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IMPLEMENTATION COMPLETION REPORT  
(IDA-28120 PPF1-P8890)

ON A

CREDIT

IN THE AMOUNT OF SDR 34.0 MILLION

TO THE

REPUBLIC OF KENYA

FOR A

NAIROBI - MOMBASA ROAD REHABILITATION PROJECT

February 8, 2005

**Transport  
Africa Region**

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective July 31, 2004)

Currency Unit = Kenya Shilling (KES)

KES 1.0 = US\$ 0.012

US\$ 1 = KES 80.4

SDR 1 = US\$1.456

## FISCAL YEAR

July 1 June 30

## ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Strategy
EU	European Union
GOK	Government of Kenya
HDM	Highway Design Model
HMMS	Highway Maintenance Management System
ICB	International Competitive Bidding
IDA	International Development Association
KRB	Kenya Roads Board
LCB	Local Competitive Bidding
MOPWH	Ministry of Public Works and Housing
MORPWH	Ministry of Roads, Public Works and Housing
MOTC	Ministry of Transport and Communications
PPF	Project Preparation Facility
RMI	Road Maintenance Initiative
RWI	Road Works Inspectorate
SAR	Staff Appraisal Report
SDR	Special Drawing Rights
THSP	Third Highway Sector Project

Vice President:	Gobind Nankani
Country Director	Makhtar Diop
Sector Manager	C. Sanjivi Rajasingham
Task Team Leader/Task Manager:	Josphat O. Sasia

**KENYA  
NAIROBI MOMBASA ROAD**

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<i>Project ID:</i> P035691	<i>Project Name:</i> KENYA - NAIROBI MOMBASA ROAD
<i>Team Leader:</i> Josphat O. Sasia	<i>TL Unit:</i> AFTTR
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> February 7, 2005

## 1. Project Data

*Name:* KENYA - NAIROBI MOMBASA ROAD      *L/C/TF Number:* IDA-28120; PPFI-P8890  
*Country/Department:* KENYA      *Region:* Africa Regional Office

*Sector/subsector:* Roads and highways (93%); Central government administration (7%)

*Theme:* Export development and competitiveness (P); Other financial and private sector development (P)

### KEY DATES

	<i>Original</i>	<i>Revised/Actual</i>
<i>PCD:</i> 01/16/1994	<i>Effective:</i> 05/13/1996	04/11/1997
<i>Appraisal:</i> 07/07/1994	<i>MTR:</i> 12/31/1998	10/13/1999
<i>Approval:</i> 01/30/1996	<i>Closing:</i> 03/31/2002	03/31/2004

*Borrower/Implementing Agency:* GOVERNMENT OF KENYA/MIN OF WORKS

*Other Partners:*

STAFF	Current	At Appraisal
<i>Vice President:</i>	Gobind Nankani	Callisto E. Madavo
<i>Country Director:</i>	Makhtar Diop	James W. Adams
<i>Sector Manager:</i>	C. Sanjivi Rajasingham	S. Weissman
<i>Team Leader at ICR:</i>	Josphat O. Sasia	Simon Thomas
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## 2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

*Outcome:* S  
*Sustainability:* L  
*Institutional Development Impact:* M  
*Bank Performance:* S  
*Borrower Performance:* S

*QAG (if available)*      *ICR*  
*Quality at Entry:* S      S  
*Project at Risk at Any Time:* No

## Background

This project was initially a component of a proposed Third Highway Sector Project (THSP) a follow-on project to the Second Highway Sector Project that closed in 1993. The Bank support for the THSP hinged on Government of Kenya's (GOK) commitment to (i) achieve financial sustainability within the road sector particularly allocating adequate resources for road maintenance, which had been neglected over the years; (ii) define a Strategic Plan with clear expenditure priorities between maintenance, rehabilitation, upgrading and new construction together with an investment program, and (iii) define an explicit institutional and policy framework necessary to ensure the effective implementation of the strategic plan and identified priorities. THSP was to support the implementation of the Strategic Plan. Meanwhile, the road conditions of the Nairobi-Mombasa road were deteriorating very fast and it became a major transport constraint not only for Kenya but the larger East Africa region that relies on the port of Mombasa. Under these circumstances, the Government proposed in December 1993 that this particular road section, though included in the THSP, be de-linked and considered as a separate project.

The Bank was faced with three options in deciding to de-link this project from the THSP: (i) not to de-link the Nairobi Mombasa road rehabilitation from the THSP; (ii) de-link with no institutional and policy reforms under the project due to enormous deterioration of the road which needed immediate attention; and (iii) de-link and include implementation of institutional and policy reforms under the project.

Option (iii) was adopted, even though the sector approach was the best framework to address overall sector issues. Options (i) and (ii) were not considered because, first, the likely adverse effects on the economy were serious as the Northern corridor is the main transport link between Kenya's primary production areas and the port of Mombasa. Second, the poor state of the road network in Kenya was mainly due to lack of adequate maintenance funding and dubious expenditure priorities. Inevitably any sustainable support could not ignore focusing on improved expenditure management, policy and institutional reforms in the sector. Lastly, the achievement of the CAS objectives of promoting the development of export-oriented private sector would have been constrained, as this road is a key link to the export market.

In adopting, option (iii), Bank also reviewed the various Government initiatives including the dialogue with other donors with regard to a comprehensive rehabilitation of the Nairobi-Mombasa road. Accordingly, an agreement was reached with the Bank, European Union (EU) and GOK on the overall rehabilitation of the road as a stand-alone project but within the framework of policy and institutional reform and development of road sector strategy. This was in recognition that the road was a primary freight transport route not only for Kenya but also for the neighbouring countries and had become a serious transport constraint.

Governance matters in Kenya during this period though evident through inappropriate public expenditures and uneven implementation of policy reforms were not adequately understood within the Bank during preparation of this project as is the case today with the establishment of Department of Institutional Integrity (INT) two (2) years after approval of this project

### **3. Assessment of Development Objective and Design, and of Quality at Entry**

#### *3.1 Original Objective:*

The objectives of the Project, as stated in the Staff Appraisal Report (SAR) dated November 8, 1995 were to: (i) safeguard the Borrower's main transport link between its primary production areas and the port of Mombasa through the reconstruction and strengthening of the Nairobi-Mombasa road, (ii) strengthen the monitoring and control of road maintenance activities, (iii) encourage private sector involvement in the maintenance of infrastructure, and (iv) provide basic support for road maintenance planning.

The objectives were stated clearly. They were consistent with the Country Assistance Strategy (CAS) discussed by the Executive Directors on April 5, 1994 of stimulating the economic growth through the development of an export-oriented private sector. The project was also to promote the CAS through increasing the role of the private sector in road maintenance and helping to ensure cost-effective maintenance of basic infrastructure, which was a critical function of Government.

#### *3.2 Revised Objective:*

The original objectives were not revised.

#### *3.3 Original Components:*

The project comprised of three main components: (a) reconstruction/strengthening of the Nairobi-Mombasa road; (b) pilot routine maintenance contracts; and (c) institutional support including twinning with an external road agency. The estimated project cost was US\$ 122 million, with a proposed financing through an IDA credit of US\$ 50 million (41% of the total project cost), EU grant of US\$ 58.8 million (48%) and Government counterpart contribution of US\$13.2 million (11 percent of project cost). The Government counterpart contribution related only to the IDA portion of the project.

The EU funding was exclusively toward civil works of Km 103 –238 that is, the Sultan Hamud – Mtito Andei (135 Km) and whose implementation experienced a slow start such that construction started in April 2003 well after the completion of the IDA financed section. In addition, EU financed emergency resealing of this road section while the design and main works funding was being worked out.

#### *3.4 Revised Components:*

The civil works contracts attracted very competitive bids and Ministry of Roads and Public Works with these savings, undertook additional critical works including widening of three road bridges, one railway bridge (the road had effectively been acting as a dam, protecting the railway embankment) and repair of a 9 Km loop road through Voi town off the Nairobi-Mombasa road. The pilot routine maintenance contracts and twinning arrangements were dropped. The rest of the other institutional support components such as establishment of Road Works Inspectorate, establishing a secure source of funding maintenance, and design studies including the preparatory work under the NCTIP were successfully completed.

#### *3.5 Quality at Entry:*

The quality at entry of the Project is rated as **satisfactory**. The project was a relatively simple

and well-focused standard investment project. The Bank's assessment of various options available and adoption of one that combined fundamental policy and institutional reforms under a comparatively "small" investment project, worked well. Otherwise these reform issues would not have been implemented had they remained under THSP, which eventually was dropped.

Experience on previous Bank assisted projects in Kenya roads sector provided insights. Typically the physical improvement objectives were achieved but not sustained. Benefits gradually reduced by subsequent inadequate road maintenance. The Board date was postponed on two separate occasions, arising from Government decision to (i) construct a new international airport, and then (ii) purchase a presidential aircraft at a time when the road sector was experiencing serious financial constraints. The progressive increase in funding for road maintenance was key to approval of this project. Development partners in the sector and the Letter of Sector Policy were explicit on these issues by linking support to increased budgetary allocation for road maintenance and accelerating institutional and policy reform.

#### **4. Achievement of Objective and Outputs**

##### *4.1 Outcome/achievement of objective:*

The overall outcome of the Project is rated as **Satisfactory**. The achievement of the objective to safeguard the Borrower's main transport link between its primary production areas and the port of Mombasa through the reconstruction and strengthening of the Nairobi-Mombasa road is rated **highly satisfactory**. The El Nino rains destruction of this road would have resulted into a major economic crisis in the East African region had this project not come just in time. Emergency repairs under a variation order were undertaken to address this crisis prior to the commencement of the main road works. The main road construction for the Mtito Andei - Bachuma Gate section was successfully completed on time and within the budget. To enhance the quality of the this transport corridor, additional works including widening of Kenani, Tsavo and Voi River bridges, Mbololo railway culverts and the repair of the road through Voi town were undertaken and completed on time. The Government using its own funds concurrently carried out periodic maintenance of the section between Bachuma Gate and Maji ya Chumvi and Miritini and Mombasa town. This resulted in a major improvement to road transport operating conditions, and a substantial reduction in vehicle operating costs and travel time between Nairobi and Mombasa. These benefits will be augmented once the on-going construction of the EU funded section, Mtito Andei - Sultan Hamud (135 Km) is completed.

The second objective to **strengthen the monitoring and control of road maintenance activities** was successful. The envisaged institutional setup to provide the required oversight in the road sector, and establishment of a secure financing mechanism for road maintenance were achieved. *The Road Works Inspectorate (RWI)* was established through Project Preparation Facility, and undertakes technical audits of road works activities. This has greatly contributed to improving efficiency, cost effectiveness and accountability in all aspects of construction and maintenance activities. *Kenya Roads Board (KRB)* was established and provides major improvements in policy direction, expenditure priorities, accountability, funding and implementation in the sector. On securing a sustainable financing mechanism for road maintenance, a *Road Maintenance Levy* was introduced and generates substantial funds annually for road maintenance and repair. Through the fuel levy, the Government is able to generate more

resources above the agreed maintenance-financing plan. For instance, the target under the project was for Government to provide Ksh. 6.1 billion annually for road maintenance of the classified network but through the fuel levy and transit tolls over Ksh. 9 billion (equivalent to Ksh. 6 billion in real terms) is collected annually for road maintenance. This was a major step by the Government in its efforts to resolve the long-standing financial issue that faced the road sector prior to the introduction of this fund. Enforcement of *Axle Load Control* along the Northern Corridor was enhanced though it contributed to an increase in freight charges, it also helped to reduce the deterioration rate of the road conditions on the Northern Corridor. However, the standard of enforcement has subsequently declined. The Government is deliberating on alternative enforcement mechanisms in the context of the proposed road concessioning.

The third objective to **encourage private sector involvement in the maintenance of infrastructure** was achieved though not explicitly as designed under the project, but as part of the overall policy and institutional reforms in the roads sector and the general public sector.

The fourth objective to **provide basic support for road maintenance planning** was met. The *road inventory and condition survey study* has now been substantially completed and the MORPW has a rationalized road inventory, condition and updated maps of the classified road network. The Ministry is working on establishing a clear sustainable system of updating this data. A similar study will be undertaken under the Northern Corridor Transport Improvement Project (NCTIP) to cover the rest of the road network.

*Overall, (i) the strong institutional structure that was developed under this project through the establishment of KRB, introduction of the Road Maintenance Fund that receives about Ksh. 9 billion annually (US\$ 110 million equivalent) from the fuel levy now form the foundation upon which subsequent support to the roads sector is anchored on a more sustainable basis; (ii) the comparatively lower units costs for road reconstruction achieved under this project compared to similar projects in Kenya now provides a benchmark upon which costing of rehabilitation and reconstrction of road works is based; and (iii) pioneering of private sector involvement in road activities has encouraged Government to deepen this initiative through the planned road concessioning and long term performance based maintenance contracting.*

#### *4.2 Outputs by components:*

The project's three main components (outputs) were successfully implemented.

(a) The component on the *reconstruction and strengthening of the Nairobi-Mombasa Road* is rated highly satisfactory. The IDA financed section, Bachuma Gate – Mtito Andei (150 Km), was successfully completed on time and within budget. The construction of the EU funded section Km 103 - 238 (Sultan Hamud - Mtito Andei) started in April 2003 and about 30 km has been constructed and handed over to the Government with another 20 Km completed and to be handed over soon. The IDA financed section was estimated to cost US\$ 52.8 million, however very competitive bids were received and US\$ 35.03 million was spent on this component including the additional works as described in section 4.1 above. The performance of the road has been good since completion. This has resulted in (i) a major improvement to road transport operating conditions; (ii) reduced travel time between Nairobi and Mombasa by about 40%, that is from 12 hours before the project to 7-8 hours after the project, and (iii) a substantial reduction in vehicle operating costs.

(b) *Pilot Routine Road Maintenance*: Three sections on the Northern Corridor were identified for routine maintenance by contract on a pilot basis as an alternative to force account. During project implementation a number of changes to this component happened. These included: (i) the El Nino rains damaged some sections so extensively that normal routine maintenance became impractical without immediate major remedial works; (ii) the recognition by the MORPW that force account capability had declined so much (partly due to GOK implementing overall public sector reform) to an extent that meaningful comparison was no longer plausible; (iii) major delays in the implementation of the twinning arrangements which was designed to provide contract maintenance training and support; and (iv) decision by the MORPW that private sector in road maintenance was the only way forward in maintaining infrastructure and piloting as was envisaged under the project was not necessary; and (v) the Government was implementing public sector reform programs including rationalization of functions of ministries and rightsizing, retrenchment and privatization. These measures provided the basis for contracting out certain identified activities suitable to the private sector. Accordingly the Government decided that contracting out maintenance of infrastructure assets was the way forward and therefore piloting was no longer necessary and the component was dropped from the project.

This notwithstanding, private sector involvement in routine maintenance has increased, especially for such activities as grading. For instance, at appraisal almost 100 % of major rehabilitation road works and about 70 % of periodic maintenance works were contracted out. All the routine maintenance works were carried out by force account. Currently 100% of new and rehabilitation works are contracted out, 80% periodic and about 40% routine maintenance works. In addition, to deepen private sector participation in road maintenance MORPW is considering the introduction of concessioning/long term performance based maintenance contracting on part of its network under the NCTIP.

(c) The implementation performance of the *institutional support* component was mixed. Some sub-components experienced major delays and eventually dropped and others were successfully implemented. Specifically:

*Road Works Inspectorate (RWI)* was successfully established and continues to undertake technical audits of road works to complement the financial audits undertaken by other departments of government. RWI reports have contributed to implementation of remedies including MORPW negotiating and scaling down scope of works for contracts found to be unfavourable to the Government. Initially the RWI reported to the Chief Engineer (Roads) but now reports to Permanent Secretary through Engineer-in-Chief an appropriate shift that occurred during project implementation. However, due to its satisfactory performance, the role of the RWI was extended to include verification and approval of payment certificates. This created substantial additional workload for the RWI for which it was neither staffed and equipped nor suited to do. The results were delays in approving payments, and the random inspection of contracts for technical audit was significantly reduced. In addition, the new role created a conflict of interest. RWI was both verifying certificates as correct, while also being responsible for the technical audits of the same works. The Bank has recommended that MORPW relieve the RWI these additional responsibilities to concentrated on continuous random technical audit and adopt internationally acceptable contractual practice in FIDIC based contracts.

*The Twinning Arrangements* envisaged combining both technical assistance and training from an established overseas road agency suffered long procurement delays. Progress on implementing the sub-component stalled and eventually it was deleted from the project due to (i) procurement delays, (ii) high turnover of key staff in MORPW most of whom had different view on the matter in which the twinning partner was identified and the usefulness of twinning; and (iii) the reluctance and indecision on the side of the twinning partner to conclude the contract. Eventually MORPW decided to drop this contract as moving ahead with the contract required extending the Credit closing date beyond the revised closing date. Instead MORPW opted to train its staff in contract management under the project.

*Mechanical and Transport Department (MTD) Strategic Options Study* was dropped as contracting out increased and the Roads Department was not obliged to use MTD equipment for road maintenance and could hire from the private sector. However the role of the department is under review in the context of deepening of reforms in the roads sector. An Inter-Ministerial Reform Taskforce established by the Government with advisory and facilitation support provided under the project spearheads this. Key recommendations of the Taskforce will be implemented under the NCTIP.

*Road Inventory and Condition Survey study:* The road inventory and condition survey study for the classified road network was substantially completed. The MORPW has produced an updated and rationalized inventory, condition and updated maps of the classified road network. To build on this, a similar study will be undertaken for the unclassified road network under the NCTIP, which will greatly assist in the prioritization, planning and budgeting of road maintenance and improvement activities.

*Road Maintenance Funding and Implementation of the Strategy Plan*

The introduction of the Road Maintenance Levy Fund was to fulfill an agreement under the project that continued support for the road sector would be upon substantial increase in maintenance funding for the classified road network to reach full funding by 2000. A schedule for maintenance funding was agreed which, would progressively bring funding to the level required for maintenance of the classified road network. Table 1 below compares the maintenance levels agreed and the actual budgetary allocation.

**Table 1: Levels of Maintenance Funding and Agreed Budget Allocations for Maintenance (Ksh. Million)**

Year	Agreed Maintenance Funding	Budget Allocation for Maintenance
FY96	3,645	3,633
FY97	4,120	4,314
FY98	4,605	5,277
FY99	5,296	4,984
FY00	6,094	6,293
FY01	6,160	6,885
FY02	6,160	8,058
FY03	6,160	8,461
FY04	6,160	8,581

From FY99 all maintenance funding is exclusively derived from the fuel levy and transit tolls. At appraisal, it was estimated that Ksh. 6.16 billion was sufficient for maintenance of the classified road network. It is clear from the table that the Government closely followed the agreed schedule. The level of funding of about Ksh 9 billion generated annually is almost sufficient taking into account inflation to fully cover road maintenance of the classified road network if the road network was in a maintainable condition. This is a major step by the Government in its efforts to resolve the long-standing financial issue that faced the road sector prior to the introduction of this fund.

During the implementation of this project, external funding to the sector drastically reduced due to donor concerns with regard to economic governance in the country. Increasingly, domestic resources for road maintenance from the fuel levy replaced external funding leaving a big financing gap. Inevitably the resources collected for road maintenance were utilized for rehabilitation at the expense of periodic and routine maintenance. In spite of this, the Government was able to hold the road network from total collapse. However, the priorities established in the Strategic Plan priorities were shelved and roads with comparatively little economic priority were allocated substantial resources: this raised questions as to whether road users received value for money. This notwithstanding, at appraisal, 3.9% of the classified road network was in good condition, 12.5% in fair condition while 83.6% was in poor condition. At completion of this project 17% of the network is in good condition, 39% in fair condition and 44% in poor condition.

#### *Preparation of future projects*

The savings under the project were used to finance the preparatory work under the NCTIP and additional road works including (i) the widening of 4 bridges, and repair of a 9 km loop road through Voi town; (ii) the feasibility and design studies of about 230 Km (out of 373 Km are under NCTIP) of road sections; (iii) technical assistance to the inter-ministerial road sector reform taskforce working on deepening of the reforms in the road sector; and (iv) consultants' services for identifying HIV/AIDS mitigation measures along the Northern Corridor and road safety improvement. All these were successfully completed by the close of the Credit, March 31, 2004.

Processing of a Supplementary Credit was dropped due to slow project preparation by MORPW and the need for a second extension of the Credit closing which was considered untenable.

### *Major Developments*

Significant achievements in the sector reform during implementation of this project include:

- Establishment of a strong institutional structure that provides a basis for future support in the roads sector
- Introduction of the Road Maintenance Fuel Levy which now generates Ksh. 9 billion annually (approx. US\$ 110 million annually for road maintenance, one of the largest Road Fund in Africa;
- Establishment of the Kenya Roads Board (KRB) that manages the Road Fund and now provides a chance for major improvements in policy direction, expenditure priorities and accountability in the sector;
- Establishment of a Road Works Inspectorate (RWI) within the MORPW that undertakes technical audits of road works activities which has greatly contributed to improving efficiency, cost effectiveness and accountability in all aspects of construction and maintenance activities;
- Enforcement of the axle load control enhanced; and
- Decentralization of flow of road maintenance funds to all corners of the country and decision making, priority setting through District Roads Committees.

#### *4.3 Net Present Value/Economic rate of return:*

A full cost-benefit analysis of the capital investment input in the improvement of the Mtito Andei - Bachuma Gate section was undertaken at appraisal using HDMIII. A repeat of the analysis has been carried out by the MORPW using HDM IV. In both analyses only the effect of the improvement of pavement condition/strength on vehicle operating costs and maintenance costs has been considered. At appraisal, the results of the analysis were as follows: FYRR 20.6 %, NPV US\$ 138.2 million, and ERR 43.9 %. In the repeat analysis using the actual capital costs spread over the period of implementation, the results are as follows: FYRR 16.86%; NPV US\$ 35.2 million; and ERR 28.7%. The results imply that the project was economically viable both at appraisal and after implementation. The lower result of ERR after improvement, may be explained comparatively higher actual capital costs of Ksh. 3.04 million against Ksh. 1.975 million assumed at appraisal arising from depreciation of Ksh. against the US\$ and additional civil works discussed elsewhere. Actual capital expenditures were incurred from 1997 to 2001 compared to 1996 to 1998 envisaged at appraisal. Details on the full analysis are provided in Annex 3.

A preliminary economic analysis of the EU section was done in November 1995 and the results were as follows: NPV US\$ 131million and ERR 36.7%. There is no indication that an economic analysis will be done after the completion of this section, scheduled for completion by September 2005.

No economic analysis was done for the other components due to difficult in quantifying the benefits in monetary terms. But their contribution is highly recognized.

#### *4.4 Financial rate of return:*

No financial Analysis was done at appraisal and none has been done for the ICR.

#### *4.5 Institutional development impact:*

Overall, the project's institutional development impact is rated as satisfactory. Institutional arrangements in the sector were developed and responsibilities of various agencies clarified with the enactment of the Kenya Road Board Act. A secure funding arrangement was established through the creation of the Road Maintenance Fund, which receives US\$110 million annually from fuel levy and transit tolls. In addition, with the agreement to establish a National Highways Authority to manage a core road network, these benefits are likely to be consolidated.

### **5. Major Factors Affecting Implementation and Outcome**

#### *5.1 Factors outside the control of government or implementing agency:*

The two main factors were: first, *El Nino rains* which extensively damaged some sections of the Northern corridor including the sections earmarked for pilot routine maintenance contracting and made it impractical to implement these contracts as originally envisaged. Instead, major remedial works funded by the Bank and EU, were undertaken prior to the project works, thereby altering the concept designed under the project. Second, the reluctance on the part of the identified twinning partner impeded the conclusion of the twinning arrangement.

#### *5.2 Factors generally subject to government control:*

As mentioned elsewhere the Department of Institutional Integrity (INT) was established two (2) years after the approval of this project and therefore Bank's knowledge and information on governance issues was scanty. Most factors that affected implementation and outcome of the project mainly revolved around governance issues. Previous experience on Bank funded projects in the sector provided a basis for addressing problems once they ensued during project implementation.

The key factors were:

(i) *Road Maintenance Funding Plan* - Strong GOK commitment on ensuring progressive increase in budgetary provision for road maintenance resulted in exemplary results through the establishment of the Road Maintenance Fund that now receive Ksh. 9 billion (US\$ 110 million equivalent) annually from the fuel levy and transit tolls amounts above levels agreed at appraisal. This was achieved in spite of deteriorating governance and increasing fiscal distress affecting the entire economy.

(ii) *Submission of audit reports* - Audit reports were initially submitted late due to delays in the preparation of annual financial statements and capacity constraints at the Office of the Controller & Auditor General (CAG). Non-compliance with reporting requirements led to suspension of remittances to the Special Account on one occasion. In response, MORPW appointed and entrusted one accountant with the responsibility of preparing the accounts early enough for auditing by CAG. Meanwhile the CAG can now contract out this activity in times of constrained capacity, as is the case for the NCTIP.

(iii) *Countersigning of contracts by the MOF* - this requirement partly contributed to delays in commencement of works as contract could only become effective after MOF countersignature. The Government's procurement law is under review to address this issue among others. In the interim, for this project and the NCTIP, the MOF posted a senior procurement specialist to MORPW to handle all procurement issues.

(iv) *Project implementation arrangements* – initially there was no specific project team responsible for the overall project implementation. For instance, no designated accountant was responsible for financial management of the project including ensuring that payments were made on time. During project implementation, MORPW established an empowered Project Technical Team (PTT) with key staff established to handle all aspects of the project on a day-to-day basis including financial management, procurement, technical, environment and social issues. This is also applicable to NCTIP.

(v) *Payment of contractors, supplier and consultants* – delays in processing of payment was a constant feature at the early stages of project implementation mainly due to lengthy payment processing procedures requiring some 23 approvals and signatures including those expected to provide independent oversight. For instance, involvement by the RWI and Internal Audit was not considered necessary. In response, MORPW reduced the number of approvals and signatures to 7. This will also apply to the NCTIP.

(vi) *Release of counterpart funding* - The Government faced serious financial difficulties that caused delayed release of counterpart funding. In addition, the comparatively higher local cost component of the civil works contracts (40%) than was envisaged during project preparation (20%) compounded the situation. Subsequently, IDA agreed to increase its financing percentage of local costs to 28 percent which improved the release of counterpart funding. For the NCTIP the MORPW opted to provide quarterly counterpart funding requirements at the beginning of every quarter.

(vii) *Sector priorities* - the development of a third international airport, at Eldoret, and the purchase of a presidential jet contributed to the postponement of the Board date on two occasions. Such large expenditure seemed impossible to justify in the light of conditions in the road sector. Implementation of the strategic plan was therefore key to addressing such issues.

(viii) *Fulfilment of conditions of Credit Effectiveness* - the approval of a strategic plan for the road sector by the Cabinet delayed by almost 14 months. However, once the project became effective, implementation was satisfactory

### *5.3 Factors generally subject to implementing agency control:*

The MORPW had the capacity to implement the project. The following factors impacted on project implementation:

(i) *Differences in Technical Opinion* - the project suffered a two-year delay due to slow completion of the design done in-house and differences in technical opinion on the design by the design review and supervision consultants. Hence the bidding documents were not ready at Board approval. In addition, MORPW rejected the first two Contractor's Representatives for lacking sufficient experience and were subsequently replaced by more qualified and experienced staff.

(ii) *Quality of works supervision Consultants' Staff* - the selection of the design review and supervision consultants was protracted due to quality of the Consultants staff. The Bank only accepted the consultants on condition that they employed a senior civil engineer with international experience as Senior Resident Engineer. This enhanced the engineering supervision team and complemented the support of two experienced senior engineers from MORPW who were responsible for the management of the civil works contracts.

(iii) *Processing of procurement and payments* - some components were dropped and conclusion of some contracts delayed. The civil works contracts were successfully completed.

The implementation of the other sub-components such as the MTD study, twinning arrangements and a proposed supplementary credit under the credit were dropped. The manner in which the Road Inventory and Condition Survey study contract was designed/package rendered its implementation difficult. For instance, the consultants needed equipment in particular the Falling Weight Deflectometer (FWD), vehicles and drivers. All these were provided under different contracts. In fact the FWD was not delivered in time and GOK had to hire the equipment for the Consultants' use. This delayed the completion of this contract.

The decision to package the IDA financed civil works into two manageable contracts (100 km and 50 Km respectively) instead of a single contract and one, supervision contract, worked out well. In addition, the strong MORPW civil works supervision team helped in speeding up implementation and ensuring quality work was done.

#### *5.4 Costs and financing:*

Overall the total cost of the project was estimated at US\$ 122 million of which US\$ 50 million (SDR 34 million equivalent at negotiations) was IDA Credit. About US\$ 42.8 million of the IDA Credit was to finance civil works, US\$ 3.5 million for pilot routine maintenance contracts and the balance US\$ 3.7 million for institutional support. Actual project costs amounted to US\$120.26 million with US\$ 14.93 million from the Credit and US\$ 14.87 million from the Government. The remaining undisbursed balance of approximately US\$ 4-Million (net of foreign rate fluctuations between the SDR and US\$ of about US\$ 4 million) under the IDA will be cancelled.

## **6. Sustainability**

### *6.1 Rationale for sustainability rating:*

Project sustainability is rated as **likely** for the following reasons: (i) the enhancement of institutional capacity and deepening of the reforms in the sector. The institutional support is already bearing fruits with the Road Works Inspectorate carrying out technical audits of road works, complemented by financial audits undertaken by other departments of government; (ii) completion of the road inventory and condition survey that provided vital information to the MORPW to manage its Highway Maintenance and Management System and improve on maintenance planning; (iii) establishment of KRB and the Road Maintenance Fund which is a sure source of funding road maintenance, including maintenance of the roads completed under the project. In addition, the project sustainability will be reinforced with the planned establishment of the National Highways Authority to manage a core road network and implementation of long-term performance based maintenance contracting to be partly supported under the NCTIP.

### *6.2 Transition arrangement to regular operations:*

Transition measures of this operation to regular operations were in-built into the project at the design stage. First, the project was implemented by the Roads Department responsible for the maintenance of the main roads. Second, part of the surplus funds under the project were used for design and feasibility studies of over 230 Km of road sections along the Northern Corridor for the follow on project. Finally, the Bank under the NCTIP is supporting the implementation of some of the transitional activities such as the establishment of the National Highways Authority.

## 7. Bank and Borrower Performance

### Bank

#### *7.1 Lending:*

The Bank's performance in project identification, preparation and appraisal is rated **satisfactory**. The project components and objectives as originally identified were realistic. There was Government commitment to rehabilitate the Nairobi-Mombasa road rapidly given the poor transport conditions on this major road link hence Government agreement to de-link it from the THSP. In addition, for the civil works contracts, the Government assigned senior engineers with relevant experience. Satisfactory preparation was maintained with continuous monitoring of the project activities by Washington based and Country Office staff. Most technical issues were identified and addressed at appraisal for instance, agreement on the technical designs, adequate staffing of key staff by consultants and contractors.

#### *7.2 Supervision:*

The Bank's performance in supervision is rated as **satisfactory**. Although the project had some initial teething problems. Once the project became effective, implementation improved. The Bank fielded adequately staffed supervision missions, especially in the Project's early stages. Throughout, the Bank maintained a substantial level of dialogue, largely due to a team member being in the field. Bank missions worked closely with MORPW in improving operational efficiency, visited project sites regularly to review the implementation including environmental mitigation measures. The informal portfolio reviews, chaired by the Ministry of Finance and attended by project staff and IDA also had a positive impact on the project implementation.

A Quality Assurance Group (QAG) panel of reviewers carried out a Quality of Supervision Assessment (QSA) during FY03. Supervision was rated as satisfactory overall for all categories.

#### *7.3 Overall Bank performance:*

The Bank's overall performance is rated as **satisfactory**.

### Borrower

#### *7.4 Preparation:*

The Government's performance during project preparation is assessed as **satisfactory**. The designs were undertaken by the MORPW's Roads Department and reviewed by an independent consultant. Apart from the initial delays in finalising the design by the MORPW and preparing the Strategic Plan, the Government diligently undertook these activities. The Government cooperated fully with the Bank in evaluation of civil works bids and selection of the contractor. Finally, very competitive bids were received.

#### *7.5 Government implementation performance:*

The Government performance during implementation is rated **satisfactory**. Key policy decisions were implemented including as indicated under 4.2 (major developments) above. These initiatives helped the Government not only to hold the road network during a period of dwindling external funding to the sector but also reduced the rate at which the road network would otherwise have deteriorated. Government agreement under the NCTIP to establish a National Highways Authority to manage a core road network will support the consolidation of these benefits.

#### *7.6 Implementing Agency:*

The civil works contracts were not only successfully completed on time and within the budget but also of good quality, a departure from the past in Kenya's road sector. Reacting to this, at the official launch of the completed works by the President of Kenya, the then Country Director said: *"In spite of the delay in the start up of the works, we would like to commend the MORPW, Roads Department in particular, the Contractor, Consulting Engineer for the good quality workmanship and speedy implementation of this project. It is remarkable that the reconstruction of this 150 Km section of this key transport corridor... is an example of professional teamwork that one would like to see permeating the sector"*. The decision to have two contracts, increased competition also fastens implementation. The performance of the implementing agency is rated **satisfactory**.

#### *7.7 Overall Borrower performance:*

The Borrower's overall performance is rated as **satisfactory**.

### **8. Lessons Learned**

*Policy reforms attached to an important project:* The decision by the Bank and the EU to assist the Government in rehabilitating and strengthening the Nairobi-Mombasa road as a stand-alone project but within the framework of policy and institutional reform, and development of road sector strategy was critical for the accomplishment of some difficult policy reform measures that were needed to establish an efficient and sustainable rehabilitation and maintenance program for Kenya's road network. The issues of institutional and financial reform, staff reduction and increased use of private contractors were difficult to resolve yet key to mitigate against future recurrence of financial problems that contributed to the poor state of the road network. Bank support was critical for success of the reform program.

In retrospect, the Bank's choice of the option of including institutional, policy and road maintenance financing reform was a sound one. The THSP did not take off due to macroeconomic concerns including poor economic governance, malfunctioning of public institutions, fiscal and monetary indiscipline, poor public expenditure management and unprecedented developments in the aviation sector. Had the reform agenda been excluded under the project, perhaps the positive institutional and policy reform developments recorded so far may not have occurred at this point in time. Therefore a critical assessment of the outcomes (and what is at risk) of possible choices is key before deciding to support or not a particular project.

Furthermore, though the magnitude of the support under this project was comparatively modest in the context of the Kenya's road sector needs, the poor state of this key transport corridor (more or less in an emergency situation) solicited strong Government's commitment to implement the project. This provided an opportunity to jointly implement some critical institutional/policy changes recognised as important to address underlying fundamental recurring problems of the sector. In this case, was advisable to reach agreement and commitment with the Borrower on upfront irreversible actions as the overall macro-economic history manifested weak commitment to reform. The experience for this case is that, (i) Borrowers seem to exhibit strong incentives to implement policy reforms associated with key projects, and (ii) confronted with limited choices and scope for possible assistance, Borrowers tend to make some prudent sustainable decisions.

The introduction of the fuel levy and increased domestic road maintenance funding during a period of declining external funding to the roads sector attests to this.

*Civil Service Project Management Capacity:* The project was implemented by MORPW staff and project activities integrated within the ministry. The implementation lesson indicate that there are strong professional skills within the road sector to design and manage projects provided that the administrative framework supported with effective leadership is in place in which staff would operate. For example, the experience with the effective implementation of civil works contracts sharply contrasts with that of the studies for which the team was not fully empowered.

*Technical:* Packaging of contracts should take into account the follow on implementation realities and practicability of ability to effectively deliver a particular task. For instance, undertaking the road inventory and condition survey, the consultants were depended on the successful performance of other parties, supplier of vital equipment, vehicles and staff all under separate contracts. This did not work out well.

*Financial Management:* There is need to include a dedicated financial management function within the project technical team that will be responsible for funds flow, accounting and reporting. Payment processing procedures should be simplified and separated from supervisory and monitoring functions. Commitment to timely provision of counterpart funding should be monitored during quarterly FMR reviews and timely corrective action taken.

## **9. Partner Comments**

*(a) Borrower/implementing agency:*

### **Comments from Ministry of Roads & Public Works**

#### **1. Development Of Project Objective**

Development of Project objective was well designed. Due consideration was given to the state for infrastructure and those factors affecting it.

#### **2. Project Objectives And Achivement**

Project objectives were achieved satisfactory taking into consideration the outputs:

##### **(i) Civil Works**

The section of the road between Mtito Andei – Bachuma Gate was completed in time and at budget. It has hereby reduced travel time as well as vehicle operating cost drastically. Expansion bridges improved road safety along the road.

**(ii)** Design studies for other section of the road were completed in time. This enabled the subsequent

Northern Corridor Transport Improvement Project (NCTIP) to take off smoothly.

##### **(iii) Training**

Many staff gained knowledge on various training courses financed by the Bank.

These were particularly in the areas of Procurement Finance, Road Maintenance and Project Management. However the training programme and courses were not well defined by both parties concerned

(iv) Institutional Development

The institutional reform resulted into establishment of Fuel Levy Fund (FLF), Kenya Roads Board (KRB) and Road Works Inspectorate (RWI), thereby ensuring that Ministry of Roads and Public Works (MOR&PW) have sustainable source of funds for Road Maintenance with sound management. Establishment of RWI not only ensured technical audit of fuel heavy funded projects but also other development funded projects. The funds being generated through FLF is substantial US\$ 110 million.

These developments are not only sustainable but are irreversible given the government commitment.

(v) Road Inventory Study

This has enabled Ministry of Roads and Public Works to have road inventory together with relevant road inventory Maps which will go along way in assisting in planning development and maintenance of road network in the republic. However there is a need for a follow-on project to ensure sustainability

**3. Supervision**

Supervision by World Bank Team, both from Washington and Country Office attributed greatly towards the success of this project. The supervision was regular, focused, inclusive and proactive throughout the implementation of the project. The Team connected well with their counterparts from MOR&PW. Technical decisions regarding the project were made with due consultations. The MOR&PW Team supervising civil works were given good support by their superiors, such that decisions both technical and administrative could be made in timely manner.

**4. Factors Affecting The Implementation**

(i) Procurement

Procurement arrangement for Road Inventory studies was not properly designed as services, vehicles and other equipment were procured under different contracts. This affected negatively the output of this study. Procurement procedures were also partly to blame for the cancellation of Twinning Arrangement and Mechanical and Transport Department (MT) strategic option study.

(ii) Counterpart Funding

During the execution of Civil Works Exchequer Release was not enough causing some payments to the Contractor to delay. This resulted into substantially claim on

Interest on delayed payments as well as partial suspension of the Works. Through the effect of suspension on the overall progress of the Works was minimal.

(iii) Implementation arrangements

From the beginning of the project right up to the near end of the project, there was no specific project team responsible for overall coordination thereby impeding Implementation. It is important that at the designing stage, coordination of implementation of such project be properly defined.

**5. Lesson Learnt**

- (i) Communication through dialogue and discussion between Bank Team and Implementing Agency Team is very necessary for smooth implementation of the Project.
- (ii) There is a need for a specific Team responsible for overall coordination of the Project.
- (iii) Given the problems encountered in Road Inventory Study the Packaging of a Project need to be simple with no ambiguity and duplication. Consultant given the services should be responsible for all goods and equipment required to execute the job.
- (iv) Procurement procedures need to be simplified and understood thoroughly by both parties.
- (v) Flexibility on the side of Bank and Implementing Agencies without compromising the project objectives and quality is necessary.

**6. Overall Assessment**

The Project was successful and there was a lot of lessons learnt which will benefit the subsequent project.

*(b) Cofinanciers:*

*(c) Other partners (NGOs/private sector):*

**10. Additional Information**

## Annex 1. Key Performance Indicators/Log Frame Matrix

### Outcome / Impact Indicators:

Indicator/Matrix	Projected in last PSR <sup>1</sup>	Actual/Latest Estimate
1. Eliminating major constraint to Kenya's production by increasing pavement width on main link between Nairobi and the port of Mombasa to 7 meters and reducing road roughness to 2200mm/km with consequent reduction in vehicle operating costs.	Construction works completed on time and reduced travel time reduced by about 40%	Construction works completed on time and reduced travel time reduced by about 40%
2. Safeguarding the investment in the paved road network by the contracting of routine road maintenance to the private sector.	Piloting was dropped. GOK instead adopted the principle	Piloting was dropped. GOK instead adopted the principle
3. Improved accountability within the Ministry of Public Works and Housing by the introduction of performance auditing. Progressive increase in road maintenance funding to achieve the level required for a sustainable road sector over the implementation of the project	RWI established and fully operational. Undertakes technical audits and enhanced accountability Road Maintenance Fund established and receives Ksh. 9 billion annually from fuel levy. Amount exceed the agreed levels at appraisal	RWI established and fully operational. Undertakes technical audits and enhanced accountability Road Maintenance Fund established and receives Ksh. 9 billion annually from fuel levy. Amount exceed the agreed levels at appraisal

### Output Indicators:

Indicator/Matrix	Projected in last PSR <sup>1</sup>	Actual/Latest Estimate
Sultan Hamud - Mito Andei Road: Reconstruction along its existing alignment, & widening of the road to 7 meters, with 2 meter sealed shoulders	Construction works on-going under EU funding	On-going
Mtito Andei - Bachuma Gate Road: widening of the road to 7 meters, with 2 meter sealed shoulders	Successfully completed on time and within the budget. Savings used to widen four bridges and repair the road through Voi town (9 km)	Achieved satisfactory
Establishment of Road Works Inspectorate (RWI)	Established and fully operational	Fully operational

<sup>1</sup> End of project

## Annex 2. Project Costs and Financing

### Project Costs by Component (in US\$ million equivalent)

Component		Appraisal Estimate US\$ million	Actual/Latest Estimate* US\$ million	Percentage of Appraisal
A.	<b>Reconstruction/strengthening of Nairobi-Mombasa Road</b>			
	<i>Civil Works:</i>			
	Km 103 - 238 (EU finance)	45.9	61.61	134.2%
	Km 238 - 393 (IDA finance)	41.1	42.64	103.7%
	<i>Supervision:</i>			
	Km 103 - 238 (EU finance)	2.0	1.85	92.5%
	Km 238 - 393 (IDA finance)	2.6	1.64	63.1%
<b>Sub-Total Nairobi-Mombasa Road</b>		<b>91.6</b>	<b>107.74</b>	<b>117.6%</b>
B.	<b>Road Maintenance Strengthening</b>		<b>7.26</b>	
	Pilot Maintenance Contracts	5.1	0.00	0.0%
	Structured Learning	0.4	0.00	0.0%
<b>Sub-Total Maintenance Strengthening</b>		<b>5.5</b>	<b>7.26</b>	<b>132.0%</b>
C.	<b>Institutional Support</b>			
	Road Works Inspectorate	0.1	0.31	312.0%
	Other Institutional Support	3.2	4.94	154.5%
<b>Sub-Total Institutional Support</b>		<b>3.3</b>	<b>5.26</b>	<b>159.2%</b>
<b>TOTAL BASE COST</b>		<b>100.4</b>	<b>120.26</b>	<b>119.8%</b>
	Physical Contingencies	9.2		
	Price Contingencies	12.4		
<b>TOTAL COST (net of taxes and duties)</b>		<b>122.0</b>	<b>120.26</b>	<b>98.6%</b>

Note: Taxes and duties were estimated at US\$10.2 million at appraisal

\* Including contingencies

\*\* Contract Amounts.

### Project Costs by Procurement Arrangements (Appraisal Estimate) (US\$ million equivalent)

Expenditure Category	Procurement Method <sup>1</sup>			N.B.F.	Total Cost
	ICB	NCB	Other <sup>2</sup>		
<b>1. Works</b>	50.00 (39.50)	6.20 (3.50)	0.00 (0.00)	56.50 (0.00)	112.70 (43.00)
<b>2. Goods</b>	0.00 (0.00)	0.00 (0.00)	0.40 (0.40)	0.00 (0.00)	0.40 (0.40)
<b>3. Services</b>	0.00	0.00	5.30	2.30	7.60
<b>Consulting Services</b>	(0.00)	(0.00)	(5.30)	(0.00)	(5.30)
<b>4. Training</b>	0.00 (0.00)	0.00 (0.00)	0.30 (0.30)	0.00 (0.00)	0.30 (0.30)

<b>5. Studies</b>	0.00 (0.00)	0.00 (0.00)	0.40 (0.40)	0.00 (0.00)	0.40 (0.40)
<b>6. Repayment of PPF</b>	0.00 (0.00)	0.00 (0.00)	0.60 (0.60)	0.00 (0.00)	0.60 (0.60)
<b>Total</b>	50.00 (39.50)	6.20 (3.50)	7.00 (7.00)	58.80 (0.00)	122.00 (50.00)

**Project Costs by Procurement Arrangements (Actual/Latest Estimate) (US\$ million equivalent)**

Expenditure Category	Procurement Method <sup>1</sup>			N.B.F.	Total Cost
	ICB	NCB	Other <sup>2</sup>		
<b>1. Works</b>	42.64 (35.03)	0.00 (0.00)	0.00 (0.00)	68.87 (0.00)	111.51 (35.03)
<b>2. Goods</b>	0.03 (0.03)	0.19 (0.19)	0.00 (0.00)	0.00 (0.00)	0.22 (0.22)
<b>3. Services Consulting Services</b>	0.00 (0.00)	0.00 (0.00)	4.57 (4.57)	1.85 (0.00)	6.42 (4.57)
<b>4. Training</b>	0.00 (0.00)	0.00 (0.00)	0.08 (0.08)	0.00 (0.00)	0.08 (0.08)
<b>5. Studies</b>	0.00 (0.00)	0.00 (0.00)	1.91 (1.91)	0.00 (0.00)	1.91 (1.91)
<b>6. Repayment of PPF</b>	0.00 (0.00)	0.00 (0.00)	0.12 (0.12)	0.00 (0.00)	0.12 (0.12)
<b>Total</b>	42.67 (35.06)	0.19 (0.19)	6.68 (6.68)	70.72 (0.00)	120.26 (41.93)

<sup>1/</sup> Figures in parenthesis are the amounts to be financed by the IDA Credit. All costs include contingencies.

<sup>2/</sup> Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

**Project Financing by Component (in US\$ million equivalent)**

Component	Appraisal Estimate			Actual/Latest Estimate			Percentage of Appraisal		
	IDA	Govt.	CoF.	IDA	Govt.	CoF.	IDA	Govt.	CoF.
<b>Reconstruction/strengthening Nairobi-Mombasa Road</b>	42.80	10.00	58.80	36.67	7.61	63.46	85.7	76.1	107.9
<b>Road Maintenance</b>	3.50	3.20	0.00	0.00	7.26	0.00	0.0	226.9	0.0
<b>Strengthening Institutional Support</b>	3.70	0.00	0.00	5.26	0.00	0.00	142.2	0.0	0.0

### Annex 3. Economic Costs and Benefits

The project comprised of four main components: (a) reconstruction/strengthening of the Nairobi-Mombasa road; (b) **strengthening the monitoring and control of road maintenance activities** - pilot routine maintenance contracts; (c) **encouragement of private sector involvement in the maintenance of infrastructure**. **Of these, the only civil works component was the reconstruction/strengthening of the Nairobi-Mombasa road**, which forms part of the Trans Africa Highway and serves not only Kenya but also landlocked countries like Uganda, Rwanda, Burundi, Democratic Republic of Congo and the Southern Sudan.

Construction of the IDA financed section, Bachuma Gate – Mtito Andei (150 Km) commenced in 1997 and was completed in 2001. Construction of the EU funded section Km 103 - 238 (Sultan Hamud - Mtito Andei) started in April 2003 and about 30 km had been constructed and handed over to the Government at the time of preparation of this ICR.

The economic analysis for this ICR focuses on the civil works for the reconstruction/strengthening of the IDA financed section, Bachuma Gate – Mtito Andei (150 Km). Under the project, the road was widened to accommodate a 7.30m wide carriageway with 2.00m wide sealed shoulders. The new pavement was designed and constructed to carry up to 40 million cumulative standard axles over the 15 years design period. The works further included the construction of a new highway bridge over Tsavo River, pedestrian bridge over Voi River, construction of new culverts and the general improvement of the drainage facilities.

This analysis considers a case of improved road over a time period of 15years and thus defines the Base Case as the scenario in which the following intervention measures shall be taken on the road project:

Full Maintenance on the project road, which will consist of:

- i) Edge Break area 10m<sup>2</sup>/km
- ii) Ensure there are no potholes, i.e. where every pothole that may appear shall be repaired
- iii) Do a Crack Seal once the road has 15% cracks,
- iv) Carry out Routine maintenance once every year.

These assumptions were derived from the prevailing road condition as per the results of a Road Inventory and condition survey that was carried out on the road in the year 2003. The survey revealed the following:

Number of Potholes	0
Crack Area	0
Ravel Area	0
Bleed Area	0
Edge break Area	0
Average Rut Depth	0
Centerline Condition	Good
Edge line Condition	Good
Shoulder Condition	Good

The current Average IRI for the road project is

Mtito Andei - Voi	1.855
Voi – Bachuma Gate	1.691

### Approach to Economic Analysis of the Project

The potential economic benefits of rehabilitation and upgrading the road project derive from:

- Savings in vehicle operating cost
- Savings in maintenance expenditures
- Timesavings to passengers and freight
- Reduction in the number and severity of accidents
- Residual value of the road structure at the end of the evaluation period
- Induced economic development, such as industrial, agricultural or tourist activities that were previously constrained by poor access.
- Social benefits arising from the increased mobility of the population and improved accessibility to health, education and other services.

The Economic Analysis of the project has been performed using HDM 4 model and the maintenance costs derived for input into the HDM Model. The costs include routine maintenance, patching, resealing, overlay and reconstruction. These costs were computed using guidelines from the Ministry's 1999 contract rates. The computed costs are shown in the table below:

<b>Operation</b>	<b>Units</b>	<b>Economic</b>	<b>Financial</b>
		<b>Cost \$</b>	<b>Cost \$</b>
Reconstruction	Km	253,200	261,000
Overlay	m2	9.59	11.84
Resealing	m2	1.73	2.13
Drainage Maintenance	Km	223.82	276.32
Edge Repair	m2	7.53	9.30
Patching	m2	15.07	18.61
Crack sealing	m2	1.15	1.42
Routine Maintenance	Km/year	895	1,105

### Projected Savings in Accident Costs

Making an estimate of potential accident savings is shadowed with some difficulties, hence the reference to international experience and reports. The Manual on Road Project Appraisal (ODA) reports that construction of a dual carriageway carrying upto 20,000 vpd can reduce all injury accidents by up to 50% and fatal and serious accidents by about 25%. Even an increase in the width from 5 to 7m might reduce accidents rate by 40%. The Ministry's Manual on accident prevention using low cost engineering countermeasures (1990) demonstrates that widening a

carriageway from 6.5m without shoulders to 7m with shoulders can reduce accidents by 28-40% depending on other environmental factors.

### **Traffic Data**

For the purpose of this evaluation, the traffic data was taken from the traffic database carried out by consultant, M/s BKS on the road in the year 2001. The traffic data used in the analysis is as follows

Road Section	2001 ADT	Car	Matatus	LGoods	MGoods	HGoods	Buses
Mtito Andei - Voi	1890	16.2%	8.4%	13.8%	8.8%	47.2%	5.7%
Voi - Bachuma Gate	2250	13.6%	12.7%	13.6%	8.0%	45.2%	7.0%

Based on the foregoing methodology and assumptions, the estimated net present value and internal rates of return are as follows: FYRR 16.86%; NPV US\$ 48.9 million; and ERR 28.7%. A full cost-benefit analysis of the capital investment input in the improvement of the Mtito Andei - Bachuma Gate section was undertaken at appraisal using HDMIII and the results of the analysis were as follows: FYRR 20.6 %, NPV US\$ 138.2 million, and ERR 43.9 %. The results imply that the project was economically viable both at appraisal and after implementation. The lower result of ERR after improvement, may be explained by the fact that the actual capital costs of Ksh. 3.04 million (equivalent to US\$ 54.2 million @ US\$ 1 = 56.1) at completion is 50 % higher than the estimated cost of Ksh. 1.975 million (equivalent to US\$ 35.9 million @ US\$ 1 = 55 Ksh) assumed at appraisal. Further, actual capital expenditures were incurred from 1997 to 2001 compared to 1996 to 1998 envisaged at appraisal.

The data used in the analysis is replicated in Table 3.1 below.

**ECONOMIC EVALUATION : MITTO ANDEI - BACHUMA GATE**

Economic Costs : Ksh 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	1996	13.608									-13.608
1997	1997	246.446									-246.446
1998	1998	727.547									-727.547
1999	1999	1309.342									-1309.342
2000	2000	726.941									-726.941
2001	2001		11.572	5359.423	118.679	5489.674	10.402	4298.424	97.490	4406.316	1083.358
2002	2002		10.410	5402.475	120.859	5533.744	10.402	4301.550	97.508	4409.460	1124.284
2003	2003		10.402	5342.73	117.837	5470.969	10.402	4303.374	97.517	4411.293	1059.676
2004	2004		11.580	5374.904	119.465	5505.949	10.402	4305.430	97.529	4413.361	1092.588
2005	2005		40.410	5417.295	121.617	5579.322	10.402	4307.872	97.541	4415.815	1163.507
2006	2006		10.402	5356.068	118.509	5484.979	10.402	4310.904	97.555	4418.861	1066.118
2007	2007		11.587	5387.665	120.114	5519.366	10.402	4315.104	97.570	4423.076	1096.290
2008	2008		10.410	5429.481	122.241	5562.132	10.402	4321.020	97.588	4429.010	1133.122
2009	2009		11.047	5367.012	119.064	5497.123	10.402	4329.830	97.606	4437.838	1059.285
2010	2010		10.948	5398.104	120.647	5529.699	10.402	4343.829	97.629	4451.860	1077.839
2011	2011		10.410	5439.414	122.752	5572.576	10.402	4367.745	97.660	4475.807	1096.769
2012	2012		10.402	5375.902	119.516	5505.820	10.402	4403.170	97.700	4511.272	994.548
2013	2013		11.627	5406.545	121.079	5539.251	10.402	4442.384	97.753	4550.539	988.712
2014	2014		10.410	5447.404	123.162	5580.976	10.402	4477.433	97.809	4585.644	995.332
2015	2015		10.402	5383.013	119.879	5513.294	10.402	4513.334	97.822	4621.558	891.736

3023.884

	NPV 12%	IRR %
Kshmm	2743.75	28.7
US\$m	48.9	

## Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating		
	Month/Year	Count	Specialty	Implementation Progress	Development Objective
<b>Identification/Preparation</b>					
08/93 This project was initially a component of the Third Highway Sector Project	4	Transport Economist (TTL); Sr. Financial Analyst; Sr. Railway Engineer; Port Engineer			
<b>Appraisal/Negotiation</b>					
06/20/1994	4	Sr. Transport Economist (TTL); Road Engineer; Road Maintenance Consultant; Road Design Consultant			
03/19/1995	3	Sr. Transport Economist (TTL); Road Engineer (2)			
<b>Supervision</b>					
10/25/1996	2	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1)			
03/08/1997	4	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); ENVIRONMENTAL SPECIALIST (1); RURAL ROADS EXPERT (1)			
07/05/1997	3	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); RURAL ROADS EXPERT (1)			
02/23/1998	3	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); OPERATIONS OFFICER (1)	S		S
09/20/1998	4	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); OPERATIONS OFFICER (1); FINANCIAL MANAGEMENT EXPERT			
02/08/1999	2	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1)			
11/15/1999	3	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); OPERATIONS OFFICER (1)	S		S
04/17/2000	2	ROAD ENGINEER (1);			

<b>ICR</b>	05/06/2000	3	OPERATIONS OFFICER (1) SR. TRANSPORT ECONOMIST (TTL) (1)		
	10/18/2000	3	SR. TRANSPORT ECONOMIST (TTL) (1); ROAD ENGINEER (1); ECONOMIST (1)	S	S
	04/24/2001	2	SR. TRANSPORT ECONOMIST (TTL) (1); ECONOMIST (1)	S	S
	04/09/2002	3	OPERATIONS OFFICER (TTL) (1); SR. TRANSPORT ECONOMIST (1); ROAD ENGINEER (1)	S	S
	09/30/2002	3	OPERATIONS OFFICER (TTL) (1); SR. TRANSPORT ECONOMIST (1); ROAD ENGINEER (1)	S	S
	05/30/2003	3	OPERATIONS OFFICER (TTL) (1); HIGHWAY ENGINEER (1); PROCUREMENT SPECIALIST	S	S
	12/17/2003	4	OPERATIONS OFFICER (TTL) (1); HIGHWAY ENGINEER (1); PROCUREMENT SPECIALIST (1); FINANCIAL MANAGEMENT SPECIALIST (1)		
	08/16/2004	7	OP. OFFICER (TTL) (1); HIGHWAY ENGINEER (1); FM SPECIALIST (1); PROCUREMENT SPECIALIST (1); OPERATIONS ANALYST (1); TEAM ASSISTANT (1); CONSULTANT (1)		

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation	7.5	20.5
Appraisal/Negotiation	34.9	130.1
Supervision	220.0	577.2
ICR		
Total	262.4	727.8

Note: Supervision includes time spent on the preparation of the ICR.

## Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	<u>Rating</u>				
<input type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Physical</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA

### Social

<input type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Private sector development</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA

## Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

### 6.1 Bank performance

#### Rating

- |                                      |                          |                                    |                         |                          |
|--------------------------------------|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input type="checkbox"/> Lending     | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Supervision | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Overall     | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

### 6.2 Borrower performance

#### Rating

- |  |                          |                                    |                         |                          |
|--|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input type="checkbox"/> Preparation                           | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Government implementation performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Implementation agency performance     | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input type="checkbox"/> Overall                               | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

## **Annex 7. List of Supporting Documents**

- Pre-Appraisal mission terms of reference, Aide-Memoire and Back to Office reports.
- Appraisal mission terms of reference, Aide-memoire and Back to Office report.
- Staff Appraisal Report dated November 8, 1995
- Legal Documents and amendments
- Project Status Reports (PSRs)
- Supervision mission Aide-Memoires
- Progress Reports

