

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/265066196>

# Road Infrastructure Policies in Kenya: Historical Trends and Current Challenges

## Article

---

CITATIONS

20

---

READS

1,340

### 1 author:



[Wilson Wasike](#)

The National Treasury of Kenya

**11** PUBLICATIONS **63** CITATIONS

SEE PROFILE

# **Road Infrastructure Policies in Kenya: Historical Trends and Current Challenges**

Wilson S.K. Wasike

*Infrastructure and Economic Services Division*

*Kenya Institute for Public Policy Research and Analysis*

**KIPPRA Working Paper No. 1**

*April 2001*

---

## **KIPPRA in brief**

The Kenya Institute for Public Policy Research and Analysis (KIPPRA) is an autonomous institute whose primary mission is to conduct public policy research, leading to policy advice. KIPPRA's mission is to produce consistently high quality analysis of key issues of public policy and to contribute to the achievement of national long-term development objectives by positively influencing the decision-making process. These goals are met through effective dissemination of recommendations resulting from analysis and by training policy analysts in the public sector. KIPPRA therefore produces a body of well-researched and documented information on public policy, and in the process it assists in formulating long-term strategic perspectives. KIPPRA serves as a centralized source from which the government and the private sector may obtain information and advice on public policy issues.

Published 2001

© Kenya Institute for Public Policy Research and Analysis

Bishops Garden Towers, Bishops Road

PO Box 56445, Nairobi, Kenya

tel: +254 2 719933/4

fax: +254 2 719951

email: [admin@kippra.or.ke](mailto:admin@kippra.or.ke)

### **The Working Paper Series**

KIPPRA acknowledges generous support by the European Union (EU), the African Capacity Building Foundation (ACBF), the United States Agency for International Development (USAID), the Department for International Development of the United Kingdom (DfID) and the Government of Kenya (GoK).

---

## Abstract

*Development and maintenance of physical infrastructure are prerequisites for rapid economic growth and poverty reduction, as they influence production costs, employment creation, access to markets, and investment. This paper reviews and analyses roads infrastructure policies in Kenya over the post-independence period. The paper has six sections. After the introduction, it presents the theoretical and policy framework for roads infrastructure, focusing on the phases of roads development, structure for roads administration and provision, basic objectives of roads policies, and strategies for sustainable transport policies. The third and fourth sections deal with the trends in and the impact of the Kenya road policy. A critique on the policy framework and conclusions are presented in the penultimate and last sections.*

*An inventory of the Kenya road policy framework over time shows that i) the main policy initiatives during the first post-independence decade involved provision of infrastructure by the public sector and development of rural roads using cess funds from sale of rural output, ii) rural access and minor roads programmes have characterized the Kenya road policy since the second decade, and iii) several policy reforms for road infrastructure development typify the third and fourth decades. The landmarks in the road policy evolution include the formation of the Kenya Roads Board, the introduction of a road maintenance levy fund and axle-load limits, and moves towards increased private-sector participation in all facets of road service delivery.*

*The impact of Kenya's roads policy is demonstrated by the size of the roads network, which is fairly well developed. However, the network's operating condition has suffered from inadequate maintenance, repair and rehabilitation (MR&R), and the fragmentation of the institutional framework within which it is managed.*

*Clearly, the overall road policy framework is not integrated to promote a positive impact and generate cumulative positive externalities. It does not provide a balanced approach to strengthening and rehabilitating existing assets, on one hand, and constructing new roads and bridges, improving low-grade sections and widening roads to four lanes, on the other. Moreover, there have been unexplained reversals and weak implementation of specific policy strategies; little progress towards instituting legal and regulatory frameworks for private-sector participation; and no privatization strategy, such as for unbundling viable roads into build-operate-transfer concessions for awarding through competitive bidding.*

*Future policy initiatives should address the questions of integrated transportation, funding, commercialization, sharing and disbursement of road funds, vehicle weight and size, MR&R through fiscal decentralization and road asset management, and private sector participation. There is also need for further research to inform Kenya's future strategic policy directions, which imposes a broadening set of performance demands on the roads system.*

---

## Acknowledgements

I would like to thank the following individuals for providing useful comments on this paper: Geoffrey West, economic adviser to the Ministry of Finance and Planning; Samuel Oluoch Helu of the Ministry of Information, Transport and Communications; and my colleagues at KIPPRA. However, I remain responsible for any errors or shortcomings in the paper.

## Abbreviations

BOT	build operate transfer principle
COMESA	Common Market for Eastern and Southern Africa
DDCs	District Development Committees
DFRD	District Focus for Rural Development
ENEP	El-Niño Emergency Programme
KMDP	Kenya Market Development Programme
KRB	Kenya Roads Board
KRSA	Kenya Road Safety Authority
KTDA	Kenya Tea Development Agency
KUTIP	Kenya Urban Infrastructure Programme
LPVR	least-present-value of revenue auction/concession
MoITC	Ministry of Information, Transport and Communications
MoRPW	Ministry of Roads and Public Works
MR&R	maintenance, repair and rehabilitation
MRP	Minor Roads Improvement and Maintenance Programme
NCTA	North Corridor Transit Agreement
NMT	non-motorized transport
NRSP	National Roads Strategy Plan
O&M	operation and maintenance
PFP	policy framework paper
PPI	private-sector participation in infrastructure
RARP	Rural Access Road Programme
RMLF	Road Maintenance Levy Fund
RoK	Republic of Kenya
RROW	roads rights-of-way
RTPCs	rural trade promotion centres
SIDA	Swedish International Cooperation Development Agency
SME	medium- and small-scale enterprises
SPRP	Special Purpose Roads Programme
SRDP	Special Rural Development Programme

---

## Contents

1	Introduction	1
2	Theoretical and Policy Frameworks	3
2.1	Phases of roads development	3
2.2	Factors in road network management	6
2.3	Basic objectives of roads policies	12
2.4	Policy framework for sustainable transport	18
3	Trends in the Kenya Road Policy	21
3.1	The first decade, 1963–1972: the era of rapid economic growth	22
3.2	The second decade, 1973–1982: the period of continuous decline	24
3.3	The third and fourth decades, 1983–now: era of structural adjustment and reforms	29
4	Policy Performance and Evaluation	39
4.1	Fairly developed roads assets	39
4.2	Disjointed institutions	42
4.3	Deficient maintenance	43
4.4	Rural access and agricultural productivity	47
4.5	Environment and safety	49
5	Critique of the Policy Framework	49
5.1	Common policy weaknesses	50
5.2	Continuity, implementation and trade-offs	51
5.3	Road asset maintenance strategies	54
5.4	Private-sector participation	54
5.5	Cess and fuel levy as road user charges	55
5.6	Poverty alleviation and the environment	56
5.7	Fiscal decentralization and road funds	57
6	Conclusions	58
6.1	Policy directions	58
6.2	Strategic research directions	65
	References	68

---

## List of tables

Table 1	Kenya's road policy reform directions and the timetable of implementation	31
Table 2	Existing road user charges, efficiency charges, and estimates of optimal road user charges	35
Table 3	Comparison between RARP and conventional road construction, 1977–1978	37
Table 4	Structure of Kenya's transport service sector	40
Table 5	Road-to-population ratio for selected African countries	40
Table 6	Kilometres of roads by type and classification, 1977–1999	41
Table 7	Institutions responsible for road maintenance in Kenya	42
Table 8	Paved primary roads for selected African countries	47
Table 9	Number of traffic accidents due to road transport, 1972–1997	50

---

# 1 Introduction

Development and maintenance of physical infrastructure are key to rapid economic growth and poverty reduction. Production costs, employment creation, access to markets, and investment depend on the quality of infrastructure, especially transport. Road transport is the most widely used means of transportation in Africa. The fragmentary nature of the railway system and the limitations imposed on the scope of inland water transport by geographical factors mean that transport of people and freight by rail and inland waterways has to be supplemented, usually by road transport over long distances.

An accurate assessment of the development of road networks in African countries is made difficult by the lack of reliable statistical information. This makes it necessary to employ for analytical purposes surrogate indicators such as aggregate lengths—classified according to operating conditions—instead of standard indices such as tonne per kilometre or passenger per kilometre. The data available show that Africa had approximately 311,184 km of paved roads in 1996, half of them in poor condition:

With the exception of Mauritius and the North African countries of Algeria, Egypt, Morocco, and Tunisia, paved roads account for less than 50 per cent of the road network in Africa. Indeed, paved roads in sub-Saharan Africa account for less than 17 per cent in 1996, with many countries falling below the average. About 57 per cent of the roads in North Africa were paved compared to 25 per cent in South Africa and 10.2 per cent in Central Africa. ... Road density per km<sup>2</sup> is generally much lower than those of Asia and Latin America (ADB 1999:122).

Traditionally in most African countries road building has been given a higher priority than road maintenance, with scant attention to the imperatives of recurrent costs of road management once the road has been constructed. In a study on road deterioration in developing countries, Harral and Faiz (1988) estimated the annual maintenance expenditure required to prevent road deterioration. On average, expenditures for 1986–1990 varied from 0.2% of GDP for countries in East Asia and the Pacific to 1% for countries in West Africa. They estimated that the backlog of maintenance work varied from 1.6% of GDP in East Asia and the Pacific to 3.5% in South Asia.

The poor condition of paved roads, in effect, speaks to the low level of maintenance in the individual countries. And, as the road networks have expanded, their institutional and financial burden has tended to increase much more rapidly than the national budget could cater for, especially in times of socioeconomic crisis. Many countries are not able to meet maintenance costs from budgetary resources, let alone to finance investment in new trunk-road systems that meet stipulated requirements and standards according to volume and weight of traffic. Lack of maintenance has left over 50% of the paved roads in Africa in poor condition, and the condition of more than 80% of the unpaved main roads would be



---

considered just fair. The case of rural feeder roads is even worse: at the end of 1999, up to 85% of them were estimated to be in poor condition with accessibility limited to dry seasons in most cases. The inadequate and poorly maintained rural feeder roads connecting villages and farming areas with each other and with market centres is a major gap in rural transport in many countries.

Road networks have not kept pace with growth in demand: kilometre lengths are limited and construction standards are often low. And few cities have been able to keep pace with road network needs. Although the construction of regional road networks on a subregional basis is crucial for economic cooperation and integration, a real regional African road system does not exist as yet, and a large number of national road networks are not coordinated effectively. As agriculture and industry expand, and as national and subregional economies develop, existing road networks will require tremendous extension and improvement in quality. In particular, road links between nations will have to be strengthened to meet the large-scale demand for intra- and interregional goods traffic. In many African countries all of this requires heavy capital investment and expenditure.

The transport sector in Kenya comprises a road network with 150,000 km of roads and 350,000 vehicles, a single-track railway running from Mombasa to Uganda, a major seaport at Mombasa, small ports at Lamu and Malindi, a ferry service to Uganda, an oil pipeline from Mombasa to Kisumu via Nairobi and Eldoret, four international and many small airports, and three inland container depots (IEA 1998). With a 34% share in the total transport sector in 1998, road transport has the highest contribution to national output among the transport systems. It is followed by air transport, with 25%, and water transport, with 16% (Ikiara et al. 2000). Considering that this level of performance was achieved over a period of deficient road maintenance, it is obvious that the subsector—and by implication the road infrastructure policy—holds the potential for rapid economic growth and poverty reduction through its influence on production costs, employment creation, access to markets, and investment (Howe and Richards 1984; van de Walle 1996; RoK 2000a).

The objective of this study is to examine the nature, rationale and performance of major roads and road transport policies in Kenya over the post-independence period, highlighting major shifts and continuities in policy strategies.

The paper, which is intended as a background for further policy research and analysis, has six sections. Section 2 develops conceptual and policy frameworks on the link between roads infrastructure and road transport and economic development. Section 3 inventories the trends in Kenya's road policy over the post-independence period. Section 4 is an evaluation of the performance of the road policy in terms of stock of assets, network condition, institutional and management framework, impact on rural access and agricultural

---

productivity, and externality effects. Section 5 is composed of a critique of the Kenya road policy framework, including challenges for the ongoing reforms. Section 6 concludes and makes some recommendations.

## **2 Theoretical and Policy Frameworks**

### **2.1 Phases of roads development**

The productivity, welfare, and security of both rural and urban people are greatly influenced by the level of infrastructure development in their communities and the infrastructural links to district, provincial, and national centres of administration and commerce. Infrastructural services are social overhead capital facilities and activities that share technoeconomic features (such as economies of scale and spillovers from users to nonusers) and enhance productive capacities of firms (within agriculture, and non-agricultural industries) and households.

The services provided by infrastructure are known as public inputs, public intermediate goods, or collective factors of production. They are not part of individual utility functions, as are public goods.<sup>1</sup> Rather, these inputs enter firm and household production functions, and they do so in a collective manner. Broad examples include public infrastructural services (such as public utilities, public works, and other transport sectors)<sup>2</sup> and the provision of information. Clearly, such commodities are important, and there has been substantial empirical investigation of their impact (for example, Aschauer 1989; Lynde and Richmond 1992; Shah 1992). Focusing on roads, the largest component of public capital, Fernald (1999) explored the interpretation of the positive correlation between infrastructure and productivity.

Different kinds of infrastructure have in common a set of activities, each with somewhat distinct institutional requirements: design of facilities and supporting activities, construction, operation, and maintenance. In infrastructural development, these are

---

<sup>1</sup> Feehan (1998) develops a theoretical treatment of optimal provision of public inputs that parallels the theory of public goods. And using a simple, static, neoclassical general equilibrium model, he performs a decomposition of the beneficial impact of a public input and examines the marginal social cost of a public input.

<sup>2</sup> Public utilities relate to electricity, telecommunications, piped water, piped gas, sanitation, sewerage, and solid waste collection and disposal. Public works include roads and major dam and canal works for irrigation and drainage. Urban and interurban railways, urban transport, ports and waterways, and airports are the other transport sectors (World Bank 1994: 2).

---

generally conceived as constituting a fixed sequence (phases). However, in practice maintenance and operation may occur concurrently, and redesign, rehabilitation, or repair may be conducted when necessary. The following is a brief description of the phases of infrastructure development with respect to roads and bridges.

### ***2.1.1 Design and construction***

Design is a highly technical process requiring highly trained staff, especially when the technology involved is complex (for example, the installation of a large hydroelectric generating facility or an advanced telecommunications network). The basic design is apt to be successful if presented and adapted through a process of consultation and active stakeholder participation at all stages. Indeed, there is increasing evidence that local involvement in design and construction of rural infrastructure leads to better design and better subsequent performance. This is most clearly seen with domestic water supply projects (USAID 1982; Williamson 1983). An expanding amount of literature suggests that design decisions and choice of technology for rural roads are more appropriate when made at the lower levels. There is also more incentive for communities to take responsibility for the construction phase if they have had significant involvement in the design phase (Edmonds 1980).

The role of different levels of institutions in construction is a function of the technological requirements of the task. Farm-to-market roads, which have less-exacting standards and can draw on techniques already mastered by local people, are more readily undertaken by local institutions than are inter-city highways (Uphoff 1986). By and large, however, the local government, other local institutions and private enterprises have a critical role in infrastructural development because construction activities rely on local materials and familiar technologies.

### ***2.1.2 Operation and maintenance***

Operation and maintenance each has its particular activities, although they are usually grouped together in language and practice as 'O&M'. Central government agencies often concede O&M tasks to be 'suited' to local institutions. However, one of the main frequent conclusions from literature is that the willingness and ability of local institutions to discharge O&M responsibilities depend in large part on their involvement in the design and construction of the facility concerned (see, for example, USAID 1982). So, simply handing over O&M responsibility to local institutions as in a 'turnkey project' is apt to undermine the maintenance of the infrastructure. The critical variables, therefore, are how much the community understands and values the benefits of the infrastructure in question. This is why stakeholder participation in design and construction is important, first in ensuring that

---

the infrastructure is needed and supported, and second in giving people a sense of ownership of and responsibility for the facility.<sup>3</sup>

In sum, there are no good alternatives to local management of road infrastructure. The principle of comparative advantage proposes that all parties concentrate on doing what they can do best or avoid what they do worst, in order to contribute the greatest total benefit. Central government administration of roads at the local level is seldom the best way to use scarce financial and management resources.

Most considerations affecting the role institutions play in maintenance (encompassing maintenance, repair and rehabilitation—MR&R) are similar to those for construction. However, some MR&R factors deserve separate discussion. MR&R ranges from continuous (routine) to periodic (ad hoc or planned) activities. The former are often undertaken as ‘preventive maintenance’, which is important but is commonly neglected.<sup>4</sup> The latter deal with improving repair, rehabilitation or, if the deterioration is substantial, reconstruction, which may amount to deferred maintenance.

Some forms of physical capital, such as bridges, need fairly continuous attention because any failure they suffer disrupts the working of the system and its provision of a crucial good or service. Others, such as roads and irrigation systems, are more subject to gradual deterioration and thus are more amenable to periodic maintenance. Infrastructure that needs routine servicing must have institutional support, whether from national or local institutions.

Three conditions determine how well any institution will carry out MR&R responsibilities, ranging from preventive maintenance to repair (Uphoff 1986): how *perceptible* is the deterioration of the function and the need for restoring or preserving it in adequate service; how *clearly fixed* is the responsibility for dealing with deterioration; and how *empowered* are those affected by the deterioration.

An illustration of how these conditions determine the efficiency with which MR&R responsibilities are executed are provided by comparing factors related to the provision of roads and rural electricity:

---

<sup>3</sup> Hamilton et al. (1981) reported a case in Honduras where agricultural cooperatives did a good job maintaining access roads in their areas. The members depended on the roads for sale of their crops, thus they could see evident payoffs from good road operation and maintenance.

<sup>4</sup> Preventive maintenance should be a concern for all of institutions dealing with infrastructure. A USAID study (1982) suggested that the lack of preventive maintenance is the major cause of failure of water supply systems in developing countries.

- 
- Road deterioration is usually quite incremental, unlike interruption or reduction of electricity supply. While vehicles can usually operate on a deteriorated road, electrical appliances may be damaged by reduction or fluctuation of current and will stop completely when the supply is cut off.
  - Responsibility for a road may rest with a highway or public works department, but maintenance delays can be blamed on different people at different levels. When an electricity generator fails, responsibility for this is easy to pin on one person—the supervising engineer or technician—since the problem is usually associated with a single piece of equipment.
  - It is likely that on the average electricity users are more influential than road users (unless the road is a thoroughfare frequently used by a senior official). Businesses whose equipment stops or is damaged by power failure are usually in a better position than are road users to demand quick repair and to penalize the offending person or institution.

Local institutions are more likely to be charged with MR&R responsibilities for activities whose MR&R needs can be easily measured or specified, where responsibility can be placed on one person or a few people, and where influential people are inconvenienced or injured when MR&R is neglected.

## **2.2 Factors in road network management**

### ***2.2.1 Road classification***

Roads are usually classified into three levels: i) national or primary roads connecting capital cities, which serve as the main linkages to other countries, the sea, and other strategic points; ii) departmental, provincial, regional or secondary roads connecting regions within the country; and iii) municipal, local and tertiary roads connecting towns within one province. Tertiary roads are further divided in rural and urban roads. Practically all countries have a similar classification system. This paper focuses mainly on primary and secondary networks.

### ***2.2.2 Management tasks***

Management tasks for road networks can be grouped into four categories: i) planning road investments—including defining and prioritizing future network requirements—reclassifying road networks, and evaluating operational tasks; ii) rehabilitating and construction tasks, including engineering design, contracting, and supervising works; iii) operation and maintenance; and iv) formulating policies and regulations.

---

### ***2.2.3 Financing mechanisms***

Financing mechanisms are usually limited to three options: i) budgetary resources, including block grants, matching grants and earmarked resources; ii) road funds financed through the assignment of user charges, mainly fuel tax collections; and iii) tolls. These can be combined in various ways depending on the management task and the road level.

### ***2.2.4 Levels of government***

Basically, three levels of government are involved in the roads sector, although there might be variations in each country: i) the national government, which for road management purposes is usually represented by a transport or communications ministry, and also by autonomous and semi-autonomous agencies; ii) the departmental or provincial government, which might have either a road division within its administrative structure or a separate but subordinate road agency, and iii) the municipal government, whose road arrangements vary depending on the size of its jurisdiction.

### ***2.2.5 Political structure of the country***

Road network management schemes depend to a large extent on the political structure of a country. ‘Centralized’ countries do not have more than a deconcentration of network management tasks, notably operations and maintenance; planning, regulation and financing remain with the central government. Examples are Chile, Peru and most Central American and Caribbean countries. This system is favourable for small countries, locations where the population is concentrated in a small area, or where there is unequal distribution of skills.

A variety of schemes exist in ‘decentralized’ countries depending on the level of political autonomy. Countries with moderate degrees of political autonomy usually have decentralized control over the departmental network but full central control over the national network. An example is Colombia in Latin America.

In countries with a ‘federal structure’, the departmental network is the responsibility of the provinces, states or departments. O&M, rehabilitation, and construction functions pertaining to the national network might also be fully decentralized, with the central government maintaining the planning, financing and regulation functions. Argentina, Brazil and the USA are examples of countries that use this scheme.

### ***2.5.6 Decentralized and privatized road provision***

Minimizing costs is considered essential in optimizing road service delivery. Road administration and management refers to the functions of road planning, selection, and management. Institutional arrangements—including decentralization and privatization—determine the degree to which costs are minimized.

---

Decentralization is a broad concept encompassing the transfer of responsibility for planning, management, and resource generation and allocation from the central government and its agencies (Rondinelli et al. 1983: 13).<sup>5</sup> Humplick and Moini-Araghi (1996) present a conceptual framework for analysing links between decentralization and road service delivery. First, in considering roads decentralization, it is important to distinguish among the various types of decentralization. To ensure proper assignment of responsibilities for road works, activities will be allocated to entities to which they are suited depending on the technology and type of resources used. In this respect, the activities will be categorized into three groups: i) decentralization of construction, which requires heavy equipment and machinery and lump-sum and large resource allocations; ii) decentralization of maintenance operations, which may be labour or equipment based, but in general requires fewer resources periodically; and iii) administrative decentralization, which may serve as a measure of how decentralized the functions are because it concerns the organization and management of road activities.

This decentralization scheme is associated with the phases of road development. As a matter of fact, the basis for the distinction between construction and maintenance activities derives from Oates' (1972) definition of what determines which system—centralized or decentralized—will be adopted in the provision of a public good: mainly the technical character of the good and the diversity in individual preferences for the good. Compared with maintenance, construction activities are more technical in nature, requiring more coordination and complex technology. Hence, in the absence of possibilities for private provision through competitive contracting out, economies of scale savings may be realized if construction activities are centrally provided through force account.<sup>6</sup> This may be the reason why more services are contracted out to the private sector when service provision responsibilities are decentralized, since it is difficult for the lower levels of government to realize economies of scale savings (see Lopez-de-Silanes et al. 1995 for empirical evidence of this effect in the USA).

The fact that individual preferences for road conditions vary would suggest potential savings in meeting the diversity of local demands if decentralized systems of maintenance

---

<sup>5</sup> The concept could take various forms. Administrative responsibilities could be redistributed within the central government (*deconcentration*). Decision-making and management authority for specific functions could be delegated to semi-autonomous organizations (*delegation*). Authority could also be transferred to autonomous and independent units of the district or facility levels, with the supervisory power and financial role retained by the central government (*devolution*). Lastly, functions may be transferred from the central government to non-governmental institutions (*privatization*).

<sup>6</sup> When construction activities are contracted out to the private sector, there the question of managing the contracts arises. This requires capacity and skills in procurement and supervision of civil works, which may be better provided centrally in some cases.

---

were adopted.<sup>7</sup> According to Buchanan and Tullock (1962), resource costs of administrative activities in decentralized systems would differ from those in centralized ones, and would be captured by the level of decentralization of administrative functions.

Drawing on analyses of experiences with decentralization in eight countries, a longitudinal analysis over 25 years in Korea, and vertical and horizontal analysis across states and local governments in Germany, Humplick and Moini-Araghi (1996) studied how decentralized road provision relates to efficiency of service delivery or performance. To measure performance, they used the extended double-cost approach. They distinguished between two categories of costs: i) *resource costs*, which are simply the costs of provision, administration, and management of roads (input costs), and ii) *preference costs*, which are defined as costs incurred because of insensitivity to local demand for road services. In line with economic theory, a suitable social objective is to minimize total cost, which is the sum of preference costs and resource costs. The analysis recognized that different *levels of effort* can be applied to achieve the same level of service delivery.<sup>8</sup> The cross-country study found that decentralizing the responsibility for roads costs more at first, mostly through losses in economies of scale, but these losses may be outweighed by increases in efficiency when the locus of roadwork is closer to the people.

The advantages and limitations of decentralization are function specific:

- MR&R functions are best provided locally. If both resource and preference costs are considered, the local government should be allocated more than 40 but less than 70% of the fiscal responsibility for MR&R. If only resource cost efficiencies are considered, there should be complete decentralization.
- To minimize resource costs, construction should be either completely centralized or completely decentralized. The efficiency of construction is more sensitive to the degree of competition in award contracts than to the degree of decentralization.
- Local units similar to local maintenance units provide administrative activities more efficiently than centralized systems. In the early stages of decentralization, administering the large number of road agents is costly. Therefore, the optimal level of fiscal responsibility allocated to local authorities at that stage should be more than 50% but less than 80%.

---

<sup>7</sup> For roads, exceptions include transit users and their demands, as well as externalities such as air pollution.

<sup>8</sup> This term is borrowed from economics of the firm, where it is defined as the degree of attention paid by a manager to reduce costs or improve performance (see, Laffont and Tirole, 1993: 168).



---

There are exceptions to these general guidelines: some countries such as the USA are highly decentralized in all road functions yet they operate efficiently. In fact, evidence shows that the level of cost recovery improved even further when decentralization was deepened (Walzer et al. 1989).

Privatization can be viewed as a form of decentralization of management functions from government to private enterprises. There is widespread agreement that most developing countries urgently need massive highway construction programmes. Traditionally, highways have been viewed as public goods that must be financed and operated by the public sector. But in recent years many governments have neglected MR&R because of chronic budgetary problems, and traffic has grown well ahead of capacity. So, it has become increasingly accepted that highways should be built, financed, and operated by private firms and that users should pay for using them.

There are several advantages of privatizing roads: i) private firms build highways faster than government agencies because they face fewer financing constraints and they are more efficient, ii) users are more likely to accept to pay for roads owned by the private sector, and iii) franchising should prevent the building of 'white elephants', since private firms do not want to lose money.

Despite these advantages, experience with highway franchising has been rather disappointing (Engel et al. 1997). Three of the four franchises that France awarded in the early 1970s went bankrupt after the oil shock and were taken over by the government. Several of the 12 franchises awarded by Spain before 1973 ended up with building costs four to five times higher than expected but traffic about a third of original projections. As a result, three firms went bankrupt, stronger franchise holders absorbed two firms, and the government was forced to increase tolls and extend the term of the franchises. In Mexico, excessively high tolls have led to empty highways and the renegotiation of franchise agreements, the duration of some of the toll road franchises has more than doubled, and the government has had to pump in US\$2 billion to save some of the firms (and the banks that made loans to them) from bankruptcy.

Many of the problems that have plagued highway privatization stem from the combined effects of the special features of the highway business and the type of contracts (fixed-term franchises) that have typically been used. Two features characterize the highway business. First, traffic forecasts are notoriously imprecise; it is difficult enough to make accurate traffic predictions for the short run let alone for the long run. Moreover, demand for a highway is largely beyond the control of the franchise holder. Second, most franchises have been awarded for a fixed term (say, 20 years) independent of demand realization.

The least-present-value-of-revenue (LPVR) auction, a new mechanism proposed by Engel et al. (1997a,b), corrects some of the shortcomings of the fixed-term franchise. This

---

mechanism endogenously adjusts the duration of the franchise to demand: the term lengthens if traffic grows more slowly than expected, and vice versa. The basic principle underlying LPVR auctions is that the franchise holder should not make losses when the long-run demand for the highway is sufficient to pay all costs. Revenues do not change even when demand does not agree with the projections, so the risk borne by the franchise holder is far smaller than under fixed-term franchises. For this reason, the franchise holder requires a smaller risk premium, and users pay less on average. The lower risk for the franchise holder also means that the ‘winner’s curse’ is less likely, because bids are less dependent on demand projections.

With LPVR auctions, the franchise holder still bears the risk that the road may not be self-financing in the long run—that is, that it might turn out to be a white elephant. But since white elephants usually result from lobbying by pressure groups, potential bidders should be able to detect them easily.

Another advantage of LPVR auctions is that competition for the franchise reveals through the winner’s bid the income required to earn a normal return. This reduces the scope for opportunism after the contract is awarded, because the winning bid can be used as a benchmark. In the case where government opportunism leads to a regulatory taking, the franchise holder can go to court asking for fair compensation equal to the difference between the bid and the present value of toll revenues already received.

Opportunistic renegotiations that favour the franchise holder are also less likely, for three reasons. First, because the term automatically lengthens if demand grows more slowly than expected, it is less likely that franchise holders will face financial distress and therefore demand renegotiation. Second, renegotiations in favour of the franchise holders are explicit wealth transfers: term extensions are impossible by definition, and the only effect of a toll increase is to shorten the term of the franchise. Since explicit wealth transfers are easy to detect by the public and the media, they are less likely to occur. Third, the government can discourage lowballing by bidders by threatening to end the franchise and to compensate the franchise holder with whatever sum remains to be collected, if the franchise holder asks for a renegotiation.

The winning bid determines the fair compensation for terminating the contract as the difference between the present value of revenue earned and the original bid. This ensures flexibility in LPVR contracts. If demand exceeds expectations and requires an expansion of the highway, the franchise holder can be paid a fair compensation and the franchise can be reaucted. It is also easy to adjust tolls. If tolls need to be raised because of congestion, the only effect is that the franchise ends earlier. If demand for the highway is highly uncertain before it is built (as is often the case with new highways), the setting of tolls can be postponed until after construction.

---

## 2.3 Basic objectives of roads policies

Generally, commitment to a strategic and broad-based approach to transport planning is often gauged by examining the extent to which a country's roads policies are based on the following fundamental criteria:

- Integration—ensuring that all roads decisions are taken in the context of a coherent, integrated transport policy covering all modes
- Accessibility—making it easy to reach the places we wish to get to
- Safety—making travel safer
- Economy—getting good value for money and supporting sustainable economic activity in appropriate locations
- Environmental impact—both positive and negative, on both the built and the natural environments, and at the global, regional and local levels
- Tackling road congestion

### 2.3.1 *Integration*

Integration is fundamental to a successful transport strategy. We need integration among different areas of policy, different levels of government, different areas of the country and different transport modes and operators. In developing an integrated transport strategy, the trunk road network has to be planned and managed not just in the context of the transport system as a whole but also in regard to economic development and other land-use and environmental considerations.

### 2.3.2 *Accessibility*

Accessibility is about making it easy to reach the places we need to get to. This might involve either providing appropriate means of transport or ensuring that the places we need to reach are close together. The latter objective can be pursued through a land-use planning system. Proper coordination of different transport modes is vital. Accessibility considerations could also embrace the concept of equity—being fair to every group of people all with their different needs, including the disabled, the elderly, and children, as well as those in different income groups and locations, and those using and being affected by the different modes of transport. However, these issues may be more relevant for local roads than trunk roads.

---

### **2.3.3 Safety**

Preventing accidents and saving human lives are important elements in road policies. For any country, the local and trunk road networks have to be constantly monitored to identify unsafe locations. It is important to target resources effectively on priorities, taking account of cost–benefit analysis. Data show that, on average, local safety schemes pay for themselves within 12 months and that safety benefits of bypasses and other larger road schemes form a significant proportion of the total benefits of the safety scheme.

### **2.3.4 Economy**

Economy means both getting the best overall value for money from the maintenance, management and construction of a road system and providing and managing transport so as to support economic activity in appropriate locations.

The quantity and quality of roads transport infrastructure are some of the major determinants of price and non-price competitiveness in both domestic and international markets, and new or improved infrastructure activity can facilitate alleviation of poverty.

#### *a. Price and non-price competitiveness*

As infrastructure is an intermediate input, the low cost and high quality of any form of infrastructural service will tend to improve price competitiveness. Also, by improving communication between exporters and importers (as well as domestic producers and domestic consumers) and allowing timely and safe delivery of goods, infrastructure can improve non-price competitiveness. Modern business practices such as ‘just-in-time’ delivery are imposing increasing demands on speed across all routes, and particularly the reliability of journey times.

For exporters, transport costs of moving goods from the production point to the foreign market affect profitability where world prices are given for the export good. Where costs are passed on to the buyer in the foreign market, transport costs tend to reduce the exporter’s price competitiveness. The latter is more applicable to Africa, where most countries are price-takers in the international market. Transport costs, along with import tariffs on imported inputs used in producing export goods, impose significant costs on exporters, which are not paid by domestic producers of competing goods. This anti-export bias can remain even after trade reform has taken place.

The anti-export bias emanating from transportation costs is evident in many African countries, where costs are generally higher than in other regions and constitute a large portion of import (c.i.f.) or export (f.o.b.) prices. This is partly due to geographical conditions with many economies landlocked, and partly due to the slow and costly nature of the transport network. High transport costs in moving goods between countries impose

---

significant natural barriers to trade within the region. Therefore, there can be significant differences in prices for similar goods between countries even after import tariffs are lowered in intra-regional trade.

*b. Poverty alleviation*

Two possible avenues exist through which new or improved infrastructure can facilitate poverty alleviation. The first route is through the link between infrastructure and economic growth. The second one is through the direct contribution of infrastructure to the process of pro-poor growth. The poor are usually associated with inadequate access to infrastructural services such as clean water, sanitation, transportation, and communication, which are considered as ‘input indicators’ of poverty. This limits their access to another set of input indicators, namely, health services, education facilities, food, and markets, and causes a negative impact on ‘output indicators’ of poverty, such as life expectancy, literacy, income and nutrition. Hence, road transport, water supply, and sanitation are the components of infrastructure most likely to promote pro-poor growth. This is particularly true if the environmental impacts of roads and road transport are internalized.

Improvements in roads and paths, especially in rural areas, have the potential to improve the position of the poor, although they will have to be provided as part of a package of measures that include credit, extension services and investments in areas such as irrigation and water. Evidence from surveys in Zambia, Uganda and Burkina Faso suggests that the average rural adult spends 1.25 hours per day on essential travel and transport. Of this time 75% is spent on domestic chores (including collection of water and fuelwood and trips to the grinding mill to obtain ground flour for family consumption), 18% on agricultural activities (covering trips to the fields for cultivation, movement of farm inputs, and collection of harvested crops), no more than 1% on health visits to rural clinics or doctors, and the remaining 6% on marketing crops. The average adult expends a carrying effort equivalent to moving a load of 20 kg over 2 km a day (Barwell 1996).

Road transport improvements can ease the transport burden on the rural and urban poor. For example, new or rehabilitated feeder roads will allow motor vehicles to operate to the village level, transporting farm inputs to the villages and farm outputs from the villages to market centres. Improving paths or tracks can reduce the transport burden where non-motorized modes such as foot, bicycles or carts are involved. Improvement or construction of bridges or water crossings can shorten journeys. Involving communities themselves in planning local transport interventions is likely to increase the effectiveness of the services by allowing an accurate identification of bottlenecks and ensuring regular maintenance.

These improvements can raise incomes of the poor through diverse mechanisms. Agricultural output, especially where bulky, low-value crops are involved, would benefit from the reduction in the time spent on water and firewood collection, particularly by

---

women. Trucks can be hired to move bulk produce, and fertilizer can be moved to villages and stored close to where it is needed. Improved tracks and footpaths facilitate the movement of hired farm labour to the fields. In isolated rural areas where there is great difficulty in marketing produce, crops can be moved in smaller quantities by non-motorized transport if roads or paths are in good condition. Improving roads will result in better access to social services, including health clinics, and increase non-agricultural, income-generating activities and travel from peri-urban to urban locations to work in services and construction in the informal sector.

### ***2.3.5 Environmental impact***

All road improvements need to be sustainable. Consequently, short-run gains from road infrastructure should not obscure wider or long-run damage that may be associated with it. The aim is to limit and where possible reduce damage at local, regional and global levels, taking account of all relevant environmental policies such as those on climate change, local air quality and biodiversity. It is also important to acknowledge positive environmental benefits that the trunk road system can bring.

Bypasses have their positive and negative sides. They can take noisy, polluting traffic out of towns and villages and allow the implementation of traffic calming and other measures to improve the urban environment. They can also reduce accidents. On the other hand, bypasses intrude on the countryside.

Road improvements have a mixed effect on emissions. By easing congestion they could help reduce emission of some pollutants, but they increase emission of others.

Environmental impacts arising from road development projects can be categorized into direct, indirect, and cumulative impacts. These categories can be further broken down according to their nature, into positive or negative impacts, random or predictable impacts, local or widespread impacts, temporary or permanent impacts, and short- or long-term impacts.

Direct impacts are caused by the road itself—that is, by road building processes such as land consumption, removal of vegetation, and severance of farmland. An example of this is removing gravel material from a borrow pit for use in surfacing a road. In this case, the land area where the pit is located is affected directly by activities associated with the road project. Direct impacts are generally easier to inventory, assess and control than indirect ones, since the cause–effect relationship is usually obvious.

Indirect impacts (also known as secondary, tertiary, or chain impacts) are usually closely linked to the project and may have more profound consequences on the environment than do direct impacts. Indirect impacts are more difficult to measure, but can ultimately be

---

more important. Over time they can affect larger geographical areas of the environment than anticipated. Examples include degradation of surface water quality by erosion of land cleared for a new road, urban growth near a new road, and increased deforestation of an area stemming from easier (more profitable) transportation of logs to market or the influx of settlers. In areas where wild game is plentiful, such as Africa, new roads often lead to rapid depletion of animals due to poaching.

Environmental impacts should be considered as they pertain not only to road rights-of-way (RROW) but also to sites associated with the road project, which include deposit and borrow sites, materials treatment areas, quarries, access roads, and facilities provided for project workers. These 'off-RROW' areas are often where indirect impacts appear. Environmental impact assessment practitioners predict and evaluate the significance of possible indirect effects by taking a holistic approach to impact assessment. It is especially important that any synergetic relationships between impacts be closely examined, since indirect effects frequently lead to synergetic ones.

It is with indirect impacts that linkages between the natural and social environment are most pronounced. For example, the appropriation of land for a road may displace farmers or interfere with their cropping patterns forcing them to use a different water supply. This change could result in the depletion of a groundwater aquifer, intensification of new land clearing, erosion, and contamination of water with fertilizers and pesticides carried in runoff.

The process of cumulative environmental change can arise from any of the following types of events: i) single large events such as a large project, ii) multiple interrelated events such as road projects within a region, iii) catastrophic sudden events such as a major landslide into a river system, and iii) incremental, widespread, slow-change events such as a poorly designed culvert or drainage system along a road passing through a watershed.

Cumulative impacts can generate additive, multiplicative or synergetic effects, which may damage the functioning of one or several ecosystems (for example, impairing the water regulating and filtering capacity of a wetland system by constructing a road across it), or the structure of an ecosystem (for example, placing a new road through a forest would lead to migration or land clearing, which results in severe structural loss to the forest). Assessing cumulative effects is a complex process requiring extensive knowledge of ecological principles and ecosystem-response mechanisms (Preston and Bedford 1988; Spaling and Smit 1994, 1993).

Technically a subset or variant of cumulative impacts, ecosystem function impacts that disable or destabilize whole ecosystems are the most dangerous and often the least likely to manifest themselves over a short period of time. Many of these cases deal with roads that traverse watersheds in which surface and subsurface water movement are complex.

---

Important examples are a highway constructed across a mangrove forest, a road bisecting wildlife migration routes, and the linkage of road construction with the social environment.

It is not enough to qualify environmental impacts by the type of effect they have on the environment: they must also be categorized according to their seriousness. The most damaging and longest lasting impacts will obviously be the first to be avoided or mitigated (World Bank 1991).

### ***2.3.6 Tackling road congestion***

Dealing with road congestion is another important aspect of roads policies. A strategy has to be developed on both economic and environmental grounds to deal with increasing congestion. Measures to reduce the need to travel and to attract demand to other modes of transport have to be considered in the wider approach to an integrated transport policy. Three potential options exist for responding to the predicted increase in congestion on trunk roads:

- Making better use of existing road infrastructure
- Managing demand for travel by road
- Creating new infrastructure

The options are not mutually exclusive. They could be mixed, and different mixes may be suitable to different locations. All options need to be weighed against the implications of doing nothing and allowing the increasing congestion to influence road users' decisions on when, how and whether to travel.

#### *a. Making better use of the existing road infrastructure*

There is an extensive range of tools either in existence or being developed that can aid the effective management of the available road space. The tools, many of which use new technology, include controls on access (limiting the number of vehicles entering a road junction) and speed (setting and enforcing speed limits for smooth flow thereby contemporaneously engendering better air quality and less noise pollution). Improved journey information in the home (for example, through teletext), the car (for example, through radio broadcasts) and on the road (for example, message signing) assists in choice of travel. Provision of travel information can be more closely linked to 'park and ride' sites and other transport interchanges. Dedicating lanes for buses can help make their journey times less variable. All these measures can help to increase the use of alternative travel modes.

#### *b. Managing demand for travel by road*

Sometimes there is need to address the likelihood that an existing network might not satisfactorily cope with projected demand. Since constructing new roads alone will not



---

resolve the traffic congestion problem, measures for managing growth in demand are necessary. However, the transport demand management option, like the engineering solution, is not a costless process. This is obviously an important aspect in developing an integrated transport strategy for all modes, and it often features prominently in such work.

*c. Creating new road infrastructure*

Increasing road capacity is expensive and can have adverse environmental effects. There are, however, no easy solutions to the growing demand for travel and there may be situations in which increasing capacity is the best option. In some cases, road connections have a vital role in regional regeneration.

Tackling increasing road congestion is undoubtedly the biggest challenge faced in developing an integrated transport strategy. It is crucial to get right the relationship between roads and the wider transport picture at national, regional and local levels.

## **2.4 Policy framework for sustainable transport**

To be effective, a transport policy must satisfy three main requirements: i) creating incentives for efficient response to needs, ii) promoting more livable settlements and reducing adverse external effects, and iii) reducing poverty (Wasike 1995a,b). To achieve this, the policy must fulfil three requirements. First it must ensure that a continuing capability exists to support an improved standard of living. This corresponds to the concept of economic and financial sustainability. Second, it must generate the greatest possible improvement in the general quality of life, and not merely an increase in traded goods. This relates to the concept of environmental and ecological sustainability. Third, the benefits that the transport service produces must be equitably shared by all sections of the community. This is often termed social sustainability.

Economic, social and environmental sustainability are often mutually reinforcing (Munasinghe 1993). Road or public transport systems that fall into disrepair because they are economically unsustainable fail to serve the needs of the poor and often have environmental consequences. Hence, there is need for policy instruments that serve all dimensions of sustainability in a synergistic way, generating ‘win-win’ solutions. These include measures to improve asset maintenance, charging for external effects, technical efficiency of supply, safety, contract design, and public administration.

That convenient synergy does not always hold. Increased mobility, particularly private motorized mobility, typically increases measured GDP but damages the environment. Global sourcing in the manufacturing industry and just-in-time logistics reduce product costs but tend to increase expenditure on transport as many more goods are transported over longer distances. Shifting to faster modes (air) for moving goods or smaller batches

---

with greater flexibility in frequency of freight and variety of routes (road) also has potentially adverse environmental implications. Transport infrastructure improvement may involve involuntary resettlement of people. Efficient production of transport services in a competitive framework may involve loss of jobs, imposing some social costs and restructuring prices and services, which may hurt some users.<sup>9</sup> Public transport provided cheaply by the informal sector and motorized two-wheelers may meet the transport needs of the poor but might be environmentally damaging. All of these phenomena involve ‘trade-offs’ that must be faced by governments. A policy for sustainable transport is one that both identifies and implements the win-win policy instruments and explicitly confronts the trade-offs so that the balance is chosen rather than arrived at accidentally. It is a policy of informed, conscious choices.

#### ***2.4.1 Economic sustainability—creating incentives for efficient response to needs***

A sound economic base is fundamental to sustainability. Transport investments should thus continue to be subject to rigorous cost-benefit analysis, albeit expanded to encompass environmental externalities. The need for economic justification applies not only to infrastructure—which typically accounts for only between a quarter and a half of the value of total capital stock employed in transport and contributes only about 5% to the total cost of providing transport services—but also to decisions on vehicle fleet purchase and use, whether in the public or private sector. Ensuring the long-term sustainability of facilities requires the adequate maintenance of capital assets. In infrastructural services this is hampered by inadequate budget provisions for maintenance and follow up, and accentuated by the government’s decision to take the ‘soft’ option of deferring maintenance during a debt crisis. In transport service supply, regulated prices have often been set at levels that are too low to provide for adequate maintenance of equipment. The costs of maintaining excessively ambitious roads and other transport networks and the subsidized operations of poorly managed public enterprises in transport also frequently impose unsustainable fiscal burdens in developing and transitional economies. Conversely, development will be constrained where transport infrastructure is seriously deficient. This applies to both poor countries with very sparse networks and some wealthier and more rapidly growing countries where inadequacies in transport capacity create severe bottlenecks in trade flows.

This is not all that economic sustainability implies. Changes in the global economy have altered the nature of the demands that economic development makes on transport. To take

---

<sup>9</sup> The concept of economic efficiency is not synonymous with that of technical efficiency. A technically superior infrastructure is considered economically superior only if the extra benefits accruing from its technical superiority outweigh the extra cost of its construction.

---

advantage of the benefits of global trade in manufacturing goods, developing countries must be capable of providing freight transport that is fast, reliable and, above all, flexible in response to user needs.

#### ***2.4.2 Environmental sustainability—promoting more livable settlements and reducing adverse external effects***

The demand for greater transport flexibility has increased dependence on road transport, which tends to raise the aggregate energy consumption, generate air pollution and produce other adverse effects on the environment that, though not always cumulative and irreversible, are nevertheless not sustainable because they do not represent chosen outcomes. In practice, however, these adverse environmental (and social) impacts are very difficult to reverse once activity locations and personal lifestyles have been arranged to accommodate high dependency on road transport. The challenge is to devise a transport policy that ensures that the actual outcomes are chosen, not the unintended and unforeseen consequences of the policies adopted.

Viewing transport within the general perspective of sustainable development yields some obvious insights. The weight placed on the various components of the general quality of life varies between cultures and, therefore, countries that borrow policies must ultimately define their own path of development. The relative importance of the components of the quality of life also varies between stages of development. For example, low-income countries may best be assisted by provision of infrastructure, while policy reform or environmental improvement measures may be more appropriate for other countries. With any of the options, increasing economic sustainability could always advance environmentally sustainable development, but it does not necessarily do so. Failing to incorporate environmental considerations in assessing projects and policies is what creates a ‘sustainability gap’. The policy challenge is for countries to recognize the trade-offs that they face and to devise instruments that will prevent a sustainability gap from developing.

#### ***2.4.3 Social sustainability—reducing poverty***

In rural areas, the poor depend for their livelihood mainly on their ability to produce and market agricultural products. Increasing access to traded inputs (for example, fertilizers and equipment) and making it possible to transport agricultural products to distant markets are the means whereby cash cropping can replace subsistence farming. This transformation will also facilitate the development of non-agricultural activities in rural areas. Inadequate provision for vehicles can be very costly. Headloading of damagingly heavy freight is

---

frequent. Rates of accidents involving motorized vehicles and pedestrians or cyclists are very high due to the lack of shoulders on roadways and poor maintenance of rural roads.<sup>10</sup>

The principal resource of the poor in urban areas is their labour. Therefore, adequate and affordable transport to work is critical. In practice, in major cities on most continents (for example, Lagos, Bangkok and São Paulo), workers have to make excessively long journeys to work. Where incomes are very low in comparison with transport costs this involves walking long journeys to work, as in Nairobi (Saad 1989).

In both urban and rural areas, anything that limits ‘basic’ public transport provision or makes it expensive will be particularly damaging to the poor. The ultimate harm that can be done to the poor is to eliminate either their home (for example, through resettlement) or their job (for example, through redundancy), which can happen as a by-product of transport change. Particular problems arise in meeting the transport needs of women. The larger proportion of trips made by women is conventionally regarded—and often incorrectly—as ‘inessential’ (that is trips not associated with formal work). As a result, these needs have received inadequate attention in both planning and financing public transport.

Central to these problems is the failure to provide or maintain activities and services that are most critical in ensuring that the poor have access to markets, employment and social facilities. The fact that the planning skills and paradigms that are more relevant to industrial countries have been deployed in developing countries has meant that priority has been given to providing high mobility rather than basic accessibility. This has favoured those who are already mobile, particularly vehicular road users.

### **3 Trends in the Kenya Road Policy**

Public policies adopted by the Government of Kenya on the roads infrastructure and road transport are contained in sessional papers produced over the years and development plans. On attaining independence in 1963, the Government of Kenya embarked on a process to formulate and implement policies for rapid economic growth and development. Apart from the budget statement of 1964, the government produced the first national development plan covering the years 1964–1970, as well as the Sessional Paper No. 10 of 1965 on ‘African Socialism and its Application to Planning in Kenya’ (RoK 1964; RoK 1965).

Kenya’s economic policies immediately before and after political independence were based on the principles outlined in Sessional Paper No. 10 of 1965: primarily political equality,

---

<sup>10</sup> A study of urban road accidents in Côte d’Ivoire found that 60% of pedestrian accidents and 40% of all accidents were related to the lack of pedestrian facilities, and 20% to deteriorated road surfaces (Saad 1989).

---

social justice, human dignity, and equal opportunities (RoK 1965). The major emphasis and hence the underlying rationale in public policy during that period was to alleviate the pressing and immediate problems of transition and to establish a firm basis for rapid economic growth. The 1960s were a decade for post-colonial transition in all socioeconomic spheres. The country was in transition from a subsistence to a monetary economy, from economic dependence on agriculture to more balanced growth, and from developing natural resources for others to developing human and natural resources for the social welfare of the people of Kenya.

Kenya's economic growth and development has been viewed under three phases: 1963–1972, 1973–1982, and 1983–1995 (Ikiara and Okeyo 1998; Onjala 1999). These phases coincide with the timing of major changes in development policies and strategies. This section reviews the trends in Kenyan public policy on roads infrastructure over the post-independence period, 1963–1999. It is divided as follows:

- The first decade, 1963–1972: the period of rapid growth
- The second decade, 1973–1982: the period of continuous decline
- The third and fourth decades, 1982 to now: the era of structural adjustment and reforms

### **3.1 The first decade, 1963–1972: the era of rapid economic growth**

During the early years of independence, Kenya achieved commendable economic growth compared with other developing countries. GDP grew on average at 6.6% per year in 1964–1973. The rapid growth resulted mainly from successful rural development policies that led to increased agricultural output, an import-substitution industrialization strategy supported by access to the East African Community market, and good macroeconomic management.

Infrastructural growth contributed to the rapid growth during this decade through its increased performance over the last decade of the colonial period. The five most rapidly growing sectors over 1954–1963 were banking, insurance and real estate (with annual rates of growth of 12.5%), electricity and water (10.8%), government services (9.4%), services (8.8%), manufacturing (7.6%), transport, storage and communications (8.3%), rents (7.1%), and agriculture (6.4%).

#### **3.1.1 Public sector provision**

In the decade immediately after independence, the public sector in Africa made significant strides in promoting infrastructural development. In transport, for instance, the density of paved roads exhibited an upward trend with the length of paved roads per 1000 persons increasing from the period immediately following independence to 1986, from when it

---

stagnated (ADB 1999: 113). Apart from some elements of ideological orientation, the primary rationale for public sector involvement in infrastructure was to address what was perceived as pervasive market failures in African economies.

At independence, creating employment and providing a regionally distributed infrastructure and economic services milieu were seen as the most important means of improving the national welfare. However, extensive infrastructure development demanded huge investment. Because of their inherent risk, these large economic ventures did not necessarily attract foreign investors, especially in light of the small size of the domestic markets. On the other hand, local entrepreneurs were thought to be too few and to possess fairly limited technical skills and too little capital to undertake major investments. Capital markets were underdeveloped and could not be relied upon to provide sufficient credit. For many countries, the aspirations of rapid growth and development through expanded infrastructure coverage were to be realized through substantial state involvement. In addition, these public sector utilities were kept in government hands to prevent exploitation, given their status as natural monopolies.

The main thrust of Sessional Paper No. 10 of 1965 with respect to infrastructure and economic services was public provision,<sup>11</sup> but it recognized the need for private sector participation in certain areas:

Surface transportation, outside of the railways, is privately owned and operated through many small enterprises. As such it is proving to be an excellent training ground for African entrepreneurs. Unfortunately, the services provided are varied in standard and quality and frequently are wholly unsatisfactory. When funds are available, nationalisation of many segments of surface transportation may be required, but the immediate need is to find solutions that will be less expensive in terms of Government money now urgently needed for development elsewhere. The most pressing problems are urban passenger transportation and cross country, trunk road passenger transport.

... If efforts to regulate [transport infrastructure provision by municipalities and the Government] turn out to have unsatisfactory results, partnerships with private capital and management could be explored, preferably with large, experienced firms operating in municipalities or cross-country roads (RoK 1965: 41–42).

---

<sup>11</sup> The principle of state direction of the overall development process, which implied centralized government, was underlined by the statement in the paper that the “fundamental characteristic of African Socialism is that society has a duty to guide and control the use of all productive resources” (RoK, 1965: par. 30).

---

A principal line of Kenya's strategy was to develop transport and other infrastructure so as to draw the entire nation into the market economy and to lay the basis for rapid industrial growth. The paper declared that the policy consideration for public utilities would be "greater control of privately operated utilities, notably of urban and cross-country surface transportation, ... and investigation ... as to whether or not bus transportation in Mombasa and Nairobi should be taken over by those local authorities" (RoK 1965).

### ***3.1.2 Special purpose roads programme and cess on marketed rural output***

Initial policy initiatives for roads development in Kenya were linked to attempts to address the rural development problem during the closing years of colonial administration when it published the Swynnerton Plan of 1954 as a blueprint for modernizing agriculture in African reserves. Evidently, the plan recognized the importance of infrastructural investments and development as a policy strategy that would bolster agricultural development. The implementation of the strategy began with the setting up of irrigation schemes that culminated in the establishment of the National Irrigation Board in 1966 (Nyangito and Kimenye 1999).

The development of roads was also considered as a major policy for the development of agriculture. The central government had the overall responsibility for constructing roads in all areas of the country. However, district councils had the mandate for developing rural roads using cess funds from the sale of agricultural commodities. Some agricultural marketing boards, such as the Kenya Tea Development Authority (now the Kenya Tea Development Agency—KTDA) were authorized to develop roads in the small-scale tea growing areas. For the convenience of the public and the farming community, cess was levied at only a single stage of sale and collected by the Department of Excise and Taxation on behalf of the Ministry of Roads and Public Works. Specifically, the levy was discounted from farmers' income at marketing centres for coffee, tea and sugarcane, among others.

Overall, the special purpose roads programme (SPRP) involved the construction or improvement of roads that served specific development objectives. These roads included access roads to areas that produced cash crops such as wheat, tea, sugar, rice and coffee; roads to regions with potential for tourism and fisheries; and those that served settlements and other rural development points. Under this programme, ministries or agencies that required specific road improvements to support their activities financed the needed improvements. The Ministry of Works acted in only an advisory or contractual capacity.

## **3.2 The second decade, 1973–1982: the period of continuous decline**

The national and sectoral growth rates of the first decade were short lived, and the country registered extremely low growth rates after 1973. Over the 1974–1978 and 1979–1983

---

periods, Kenya registered total GDP growth rates of 5.9 and 4.4%, respectively, against the projected 7.4 and 5.4%. This was accompanied by rising unemployment and an increase in poverty among the Kenyan population.

The steady decline in economic growth was attributed to, inter alia, the international oil crises of 1973 and 1978, which revealed serious constraints in the economy. The situation was exacerbated by the collapse of the East African Community and the growing inefficiency in public investments.

The roads policy for Kenya over the 1970–1989 period was encapsulated within the second (1970–1974), third (1974–1978), fourth (1979–1983), fifth (1984–1988) and sixth (1989–1993) national development plans; the 1984 National Transport Plan; and the 1986 Sessional Paper No. 1 on ‘Economic Management for Renewed Growth’. Policy packages presented in the Sessional Paper were believed to indicate the government’s medium- to long-term socioeconomic policy framework. It is notable that at the time of this paper’s formulation, a number of issues emerged relating to infrastructure performance and development. Moreover, this Sessional Paper was the first major policy statement focusing on the medium- and small-scale enterprise (MSE) sector in Kenya (Bokea et al. 1999).<sup>12</sup> A more integrated and facilitative role was to be adopted by the government under which the place of the private sector in development was recognized.

### ***3.2.1 Decentralization of roads delivery***

Despite the need for expanding the public enterprise sector, the decades following the 1970s witnessed increasing disillusionment with the performance of public enterprises in general. As in many developing countries, public ownership and provision of infrastructure in Kenya were effective in meeting the needs of the public, at least in urban areas (ADB 1999). However, the explosion of urban populations and subsequent shrinking of resources in the wake of economic crises after the mid-1980s have meant that public provision of infrastructural services is for the most part characterized by less-than-adequate performance, especially in respect to resource allocation and enterprise management. The combination of poor management, inadequate capital structures, bad investment decisions and bureaucratization of the decision-making process means that public enterprises have been ill-prepared to address the rapidly changing conditions of African economies.

---

<sup>12</sup> The basis and policy framework for the development of the SME sector are presented in the Sessional Paper No. 2 of 1992 on ‘Small Enterprise and Jua Kali Development’ in Kenya. Bokea et al. (1999) consider inadequate physical infrastructure as a major constraint to SME operations. SME access to utilities such as power and water is sporadic at best and usually non-existent, and roads are so bad that neither the artisans nor their customers can readily reach their work place, not to mention the direct implications of these problems on transaction costs of SME businesses. The authors also consider the role of local authorities in redressing the situation.



---

Right at the dawn of political independence, Kenya envisaged decentralization as the structure for delivering road services, as Sessional Paper No. 10 of 1965 states:

The highest priority must be assigned to increasing tax collections by both the Central Government and Local Authorities in order to provide a substantial margin over recurrent costs for development. ... As more and more of our domestic demand is satisfied with domestic production, import duties will become less important as a source of revenue. Other sources must be found. The main ways that must be considered to increase tax collections in the future [include] ... (ix) *charging for some services* now rendered free by the Government, in particular charging tolls on major highways [*Italics are in original*] (RoK 1965: 33).

In the 1960s and 1970s, the policy of decentralized road delivery was operationalized through assigning county councils the responsibility for collecting cess from sale of agricultural products, and road tolls on major highways. The establishment in 1969 of the Special Rural Development Programme (SRDP) was a milestone in the process of decentralizing planning, as it institutionalized rural planning and management through establishing an administrative structure.<sup>13</sup> Kenya's first national development plan, 1964–1970, recommended that the district become the basic planning unit and that the emergent provincial and district development committees (DDCs) be responsible for initiating and coordinating local development plans (RoK 1964). The establishment of development committees is seen as part of the government's efforts to strengthen its development machinery, especially in the rural areas (Alila 1988).

In the 1980s, the government through the District Focus for Rural Development (DFRD) strategy and rural trade promotion centres (RTPCs) aimed at effecting decentralized and participatory planning, further decentralizing road provision. The DFRD programme intended to broaden the base for rural development and encourage local initiative to complement the ministries' role in order to improve problem identification, resource

---

<sup>13</sup> The objectives of the SRDP were to i) increase agricultural, industrial and commercial output; ii) reduce unemployment in SRDP areas by increasing wage employment in private enterprise and public works; iii) improve extension, education, health and social public services in SRDP areas; and iv) increase decentralization of decision-making authority and responsibility in the SRDP areas. The programme package included i) agricultural extension and inputs focusing on the 'most progressive' farmers, ii) promotion of cotton as a cash crop, iii) construction of sale yards for livestock, iv) agricultural credit, iv) rural roads, and v) water projects. The programme was terminated in 1976. Two evaluations—one in 1972 and the other in 1975—found that to a large measure the programme did not achieve its objectives (IDS 1973, 1975). One of the main factors for the programme's failure was that it was designed implemented in a top-down manner by a bureaucracy used to public administration but not to promoting commercial activities. In particular, delivery of critical inputs was frequently late, resulting in crop failure and the inability of farmers to repay loans.

---

mobilization and project implementation at the local level (RoK 1983: 91). The rationale of the strategy was clear:

First the people will be directly involved in the identification, design, implementation, and management of projects and programmes. This will make development more consistent with the needs and aspirations of wananchi. Secondly, the decision-making structure will centre around the districts themselves. This will minimize delays that often characterize centralised decision-making systems. Thirdly, and most important is that equitably, resources will be directed to areas of most need (Alila 1988: 159).

The institutional mechanism for carrying out the DFRD strategy is the DDCs. A DDC is composed of the district commissioner (chair), the district development officer (secretary), district heads of government departments, divisional district officers, members of parliament of the district, the chairman of the county council, and an elected councilor.

DDCs operate the Rural Development Fund (RDF), which comprises the district development grants (DDGs) and the rural works programme (RWP) fund. The main function of these grants is to encourage DDCs to identify and fill gaps in the sectoral programmes financed centrally through the operating line ministries. DDGs have been used to cover such small projects as cattle dips, afforestation, and soil conservation. The RWP implements labour-intensive rural-development projects chosen by DDCs, such as minor irrigation projects, soil conservation, bush clearing and minor roads upgrading in which labour accounts for at least 60% of the total cost. In addition to the RDF, there is a District Development Fund (DDF), which is controlled by the Ministry of Finance and Planning and used to support DDC projects. The district commissioner has authority to incur expenditure against the DDF.

The Sessional Paper No. 1 of 1986 recommended the establishment of RTPCs to provide infrastructure for MSEs operating in the rural areas. The idea was to stabilize rural–urban migration by creating an enabling environment that would attract and stimulate investments in the rural areas. The objective of the RTPCs was

... to concentrate scarce resources for urban infrastructure in a limited but growing number of selected rural centres which have the best potential for supporting agriculture and its linked productive activities, including the concentration of resources in a rural centre ... Processing, manufacturing and services is designed to remove obvious bottlenecks in physical infrastructure (RoK 1986: 45).

After a long delay due to technical and administrative problems, the implementation of the RTPC jointly by DDCs and the respective local authorities began in 1990 with eight

---

RTPCs. The towns covered were Kapsowar and Kipkelion in Rift Valley Province, Kutus in Central, Suneka in Nyanza, Kimilili in Western, Mwingi in Eastern, Kingano in Coast and Rhamu in Northeastern. The typical project package included improvement of town and link roads, water and electricity supply, grain stores, slaughterhouses, bridges, bus parks, telecommunications (telephone, post offices), market centres, youth polytechnics, access roads, footpaths, and ablution blocks.

### ***3.1.2 Rural access, minor roads, and market development programmes***

In the ongoing effort to improve communication and transportation in the rural areas, the government initiated the Rural Access Roads Programme (RARP) in 1974. It was renamed the Minor Roads Improvement and Maintenance Programme (MRP) in 1985. The RARP involved the construction of all-weather, farm-to-market roads (new links) in high-potential agricultural districts, whilst the MRP covered the improvement of existing links through gravelling, improving bridges, and building culverts.

Because they used labour-intensive techniques in all the civil engineering works, the RARP and MRP played an important role in the development of rural areas, as well as in generating employment opportunities for the rural population. The programmes had constructed 7,600 km of access roads and created 72,000 person-years of employment by 1985 against targets of 14,000 km and 80,000 person-years (RoK 1990a; von Braun et al. 1991: 93). By the end of June 1992, the two programmes covered a total of 31 districts mainly in Nyanza, Western, Coast, Central, Eastern, and Rift Valley provinces. Under the RARP, a total of 8,120 km of rural access roads had been constructed by June 1992, of which 7,552 km had been gravelled, and 3,100 km of minor roads had been constructed by June 1992, of which 2,390 km had been gravelled (RoK 1994: 76).

Some of the problems faced by the rural roads programmes (RARP and MRP)—and which partly account for the failure to meet targets—were shortage of labour in the high-potential agricultural areas, particularly during harvest times; shortages of middle-level staff such as inspectors and overseers; lack of transport; failure of the government to fully honour its part of the cofinancing agreement made with donors; and, in some cases, technical construction problems attributed to soil conditions, structure and topography (RoK 1990b; World Bank 1993). Waning donor interest due to their dissatisfaction with the government's procurement and accounting procedures compounded these problems.

Both the RARP and MRP strategies continued to be pursued even after a strategic and comprehensive development policy document on 'Economic Management for Renewed

---

Growth’ was published as Sessional Paper No. 1 of 1986 (RoK 1986).<sup>14</sup> The tempo of the two programmes was accentuated through the Kenya Market Development Programme (KMDP). The KMDP was designed to enhance agricultural productivity and farm incomes by alleviating production and marketing constraints in high-potential areas. This goal can be achieved at the farm level through higher yields, lower input prices, or higher output prices. These benefits, it was then correctly argued, could be realized by public investments in agricultural infrastructure that boost the return to private investments.

The road rehabilitation component of the KMDP aimed at reducing transportation costs incurred in moving agricultural commodities from rural producers to markets by improving to a all-weather standard selected rural roads in eight districts: Kakamega, Kisii, Kitui, Nakuru, Narok, Nyamira, Nyeri and Uasin Gishu (Rhodes 1993). All-weather roads are roads that can be used daily by agricultural transporters to deliver commodities to markets in a timely fashion even during periods of heavy rainfall. District development officials helped the KMDP in road selection during the initial stages of the programme. The Ministry of Public Works (MoRPW) in Nairobi reviewed the recommendations from the districts. The roads were evaluated, selected and ranked by an interdisciplinary MoRPW team using a scheme for rating roads according to how much they fulfilled the conditions defining road importance. These factors included the road condition, population density, average size of land holdings, market linkages, drainage, terrain, and construction cost.

### **3.3 The third and fourth decades, 1983–now: era of structural adjustment and reforms**

By the mid-1980s, structural and managerial constraints were emerging within the Kenyan economy that prevented it from achieving the high growth rates of the 1960s and early 1970s. During the 1984–1988 and 1989–1993 planning periods, the economy grew at 4.2 and 2.92% against projections of 4.9 and 5.4%, respectively.

The economic recession characterized by low growth rates, dwindling public resources, and a reduction or discontinuation of development aid led to the adoption of the structural adjustment programmes (SAPs) in early 1980. Through the publication of Sessional Paper No. 1 of 1986 on ‘Economic Management for Renewed Growth’, the government sought to broaden the role of market signals and to align relative prices more closely with the

---

<sup>14</sup> The government and donor agencies and countries considered this paper to be very important, and it was to become the blueprint for the subsequent development process and plans for 1986 and 2000. During the period, critical socioeconomic reforms and structural adjustments were main projects for implementation.

---

world market. There was a break with past policies (or economic restructuring and reforms) during the 1990s with more emphasis on participation for progress, and resource mobilization for sustainable development. The policy focus was on cost sharing, retrenchment, sale of parastatals, privatization of some government functions, price and import decontrol, removal of government subsidies, and budget rationalization away from social programmes.

The background to and the nature of roads and road transport policy reforms in the 1990s are provided by a number of Government of Kenya blueprints (Table 1). These include the seventh (1994–1996) and eighth (1997–2001) national development plans, the Policy Framework Paper (PFP) on Economic Reforms for 1996–1998 (RoK 1996b), the Sessional Paper No. 2 of 1996 on ‘Industrial Transformation to the Year 2020’ (RoK 1996a), and the 1997 National Roads Strategic Plan (NRSP).

The theme of the seventh planning period was ‘Resource Mobilisation for Sustainable Development’ (RoK 1993: 39).<sup>15</sup> For the roads sector, the plan pledged government commitment to continue the principles of the RARP and MRP under a new Minor Roads Transition Project. The Eighth National Development Plan (RoK 1997) focuses on issues relating to road development coordination, lays out priorities and strategies for integrating the sectors, and details a five-year infrastructural investment programme. The stated overall government policy for the Kenya road transport infrastructure over the 1997–2001 is three-pronged: i) to continue implementing a programme for providing adequate funding and to strengthen the management of roads, ii) to improve urban transport efficiency, and iii) to increase accessibility and mobility in rural areas by supplementing motorized transport with non-motorized modes.

Sessional Paper No. 2 of 1996 recognized that insufficient accessibility to infrastructure was a major disincentive to potential investors in most sectors of the economy and a threat to the realization of the goal of industrialization. The PFP outlines a three-point strategy for arresting deterioration of the road network:

- Adopting a strategic plan for the road sector that includes defining MR&R activities to be financed by the road maintenance levy, procedures for transparent management of the road fund, and a mechanism to ensure that all the levy funds are used effectively for road maintenance

---

<sup>15</sup> Sustainable development was conceived as a socioeconomic advancement process that satisfied the needs of the future. Fundamental to this concept is the preservation of the quality of the natural environment during the process of development, or providing compensation for its damage.

Table 1. Kenya's road policy reform directions and the timetable of implementation

Long-term objective	Short-term actions	Date for action
1. Appropriate highway institution for sustainable road maintenance	a. Study of the appropriate institutional framework	June 1995 to June 1996
	b. Seminars or workshops on the recommendations of the study	June 1996 to Dec. 1996
	c. Develop cabinet paper on recommended reforms	Jan. 1997 to March 1997
	d. Establish institutional framework	As soon as cabinet approval is received
2. Improve operational efficiency of road maintenance operation	a. 90% contracting of periodic road maintenance	1995/96
	b. Contract out some labour-based gravelling	1995/96
	c. Contract out routine maintenance on a pilot basis	1995/96
	d. Evaluate routine maintenance contracting	1995/96 to 2000
3. Increase funding for road maintenance to full maintenance needs	a. Raise recurrent budgetary allocations and maintenance levy fund levels.	1995/96 to 1999/2000
	b. Establish the Road Works Inspectorate Unit	1995
4. Develop equipment policy	a. Authorize Roads Department (RD) to seek equipment maintenance services from the private sector if Mechanical and Transport Department (MTD) cannot provide the service	Jan. 1996
	b. RD to lease/hire plant and equipment from the private sector where such plant and equipment is unavailable at MTD	1998
	c. Strengthen MTD	1998
5. Staffing and training of RD and MTD	a. Establish staffing needs	March 1995
	b. Establish shortfalls or excesses	March 1995
6. Axle-load controls	a. Rehabilitate weighbridge facilities	1995–1997
	b. Operate weighbridge facilities on a 24-hour basis	1995
	c. Volumetric controls (except on gas and black oil)	1995
7. Rationalize expenditure priorities	a. Develop funds allocation criteria	1996

Source: World Bank (1995); RoK (1996a: 98).

- Providing budgetary allocations for at least 50% of the funds required for routine and periodic road maintenance
- Progressively raising budgetary allocation to finance full routine and periodic road maintenance by 2000

Pursuant to the PFP proposals, the NRSP was successfully completed in 1997 (RoK 1997). The NRSP provides the framework for six principal policy actions:

- Capacity building and increased reliance on the private sector for roads maintenance and construction

- 
- Provision of adequate and sustainable funding for road maintenance (including urban roads)
  - Establishment of guidelines for transparent management and use of road maintenance funds
  - Development of modalities for setting priorities for road investments
  - Establishment of additional dual carriageways and replacement of roundabouts with fly-overs or traffic lights
  - Provisions for pedestrian and bicycle routes along future roads

The principal roads policy reform initiatives over the 1990s (post-1995) period can be grouped into seven categories:

- Increased investment through public-private partnerships
- Giving MR&R a higher priority than new development
- Appropriate pricing
- Strengthening management and the institutional framework
- Labour-based methods for maintenance and construction
- Improvement in transport operations efficiency
- Commitment to improved infrastructure for non-motorized transport (NMT)

Let us consider each of these initiatives.

### ***3.3.1 Public-private partnerships***

Provision of infrastructure is one of the government's major functions and responsibilities, and there have been many policies for developing or improving infrastructure. These should be reviewed (RoK 1996a). Sessional Paper No. 2 of 1996 specifically declares that, among other measures,

- The government would, wherever feasible, provide infrastructure on a cost-recovery basis, and where capital costs cannot be recouped, operation and maintenance expenditures would increasingly be funded from user charges. The private sector would be encouraged to engage in joint ventures with the government to undertake privately financed projects.
- An immediate priority should be to initiate MR&R of the existing public infrastructure to satisfy demand. This would mean reviewing the various initiatives started over the years and suggesting remedial actions to address their shortcomings before starting new programmes. Care should be taken to ensure that all levels and

---

sectors of the industrial set-up are catered for, and that a progression mechanism is built in.

The Sessional Paper proposes two measures on private-sector participation in roads infrastructure: recovering some of the capital gains to private investors emanating from the road programme; and using other innovative ways, such as shadow tolls where private investors build roads and the government pays a rate for a limited concession period for each vehicle using the road.

In the PFP, the government continues to place great accent on PPI as a basis for sustainable, long-term economic growth (RoK 1996b). It articulates government commitment to progressively reduce the role of the public sector in the economy through rationalizing public sector firms and an accelerated programme of privatization. To improve the environment for private sector investment in productive sectors, the PFP puts special attention on rehabilitation and expansion of infrastructure.

### ***3.3.2 Roads 2000 strategy: maintenance and rehabilitation versus developing new capacity***

Most analysts (for example, Nalo 1993; World Bank 1995; Kimuyu and Mugerwa, 1998) agree that the condition of the road network began to deteriorate extensively in the 1980s. This was partly because overall road funding fell and priority was given to development rather than maintenance of the road network. The Government of Kenya maintained the high-traffic network, while donors assisted with maintenance of selected links at the lowest classified level. There was almost no funding for secondary and tertiary links connecting access roads to the main road network.

The first major policy reform involves making MR&R the top priority—including upgrading the service level of roads linking Kenya to its trading neighbours—not constructing new assets. Starting with the Seventh Development Plan (1994–1996), the government gave high priority to the maintenance and rehabilitation of existing roads. Similarly, the NSRP emphasizes MR&R of the road network. Under this policy reform, new road development *may* be undertaken only to remove constraints to economic activities. Furthermore, the Government of Kenya recently approved a Road Sector Strategic Plan that gives high priority to the maintenance of maintainable roads, followed by strengthening or rehabilitating the existing network.

Past interventions in the rural road network development have been in the construction of new links through the RARP, or the improvement of existing links through the MRP. While these programmes generally met their immediate objectives of improving rural access roads, they failed to provide Kenya's rural areas with the level and quality of access required for sustained agricultural and social development. The Ministry of Roads and



---

Public Works (MoRPW) recognized that a network approach was required but that full rehabilitation of the network would be financially prohibitive. The MoRPW has now adopted an approach to road rehabilitation and maintenance based on district networks. Known as Roads 2000, this approach is designed to raise operating conditions on the 55,000 km of unpaved classified roads. The Roads 2000 strategy of partial rehabilitation, spot gravelling and improved drainage has been developed to improve road conditions, increase accessibility, and bring the network to a maintainable standard.

In essence, the Roads 2000 strategy is expected to:

- Provide basic transport conditions for faster agricultural growth and social development by rehabilitating the rural road infrastructure and improving the roads within the rural areas for all-weather access
- Increase rural employment directly through the extension of labour-based road works (wherever conditions permit), and indirectly through faster agricultural growth
- Remove the constraints to private sector initiatives and development in general imposed by the deteriorating road infrastructure
- Support the development of small domestic contractors through the provision of contractor training and small construction contracts
- Support increased efficiency within the civil service through a substantial reduction in force account activity in the road sector and increased capability in district planning and contract administration

### ***3.3.3 Road user charges and regulations***

Charges for use of roads are important in so far as they limit misuse of roads and contribute financial resources for road maintenance. In 1994, a road maintenance levy fund (RMLF), consisting of an automotive fuel levy and transit toll collections, was introduced by the Road Maintenance Levy Fund (Amendment) Act of 1994. The RMLF Act empowers the minister in charge of roads to impose levies on petroleum products, the proceeds of which will go to the maintenance of public roads. Despite its promising start,

... the Road Maintenance Levy Fund (RMLF) is still inadequate and may not be able to meet the minimum road maintenance funding requirements ... for the total network. Considering the Government's budgetary constraints, however, donor funding may still be required to supplement the RMLF and budgetary allocations before full funding is achieved (RoK 1997: 106).

In September 1994, the government introduced transit toll charges under COMESA (Common Market for Eastern and Southern Africa) arrangements in addition to axle-load

limits on trucks that carry heavy loads. These trucks are partly responsible for damaging the Mombasa–Nairobi–Kampala–Kigali road. Kenya’s axle-load regulations represent the core of the transport policies relating to trucking productivity, infrastructure provision, and management (Edward and Fekpe 1997). Revisions in size and weight limits are reflected in truck fleet, operating weights, and volumes, which in turn affect the geometric requirements, loadings, maintenance, and rehabilitation intervention levels of the infrastructure.

The Kenya-Danida (1980) study and Laferriere and Nalo (1992) provide the background for Kenya’s reforms on road user charges and axle-load limits. Road pricing analysts agree that, in spite of the various arguments in favour of the average cost pricing method, its approach does not generally result in an efficient allocation of resources. This is because it understates the true cost of road use. The studies, which estimated optimal and efficient user charges for Kenya using the marginal cost pricing approach, illustrated the factors that could explain the difference between marginal costs and average variable costs. The factors include congestion, the additional costs of road damage, and the costs to society due to increased accident risks and environmental costs. The studies showed that i) the estimated optimal user charges were higher than the then existing charges but were lower than efficient charges, and ii) the distributional weights led to user charges that tended to favour the use of paved roads (Table 2). Two policy issues emerged from the Lafferiere and Nalo (1992) study. “First, the Kenya government should include distributional considerations when determining road user charges. Second, the proposed second best pricing approach should be preferred to the average cost pricing because it minimizes welfare loss and achieves income redistribution.”

Table 2. Existing road user charges, efficiency charges, and estimates of optimal road user charges (shillings per vehicle-kilometre)

Mode	Existing paved	Charges <sup>1</sup> unpaved	Efficient paved	Charges unpaved	Optimal paved	Charges unpaved
Car	0.49	0.48	0.61(24.5) <sup>2</sup>	0.76 (58.3)	0.55 (12.2)	0.65 (35.4)
Bus	0.39	0.62	0.70 (77.2)	0.93 (50.0)	0.66 (67.1)	0.89 (43.5)
HGV	0.84	0.87	1.57 (86.7)	1.56 (77.9)	1.56 (86.2)	1.56(86.4)

Notes: <sup>1</sup> Existing road user charges are obtained from the Kenya-Danida study (1980: Table 6.03)

<sup>2</sup> Figures in parentheses are percentage increases in efficient charges and optimal prices over existing charges

HGV = heavy goods vehicles

Source: Lafferiere and Nalo (1992: 76)

### ***3.3.4 Strengthening the institutional framework***

One of the strategic policies the Kenya government has adopted to improve road maintenance is to strengthen the management of and the institutional framework for roads. A study on road sector institutions was commissioned between 1995 and 1999 with

---

support from the European Union. The objective was to develop an institutional framework within which the management of the entire road network would most effectively be undertaken. In 1998, a Kenya Roads Board (KRB) bill was drafted for establishing an autonomous, executive (or national) roads board to manage the RMLF and MR&R.<sup>16</sup> The bill was discussed and passed by the parliament in December 1999 as the KRB Act 1999. The act outlines the major tasks of the KRB as follows:

- Coordinate implementation of all policies relating to the maintenance, rehabilitation and development of the network
- Coordinate maintenance, rehabilitation and development of the road network with a view to achieving efficiency, cost-effectiveness and safety
- Administer funds derived from the fuel levy and any other funds that may accrue to the board
- Determine the financial allocations for road agencies and evaluate the delivery of works through technical, financial and performance audits
- Ensure that all procurement of works is conducted in accordance with the guidelines and criteria set by the board
- Recommend to the minister responsible for roads the areas for study and research; the specifications, design standards and classification for roads; vehicle types and dimensions; axle-load limits; and road safety measures

In essence, the board provides an institutional framework within which the entire road network is managed, and is entrusted with the authority to efficiently use KRB funds to develop, rehabilitate and maintain the network. The KRB Act provides for broad allocation of funds, with 60% going to international and national trunk roads and primary roads, 24% to secondary roads, and 16% to rural roads.

The KRB is composed of major stakeholders in the roads sector, who constitute the majority of its membership, and representatives of relevant government ministries or departments. The stakeholders include the Kenya National Chamber of Commerce and Industry, the Kenya National Farmers' Union, the Automobile Association of Kenya, road contractors, road transporters, and the Kenya Association of Tour Operators. The government is represented by the Ministry of Transport, Information and Communications

---

<sup>16</sup> Over the post-independence era, there has been concern by many stakeholders about the fragmented manner in which responsibilities relating to road transport have evolved in various institutions in rural and urban areas.

---

(MoITC), the Ministry of Roads and Public Works (MoRPW), the Ministry of Finance and Planning, and the Ministry of Local Government.

The successful implementation of the KRB Act is expected to translate into the physical improvement of the road network, improved utilization of the fuel levy funds, reduction in vehicle operating costs and travel times, open and accountable procurement of road works, and effective financial and technical auditing of road works.

### ***3.3.5 Labour-based road maintenance and construction***

Emphasis on labour-intensive techniques for road development is one of the planks of the Kenya road policy. The government has consistently pursued this policy strategy since independence (from RARP through the MRP to the Roads 2000 programme) in recognition of the high cost of capital-based techniques, Kenya's limited financial resources, unemployment, and the need to readily bring much of the road network to a maintainable condition.

Table 3 compares the costs of labour-intensive RARP/MRP roads with those of other minor subdistrict link roads under the Ministry of Roads and Public Works portfolio. An RARP job costs less than 10% of a job in the mechanized construction system, and its capital-labour ratio is a mere third. A similar picture is revealed by comparing a typical MRP road with one in the machine-intensive Gravelling, Bridging and Culverting (GBC) programme of the ministry. The end-products are of the same standard but the MRP uses a labour-intensive technology employing such simple implements as forks, spades and wheelbarrows, while the GBC programme uses automated loaders, tippers and graders. A 1990 evaluation found that the cost of road improvement is 10% higher in financial terms and 35% in economic terms when capital-intensive rather than labour-intensive methods are used (RoK 1990b).

Table 3. Comparison between RARP and conventional road construction, 1977–1978

Criteria	RARP	Conventional programme
Cost per km of road (K£)	2,050	7,500
Cost per job created (K£)	152	1,760
Capital-labour ratio	1.04	3.00
Share of wages in total cost (%)	49	25–30
% of foreign exchange in total cost	20	60–65

Source: World Bank (1993: 96)

Under the Roads 2000 strategy, private and public sector road contractors are encouraged to use labour-based methods to minimize economic costs, save foreign exchange, and provide employment opportunities. Training support to labour-based contractors is an

---

important element of the strategy. Extensive training is necessary to orient small general contractors to the roadwork and the techniques of the Roads 2000 district-based network approach. This process has already been successfully tried under a SIDA-funded programme, and there are plans to expand the programme to increase the pool of small, labour-based contractors who bid for works. The training programme, which is undertaken within groups of administrative districts, consists of initial instruction activities (classroom and field) followed by small training contracts, after which the contractors are awarded one round of contracts through restricted bidding.

### ***3.3.6 Efficiency and safety in transport operations***

The policy of enhancing the efficiency of road transport operations aims to constantly review the laws and licences that might hinder efficient operation. The laws relate to the capacity of vehicles on the roads, such as 'matatus' and heavy goods vehicles, and the adoption of sound work ethics by instilling discipline in operators. Vehicles engaged in international transport on Kenyan roads are required to observe the limits on maximum axle load and vehicle dimensions as stipulated in the agreements of COMESA and the East African Cooperation countries in which Kenya is a signatory.

The government has several mobile weighbridges, and static ones at Athi River, Mariakani, Webuye, Isebania, Gilgil and Busia for controlling axle load. And more effective rules have been instituted for enforcing axle-load regulations. Load limits are checked 24 hours a day unlike in the past when this was done for only a few hours a day. In addition, following the completion of the extension of the pipeline to western Kenya, volumetric controls are being applied on all tankers except those transporting gas or black oil.

The policy on road safety in Kenya focuses on reducing the incidence and severity of road accidents. In a bill awaiting parliamentary approval, the government proposes to establish the Kenya Road Safety Authority for general supervision of matters on road safety and to be the principal government instrument in formulating and implementing road safety policies (RoK 2000a).

### ***3.3.7 Infrastructure for non-motorized transport***

In addition to the poor and deteriorating road conditions in the country, there is a considerable lack of facilities such as footpaths, lanes for cyclists and other NMT modes, street lights to make walking safe, and fly-overs and by-passes to ease traffic congestion. Most of these are as important in rural areas as in urban ones.

The government's principal policy initiatives for promoting NMT beyond their conventional use aim to i) guarantee urban local authorities a share of RMLF revenues raised within their jurisdiction, ii) continue major reforms through the Kenya Urban

---

Transport Infrastructure Project (KUTIP), in collaboration with the International Development Association (IDA), and iii) encourage locality-specific interventions through the National Forum Group on Rural Transport and Development established in 1996.

Under KUTIP, the government will contribute US\$115 million as part of IDA's sub-Saharan Africa Transport Policy Programme for upgrading the urban infrastructure in 26 towns in Kenya and strengthening the financial, management, and institutional capacity of the local authorities (RoK 1997). The project, which was scheduled to run from 1995 to 2000, included an NMT component dealing with the construction or improvement of bicycle paths and footpaths.

## **4 Policy Performance and Evaluation**

### **4.1 Fairly developed roads assets**

Transport services constitute a key component of Kenya's service sector in both their contribution to the country's employment and income generation and their role in external trade, especially at the regional level (Ikiara et al. 2000). The main transport modes include road, rail, water, and air. The most important transport services on the basis of output (using 1998 data) are road, at 34%; air, at 25%; and water, at 16% (Table 4).

The regional demand for all transport services is significant and is expected to rise with the growing economic cooperation among the three East African and COMESA countries. Current regional arrangements that promote cooperation in transportation in the Eastern and Southern African region include the North Corridor Transit Agreement<sup>17</sup> that unifies transportation rates and regulations in Kenya, Uganda, Rwanda and Burundi, and the Preferential Trade Area's (PTA) Communications Development Programme for boosting the regional transport network and collaboration.

The Kenya economy is dependent on roads and road transport. Even if the proposed restructuring of the Kenya Railways succeeds fully, roads and road transport will remain

---

<sup>17</sup> Traditionally, the regional transport industry in East Africa was centred on the Ports of Mombasa and Dar-es-Salaam. From these two ports evolved what has been termed as the Northern and Central Corridors, respectively. In the 1960s and 1970s the two corridors simply comprised the rail and road infrastructures linking Mombasa and Dar-es-Salaam to landlocked countries. In addition to the road network running parallel to the Kampala–Kasese railway and the road network from Kampala to Mbarara and Kabale, which also goes to Rwanda and Bujumbura, the North Corridor comprises the 1,333 km of rail network from Mombasa via Malaba and Busia to Kampala. The Central Corridor comprises the Dar-es-Salaam/Kigoma rail network (1,254 km), connecting Bujumbura by ship on Lake Tanganyika, and Rwanda by road.

Table 4. Structure of Kenya's transport service sector (Kenya £ millions)

Transport type	1975	1980	1985	1990	1995	1998
Road	35.8 (24.4)	92.3 (33.1)	248.8 (45.1)	476.9 (44.3)	810.7 (36.3)	870.7 (33.7)
Railway	25.4 (17.3)	32.9 (11.8)	57.7 (10.5)	94.5 (8.8)	225.0 (10.1)	187.4 (7.3)
Water	34.5 (23.6)	62.7 (22.5)	89.2 (16.2)	134.2 (12.5)	372.3 (16.7)	408.6 (15.8)
Air	39.9 (27.2)	41.6 (14.9)	86.8 (15.8)	268.2 (24.9)	471.1 (21.1)	650.5 (25.2)
Pipeline	–	18.6 (6.7)	23.4 (4.2)	31.1 (2.9)	197.8 (8.9)	278.0 (10.8)
Incidental services	10.9 (7.4)	31.2 (11.2)	45.2 (8.2)	72.7 (6.7)	153.8 (6.9)	186.7 (7.2)

Note: Figures in parentheses are percentages of the share of each service in the transport sector output.

Kenya's primary transport system. Considering the importance of the sector, the priority given to the development of the road infrastructure since independence is not exceptional, but is similar to most sub-Saharan countries (Table 5). The total length of both bitumenized and gravel or earth roads increased from 41,941 km in 1963 to 46,600 km in 1972. Table 6 shows data on the length of classified road stock during 1975–1999.

Table 5. Road-to-population ratio for selected African countries

Region	Road 1000 km per 1 million persons			Annual average		
	1980	1990	1995	1975–84	1985–89	1990–97
Sub-Saharan Africa (SSA)	3.3	2.5	2.9	3.3	3.1	2.5
SSA excluding South Africa	3.1	2.2	2.5	3.1	2.8	2.4
SSA excluding South Africa and Nigeria	3.5	2.6	2.7	3.5	3.3	2.6
Botswana	9.1	7.0	12.5	11.7	9.8	11.6
Cameroon	7.2	6.1	2.6	6.6	5.5	3.5
Ethiopia	1.0	0.5	0.5	0.9	0.7	0.5
Ghana	3.0	2.6	2.2	2.8	2.7	2.3
<b>Kenya</b>	<b>3.1</b>	<b>2.6</b>	<b>2.3</b>	<b>3.2</b>	<b>3.0</b>	<b>2.4</b>
Malawi	1.7	3.2	1.5	1.9	1.5	1.8
Mauritius	1.8	1.7	1.7	2.2	1.7	1.7
Namibia	–	28.7	41.0	–	–	38.9
Nigeria	1.5	1.2	1.7	1.5	1.3	1.5
South Africa	6.7	5.3	8.5	7.1	5.5	6.3
Tanzania	2.5	–	3.0	2.5	3.8	2.7
Uganda	2.1	1.8	–	2.1	2.0	1.7
North Africa	2.1	–	–	2.1	1.6	2.0
Algeria	3.9	–	3.7	4.1	3.6	3.6
Egypt, Arab Republic	0.7	0.9	–	0.7	0.7	0.9
Morocco	3.0	–	2.3	2.9	2.6	2.1
Tunisia	3.7	–	2.5	3.4	3.6	2.5
All Africa	3.1	2.3	3.0	3.1	2.9	2.6

Source: World Bank (2000: 256)

Table 6. Kilometres of road by type and classification\*, 1977–1999

Road class	1977		1980		1985		1990		1995		1999	
	Bitumen	Earth+	Bitumen	Earth	Bitumen	Earth	Bitumen	Earth	Bitumen	Earth	Bitumen	Earth
A	1,799.7	1,126.3	1,900.2	1,541.6	2,328.5	1,241.8	2,607.9	971.0	2,653.0	957.9	2,890.0	870.0
B	749.1	1,659.8	958.7	1,747.0	1,217.5	1,548.1	1,307.6	1,442.9	1,304.4	1,366.5	1,430.0	1,370.0
C	1,342.9	6,536.6	1,473.4	5,921.8	1,931.7	5,852.1	2,293.4	5,476.4	2,561.7	5,468.9	2,490.0	5,180.0
D	350.0	9,814.0	527.0	9,477.4	713.9	10,261.8	1,041.4	10,066.7	1,183.8	10,155.0	1,170.0	10,050.0
E	134.6	20,020.9	176.6	19,883.4	378.1	25,848.7	512.4	25,756.6	749.3	26,321.5	750.0	25,800.0
F**	–	6,869.9	505.9	7,359.2	161.0	2,787.9	180.5	10,627.7	219.5	11,000.4	210.0	11,090.0
Total	4,376.3	46,027.5	5,541.8	45,930.4	6,730.7	47,450.4	7,943.2	54,341.3	8,671.7	55,270.2	8,940.0	54,360.0

Notes:

\*The Roads Department of the Ministry of Transport and Communications completed the road reclassification in 1970.

All roads in Kenya now fall under one of the following categories:

- A – international trunk roads linking centres of international importance, crossing international boundaries or terminating at international ports
- B – national trunk roads linking centres of national importance
- C – primary roads linking provincially important centres to each other, or to higher class roads
- D – secondary roads linking locally important centres to each other and to higher class roads
- E – minor roads are any link to a minor centre
- F – special purpose roads including those for tourist, township, agriculture, and strategic purposes

+These include gravelled roads

Source: *Statistical Abstracts*, various issues.



---

By the end of June 1992, the RARP and MRP covered a total of 31 districts, mainly in Nyanza, Western, Coast, Central, Eastern, and Rift Valley provinces. From 1974 to 1992, RARP alone covered about 8,120 km, out of which 7552 km was gravelled. As at July 1999, the classified road network covered about 63,300 km, representing about 42.2% of the country's total road network of about 151,000 km. Over the 1995–1999 period, the length of bitumen roads increased by only 3.1%, compared with 9.2% for the previous five-year period. The government attributes the slow growth in paved roads in the recent past to the fact that emphasis is being put on road maintenance and rehabilitation. During 1995–1999, the length of earth or gravel roads declined by 910 km, mainly because these roads were upgraded to bitumen standards. But bitumenized roads increased by only 268 km.

## 4.2 Disjointed institutions

In Kenya, like in most Sub-Saharan Africa, roads are managed by government departments (Table 7). The Ministry of Information, Transport and Communications (MoITC) has nominal overall responsibility for Kenya's policies involving planning, designing and management of rail, road, air and maritime transport. In practice, however, the MoITC has very little involvement in the road sector. The Roads Department of the Ministry of Roads and Public Works is responsible for planning, designing, constructing, and maintaining the classified network over 63,000 km. The Kenya Wildlife Service (KWS) is in charge of roads in the national parks. The rest of the network is administered by either municipalities and county councils, which are under the Ministry of Local Government, or the Forest Department, which falls under the Ministry of Environment and Natural Resources. In general, each agency involved in the roads subsector (that is, the three government ministries, local authorities, and KRB) has its own objectives and funding sources.

Table 7. Institutions responsible for road maintenance in Kenya

Road type	Responsible institution	Network size (km)
Classified roads	Ministry of Roads and Public Works	63,300
Unclassified network		
National parks	Kenya Wildlife Service (KWS)	5,900
Game reserves	Local authorities, but contracted out to KWS	2,800
Urban roads councils	Local authorities (city and municipal councils)	6,000
Rural roads	County councils	63,600
Forest roads	Forest Department	8,000
Total		149,600

Source: IEA (1998: 195).

The disjointed nature of the institutional framework for the roads sector may be a factor in the sector's poor performance in maintaining the network. Indeed, IEA (1998) sees this as

---

a principal reason for the poor performance of the entire transportation sector. It is difficult to coordinate the activities of the various road agencies, to determine their financial requirements, and to address the problems of the road sector in a synchronized manner. The general high value of roads compared with railways and air travel provides a *raison-d'être* for ensuring coordinated management with access to adequate funds to ensure the large investments in roads yield value-for-money operations.

### 4.3 Deficient maintenance

While there may be a few areas in Kenya with an insufficient density of classified roads, the coverage of the network is generally adequate to support the present level of economic activity in Kenya; roads are concentrated in areas of high population and economic activity. The primary problem with the Kenya road sector is not the quantity but the quality of the network. This is the consequence of two rather different factors (World Bank, 1995: 12):

- 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 that would justify paving the roads: about 2,500 km of unpaved roads carry over 200 vehicles per day.

Inadequate road maintenance has been a significant problem for most of Kenya's post-independence period. In 1968, road network deterioration was attributed partly to vehicle overloading, but mainly to the inadequate maintenance by local authorities. To improve the situation, the central government assumed responsibility for the maintenance of the entire classified road network. Road maintenance improved considerably until 1975 when insufficient funding began to cause substantial cutbacks in both periodic (resealing and regravelling) and routine maintenance. Underfunding was not resolved even by the World Bank's First Highway Sector Project, which had as one of its objectives to support the road maintenance sector.<sup>18</sup> During the 1970s the agencies responsible for the road sector were

---

<sup>18</sup> By mid-1990s, the World Bank group had undertaken 12 projects in the Kenya road sector (World Bank 1995). During the 1960s and 1970s the International Development Association supported the government in the road sector development through (World Bank 1995: 8–9):

- Creation of a well-integrated network of national and regional roads (the First and Second Highway projects)
- Rural roads for specific agricultural programmes (agricultural development—roads in tea and sugar producing areas and rural access roads)
- Projects combining main road construction with rural development (Third, Fourth and Fifth Highway projects).

---

strengthened, the Roads Department had demonstrated its capacity, and the government had developed appropriate objectives and policies for the sector under the Fourth Transport Plan. The World Bank, therefore, agreed to a Highway Sector Project to support the implementation of the government's highway sector plan. The slow economic growth during that period prevented the government from fully fulfilling its funding commitment for maintenance and construction. There were even bigger shortfalls in the physical implementation of the plan, especially the maintenance programme. The World Bank (1995: 9) concluded 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."

The Second Highway Sector Project that was prepared in 1984 with the objective of financing the last four years of the government's Fifth Highway Sector Plan (FY 1984–1988) was expected to reduce the backlog of periodic maintenance. But the achievements of this project were well below the initial expectations. The World Bank Group's funding support for the plan was expected to reseal 2,800 km, regravell 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 consultant services to assist the Ministry to improve highway and maintenance planning.

The project became effective on 26 September 1986, but implementation was very slow mainly because of the government's inability to allocate sufficient counterpart funding to allow the Roads Department to use the World Bank funds. Following the government's August 1987 request for a reduction in the scope of the works and in the level of counterpart funding, the project was revised substantially, the loan component was reduced from US\$50 million to US\$5 million and the disbursement percentage was increased. In addition, the project's closing date was extended by two years to 31 December 1993. The project succeeded in implementing the revised 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, providing road maintenance equipment, purchasing bitumen for locally funded resealing projects, and providing technical assistance for the introduction of improved highway and maintenance planning.

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

Project completion reports show that 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 and cost overruns and their economic returns were generally below the appraisal estimates.

---

Shortage of local funding was a critical issue throughout the Second Highway Sector Project, restricting the scope of work and delaying payments to contractors. While the revised project components were successfully implemented, the overall objectives of the 1984 Highway Plan were not attained, and the continued inadequacy of maintenance funding for the network largely offset the benefits achieved by improving 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. This critically depends on provision of adequate local funding for road maintenance.

The expansion of the network has intensified the problem of funding maintenance activities. Road tolls were introduced on the main paved network in the early 1980s to supplement regular budgetary funding. The toll revenue provided funds outside the normal budget (in 1992/93 Ksh 326 million was collected from tolls and used for periodic maintenance and strengthening of the main paved road system), but the net increase in funding was limited because the normal budgetary allocations declined in real terms. Various government annual Development Estimates and Statistical Abstracts show recent expenditure in the sector (World Bank 1995).

Overall, there has been a significant reduction in maintenance funding since the 1970s and a major fall in total road expenditure until the mid-1990s. The extent to which road maintenance has been underfunded has not been established with precision, but it is very considerable:

A consultant study for the recent public expenditure review estimated that total annual spending by MOPWH [same as MoRPW] on the maintenance and rehabilitation of the network was Ksh 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 Ksh 4.70 billion. Several other estimates indicate rather higher funding needs and Ksh 6 billion is a reasonably robust estimate of maintenance requirements for the entire classified road network (World Bank 1995: 13).

The present funding for maintenance cannot be optimally allocated because a high proportion of it goes salaries for large workforce of labourers who are not productive since funds are not sufficient to provide them complimentary materials, tools and transport for their work. The recent retrenchment programme for the civil service has not helped here.

Most estimates of road maintenance needs have been made on the assumption that the road network is maintainable. Unfortunately, neglect over the years has resulted in much of the network deteriorating to the point where rehabilitation is necessary before maintenance

---

is possible. Rough estimates in the mid-1990s indicated that full rehabilitation of the system to conventional standards would cost Ksh 36 billion.

Even in the 1990s, the deterioration of both the classified and unclassified roads led to high production costs, consequently discouraging investment (Nalo 1993; Kimuyu and Mugerwa 1998; RoK 2000a). This is increasingly hindering economic turnaround and the implementation of the country's long-term industrialization strategy. The performance of the road subsector has remained depressed over the last five years due to inadequate funding for road MR&R activities. However, in the 1999/2000 fiscal year the subsector benefited from funding for rehabilitation and maintenance of both rural and urban roads under the El-Niño Emergency Fund, the Kenya Urban Infrastructure Programme (KUTIP) and the Roads 2000 programme. These programmes averted further decline of the sector (RoK 2000a).

A large proportion of the road network in Kenya is 'unclassified' and its maintenance is left to poorly funded local authorities or poorly coordinated efforts by line ministries. According to World Road Federation statistics, the proportion of Kenya's paved primary roads and of roads in good condition stagnated in the 1990s at 13% and 32%, respectively. These compare unfavourably with averages for Africa and even sub-Saharan Africa. Classified roads are heavily trafficked, with high costs for repair and rehabilitation. There has been marginal investment in road extension in recent years, and flooding and other weather-related disasters have done considerable damage to roads. Table 8, which is based on statistics from the World Bank and the International Road Federation, shows percentages of paved primary or bitumen roads (that is, those that have been sealed with asphalt or a similar bonding material) in the total classified roads network, and of those in good condition.

Kenya has 4,509 km of roads purposely developed to serve tea-growing areas. It was estimated that on the basis of 1991/92 prices, Ksh 56 million would be required annually for maintaining this network (RoK 1992). Cess contributions from all tea farmers (estates and smallholders), who pay 1% of their total tea earnings to the local government for maintenance of tea roads, reached more than Ksh 62 million and Ksh 76 million in 1990 and 1991, respectively. This means that rehabilitating and maintaining tea roads nationally would require less than 74% of the cess collection. The capacity of districts to meet the requirements of their tea roads varies from district to district depending on tea production and the state of the roads. But majority of tea roads require urgent and major rehabilitation, especially for the benefit of smallholders (RoK 1992).

Table 8. Paved primary roads for selected African countries

Region or country	% of paved roads						% in good condition
	1991	1992	1993	1994	1995	1996	1989
Sub-Saharan Africa (SSA)	17.0	16.5	16.4	16.1	16.2	16.5	39
SSA excluding South Africa	17.0	16.5	16.4	16.1	16.0	16.5	39
SSA excluding South Africa and Nigeria	17.0	16.0	15.8	15.6	15.5	15.8	41
Botswana	34.0	19.9	21.1	22.2	23.3	23.5	94
Cameroon	10.9	11.3	11.7	12.1	12.5	–	25
Ethiopia	15.0	15.0	15.0	15.0	15.0	15.0	47
Ghana	23.0	23.5	23.9	24.4	24.9	24.1	28
<b>Kenya</b>	<b>13.3</b>	<b>13.8</b>	<b>14.3</b>	<b>13.6</b>	<b>13.8</b>	<b>13.9</b>	<b>32</b>
Malawi	17.0	17.0	18.0	18.0	20.0	20.0	56
Mauritius	93.0	93.0	93.0	93.0	93.0	93.0	95
Namibia	10.9	10.9	7.3	7.9	7.9	8.2	–
Nigeria	30.0	30.0	30.0	21.3	18.8	18.8	34
South Africa	–	–	–	–	41.5	–	–
Tanzania	37.0	37.0	4.2	4.2	4.2	4.2	39
Uganda	–	–	–	–	–	–	10
North Africa	70.0	66.0	66.7	68.0	68.9	78.1	–
Algeria	70.0	66.0	66.7	68.0	68.9	–	–
Egypt, Arab Republic	52.7	53.8	54.9	56.0	57.1	–	–
Morocco	49.5	49.5	49.6	50.2	50.2	51.8	–
Tunisia	75.5	74.6	76.0	77.4	78.8	78.9	–
All Africa	17.2	17.5	17.8	18.1	18.6	18.3	39

Source: World Bank (2000: 257).

#### 4.4 Rural access and agricultural productivity

Studies on rural road projects in sub-Saharan Africa reveal a strong catalytic effect of rural feeder projects on agricultural development. In Kenya, rural access and minor roads programmes (RARP and MRP), which are formulated and implemented by the government as central infrastructure strategies for rural development, have had positive impacts in providing cheap access to markets for both agricultural outputs and modern inputs.

A number of studies have been undertaken on access to markets and the benefits of rural roads. The theoretical framework for much of the analysis is the Ellet-Walters model of rural transport (see Walters 1968; Gertsovitz 1989) in which land rents decline with distance to markets through the influence of distance on effective prices. Various studies have been undertaken in Kenya on the interaction between agricultural production and

---

road infrastructure. Impact evaluation of the RARP showed an increase in crop production of 29% from baseline conditions one year after the programme was completed. Over that period, sales of farm produce went up by 51%, farm income by 27%, non-farm cash earnings by 11%, and total household earnings by 20% (MoITC 1984). Similar rural road projects in Uganda led to an ex-post increase in cotton production of 200–700% with a corresponding rise in income of 373–525% (MoITC 1981). Dijkistra and Magori (1992) show that an inadequate road and transport infrastructure discourages adoption of high-value horticultural crops through which farmers could easily improve their incomes.

An inadequate public infrastructure could result in massive losses to producers. In 1988, three regions of Tanzania lost 50% of their cotton, one region 80% of its rice, and another region 50% of all its seeds and fertilizers and other chemicals when rural roads became impassable following heavy rains (Gavira 1990). In Kenya, the transport problems faced by KTDA include high vehicle operation costs due to excessive wear and tear, loss of green leaf in transit, losses associated with the short plucking periods in a day (four hours compared with nine hours in estates), and quality losses due to delays in collection. Studies show that declines in green leaf delivery have followed closures of buying centres, especially where the distance to an alternative centre is long. And losses in transit have been as high as 0.2% (in 1988) of the leaf weight (RoK 1992). Poor road transport and long transit times affect the quality of processed tea. Trials by the Tea Research Foundation show that made-tea quality declines if green leaf is subjected to more than 14 hours of uncontrolled withering, a common phenomenon in Kenya where tea leaf delivery is almost never prompt because of transport problems (Owuor et al. 1990). The difficulties of road access during the rainy season have led the KTDA to operate a vehicle fleet designed to maximize access rather than minimize transport costs.

Rhodes (1993) studied the central policy issue of whether within the KMDP the anticipated agricultural benefits from public infrastructure investments in rural road rehabilitation exceeded the cost of the programme. The results of the analysis, based on improvements along the highest ranked road in each of the eight KMDP districts, showed that all roads passed a benefit-cost ratio test in the baseline case, except the Kitui road at the highest assumed discount rate of 22%. Furthermore, the difference in benefits between the baseline case and an unmaintained road ranged from a low of Ksh 20 million on the Nakuru priority road to a high of Ksh 87 million in Uasin Gishu. This amount may be seen as the agricultural benefits that would be lost if the rehabilitated roads were not maintained adequately. Njehia (1994) uses a simultaneous equations model to estimate the effect of market access on productivity and resource use. In essence, market access, proxied by the time it takes a farmer to get to the market, reduces the intensity of resource use and efficiency of market distribution.

---

Using an integrated, non-separable household model on small farms in southern Siaya, Omamo (1998) established that cropping patterns were a reflection of rational adjustments by farmers to adverse external conditions and food security concerns. Among the external conditions that influence the cropping patterns is the proximity of farms to market centres, which determines transport costs. The physical distance from market centres and the associated transport costs are a function of the state of existing road infrastructure. Based on two crops, cotton and maize, the study demonstrated that costly farm-to-market transport makes specialization and commercial farming less attractive. A recent study by Obare (2000) corroborates findings of previous research: in Nakuru District a reduction of access costs by 10% translated into average production costs savings of Ksh 14,000 per hectare.

#### **4.5 Environment and safety**

The road transport system, particularly in major urban areas, is characterized by heavy congestion during peak hours, over-loaded public transport vehicles, speeding, and reckless driving. Newspapers and government statistical abstracts show that the cost of road transport in Kenya is extremely high in terms of accidents and loss of human life (Table 9). The average death rate on Kenyan roads is approximately seven persons a day. Netherlands has a similar rate but its vehicle density is at least 10 times higher than Kenya's.

Dykstra and Jungerius (1997) attribute most accidents on Kenyan roads to poor road design, construction, and maintenance. Studies on urban transport problems have recommended intensive road improvement in Nairobi (for example, Ogonda 1976), Mombasa (Irindu 1982) and Kisumu. Most urban roads are relatively narrow single carriageways.

### **5 Critique of the Policy Framework**

International development funds have had a big role in improving major routes. But these improvements are not long lasting, and soon after a road project is completed, its condition deteriorates fast resulting in huge potholes, broken bridges and culverts and muddy sections. Industrialists and other observers have attributed the poor state of Kenyan roads and road transport to the government's failure to efficiently allocate financial resources and to raise additional funds for road extensions and maintenance (IEA 1998; Watts 2000). The Kenya Interim Poverty Reduction Strategy Paper supports this view, attributing the poor condition of Kenya's road network to several factors. These include lack of periodic and routine maintenance, rampant corruption in road construction contracts, collusion between contractors and government officials leading to approval of substandard work, increased



traffic volume, overloading, El-Niño rains, and non-prioritization of roads in government expenditure (RoK 2000a). Evidently, inadequacies in the general road policy framework, in continuity and implementation of specific policy strategies, and in policy research and analysis focusing on the roads subsector explain the deterioration of the quality of the Kenyan road network over the last decade.

Table 9. Number of traffic accidents due to road transport, 1972–1997

Description	1972	1975	1980	1985	1990	1995	1997
Total Number of accidents	6,616	6,534	6,162	8,474	10,308	12,960	14,849
Persons killed and injured							
Killed	1,331	1,338	1,413	1,800	1,856	2,617	3,022
Seriously injured	3,062	3,106	3,459	5,113	6,455	8,666	9,618
Slightly injured	6,135	5,177	5,541	8,470	10,619	14,332	16,133
Total	10,528	9,621	16,192	15,383	18,930	25,615	28,773
Vehicles primarily responsible							
Motor car	3,233	3,540	2,832	4,424	4,247	4,573	5,129
Lorry, bus or taxi	1,172	1,191	1,346	2,068	3,572	3,814	2,689
Motor cycle	363	129	307	326	348	375	423
Pedal cycle	365	220	220	205	430	678	697
Animals and handcarts	177	112	139	75	113	273	170
Others	1,413	1,342	1,318	1,376	1,498	3,257	5,656
Person primarily responsible							
Driver (including motor cycles)	3,460	3,342	3,316	3,643	4,582	5,130	5,719
Pedestrian	1,448	1,524	644	2,405	2,794	4,076	4,401
Pedal cyclist	392	312	246	454	742	786	1,287
Passenger	232	273	257	573	699	829	918
Other cause	1,081	1,083	1,699	1,399	828	1,939	1,218
Time of accident							
Day	4,415	4,379	4,381	5,583	6,515	8,286	9,092
Night	2,198	2,155	1,781	2,891	3,793	4,674	5,757

Source: *Statistical Abstracts*, various issues.

## 5.1 Common policy weaknesses

To provide direction for the vision of the transport sector and criteria against which the strategies of the sector can be assessed, 10 key elements relating to strategic issues should be considered:

- Focusing on customer needs
- Meeting basic needs
- Defining sources of finance and return on investment

- 
- Ensuring lowest cost for a given level of service
  - Guaranteeing safety, security and consumer protection
  - Integrating systems
  - Developing human resources
  - Ensuring competition
  - Broadening participation in the economy
  - Catering for environmental impact

These represent a set of high-level imperatives that form the basis of an integrated transport policy, although not all of them are relevant to every sphere of the transport policy. If the pre-1995 road policy for Kenya is judged against these criteria, it is the view of this author that it will score dismally.

Kenya's general road policy framework has two main weaknesses. First, the absence of an integrated policy for developing transport infrastructure has tended to encourage compartmentalization of road sector strategies, invariably failing to exploit wide synergies, positive cross-externalities in different fields, and the advantages of cooperation between different government and non-government agencies.

Second, the overall policy framework does not consider the impact on land use, the natural environment and local public finance. Contemporary wisdom on sustainable development demands that the country must develop a road policy strategy that accounts for other transport sectors and the overall development concerns of efficiency, equity and environmental sensitivity.

## **5.2 Continuity, implementation and trade-offs**

In general, there has been a major shift in road policies from the Sessional Paper No. 10 of 1965 to the era of structural adjustment. Specifically, there was one continuity, two major shifts and one trade-off. The only policy strategy that has been consistently pursued is decentralization of road service provision. Otherwise, starting in the mid-1980s there has been an increasing effort to move towards PPI—including privatization and full cost recovery for public inputs—as opposed to emphasizing government provision, as was the case in 1963–1984. Widespread adoption of an economic development paradigm based on policies to strengthen market forces, increase competition and refocus the role of the state has heightened the importance of private sector development. Many developing countries are undertaking structural reforms aimed at encouraging private enterprise to take root and flourish. These efforts focus on macroeconomic stability (fiscal and monetary reform); creating incentives for efficient production (trade, exchange rate and price reform);

---

promoting deregulation and competition; and improving the legal, judicial and regulatory environments.

The second shift relates to the road-financing policy in which emphasis is shifting from tolls and cess collections from agricultural commodities to the predominance of the RMLF. There is a notable move from direct government pricing of roads through tolls to indirect methods, a process begun in 1994 by the introduction of a special levy on motor vehicles.

A major trade-off that the policy framework fails to consider is the need to balance the strengthening and rehabilitation of existing assets, on one hand, and the construction of new roads and bridges, improvement of low-grade sections, and widening of roads to four lanes, on the other.

The shifts in policies over the years can be said to be gradual and continuous as occasioned by changes in the economy. But some changes have been ad hoc. For instance, the apparent de-emphasis on cess collections and road tolls as policy strategies has been largely unexplained and uninformed by policy research. It would be judicious to supplement the RMLF with cess receipts and direct pricing of specific segments of Kenyan roads. Particular government road programmes such as the KMDP that pass cost-benefit tests have been discontinued! Yet government-commissioned research (MoITC 1981, 1983, 1984; MoRPW 1991) and other studies (for example, Rhodes 1993) show that gains to agriculture from rehabilitating rural roads are considerable, and that lack of road maintenance can greatly reduce the benefits to agriculture of rehabilitated roads.

Policy implementation has been weak and inadequate. In the 1960s and 1970s, most policies were implemented adequately, possibly because of the abundance of central and subnational (local authority) government resources and policies. Later (from the late 1980s onwards) fewer resources were committed to the maintenance of old roads and development of new ones. From the late 1980s, the government's burden of supporting most services increased with the rapidly increasing population and declining macroeconomic performance. It is widely acknowledged by the Kenyan industry that most of the infrastructure, including the transport network, collapsed during that period. Most entrepreneurs interviewed in the survey of the Kenyan component of the World Bank's Regional Programme on Enterprise Development recognized deterioration in the majority of infrastructural services, especially ports, roads, electricity, freight transport, and telephone (Bigsten and Kimuyu 1998).

Even during the 1990s, the pace of reforms in the roads subsector and the entire transport sector in Kenya remained rather tardy. Results of a study (RoK 1997) on the feasibility of inviting the private sector to invest in road construction under the Build Operate Transfer (BOT) framework, though visionary, are yet to be published and discussed by stakeholders.

---

Many policy analysts contend that trade policy reforms have not had a significant impact on Kenya's export performance, largely due to the poor state of the transport infrastructure (Kimuyu and Mugerwa 1998; Moyi and Kimuyu 1999; Wagacha 2000). In addition to providing the necessary conditions for appropriate and properly implemented macroeconomic policies, access to adequate 'supply of reliable infrastructure' facilitates competition for new export markets and even retention of old niches. In the last two decades, globalization of international trade has risen as a result of liberalization and major advances in the technologies for communications, transportation, and storage, permitting significant cost reductions in inventory and working capital and compelling enterprises to respond readily to demands from consumers.

The need for effective roads development and maintenance policies and works was realized long ago, as shown by the government's attempt to meet the requirements through initiatives such as decentralizing development planning and implementing the District Focus Strategy, the rural works programme funded by the RDF, the MRP, and the RTPC programme. The conceptual design of most programmes has been good. However, implementation has often fallen short of the programmes' blueprints. These failures may be attributed to heavy reliance on government funding and technical support for most activities, which means that the projects are not adequately implemented when resources are scarce. But more significantly, the shortcomings have in some instances resulted from poor administration and the apparent lack of commitment and political will at the highest policy levels to implement some of the fundamental tenets of the programmes. The implementation of the RTPCs provides a good example of how this phenomenon has hindered the realization of programme objectives.

There has been considerable reluctance by officials of the Ministry of Finance and Planning to delegate responsibilities for the implementation of roads policies to DDCs as specified in the RTPC programme concept. However, even if effective delegation to DDCs had occurred, it still would not have met the objectives of decentralized and participatory planning enunciated by the District Focus Strategy. Of the 40 to 60 people on a typical DDC, only about 5 (the local authorities' representatives and members of parliament) are elected representatives: the rest are central government officers. There is hardly any representation from the private sector (farmers or enterprise associations in the districts). And with the political climate that prevailed in Kenya until recently, even members of parliament and local councilors were subject to central government direction. This and the fact that practically the whole budget is funded by the central government make the DDCs just an extension of the central government in disguise.

---

### **5.3 Road asset maintenance strategies**

Apart from the current institutional framework apportioning specific road classes to particular agencies, there is no maintenance policy for Kenya's road networks. Many rural roads in Kenya are 'returning to bush' because they are not inadequately maintained (Nalo 1993; Howe 1999). Development loans have not helped this, because they encourage construction of new roads and rehabilitation of existing infrastructure rather than better value, ongoing maintenance.

Despite the strides that the country has made in decentralizing road delivery, it has failed to increase road revenue and improve maintenance. This has been attributed to several factors, key among them being the lack of fiscal decentralization, accountability, transparency, and good governance. The problem also lies in the technical, economic or political justification decision-makers receive on certain new roads vis-à-vis maintenance. Major road projects are comparatively easy to finance internationally. The World Bank, for instance, has funded major road rehabilitation projects in Kenya under KUTIP (Kenya Urban Transport Infrastructure Programme) and the El-Niño Emergency Programme. In the past, funding for rural roads, with the exception of roads in tea growing areas, has tended to be neglected because it was difficult to justify in economic terms.

The lacuna of road maintenance policy strategies persists even in the road sector reforms of the 1990s. All there is is an apparent overconfidence in the ability of the existing investment promotion framework to attract private-sector participation in infrastructure development and maintenance.

### **5.4 Private-sector participation**

The neglect by the current investment promotion framework to attract PPI that runs the gamut of most PRSP proposals masks the germane necessity for a strategy setting forth specific legal requirements and regulations to strengthen the role of private operators and investors and to spur local and international private sector road financing.

As private sector participation grows in setting the agenda at the top level of the political, economic and social segments of economies, the focus of the debate has shifted from the why to the how, thereby fueling the demand for lessons on best practice in reform strategies, regulatory frameworks, institutional arrangements, and risk mitigation. Important lessons on toll road concessions can be learned from case studies of Argentina, Chile (Gómez-Lobo and Hinojosa 2000), and Mexico. For instance, Argentina, as a first step, offered intercity highways for competitive bids, setting the terms, tolls, and service levels

---

and basing bid selection primarily on the rent offered for the infrastructure.<sup>19</sup> When it concessioned the access roads in a second round, it set the terms and the investments and selected the bid offering the lowest tolls. The results so far have been mixed. Investment has lagged but maintenance of intercity highways has improved. Estache and Carbajo (1996) identify some challenges for future concessions: following clear and simple rules in the bidding process, establishing clear rules for renegotiation, and strengthening the regulatory capacity.

Kenya's roads policy blueprints do not provide fundamental initiatives for attracting PPI in the roads subsector, such as land acquisition and utility removal (including right of way to concessionaires free from all encumbrances), specific proportions on capital grant for project cost, and tax exemptions and relief in general and on modern high-capacity equipment for highway construction.

## **5.5 Cess and fuel levy as road user charges**

The principal arguments against cess on agricultural commodity are:

- That there is little evidence that the funds are used for road maintenance
- That cess deductions are an extra burden on farmers whose incomes are affected also by the recession in international commodity markets such as those for coffee and tea
- That the deductions are perceived as double taxation because the commodities are also taxed by the central government
- That the cost of collecting cess is high vis-à-vis the total income

Even though cess funds are not adequate for the requirements of the oft-ambitious district road development programmes, their poor administration by local authorities is a major constraint to the use of the instrument (Nyangito and Kimura 1999).

The government's move to supplement cess revenue with a levy on diesel and petrol is still inadequate, as total funds collected do not meet the requirements for road costs. Furthermore, the fuel levy is problematic in targeting, as non-road carriers such as trains

---

<sup>19</sup> When Argentina initiated reform in its transport sector in 1989, it was the first Latin American country to privatize its intercity railroad, to explicitly organize intraport competition, and to grant a private concession to operate its subway (Estache 1999; Estache et al., 1999). It was the second (after Japan) to privatize its urban commuter railways and one of the first (along with Chile and Mexico) in the developing world to grant road concessions to private operators. Argentina's experience shows that transport privatization and deregulation provide efficiency gains that can be delivered to users. Despite unexpectedly high residual subsidy requirements, fiscal costs are lower, services have improved, and investment is starting to increase.

---

also pay it in equal proportions! As a policy instrument, a service tax on road transport would yield greater funds, but it could be politically sensitive. The case of India illustrates this. In India, a transport operators' strike forced the government to scrap a service tax it had introduced in the 1997–1998 budget on goods receipts issued by transport companies to consignors. By and large, the political costs of public rejection of a service tax have to be judiciously examined against the effects of a fuel levy on the performance of commercial vehicle sector in an economy, notwithstanding the need to augment funds dedicated to roads development, maintenance and rehabilitation.

## **5.6 Poverty alleviation and the environment**

Culturally, socially and environmentally, Kenya is at a crossroads. It has to pursue the same car-based, land-use and transportation model that has failed to deliver social cohesion in Europe and the USA (Fletcher 1999). It is important, therefore, to consider other transportation models to minimize automobile dependency, which is characterized by high levels of per capita automobile travel, automobile-oriented land-use patterns, and just a few transport alternatives.

Even though Kenya's rural access and minor roads programmes have had positive impacts in providing cheap access to markets for both agricultural outputs and modern inputs, it is questionable whether the distribution of benefits from such road investment has been equitable. The distribution issue is salient not only in formulating policy within the PRSP framework, but also in understanding the political constraints on the allocation of infrastructural investment. On one hand, road building and maintenance seem desirable on the grounds of providing equitable distribution of infrastructure, but on the other hand, the benefits of infrastructural projects accrue mainly to landowners, who are generally rich. Thus, the extent to which rural road construction ameliorates income inequality is ultimately an empirical question.<sup>20</sup> Jacoby's (1998) empirical analysis using data from Nepal suggests that providing extensive road access to markets would confer substantial benefits on average, most of these going to poor households. However, the benefits would not be large enough to appreciably reduce income inequality in the population. These results may apply equally to both the RARP and MRP.

There is a strong equity justification for improving safety and convenience for walking and cycling. Since the late 1970s urban centres in Kenya have been aware that the apparently marginal non-motorized transport (NMT) modes could significantly benefit the urban

---

<sup>20</sup> Howe and Richards (1984) discuss some distributional aspects of rural roads, and present case studies. Also, van de Walle (1996) uses micro-data and a profit function approach to examine the distribution of benefits of irrigation schemes in Vietnam.

---

environment. Despite this and the incessant pledges in national plans to improve infrastructure for NMT, lack of foresight in planning has left the towns with restricted capacity to take advantage of these low-tech options. However, the formulation and full implementation of a national transport policy may result in private vehicle users paying for the ecological, social and economic costs of motoring. This may provide an impetus for a better balance between transport options for Kenya. Mode substitution and intermode complementarity may be part of the solution for making roads and road transport economically and environmentally sustainable.

## **5.7 Fiscal decentralization and road funds**

So far, decentralizing road provision has had mixed success. For instance, political interests have overshadowed the development agenda in the DDCs that fall under the DFRD strategy to the extent that 'people's involvement is almost non-existent. The allocation of development funds is still largely centralized, and the central government has continued to control the districts through the financial purse. And as in Uganda, only a small proportion of the money released by the Ministry of Finance and Planning for non-salary road maintenance expenditure actually reaches, and is applied to, the intended MR&R of particular roads or road sections. Road MR&R has been particularly constrained by massive rent seeking, because direct payment of contractors is the primary method for disbursing funds to road agencies.

Clearly then, decentralization of responsibilities to the districts has not been matched with a flow of resources from the central government. But it is expected that with the KRB the decentralization learning curve will smoothen out such that resource flows that are consistent with the magnitude of responsibilities transferred are realized. This consistency is crucial if the shift of development assistance strategy from project aid to budget support is to enhance rural economic growth. The Medium-term Expenditure Frameworks for 2000/2001 to 2002/2003 indicate that fiscal transfers will continuously rise throughout this period, especially in sectors that have been identified as crucial for poverty reduction (such as infrastructure).

For the projected improvement in resource flows for road MR&R, a strategy is needed on how the nascent KRB will divide roads funds among different district road committees. At the moment, Kenya has no transparent and fair procedure for dividing funds among the agencies entitled to money from the RMLF.



---

## 6 Conclusions

This paper has highlighted policy initiatives on roads and road transport in Kenya over the post-independence era. It reports two findings: i) in terms of quantity, increased decentralization, cess on agricultural products, rural access, and minor roads programmes have served the road stock well in spite of the glaring lags in maintenance, repair and rehabilitation, and disjointed institutions, and ii) the post-1995 period has witnessed ambitious strategic road planning and policy reforms, including the formation of the KRB, the introduction of a road maintenance levy fund and axle-load limits, and the plan for increased private-sector participation in all facets of road service delivery.

In essence, the reforms are necessary since the traditional emphasis on public-sector operation and regulation have not evolved in a continuing, sustainable way. This has been partly a human resource problem, as governments do not possess adequate skills for the planning and control tasks required of them, and partly an institutional problem so far as governments continue to rely on mechanisms that make unrealistic demands on human resources and motivations.

The overall transport policy framework in Kenya is not integrated to promote positive impacts and generate cumulative positive externalities, and it does not provide a balance between strengthening and rehabilitating existing assets, on one hand, and constructing new roads and bridges, improving low-grade road sections, and widening roads to four lanes, on the other. Moreover, the sector has been characterized by unexplained reversals and weak implementation of specific policy strategies, little progress towards instituting legal and regulatory frameworks for private sector participation, and lack of a privatization strategy, for example for unbundling viable roads into build-operate-transfer concessions for awarding through competitive bidding.

### 6.1 Policy directions

#### *6.1.1 Integrated transportation*

Contemporary public policy research and analysis has two goals for the transport sector: i) to encourage governments to adopt market-oriented policies and regulations for surface transport services (road, rail, ports), and ii) to strengthen policy planning for the transport sector and evaluation capabilities in governments and regional institutions. Recently, policy advisers have focused on taking advantage of privatization opportunities in railway transport, strengthening regional railroad organizations, analysing road user charges, and facilitating cross-border trade. The work of advisers has already resulted in regional transportation policy protocols. Kenya needs an integrated transport policy within which road policies are embedded. Integrated transport policy interventions would act exactly on

---

the positive interaction effects and positive cross-externalities that the different fields characterizing rural and urban settings generate. At the same time, countervailing policies would be promulgated to overshadow the negative aspects and the social costs associated with the interaction effects.

Judiciously integrated transport policy interventions often reinforce each other and either avoid or limit adverse side effects of a given policy. For instance, mixing measures to control private transport modes in urban centres and improved public transport policy increases the effectiveness of transit improvements. Controlling private cars in urban centres without improving the efficiency of public transport would have major negative effects on the mobility of people, and make the impact on car drivers unpleasant.

To promote positive impact and generate cumulative positive cross-externalities within the road sector, short- and long-term integrated transportation policies are necessary in four fields: transport and land-use planning, transport and environmental policies, transport and telecommunications, and transport and local public finance. The policy interventions are necessary in road infrastructure development, as well as in ensuring the quality, reliability and attractiveness of road transport services.

### ***6.1.2 Funding and commercialization***

As an axle of road policy reform in Kenya, the KRB must operate efficiently, effectively and with autonomy in managing the entire road network. The commercial management of road funds ought to be overseen by either the KRB or a subcommittee of that agency.

When revenues available to the road sector are inadequate to maintain the road network in a stable, long-term condition and to undertake necessary improvement—which is the situation in Kenya—the KRB should prepare an explicit, long-term financing plan showing the size of the financing gap and suggesting how it is to be bridged.

More specifically, there is need to consider the scope for:

- Realizing better service and value from existing resources by, for example, contracting out more design and implementation work to the private sector or exposing in-house work to competition from outside contractors. The former entails bringing in the private sector to build and operate some roads under concession arrangements
- Augmenting revenue mobilization through simplifying or restructuring road-user taxes and charges, or improving revenue administration to reduce tax avoidance, evasion and leakage

- 
- Allocating additional revenue from the government's consolidated budget. As is the case in all fiscal matters, it is necessary to identify opportunities for earning additional revenues and determining their cost, by either taking funds away from other sectors and/or raising clearly identified taxes and charges

Whichever option is adopted—off-budget financing, or commercialization (charging road users directly through a fee-for-service approach and depositing the proceeds in an off-budget account)—it will be necessary to make research and analysis a policy in the roads sector.

The second option is not the same as the conventional (first generation) earmarking practised and recorded in annual audit reports during the 1960s–1980s. The revenue sources identified for earmarking include gasoline taxes, motor vehicle fees, and revenue sharing among different levels of government. Conventional earmarking is often automatically opposed by the International Monetary Fund and the Ministry of Finance, for several reasons (McCleary 1991): i) it leads to misallocation of resources, with too much being given to earmarked activities and not enough to others, ii) it hampers effective budgetary control, iii) it infringes on the powers and discretion of the legislative and executive branches of the government, and iv) it introduces inflexibility in budgets.

The case for earmarking is often presented based on the following advantages: i) it applies the benefit principle of taxation, ii) it assures minimum levels of financing for public services, iii) it provides greater stability and continuity of funding, and iv) it overcomes resistance to taxation by linking taxation to spending.

Generally, earmarking appears to work more successfully in the context of the local government where the correspondence of beneficiaries and taxpayers is closer. However, according to McCleary (1991), World Bank experience shows that funding from earmarking is not automatic and remains dependent on government judgement, and that from the experience of Turkey and Colombia as prolific earmarkers, the practice is not justified and should be abolished.

The new, second-generation, commercially managed road funds are not simply loosely managed off-budget accounts. They are based on a set of important design principles (Schliessler and Bull 1993; Heggie 1999; Gwilliam and Shalizi 1999). Specifically, they are radically distinguishable from past road funds (particularly those set up in Africa and Latin American countries) because i) they are specially designed to minimize adverse fiscal impacts on the government's budget, ii) they form part of an agenda to manage roads along commercial lines, and iii) the stricter financial discipline created by their strong financial management skills produces benefits that more than offset the costs of the added fiscal inflexibility.

---

### ***6.1.3 Sharing and disbursement of road funds***

For the decentralized system of road administration envisaged by the KRB, a simple and consistent procedure is needed to divide funds among the various agencies entitled to money from the RMLF. The procedure must be transparent, fair, related to need, and, where feasible, related to the KRB's and district roads committees' ability to generate funds from other sources. In principle, there are two basic approaches: the KRB could allocate the funds either using formulae (as is done in Korea, Latvia, Mozambique, Romania, Tanzania, Zambia, and USA) or based on a direct assessment of need (as in New Zealand, South Africa and UK). The implications of each method ought to be studied before a choice is made.

Both methods work best when there is good governance, competent road agencies, and a highly decentralized system of road administration. The basic principle of the former is that the road fund provides finances to road agencies only if they agree to provide all the information and cooperation necessary to enable the fund to review and audit the application of these funds, usually against an approved annual expenditure programme. The latter system, which the US Highway Trust Fund uses, operates like a line of credit.

Disbursing funds directly to road agencies and reimbursing road agencies after work has been completed should be considered as strategic alternatives to paying contractors directly.

### ***6.1.4 Heavy vehicles in road traffic***

Overall, road and road transport policies should address the key issues relating to heavy vehicles in road traffic, whose numbers are significant today and are likely to become increasingly prominent in the future. They policies should aim at:

- Reducing all types of impact of heavy vehicles on road networks, including deterioration in road condition, safety and environmental conditions
- Improving road freight productivity through reforms in policy on vehicle size and weight
- Quantifying the potential benefits of 'road-friendly' vehicle suspensions in extending pavement life and reducing maintenance costs for trucks
- Taking greater account of the effects of heavy vehicles on pavements and bridges in choosing design methods for the construction of new infrastructure

---

### ***6.1.5 Fiscal decentralization and road asset management***

The classical fiscal federalism argument is that local governments are closer to the point of demand and are, therefore, more efficient providers of road services. Similarly, consistent with public choice theory, decentralization of administrative functions is considered desirable because it leads to larger efficiency gains in resource cost savings. Recent results from meta-analyses suggest two solutions for all three the road functions, but especially for construction: fiscal centralization or complete decentralization. Economies of scale and technological effects make the central government a good provider of road construction services (in terms of financing but not necessarily in producing the works through force account), while the ability to match supply to demand makes decentralized units more efficient. Kenya needs to further decentralize the more localized activity of road maintenance, and maintain current levels of decentralized construction and administration of roads, which have the potential for large positive externalities.

Once ongoing rehabilitation works have been completed, routine maintenance should be institutionalized within local authorities by contracting out the maintenance work for roads and drainage to private sector enterprises (such as local MSEs or international firms). Local authorities are familiar with the process of contracting out road maintenance in rural areas, and this could be extended to urban roads and their drainage systems. Since revenue collection and expenditure plans by Kenya's local authorities have been replete with inefficiency and abject corruption, thereby greatly constraining the authorities' allocated funding for road maintenance, expenditure declaration on roads maintenance would be a good starting point for improved performance.

It is imperative that Kenya develop a national (and/or district) road asset management strategy as a road maintenance policy. The strategy can be developed from the collective or individual consideration of the following:

- The strategy's objectives, which describe the outcomes being sought through the supply and operation of the road infrastructure system
- A time scale for implementing the strategy
- System performance measures (annual and long-term targets)
- Physical condition standards to be achieved (noting annual and long-term targets)
- Procedures for monitoring and reviewing the system's performance and physical condition
- Policy and legislative controls on the use of the system
- Maintenance standards (warning levels, intervention levels and minimum levels)

- 
- Financial implications of the management strategy to the KRB (in terms of the annual budget demand), the community (in terms of capital equity in the road asset), and road users and other affected members of the community (in terms of vehicle operating costs and transport efficiency)
  - The sensitivity of the strategy's outcomes and outputs to the level of resources allocated, ensuring a clear indication of procedures for establishing priorities at suboptimal resource levels

The mission of the KRB's Infrastructure Maintenance Programme should be to deliver economic benefits to the community via savings in vehicle operating costs by providing improved ride quality of pavements. This will lower fuel and oil consumption, vehicle maintenance costs, tyre wear and vehicle depreciation.

In allocating maintenance funds, the KRB should give priority to programmes that:

- Achieve the best overall return on maintenance investment (given that smoother roads cost more to provide but offer savings to vehicle operators)
- Provide community-wide benefits by reducing accidents and travel time
- Reduce environmental impacts of road infrastructure maintenance

#### ***6.1.6 Private sector participation***

Broadly speaking, measures to encourage immediate private participation in Kenya's transport sector are important. Although many transport and road concessions across the world show mixed results, the government ought to identify road segments for concessioning and then commission a study on their market and traffic viability. The study would, inter alia, evaluate existing traffic flow and forecast future traffic volumes in the earmarked road segments.

To exploit private participation opportunities in transport, it is important to consider the immediate fiscal costs of planned concessions and give clearer and credible signals on the timing of the transactions, and involve potential private investors more in consultation and information sharing. Further, to maximize economic benefits, it is necessary to facilitate linkages across transport modes to encourage use of alternative modes of transport, develop brokerage markets to improve capacity utilization, and promote optimization of all transportation modes.

Recommendations specific to the exploitation of PPI opportunities in the road sector are threefold. First, it is important to define the privatization strategy and review the existing legal framework, identify suitable investors, supervise the bidding process, and assist in

---

negotiations and transaction closing. A judicious comparison of the benefits of LPVR franchises and the limitations of fixed-term concessions is important. The basic principle underlying LPVR auctions is that the franchise holder should not make losses when the long-run demand for the highway is sufficient to pay all costs. LPVR auctions are attractive for projects that require large, up-front investments and in which demand is independent of efforts by the franchise holder. They also require a low-cost capability to verify revenues, the quality of service, and the residual value of investments.

Second, it must be ensured that the loss of toll revenues from the concessioned network does not adversely affect KRB's capacity for effective maintenance of the remaining network. This relates to local authorities: there is need to clarify issues on the autonomy of municipalities in negotiating concessions and the regulatory jurisdiction over them, as well as to clarify access and inter-linkage issues with respect to national and municipal roads. As a start, local authorities should upgrade their traffic management efforts and enforce the traffic code to stop trailers and multi-tonnage trucks from using residential access roads subsequently damaging them and the drainage systems. Regulations on use of roads by traffic should be enforced in parallel with timely maintenance of the road network.

Third, clear policy incentives are necessary for attracting foreign and private investment. These may include:

- Government commitment to carry out all preparatory work including land acquisition and utility removal. Rights of way free from all encumbrances may be made available to concessionaires
- A national highway agency (say KRB) may pledge to provide a specific fraction of the project's capital grant (this is up to 40% in India) to enhance viability
- Tax exemption for a specific period
- A clearly defined allowable concession period
- Provision for foreign direct investment of up to 100% for equity partners in construction of roads and bridges
- A clear legislative framework for arbitration and conciliation
- Treating housing and real estate developments that are integral to highway projects as infrastructure and extending tax benefits to them
- Allowing the national highway agency (maybe KRB) to participate in equity in BOT projects up to a predetermined proportion of total investment
- Duty-free importation of modern, high-capacity equipment for highway construction

---

## 6.2 Strategic research directions

Kenya's transportation policy must respond to the needs of the 'new economy' (which is global, rapidly changing, and customer focused), the desire for greater environmental sustainability, a demand for a good quality of life, the public's expectations for greater involvement in decision-making on transportation, and the need for technologies and expertise not traditionally associated with highway engineers. Meeting all these expectations requires a systems approach that includes sensitivity and responsiveness to the context (social, economic, environmental, and technological) in which transportation takes place.

Stronger political will and consistent action will overcome some of the barriers to improved roads infrastructure for improved transportation efficiency, economic growth and poverty alleviation in Kenya. Other impediments, however, will remain unsolved because they are poorly understood. These require a strategic policy research agenda for harmonious development and maintenance of the road network. Five facets are proposed for strategic focus on transport and road policy research: evaluation of impacts and problems, road tolling and price reforms, MR&R, road safety, and institutional issues.

### 6.2.1 *Evaluating impacts and problems*

To appreciate the true value of road policy shifts, it is necessary to start with an understanding of the impact of transportation. Just as a vehicle buyer needs accurate information on ownership and operating costs of a vehicle they are considering purchasing, the society needs accurate accounting of all benefits and costs of alternatives considered when making transportation policy and investment choices. A comprehensive analysis of benefits and costs would answer questions such as, what are the full costs of an increase in motor vehicle travel? and, what are the full benefits of a management strategy for transportation demand?

Although there have been several cost studies on transportation, a 'Kenya transportation cost analysis model' is required that it is regularly updated as new information becomes available. It could be developed as an overview to costing theory, a detailed reference for the various costs, and a guide for applying comprehensive economic analysis to specific transportation decisions. Such a model would constitute a bridge between theoretical research application and real-world transportation planning and policy decisions, as in the case of the transportation cost analysis model developed for Canada by the Victoria Transport Policy Institute.

### 6.2.2 *Road tolls and price reforms*

An efficient market provides consumers with competitive choices for goods and services, and is economically neutral (that is, public policies do not favour one option over others).



---

The Kenya road transport sector, like road transportation markets in most economies, does not satisfy these criteria. For instance, economic inefficiency and inequity are engendered by the fact that many costs of vehicle use are external, and a significant portion of the charges paid by users are fixed and therefore not marginal.

Reforming the payment methods for motor vehicle travel is a key strategy for managing transportation demand. It is important to examine the numerous distortions in current transportation markets that result in inefficient, excessive and inequitable transportation choices, and to determine costly market failures. Research questions in this area would include:

- What is the impact on vehicle travel of implementing distance-based vehicle insurance whereby vehicle insurance premiums are determined by prorating vehicle mileage? The essence is, the more you drive, the more you pay, which reflects a vehicle's insurance compensation costs more accurately.
- Why is it that parking and road requirements tend to be excessive? What are the costs that result? And how do we implement more efficient parking and roadway policies? A major market distortion is the abundance of free parking, which results in part from zoning laws with excessive parking requirements.

In summary, there is need for research and analysis on road transportation market distortions, using road-pricing revenue for economic efficiency and equity considerations, and distance-based charges as optimal vehicle pricing.

### **6.2.3 Road MR&R**

Much of the nation's road network is in need of major repair or rehabilitation. To optimize MR&R, all Kenya's road agencies need to i) streamline the entire project delivery process, including planning, environmental review, design, construction, and procurement procedures; ii) improve the quality of renewed facilities, including lengthening facility life and reducing lifecycle cost; and iii) moot ways of increasing road funding. Asset management concepts and tools hold promise, but the necessary data and performance models are often lacking. Despite these challenges, renewing aging highways also presents an opportunity to improve their safety, design, performance, interaction with the environment, and role in the community. The expected benefits are improved facility and system performance, and reduced user and lifecycle costs.

The possible research areas in MR&R include construction methods, innovative construction materials, non-destructive evaluation technologies, innovative contracting and finance, traffic management alternatives during construction, work zone safety, environmental-mitigation techniques, lifecycle cost analysis, development of evaluation

---

measures for performance-related specifications, collection and analysis of data and development of predictive performance models to support asset management, development of renewal approaches that improve or restore the quality of urban life, and projected trends in vehicle design and their impact on road design.

#### **6.2.4 Road safety**

New approaches are needed to respond to public demand for safe highways. Comparatively straightforward solutions have already been implemented and have resulted in tremendous progress over the last few decades. Any policy that aims to significantly reduce the current toll of more than 3,000 lives per year must address complex factors such as human behaviour; enforcement of limits; the interaction among vehicle, the driver, and the road; and the use of more advanced technologies for policing the road transport regulatory framework. The expected benefit is a reduction in fewer accidents.

Possible research areas cover human-factor studies, including research on special populations (older, new, and impaired drivers; immigrant populations); road designs that promote safety; better access and protection for cyclists and pedestrians; database development, data collection and analysis related to crash causes and the impact of design on safety; tools for data collection, such as event data recorders; a special study to investigate crash causation; development of standards or strategies for safety-centred design; the effectiveness and best use of automated systems for enforcing road regulations; interaction between the vehicle and the infrastructure.

#### **6.2.5 Institutional issues**

Regardless of the specific technical focus adopted, the research undertaken will need to include the following considerations: rethinking roles, responsibilities, and institutional structures; identifying educational requirements for future transportation professionals; addressing workforce issues such as recruitment, training, and retention; developing new ways of managing highway activities, including financing strategies that better leverage public funds and procurement methods that promote faster and higher quality construction, rehabilitation, and maintenance; and streamlining approval processes with resource agencies.

---

## References

- African Development Bank. 1999. *African Development Report 1999: Infrastructure Development in Africa*. Oxford University Press.
- Alila, P.O. 1988. 'Rural development in Kenya: a review of past experience.' *Regional Development Change* 9(2):152–165.
- Aschauer, D. 1989. 'Is public expenditure productive?' *Journal of Monetary Economics* 25:310–32.
- Bigsten, A., and P.K. Kimuyu, eds. 1998. *The Structure and Performance of Manufacturing in Kenya*. Departments of Economics, University of Gothenburg and University of Nairobi.
- Bokea, C., A. Dondo, and J. Mutiso. 1999. 'Physical infrastructure.' In: A. Mullei and C. Bokea, eds. *Micro and Small Enterprises in Kenya: Agenda for Improving the Policy Environment*. Nairobi: International Centre for Economic Growth. p. 57–80.
- Buchanan, J. and G. Tullock, 1962. *The Calculus of Consent. Logical Foundations of Constitutional Democracy*. Ann Arbor: The University of Michigan Press, 1962.
- Dijkstra, T., and T.D. Magori. 1992. *Horticultural Production and Marketing in Kenya*. Part 2B. Horticultural Production in Nyandarua District. Food and Nutrition Studies Programme Report No. 48. Leiden: African Studies Centre.
- Dykstra, P., and Jungerius, P.D. 1997. 'Environmental impact of roads.' In: M.P. Tole, ed. *Environmental Impact Assessment in Kenya: Theory and Practice*. Eldoret, Kenya: Moi University School of Environmental Studies.
- Edmonds, G.A. 1980. 'The "Roads and Labour" programme, Mexico.' In: G.A. Edmonds and J.D.F.G. Howe, eds. *Roads and Resources: Appropriate Technology in Road Construction in Developing Countries*. London: Intermediate Technology Development Group for ILO. p. 123–134.
- Edward S.K., and P.E. Fekpe. 1997. 'Vehicle size and weight regulations and highway infrastructure management.' *Journal of Infrastructure Systems* 3(1).
- Estache, A. 1999. 'Privatization and regulation of transport infrastructure in the 1990s: successes . . . and bugs to fix for the next millennium.' Working Paper No. 2248. Washington, DC: World Bank.
- Estache, A., and J. Carbajo. 1996. 'Designing Toll Road Concessions—Lessons from Argentina.' Public Policy for the Private Sector Note No. 99. Washington, DC: World Bank.
- Estache, A., J.C. Carbajo, G. de Rus. 1999. 'Argentina's transport privatization and re-regulation: ups and downs of a daring decade-long experience.' Working Paper No. 2249. Washington, DC: World Bank.
- Feehan, J.P. 1998. 'Public investment: optimal provision of Hicksian public inputs.' *Canadian Journal of Economics* 31(3):693–707.
- Fernald, J.G. 1999. 'Roads to prosperity? Assessing the link between public capital and productivity.' *American Economic Review* 89(3):619–638.
- Fletcher, E. 1999. 'Road transport, environment and social equity in Israel in the new millennium.' *World Transport Policy and Practice* 5(4):8–17.
- Gavira, J. 1990. 'A regional analysis of institutional and financial constraints to rural transport: the case of Tanzania.' SSATP/MADIA Discussion Paper. Washington, DC: World Bank.
- Gertsovitz, M. 1989. 'Transportation, state marketing, and the taxation of the agricultural hinterland.' *Journal of Political Economy* 97(5):1113–1137.

- 
- Gómez-Lobo, A., and S. Hinojosa. 2000. 'Broad roads in a thin country: infrastructure concessions in Chile.' Working Paper No. 2279. Washington, DC: World Bank.
- Gwilliam, K. and Z. Shalizi. 1999. 'Road Funds, User Charges, and Taxes.' *World Bank Research Observer* 14(2):159-85.
- Hamilton, J. et al. 1981. 'Honduras rural roads: old directions and new.' Project Impact Evaluation Report No. 17. Washington, DC: USAID.
- Harral, C.G., and A. Faiz. 1988. Road Deterioration in Developing Countries: Causes and Remedies. World Bank Policy Study: Washington, DC: World Bank.
- Heggie, I.G. 1995. 'Management and financing of roads: an agenda for reform.' World Bank Technical Paper No. 275. Washington DC: World Bank.
- Heggie, I.G. 1999. 'Commercially managed road funds: managing roads like a business, not like a bureaucracy.' *Transportation Research* 26(1):87-111.
- Howe, J. 1999. 'Sustaining Africa's rural road networks: the asset management approach.' *World Transport Policy and Practice* 5(1).
- Howe, J., and P. Richards. 1984. *Rural Roads and Poverty Alleviation*. London: Intermediate Technology Publications.
- IDS (Institute for Development Studies). 1973. An overall evaluation of the Special Rural Development Programme.' IDS Occasional Paper No. 8. Nairobi: University of Nairobi.
- IDS (Institute for Development Studies). 1975. 'Second overall evaluation of the Special Rural Development Programme.' IDS Occasional Paper No. 12. Nairobi: University of Nairobi.
- IEA (Institute of Economic Affairs). 1998. *Our Problems Our Solutions: An Economic and Public Policy Agenda for Kenya*. Nairobi: IEA.
- Ikiara G.K., and Z.A. Okeyo. 1998. 'Kenya's experience with economic policies for regional development'. In: A. Tiffee, P. Ngau, and I.K. Mwangi, eds. *Regional Development Policy in Africa: Problems and Prospects Toward the 21st Century*. Nairobi: United Nations Centre for Regional Development, Africa Office. p. 59-66.
- Ikiara, G.K., M.I. Muriira, and W.N. Nyangena. 2000. 'Kenya's trade in services: should the country fully liberalize?' Paper presented to the AERC-KIPPRA Workshop on World Trade Organization (WTO) Agreements, held 11-12 September 2000, Nairobi.
- Irandu, E.M. 1982. 'The road network in Mombasa Municipal area: a spatial analysis of the effects of land values.' M.A. thesis. Nairobi: University of Nairobi.
- Jacoby, H.G. 1998. 'Access to markets and the benefits of rural roads: a nonparametric approach.' Working Paper No. 2028. Washington DC: World Bank.
- Kimuyu, P.K., and S.K. Mugerwa. 1998. 'Enterprise response to deficient infrastructure.' IPAR Discussion Paper No. 011/98. Nairobi: Institute of Policy Analysis and Research.
- Laferriere, R., and D.S.O Nalo. 1992. 'Optimal road user charges and income distribution in Kenya.' *International Journal of Transport Economics* XIX(1):61-83.
- Lane, P.A., R.R. Wallace, R.J. Johnson, and D. Bernard. 1988. *A Reference Guide to Cumulative Effects Assessment in Canada*. Volume 2. Hull, Canada: Canadian Environmental Assessment Research Council.
-

- 
- Lantran, J.M. 1995. 'Water management and road design in the Sahel region.' World Bank Transportation, Water and Urban Development Department; Infrastructure Note RD-20. Washington, DC: World Bank.
- Lynde, C., and J. Richmond. 1992. 'The role of public expenditure in production.' *Review of Economics and Statistics* 74:37–44.
- McCleary, W. 1991. 'The earmarking of government revenue: a review of some World Bank experience.' *World Bank Research Observer* 6(1):81–104.
- MoITC (Ministry of Information, Transport and Communications). 1984. Assessment of the Socio-Economic Impacts of the Kenya Rural Access Roads Programme. Nairobi: MoITC.
- MoITC (Ministry of Information, Transport and Communications). 1981. *The Framework of the Impact Study to Monitor and Evaluate Rural Access Roads in Kenya*. Nairobi: MoITC.
- MoITC (Ministry of Information, Transport and Communications). 1983. *A Baseline Study of Rural Access Roads in Kenya*. Nairobi: MoITC.
- MoRPW (Ministry of Public Works). 1991. Evaluation of Selected Roads in ... [each of eight KMDP districts]. Kenya Market Development Programme. Government Printer: Nairobi: MoRPW.
- Moyi, E., and P. Kimuyu. 1999. 'Revealed comparative advantage and export propensity in Kenya.' IPAR Discussion Paper No. 015/99. Nairobi: Institute of Policy Analysis and Research.
- Munasinghe, M. 1993. 'Environmental economics and sustainable development.' World Bank Environmental Paper No. 3. Washington, DC: Environmentally Sustainable Development Department, World Bank.
- Nalo, D.S.O. 1993. 'Adequate road maintenance in Kenya: the need for appropriate policies.' *International Journal of Transport Economics* 20(2):221–237.
- Njehia, B. 1994. *The Impact of Market Access on Agricultural Productivity: A Case Study of Nakuru District, Kenya*. Berlin: Everlag Dr. Koster.
- Nyangito, H.O., and L.N. Kimenye. 1999. 'Agricultural development policies in Kenya, 1963–95.' In: N. Ng'ethe and W. Owino, eds. *From Sessional Paper No. 10 to Structural Adjustment: Towards Indigenizing the Policy Debate*. Nairobi: Institute of Policy Analysis and Research. p. 116–149.
- Nyangito, H.O., and J.H. Kimura. 1999. 'Provision of agricultural services in a liberalised economy: the case of the smallholder tea sub-sector.' Discussion Paper No. 016/99. Nairobi: Institute of Policy Analysis and Research.
- Obare, G.A. 2000. 'The impact of road infrastructure on input use and farm level productivity in Nakuru District, Kenya.' PhD thesis. Egerton University, Njoro, Kenya.
- Ogonda, R.T. 1976. Transportation in Nairobi area: a geographical analysis. MA thesis. University of Nairobi.
- Omamo, S.W. 1998. 'Transport costs and smallholder cropping choices: an application to Siaya District, Kenya.' *American Journal of Agricultural Economics* 80:116–123.
- Onjala, J.O. 1999. 'Economic growth and development in Kenya since independence.' In: N. Ng'ethe and W. Owino, eds. *Towards Indigenizing the Policy Debate*. Nairobi: Institute of Policy Analysis and Research.
- Owuor, P.O., Orchard, J.E. et al 1990. 'Variations of the chemical composition of clonal black tea due to delayed withering.' *Journal of Food Science and Agriculture*. No. 52.
-

- 
- Preston, E.M., and Bedford, B.L. 1988. 'Evaluating cumulative effects on wetland functions: a conceptual overview and generic framework.' *Environmental Management*. 12(5):565–583.
- RoK (Republic of Kenya). 1964. *First National Development Plan 1964–1970*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1965. *Sessional Paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1970. *Second National Development Plan 1970–1974*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1974. *Third National Development Plan, 1974–1978*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1978. *Fourth National Development Plan, 1979–1983*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1983. *Fifth National Development Plan, 1984–1988*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1984. *National Transport Plan 1984*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1986. *Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1988. *Sixth National Development Plan 1989–1993*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1990a. Rural Access Roads Programme and Minor Roads Programme. Progress Report. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1990b. Minor Roads Programme Evaluation Mission. MRP Evaluation Report. February. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1992. *Tea Roads Rehabilitation Study*. Ministry of Public Works. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1993. *Seventh National Development Plan 1994–1996*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1994. *Sessional Paper No. 1 of 1994 on Recovery and Sustainable Development to the Year 2010*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1996a. *Sessional Paper No. 2 of 1996 on Industrial Transformation to the Year 2020*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1996b. *Policy Framework Paper on Economic Reforms for 1996–98*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1997. *Eighth National Development Plan 1997–2001*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1997. *Strategic Plan for the Road Sector: March 1997*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 1999. *Kenya Human Development Report 1999*. Nairobi: Government Printer.
- RoK (Republic of Kenya). 2000a. *Kenya Gazette Supplement* No. 25: The Traffic (Amendment) Bill, 2000. 28 April 2000. Nairobi: Government Printer.
- RoK (Republic of Kenya). 2000b. *Economic Survey 2000*. Nairobi: Government Printer.
-

- 
- RoK (Republic of Kenya). 2000c. *Interim Poverty Reduction Strategy Paper 2000–2003* (7 May). Nairobi: Government Printer.
- Republic of Kenya. Statistical Abstracts. Various issues. Nairobi: Government Printer.
- Rhodes, T. 1993. 'Benefits of public investment in rural road rehabilitation.' *Proceedings of the Conference on Agricultural Exports and Market Development*, held 23–24 June 1993, Nairobi. Njoro, Kenya: Egerton University. p. 203–240.
- Rondinelli, D., J. Nellis, and S. Cheema. 1983. 'Decentralisation in developing countries—a review of recent experience.' World Bank Staff Working Paper No. 581: Washington DC.
- Saad, F. 1989. 'Road accidents and safety perception in urban areas.' Paper presented at the Second African Road Safety Congress, Economic Commission for Africa (OECD), October 1989, Paris.
- Schliessler, A., and A. Bull. 1993. *Roads: A New Approach for Road Network Management and Conservation*. Santiago: United Nations Economic Commission for Latin America (ECLAC).
- Shah, A. 1992. 'Dynamics of public infrastructure, industrial productivity and profitability.' *Review of Economics and Statistics* 74:28–36.
- Spaling, H., and B. Smit. 1993. 'Cumulative environmental change: conceptual frameworks, evaluation approaches, and institutional perspectives.' *Environmental Management* 17(5):587–600.
- Spaling, H., and B. Smit. 1994. 'Classification and evaluation of methods for cumulative effects assessment.' Paper presented at the Conference on Cumulative Effects in Canada: From Concept to Practice, 13–14 April 1994, Calgary, Canada: Canadian Societies of Professional Biologists.
- Uphoff, N. 1986. *Local Institutional Development: An Analytical Sourcebook with Cases*. West Hartford, Connecticut, USA: Kumarian Press.
- USAID (United States Agency for International Development). 1979. 'Community water supplies in developing countries: lessons from experience.' Project Evaluation Report No. 7. Washington, DC: USAID.
- USAID (United States Agency for International Development). 1982a. 'Rural roads evaluation: summary report.' Program Evaluation Report No. 5. Washington, DC: USAID.
- van de Walle, D. 1996. 'Infrastructure and poverty in Vietnam.' LSMS Working Paper No. 21. Washington, DC: World Bank.
- von Braun, J., Teklu, T., and Webb, P. 1991. 'Labour-intensive public works for food security: experience in Africa.' Working Paper No. 6. Washington, DC: International Food Policy Research Institute.
- Wagacha, M. 2000. 'Analysis of liberalization of trade and exchange regime in Kenya since 1980.' IPAR Discussion Paper No. 023/2000. Nairobi: Institute of Policy Analysis and Research.
- Walters, A.A. 1968. 'The economics of road user charges.' World Bank Staff Occasional Papers No. 5. Washington, DC: World Bank.
- Wasike, W.S.K. 1995a. 'Valuing natural resources and the environment.' *The British Review of Economic Issues* 17(41):71–76.
- Wasike, W.S.K. 1995b. 'Review of cost-benefit analysis and the environment by N.D. Hanley and C.L. Spash.' *The Environmentalist* 15(1):65–66.
- Williamson, J.R. 1983. 'Towards community-managed drinking water schemes in Nepal.' *Waterlines* 2(2):8–13.
-

- 
- World Bank. 1991. *EA Sourcebook*. Volume II. 'Rural Roads' (p. 113), and 'Roads and Highways' (p. 168). Washington, DC: Environment Department, World Bank.
- World Bank. 1993. 'Kenya employment growth for poverty alleviation.' Report No. 11650-KE. Washington, DC: World Bank.
- World Bank. 1995. 'Staff appraisal report: Kenya: Nairobi–Mombasa Road Rehabilitation Project.' Report No. 13798-KE. World Bank Eastern Africa Department: Nairobi.
- World Bank. 2000. *African Development Indicators 2000*. Washington, DC: World Bank