

EXPERIENCE IN REFORMS OF ROAD MAINTENANCE FINANCING AND MANAGEMENT IN SUB-SAHARAN AFRICA

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ABSTRACT

The need to capture efficiency gains of modern business practice in road network management has been recognized in many countries. This is particularly relevant to sub-Saharan Africa in its efforts to address road deterioration due to constrained human and financial capacity. Progress has been achieved through improved policies and more appropriate management structures for roads since the early 1990s. The initial focus has been on road maintenance financing and addressing the deficits in this area. Some improvements have indeed been obtained in financing provision and service levels through road user charge related instruments. Experience suggests, however, that raising resources is not enough. More attention has to be paid to the overall effectiveness of road management. Efforts in this regard need to focus on four areas: creating efficient, autonomous agency structures to manage road programmes, strengthening government oversight capability, exploiting new technologies to reduce costs and utilizing performance-based approaches to contracting.

Keywords: Road management and financing, Road maintenance initiative, Road funds, Second generation road fund, Sub-Saharan Africa, Transport Policy Programme.

INTRODUCTION

High road expenditures as a reflection of the economic importance of roads

The public road network has been identified as the largest public infrastructure asset (Heggie and Vickers 1998). Estimation of road asset values,

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and costing out the implications of deferred maintenance to the economy and the road user, have given a strong impetus to asset preservation policies and maintenance prioritization. For sub-Saharan African countries this is a particularly important consideration as they generally carry higher road asset values per GDP than average. Thus the costs to economies of degraded networks are very high and constrain national economic development potential. For example, using Heggie's and Vickers' asset value estimates, and year 2000 GDP data from the World Bank, it is found that Ghana's ratio of asset value to GDP is 33 per cent and for South Africa it is 16 per cent compared with the following examples from other regions: Chile 5 per cent; Thailand 8 per cent, and Jordan 10 per cent.

The predominance of road transport as the principal means of passenger and freight movements – averaging 80 per cent worldwide, and generally higher than 60 per cent in sub-Saharan Africa – underlines the economic importance of roads. Growth rates of road networks have accelerated, particularly in transition and developing countries, which have sought to respond to increasing demand. Expansion has been particularly fast in Asia and Latin America, but somewhat lagging in sub-Saharan Africa. The investment implications are significant. Fay and Yepes (2003) estimate that needed yearly infrastructure expenditure in developing countries is around US\$ 233 billion with a similar amount required for maintenance, approximating about 5.5 per cent of GDP in total. On average, roads are projected to require about 19 per cent of all infrastructure investment needs, or up to 1 per cent of GDP, to which allowance for current maintenance has to be added. For sub-Saharan Africa the numbers will be generally higher in view of past underinvestment and the accumulation of arrears on maintenance. For example, recent World Bank reports cite annual road sector expenditure as a percentage of GDP amounting to 2.2 to 2.5 per cent in Malawi (World Bank 2001) and 1.9 per cent in Zambia (World Bank 1997) in neither case was this regarded as sufficient to meet all needs.

Raising the finance that is needed

In recent years, greater attention has been paid to diversifying the sources of financing for road investment and maintenance. In this regard, recourse to private financing options is seen to be important. However, experience suggests that there are limits to the extent that public financing can be replaced. The fact of the matter is that in most regions of the world only a fraction of road networks can be fully funded by toll revenues raised either directly or indirectly. For Latin America, Fay and Yepes estimated that at best, private funding could cover 30 per cent of infrastructure investment needs. In

sub-Saharan Africa the situation is generally less favourable because of lower levels of traffic and, with the notable exception of South Africa, the prospects of raising substantial private financing are few and far between.

Therefore, the challenge of providing increased funding to the sector when traditional sources, especially those from direct budget allocations, are under increasing pressure from competing end uses remains. In nearly all regions, it has become necessary to find ways to improve resource inflows through various forms of off-budget financing, and to improve the effectiveness of the management of these funds. A number of countries such as Sweden, the United Kingdom of Great Britain and Northern Ireland, Finland and New Zealand have begun to lead the way towards commercialising road management, managing roads as the big business that they indeed are. However, as pointed out by Heggie (2003) not all of these experiences may be directly transferable to developing countries. Nevertheless, over the last decade, great progress has been made in revamping road sector institutional arrangements, and creating new sources of funding that tap directly into user demands for increased expenditure. This progress is particularly evident in sub-Saharan Africa.

I. AFRICA'S ROADS PREDICAMENT: LOSING ROAD ASSETS

Road deterioration, and the subsequent loss of road assets, started to receive serious attention in the 1980s. As stated by Harral and Faiz (1988), "failure to maintain roads is tantamount to an act of disinvestment, for it implies the sacrifice of past investments in roads." Their study identified that the loss of approximately US\$ 45 billion in road infrastructure in the 1970s and 1980s could have been averted by spending just US\$ 12 billion on preventive maintenance. Crucially, they also drew attention to the inadequacies of traditional road management structures and functions in coping with the scale of the maintenance problem. They also made important contributions in focusing external support, including World Bank lending, on road maintenance and on setting up appropriate and adequately funded road maintenance organizations.

At this time it could fairly be stated that road maintenance in sub-Saharan Africa was as problematic as in any region. Heggie (2003) estimated that less than half of the required expenditure to prevent further deterioration was being met and that the required increases were on average 0.85 per cent of GDP. On average the quality of main road networks was extremely low, with not less than 25 per cent of paved and 33 per cent of

unpaved roads in poor condition. These road conditions led to higher vehicle operating costs and lengthier travel times. The situation was even worse for feeder road networks, with about 90 per cent of roads in poor condition, heavily penalizing agricultural production and the rural poor. Despite the allocation of a significant proportion of public resources, 5 to 10 per cent of recurrent budgets and 10 to 20 per cent of development budgets, the capacity to absorb and efficiently utilize these funds was very low. The combination of these factors was contributing to a substantial degree of frustration on the part of road users and other beneficiaries, as well as disenchantment among financiers.

II. NEW APPROACHES TO RESOLVE THE PROBLEMS

Clearly the time was right to try to address the problem before it became unmanageable, and before the negative economic consequences for regional economies became overwhelming. Fortunately, African countries, with assistance from the Economic Commission for Africa (ECA), the World Bank and a number of donor nations, were developing the sub-Saharan Africa Transport Policy Programme (SSATP). The SSATP was intended to act as a framework to address critical policy issues for improving transport in sub-Saharan Africa. The SSATP was launched in 1987¹ with addressing road maintenance policies as one of its first priorities, and help put road maintenance on the path to long-term sustainability. This was the objective of the Road Maintenance Initiative (RMI), a major component of the SSATP. The RMI commenced with a diagnostic phase and then branched out into a second phase of country-level initiatives in nine target countries.

This work permitted the identification of a wide array of problems contributing to poor road maintenance policies and practices. It subsequently led to the development of a reform agenda, the implementation of which started in the early 1990s. The driving philosophy behind this agenda was to manage roads on a more business-like basis, in particular, to charge for road use on a fee-for-service basis.

The framework for bringing about the necessary changes involved four “building blocks”:

<i>Ownership</i>	Involve road users in the management of roads
<i>Financing</i>	Secure a stable flow of funds for adequate road maintenance

¹ The SSATP was created in response to the perceived failure of the first United Nations Transport and Communications Decade for Africa (UNTACDA I) to generate clear developmental improvements. This failure was largely attributed to poor transport policy frameworks and implementation.

<i>Responsibility</i>	Ensure all parties know their responsibilities and are given corresponding authority
<i>Management</i>	Introduce sound business practices and managerial accountability

III. CONTRIBUTION OF THE ROAD MANAGEMENT INITIATIVE – BUILDING THE PARTNERSHIP

RMI has always operated as a partnership, bringing together countries committed to road sector reforms with external donors and organizations who endorse these reforms. The name was changed to Road Management Initiative in 1997 (the acronym thus being unchanged) and in 2004 changed again to Road Management and Financing (RMF), to better reflect the broadening of the partnership. RMI and RMF have also actively pursued dialogue on road maintenance reforms with countries outside the original nine, and as a result, the number of partners increased to 13 by the end of 2000 and now numbers 19. Member countries include Angola, Burundi, Cameroon, Chad, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mozambique, Niger, Senegal, the United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe.

The RMI and RMF have pursued a broadly based programme from the start, as is evidenced by the record of publications since 1991.² Among the issues addressed are environment, contractor development, plant pool reform and road safety. While the key area of attention until now have been addressing the road maintenance funding deficit and management issues, RMF is expanding its agenda to complementary areas. It is hoped that through this expansion a more efficient use of resources generated for road maintenance can be achieved. This agenda covers improvement of the management of road maintenance systems and the execution of road maintenance by private contractors.

Key interlocutors for the RMI and RMF are regional associations of road funds and road agencies as well as the Regional Economic Communities (REC) in sub-Saharan Africa. Annual programmes of activities are defined with these regional associations. These activities are managed by a small team based in Washington, which is being progressively decentralized (one team member is based in Yaounde and two coordinators are being selected for posts in West and East Africa.

² Can be seen at <www.worldbank.org/afr/ssatp>.

IV. PROMOTING THE “SECOND GENERATION ROAD FUND”

The notion of a road fund was not a novel idea. As set out quite extensively in Heggie and Vickers, there were, and still are, a range of such funds in the developed world, notably in the United States of America and Japan. They also exist in quite a large number of transition and developing countries. The performance of such funds had, however, been mixed. Some of the common problems cited were: poor financial management; absence of independent audits; extensive use of funds for unauthorized expenditures; diversion of funds; and weak oversight. As a result, many of these earlier road funds, sometimes known as “first generation” road funds, have actually been closed down, very often at the express urging of the World Bank and IMF, notably in Europe and Central Asia (Georgia, Latvia, Romania and the Russian Federation, for example) but also in sub-Saharan Africa (Mali). A number of other “first generation” road funds in sub-Saharan Africa are under restructuring in an effort to address these problems (Gabon, Madagascar and Senegal, for example).

The road fund model championed by RMI was intended to address the above-mentioned historical weaknesses in a systematic manner, as well as to put into practice the aforementioned building blocks. Emerging from this process has been the so-called “second generation” road fund, of which there are now more than 20 in place or being established in sub-Saharan Africa. The key characteristics of these funds, as generally understood, are set out below:

- Sound legal basis – separate road fund administration, clear rules and regulations
- Strong oversight – broad-based private/public board
- Agency which is a purchaser not a provider of road maintenance services
- Sound financial management systems, lean efficient administrative structure
- Regular technical and financial audits
- Revenues incremental to the budget and coming from charges related to road use.

Much attention was given to convincing key development partners that the revised approach to road funds was not only viable but highly desirable in

terms of addressing the underlying weaknesses in road maintenance funding and the allocation of resources raised for this end. A particular focus has been on persuading IMF that such approaches could be reconciled with the concern, shared also by some ministries of finance in African countries, for maintaining a common, disciplined budget. IMF views on the acceptability of road funds, under certain conditions, are set out in Potter (1997).

IMF criteria in determining the acceptability of road funds include: a focus on dedicated road maintenance funding rather than on avoiding strict budget discipline; the separation of the purchaser function of the road fund agency from the road maintenance service provider; the presence of a management board with private sector participation but free from producer pressure; and the adoption of a robust financial management system to assure equal or better standards to those prevailing in central Government. Potter also underlined the desirability of a high level of cost recovery through road user charges, without necessarily excluding some level of continued government budgetary support.

In most of the countries where such funds have been created, the reaction has been largely positive. This is almost universally so among road users and the private sector, where the benefits have been demonstrable. In addition, key government ministries have largely seen the funds as positive. A good example of the perception of the reform's benefits, is contained in the presentation of the Chairman of the Zambia National Roads Board to the PIARC World Congress in Durban (Chipewo 2003). This presentation describes how perceptions of the maintenance problem, and what can be done to address it, have changed for the better over time.

V. MEASURING THE IMPACT OF ROAD FINANCING REFORMS

With the passage of time and the steady increase in the number of countries creating "second generation" funds, RMI paid increasing attention to reviewing the impacts of returns and has sought to validate some of the underlying assumptions and expectations relating to these reforms. Kumar (2000) carried out a detailed assessment of the road funds of five countries: Benin, Ethiopia, Ghana, Kenya and Zambia. The assessment primarily examined three areas: institutional and management structure; the process of setting up and implementing road funds and objective achievements. His analysis supported the view that incremental funding was being raised for road maintenance. He also noted that the road funds chosen for analysis were

generally doing a good job in managing resources and especially enhancing transparency in the use of these resources.

While it is difficult to empirically relate the creation of road funds to improved road conditions, a comparative evaluation of data in the above five countries indicates an increase in the length of “good” quality paved roads. In Zambia, the impact of road sector reforms has taken the form of substantial improvements in road network quality. In addition, there appears to be a sound strategic framework in place to reverse the trend towards deterioration and to address the neglect of past decades. In Ethiopia, the proportion of main roads in good condition has increased from 15 per cent in 1996 to 25 per cent in 1999. In Ghana, it increased from 15 per cent in 1997 to 30 per cent in 1999. However, these improvements were confined to main and urban roads and have not been seen on rural roads.

The new procedures for managing road maintenance resources have also impacted operational efficiency. Indeed, most road maintenance works financed by road funds are executed by private contractors. More transparent management and disbursement arrangements, as well as more stable resources, have resulted in a reduction of road maintenance costs per kilometre by 10 to 20 per cent in Zambia, Ethiopia and Ghana. However, allocative efficiency remains weak, even with the presence of road users on road fund boards. In the absence of fully functional maintenance management systems, funds have been allocated with little economic prioritization.

Another important finding was that dedicated financing is a necessary but not sufficient condition for stable and sustainable road maintenance. Another concern was the unevenness of the impact of the reforms on road quality and road user costs when absorptive capacity did not increase to match additional funding. Brushett and Kumar (2001) added that the sustainability of the road fund's financial gains was likely to remain uncertain unless more robust arrangements were put in place for the adjustment of road user charges to keep pace with changing needs and inflation. They also indicated that more attention had to be given to incentivizing road agencies to improve performance, exploit new technologies and review standards.

The most recent comprehensive assessment of the state of implementation of these funds was carried out by Gwilliam and Kumar (2003). This work has brought the benefits of such reforms into focus, especially in terms of funding availability and execution capacity. In most countries, revenues are less than the required level, with approximately 30 to 80 per cent of maintenance needs being met, while this is still well below what is needed for

true sustainability, it is marked progress over the 15 to 20 per cent common in the early 1990s. Improvements in operational efficiency and resource allocation are still limited, although they appear to have been strong enough to reverse the trend towards a decline in external (donor) support to the sector.

The major findings about the impact of financing reforms by Gwilliam and Kumar are summarized in table 1.

Table 1. Assessment of impact of financing reforms

Criteria	Assessment
Overall	"Evidence on new road funds in Africa... finds that they have not undermined fiscal flexibility. Moreover, they have improved administration of road funding (in terms of execution capability) and its outputs (in terms of road conditions)".
Maintenance funding	"Underfunding has been reduced but it remains a serious problem".
Resource use efficiency	"Despite limitations (inadequate capacity of maintenance providers), maintenance costs have been reduced".
Resource allocation efficiency	"Contractors have become better able to absorb allocated funds..." but "... in practice resource allocation continues to be driven by standard formulae rather than planned reviews of programmes put forward ..."
Road quality impact	"Long term declines in road quality have been arrested and in some countries significantly reversed".

Source: Gwilliam and Kumar 2003.

VI. TRACKING THE PERFORMANCE OF ROAD FUNDS

RMI (now RMF) developed a simple "matrix", updated on an annual basis, to track the progress of road management reforms. The matrix tends to focus on "second generation" road funds. The matrix covers 28 sub-Saharan African countries in the process of implementing road financing and management reforms, including, but not limited to the 19 RMF partner countries. The main purpose of the matrix is to provide a regularly updated

“snap shot” of the structure of the road funds, their sources of financing and the level and allocation of expenditures. The matrix also provide comparative information on road policy and management arrangements as well as on road conditions.

All but four of the countries covered in the matrix have road funds in place. It is uncertain whether or not they are true “second generation” road funds. For the most part, they have most of the characteristics of “second generation” road funds. Most have a management board, but just over half have a private sector majority. However, the number of representatives from the private sector may not be the most important criteria for efficient road funds. It is more the presence of the private sector which seems to make a difference.

Perhaps not more than five or six road funds depend solely on road user charges, mostly raised through a fuel levy. A key problem suffered by just under half of the funds is that road user charges are not directly channeled to the Road Fund. This leads to delays and uncertainties in the programming of work and decreases efficiency in the use of road maintenance resources. A surprisingly large number of funds (14 in total) are not meeting routine maintenance needs, although it appears that the level of resources would be sufficient if expenditures were properly prioritized. In only two or three cases are two thirds or better of total maintenance funding requirements met. However, in aggregate, performance does seem to have improved since 1999/2000, when the original case study reviews were carried out by Kumar. While the data on road network conditions is of variable quality, there is evidence of an increase in the proportion of publicly maintained roads listed in good or fair condition since 2000. Road funds have certainly contributed to this increase, especially in Benin, Ghana, Ethiopia and Zambia, where the average annual improvement has been at least 3 to 4 per cent since 2000.

In total 24 road funds are in place, of which nine were established since 2000. Management boards are featured in 23 of the road boards and the private sector has a majority of members on 13 management boards. Road user charges account for 90 per cent or more of revenue for 13 road funds. Fuel levies generally fall in the range of US\$ 0.04 to 0.09, still short of the US\$.10 to .13 recommended by RMI. This may partially explain why only about one third of sub-Saharan African road funds meet routine maintenance expenditure targets.

VII. FINANCE IS NOT ENOUGH – THE LIMITS TO REVENUE GENERATION

Experience suggests that it is still difficult to raise sufficient revenues to fully meet the demand for maintenance. Countries adopting road financing reforms have found it easier to create road funds with an initial (incremental) road user charge than to adjust that charge and diversify sources of revenue – even where road user demand remains strong. Governments, in all cases, remain the final arbiters of the level of road user charges, and for a number of reasons have shown reluctance to carry out frequent upward adjustments. As noted by Potter (1997), there may be limits to the capacity of countries to raise fuel levies, as taxes and duties on fuel are already very high and an important contributor to general revenue.

Thus, the performance analysis of road funds leads naturally to the consideration of what has to be done to address the other aspects of road management. This is not to say that road funds have outlived their usefulness, indeed consolidating the impressive gains made to date and addressing other issues is crucial, but the underlying constraints to improved absorptive capacity and enhanced institutional efficiency remain unresolved. Addressing these constraints through improvements in the organization of road management services will therefore be necessary to garner efficiencies and cost reductions that can be passed on to road users.

VIII. THE IMPORTANCE OF INCREASING CAPACITY AND EFFICIENCY

Talvitie (1996) identified a number of factors relevant to road administrations in terms of enhancing organizational effectiveness. Table 2 below summarizes the key dimensions, as well as estimating the order of magnitude of cost savings. Subsequent experience suggests that these figures are on the conservative side – for example, contracting out maintenance works

Table 2. Sources of efficiency gains from road sector reform

Source	Cost savings
Decentralized programming	10 to 15 per cent
Improved data collection	2 to 3 per cent
Contracting out	5 to 15 per cent
Planning improvements-Shorter design cycle	5 to 30 per cent

Source: Talvitie 1996.

on a performance-specified basis in Latin America (Zietlow, 1998) and in Australia (Frost 2001) found that reductions of up to 40 per cent may be feasible.

The potential for exploiting such opportunities has been realized, to some extent, since the early days of RMI. However, it has proved more difficult to introduce and sustain these reforms than to reform financing. This is because they involve significant restructuring of existing institutions and require changing entrenched practices and procedures. SSATP's recent internal review of the progress achieved in this direction has recognized the existence of "two waves" which are summarized in table 3 below (Brushett 2004). The "waves" represent, early attempts at reform, many of which predate RMI, which were pursued into the mid-1990s, and more recent approaches which have pushed the message of commercialization³ and its potential benefits. The review found that the agenda pursued under the first wave has been generally accepted and that in some areas, such as contracting out and downsizing plant and equipment pools, the recommendations are being followed in nearly all countries. However, because the first wave of reforms failed to bring significant improvements in efficiency, an environment for enabling the second wave of reforms developed.

Table 3. Road management restructuring in Africa – the two waves

Reform measures	
First wave	Contracting out works Downsizing plant and equipment pools Restructuring roads departments Retraining and retention Improving staff incentives Strengthening road management systems Separating responsibilities, identifying the core client functions
Second wave	Creating new institutional structures Contracting out network management Bring in appropriately structured boards Adding new services Spreading services Strengthening public relations Sharpening accountability and emphasizing client orientation

Source: SSATP.

³ The word "commercialization" is not synonymous with "privatization". In this context it is used to mean the adoption of appropriate, sound business management practices.

IX. EXPERIENCE WITH ROAD MANAGEMENT RESTRUCTURING

A number of countries, Zambia is a good example, had first sought to restructure and improve incentives within the existing public sector frameworks, often in conjunction with an overarching public sector reform process. The limitations of such approaches have already been outlined, inter alia, by Heggie (1994) focusing on the impact of pay differences between the public sector, and competing private sector employers of skilled staff. Such differences remain important in most cases. However, in the case of Zambia, restructuring has had some impact on improved staff retention, and generally increased the level of qualified staff. Nevertheless, the capacity to increase work output and to reduce costs through higher staff productivity and more effective planning and delivery remains limited. For example, under this type of restructuring road management systems have not become well established and monitoring and evaluation have not really improved. Consequently, an increasing number of countries, including Zambia, have found it necessary to implement further institutional reform as a means of ensuring better road services and the adoption of business-oriented approaches to road management.

X. PROGRESS ON ROAD MANAGEMENT INSTITUTIONS

Experience with commercially managed road management institutions in Africa is much more limited than with road funds. Aside from Namibia and South Africa (not currently SSATP member countries), there are 12 sub-Saharan African countries at various stages of creating such institutions. These countries include Angola, Ethiopia, Ghana, Sierra Leone, Cote d'Ivoire, Malawi, Mozambique, Senegal, the United Republic of Tanzania, Mali, Uganda and Zambia. There is still no systematic performance review of these organizations to accurately quantify improvements. This is a high priority on the agenda for SSATP, and should be available by end of 2005. Some of the most important tentative conclusions include:

- Business orientation is difficult to achieve even with a conducive legal structure. Getting the right management and board of directors in place is crucial, as is effective and regular interface with stakeholders, including road users.
- Operational targets must reflect actual and expected financial resource levels. Management must have a sharper focus on

efficiency improvement. In fact, inadequate funding continues to be a major impediment to institutional progress.

- Institutional focus on a limited number of practical steps to improve efficiency, such as improving turnaround on procurement of works and contracting suppliers, can pay immediate dividends.
- Performance agreements, for the agency as well as for its senior management, can provide a framework for improved oversight and for measurable improvements in effectiveness and efficiency.
- Institutional improvements should take advantage of windows of opportunity. Regular implementation reviews should however be undertaken to ensure that changes are on track in relation to original plans.
- Ministerial oversight arrangements tend to be a neglected area of institutional reform. A weak policy and regulatory framework may undermine gains elsewhere.

XI. ADDRESSING THE CONSTRAINTS TO FURTHER PROGRESS – ENHANCING THE ROLE THAT GOVERNMENTS STILL HAVE TO PLAY

Ensuring that governments play an effective role in transport policy formulation and in regulation and oversight of newly created road sector institutions is seen as a neglected area of road sector reform. The importance of this role is frequently reaffirmed, but much of the earlier effort to create road funds, and now to establish agencies, appears designed to externalize key functions from central Government, and thus to avoid the perceived constraints of low pay and outdated procedures and practices. However, significant key functions, such as determining road standards, carrying out road classification and setting long-range planning goals tend to remain in the remit of governments. But if these functions are not carried out effectively, the performance of the new institutions are bound to suffer. For example, road funds will not receive the revenue increases they need and road agencies will not be in a position to deliver realistic network improvement programmes.

What can and should be done? Some tasks that government has traditionally undertaken can be further broken down, and more responsibilities can be delegated to agencies. For example, Malawi and Uganda are

considering this approach with regard to transport sector regulatory functions, which would, *inter alia*, cover the road sector. However, it remains unclear how such agencies would be funded. The residual functions of government may then be lesser in scope, but still critical in terms of content. It is conceivable that these functions could be performed by small, motivated and experienced teams advising ministers. Experience in many parts of the world suggests that, even with significant reforms in this area, pay and condition differentials will continue to exist, and they will not generally favour the public sector. Other means of motivating and rewarding staff need to come into play so that transport ministries are not perceived externally or internally as the residue left behind by the tide of change.

XII. INNOVATIONS TO IMPROVE ROAD SECTOR PERFORMANCE

The first innovation aims to exploit cost saving and performance enhancing technologies. Pinelo et al. (2003) suggest that research and development in road technologies has often been neglected as a means of improving road sector performance. Their work, focusing on Uganda and Mozambique as examples, hints at the potential that exists to harness new technologies that could substantially reduce unit capital cost as well as the average annual maintenance burden on low-volume roads in sub-Saharan Africa. Pinard et al. (2003) support this case and emphasize the need for administrations to move towards a more holistic and sustainable approach, and away from a purely technical view on choices of technology for roads.

Mainstreaming innovations may take time. Nevertheless, it is reasonable to expect that commercially oriented agencies would be better positioned to exploit opportunities for change: to review standards and past practices that are often inappropriate for current needs; to aggressively pursue cost reduction possibilities through the utilization of new approaches; to ensure that accrued benefits are passed on to road users, who will gain from lower costs and reduced travel times. It must be emphasized that these opportunities now apply as much to the paved main road networks of African countries as to the unpaved secondary and tertiary networks, where much of the original research was focused.

The second innovation aims at increasing the efficiency and effectiveness of road maintenance operations through the introduction of performance-based contracting for the management and maintenance of road networks. The objective of this relatively new concept is to ensure that the

physical condition of the roads under contract is adequate for the needs of road users over the entire period of the contract. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of road assets. The Performance-Based Management and Maintenance Contract (PBMMC) tries to address the issue of inadequate incentives in traditional contracts (the more quantities, the more the contractor is paid). In order to maximize profits under PBMMC arrangements, the contractor must reduce his/her activities to the smallest possible volume of intelligently designed interventions, which nevertheless ensure that pre-defined indicators of service levels are achieved and maintained over time. Within the contract limitations, and those required to comply with local legislation, technical and performance specifications, and environmental and social regulations, the contractor is entitled to independently define: (a) what to do, (b) where to do it, (c) how to do it, and (d) when to do it. The role of the road administration and of the employer is to enforce the contract by verifying compliance with the agreed service levels and with all applicable laws and regulations.

The beneficiaries of the new concept are expected to be road users, road administrations, contractors and other private sector enterprises. In a wider sense, future generations will be able to benefit from better preservation of past investments in roads. Road users will know the service level they can expect in return for the payments they make for the use of the infrastructure (tolls, tariffs, user fees, taxes, etc.). Road administrations should benefit by obtaining better overall road conditions from the same levels of expenditure. For contractors and other private sector enterprises, the new types of contracts should open up new business opportunities, in which longer contract periods provide a more stable business environment. However, it may be future generations that benefit most, since they will not have to pay for the reconstruction of neglected roads.

The use of performance-based contracts is expected to develop rapidly in sub-Saharan Africa. Several projects are either at an advanced stage of preparation (United Republic of Tanzania – five contracts on 1,100 km of earth roads, Cape Verde – eight contracts on 330 km of paved roads, Chad – 600 km of paved roads) or at an early stage of preparation (Madagascar, Burkina Faso, Democratic Republic of the Congo, Mozambique) in sub-Saharan Africa. The World Bank has developed standard bidding documents for contracts above US\$ 1 million that are applied to the above projects as well as those under preparation outside Africa (Cambodia, Indonesia, Paraguay, Thailand, Viet Nam). SSATP is looking into the possibility of developing smaller contracts below this threshold for small and medium-sized enterprises.

QUO VADIS?

Despite the sometimes uneven results on the ground, stakeholder support for the reform process remains strong. Evidence to this effect comes from a survey among 142 stakeholders in 7 RMI member countries (Pinard and Kaombwe 2001). However, the survey also indicated, that improvements may remain fragile unless firmly backed by a sustainable financing scheme. There was also a plea for more technical support and the availability of appropriate advocacy tools in the member countries, the advocacy tools will be used as a means to convince decision makers that the full vision of commercialization must be realized. Nyangaga (2001), from his experience in Kenya, sets out the obstacles to effective implementation of road sector reform. These underlie the need for governments to be informed and committed partners. He identifies, in particular, the reluctance of government to give up traditional power and responsibilities to new institutions. This is why SSATP has seen the need to become increasingly engaged in the development of tools and methodologies that are supportive of commercial management in the road sector. Of course, these tools must be well adapted to sub-Saharan Africa's requirements.

Expectations have been raised among road users and other beneficiaries about the impact of road sector reform in Africa. Generally the direction of reform has been good, although the speed and efficiency of change leaves something to be desired. Even as matters stand. Africa's road sector has probably performed as well, if not better, than any other sector in recent years. This is starting to show in the level of expenditures in relation to GDP. The areas that are now going to need greater attention from decision makers and external partners are reasonably clear. The priority is now to design and then implement imaginative strategies and monitorable programmes to achieve results on the ground.

REFERENCES

- Brushett, S. and A. Kumar, 2001. "Improving road management and financing: A review of some recent experience of policy reforms in Africa", *Proceedings of the First Road Transportation Technology Conference in Africa*, Arusha, United Republic of Tanzania, pp. 288-304.
- Brushett, S., 2004. Restructuring Road management in Africa, presentation to World Bank Transport Network (Washington, D.C., World Bank).
- Chipewo, H., 2003. National Roads Board of Zambia – origin of the board and involvement of road users in the decision making process, presentation to PIARC World Congress, Durban, South Africa.

- Fay, M. and T. Yepes, 2003. "Investing in Infrastructure – What is Needed from 2000 to 2010?", Policy Research Working Paper No. 3102 (Washington, D.C., World Bank Infrastructure Vice Presidency).
- Frost, M., 2001. "Imperatives in Future Road System Management in Africa: The Australian Case", 14th IRF World Road Congress, Paris.
- Gwilliam, K. and A. Kumar, 2003. "How effective are second generation road funds? A preliminary appraisal", *World Bank Research Observer*, vol. 18, pp. 113-128.
- Harral, C.G. and A. Faiz, 1988. "Road Deterioration in Developing Countries – Causes and Remedies", Policy Study (Washington, D.C., World Bank).
- Heggie, I.G., 1994. "Commercializing Africa's Roads: Transforming the Role of the Public Sector", SSATP Working Paper No. 10 (Washington, D.C., World Bank).
- Heggie, I.G. and P. Vickers, 1998. "Commercial Management and Financing of Roads", Technical Paper No. 409 (Washington, D.C., World Bank).
- Heggie, I.G., 2003. "Commercializing road management and financing of roads in developing and transition countries", *Transport Reviews*, vol. 23, No. 2, pp. 139-160.
- Kumar, A., 2000. "Assessment of selected road funds in Africa. Case study of Benin, Ethiopia, Ghana, Kenya and Zambia", SSATP Working Paper No. 51 (Washington, D.C., World Bank).
- Nyangaga, F., 2001. "Reforming road management in sub-Saharan Africa", SSATP Technical Note No. 32 (Washington, D.C., World Bank).
- Pinard, M.I. and S.M.K. Kaombwe, 2001. "Implementation and impact of RMI. A survey of stakeholders in seven member countries", SSATP Working Paper No. 62 (Washington, D.C., World Bank).
- Pinard, M.I., C.S. Gourlay and P.A.K. Greening, 2003. "Rethinking traditional approaches to low road provision in developing countries", Transportation Research Board 1819 Paper No. LVR8-1153 (Washington, D.C., World Bank).
- Pinelo, A., P. Carvalho, Y. Kamhi and A. Ghazla, 2003. "Role of research and development in road sector reform", Transportation Research Board 1819 Paper No. LVR8-1140, (Washington, D.C., World Bank).
- Potter, B.H., 1997. "Dedicated road funds: a preliminary view on a World Bank initiative", PPAA/97/7, Fiscal Affairs Department (Washington, D.C., International Monetary Fund).

- Talvitie, A., 1996. "International experiences in restructuring the road sector", paper presented at Transportation Research Board Annual Meeting, Washington, D.C.
- World Bank, 1997. Zambia, Staff Appraisal Report – Project to Support a Road Sector Investment Program. Report No. 16539-ZA.
- World Bank, 2001. Malawi, Public Expenditures: Issues and Options. Report No. 22440-MAI.
- Zietlow, G., 1998. "Cutting costs and improving quality through performance specified road maintenance contracts – pilot experiences in Latin America offers lessons for Africa", SSATP Technical Note No. 14 (Washington, D.C., World Bank).