case

Road Section	*Length (km)*	*ERR (%)*
Mtito Andei - Tsavo	49.8	49.1
Tsavo - Manyani	11.0	35.1
Manyani - Voi	38.3	29.6
Voi - Junction (C105)	4.9	35.0
C105 - Maungu	25.7	45.7
Maungu - Bachuma Gate	25.2	49.2

Minimum Investment

The base case assumes full routine maintenance but no major strengthening of the road. An overlay of the existing road would reduce the rate of road deterioration and could be considered as a substitute for the proposed investment. The overlay would be, however, only a partial substitute as the operating, maintenance and safety benefits of the pavement and shoulder widening would not be obtained. Unfortunately, HDMIII inadequately encompasses the benefits from road widening and thus the analysis relates only to the differential impact of the overlay and the proposed improvement on pavement conditions. The incremental economic

analysis of the project, compared with the overlay scenario, indicates that the additional investment is justified, despite the under-estimation of the benefits, with an ERR of 23.4%.

All sections of the proposed project are justified in the analysis, except the Manyani - Voi section which only generates an ERR of 8.9%. This ERR is, however, considered acceptable in view of the underestimation of the widening benefits. The FYRR of the incremental investment is also low, 5.6%, but again is considered marginally acceptable in view of the underestimation of benefits.

Sensitivity Analysis

(a) **Impact of Changes in Costs and Benefits**: Conventional sensitivity analysis was undertaken on the economic rate of return, on the basis of changes in investment costs and benefits: Table 3.

Table 3: Base Case: ERR Sensitivity Analysis

		Investment Costs		
		No Change	*+ 25%*	*+50%*
Investment Benefits	*No Change*	43.9	38.5	34.6
	- 25%	37.2	32.5	29.1
	- 50%	29.2	25.3	22.3

The investment still generates a satisfactory ERR when investment costs are increased by 50 percent and benefits are reduced by 50 percent. The ERR would be reduced to 12 percent, and the NPV to zero, only if construction costs were to increase by 100 percent, benefits were reduced by 50 percent and the project life reduced to 10 years. This type of sensitivity analysis is, however, mechanistic and does not indicate the impact of potential changes in Kenya's transport and economic system.

(b) **Revival of Kenya Railways Capacity**: If the proposed Railways Restructuring Project is successful, Kenya Railways freight capacity should increase to almost 4 million tonnes. Approximately one million tonnes of freight could be diverted away from the Nairobi-Mombasa road, equivalent to about 100 heavy trucks per day. This diversion would reduce the vehicle operating cost benefits of the proposed road investment in two ways: (i) the total vehicle flow would be reduced; and, (ii) the rate of road deterioration would be slowed and thus the rate of increase in vehicle operating costs would decline.

The effect of a revival in the freight carrying capacity of Kenya Railways is to reduce the ERR for the project to 38.2% and the FYRR to 14.6%. The project should thus still have a very high priority, irrespective of the proposed Kenya Railways Project. In terms of the incremental analysis with the minimum investment, the ERR is reduced to 18.7%, which is still acceptable.

(c) **Slow Economic Growth in Kenya**: The base case scenario is based on an average annual growth in traffic of 6 percent. This rate of growth assumes that economic growth returns to earlier levels and that the growth is export oriented, thus using the Nairobi-Mombasa corridor. Economic growth rates are very difficult to predict and growth has been very low in Kenya over the last few years. It was thus decided to test the sensitivity of the analysis to very low rates of growth in traffic, one percent per annum.

The impact of very slow economic and traffic growth is, not unnaturally, to reduce substantially the economic benefits. The overall economic returns are still high, however, with an ERR of 34.2% and a FYRR of 15.7%. The project does become marginal with respect to the overlay option with an ERR of 10.9%. This ERR is, however, underestimated by the exclusion of the road widening benefits.

(d) **Slow Growth and Revived Kenya Railways**: Under the base case analysis, total traffic on the Mtito Andei - Bachuma Gate section of the Nairobi-Mombasa road is forecast to rise to over 3,900 vehicles per day, by the year 2013. If there were to be very low growth in Kenya and a revival of the freight capacity of Kenya Railways, the combined effect would be a very dramatic fall in the level of future traffic on the road; the flow in 2013 would be only one-third of the base case flow i.e. 1,300 vehicles per day.

Road conditions on the existing road are such, however, that the investment is still justified with an ERR of 29.5% and a FYRR of 12.0% even with one percent annual traffic growth and the diversion of a million tonnes of freight to the railway. In terms of the incremental analysis to the overlay option, however, the project becomes marginal with an ERR of only 7.0%, but this excludes the accident cost and maintenance cost savings which would result from the road widening. The probability of both slow economic growth and a revival of Kenya Railways is, perhaps, remote; if Government adopts the type of policies necessary to promote a revival of the railways, relatively rapid economic growth is also probable.

(e) **Assessment of Project Sensitivity**: In view of the strategic importance of the Nairobi-Mombasa road, its present condition and traffic, and residual structural strength, it is not surprising that the economic analysis generates very high rates of return. The viability of the project is also robust to the range of possible changes in the underlying parameters of the analysis and even in the worst case scenario, acceptable economic results are generated.

MINISTRY OF PUBLIC WORKS AND HOUSING

PROPOSED TWINNING WITH THE DEPARTMENT OF ROADS

TERMS OF REFERENCE

1. Statement of Intent

1.1 The Government of Kenya (GOK) is receiving assistance from the International Development Association (IDA) for development of the road network. The assistance includes components for: (i) developing private sector contracting for the routine maintenance of paved roads; and (ii) establishing and institutionalizing a Road Works Inspectorate within the Department of Roads.

1.2 The introduction of routine maintenance contracting forms part of MOPWH's policy of promoting cost-effective road maintenance and increasing the role of the private sector is in accordance with GOK's liberalization policies. The Inspectorate is required to ensure cost-effective road maintenance as well as transparency and accountability for the use of road maintenance funds, most of which are now derived directly from road-users.

1.3 The Roads Department has had some limited previous experience with a works inspectorate but has had no experience with routine maintenance contracting. The Department of Roads would, therefore, like to enter into an agreement with a highly competent Road Agency whose responsibilities are similar and which already undertakes routine maintenance by contract and has a developed internal inspectorate function.

1.4 A Twinning arrangement between the Department of Roads and the Road Agency is proposed as the best means of transferring technology, knowledge and experience for these new activities to the Roads Department. The Twinning arrangement would include study visits by officers of the Roads Department to the Road Agency, short secondments and training courses within country of the Road Agency. The Road Agency would also provide officers to assist the Roads Department to establish the routine maintenance contracts and Inspectorate and to supervise and monitor their progress through periodic visits.

1.5 This arrangement, for the purpose of establishing and monitoring the progress of the activities, is expected to last approximately four years. The Roads Department hopes, however, that this Twinning would develop into a longer-term relationship, covering other functions and responsibilities within the road sector, that would be mutually beneficial to both organizations.

2. Description of Proposed Twinning

2.1 The Roads Department has received much conventional technical assistance and, while realizing that such assistance may still be appropriate for certain assignments, believes that a change in emphasis is necessary. The Roads Department views the twinning arrangement as a means of :

- Establishing firm links with an organization with a similar role to its own for the purposes of sharing experience and knowledge on a long-term, continuing basis.

- Directly learning from the experience of the twinning partner on the implementation and operations of road maintenance contracting and inspectorate/performance auditing functions.

- Developing a flexible arrangement for the provision of technical advice and assistance, on terms mutually beneficially for both parties, without the constraints and rigidities imposed by normal consultancy contracts.

2.2 The Roads Department would like the Twinning arrangement to provide the following elements and activities:

- *Training*: the twinning agency would arrange study tours, short courses and other programs to provide appropriate training for Roads Department staff in the implementation and supervision of maintenance contracts and inspectorate functions.

- *Secondment*: the twinning agency would provide the opportunity for the Roads Department to second staff for limited periods in order to gain practical experience of maintenance contracting and inspectorate work.

- *Technical assistance*: the twinning agency would provide short-term experts to work closely with senior engineers of the Roads Department to develop, implement and supervise maintenance contracting and the Works Inspectorate.

- *Technical advice and information*: the two agencies would share information and technology in a manner beneficial to both organizations.

The Roads Department hopes that the arrangement with the Twinning agency can be implemented in a flexible manner under which progress would be periodically reviewed and the twinning program modified in the light of experience, priorities and circumstances. It would be hoped, for example, that the Twinning Agency would participate in the annual Road Donors seminar organized by the Ministry as well as in the proposed road maintenance seminars.

Role of the Twinning Partners

2.3 The Roads Department will provide counterparts, support staff, office space, furniture, as well as accommodation and transport expenses for staff of the Road Agency while they are

within Kenya and will generally provide an atmosphere which is conducive for the development and implementation of the proposed program.

2.4 The Road Agency will arrange, after discussion and agreement with the Roads Department, for training, study visits and hands-on learning in the Agency's country. In addition the Road Agency will provide technically qualified staff with relevant practical experience to work in Kenya for short periods, as agreed, for developing and implementing the project components and to provide advice on their modification or extension.

Initial Twinning Inputs

2.5 **Technical assistance**: The following technical assistance requirements are initially envisaged under the twinning arrangement:

- *Road maintenance/contracting expert*: an initial 3 month assignment, to be followed by a further 3 visits, spread over three years: total 6 person-months.

- *Road works inspector/performance audit expert*: an initial 4 month assignment, to be followed by a further 2 month assignment after six months, and 3 subsequent monitoring missions over the following three years: total 9 person-months.

- *Maintenance systems expert*: an initial 3 month assignment, to be followed by a monitoring/development mission: total 4 person-months.

2.6 **Training**: The Road Agency will assign a training coordinator to arrange a program of training, field visits, secondments for Roads Department Staff. It is expected that initially there will be the following training visits:

- *Roads Works Inspectorate*: one training group of 5 engineers, for a period of up to a month.

- *Routine Maintenance Contracting*: two training groups of 4 - 5 engineers, for a period of two - three weeks.

A study tour of about two weeks is also envisaged for the most senior engineers in the Roads Department, to discuss and review experience of both performance auditing and maintenance contracting

3. Funding of the Proposed Twinning Arrangement

3.1 The funding of the twinning arrangement will be met from the assistance provided by the IDA for the Nairobi-Mombasa Road Rehabilitation Project. The funding will cover technical assistance fees and expenses, the costs of training (including fees for the training coordinator), and all other costs necessary for the successful implementation of the program.

LETTER OF SECTORAL POLICY

1.0 STATEMENT OF PURPOSE

1.1 Road transport is the dominant mode of transport in Kenya. It represents 72 percent of the total value of output for the domestic surface transport sector. However, roads and road transport services are characterised by high cost and low quality services mainly due to the substantial backlog of road maintenance.

1.2 The recently concluded Expenditure Priorities Report (June, 1994) indicates that 3.9% of the classified road network is in good condition, 12.5% is in fair condition while 83.6% is in poor or very bad condition. Delays in routine and periodic maintenance will mean that more and more of these roads will have to be either abandoned or completely rebuilt at high costs to the economy.

1.3 The Government has developed a dual strategy to correct the present situation and provide the road network necessary to sustain economic and social development in Kenya. First, the Government through the Ministry of Public Works and Housing (MOPW&H) is to introduce an activity-oriented maintenance, rehabilitation, reconstruction and possibly upgrading programme for the road network. This will be implemented through the Strategic Plan which will also contain the policy framework within which the strategy will be implemented. Secondly, the government will work out the formula and modalities for the establishment of an appropriate Institutional framework to manage Kenya's road network. This Letter of Sectoral Policy briefly outlines the most pressing reform requirements and the Government's intentions for meeting them.

1.4 The Government is carrying out studies in 7 key areas which require attention. The areas:

(a) Institutional arrangements
(b) Expenditure Priorities
(c) Delivery Options for Road Maintenance
(d) Financing of Road Maintenance
(e) Equipment Ownership and Maintenance Policies
(f) Staffing and Training
(g) Axle Load Controls

2.0 INSTITUTIONAL ARRANGEMENTS

2.1 In Kenya, like in most Sub-Saharan Africa countries, roads are managed by Government departments: classified roads are under the Roads Department of

MOPW&H, roads in the national parks are under the Kenya Wildlife Services (KWS), other roads are under local authorities and the Forest Department.

2.2 It is difficult to co-ordinate the activities of all these agencies, to determine their financial requirements, and to address the problems of the road sector in a co-ordinated manner. Moreover, the Government recognises that the value of roads is significantly higher than that of railways and the airline, hence roads are truly a big business. There is, therefore, need for them to be well-managed, with access to adequate funds, to ensure the large sums of money invested in roads produce value-for-money.

2.3 The Government, with the assistance of the European Union, is preparing to undertake a Study on the appropriate Institutional framework within which the road sector will be managed. The study will commence around June 1995 and be completed by June 1996. It will address itself to the autonomy of the institution, its mandate with respect to road sector co-ordination problems, funding, motivation of staff as well as improved operational efficiency. The recommendations of the study will be implemented upon approval by the Government.

3.0 EXPENDITURE PRIORITIES

3.1 A recent study which was carried out with the assistance of the World Bank on Expenditure Priorities indicated that benefit/cost ratios for maintenance works are high when compared with the ratios obtained for capital projects. This is in line with the general wisdom that the maintenance of an existing road system is more beneficial than expanding the network. The Government will, therefore, concentrate its financial resources on the regular maintenance of the present network. Special attention will particularly be paid to the heavily trafficked roads in both the paved and unpaved system. All maintenance and rehabilitation activities with benefit/cost ratios equal to or greater than 2.5 will receive priority. Currently, the Highway maintenance System (HMMS) is being used to address these roads but more acceptable funds allocation criteria are being considered.

3.2 The Expenditure Priority Study also suggested that although upgrading of roads is an expensive strategy, there are certain cases when upgrading is still preferable rather than regravelling or carrying out unattainable maintenance. For instance, upgrading from gravel to bitumen is the strategy of the highest priority at any traffic level in excess of 300 vehicles per day (vpd). Economic analysis also suggested that it is economically viable to upgrade an earth road to gravel standard once traffic exceeds 100 vpd. The Government will concentrate the use of its resources to upgrade roads which are economically justifiable, in the light of the returns on maintenance and rehabilitation. However, in certain circumstances, important social and other considerations shall be taken into account in its allocation of funds.

4.0 DELIVERY OPTIONS FOR ROAD MAINTENANCE

4.1 Road maintenance works under the Roads Department of MOPW&H are executed by the Paved and Unpaved Roads Maintenance Branches. Periodic works are executed by contract (70 percent) or force account (30 percent) operations which are either equipment-intensive or labour-intensive. Routine maintenance works are currently being carried out by force account units of the department. These units are highly equipment-intensive. Thus, the units have become extremely expensive and inefficient leaving large numbers of personnel idle when fuel, materials and spare parts become unavailable. The Government has taken steps to increase road maintenance funding and thus provide the necessary inputs for these units. In addition, through Civil Service Reform Programme, the staffing norms are being addressed.

4.2 Kenya has been a pioneer in Sub-Saharan Africa for the construction and maintenance of unpaved rural roads using labour-based techniques. This has been done through the Rural Access Roads Programme (RARP, 1974-1986) and the Minor Roads Programme (MRP, 1986 to date). The Programmes have been successful but their approach does not provide a complete solution to the rural roads problems.

4.3 The Government has, within the ongoing MRP, developed the Roads 2000 Strategy for the unpaved road network which attempts to resolve the problems and constraints which were not addressed by RARP and MRP. The strategy, which combines labour and tractor-based maintenance, offers the prospect of a major improvement over the present system. It has been successfully applied in two districts and the Government is seeking funds to extend its application nationally. In accepting the principles underlying the Roads 2000 approach, need has been recognised to address the following:-

(a) The employment of casual labour and labour-only contractors will assist the Government policy of creating employment in the rural areas.

(b) Towed graders and motor graders will be put into complementary uses. Their ownership and maintenance policies will be developed within the general framework of the Strategic Plan.

4.4 Opportunities clearly exist for expanding the use of contractors into areas which have hitherto been the preserve of the force account organisation. As mentioned earlier, about 70% of the periodic maintenance are already carried out by contracting. Efforts will be made to contract out 90% of the works in the 1995/96 financial year.

4.5 A project has been undertaken in Kenya with the assistance of the Swedish International Development Agency to develop small local contractors to undertake labour-based gravelling works. Some contractors have now been certified, even though

difficulties were experienced with their performance. Labour-based gravelling works will be contracted out to the certified contractors in the 1995/96 financial year. The Government will also seek donor assistance to supplement Government financial resources for training additional contractors. This will strengthen the Country's civil engineering contracting base.

4.6 Contracting out of routine maintenance of both paved and unpaved roads will depend on the completion of the preparation of contract documents, pilot routine maintenance contracts, development of routine maintenance contractors and supervisors. It is proposed that three of the five sections of the Northern Corridor will be contracted out while maintenance of the other two sections will be undertaken by force account. Concurrently the Government will examine routine maintenance of unpaved roads on a pilot basis. It is also proposed that this pilot maintenance project will be undertaken over a four-year period. The pilot project will demonstrate the viability and/or cost-effectiveness of this approach. At the same time, efforts will be made to establish the capacity and willingness of the private sector to undertake routine maintenance contracts. Subject to the successful results of the pilot projects the Government plans to commence contracting out routine maintenance by the year 2000.

4.7 Labour-based methods have been used in the country since the 1970s. It is the Government's intention to expand their use wherever possible and where these methods are more cost-effective than equipment-based methods under the Roads 2000 project. At the end of the current agreements with MRP donors, the Government plans to introduce Roads 2000 approach in the MRP districts. In addition, 5-10 non-MRP districts can be taken on board annually, subject to intensified training of supervisors and availability of funds.

5.0 FINANCING OF ROAD MAINTENANCE

5.1 The conclusion from a review of past maintenance expenditure is that matched with maintenance requirements they have been inadequate. Redressing the imbalance requires extending the funding base of road maintenance finance, reducing the scope of requirements or a combination of the two. The Government has decided to extend the funding base of maintenance finances and to improve on the operational efficiency.

5.2 The Government in June 1994 imposed a levy of K Sh 1/50 per litre of ordinary and premium petrol, K Sh 1/00 per litre of diesel and K Sh 1/00 per litre of lubricants. From June 1994 to 3rd February 1995 a total of K Sh 763,650,289.60 (K£ 38,182,514) had been collected. This works out to a weekly collection of K Sh 23,140,917.87 (K£ 1,157,046) or an annual collection of K Sh 1,203,327,729.07 (£60,166,386).

5.3 In September 1994 the Government introduced the Common Market for Eastern and Southern Africa (COMESA) harmonised road transit charges at the rate of US$3/100

km for heavy goods vehicles (HGVs) with upto 3 axles and US$8/100 km for HGVs with more than 3 axles and all articulated vehicles. Between September and December 1994 a total of K Sh 45,374,522.90 (K£ 2,268,726) had been realised from the levying of these charges. This works out to a monthly collection of K Sh 11,343,630.70 (K£ 567,182) or an annual collection of K Sh 136,123,568.70 (£ 6,806,178). It is expected that the charges will be revised upwards in April 1995 the effect of which will be an increase in annual collections to about K Sh 180 million.

5.4 The Treasury also continues to allocate funds for road maintenance under the Recurrent Expenditures. The proposed Recurrent Forward Budget and Maintenance Levy Fund levels for the financial year 1995/96 will be K£ 182,251,295. According to the recent study on Expenditure and Funding Needs in the Roads Sector, the total expenditure required for the classified network, based on the most economically attractive practice is K£ 308 million. A comparison of the funding requirements with the available financial resources indicates that there will be a gap in funding. The Government will seek donor assistance to bridge this gap. At the same time, the Government commits itself to bridge the gap gradually on a sliding scale. The outline of the Government's programme for meeting the commitment of full maintenance funding of the classified road network by the year 2000 is as follows:-

1995/95	-	K£ 182,251,295
1996/97	-	K£ 209,003,689
1997/98	-	K£ 230,263,859
1998/99	-	K£ 264,803,437
1999/2000	-	K£ 304,523,954

6.0 MONITORING PROCEDURES

6.1 The Government will ensure that funds allocated for road maintenance operations are used effectively and efficiently. In this regard, a budget is prepared based on the workplans and priorities at the districts and provinces. The budget is subject to Treasury approval before expenditures are incurred to ensure that the funds are audited by the Controller and Auditor General. Also, in pursuit of operational efficiency, districts/provinces are required to submit progress reports on a monthly basis.

6.2 Further, the Government will establish an Inspectorate Unit in MoPw&h to monitor the quantity and quality of work. The Inspectorate Unit will be located within the Design and Inspectorate Branch of the Roads Department and will be functionally headed by a Senior Superintending Engineer (Design and Inspectorate) who will be supported by experienced Superintending Engineers.

7.0 EQUIPMENT OWNERSHIP AND MAINTENANCE POLICIES:

7.1 Until recently, Kenya's road maintenance operations have been mainly equipment intensive. For many years, the Mechanical and Transport Department (MTD) operated a highly effective Equipment Funding Scheme. The Scheme was suspended in 1979 due to the inability of user departments to pay the set charges. Since then, repair and maintenance of equipment has been funded directly from the Treasury, but this has not improved the availability of equipment.

7.2 Prior to 1984, all road maintenance operations including the repair of plant and equipment was under the control of the Provincial Engineer (PE) who was traditionally a Highway engineer. It was then possible to achieve flexibility in prioritisation of equipment repair, spare parts procurement and distribution particularly in times of resource constraints. With the advent of the District Focus Strategy for Rural Development the users and providers of the mechanical services report to different Departmental Heads at the Headquarters and flexibility in prioritisation of equipment repair was lost.

7.3 The Government's move towards greater use of contractors for road maintenance operations will mean that in the long term the government will be required to operate only a skeleton of equipment for emergency works as well as supervisory vehicles. But desired level of contracting of road maintenance operations cannot be achieved before the year 2005 at the earliest. This means that the government will continue to require equipment for its force account units. It is, therefore, desirable that the Government continues to use the available fleet with limited replacement so that the fleet size can diminish as road maintenance contracting picks up. Should replacement of equipment becomes necessary before full contracting of road maintenance operations, consideration will be made for its leasing/hiring either from the private sector or MTD.

7.4 Through the Civil Service Reform Programme, the Government is restructuring MTD and will address the question of staff motivation in order to improve the efficiency of MTD. In addition, the Government is committed to increasing the funding of MTD and to reduce its staffing level.

8.0 STAFF

8.1 In 1993 the Government had in its Roads Department a total of 12,279 employees consisting of 174 engineers, 1059 road supervisors, 1867 artisans, 1255 drivers and plant operators and 7924 support and other general staff. Their salaries and allowances consumed about 70% of the funds allocated for road maintenance leaving about 30% for operations.

8.2 The Government has launched a major reorganisation of Ministries and Departments with the aim of making them simple, efficient and relevant to the present day needs and priorities. Towards this end, the Government is encouraging voluntary early retirement of the junior staff and has frozen the filling of posts left vacant for any reason. A survey is being planned to determine the reduction of staff through the early retirement scheme, natural attrition, etc. The remaining personnel will be well-motivated.

8.3 The staffing needs of the Roads Department are currently being worked out under the study of Staff Rationalisation. This study will take into account Government's efforts to move towards greater contracting of road maintenance operations. It is likely that with greater contracting the perceived shortages of staff will not be there and the Government may continue to encourage certain groups of people to retire voluntarily.

9.0 AXLE LOAD CONTROLS

9.1 The Government has 6 operational mobile weighbridges. It also has an operational static weighbridge at Athi River and plans are in place to rehabilitate the static bridge at Mariakani. Plans are also in place to construct static weighbridges at Webuye, Isebania, Gilgil and Busia. The Mariakani weighbridge station is expected to be operational by May 1995 while the construction of the Webuye, Isebania, Gilgil and Busia is expected to be completed in June 1995, 1996, early 1996 and in 1997 respectively.

9.2 The Government has also put in place more effective rules governing the axle load enforcement. Unlike in the past when axle load enforcement was being done for only a few hours, it is now being done on a 24-hour basis. In addition, following the completion of the extension of the pipeline to Western Kenya, volumetric controls are being enforced on all tankers except those transporting gas and black oil.

9.3 Automatic data collection systems are also being installed at Mariakani, Gilgil, Eldoret and Ahero for axle load monitoring and road design purposes.

10.0 SEQUENCING AND TIMING OF POLICY REFORMS

10.1 The key policy directions/goals which the Government proposes to pursue and the time table for their implementation is contained in the attached Table 1.0.

Table 1.0
Policy Directions/Goals which GOK Proposes to Pursue
(Timetable of Implementation)

Long Term Objective	Short Term Actions	Date for Action	Responsibility	Present Status
1. Appropriate Highway Institution for sustainable road maintenance	a) Study of the appropriate institutional framework	June 1995 to June 1996	MOPWH	Consultants have been invited to submit proposals for evaluation
	b) Seminars/workshops on the recommendations of the study	June 1996 to Dec. 1996	MOPWH	
	c) Cabinet paper on recommended reforms	Jan. 1997 to March 1997	MOPWH	
	d) Establishment of the institutional framework	As soon as cabinet approval is received	MOPWH and relevant organizations	
2. To improve operational efficiency of road maintenance operation	a) 90% contracting of periodic road maintenance	1995/96	MOPWH	70% of works contract out
	b) Contracting out some labor-based gravelling	1995/96	MOPWH	11 contractors have been trained and registered. Process of awarding tenders to registered contractors has started. Technical assistance being provided to draw up detailed tender documents for each of the sections.
	c) Contracting out routine maintenance on a pilot basis	1995/96	MOPWH	
	d) Evaluation of the routine maintenance contracting	1995/96 -2000	MOPWH	

Long Term Objective	Short Term Actions	Date for Action	Responsibility	Present Status
3. Increase funding of road maintenance to full maintenance need	a) Raise recurrent budgetary allocations and maintenance levy fund levels	1995/96 1996/97 1997/98 1998/99 1999/2000	MOPWH	MOF has promised to increase the level of funding
	b) Establish the Road Works Inspectorate Unit	1995	MOPWH	An SSE(RWI)) and 4 SE's (RWI) have been appointed
4. Equipment Policy	a) Roads Department (RD) to be authorized to seek equipment maintenance services from the private sector if MTD cannot provide the service.	Jan. 1996	MOPWH	Equipment maintenance services can be procured from the private sector subject to MTD approval
	b) RD to lease/hire plant and equipment from the private sector where such plant and equipment is unavailable at MTD.	1998	MOPWH	RD hires vehicles (not plant) from MTD only
	c) Strengthening of MTD	1998	MOPWH	Recommendation of the Institutional Study to be ready by 1997
5. Staffing and training of RD and MTD	a) Establishment of the staffing needs	Mar. 1995	MOPWH	Study ongoing
	b) Establish shortfalls or excesses	Mar. 1995	MOPWH	Study ongoing
6. Axle Load Controls	a) Rehabilitation of weighbridge facilities	1995-1997	MOPWH	Ongoing
	b) Operations of weighbridge facilities on a 24-hour basis	1995	MOPWH	Ongoing
	c) Volumetric controls (except on gas and black oil)	1995	MOPWH and OP	Ongoing
7. Rationalization of Expenditure Priorities	Development of the funds allocation criteria	1996	MOPWH	Pilot Work ongoing.

PROJECT IMPLEMENTATION SCHEDULE

Project Component	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001
Quarter:	*1 2 3 4*	*1 2 3 4*	*1 2 3 4*	*1 2 3 4*	*1 2 3 4*	*1 2 3 4*
Major Civil Works						
Km 103 - 238	+ + + +	+ + + #	# # # #	# # # #	# # # *	* * *
Km 238 - 393	+ + + +	# # # #	# # # #	# # # #	# * * *	* *
Routine Maintenance						
First round Contracts	+ + + #	# # # #	# # #			
Second round Contracts			+ + + #	# # # #	# # #	
Goods	+ + + #	# # #				
Technical Assistance						
Structured Learning	+ + + #	# # # #	# # # #	# # # #	# # #	
Twinning	+ + + #	# # # #	# # # #	# # # #	# # #	
HMMS	+ + + #	# # # #				
Road Inventory	+ + + +	# # # #	# # # #			

+++ = Procurement
= Implementation
*** = Contractual maintenance period

ROAD MAINTENANCE LEVY FUND

OPERATING MODALITIES[1]

The Road Maintenance Levy Fund consists of fuel levy and transit toll collections. The Fuel Levy Act states that the Minister of Public Works shall impose levy on any or all of the petroleum products, the proceeds of which will go towards the maintenance of public roads (classified roads and adopted streets).

Collection of Funds

- Fuel levy is collected by Customs Department which in turn remits the collections to the MOPW&H on weekly basis. On average, the Ministry has been receiving K 1 million.

- Transit toll charges are collected jointly by MOPW&H and Customs. Projected annual collection is K 12.5 - 15.0 million.

Budgeting

The budget sets priorities and splits the fund between the following:

- routine maintenance
- periodic maintenance
- design
- planning and road safety

Disbursements

Routine Maintenance: disaggregation is carried out using HMMS and the funds are disbursed to the districts.

Periodic Maintenance: Work plans and priorities on which the budget is based come from the districts/provinces.

Design: Funds for the demarcation of road reserves, road furniture, and the re-design of dangerous locations are allocated on the basis of work plans.

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1 Prepared by the Ministry of Public Works and Housing

Planning and road safety: Funds are allocated for the collection of transit tolls, monitoring of the collection of the fuel levy, identifying of road safety counter-measures and traffic surveys.

The total budget is presented to the Treasury for approval and is, therefore, subject to audit by the Auditor and Controller General.

Reporting

- The Districts submit their monthly progress reports through the Provinces showing outputs/achievements on grading, patching, gravelling and other labour-based activities.
- Reports on paved road activities are sent monthly to show progress/achievements on shoulder repairs, patching, bush clearing, ditch and culvert cleaning.
- Districts/Provinces carrying out periodic maintenance activities submit monthly progress reports

Annual summary of physical maintenance achievements will be prepared.

Monitoring and Auditing

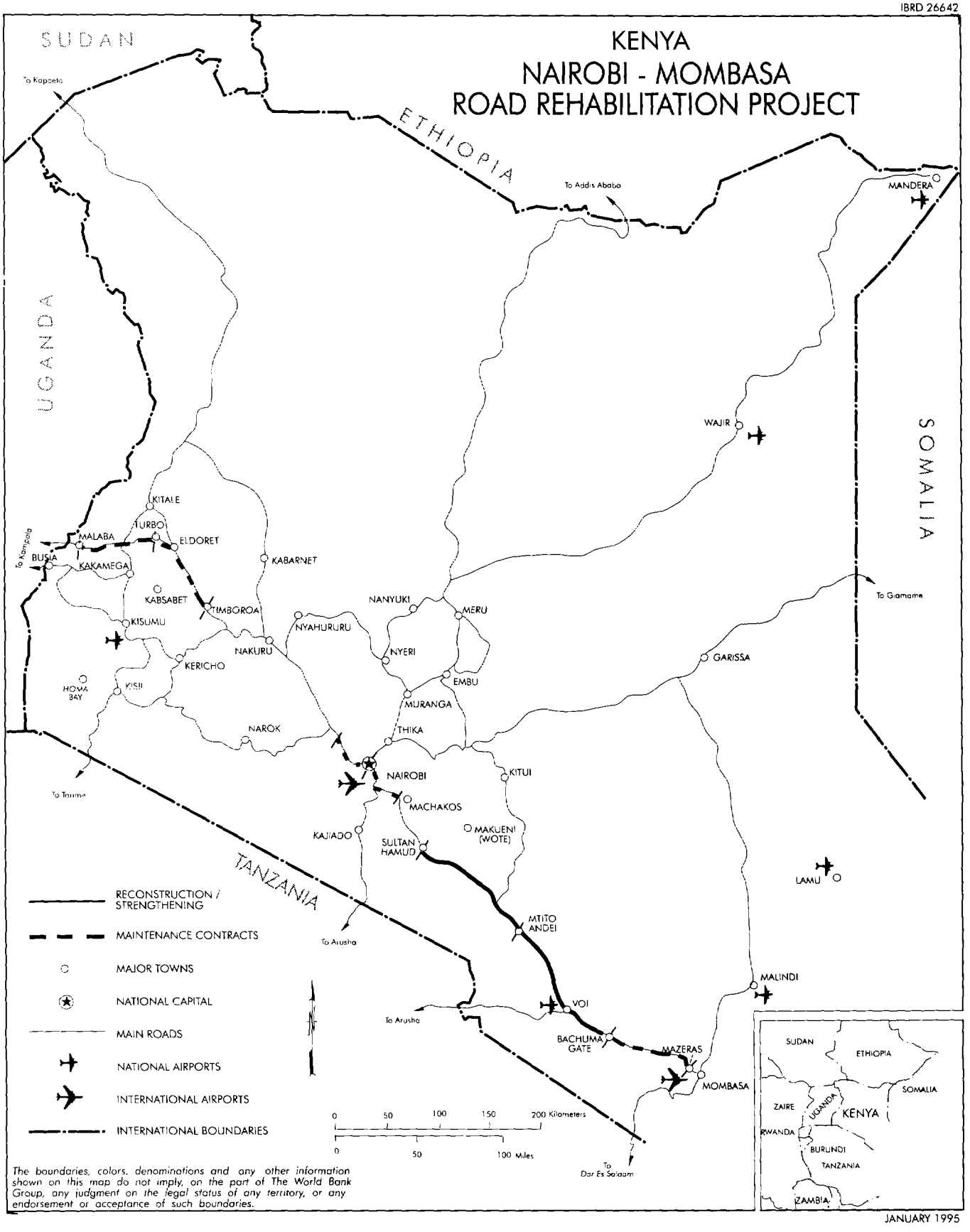
- The Fund is subject to audit by the Controller and Auditor General.
- An Inspectorate Unit has been established to monitor the quality and quantity of work to ensure that the Government gets value for money.

PROJECTS IN DOCUMENT FILE

1. Engineering Report: Mtito Andei - Bachuma Gate Road, MOPWH, 1994
2. Rehabilitation and Overlay Design Report: Mtito Andei - Bachuma Gate Road, MOPWH, 1994
3. Economic Evaluation: Mtito Andei - Bachuma Gate Road, MOPWH, 1994
4. Accident Analysis Report: Mtito Andei - Bachuma Gate Road, MOPWH, 1994
5. Design Review: Mtito Andei - Bachuma Gate Road, Otieno Odongo & Partners, 1995
6. Environmental Mitigation Plan: Mtito Andei - Bachuma Gate Road, MOPWH, 1994
7. Project Implementation Manual, MOPWH, 1995

IBRD 26642

KENYA
NAIROBI - MOMBASA
ROAD REHABILITATION PROJECT



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JANUARY 1995

TRAINING

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