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SUB-SAHARAN AFRICA TRANSPORT PROGRAM

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The Road Maintenance Initiative

Building Capacity for Policy Reform

Volume 1. Report on the Policy Seminars

Steve Carapetis
Hernán Levy
Terje Wolden



EDI SEMINAR SERIES

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Steve Carapetis
Hernán Levy
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The World Bank
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Foreword

The constraints that inefficiencies in the transport sector impose on economic development in Sub-Saharan Africa have long been recognized and have been recently underscored in the Long-Term Perspective Study of Sub-Saharan Africa prepared by the World Bank. Despite the great experience of donors in financing transport projects, the effectiveness and sustainability of past programs designed to increase the performance and efficiency of transport services have been disappointing.

In this context the World Bank, in close association with the UN Economic Commission for Africa (ECA) and several primary donors, has developed the Sub-Saharan Africa Transport Program (SSATP). The main objective of the program is to improve transport efficiency through major policy reforms. It also provides the ECA with substantive inputs for the preparation of the Second UN Transport and Communications Decade for Africa, which will serve as a framework for mobilizing energies and resources to improve the performance of the transport sector and pursue its development. The program is an excellent example of the cooperation that can be achieved by African countries and international agencies in addressing difficult policy issues through a regional approach.

This book is one of three volumes that report on a series of six subregional policy seminars organized by the World Bank and the ECA under the Sub-Saharan Africa Transport Program to address the problems and issues of road deterioration and maintenance. These policy seminars provided a forum in which policymakers from different countries, leading experts in development, and World Bank staff were able to share ideas and experience concerning development policies that relate to road transport and maintenance.

These reports are now being published for widespread distribution as a guide to defining future activities, programs, and initiatives for reforming road maintenance policies in Africa. Recognizing that policy reform is a complex, dynamic, and long-term task, all who participated in the seminars see the effort and these reports as the beginning of a long process.

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Preface

The present process of economic reform in Sub-Saharan Africa has far-reaching implications for the transport sector. Against a background of a deteriorating transport system and the high cost of providing new road infrastructure, issues of transport policy become especially prominent. These issues are inherently difficult to deal with because transport is almost always an intermediate output. As a first step toward addressing these issues and helping governments improve their own capacities to address transport problems, the Sub-Saharan Africa Transport Program (SSATP) was initiated in 1987.

The Road Maintenance Initiative (RMI) is one of the key components of the SSATP. It has been envisaged as a project with a five-year duration (1987-92), in two phases. Phase I consisted of six subregional policy seminars. Representatives from forty-two Sub-Saharan African countries attended one of the seminars held between May 1989 and February 1990 in Harare, Accra, and Addis Ababa (for anglophone countries) and Dakar, Libreville, and Antananarivo (for francophone countries). Country delegations to these seminars normally included ministers of public works, heads of highway departments, and senior officials from ministries of planning and finance. The objectives of Phase I were to develop awareness of the consequences of neglect of the road network, to recognize the policy nature of the problem, to identify key areas for policy improvement and endorse related policy options, and to engage delegations in the preparation of policy reform plans for their own countries through Policy Action Planning exercises. Phase II will include facilitation support for national activities directed toward improving national capacity to deal more effectively with important policy issues and reforms. Activities will consist of country-level development of Policy Action Plans for highway maintenance and will be designed to create a broad national commitment for policy changes and institutional reforms. Implementation of the Policy Action Plans with monitoring and evaluation would follow Phase II.

The Phase I policy reform seminars were organized by the SSATP Unit in the Infrastructure Division of the World Bank's Africa Technical Department and by the Infrastructure and Urban Development Division of the Economic Development Institute of the World Bank in close collaboration with the ECA. The SSATP has been made possible by the support, financial and otherwise, of a number of international donors. The RMI and the policy seminars, specifically, benefitted from donor assistance from the governments of France, Germany, Norway, Sweden, Switzerland, and the United Kingdom. The Carl Duisberg Gesellschaft, the International Labour Office, SETRA, and the Transport and Road Research Laboratory provided help and guidance.

The RMI seminars were conducted in two parts, beginning with an introduction to and discussion of, the regional issues in road maintenance. Three broad areas were considered: planning, budgeting and financing; operational efficiency; and institutional reform and the development of human resources. Following two days of presentations and discussions, individual country teams explored and applied the Policy Action Planning method, which was

presented in workshop exercises designed to demonstrate a systematic procedure for prioritizing problems and developing policy reform action plans to resolve them.

The documentation for the Phase I seminars are being published in the following three reports:

- Volume 1: Building Capacity for Policy Reform
- Volume 2: Readings and Case Studies
- Volume 3: Guidelines for Policy Action Planning

The production and editing of these reports are a joint collaborative effort of the Infrastructure Division of the Africa Technical Department and the Infrastructure and Urban Development Division of the Economic Development Institute of the World Bank.

Overview of the Seminars

This book reports on the first phase of the Road Maintenance Initiative (RMI), a project under the Sub-Saharan Africa Transport Program (SSATP). The SSATP is a joint program of the World Bank and the United Nations Economic Commission for Africa (ECA) and is sponsored by a number of bilateral financing agencies. The objectives and modus operandi of the SSATP are:

- An emphasis on policy responses to key transport sector issues and on strengthening capabilities for policy development at the national and regional level
- Implementation through a series of discrete components (each defined in terms of specific outputs) in partnership with development agencies and African institutions, with participation by African experts and advisers
- A light management structure with flexible arrangements for participation and each component defined up to closure with specific outputs.

Activities of the SSATP are closely coordinated with the preparation of the UN Second Transport and Communications Decade for Africa, 1991-2000.

Within the general framework and objectives of the SSATP, the Road Maintenance Initiative (RMI), focuses on road maintenance. The RMI originated in the need of African countries to halt and, it is hoped, reverse the massive deterioration of the African road networks. The critical situation is illustrated by the following facts.

- About half the region's paved roads and 70% of its unpaved roads are in only fair to poor conditions and require substantial repairs.
- The region's losses in increased road transport costs, caused by lack of maintenance, are estimated at \$1.2 billion a year.
- According to World Bank estimates, the cost of overcoming Sub-Saharan Africa's road maintenance backlog is US\$5 billion, and about US\$1.15 billion will be needed annually over 10 years to reconstruct priority roads to good condition and to provide routine and periodic maintenance for good roads to prevent them from further deterioration.

The RMI's program is based on two essential postulates:

- (a) The core problem of road maintenance is not rooted in technical matters but is political and institutional.
- (b) Any change in policies, to be effective, must be rooted in a firm awareness, at the highest level of government, of the importance of road maintenance.

The aim of the RMI is to facilitate policy change. The lack of success with externally initiated or directed reforms, highlights the need for alternative approaches that African governments can use to improve their capacity to deal with complex policy reforms themselves. The RMI addresses this need through a more

structured, multiphase program over 5 years, to be closely coordinated with programs and projects financed by international and bilateral lending agencies in order to maximize effectiveness.

The first phase of the RMI consisted of six subregional policy seminars at which senior policy makers, including ministers, discussed road deterioration, and exchanged experiences and views on various policies, their appropriateness in the African context, and how best to introduce them through collaborative preparation of national action plans. Each Sub-Saharan African country sent a team of three to five officials from ministries related to planning, financing, budgeting, and implementation of road maintenance and rehabilitation programs. The country teams were normally led by the minister or deputy minister responsible for road maintenance.

The seminars were preceded by careful preparation over a two-year period. A survey of the road maintenance and road deterioration situation in each country was carried out, and materials were prepared: eight Policy Issues Papers that addressed the main issues, focusing on the nature of the issue and the relevant policy options; several case studies illustrating African examples of successful policy reform; a module on Policy Action Planning, with guidelines and examples for developing action plans for policy and institutional reform, and, for each country, a Country Review and Analysis that country teams could use to identify the key policy issues and assess the relevance and applicability of policy options. The seminars themselves consisted of two parts. The first concentrated on a discussion of key policy issues with the aim of building commitment to policy change. The second presented an approach to Policy Action Planning and gave country teams an opportunity to explore and apply it to their national situations.

The issues covered in the seminar, grouped under three themes, and the participants' reactions, are summarized below.

A. Planning, Financing and Budgeting

- Developing a network-based framework for planning. Currently, in most countries, planning and programming road expenditures is divided between new investments and maintenance. This hampers efficient allocation of scarce resources and has resulted in a significantly lower allocation of total road expenditures for road maintenance than required and economically justified. Participants agreed that the lack of a unified, or network-based, framework for planning made it difficult to allocate resources rationally. Even in Senegal, which is devoting 80 percent of road funds to maintenance, available finance is spread thinly among highways, and as a result, few, if any, of the roads receive the attention they need.
- Collecting and disbursing funds. Not only must the total level of funding be adequate, but it is also vital that resource flow be regular and dependable. When budget mechanisms consistently fail to provide the amount required in a dependable manner, the setting up of a Road Fund, rigorously managed and monitored and funded with earmarked resources, may be the best option. Participants generally favored this approach, although in some cases national budgetary procedures did not allow for the earmarking or creation of special funds, and in other cases such funds were not deemed necessary. Participants also pointed out that fairness, and efficiency in cost recovery, posed questions regarding the imposition of tolls or special taxes on trucks with heavy axle loads -- which are especially destructive of pavements -- in both national and international transit traffic.
- Performance budgeting. Efficient and transparent budgeting procedures require the establishment of quantifiable objectives and quality controls and the implementation

of institutional changes to make possible financial as well as technical audits of road maintenance works. Participants agreed that, in general, ministries of public works were not organized for or concerned with the efficient use of allocated resources. Performance budgeting could increase accountability and provide an important image of effective planning and good use of resources, thus increasing the likelihood of attracting higher levels of funding.

B. Operations and Management

- Reducing force account and increasing contracting. Almost exclusive reliance on public sector force account operations has led to over-staffing, lack of incentives for capable staff, and rigid controls and rules that inhibit staff initiatives in adopting cost-effective management solutions. Governments accepted that, in situations of labor shortages and huge backlogs of road maintenance, the increased use of contract maintenance could be a viable option. Domestic contracting and construction industries, however, are often underdeveloped and would require assistance and encouragement to strengthen the industry. Key factors in the development of the industry would be stable markets and supportive policies, training programs, simplified procurement and contract procedures, timeliness and reliability of payment procedures and, possibly, joint ventures with international firms. Such a transition would have to be planned and phased over time and requires serious commitment and a long-term view. A combination of direct labor and contract work, with the proportion of contract work increasing over time, is indicated. Local contractors rarely have the capital for equipment but in some cases governments have leased them equipment. Many roads departments may lack the necessary skills mix for this type of arrangement and would need to address this in their staff development and recruitment programs.
- Increasing use of labor-based operations. Constraints on resources and the availability of under-employed or unemployed labor that can be mobilized for up to \$4.00 daily often makes the adoption of labor-intensive maintenance techniques economic. Several countries reported positive results, including reduced costs and increased maintenance effectiveness. Success depended on terrain, population density and climate. Labor-based approaches, however, also require the decentralization of supervision, administration, contracting, and payment authority, as well as technical assistance and staff training. Participants concluded that this may be the only feasible approach under conditions of extreme resource constraint. Further, they agreed that there were considerable economic and social advantages, including savings in foreign exchange. Also it could provide for the use of rural and communal groups in the execution of the work.
- Reducing publicly owned equipment fleets. Maintenance managers have been overburdened by the need to keep up huge -- and often incompatible -- equipment fleets. Availability and utilization is very low: in some countries only about 20% of the national road maintenance fleets is in working condition. The result are fleets with unnecessarily high operating costs. This represents a large wasted investment, much of which is in foreign exchange. Smaller fleets with higher availability and utilization rates would save money while raising productivity and reducing unit costs and management overhead. The reforms indicated include autonomous agencies responsible for equipment management, commercially run equipment pools, centralized

spares purchase, and contracting out equipment maintenance (as well as road maintenance tasks as mentioned above). The lack of standardization emerged as a major concern of participants, who also saw the potential for addressing this issue through modified policies of external aid agencies and better planning and packaging of their programs for external aid.

C. Institutional Reform and Human Resources Development

- Institutional reform. Most road authorities in Sub-Saharan Africa inherited institutional structures, procedures, and systems from pre-independence days, and these are now in urgent need of review and revision to make them more directly relevant to current circumstances. As referred to above, the delivery of parts of the road maintenance program through contractors would help achieve some desirable changes. Also, some of the institutional systems such as local procurement procedures are in need of streamlining. Participants acknowledged the need for changes that are tailored to the specific situations and needs of countries. They felt that such changes should aim at a progressive reduction of the role of the state, with the emphasis on a leaner and more efficient government organization. Separate, autonomous road authorities seemed to be necessary, at least during the coming decade while roads systems pass through a crisis period
- Improving staff motivation and utilization. Apart from the issues relating to institutional organization and structure, participants agreed that human resource development is one of the most critical factors in addressing road maintenance. At present, constraints on personnel utilization and development caused by inappropriate and inflexible public employment policies result in serious problems: lack of staff accountability; difficulties in retaining competent staff; loss of good staff to the private sector; lack of on-the-job development and motivation; lack of application of previously learned skills, stagnation, and waste of expensive education and training; and generally low levels of manpower productivity. One advantage of autonomy in road agencies is that they can avoid becoming financially overburdened with unneeded staff and thus increase funds applied to operations, supplies, and equipment. They can also promote staff on merit and can remove nonperformers. Creating a personnel unit and strengthening line managers are key to this issue. Line managers will need skills in setting objectives, allocating work, delegating, setting standards, establishing accountability, and providing on-the-job training, recognition, and feedback. Participants also identified as other important contribution to improved staff performance: giving staff greater responsibility, increasing motivation, establishing productivity bonuses, and improving opportunities for training. Regarding training, they endorsed the idea of reinforcing national training programs and, if necessary, creating regional training structures. Participants concluded that before defining their needs for technical assistance, they should make full and efficient use of qualified and experienced local staff and, to the extent possible, deploy them in key planning and decision making roles. Expatriates should be assigned to temporary short-term positions with clear terms of reference, measurable and monitorable objectives, and strong incentives for training local staff.

Policy Action Planning

The second part of the seminars was the conduct by country teams of Policy Action Planning (PAP), following the approach developed by the Carl Duisberg Gesellschaft. The approach consists essentially of three stages:

- Road maintenance constituencies identify the constraints and functional deficiencies the sector faces. From this analysis, priorities are determined and then transformed into concrete objectives.
- Participants define the measures needed to achieve the objectives. These measures are critically screened taking into account financial, human, and institutional constraints. An action agenda is established.
- Responsibilities, resources, and the time frame for implementation are determined.

By bringing out the agendas of all the constituencies involved and showing the areas of possible conflict, the PAP process ensures that both the resource-allocating agencies and the line agencies have a realistic framework for seeking compromise and consensus.

The seminars were successful in introducing the Policy Action Planning concept and demonstrating its value in policy formulation and decision making. Participants found PAP's focusing and consensus-building attributes extremely valuable; the process was also praised as a powerful tool for bringing issues to the surface and making choices between them explicit. The PAP's cross-ministerial structure was also found particularly valuable. Participants suggested that the PAP as presented would benefit from full-scale testing in a Sub-Saharan African country and that one aim would be to find ways to streamline and simplify the process.

The participants found a surprising level of commonality in the road maintenance problems each country faced and in their priorities in ranking these problems. In the anglophone seminars, those countries more committed to maintenance, with better institutions and financial resources, tended to identify planning, programming, and budgeting, and improvement of staff capabilities and skills as the overriding issues; countries at the other extreme of the spectrum, particularly the poorest countries, appeared to focus more on the level of funding as the main issue. In the francophone seminars, the pattern was less well defined. The better-off countries focussed on the planning and use of funds, while at the other extreme priorities were diffused over a larger number of issues.

Follow-up

The follow-up phase (Phase II) of the RMI will support the preparation of policy reforms in a limited number of areas that are central to better management of road infrastructure. That phase will also build up the capacity of selected training institutions, such as ESAMI, to provide process assistance to policy reform in road administration and management.

Phase II would be:

- Driven by country initiatives under the aegis of an interministerial committee or steering group

- Targeted at a limited number of important policy issues requiring action by several departments or agencies
- Closely coordinated with ongoing and planned programs by external financiers
- Designed in harmony with the priorities established by the National Coordinating Committee that will be responsible for the preparation of the country's contribution to the Second Transport and Communications Decade.

The start-up of Phase II involves invitations to preselected countries and joint studies by the World Bank and lead bilateral agencies to assess the country requests and make a decision. Burkina Faso, Cameroon, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, Uganda, and Zimbabwe have been identified as candidates for Phase II.

CHAPTER 1

The Road Maintenance Initiative: A Process of Policy Reform

THE SUB-SAHARAN AFRICA TRANSPORT PROGRAM

Inefficient transport is a major impediment to economic growth and national and international trade in most countries in Sub-Saharan Africa. Sector needs for improvement are vast. Systems suffer from inadequate maintenance, burdensome regulation, and inefficient operations that result in high costs and unreliable services. Human resources are relatively untrained and the region lacks indigenous institutions capable of addressing these problems.

The Sub - Saharan Africa Transport Program (SSATP) was initiated to improve efficiency and sustainability through major policy reform programs. An International Advisory Committee (IAC) was established and, to launch the program, met for the first time in Washington D.C. in March 1987 under the chairmanship of Professor Adebayo Adedeji, U.N. Under-Secretary General and Executive Secretary of the Economic Commission For Africa (ECA). The Infrastructure Division of the World Bank's Technical Department in the Africa Region has overall responsibility for managing the program in coordination with the Transport, Tourism and Communications Division of the ECA. SSATP components are coordinated by Coordinating Committees representing key donors, ECA and the World Bank.

The program has proceeded along the principles laid down in the second IAC meeting held in Oslo in November 1988, namely:

- ◆ Focus on policy responses to key transport sector issues and strengthening of capabilities for policy development at the national and regional level.
- ◆ Implementation through a series of discrete components - each defined in terms of specific outputs - in partnership with development agencies and African institutions with participation of African experts and advisors and;
- ◆ Light management structure with flexible arrangements for participation and each component defined up to closure with specific outputs.

SSATP initiatives also share a structural progression, beginning with operational reviews of country experiences through analysis of ongoing policies; these reviews lead to the identification of key issues and new directions, and the selection of suitable case studies. This is followed by case studies of policies, institutions and programs that illustrate positive responses to key issues.

Dialogue on these findings through workshops and seminars is to be followed by circulation of proceedings outlining policy options validated by the countries themselves in the seminars and recommended follow-up actions. Further, to ensure full transparency and communication about the program, regular progress reports are issued. These are complemented by a newsletter, "Africa Transport" which is issued and distributed periodically.

There are eight SSATP components underway:

Railway Management

Road Maintenance Initiative

Rural Travel and Transport

Human Resources and Institutional Development

Trucking Industry

Urban Transport

Transport Survey

The main aim of the first phase of each component is to raise awareness of the need for changes by presenting convincing case studies that highlight transport problems and constraints and propose solutions that have proven successful in the Africa environment. The second phase is designed to assist SSA governments to go from awareness to implementation, by designing country focussed programs of activities in countries that choose to serve as pilots. The program of activities in these countries will be carefully monitored and lessons learned for extension of similar reform programs in the other SSA countries.

During their seventh meeting, held in Tangier, Morocco, on November 15-16, 1989, the Conference of African Ministers of Transport, Communication and Planning approved the basic document "Objectives, Strategies and Guidelines" for the preparation of a second United Nations Transport and Communication Decade for Africa (1991-2000). Under the leadership of the ECA, African countries, and regional, sub-regional and multilateral agencies involved in the transport sector in Africa have started the preparation process, which will culminate in mid-1991 when the Decade is launched.

The SSATP has contributed to the definition of the Second Decade in several ways, and will continue to provide readily available support for the preparatory activities. SSATP studies, as well as ongoing activities, will be considered as part of the preparatory activities and will be made available to relevant Decade Working Groups. Proposals for new activities will be developed in light of the Decade's objectives and guidelines. The specific focus of the SSATP, namely to develop and disseminate improved policy response, will need to be pursued and expanded under the Decade. Similarly, the collaborative framework established under the SSATP also will be useful in meeting the continuing need for upstream policy analysis on critical transport issues.

ROAD MAINTENANCE INITIATIVE: BACKGROUND AND JUSTIFICATION

Recent studies have confirmed that the SSA road network is in an alarming state of deterioration with nearly half of the region's paved roads and 70% of its unpaved roads in only fair to poor

condition requiring substantial repairs. Establishing a program for improving maintenance efficiency of SSA's roads has become an urgent necessity for economic recovery and growth. The SSA region's annual losses in increased road transport costs, caused by lack of maintenance, are estimated at US\$1.2 billion. In addition there is the cost of the rapid deterioration and erosion of road assets. The World Bank has estimated the cost of overcoming Sub-Saharan Africa's road maintenance backlog at US\$5 billion, and that about US\$1,150 million will be needed annually over 10 years (US\$12 billion) to reconstruct priority roads to good condition and provide routine and periodic maintenance for good roads to prevent them from further deterioration.¹

An agenda for action has emerged from the experiences of governments, proceedings of conferences and from the experiences of external aid agencies. ECA has discussed Road Maintenance on a number of occasions during the last few years, including the Fourth African Highway Maintenance Conference in Harare (December 1987). The World Bank, in collaboration with ECA and several bilateral donors, has designed the SSATP Road Maintenance Initiative (RMI) to continue and accelerate this emerging agenda for action and to help the formulation and implementation of the policy reforms that will be necessary.

RMI's development and design is based on two essential postulates:

- ◆ That the core problem in the roads maintenance sub-sector is not rooted in technical matters, but is political and institutional. Expertise is certainly needed, but it will not be enough without institutional and policy changes that usually involve several ministries and government agencies.
- ◆ That any change in policies, to be effective, must be rooted in a firm understanding, at the highest level of government, of the importance of road maintenance. Reform, and the policy changes that embody it, is difficult. It will almost always falter unless policy changes are timely and relevant, and there is a broad commitment to reform based on a firm belief that it is the path to national economic and social development.

RMI should be seen as a process that facilitates policy change. External aid agencies have, in the past, generally provided sound policy advice. Many of the policy options outlined in the background documentation for the RMI were, in fact, first made over a decade ago. However, seldom have new processes and procedures been recommended or existing ones significantly improved to make the policy options workable and useful in individual countries. External aid agencies have mostly tried to encourage African governments to introduce desirable policy reforms in their countries by linking policy changes to large investment projects. But linking transport grants and loans to conditionalities involving policy reforms has not been particularly effective, because these actions often require the involvement of several ministries that have their own priorities.²

The lack of success, with externally initiated or directed reforms, highlights the need for alternative approaches for African governments to improve their capacity to deal with complex policy reforms themselves. The RMI is addressing this need through a more structured policy reform process. The approach that emerges may be through freestanding activities in some countries funded by external agencies and relatively independent of implementation of externally - funded investment projects. However, close coordination is expected between government policy initiatives and project implementation, and this will be an important factor for external aid agencies.

RMI's focus is on policies, and therefore the emphasis should be on assisting African governments to develop their capacities to formulate and implement appropriate and sustainable road maintenance policies using their own resources, initiatives and supervision. The need for policy reform has to become a matter of self-interest to policy-makers, politicians and other stakeholders. Only if policy reform is internalized can changes be developed and implemented efficiently, paving the way for mobilizing sufficient local resources that can be used more effectively in a sustaining way.

OBJECTIVES

The Road Maintenance Initiative has the following development objective:

**secure sustainable
improvement in road sector performance
in Sub-Saharan Africa**

The SSATP Road Maintenance Initiative has been designed for African policy makers and senior managers to:

- ◆ increase their awareness of, and reach agreement on, the magnitude of the road maintenance problem, and increase their motivation and commitment to addressing the problem by changing attitudes and behaviors;
- ◆ identify appropriate technical, financial, and organizational policy-options, and develop policy action plans for specific road agencies and institutions; and
- ◆ support and monitor the implementation of national policy reform plans, and assess the effectiveness of the plans carried out.

The RMI design also acknowledges and provides for two complementary objectives that will be essential to the success of any outcomes from achieving the above principal objectives. First is the need for establishing or strengthening regional training and consultancy institutions to assist countries in road maintenance policy making and planning. At the same time, the action-oriented Road Maintenance Initiative will improve cooperation and coordination among international lending institutions and bilateral aid donors.

RMI has been envisaged as a phased project over five years. The first phase consisted of six sub-regional policy seminars for senior policy makers, including ministers, to discuss road deterioration, exchange experiences and views on policies, their appropriateness in the African context, and how best to introduce them through the collaborative preparation of national policy action plans. The next phase will support the preparation and initial implementation in a number of countries of policy reforms in a limited number of areas which are central to better management of road infrastructure. The program would respond to country initiatives. The program would also build up

the capability and capacity of selected training institutions to provide process assistance related to policy reforms in road administration and maintenance. The program would be closely coordinated with ongoing projects and studies concerning road maintenance and administration.

ROAD MAINTENANCE POLICY SEMINARS

The Phase I series of seminars was run in two groups, three in anglophone countries and three in francophone countries. The anglophone seminars were held in May/June 1989 in Harare and Accra, and the third in Addis Ababa in September 1989. The three francophone seminars were held in late January and February 1990 in Dakar, Libreville and Antananarivo (See Box page 5).

The approach adopted, namely six seminars in different cities, was based on past experience that showed that for policy seminars to be effective in initiating a mood for policy reform, adequate opportunity must be provided for full discussion and debate of all the important issues and options. This demands a relatively small overall size in terms of numbers of participants, teams of policymakers and officials from each country, participants who know, recognize and acknowledge the expertise of the other participants, and an atmosphere conducive to frank, open discussion free of diplomatic formalities. On this premise, the groupings used corresponded to the allocation of countries among the World Bank's operational departments to facilitate operational follow up.

Another important aspect relating to the ability to generate frank and open interchange and dialogue in these seminars, is the person who moderates the proceedings. For these seminars, Moderators were selected from African personalities with long experience in Government and familiarity with the complexities and sensitivities of the policy reform process. They were people whose expertise and competence were recognized and acknowledged by the participants, and in the event played a critical and important role in the successful results achieved.

OBJECTIVES OF PHASE I

As mentioned earlier, each component of the SSATP is designed in terms of specific outputs. Accordingly, although the first phase of the RMI has built-in linkages to later phases, it was self-standing in itself and designed to help achieve the objectives of the RMI as referred to above. Specifically the objectives of the Seminars were defined as:

- ◆ Increase awareness and change attitude, particularly in the apex finance and planning ministries, of the importance of road maintenance;
- ◆ Identify practical and timely policy options that are workable, and develop a commitment to bringing about the benefits those policies can yield to national economies; and,
- ◆ Develop an equal commitment by donors to coordinated support of the action plans needed to put the new policies into effect.

The seminars were also designed to produce indicative Policy Action Plans that outline each country team's basic concept of the policy reforms needed to improve road maintenance in their countries. Policy Action Planning (PAP), which will constitute the main feature of Phase II of this

SUB-SAHARAN AFRICA TRANSPORT PROGRAM

ROAD MAINTENANCE POLICY SEMINARS

Date	Venue	Participating Countries	Number of Attendees /a	Moderator
May 30 - June 2, 1989 (Mozambique)	Harare	Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe	32/0/42	A. Guebuza
June 6 - 9, 1989 (Zimbabwe)	Accra	The Gambia, Ghana, Liberia Nigeria, Sierra Leone	32/0/33	D. Mulaisho
September 19 - 22, 1989 (Zimbabwe)	Addis Ababa	Ethiopia, Kenya, Mauritius Somalia, Sudan, Uganda	27/0/33	D. Mulaisho
January 22 - 25, 1990 Kane (Senegal)	Dakar	Burkina Faso, Cape Verde, Chad, Guinea Bissau, Mali, Niger, Sao Tome & Principe, Senegal	28/9/28	C. Hamidou
January 31 - February 3, 1990 (Senegal)	Libreville	Benin, Cameroon, Congo Cote d'Ivoire, Central African Republic, Equatorial Guinea, Gabon, Guinea, Togo	37/11/29	O. Seck
February 12 - 15, 1990 (Cote d'Ivoire)	Antananarivo	Burundi, Djibouti, Madagascar, Mauritania, Rwanda, Seychelles, Zaire	26/15/35	B. Ouattara

/a Figures represent: participants/observers/others

program, is a useful method for defining, initiating and implementing policy reform by a systematic approach with well defined steps.

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PARTICIPANTS

Each government in SSA was invited to send a team of three to five officials from ministries related to the planning, financing, budgeting and implementation of road maintenance and rehabilitation programs. Because the Seminars were aimed at exploring policy options and starting the process of bringing about policy changes, the seminars were designed around the participation of ministers and top civil servants who work at the level of government where substantive policy reforms would be initiated. Annex 1 presents the lists of participants from each of the countries as well as observers and others who took part. As will be noted, the country teams were normally led by the ministers responsible for the central roads departments such as ministers of public works or transport. They were normally accompanied by their chief roads engineers or the directors of roads responsible both for maintenance and rehabilitation programs. Just as importantly the country teams included senior officials from planning and finance ministries with direct responsibility for programming and budgeting road expenditures.

PREPARATION

The seminal paper for the RMI was the World Bank's report on "Road Deterioration in Developing Countries: Causes and Remedies"³ published in 1988 the result of a policy study. The relevance to Sub-Saharan Africa of the findings of this report were highlighted in the initial concept of the SSATP. It was obvious that more specific and focussed work was needed to examine the situation in SSA. Accordingly, special preparations were made for the seminars including a survey, writing of policy issues papers and positive case studies, designing policy action planning guidelines, and compiling country review and analysis papers. These preparations were carefully planned and discussed by the Coordinating Committee at its meetings in Geneva (June 1988) and London (March 1989). A separate volume presents a full collection of the various papers prepared for the seminar.

A Survey of the road maintenance and road deterioration situation in each country was carried out through the World Bank's infrastructure operational divisions. In 1987 and early 1988, questionnaires were sent to all countries in the region to gather information on road maintenance activities, including data on the condition of the road system, maintenance costs, physical accomplishments, and availability and use of resources. A compilation of the returns was the basis for the report "Road Deterioration in Sub-Saharan Africa,"(Ref. 1) which was an important source of information presented at the seminars.

A total of eight Policy Issues Papers were prepared to address the main seminar topics focusing on policies, policy options, and policy actions. Emphasis has been given to ongoing policies and their contribution to the state of affairs on the road systems and to optional alternative policies and their prospective roles in ameliorating the road maintenance problem. In addition, fifteen Case Studies illustrated African examples of policy changes that had been implemented successfully. The Policy Action Planning Module with guidelines and examples was developed by Carl Duisberg Gesellschaft, a German government training institute. This helped participants to understand the potential of the process of developing action plans for policy and institutional reforms.

Before the seminar each country team was asked to prepare a Country Review and Analysis document for use in considering the relevance and applicability of policy options. The review and analysis questionnaire covered statutory and administrative processes and constraints, including the various institutions and agencies that would be involved in potential policy changes in the areas described under the seminar topics. These Country Review and Analyses provided basic information on the road networks and on current programs and formed the basis of the work by the country teams when they carried out their policy action planning module of the seminar. To explain the concept and to assist the country teams in preparing these papers, specially selected African Advisers visited each country.

CONTENT AND FORMAT

Each seminar addressed three major topics related to road maintenance. These were divided into themes for the preparation of background papers with relevant case studies; which are further detailed in Chapter 2:

- A. **Planning, Financing and Budgeting.**
- B. **Operations and Management.**
- C. **Institutional Reform and Human Resource Development.**

Each seminar began with the hosting minister's welcome speech, SSATP's opening address, and the presentation of the Bank's introductory paper describing the state of road maintenance and rehabilitation in the region, and highlighting key issues and requirements to combat the road deterioration problem in physical and financial terms on a region-wide basis. Then the three topics A, B and C were presented and discussed. This served to identify the major policy issues and problems related to road maintenance and rehabilitation and cases of positive response. This first part of the seminars was meant to create positive awareness and to change attitudes and build commitment towards policy changes.

The second part of the seminars presented instruments and approaches to policy action planning and gave country teams an opportunity to explore and apply these to their national situations. Each team presented a report to the closing plenary session on the PAP outcomes.

During these seminars, key roles were played by the moderators as mentioned earlier. However, the presence of African Advisers, who had been selected as expert practitioners in the field of roads maintenance and administration, also played a vital part. In addition, resource people from ECA, consultants, World Bank staff, African training institutions, the International Labour Organization (ILO), and the Transport and Road Research Laboratory (TRRL) in UK, also played important roles.

POLICY ACTION PLANNING

One important function of the six RMI seminars was to introduce the country participants to the Policy Action Planning instrument⁴. PAP provides a methodology for defining policy options,

setting priorities, and developing action plans that is particularly important when decision-makers must make choices in the face of severe resource constraints. It's rigorous analytic framework makes it particularly suitable for making policy choices involving multiple actors, such as the several ministries almost always involved in setting national roads policies.

A full Policy Action Planning application is complex, and requires training, commitment by participants, and a significant amount of time to carry out. The goal at the RMI seminars was to introduce participants to the methodology and provide them with familiarity with its workings as a prelude to national PAP seminars that would bring together roads, planning, and financial agencies as well as other stakeholders - such as road user organizations, and contractors and consultant associations. These national seminars will take place during Phase II of the Roads Maintenance Initiative. A fuller description of PAP and the participants' reaction to it is found in **Chapter 4: Policy Action Planning**.

FOLLOW - UP

The second phase of the RMI would include follow - up programs at country level to support the policy reform process. These programs would be of value in selected areas where policy directions are well established; they would be conceived as distinct sets of activities:

- driven by country initiatives under the aegis of an inter-ministerial committee or steering group;
- targeted at a limited number of key policy issues requiring action by several departments or agencies;
- closely coordinated with ongoing and planned donor programs; and,
- designed in harmony with the priorities established by the National Coordinating Committees created as part of the mechanism responsible for the preparation of the Second Transport and Communications Decade.

SSATP components would typically support activities like country level workshops/seminars, policy and institutional analysis and planning, and process assistance. As the program progresses, follow-up activities will be developed and proposed to potential external aid partners. In doing so, the principles of clearly defined outputs, closure within a two-year period and systematic involvement of African institutions will be stressed.

The prime consideration in selecting countries for Phase II would be the prospects of achieving tangible results on one or two driving issues. Each country would, at the outset, define specific objectives and organizational arrangements which would then provide the basis for elaborating the specific sequence of activities to support the program. The areas of intervention of the RMI would differ from country to country; typically these areas would concern program design (audience, consultation mechanism, etc.), practical advice on key aspects such as performance budgeting, funding mechanisms, contract maintenance, incentive schemes, etc.

CHAPTER 2

Road Deterioration in Sub-Saharan Africa: The Policy Agenda

THE ECONOMIC BACKGROUND

Road conditions in Sub-Saharan Africa cannot be isolated from the general economic situation in the region. Sub-Saharan Africa is confronted with slow or negative economic growth, declining agricultural production and a heavy burden of external debt. In most countries GDP and income per capita have been stagnating or declining for more than a decade, while population growth has continued at a rate that adds 20 million people to SSA each year. The net flow of capital to the region declined from about US\$ 14.0 billion in 1981 to US\$ 8.5 billion in 1985. Total external indebtedness now exceeds US\$ 100 billion and debt service, even after rescheduling, consumes about 30 percent of export earnings. Per capita investment in real terms declined by half from 1980 to 1987 while imports, in constant dollars, fell by 35 percent.

As a result, the average African is poorer today than in 1970. This is clearly unacceptable and hard policy choices must be made by African governments to reverse the trend. Fortunately, an important and unprecedented intellectual and economic revolution is taking place in Africa. It began slowly in the early 1980's with a handful of countries undertaking economic reform programs aimed at increasing productivity and stimulating growth. Today, more than half of the Region's countries--from tiny market-oriented countries such as Togo, Mauritius and the Gambia, to large, initially more-socialist oriented Ghana, Guinea and Tanzania, have embarked on these programs. The programs deal comprehensively with public sector management, public finance and parastatal reform. They include the introduction of realistic exchange rates and improved incentives for agricultural production, as well as adjustment in trade regimes and promotion of exports. One of the main objectives of these reforms is to create a better environment for enterprise development, unleashing the enormous entrepreneurial energies of the people. The ultimate aim of these reforms is the resumption of growth; sustainable growth with equity.

The progress being made reflects the determination the African countries themselves expressed at a 1986 special session of the United Nations General Assembly, when they declared that «Africa has taken the main responsibility for its own development ... African countries are determined to take, individually and collectively, all measures and policy reforms that are necessary for the recovery of their economies and the revitalization of genuine development».

The transport sector --particularly roads-- is a key to unleashing the potential for increased production and incomes in Sub-Saharan Africa. There are telling examples where transport bottlenecks have put the brakes on growth, especially in agricultural production. If farmers and manufacturers are to take advantage of reforms in agriculture and other productive sectors they must have a dependable road system. Without efficient transport -- and in Sub-Saharan Africa transport means, more than anything else, roads -- there can be no supply response to support renewed growth.

The objectives for transportation can be captured in two words: efficiency (and thus lower cost) and sustainability. Poor economic performance has meant that levels of gross investment and maintenance expenditures in many countries have not been sufficient to preserve and modernize infrastructure and equipment. Institutional structures and national economic and sectoral policies have

not been responsive to changing market demands or have not adequately supported the build-up of sufficient technical and managerial capabilities.

THE STATE OF SUB-SAHARAN AFRICA'S ROADS

Road Deterioration, Financial Implications

The World Bank's report "Road Deterioration in Developing Countries: Causes and Remedies" (Ref. 3), provides estimates of the physical and financial magnitude of road deterioration in developing countries, including Sub-Saharan Africa. Among other things, it identified the principal causes of road deterioration and the reasons the problem has become so widespread. Deterioration of paved roads is gradual and hardly perceptible during the initial phase after construction, lasting from 10 to 15 years, sometimes up to two-thirds of the pavement life-cycle. Even this seeming "grace period" can be drastically shortened when traffic volumes and axle loads exceed the designed capacity of pavements. Thereafter, deterioration can be swift. Routine and preventive maintenance based on careful monitoring of traffic loads and pavement conditions can protect and prolong the life of important national investments in roads.

A comparison of costs for preventive maintenance and rehabilitation illustrates the point. Routine maintenance can be carried out for a cost of US\$ 300 to US\$ 1,500 per kilometer per year and each periodic maintenance (resurfacing) for about US\$ 25,000 normally carried out every 3 or more years (up to 12). When maintenance is neglected the eventual cost of rehabilitation or restoration is about US\$ 30,000 per km for unpaved roads and US\$ 200,000 per km for paved roads. This represents a 2.5 to 8 fold increase in expenditures. Also, by giving priority to new construction of roads, thereby failing to redirect spending to maintenance, on average, 3 to 4 km of existing, potentially good roads will be lost for every km of new roads governments decide to construct.

The economic consequences of neglecting maintenance are primarily borne by road users -- in the form of increased vehicle operating costs. A dollar reduction in road maintenance expenditures can result in an increase of US\$ 2 to US\$ 3 in vehicle operating costs caused by deformed and rough road surface. In reality then, reducing expenditures on road maintenance will not serve the intended purpose of releasing resources for higher priority sectors. Instead road users, who are mostly in the private sector, bear the burden of increased transport costs and a high portion of these costs require foreign exchange for spare parts, tires and vehicle replacement.

The governments of the region could save some US\$1.2 billion in road expenditures a year (about 0.85 percent of regional GNP) through preventive maintenance, of which perhaps US\$900 million is in foreign exchange. Another US\$1.2 billion in savings would accrue to road users through reduced wear and tear on vehicles as a result of improved road conditions. These figures do not account for the costs imposed on agriculture and industry by increased transport costs, lengthened travel times, or the delayed pace of development.

Balancing maintenance requirements against the construction of new roads is a difficult task. Decision-making should be rationalized by viewing new construction and maintenance as part of a single process aimed at minimizing total transport costs in the sector. This requires unifying roads budgets so all alternatives can be ranked against each other in formulating road programs. Road maintenance in its broadest sense includes repair and rehabilitation to restore bad roads to good condition, as well as strengthening and rejuvenating to keep sound roads in good state. National transport ministries and external aid agencies alike must come to recognize that most major

maintenance tasks are designed to protect and extend capital investments; they belong, therefore, in the same budget category as the initial outlay for construction.

Road Conditions in SSA

In 1987, an assessment was made of current road conditions in SSA countries based on data available for 41 countries. The results were documented in a report prepared under the RMI, "Road Deterioration in Sub - Saharan Africa".⁵ Nearly one-quarter of paved roads are in poor condition and a further quarter in only fair condition.⁶ The situation is even more serious for unpaved roads where about 39% of roads are in poor condition and an additional 32% in only fair condition. Table 1 gives a regional breakdown and compares the 1988 data with that for 1984 shown in parentheses. Annex 2 gives the country by country breakdown of road conditions.

TABLE 1: ROAD CONDITIONS 1988 (1984)
(PERCENTAGES)

	Good %	Fair %	Poor %
East Africa			
Paved Roads	50(42)	33(32)	17(26)
Unpaved Roads	28(42)	30(30)	42(28)
West Africa			
Paved Roads	54(52)	17(23)	29(25)
Unpaved Roads	19(20)	34(36)	47(44)
All Sub-Saharan Africa			
Paved Roads	52(47)	25(27)	23(26)
Unpaved Roads	29(33)	32(32)	39(35)

Road Deterioration Study. Weighted averages according to length of network have been used throughout.

Many of these roads are in imminent danger of being lost as usable thoroughfares. Some can be saved if quick action is taken. Delays will mean that more and more of them will have to be either abandoned or completely rebuilt at costs that can even range well above the US\$ 200,000 per kilometer mentioned earlier. Financial resources desperately needed for maintenance continue to be channeled, instead, into new construction.

Despite these figures, money is not the key issue. A number of extremely poor countries with few resources to devote to the roads sector have much better records in maintaining their existing road stock than some countries with much higher per capita and national incomes. In part, this reflects relatively smaller road networks. The main factor, however, seems to be their realization of the economic

importance of preserving existing assets, and a firm political commitment to maintenance that includes a willingness to forgo often prestigious new roads projects.

Following the survey in 1987 and for purposes of reporting the results, based on their records of road condition, and on past experience of their performance, countries in Sub-Saharan Africa were placed in four groups as shown below and in Table 2.

Group 1: Botswana, Cote d'Ivoire, Djibouti, Malawi, Niger, Zimbabwe

These countries have demonstrated a substantial commitment to maintenance, and have the ability to implement their road programs, and raise or attract adequate resources for the highway sector. These countries should have little difficulty in restoring--or preserving their roads in good condition, in some cases, as soon as 1995. They have already shown their ability and willingness to put sufficient resources into road maintenance; continuation of the same policies, sometimes with additional external funding, will be needed;

Group 2: Benin, Burundi, Central African Republic, Ethiopia, Lesotho, Mali, Madagascar, Mauritius, Rwanda, Swaziland, Togo

These countries have shown a growing commitment to road maintenance but have yet to build up adequate capacity for implementation. Efforts to improve maintenance look promising, and sufficient resources to undertake the needed maintenance could probably be obtained if spending priorities were adjusted accordingly. These countries should be able to restore their roads to good condition by the end of the century if they can strengthen their commitment to improved maintenance even though considerable technical and financial assistance will be needed in some cases;

Group 3: Cameroon, Congo, Gabon, Kenya, Nigeria, Senegal

These countries paid insufficient attention to road maintenance in the past, despite having the capacity and financial resources to contain deterioration of their roads. These countries have the capacity to restore their roads by the year 2000, and could raise the finance required, but they will not achieve that target unless there is a significant change in the priority accorded to road maintenance; and

Group 4: Angola, Burkina Faso, Chad, Equatorial Guinea, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Mozambique, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zaire, Zambia

These countries have experienced severe problems in building up institutional capacity and attracting funds for road maintenance. Some of their networks are severely deteriorated, and substantial amount of rehabilitation will be required. These countries will probably not be able to restore their networks to good condition by the year 2000 due to their economic condition and the size of the backlog of maintenance and rehabilitation. They will have to take difficult decisions concerning priorities of rehabilitation and maintenance that will best serve their short and medium term needs, including concentration of maintenance effort on a core road network.

TABLE 2
GROUPING OF COUNTRIES ACCORDING TO ROAD MAINTENANCE CAPACITY

Group 1:
Countries with a demonstrated commitment to maintenance, effective institutional capacity, and mostly adequate financial resources ^{1/}

Botswana
Djibouti
Malawi
Ivory Coast
Niger
Zimbabwe

Group 2:
Countries with a growing commitment to maintenance, and improving implementation capacity and availability of financial resources

Mauritius Rwanda
Madagascar Mali
Lesotho Benin
Swaziland C.A.R.
Ethiopia ^{2/} Togo
Burundi

Group 3:
Countries that have neglected maintenance despite adequate implementation capacity and availability of financial resources

Kenya
Nigeria
Gabon
Cameroon
Senegal

Group 4:
Countries that have neglected maintenance because of inadequate implementation capacity, and financial resources

Zambia Ghana
Mozambique Guinea
Zaire Eq. Guinea
Uganda Burkina Faso
Sudan Gambia
Somalia Mauritania
Sierra Leone Guinea-Bissau
Liberia Chad

^{1/} Adequate financial resources subsumes a reallocation of funds from new construction to maintenance, and the availability of funds from donors for maintenance.

^{2/} Ethiopia used to be in Group 1, but has recently incurred more problems with funding of maintenance and implementing its maintenance program.

The 1987/88 survey included a review of what Sub-Saharan Africa has been spending on roads recently (Annex 3) and showed that some 60 percent (Groups 1, 2 and 3) have been spending at least

over short periods, about one percent of their GNP. This would have been enough to restore and fully maintain all their essential roads. In those countries, a redirection of effort away from new works to better maintenance would be essential to avoid road failures on a large scale. For the remaining 40 percent of countries (Group 4), even stopping all new works until the year 2000 would still require higher levels of road financing than they have previously had. Whether these countries can plan for and manage larger amounts -and whether the donors are prepared to provide extra aid -will depend very much on the organization and efficiency of their roads administrations. If they cannot create the necessary level of institutional efficiency to manage their entire road network, and if there is no prospect of providing the necessary resources, the only solution seems to be to restrict regular maintenance to a core road network that can be managed and funded within the resources likely to be available.

Since the survey was carried out, there has been considerable progress in some countries which are now moving forcefully to reform their policies and recast their priorities relating to road maintenance (See Box). Although the three years in which these changes have been occurring is too short a time to have been reflected in improved road conditions, the prospects for the future certainly look to be most promising in those countries making these changes. In those countries action has started - one example is Tanzania where road maintenance is being tackled on a much larger scale than before under a \$900 million Integrated Road Project.

Status of Policy Reform: 44 SSA Countries	
	<i>No. of Countries</i>
<i>Minimal Reforms Started</i>	9
<i>Government Preparing Reform Package</i>	19
<i>Reform Package Agreed, Awaiting Implementation</i>	10
<i>Reform Implementation Has Begun</i>	3
<i>Substantial Reforms Completed</i>	3

Implications for Future Road Conditions

The West and Central African survey carried out in 1981-82 found that very little maintenance activity was carried out on road networks in the 16 countries included in the study. Only 4% of paved roads were either resealed, strengthened or reconstructed each year and 3% of gravel roads were regaveled or rehabilitated. The findings of the 1987-88 study indicate that the level of activity has increased slightly - for a similar number of countries about 5% of the paved and 6% of the unpaved networks received some kind of periodic maintenance or reconstruction in 1987-88. However,

increased slightly - for a similar number of countries about 5% of the paved and 6% of the unpaved networks received some kind of periodic maintenance or reconstruction in 1987-88. However, insufficient work was carried out to prevent further deterioration of networks since only 3.5% of paved and unpaved roads received either periodic maintenance or strengthening compared to the required 5.5% for the paved roads and 6.5% for unpaved roads. Only six countries out of 18 carried out work on more than 5% of their paved and unpaved network. Consequently, if the above findings for 18 countries are indicative of what is happening in the remaining Sub-Saharan Africa countries, road networks will deteriorate even further unless the present level of maintenance is raised.

The implications of continuing the strategies reflected in these levels of maintenance activities are that by the year 2000, only 38% of paved roads would remain in good condition while the proportion in poor condition would increase to 40%. These are regionwide averages - for some countries the situation would be even worse. For example, six countries did not carry out any resealing between 1984 and 1988, which means that for these countries, there would be very few roads in good condition by the year 2000 at present maintenance levels. Where countries may have overbuilt roads in lightly trafficked areas, they may be able to abandon those deteriorated roads with little or no traffic. However, even after excluding low volume roads, the study data indicates that over half of the countries surveyed are still not carrying out sufficient levels of maintenance to prevent further deterioration, even on high economic priority roads.

Adequacy of Maintenance Funds

Chronic shortage of funds allocated for road maintenance is the most usual reason given for poor network condition. However, analysis of the resources devoted to road construction, road improvement and road maintenance reveal that, in spite of best intentions frequently expressed, some countries have been spending funds on new roads while maintenance has been inadequate. Survey data for the region (Annex 3) indicate that on average SSA has been investing approximately 1.1% of GNP through 1988. The same percentage was found in the 1984 Road Deterioration Policy Study. On average, (based on data for 19 countries) it is estimated that 58% of roads expenditure was devoted to new construction or improvement, 25% to routine and periodic maintenance, and the remaining 17% to reconstruction or rehabilitation. Data from 23 countries show them spending roughly enough to maintain national roads already in good condition and restore a sizeable portion of those whose condition has fallen to fair - had not almost 60 percent of these funds been spent on building new roads instead of on maintenance and rehabilitation of existing roads.

Obviously, the economic balance of resources between maintenance and new construction varies from one country to another. For example, both Côte d'Ivoire and Botswana have spent a high proportion of their road budgets on new construction, but the level of maintenance funding has been quite adequate. The problem is with those countries that have spent more than 50% of their road budgets (including aid) on new construction whilst maintenance of the roads currently in good to fair condition has not been adequate and/or roads in poor condition have not been rehabilitated or resurfaced. It is estimated that 50% of countries for which sufficient information is available (28 countries) fall in this category.⁷

WORLD BANK EXPERIENCE

Improvement in road maintenance and rehabilitation remain a central element of the World Bank's infrastructure program for SSA. This element is being supported by more than 40 operations, either as stand alone projects or as components of broader transport sector operations. The Region's program concerning road maintenance is increasingly responsive to the policy agenda outlined in the Road Deterioration Policy Paper (Ref. 3).

On the whole progress is slow and requires persistence. A good number of countries where the Bank has been involved for a decade or more are making sensible advances on the policy and institutional fronts and are developing comprehensive rehabilitation programs (See Box page 15). Areas that require special attention include the development of network-based planning systems and increasing efficiency in the use of equipment. Also, funding remains a pervasive problem, hampering efforts towards better planning and increased efficiency. Road funds, although no panacea, appear to have a positive impact; they put a clear focus on road expenditure and offer a basis for better planning and accountability. Their implementation has required considerable time and has had to be pursued under a sequence of operations in particular countries. Also, Bank experience has shown that such funds should not be seen by road authorities as mechanistic entitlements, but allocations directly related to well formulated and justified work programs.

FUTURE PROSPECTS

As part of the study carried out in preparation for the RMI seminars, the results of the survey were assessed against four scenarios for addressing road maintenance in Sub-Saharan Africa:

- (1) Limit efforts to only routine maintenance of a limited number of priority roads costing an estimated US\$228 million a year. In East Africa, this would increase the proportion of paved roads in poor condition to 78%, in the year 2000, and 91% in West Africa. No unpaved roads would remain in good condition. This is clearly not an acceptable scenario.
- (2) Fully maintain those roads now in good condition and apply minimum maintenance standards to the remainder of the network. This would cost US\$409 million a year. By the year 2000, this would bring 50% of the East African – and 46 percent of West African road networks to at least fair condition.
- (3) Fully maintaining good roads and restoring failing roads. This would cost US\$680 million a year through the year 2000.
- (4) Restore the entire network to good condition by the year 2000. This would cost an estimated US\$1.8 billion a year, and is clearly an unaffordable scenario.

Each country must choose its own path to adequate road maintenance, based on its priorities, the extent of its problems, and its available resources. In most cases this will involve making a difficult initial choice as to which roads are economically worthy of maintenance and rehabilitation - a process of triage that recognizes that the only practical choices for many countries may be to maintain and retain only a core network of essential roads.

Applying this standard across the region suggests that its network of economic roads could be maintained, including necessary rehabilitation, for approximately US\$ 1.15 billion a year. This represents 0.8 percent of regional GNP, an amount not at all inconsistent - if the imbalance between maintenance and new building is redressed - with present estimated expenditures of US\$ 1.54 billion a year (1.1 percent of GNP). The implications of these analyses are that, far from funds shortage being the cause of poor road maintenance, it is mainly how and for what purposes available funds are used. The choice boils down to giving maintenance and rehabilitation first and full allocation of the available road funds, and then ensuring that those funds are efficiently and effectively applied.

It should be borne in mind, however, what such choices entail. The proportion of roads resources devoted to new construction will have to be greatly reduced, usually to 20 percent or less of total expenditures. A significant number of roads will have to be put on an absolutely minimal maintenance regime, or abandoned entirely. Institutional changes, many of them difficult and some requiring significant investment, will have to be undertaken. Basic decisions on such issues as the relative roles of the public and private sectors and the uses of labor and equipment intensive methods will have to be taken.

THE POLICY AGENDA

The first issue to be addressed in the Seminars is a **national commitment** to maintain a serviceable roads system. A critical requirement is a broader financing and budgeting perspective that sees road building, maintenance, and rehabilitation as a unified process with a multi-year perspective. This perspective recognizes road users as an important constituency who would rather pay fair charges to use good roads than the much higher vehicle operation and time costs resulting from roads in poor condition. It is a perspective that recognizes it is not enough to allocate funds for roads; that a real commitment includes dependable flow of funds to allow roads departments to effectively plan and implement their programs.

A second issue is **accountability**. In the absence of public pressure and lacking a clear understanding of the seriousness of the problem, few governments have given road maintenance a high priority in their budgets. The urgency of the situation has not always been fully appreciated by all external aid agencies, some having been readier to provide funds for new construction than for maintenance and restoration. New construction has sharp political visibility, maintenance little glamour. Inadequate maintenance in developing countries has various causes, but institutional weakness is at the heart of the maintenance problem.

The goals of roads departments must be set in terms of tangible physical performance. Planning, programming, and budgeting should focus on improving roads in terms of precisely defined and rigorously monitored physical conditions. This can only be achieved if there is in place an information system that tells planners both the state of the roads system and the results of previous maintenance outlays.

Accountability should also be turned outward towards the road users who are most immediately and directly affected by road conditions. It is the users, rather than road maintenance organizations themselves, who bear the immediate costs of poor roads. There is a vast public constituency in Africa for good roads; it should be encouraged to organize as a monitor of national road systems and an advocate for their improvement.

The third major issue is the need to adapt, improve, and reform institutions so they have both the mechanisms and the necessary incentives to increase their efficiency. The staff and managers of those institutions will need new skills to carry out these tasks; development of human resources must go hand-in-hand with the development of sector institutions.

The problem of institutional efficiency applies to all countries of the region. There is little point in increasing funds if they are not used efficiently. Planning for road maintenance, which includes budget estimation and preparation, can be strengthened by Maintenance Management systems like the ones in use in Malawi, Niger and Zimbabwe (and more recently, in Kenya). These three issues served as the backdrop to discussions in the Seminars.

AGENDA FOR THE SEMINARS

The problems and factors that affect or impact on road maintenance and rehabilitation are wide ranging and could not be all addressed in a single seminar. Accordingly, the preparations for the seminars focussed on identifying the key driving issues under three more general headings of:

- ◆ Planning, Financing and Budgeting;
- ◆ Operations and Management; and,
- ◆ Institutional Reform and Human Resources Development.

PLANNING, FINANCING AND BUDGETING

Under this heading, three key concerns were identified as areas of concentration for the seminar. They are:

- i) developing a unified framework for planning and programming public road expenditures over the entire network, whether recurrent, capital, or aid financed;
- ii) funding and budgeting procedures that ensure that funds are available as and when required, and that they are flexible to respond to changing circumstances; and,
- iii) planning and programming methods that foster accountability, in particular by programming maintenance based on road conditions and measurable physical outputs.

Operations and Management

The determinants of efficient operations are numerous but the key issues identified for the seminar agenda were:

- i) increasing accountability by improving information and management systems so maintenance managers can effectively plan and track performance; and, in addition, by separating planning and monitoring functions from works execution;
- ii) downsizing mechanical equipment fleets to levels that can be efficiently maintained and operated;
- iii) spinning off management burdens through increased use of contractors; and
- iv) increasing the use of labor based approaches to road maintenance and rehabilitation activities.

Institutional reform and human resources development

The issues and factors that impinge on this topic are also numerous and there are implications that overlap from many of the factors that affect the other two topics. However, for purposes of the seminars, they were summed up under two main headings:

- i) institutional reform to increase the efficiency of road maintenance and rehabilitation; and,
- ii) better management of human resources through motivation, adequate incentives, and efforts to develop a stronger and more competent workforce.

These issues, as presented to the seminars, were acknowledged by the participants as the key driving issues and formed the basis of the seminar discussions. The next Chapter summarizes the main messages and information presented to the participants and also the outcomes of the discussions under headings related to each of these issues.

CHAPTER 3

Policy Reform: Issues and Options

As noted in the previous chapter, three main areas emerge as critical for policy-makers to focus on in order to redress the deteriorating condition of the region's roads networks: Planning, Financing and Budgeting; Management of Operations, and Institutional Reform and Human Resource Development. Thus, the seminars were structured around these themes.

This chapter reports on the conduct of the seminars. To make the reporting clearer and more focused, in this chapter the 3 broad topics mentioned above are desegregated into individual issues (see box). For each of the issues, a presentation of the issue and of the policy options is introduced first, followed by the outcome of the discussions.

THE KEY MAINTENANCE ISSUES

SSATP's analysis isolated a number of key maintenance issues within three broad topic groupings:

PLANNING, FINANCING AND BUDGETING

Network-based Planning and Programming

Collecting and Disbursing Funds

Performance Budgeting

OPERATIONS AND MANAGEMENT

Reducing Force Account Work and Increasing Contracting

Increasing Use of Labor-based Operations

Reducing Publicly Owned Equipment Fleets

INSTITUTIONAL REFORM AND HUMAN DEVELOPMENT

Institutional Reform

Improving Staff Motivation and Utilization

While the seminars were structured around the substantive issues presented under the three topics, two recurring themes pervaded the discussions and were clearly signalled as underlying each of the issue areas:

- a lack of awareness and understanding of the extent of the problem with the deteriorating road condition and the management of the system, itself a root cause for inadequate national commitment to tackle the situation;
- the need for increased accountability, based on transparent actions and information, to allow policy changes and operational choices to be made with full knowledge of the available options and their full costs, and to allow external constituencies and internal management of road maintenance to assess the goals and targets set and the efficiency in fulfilling them.

The seminars' discussions clearly signalled that because the problems with road maintenance are, above all, political and institutional, policy reforms in the substantive issues identified could only be undertaken successfully if awareness and accountability were raised significantly. These, were, therefore, preconditions to policy reform. To achieve this, given that road maintenance normally lacks strong, cohesive constituencies with political clout, policy-makers needed to take the strong initiatives and pursue sustained efforts in this regard. The views of seminar participants on these pervading issues are described below.

PRECONDITIONS TO POLICY REFORM

Two recurring themes pervaded participant discussions:

The need to raise awareness and understanding, and,

The need to increase accountability.

PARTICIPANTS' VIEWS ON PRECONDITIONS TO POLICY REFORM

The Need to Raise Awareness and Understanding

The participants at the Seminars concluded that there is a growing understanding that, above all else, a real commitment to road maintenance at the highest levels of government is a key factor in overcoming the various constraints and obstructions to addressing the road deterioration situation through policy changes and institutional development. They also agreed that any efforts in changing policies should involve the political leadership in relevant ministries in all phases from the inception to implementation. The participants also found a general consensus on the lack of adequate awareness and understanding, by some policy makers, of the importance of road maintenance from technical, economic and financial perspectives. They felt that awareness campaigns needed to be mounted for higher officials of involved ministries and the public. Annual reporting, using media and newspapers are necessary for publicity.

They agreed that the first important steps had been taken through these seminars. However, many country teams promised, or foreshadowed, more specific follow-up actions when they returned to their countries. Expressions of intended actions included serious consideration of an increase of funds for road maintenance; and preparation of long term maintenance programs to attract donor support.

They identified as one of the more critical tasks of road authorities the creation of a raised level of awareness and commitment to the priority of road maintenance for ministers, not only of their own ministry but also those of Finance and Planning. They should also promote public awareness campaigns using media, NGO's, road users associations and other means.

Most participants in the RMI seminars believed they could create awareness of the importance of road maintenance and secure a national commitment to policy reform within six months to a year. They felt expressions of commitment to - and support for - the policy reform process from the international agencies could be most helpful in building national commitment. Some countries felt commitment could be achieved even more quickly, as their governments were already fully aware of the importance of road maintenance; and a few said a national commitment to reform was already in place.

The Need to Increase Accountability

The participants felt institutional responsibilities for road maintenance and rehabilitation should be tied specifically to the tasks involved; establishing clear and separate processes, procedures, and bureaucratic frameworks to prepare and implement plans and programs is particularly important. In many countries, accountability was hampered because oversight and monitoring functions are carried out by the same institutional arms that are at the same time responsible for planning, operations and supervision. This situation could only be improved through institutional reform.

They also concluded that institutional environments must be created that will increase the accountability of road agencies both to road users and the government agencies that supervise them. Common interest groups, including road users, must be better organized into associations that expect certain service levels and can bring pressures to bear to get them.

Governments must also monitor and expect results. There must be accountability for all participants in road maintenance projects, be they road authorities, external aid agencies, or technical assistance providers.

The participants agreed that accountability requires the ability to measure and compare performance with approved plans or established standards. This ability, in turn, hinges on having factual data and information built on a system of monitoring and reporting on outputs and physical results against predefined objectives and allocated resources. Participants noted that a lack of data collection systems on road maintenance performance was a serious impediment to adequate accountability, and recommended improving information systems so maintenance managers can effectively plan and track performance.

Participants also noted that works ministries and related agencies should be concerned with monitoring the efficiency of resource use as much as the level of available resources. The consensus

was that performance budgeting is desirable for the purposes of accountability and is also likely to attract higher levels of funding for maintenance. Consequently countries should endeavor to set up systems of performance budgeting.

Participants also identified several actions basic to increasing accountability within the highway maintenance agency:

- ◆ Better and more precise definition and quantification of objectives;
- ◆ Better programming of operations;
- ◆ Establishment of control units;
- ◆ Creation of management information systems adequate to the size of the network and to the resources available to enable better monitoring and control of activities;
- ◆ Effective delegation of responsibility, administrative and financial decentralization.

PLANNING, FINANCING, AND BUDGETING

Network-Based Planning and Programming

Where resources are scarce, as in Sub-Saharan Africa, it is essential to ensure that public roads expenditures bring at least as great a benefit to a country as alternative uses of resources. Quantitative comparison of benefits between sectors is not easy, and the allocation between, for example, transport and health or education is a matter of public policy or general development strategy. It should be clear nevertheless, that neglect of road maintenance has serious medium- and long-term consequences that can adversely affect economic and social progress.

The trade-offs between road expenditure options can, however, be quantified to enable countries to compare and choose between new road construction, restoring failed roads, and maintaining and preserving serviceable roads. The goal should be to minimize total national transport costs over time. Thus the costs of investments in new construction, maintenance, and rehabilitation plus the costs in vehicle wear and tear, to users of bad roads, must all be weighed in planning a roads program.

For many countries, lack of reliable data on road conditions, traffic levels, current costs and outputs has impeded the analysis needed to compare expenditure alternatives. Without these data, planning is reduced to guesswork; scarce resources of materials, equipment and skilled labor are likely to be wasted, and credibility is unlikely to last more than a single budget cycle.

Setting out and comparing expenditure options is the first step toward producing a credible roads program that can win the commitment of governments, transport customers, and external aid agencies. This requires an assessment of all roads programs - capital and current, locally funded or aid-financed - under a unified programming and budgeting framework. In almost all countries such

exercises will demonstrate that road maintenance and reconstruction have economic returns several times that of almost all new construction. Roads departments or governments may wish, on occasion, to choose an investment whose long term cost is higher than its alternatives. The most important thing, however, is that this choice be made consciously, in full realization of the costs, and foregone benefits, it implies.

Road expenditure options cannot be competently assessed unless a management information system regularly provides the roads authority the information needed for decision-making. Development of good management systems and data collection must proceed together. Reliable information on the future condition of the network and the costs of rehabilitation and higher road user costs if maintenance is not done permits the roads manager to view the system as a whole and formulate a defensible and balanced program of road construction, maintenance, and rehabilitation.

One of the most useful features of such systems is that if funds are insufficient to finance an adequate level of maintenance, it is possible to draw up a revised program that limits road deterioration and user cost increases to a minimum within the funds available. At the same time, total system costs in terms of future road rehabilitation and increased user costs can be estimated, so that the government is made aware of the consequences of underfunding maintenance.

An important element in setting the framework for unified road planning is to re-examine the existing classification between recurrent and capital expenditures. In some countries, works such as overlays, resurfacing and rehabilitation are classified as capital investments; under a rational economic approach, all types of road maintenance and improvement (e.g., strengthening, resealing, regravelling, rehabilitation, spot improvement and repairs), except purely routine activities, should be considered as capital expenditures by finance and planning ministries - as well as external financiers - and should not be classified as recurrent expenditures as in the past.

Outcome of Discussions

All participants recognized the importance of the road sector to their economic development, particularly since most of their trade is carried by road. They were also aware that the general economic decline, in part due to the falling export prices, reduces governments' ability to increase financing for the sector. The critical need to maintain road systems is well known, as is the need to allocate more resources to maintenance. The participants acknowledged that emphasis had long been given to construction of new roads to the detriment of maintenance, but said this situation seemed to be changing, and that several countries had committed themselves to apply a higher proportion of roads resources to maintenance.

But even in Senegal, which was devoting 80 percent of roads funds to maintenance, available finance is spread thinly among all highways, and as a result few, if any of the roads, receive the attention they need. The participants felt it would be better for highway agencies to concentrate efforts on only a few major roads; not only would this be a more efficient use of scarce resources, but the better quality of work that would result would also demonstrate the agencies' capabilities for doing things right if more funding became available.

They acknowledged that a lack of efficient planning, programming, and budgeting frameworks made it even more difficult to rationally address resource shortages. This was compounded by frequent lack of coordination among government agencies concerned with roads. The situation is often

made even more difficult by preallocation of resources to and within the road sector without application of objective economic criteria, such as when road budgets are arbitrarily split between capital and recurrent expenditure categories.

The participants, thus, felt it imperative that decisions made at the highest levels on the allocation of the resources available for the road sector give priority to maintenance. This requires unifying planning and decision making to facilitate the choice of priorities and the study and selection of options. This would ensure all road-related decisions are made in a consistent and homogeneous context. As a part in this process, rolling, multi-year highway investment, reconstruction and maintenance programs should be prepared yearly.

They felt governments should aim to establish structures to allocate resources and monitor their use that include all key agencies involved in the funding for the road sector - in most cases these would be the finance, planning, and public works ministries. The lack of reliable data on road conditions, traffic, and maintenance costs was considered an important factor hampering road planning, and it was recognized that an effort should be made to set up data banks for planners and decision-makers.

Collecting and Disbursing Funds

It is generally accepted that the main road network should be paid for by road users, with government collecting revenues through road user taxes and passing them on to the roads organization. The roads organization has to be sure of receiving those funds dependably and on an agreed schedule that takes into account cycles of road building and maintenance activities. If funds are allocated but not released on time, work programs are disrupted, and both efficiency and the roads network suffer. If, for some reason, disbursements cannot be made on the agreed schedule, expenditures should be redistributed to priority programmed work activities according to pre-established criteria.

If user taxes are insufficient to cover the costs of road construction and maintenance they must be supplemented from either general taxation or external financing. If user taxes exceed total road costs, the surplus goes to general revenue to help pay for other government activities. In many countries, road users taxes are seen as a practical means of collecting general revenue. There is nothing intrinsically wrong in this, so long as user charge levels are clearly identified and allocated for roads; otherwise, the diversion will lead to underfunding of the roads sector or subsidies to competing modes - such as railways - that distort relative prices and lead to inefficiency in the transport sector.

User taxes should also be set so that, insofar as possible, different vehicle types pay according to the road damage costs they impose on the system. This prevents subsidies within the sector that could otherwise skew fleet composition toward vehicles that cause more damage than they pay for.

User taxes should cover at least the variable costs of road maintenance. Most countries use fuel taxes to collect the bulk of these revenues, but they should usually be supplemented with taxes more closely related to the damage different vehicles impose on roadways. These include taxes on vehicles, spare parts, and tires, as well as vehicle license and registration fees, particularly for heavier vehicles and with heavier axle loads that impose greater damage on roads than is recovered through fuel and vehicle taxes. However, before deciding on the introduction of new taxes, not only cost recovery criteria, but also the cost of tax collection (including evasion and leakages) should be considered.

Maintaining a road network requires that resource flows be regular and dependable as well as adequate in amount. The expansion of Sub-Saharan road networks, often supported by external financing, has not taken sufficient account of this. Improvements in collecting, allocating, and using funds are obvious measures, but even then regular funds for road maintenance may not be assured because of programming inefficiencies and bureaucratic red tape.

Earmarking road user taxes, such as fuel taxes and/or tolls, with payments made directly to the account of the roads organization rather than through the treasury or finance ministry, is one way of increasing dependability. Alternatively, a special roads fund may be created into which some or all road user charges/tolls are placed. These mechanisms give the roads organization long-term assurance that funds will be reliably available, so that a multi-year road rehabilitation and maintenance program can be planned, if necessary with assistance from lending agencies, with the knowledge that funding is secure. If such a fund is put in place, it should be managed with rigorous planning, programming, and monitoring procedures, to ensure efficient allocation of resources and accountability for the moneys used.

If sufficient resources to maintain the national road network cannot be mobilized, a country may have only two options - each of them only a poor second best: continued deterioration of its entire road system, or a reduction of its network to a size that is affordable. To avoid deterioration of the whole network, when funding is uncertain in spite of all efforts, the best remaining choice may be to plan a "core" maintenance program that preserves essential roads as well as possible under the given economic conditions.

Outcome of Discussions

The need to mobilize additional resources, both domestic and external, to finance road maintenance is a priority shared by practically all governments in the region. The participants recognized that one important task of the proposed unified planning structure would be to insure that external funds allocated to roads, particularly those coming from bilateral sources - now usually channelled through planning ministries - are increasingly assigned to road maintenance. For new construction, this funding should cover maintenance - as well as investment - costs for a number of years. Until such unified structure is put in place, ministries of works should take the lead in coordinating, and if possible, integrating budgets for road works in various government agencies.

Most participants saw new or increased taxes, particularly on fuel, as the most likely source of additional domestic resources. In some countries, however, governments feel that tax levels are already too high and there is no margin for further increases. In some countries with heavily trafficked roads, tolls may be a viable and fair way to recover costs from users, although revenue "leakages" from toll collection, high administrative costs and possible suppression of demand were acknowledged as a potential problems.

Axle-load taxes should be considered to recover from heavy trucks the costs they impose on the roads, and deter the use of high axle-load vehicles. The composition and use of national vehicle fleets should be analyzed before imposing such taxes. As a first stage, participants urged external financiers to assist in setting up weighing stations to monitor and control truck overloading.

Many participants - particularly those representing landlocked and transit countries - felt that collecting user fees from international traffic was a serious problem. One transit country said international truckers using its roads pay no user's taxes whatsoever, since they buy gasoline in a neighboring country where it is cheaper. The participants suggested that regional organizations interested in international trade, such as the Union Douanière des États de l'Afrique Centrale (UDEAC), be asked to study this problem.

In most countries, roads funds are the only effective way to channel back to road maintenance the revenues collected from user charges and guarantee reliable funding at an adequate level. Although many francophone governments follow the French administrative system's unified treasury concept - which impedes earmarking taxes for special uses - some countries have established roads funds that have helped improve the financing problem; others have agreed to set up such funds or are studying their feasibility and advantages.

Participants said that another impediment to earmarked roads funds was a frequent discrepancy of views between World Bank and International Monetary Fund missions, with the latter generally opposing the earmarking of funds; a reconciliation of views between the two institutions was suggested.

While roads funds with earmarked taxes were generally supported, in some countries - notably Rwanda - roads ministries were satisfied with the level and reliability of road maintenance financing from the national budget; in such cases transferring budget funds to a commercial bank account managed by the ministry can expedite resource availability and reliability.

Foreign exchange shortages were pointed out as an acute financing problem - particularly in many anglophone countries - as about half of road maintenance costs are in hard currency. Establishment of revolving funds in foreign exchange, with the assistance of donors, would be an effective way for dealing with this problem; the precedent already exists in many countries where ports are authorized to set up revolving funds in foreign exchange to pay for their expenses in foreign currency.

The participants suggested that multilateral and bilateral donors should adapt their policies to give preference, and clearly show their commitment, to the financing of maintenance as against more glamorous new-construction projects. In addition, they stressed the need for fungibility of externally provided funds to permit purchase of consumables such as fuel, spares and materials, as the World Bank currently allows.

Performance Budgeting

Improvements in road maintenance programming and budgeting can bring large benefits to road users and cost savings to government. One of the benefits of a planning, programming and budgeting framework based on competent and up-to-date data is that unit costs and outputs become transparent, and there is an immediate link between the input resources such as materials, equipment and labor and the physical outputs of road maintenance operations.

This framework allows planning and programming to be set on the basis of physical work outputs so that performance can be monitored. Thus, future resource needs can be forecast with

greater accuracy, and areas in which efficiency increases are needed can be brought to the attention of the road authorities.

Three steps need to be taken to unify programming and budgeting. These are the establishment of quantifiable objectives based on output-based programming; setting up a suitable quality control operation, probably involving a technical audit to run in parallel with the established financial audit; and implementing institutional changes to establish an entity responsible for the audit.

Besides allowing the establishment of objectives to guide agencies in their operations, output based programming also provides a basis for monitoring and auditing performance.

Independent financial audits, operating free of ministerial control and responsible only to the legislature or chief executive, are accepted parts of most governments. Financial audits, however, normally check only that funds have been spent for the purposes intended as specified in the budget. There is no check that value has been obtained for the funds expended. The concept of productivity and quality of output is not part of the financial audit's brief unless there are glaring faults.

A technical audit, on the other hand, is concerned that the design of works is correct, that the materials used were appropriate, and that work was done according to accepted standards. Obviously, it is convenient and desirable that financial and technical audits are integrated; a technical audit should also be free of administrative control. This means that it should have its own facilities, or at least its own independent staff who may use the roads authority's laboratories and equipment. Although the roads organization may take the lead in setting up a technical audit, the agreement of other ministries and legislature will be needed.

For a technical audit to be effective, technical specifications are necessary, just as financial audit requires government financial regulations. It is desirable for many reasons, apart from audit, to work towards common specifications for all government work. As the roads organization is usually the most active construction ministry, it is appropriate for it to take the lead in suggesting uniform contracts and specifications.

Outcome of Discussions

Participants noted that ministries of works and related agencies should be as concerned with - and closely monitor - efficient use of resources as they are with resource availability. They agreed that performance budgeting could increase both accountability and the likelihood of attracting higher levels of funding for maintenance from both governments and outside funding sources, and that countries should endeavor to set up a system of performance budgeting.

A better founded budgetary process can also help gather support for road works and the agencies that manage them, which may be lacking due to the inability of the agencies to project an image of effective planning and good use of resources. Participants suggested that roads agencies use performance budgeting to demonstrate efficiency by introducing annual maintenance reports and preparing sound multi-year highway investment, reconstruction and maintenance programs

It was also suggested that performance budgeting could help roads agencies better make their case to funding ministries, such as planning and finance. Making more transparent the impact of arbitrary cuts and identifying their implications under the various elements: labor, equipment, materials and contractual services, performance budgeting gives a good basis for assessing the economic and political drawbacks of cutting maintenance funds.

They also felt setting priorities by unified planning would allow external aid agencies to provide funds for general budgetary support for roads, rather than discrete projects. Where project financing was required, unified planning would provide a framework of priorities for both national governments and external financial organizations.

OPERATIONS AND MANAGEMENT

The inefficiency of road maintenance systems and poor utilization of personnel and equipment have prevented investments in road maintenance from being fully effective in many Sub-Saharan African countries. Effective and efficient management of operations is crucial to addressing the road deterioration problem by salvaging roads that have deteriorated severely and protecting newer routes from a similar fate. More effective management that produces demonstrable improvements in both the condition of roads and the efficient use of resources is also a key to creating the political commitment necessary to increase attention to - and funding for - maintenance. It can also be a powerful tool for saving money, particularly foreign exchange. Three issues have been identified as most critical to the improvement of operational efficiency; reducing force account work and increasing contracting; increasing the use of labor based operations; and reducing publicly owned equipment fleets.

Reducing Force Account Work and Increasing Contracting

Almost exclusive reliance on public sector force account operations for road maintenance has led in many countries to over-staffing, lack of incentives for capable staff, rigid controls and rules that inhibit staff initiatives in adopting cost effective management solutions. Experience has shown that productivity and efficiency of maintenance operations increases when maintenance activities are contracted out. Market and competitive forces tend to act more strongly on private firms - especially small ones - than on public sector agencies. Their objectives are usually simple; survival and profit and are not clouded by political considerations, and their relatively small size increases their flexibility. These factors motivate them strongly to use staff efficiently and maximize the use of labor rather than capital equipment to conserve resources. Where governments have trouble to effectively and efficiently manage and implement their road maintenance programs, they might do well to explore the use of contractors for some parts of their maintenance activities.

Domestic contracting and construction industries are often underdeveloped and would require assistance and encouragement to strengthen the industry. However, most governments lack positive programs to encourage the development and use of indigenous small contractors through some forms of preferential treatment. For example, local contractors frequently encounter problems in obtaining loans for their development. Also, at times, governments and external aid agencies often discourage or discriminate against the growth and development of indigenous small contractors. Policies that discriminate against local contractors must be changed, or replaced by direct, explicit, affirmative action policies designed to promote their use. Notwithstanding the need for such affirmative action, governments must be cautious in giving preferential treatment to local contractors lest this encourages and supports the development of an inefficient industry.

Several factors are key to the development of the industry. Stable markets and supportive policies are among the most important. If contracting firms know they can expect work to be regularly available they can invest in equipment and personnel training that will strengthen their capabilities. Governments should also consider offering training programs to private contractors to increase the skills pool. Another important factor is the need to simplify procurement and contract management procedures including contract documents and specifications whose complexities at present discourage firms from entering the market. Equally important is the need to improve the timeliness and reliability of payment procedures. Further, indigenous contractors should be given the same access to foreign exchange as foreign contractors. The entry of indigenous contractors to the industry and their use of modern technology should be promoted through the introduction of joint ventures with international firms.

The transition from force account to contract work has to be planned and phased over time, starting with major activities, such as resurfacing and resealing for which precedents are common, and eventually leading to routine maintenance. Experience in Ghana has shown that the development of local contractors requires serious commitment, and requires a long term view; in Ghana it took over a decade to develop indigenous contractors, with a lot of initial difficulties. The approach has to be top-down as well as bottom-up, as single-person contractors for basic routine maintenance using labor-based techniques have proven quite effective in Ghana. A combination of direct labor and contract work is therefore desirable, with the proportion of contract work increasing over time. A small labor force to meet emergencies may continue to be needed.

Where conditions exist for the full development of contractors, all maintenance works could be entrusted to them, and the role of the state would be limited to the planning, designing and supervising the works. This would have implications for the staffing and skills mix in the road agencies. For example, increasing the use of private firms will increase the contracting authority's supervision and quality control responsibilities. Many roads departments may lack the capacity for engineering, tendering and supervision of maintenance contract works needed to increase reliance on contractors and accordingly would need to pay attention to this in their staff recruitment and development programs.

Outcome of Discussions

While many participants agreed that the use of private contractors would enhance the implementation of major road maintenance, the issue remains controversial and at least one country expressed its preference for use of force account for all maintenance operations. However, the general consensus among the other countries was that certain maintenance operations that were generally done by force account at present should be progressively turned over to small and medium enterprises (SMEs). Such an approach would result in a mixed force account and contract system. There was general agreement that in such mixed systems, most routine maintenance, emergency works, and work in sensitive and remote areas should be assigned to force account, while contracting out resealing, overlays, regravelling, road marking, bridge repair, and routine system maintenance by lengthmen (single person contracts).

Governments accepted that in situations of labor shortages and huge backlogs of road maintenance, the increased use of contract maintenance could be a viable option. However, participants noted that some countries, particularly the smaller ones, had very limited private contracting sectors. Those countries could encourage the development of SMEs by providing facilities

such as credit, advances, equipment for leasing, and long-term contracts of three to five years to guarantee work stability. While they recognized the gains to be made by subcontracting from international firms, they noted that local firms often received only a very small share of profits in such arrangements.

In the area of availability of equipment, SMEs rarely have the capital to provide themselves with equipment when it is required. In some countries, lack of foreign exchange has been hampering their development. Leasing from other private companies usually does not exist or is too expensive. In several countries, this has partially been solved by government policies to lease its equipment, which allows a better utilization of existing equipment while at the same time reducing the need for capital by the SMEs. This is generally considered a good principle, but the State may need to retain some basic equipment for some tasks, at least until the firms are fully developed. Some countries argued that there were substantial risks if the state proceeded to reduce its equipment and personnel with the intention that SMEs would take over; if the take-over didn't happen, it would be more costly for the government to return to its original level of intervention in maintenance activities. In some countries, firms had been created and some were forced to close due to the lack of sufficient and steady work to keep all the enterprises running. In some cases, equipment owned by these companies was transferred to the government.

The participants agreed that special efforts are needed to develop domestic contractors and consultants. This has not proven easy, given the narrow base of skills and resources available. Domestic contractors should be nurtured through appropriate training, provision of finance, and packaging of works that do not stretch their limited capacity.

Increasing Use of Labor-Based Operations

Although road maintenance techniques and organizations in most regional countries have been geared to equipment intensive techniques derived from construction and maintenance practices in developed countries, constraints on resources and the availability of under-employed or unemployed labor often makes the adoption of labor-intensive maintenance techniques economic. Greater use of labor-based techniques can reduce costs and increase maintenance effectiveness. There is also much scope for adapting design standards to maintenance operations to take advantage of local capabilities and local materials, thus saving foreign exchange.

Where labor is available and can be motivated at daily wage rates of up to US\$4.00, contractor or community/village-based maintenance crews can provide effective low-cost road repair and maintenance. There is considerable political commitment to using local resources such as labor in most countries, but this needs to be translated into practical administrative and technical programs. Experience in several countries such as Kenya and Botswana where labor based approaches have been proven technically and economically, the development of this approach has required a long term commitment. In most cases, it is necessary to phase in such programs through pilot projects of two or more years.

The adoption of labor based approaches also requires other essential ingredients. Decentralizing the supervisory, administrative, contracting and payment authority required for increased use of labor-based techniques can often increase the efficiency of such operations. This should be accompanied by staff training and technical assistance until the necessary trained cadres are developed. Also standards

need to be set for labor-intensive road works including for tools, equipment and road materials. The availability of local materials - such as timber for bridge-building and natural laterites for pavements - can enable significant foreign exchange savings.

Outcome of Discussions

Several countries reported positive results in their experience with labor-based road construction and maintenance, particularly in areas with high agricultural potential such as cash crop farming areas. The systems, however, required an increase of effort in some areas such as much more preparation involving detailed inventories of roads and training of engineers and supervisors, but had significant benefits because they resulted in lower overhead costs and a halving of foreign exchange costs.

Participants reported that the success of labor based systems has depended on such factors as terrain, population density, and climate. Where these factors are favorable, labor based maintenance and (re)construction can be successfully applied as has been proven in the case of Kenya. The Kenya government is now planning to introduce labor based approaches for maintaining classified roads with higher traffic volumes than rural access roads, where the approach has been proven successful in the past. Administrative and procedural improvements are also critical to success. In Rwanda, an important element of the success of the program was the rapidity of payment for the service, generally done within 15 days. Kenya also found that prompt payments in cash, for task-, or piece-work, were key to the success of their program.

Participants reported that properly planned and prepared labor-based approaches to road maintenance have been proven to be economic, efficient, and technically adequate. They also concluded that, where the necessary preconditions, of labor cost and availability and other factors, are favorable, this approach should be used. Under conditions of extreme resource constraints it may be the only feasible solution to address the deteriorating road condition. Apart from perhaps being the only feasible approach, there were also considerable economic and social advantages of using labor intensive methods, including savings in foreign exchange.

Several countries noted that government agencies sometimes had negative attitudes towards labor-intensive approaches. These attitudes are largely based on inadequate information or insufficient knowledge of the potential advantages, and could be helped by seminars such as those conducted under the Roads Maintenance Initiative. In fact, during one of these seminars, the systematic detailed analysis and action planning of policy options and strategies caused the reversal of previously held negative opinions of labor based approaches in at least one policy maker's mind. In some cases, it would be necessary to set up an institutional framework aimed at allowing and encouraging the use of rural or urban communal groups in the execution of tasks appropriate for labor-intensive technology.

There was general agreement that local resources - human, equipment, and materials - were underutilized in the region. Measures should be taken to tackle this problem, including increasing use of local consultants and consulting firms in preparing and supervising road projects and improving regional information exchange on use of local materials. External financiers were asked to assist in this process, notably by promoting the use of local consulting firms, either independently or in association with well-known international firms.

Reducing Publicly Owned Equipment Fleets

Most road maintenance operations in Sub-Saharan Africa are run by large establishments operating by force account with geographically widespread operations that rely heavily on equipment. Maintenance planning and execution often overlap, and information systems are not adequate for management to track the quantity and quality of equipment performance or assess and prioritize needs. Maintenance managers have also been overburdened by the need to keep up huge - and often incompatible - equipment fleets and supervise large and far-flung work forces. Improving information flows and streamlining management tasks are perhaps the two key factors in improving management efficiency, including efficiency of managing equipment.

Roads authorities in many Sub-Saharan African countries are trying - and often failing - to keep up equipment and vehicle fleets that are too large and too diverse to be adequately maintained. Availability and utilization is very low: in some countries, only about 20% of national road maintenance fleets is in working condition, and the plant that is available often operates at 60% or less of its normal work-rate. New equipment rapidly declines because of inadequate maintenance, shortages of spares, and inadequate operator training. Most existing fleets cannot be run or serviced economically in their present condition. The result are fleets with unnecessarily high operating costs due to frequent breakdowns; this represents a large wasted investment, much of which is in foreign exchange.

Most countries would benefit by reducing and consolidating their equipment fleets to a size and composition they can manage efficiently within the capabilities of staff, funding and support services. A smaller fleet with higher availability and utilization rates would save money while raising productivity and reducing unit costs and management overhead. The problems associated with owning, operating, maintaining and managing equipment can be eased by giving more the autonomy to the agency responsible for equipment management. Setting up a centralized unit to purchase spares can also increase efficiency and reduce costs. Equipment maintenance itself can often be consolidated by creating equipment pools as separate single-purpose management units from which the roads authority can "hire" plant. Such government plant pools should operate on commercial lines with complete autonomy and should set standardization as a major objective. Beyond some point, consolidation and rationalization may make fleets too small to carry out all the work needed on the roads.

Careful analysis - again based on good information and costing data - is needed to assess whether some equipment based maintenance tasks can be cost-effectively contracted out in line with the principles discussed earlier. Reducing the size of the equipment pool by using private contractors to carry out maintenance work - or even contracting out equipment maintenance - would reduce the equipment burden. In countries in which the private sector is not capable of entirely taking over such tasks, this can have an added advantage of creating a business environment in which the private and public sector compete to foster efficiency.

Private contractors that use and maintain their own fleets can be used for most road maintenance tasks while a "core" fleet of equipment carries out essential works best managed by the roads organization. However, private firms may require strengthening to play an expanded role in contracting and equipment maintenance, and governments may well find it economic to provide training to build up their capability.

Equipment management problems are aggravated by public sector financial controls and procurement regulations that hinder force account operations. Other rules and regulations often prevent equipment managers from contracting maintenance and other jobs to private agencies. Information systems are often weak and understate the real costs of equipment ownership. Where central mechanical departments are managed separately from highway maintenance operations, poor coordination - again, largely an information problem - often causes delays that further reduce plant availability.

For most countries, foreign aid has been the major source of equipment and spares. That aid has sometimes also introduced unintended problems. Donors have sometimes provided more equipment than countries can efficiently manage; tied aid and international tender procedures have prevented standardization of equipment so that large and diverse spare parts stocks have to be created and coordinated, while technical personnel needs additional training in operating and repairing equipment.

Outcome of Discussions

All countries expressed their support for equipment standardization but said it was sometimes difficult to achieve. Given the problems of achieving standardization different approaches are practiced at present. One country tries to restrict the number of makes of equipment imported into the country. In another the highway agency tries to standardize regionally by deploying only one type of equipment in a given region of the country.

Government policies on procurement should include standardization of fleets. However, even with such policies in place, sometimes donor rules that tie procurement contribute to the problem. Preparing multi-year highway programs facilitates donor coordination and permits those donors with less rigid procurement rules to finance the purchase of standardized equipment. This would enable governments to segregate procurement packages to enable untied donor funds to be applied towards achieving their equipment standardization objectives. When approaching aid donors for support they should present concrete programmes of equipment renewal showing the advantages of standardization.

Participants suggested that better equipment utilization could be achieved through cooperation among neighboring countries, so that those with temporarily surplus demand could have access to the equipment of countries with temporarily surplus supplies. This would involve a new degree of coordination and cooperation and it would take considerable time and effort to design and put in place control and logistics arrangements and a costing, pricing and accounting system.

INSTITUTIONAL REFORM AND HUMAN RESOURCES DEVELOPMENT

Institutional Reform

After three decades of investment in institutional and human resources development, Sub-Saharan African road maintenance institutions are not performing efficiently and effectively and still need large amounts of technical assistance. It has become apparent that effective institutional performance is not so much a question of amassing additional financial, human and technical resources as of using available resources more efficiently and effectively. The major institutional constraints facing

most Sub-Saharan roads agencies are a lack of accountability and autonomy and of efficient internal operating and management systems.

Most road authorities in Sub-Saharan Africa inherited institutional structures, procedures and systems from pre-independence days, when the objectives and priorities for road maintenance and construction were driven by criteria and conditions substantially different from those relevant and applicable today. There is an urgent need to review and revise these institutions to make them more directly relevant to current circumstances. In the face of burgeoning road maintenance and rehabilitation problems, and the limited resources available to the roads sector, there is a need to unify the planning processes for construction and maintenance, and to remove any unnecessary waste and inefficiency arising from the competition between the various levels of government with responsibilities for roads.

As referred to above, most SSA road agencies continue to rely on force account operations for their road maintenance work. Under current circumstances of almost intractable constraints on personnel reward and incentive systems, the delivery of parts of the road maintenance program through private contractors should be considered. Contractors have built-in incentives to perform well so they will be paid and receive more work. Force account does not have these incentives and the quality of performance has few practical consequences in terms of rewards or sanctions. Additionally, road agencies operating by force account are hampered by having to contend with major constraints such as civil service regulations, procurement regulations, bureaucratic impediments, overstaffing, and lack of funds. The use of contractors also contributes to the objective of separating the execution function from the planning and audit functions.

Among the several bureaucratic systems and procedures that reduce the efficiency of road maintenance and rehabilitation are anachronistic and inappropriate local procurement procedures that cause inordinate delays for minor purchases of key supplies and materials and impose tendering and contract conditions that impede the development of effective and efficient local contracting industries.

Outcome of Discussions

Participants acknowledged that reforms will be needed. At the same time, they insist that institutional reforms should be tailored to the specific needs of each country, and that the reform process leading to the recommended framework should ideally be in the context of a process of structural adjustment including measures to minimize the potential negative side-effects of reforms. In general, institutional changes should aim at a progressive reduction of the role of the state in certain activities and to leave in place a more efficient, technically qualified government organization.

On the issue of the differences between countries, participants felt the needs and scope of institutional reform can vary widely from country to country; in some, small reforms aimed at eliminating clearly identified bottlenecks are all that is required. In others, the main aims of reform would be to set up autonomous agencies with road funds and reduce the role of the State while making increasing use of the contractors and individuals. Long tendering procedures, particularly for local procurement, should be reviewed with the objective of streamlining them, and plant and vehicle procurement under donor funding should include provision for policies for standardization of fleets.

There was wide consensus that the concept of separate and autonomous roads authorities was worth exploring to ensure strong focus on the maintenance and rehabilitation needs of national road

systems. This could be necessary at least for the coming decade or so while the road systems pass through a crisis period. A number of organizational options ranging from public works departments to autonomous highway authorities were reviewed, and consensus reached that the best structure involved separating highway responsibilities from other public works functions, preferably by creating a separate highway authority.

Giving road agencies more freedom to act - and more responsibility for their actions - by making them semi-autonomous can also increase institutional performance by freeing agencies from many of the constraints inherent in the public sector. Agreements between ministries of public works and roads departments that spell out what is to be achieved and by what means can be the basis for such arrangements. A semi-autonomous highway agency operating with a road fund outside the main constraints of the civil service has additional opportunities to improve performance. Increased autonomy makes it easier for the agency to manage its human resources, financing and procurement independently and more effectively.

Discussions on the issue of institutional reform ranged widely over many factors that relate to the way institutions are organized and operate. The participants concluded that measures aimed at improving the institutional framework should include the following elements among others:

- ◆ Definition of a policy for road maintenance adapted to local conditions;
- ◆ Setting up organizational structure and procedures designed to make the services more accountable;
- ◆ Setting up interministerial commissions responsible for the approval and control of road maintenance programs;
- ◆ Improving disbursement procedures;
- ◆ Making the management of road maintenance activities more flexible and autonomous, and,
- ◆ Decentralizing and simplifying bidding and supply procedures, especially for the purchases of materials and small equipment.

Improving Staff Motivation and Utilization

Sub-Saharan Africa's education and training systems have produced many good highway engineers, and technicians, although there is still a shortfall of accountants and competent managers in many roads agencies. Institutional performance remains inadequate, however, because these personnel have not been effectively utilized, developed and retained. The initial focus after independence, in many countries was rightly on training. Now it is becoming more apparent that the human resource problem is not only one of education and training but one of utilization, motivation, development, and retention.

A variety of factors cause ineffective personnel utilization, development and retention, including the authority, rules and regulations of the civil service and resulting policies related to conditions of employment and pay within public sector agencies; the lack of overall external

institutional accountability and internal staff accountability; and the level of the road agency's organizational efficiency, structural complexity and general ability to attract, retain, train and motivate technical and managerial staff. These constraints to personnel utilization and development can result in serious problems: lack of staff accountability; difficulties in retaining competent staff; loss of good staff to the private sector; lack of on-the-job development and motivation; lack of application of previously learned skills, stagnation and waste of expensive education and training; and generally low levels of manpower productivity.

When free to operate semi-autonomously road agencies can hire only those people actually required - and avoid becoming financially overburdened with unneeded staff. Cutting unnecessary staff can free money for operations, supplies and equipment and can improve effectiveness and efficiency in the use of remaining staff. This enhances the motivation and retention of competent people. Staff can be better managed and utilized because funds become available to secure the equipment and supplies necessary for them to do their jobs - and staff who obtain the means to carry out their responsibilities tend to become more motivated. Agency semi-autonomy from the civil service can also allow management to promote staff on the basis of merit and accomplishments rather than just seniority. Staff that does not perform can also be more easily removed from payrolls. This kind of management of human resources in terms of hiring and firing and career advancement is a very important tool for increasing the internal accountability and motivation of an organization.

The build-up of a competent core of managerial and technical staff that can perform effectively in support of institutional objectives is essential. There are two main approaches to this:

- ◆ Creating a personnel unit within the road organization to strengthen its capability for personnel planning, recruitment, training needs analysis, organization of training, management of promotion and career development schemes, and administration of compensation and benefits; and,
- ◆ Strengthening the ability of line managers to utilize, supervise, motivate and develop their staff effectively.

To carry out these roles personnel units and line managers will require development of special skills and supporting administrative systems. Line management will need to acquire management skills such as how to set objectives, allocate work, delegate and follow-up, set standards, establish accountability, and provide on-the-job training, recognition, and feedback. Personnel and line management responsibilities should be integrated into a single long-term personnel development and retention program. To effectively implement such a program, roads agencies should introduce changes in hiring, promotion and termination practices to strengthen motivation, retention of talent, accountability, and performance.

Another way to improve staff performance is through compensation and benefits systems, important tools for strengthening personnel management. A semi-autonomous agency has more flexibility to pay people at the level required to retain the kind of talent it needs, in competition with the private sector. Even without autonomy, a road agency can still institute innovative compensation schemes such as pay directly linked to quantities and quality of outputs and results produced.

Effective personnel utilization also requires a good system of position descriptions, management by objectives, appropriate workload allocations, and effective staff supervision. These are basic personnel and work management tools. In road agencies, and particularly for the widely

dispersed and variable road maintenance task, good utilization of staff requires appropriate workload and responsibility allocations within units and within an organization. Within a road maintenance unit, it is the unit line manager's responsibility; within the road organization, any need for overall organizational restructuring should be identified and addressed by general management.

It is also important for road agencies to identify training needs, and develop and deliver the required courses in essential and specific job-related skills. For training and other developmental actions to be effective, they need to take place in a context of improved personnel management and utilization. It is important to remember that, if personnel management and utilization are not carefully planned to deploy and make the best use of available skills and expertise while keeping the best interests of the staff in mind, people sent on training might soon be lost to the private sector. If they stay, they may tend to stagnate and not develop in ways that are practical and useful for the organization.

When road agencies have strong personnel management, deployment and utilization systems, in-service training schemes make an indispensable contribution to staff development. In addition to the educational qualifications and experience that staff bring to the job, they need to develop additional specialized job-related skills. Careful analyses of training needs should be conducted to determine precisely what knowledge and skills are needed by each category of staff. Arrangements should be made for the development and delivery of suitable, applied, in-service courses targeted to the most essential technical, professional, and managerial topics. Needed courses or course modules can be arranged through external educational institutions or sector training centers or be developed and offered by in-house training departments.

Specialized training opportunities in managerial and professional/technical areas related to road maintenance often do not exist in a country. Therefore, special initiatives may be needed to make arrangements with appropriate educational institutions. In undertaking such initiatives, it is important to remember that this kind of training should not be academic. It should be practical, job-related, and focussed on essential skills required for road maintenance management and implementation.

Outcome of Discussions

Seminar participants agreed that human resources development is one of the most critical factors in addressing road maintenance, although it is costly and takes a long time to develop an adequate number of qualified, competent, and experienced management staff. Although technical assistance has been used, the benefit and residual impacts have frequently not been commensurate with the costs. High priority should be assigned to the development and retention of an experienced and qualified cadre of staff to plan, manage and supervise priority road maintenance and rehabilitation programs.

Amongst the several factors contributing to the problem of motivating and retaining the key staff needed to ensure effective and efficient road maintenance and rehabilitation are inappropriate and inflexible public employment policies, particularly in relation to salaries, benefits, career development and promotion, training and working conditions. Participants felt government salaries are too low compared to the private sector, making it difficult for governments to respond to staffing shortages. Better incentive systems should be developed for roads personnel to bring them up to the level of autonomous parastatals and private contractors. Greater flexibility is needed in compensating employees for working in remote areas.

The participants felt promotion should be based primarily on site experience and professional performance. Development of clear job descriptions and improved training at all levels are important first steps in career development. They noted the importance of improving working conditions by providing essential equipment to staff.

Highest priority should be accorded to the review and revision of public employment policies relating to salaries, benefits, promotion and career development, training and working conditions. Two key objectives were noted regarding human resources: improving the productivity of staff at all levels, and improving the effectiveness and benefits of technical assistance.

Several measures were noted as being appropriate to improving staff productivity:

- ◆ Giving them greater responsibility and providing them with the means to carry out their tasks;
- ◆ Increasing motivation, mainly by providing better working conditions,
- ◆ Establishing productivity bonuses, based on results and determined by simple indicators;
- ◆ Improving opportunities for training adapted to local conditions, and making use as much as possible of existing training facilities and regional programs.

Several countries noted that they were establishing bonuses to reward good performance of staff in highway maintenance activities, including Benin, Togo and in Cote d'Ivoire. In the last country, staff receive bonuses when their productivity is 80% of the target; bonuses are doubled when productivity reaches 120%. In some other countries, requirements that staff be part of the civil service precludes bonuses.

The participants agreed that staff training should be a priority for road agencies. They looked on training as a national investment in human capital that would still be realized if staff left public service for private work. In most countries, the training function is the formal responsibility of a department of the ministry of public works. The idea of reinforcing national training programs, and to make them available within the region, and if necessary, the creation of regional training structures was strongly endorsed by most countries. In order to benefit from the experience from other countries, they suggested setting up a regional organization or framework with a mandate for training, research, and general exchange of technical and operational information on the road sector.

While participants appreciated the contributions of technical assistance, they felt its implementation often has shortcomings that sometimes render it ineffective. There was consensus that technical assistance should be adapted to the needs of the country, and that efforts should be made to ensure complementarity with, and proper training of, national counterparts. They felt technical assistance programs and performance should be regularly evaluated by national authorities.

Many technical assistance problems have been attributed to ineffective performance by counterparts. However, participants felt this often reflected a lack of incentive and motivation brought on by the differences in privileges accorded to expatriates and their counterparts and the lower level of logistic support given counterparts. They also noted that counterparts often do not remain in the same job after technical assistants depart, but move from maintenance to construction partly because of higher remuneration and the glamour in construction. When this happens much of the maintenance knowhow transferred is wasted.

The continuing brain drain from developing countries has made it difficult to reduce reliance on expatriates. The participants suggest that national experts living abroad might be attracted home through salary topping schemes or by creating special "contract" positions.

Where local staff are inadequate and technical assistance is required, assignments should be carefully considered and be based on the following conditions:

- ◆ Making full and efficient use of qualified and experienced local staff before defining the needs for expatriates. To the maximum extent possible local staff should be deployed to the key planning and decision-making roles;
- ◆ Expatriates should be assigned to temporary, short term positions with clear terms of reference and measurable, monitorable objectives;
- ◆ All technical assistance assignments include strong incentives for training of, and full transfer to, local staff at the end of the assignments.

Technical assistance personnel should be accountable for their training work, and regular performance reviews should be carried out on individual performance as well as for performance of firms as a whole.

Implications for External Aid Agencies

The discussions brought out several areas which are of direct interest for the design and composition of lending programs by international and bilateral agencies, and other areas where the agencies can be important catalysts in support of countries' efforts for policy reform.

The most important point appears to be the need for the external financial agencies to continue to contribute to the process of awareness and understanding of the problems with road maintenance, and of the need for the governments to devote to maintenance the attention and resources it requires; this applies to foreign and local resources. In this connection, the discussions brought out the need for the external aid financiers to make of a concerted effort to allocate to maintenance activities an increasing proportion of the funds given to the road sector. External financiers were also asked to find ways to help reduce the problem with standardization of equipment, and allow a more flexible use of fund for essential consumable items needed in maintenance operations. Other points mentioned by the participants asked external financiers to support labor-based operations, development of local contractors and consultants and for more carefully tailored programs of technical assistance, as referred to above.

CHAPTER 4

Policy Action Planning

The last two days of each of the six RMI seminars were devoted to introducing the participants to the Policy Action Planning (PAP) policy analysis and decision-making instrument. The PAP methodology was developed for SSATP by the Carl Duisberg Gesellschaft (CDG) training institute of Cologne, Federal Republic of Germany and the presentation to the plenary was also prepared and conducted by a CDG expert-team. The methodology provides a structured framework within which constituencies that have a stake in national policy decisions can bring their agendas and their expertise together to work out consensual decisions on how best to reform policies.

Country teams, assisted by resource persons, at each of the six RMI seminars undertook Policy Action Planning aimed at acquainting participants with this analytical tool appropriate for guiding policy reform processes. Later at the seminars the country teams reported their results and perceptions of the PAP process to the plenary. The adoption of the individual country team results should be strengthened, and in some cases, start the process for policy reform.

A number of training instruments prepared by CDG (eg. guidelines, worksheets, posters and options charts) were placed at the disposal of the country teams during the PAP workshops. The PAP design and approach is especially suited to complex institutional reforms, involving several government agencies, and generally requiring significant preparation and commitment by the ministries, agencies and other stakeholders involved. The feedback from the participants was valuable in pointing out ways in which the methodology could be adapted to be more effective in an African context.

POLICY ACTION PLANNING: THE PROCESS

Policy Action Planning is essentially a three-stage process. The idea and the process is pictorially shown in Figure 1.

The first stage begins with the constituencies in a policy area - such as road maintenance - identifying the constraints and functional deficiencies the sector faces. Many problems will be identified as stakeholders bring their particular points of view to the table. The PAP framework then brings the participants together to see each other's viewpoints and begin the difficult process of choosing a limited number of goals as priorities. Those priorities are then transformed into concrete objectives.

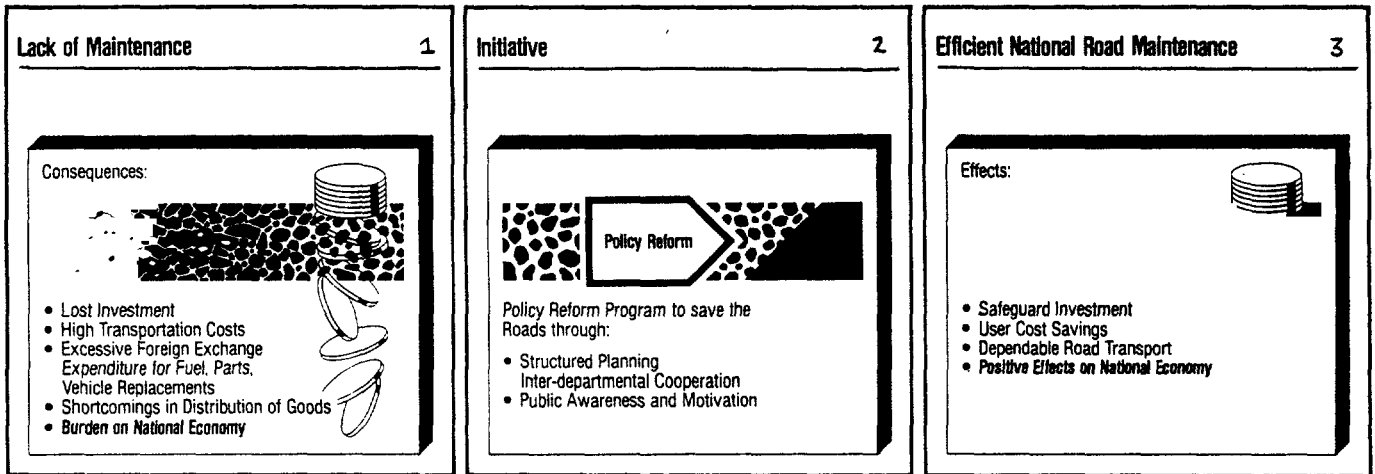
The second stage involves the participants defining the measures needed to achieve these objectives. Again, many initiatives are likely to be proposed, and the group must subject each to close scrutiny to assess its feasibility in light of financial, human, and institutional constraints. This movement from the desirable to the achievable ends with an appraisal of policy and action options in terms of their feasibility and effectiveness: an action agenda.

The third stage is to determine responsibilities, resources and time-frame for implementation. Participants must determine which government and nongovernment bodies will be given responsibilities for carrying out the agreed road maintenance agenda. A time frame must be defined for both putting in place the policy changes needed to carry out the road maintenance agenda and the operational steps to be taken. Lastly, the group must identify the resources - foreign or domestic - that will be used to implement the program and commit themselves to providing or mobilizing them.

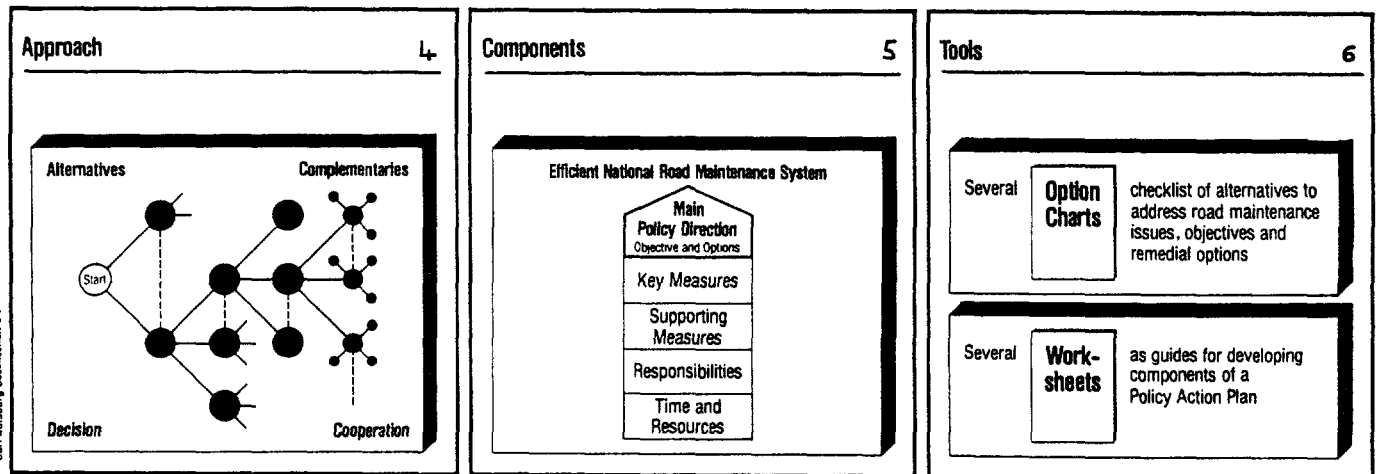
Policy Action Planning (PAP)
The Idea and the Process

FIGURE 1

The Idea



The Process



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The Policy Action Planning processes begin by polling participants to establish the broad range of priority problems each feels should be addressed. By doing so, PAP brings out the agendas of all the constituencies represented, and shows each constituency the areas of possible conflict.

The heterogeneity of the participants - unusual in such structured decision-making instruments - is designed to cut across the normal institutional boundaries that usually isolate the policy and program decision steps in most countries. In many countries, ministries plan their programs with little knowledge of overall resource situations or the conflicting demands for resources faced by the decision-making agencies who direct finance and planning. PAP brings that feedback into the loop from the beginning, assuring that both the resource-allocating entities and line agencies have a realistic framework for seeking compromise and consensus.

Thus, early in the PAP process, all government and external constituencies are brought together, rather than having two ministries plan programs based largely on imported inputs and passing on, to planning and finance ministries, decisions on allocations of scarce foreign exchange. The PAP exercises undertaken at the six RMI seminars illustrated well both the differences in priorities seen by differing constituencies and the opportunities for consensus that arise when these agendas are put on the table among peers.

INSIDE A POLICY ACTION PLANNING WORKSHOP

The PAP process, as applied during these seminars, might best be illustrated by a conceptual example, based on the actual results of certain country teams' deliberations. The following example is presented merely to demonstrate the process and possible outcomes of typical PAP exercises. The result and outcome used in this example should not be construed as conclusions regarding road maintenance policies for general adoption.

At one of the regional seminars, members of one country team began the Policy Action Planning exercise by listing the most serious problems they saw in planning, financing, and managing road maintenance programs:

KEY ISSUES IDENTIFIED	
•	<i>Lack of planning data</i>
•	<i>Insufficient funding for road maintenance</i>
•	<i>Deficient assessment of priorities</i>

Under the guidance of a moderator trained in the Policy Action Planning process, the team members then began a process of selecting criteria that would help them winnow and rank the problems in order of importance. For many teams, criteria for setting priorities included the severity of

problems themselves, the speed with which change could be accomplished, the resources needed to effect change, and the likelihood of achieving national consensus on policy reform.

After much discussion, this country team decided that a single criterion was of overriding importance:

**CRITERIA TO SET PRIORITIES
AND SELECT ISSUES**

- *Critical need to improve road conditions*

One major focus in applying this criterion was an attempt to discriminate between core issues and second-order problems whose solution depended on other changes being first put in place. In their discussion of whether priority should be given to improving planning or seeking greater funding for road maintenance, for instance, the country team came to realize both that additional financial resources would do little good unless a better system for planning the use of those funds was in place - and that building a better planning system was dependent on a number of other factors, many related to institution building and human resource development. Given these considerations, they reached consensus that the planning deficiency was their priority problem:

KEY ISSUE SELECTED

- *Poor overall planning*

A problem, however, cannot be acted upon until it is transformed into a policy objective:

POLICY OBJECTIVE

- *Improve maintenance planning*

Their policy objective identified, the team moved into the second phase of the PAP process, examining policy options and the measures needed to accomplish them. The team members soon isolated two major policy options for improving planning:

POLICY OPTIONS

- *Improve planning efficiency by improving data collection and processing, and*
- *Improving work programming and resource assignment.*

Their next task was to identify the key measures and supporting measures needed to put the policy options into action and rating the options as to their feasibility and efficiency. They identified six key measures:

KEY MEASURES

- *Establish required management information system*
- *Base planning on road inventories*
- *Perform regular road inspections and road condition measurements*
- *Base resource assignment scheduling on resource inventories*
- *Determine work priorities on the basis of true requirements*
- *Establish/improve work and cost recording systems and use data as feedback for physical planning*

However, they realized that to perform these key measures they would need specific supporting measures:

SUPPORTING MEASURES

- *Man and equip the Ministry of Works planning unit to enable it to monitor project performance.*

But implementing the policy changes needed to put these changes into effect would require action by a number of agencies, both inside and outside government, culminating in a consensus for change to which all parties were committed. The country team turned to an examination of those actions, and each potential actor's role in achieving them. Within the government, they identified a decision-making hierarchy, beginning with the roads agency itself, moving horizontally to take in other agencies and ministries whose agreement and support would be needed, then upwards to the ministry of finance. Stage three of the PAP exercise began by sketching the responsibilities relevant agencies and institutions would have to undertake to reach the policy objective that had been identified:

RESPONSIBILITIES

Ministry of Works

- *Responsible for road maintenance in general.*
- *To initiate action and be main liaison agency with other departments to achieve the objectives and measures.*

Ministry of Planning and Economic Development

- *Assist in identifying suitable staff and facilities for Ministry of Works' planning unit*
- *Formulate resource requirements for further action by financing organizations*

Ministry of Finance

- *To recognize the correct level of maintenance funds and ensure that whatever is available is released on time.*

The last step was to set a schedule for the steps needed to effect the policy changes the team had planned. The group estimated that the first stage, developing a national commitment to policy reform could be accomplished by mid to late 1989; by February 1990 they expected to be ready to embark on a five-month program of detailing a national process that would allow the abbreviated exercise they undertook at the seminar to be supplanted by a full, detailed Policy Action Planning process:

TIME SCHEDULE

	1989	1	1990
Initial Phase			XXXXXXXX
		1	
Planning Phase		1	XXXXXX
		1	

REACTION OF THE PARTICIPANTS

The seminars were successful in introducing the Policy Action Planning concept and demonstrating its value in policy formulation and decision-making. A large number of the country teams said they would utilize the PAP methodology in their own analysis and encourage national commitment to its use as a planning and policy reform tool. Several countries said they expected to be able to achieve national commitment to using PAP as a basis for entering the second phase of the RMI process within six to nine months of their return from the seminars.

Most participants reported that they found the training extremely valuable. The participants found PAP's focusing and consensus-building attributes extremely valuable, even in the truncated form in which it was presented at the RMI seminars. At several seminars they noted that the process

provided a powerful tool for surfacing issues and making the choices between them explicit. Two countries that already had made good progress in the policy reform process, indicated at the seminar that parts of the demonstrated PAP method could be used to complement their own existing approach, but that they could not see that the full process would be relevant to their situation. However, even these countries have now reconsidered and have indicated that they would like to adopt the PAP approach.

Many of the participants found Policy Action Planning's cross-ministerial structure particularly valuable. They noted that exposure to the sometimes conflicting agendas of different government constituencies early in the decision-making process helped broaden the perspective of policy discussions. Airing these perspectives forced a new realism in exploring policy and program changes, and fostered a sense of mutual commitment when consensus was jointly reached.

Statements made on conclusion of the PAP work illustrate the reactions of policy-makers. One minister noted that hearing the views and learning the problems of other agencies during the PAP exercise made him aware of gaps in his own knowledge about road maintenance; a vice-minister from another country said the workshop helped him reassess his earlier bias against labor-based construction methods. Both said they found the process extremely useful as a guide to exploring alternative options and strategies.

Participants suggested, however, that the PAP process as presented would benefit from full-scale testing in a regional country, and that one aim of this testing should be to find ways to streamline and simplify the process. They also felt that understanding and acceptance of PAP could be improved by training more Africans in the methodology, as the creation of national cadres able to explain and moderate Policy Action Planning processes would help greatly to build the instrument into national planning exercises and make the methodology much widely available.

The participants found a surprising level of commonality in the road maintenance problems each country faced and their priorities in ranking these problems, particularly within the groups of countries who attended the two series of anglophone and francophone seminars (See Table 3). In those countries attending the Anglophone seminars, countries of Group I (see Chapter 2), that is, those with relatively strong maintenance operations and systems in place, tended to identify planning, programming and budgeting as the over-riding issue; Group II countries tended to focus more on staff capabilities and skill; and Group III and IV countries appeared to focus more on the level of funding as the main issue, particularly the poorest countries in Group IV.

The pattern in the Francophone seminars was less well defined. For the countries in Group I, the main issue was funding, but not so much the level as the planning for their allocation and the release of funds. In Group II countries the priority issues had to do with internal management, systems and procedures. In Groups III and IV, the priorities were more diffused over a larger number of issues.

AREAS FOR FURTHER WORK

The exposure to Policy Action Planning and the country team work in the analysis of policy issues should be valuable in helping countries to strengthen and better articulate their efforts for policy reform. Countries that decide to use such tools will have to adapt them to local conditions and

circumstances, both in terms of the procedures and the degree of complexity warranted in each case, and of the substantive issues and options identified and illustrated by the PAP method.

For most of the issues and options likely to be targeted by the countries in the key areas of road maintenance, a substantial body of accumulated knowledge and documentation exist. If needed, with some assistance from external consultants, the options could easily - from a conceptual viewpoint-- be adapted to individual country situations. This applies to issues and options in areas such a road funds, cost recovery principles, organizational structures, and most others identified during the PAP as being priority issues.

There are, however, other issues, that are likely to be selected in many countries as requiring priority attention, where there has been insufficient groundwork to allow countries, or their consultants, to provide guidelines for reform without high risks that the approaches recommended may be unsuitable for specific country conditions. There is a risk that reforms undertaken under such conditions may backfire and cast serious doubts on the credibility of all the proposed reform program in road maintenance.

Based on the discussions at the seminars and the issues listed by the country teams during the PAP, the following appear as areas where the World Bank and other financing agencies should conduct further research and case studies:

- a) procurement methods and issues;
- b) approaches to help with the development of the domestic construction industry;
- c) improving personnel motivation and incentives through the introduction of productivity bonus schemes.

Chapter 5 elaborates on the follow-up to the seminars. The areas of further work outlined above would form part of this follow-up.

TABLE 3
POLICY ACTION PLANNING
IDENTIFICATION OF PRIORITY ISSUE BY COUNTRY GROUPING ^{1/}
OVER-RIDING PRIORITY ISSUE ^{2/}

<u>GROUP</u>	<u>ANGLOPHONE SEMINARS</u>	<u>FRANCOPHONE SEMINARS</u>
<u>GROUP 1</u> 3 Anglophone 3 Francophone	Planning, Programming & Budgeting (3)	Funds & Planning (2) Release of Funds (1)
<u>GROUP 2</u> 4 Anglophone 7 Francophone	Staff Capabilities & Skills (3) Funding levels, foreign or local (2)	Training & Motivation (1) Develop Private Contractors (1) Institutional Structure (1) Planning/Administration Procedure (1) Equipment (1)
<u>Group 3</u> 2 Anglophone 4 Francophone	Funding Levels (2) Equipment (1) Management of Operations (1) Lack of Agency Autonomy (1) Institutional Structure (1)	Management of Operations (3) Personnel Management (1)
<u>Group 4</u> 11 Anglophone 6 Francophone	Funding Levels (5) Management & Engineering Capacity (4) Planning (3)	Funding Levels (3) Local Resources (2) Planning (2)

^{1/} Based on the country grouping described in Chapter 2 of this report. Anglophone and Francophone refer to countries attending Anglophone and Francophone seminars, which included also Lusophone and one Spanish-speaking countries.

^{2/} In parenthesis, number of countries noting issue. Some countries indicated more than one priority. Four countries did not record priority issue.

CHAPTER 5

The Follow-Up

National Road Maintenance Initiatives

KEY CONSIDERATIONS

The six policy seminars have been important steps in assisting the SSATP countries, and complementing the efforts of bilateral and multilateral agencies, to strengthen and/or launch road maintenance policy reform efforts. The seminars gave further impetus to the momentum for reform, helped better identify and define the substantive policy issues, identified two preconditions for successful reform efforts -- the need to raise awareness and understanding and to increase accountability -- and introduced countries to a structured approach --Policy Action Planning-- to help guide the design and implementation of reforms. An initial evaluation of two of the seminars as they affected two countries, conducted by an outside consultant confirmed the impact of such seminars and recommended, and strongly signalled the need for follow-up. (See Box)

RESULTS OF AN INITIAL EVALUATION

An evaluation of RMI Phase I Seminars carried out in Ghana and Zimbabwe, conducted a few months after they took place, undertaken by an outside consultant (the Associate Director for Training at Canada's International Development Research Center), based on interviews with participants to the Road Maintenance Seminars, concluded:

- ◆ *The results varied in response to the respective national policy environment.*
- ◆ *Compared to other policy-focused seminars, the RMI seminars appeared to be more effective.*
- ◆ *The effectiveness of the seminars was substantially enhanced by the national policy focus within the Policy Action Planning discussions, as opposed to issue-based discussions with regional participants (the seminars contributed to increased funding for road maintenance and rehabilitation approved in Zimbabwe shortly after the seminar).*
- ◆ *Participants pointed out that further assistance to support the policy reform process at the country level is vital (some suggested that the seminars should be repeated periodically).*
- ◆ *The seminars clearly assisted communications between the various ministries; within the national context they opened the issue of the need to sustain this communication and to broaden it by involving other stakeholders (road transport operators in Ghana have been brought into this process). The seminars had little impact on constraints related to other organizations in the overall institutional setting.*
- ◆ *The increased communications was an informal process, dependent on the continuity of players. To manage the reform process, there is need for institutionalized, enhanced communication.*
- ◆ *Participants were uncertain about the follow-up process to the seminars.*

Future efforts to continue with policy reform at the national level will have to be country-driven. National initiatives will have to be framed on the fact that policy reform is a continuous process, where complex reforms may take years to design, approve and implement, but where much progress can be done over the short-term by targeting well selected and focused reform areas.

The Road Maintenance Initiative is designed to support such national initiatives, and in eight to ten countries will provide assistance for the preparation and initial implementation of policy reforms concerning a limited number of areas which are central to better management of road infrastructure. The program will respond to country initiatives.

RMI programs in individual countries will be closely coordinated with on-going projects and studies concerning road maintenance and administration. Such programs will rely on relevant aspects of on-going projects and studies, and will include support to seminars, working groups, exchanges of expertise in policy-related areas. The PAP approach would be expected to provide a common frame of reference, but individual country programs would be tailored to the conditions of each participating country. The programs will also build-up the capability of selected training institutions, such as ESAMI, to provide process assistance to policy reforms in road administration and maintenance operations.

PROGRAM IMPLEMENTATION

As noted in Chapter I, the second phase of the RMI would be conceived with the following features:

- Driven by country initiatives under the aegis of an inter-ministerial committee or steering group;
- Targeted at a limited number of key policy issues requiring action by several departments or agencies;
- Closely coordinated with on-going and planned programs by external financiers; and
- Designed in harmony with the priorities established by the National Coordinating Committees which will be responsible for the preparation of the country's contribution to the Second Transport and Communications Decade.

RMI Phase II will be managed by a small team of two to three specialists based at the World Bank Headquarters, with the support of ILO specialists in the development of capabilities for labor-based road maintenance and rehabilitation. In each country, the external support for the country program will be coordinated by the World Bank and a lead bilateral agency. Regional management training institutions, such as ESAMI, and available national training institutions, will participate in the process through the provision of expertise and the organization of training activities.

Country-level Phase II programs will be initiated as follows:

- Preselected countries will be informed about Phase II, and will be invited to respond by indicating the country's intention to participate in Phase II, and outlining

- i) the key policy aspects to be addressed;
 - ii) the institutional arrangements and leadership (task force, interministerial committee);
 - iii) the plan of operations for specific activities planned over a two-year period, with appropriate sectoral indicators.
- The Bank and the lead bilateral agency(ies) will organize a mission of sector specialists to review the country program of operation and assess the direction and targets of the program, as well as the degree of national commitment (agreements reached will be recorded in an Aide Memoire);
 - The decision to proceed with a specific country program will be made by the Bank and the lead bilateral agency(ies) on the basis of a positive assessment by the technical mission of the country's plan of operations.

Burkina Faso, Cameroon, Madagascar, Mozambique, Nigeria, Rwanda, Tanzania, Uganda, Zimbabwe and Sierra Leone have already been identified as candidates for Phase II.

It is envisaged that one of the first activities in implementing the Plan of Operations will be the organization of a national workshop to launch the program. This workshop will establish the involvement of the government, and a larger constituency including non-governmental and private organizations in the policy reform process, thus ensuring broader national understanding and commitment.

According to current schedules, the initial missions to assess the countries' plan of operations could be launched towards the end of 1990, and the program in selected pilot countries could start early in 1991.

ENDNOTES

1. *Ref.: "Road Deterioration in Sub-Saharan Africa" by Melody Mason and Sydney Thriscutt. A Background Paper for RMI Policy Seminars, 1989. All figures in 1988 USDollars.*
2. *Ref.: "Transport Policy Reform: Review of Experience and Development of a Framework for Designing Policy Reform" by Ian G. Heggie, INUTD/PPR, World Bank Discussion Paper, Report INU 15.*
3. *Ref. "Road Deterioration in Developing Countries: Causes and Remedies." World Bank Policy Study, 1988.*
4. *The PAP instrument was developed for SSATP by Carl Duisberg Gesellschaft, a Cologne training institute under a contract funded by the Federal Republic of Germany's Ministry of Economic Cooperation. The teaching aides are available on request from CDG.*
5. *The latest road condition data is generally for 1987 or 1988. Four countries were included in the analysis by using the last available data for 1984. Suitable data for Angola, Cape Verde, Reunion, Sao Tome & Principe and Seychelles are not available.*
6. *Road conditions have been defined according to the extent of maintenance and repair work that needs to be carried out to restore roads to good condition. Paved roads in fair condition are assumed to require resurfacing and selective repairs while those in poor condition are assumed to require reconstruction.*
7. *In some cases, information is only available on the overall percentage of funds spent on new construction and the general adequacy of maintenance activities whereas details of actual expenditures are either not available or there are conflicting figures.*

**SUB-SAHARAN AFRICA TRANSPORT PROGRAM
ROAD MAINTENANCE INITIATIVE**

ANNEX 1

Road Maintenance Policy Seminars

List of Key Organizers and Resource Persons

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ACRONYMS

CESAG - "Centre Africain d'Études Supérieures de
 Gestion"
 CEAO - "Communauté Economique pour l'Afrique
 de l'Ouest"
 ECA - Economic Commission for Africa
 ESAMI - Eastern and Southern Africa Management
 Institute
 ENSTP - "Ecole Nationale Supérieure des Travaux
 Publics"
 ILO - International Labour Office
 TRRL - Transport and Road Research Laboratory
 UDEAC - Union Douanière des États de l'Afrique
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**Road Maintenance Policy Seminar
Harare, Zimbabwe, May 30-June 2, 1989**

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**Road Maintenance Policy Seminar
Accra, Ghana, June 6-9, 1989**

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**Road Maintenance Policy Seminar
Addis Ababa, Ethiopia, September 19-22, 1989**

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*Table Ronde sur l'Entretien Routier
Dakar, Senegal, January 22-25, 1990*

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**Table Ronde sur l'Entretien Routier
Libreville, Gabon, January 31-February 3, 1990**

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**Table Ronde sur l'Entretien Routier
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**SUB-SAHARAN AFRICA TRANSPORT PROGRAM
ROAD MAINTENANCE INITIATIVE**

ANNEX 2

ROAD NETWORKS BY COUNTRY

COUNTRY	GNP			Main Network Length (km)	MAIN PAVED NETWORK			MAIN UNPAVED NETWORK				
	1987 GNP per capita (US\$)	Av growth rate 1980-87 (%)	1987 total GNP (US\$ m.)		Paved Length (km)	Condition of Roads (%)	Good (%)	Fair (%)	Poor (%)	Unpaved Length (km)	Good (%)	Fair (%)
EASTERN AND SOUTHERN AFRICA (* denotes 1984 data)												
ETHIOPIA	120	-1.6	5,537	17,909	4,064	47	42	11	13,414	47	31	22
MOZAMBIQUE	150	-9.5	2,135	13,660	5,113	12	75	13	1,700	6	44	50
ZAIRES	160	-2.8	5,287	40,900	2,400	38	23	39	18,300	44	29	27
MALAWI	160	-0.3	1,223	13,500	2,210	61	26	13	3,567	30	35	35 *
MADAGASCAR	200	-4.0	2,172	14,700	5,000	56	28	16	3,700	27	30	43
TANZANIA	220	-1.8	5,202	10,456	3,353	51	19	30	7,103	17	29	54
ZAMBIA	240	-4.4	1,696	20,653	5,500	40	30	30 *	15,151	30	35	35 *
BURUNDI	240	-0.4	1,205	3,014	895	58	25	17	2,119	20	57	23
UGANDA	260	-2.4	4,086	6,165	1,800	10	63	27	4,366	0	73	27
SOMALIA	290	0.8	1,656	7,409	2,757	52	33	15	4,772	4	10	86
RWANDA	310	-3.1	2,008	4,060	860	41	41	18	3,200	19	46	35
SUDAN	330	-4.0	7,646	8,184	2,335	27	43	30	5,849	20	20	60 *
KENYA	340	-1.3	7,500	51,033	6,275	32	52	16 *	16,373	66	17	17 *
LESOTHO	360	0.1	591	2,591	604	56	29	15	1,544	16	57	27
DJIBOUTI	360 *	NA	129	1,132	412	51	38	11	720	51	38	11
COMOROS	380	0.1	160	735	470	43	53	4	265	25	38	37
ZIMBABWE	590	-1.5	5,265	18,393	5,626	70	27	3	4,276	40	30	30
SWAZILAND	700	1.3	496	2,757	689	35	35	30	2,068	60	37	3
BOTSWANA	1,030	9.0	1,175	7,938	2,131	94	4	2	5,807	45	19	36
MAURITIUS	1,470	4.4	1,524	1,800	1,610	95	5	0	200			
Total/Average	396		56,693	246,989	54,104	50	33	17	114,494	28	30	42
WESTERN AFRICA												
CHAD	150	2.5	805	7,300	300	0	10	90	3,500	0	0	100
GUINEA-BISSAU	170	-2.8	152	2,636	544	39	26	35	2,092	6	6	88
BURKINA	170	-0.6	1,426	13,070	1,503	24	49	27	4,139	0	80	20
EQUAT. GUINEA	180 *	NA	67	1,090	447	27	50	23	762	30	42	28
MALI	200	0.0	1,576	12,300	2,464	63	31	6	6,320	19	13	68
THE GAMBIA	220	-4.0	177	1,210	450	22	46	32	760	32	39	29
NIGER	280	-5.3	1,898	6,694	2,768	60	23	17	3,646	24	29	47
SIERRA LEONE	300	-2.5	1,172	10,167	1,244	62	9	29	6,984	8	37	55
TOGO	300	-3.5	963	2,819	1,500	40	22	38	713	20	10	70
BERNIN	300	-0.6	1,315	3,434	1,038	26	50	24	2,346	11	35	54
C. A. R.	330	-0.5	912	5,250	442	36	35	29 *	4,808	68	16	16 *
GUINEA	330 *	NA	1,947	10,609	1,289	50	0	50	4,320	0	0	100
NIGERIA	370	-5.0	39,533	29,500	22,760	67	5	28	8,036	0	10	90
GHANA	390	-2.0	5,328	13,611	5,458	28	21	51	8,153	32	36	32
LIBERIA	440	-5.2	1,030	3,945	557	85	13	2 *	3,388	15	75	10 *
MAURITANIA	440	-1.5	816	7,100	1,630	50	39	11	765	0	5	95
SENEGAL	510	0.1	3,545	10,000	3,809	28	32	40	7,470	7	21	72
IVORY COAST	750	-3.0	8,262	14,190	3,976	75	25	0	10,078	34	65	1
CONGO	880	0.3	1,761	10,800	1,245	50	12	38	5,000	38	27	35
CAMEROON	960	4.2	10,441	32,670	2,928	38	27	35	10,660	16	57	27
GABON	2,750	-3.5	2,890	5,239	581	30	30	40	4,658	32	30	38
Total/Average	496		86,016	203,634	56,933	54	17	9	98,598	19	34	47

**SUB-SAHARAN AFRICA TRANSPORT PROGRAM
ROAD MAINTENANCE INITIATIVE**

ANNEX 3

EXPENDITURES ON HIGHWAYS
(average 1986-88, in 1988 prices)

COUNTRY	GNP			CURRENT EXPENDITURES			CAPITAL EXPENDITURES			TOTAL ROADS EXPEND- ITURE	Total Expend. as Percent of GNP	Total Maintn Expend as % of GNP
	1987 GNP per capita (US\$)	Av growth rate 1980-87 (%)	1987 total GNP (US\$ m.)	Routine Maince	Periodic Maince	Total Maince and Upgrading (US\$'000s)	Construc. and Capital	Rehabil- itation	Total Capital			
EASTERN AND SOUTHERN AFRICA (* denotes 1984 data)												
ETHIOPIA	120	-1.6	5,537	15,450	2,565	18,015	40,000	5,750	45,750	63,765	1.15%	0.43%
MOZAMBIQUE	150	-9.5	2,135							31,420	1.45%	
ZAIRE	160	-2.8	5,287									
MALAWI	160	-0.3	1,223			4,750	8,850	7,435	16,285	21,035	1.72%	1.00%
MADAGASCAR	200	-4.0	2,172	2,000								
TANZANIA	220	-1.8	5,202	3,660	392	4,052	14,470	3,160	17,630	21,692	0.42%	0.14%
ZAMBIA	240	-4.4	1,696			2,733			16,016	18,749	1.11%	
BURUNDI	240	-0.4	1,205	3,208	170	3,378	16,768	518	17,286	20,664	1.71%	0.32%
UGANDA	260	-2.4	4,086			4,100			1,500	5,600	0.14%	
SOMALIA	290	0.8	1,656	360	0	360		0				0.00%
RWANDA	310	-3.1	2,008	5,980	2,362	8,342	16,560	12,710	29,270	37,612	1.87%	1.05%
SUDAN	330	-4.0	7,646	1,110	1,220	2,330	33,000	2,220	35,220	37,550	0.49%	0.06%
KENYA	340	-1.3	7,500	18,400	6,200	24,600			59,900	84,500	1.13%	
LESOTHO	360	0.1	591	2,300	1,240	3,540	6,430	5,285	11,715	15,255	2.58%	1.49%
DJIBOUTI	360 *	NA	129			1,949	9,039	0	9,039	10,988	8.52%	1.51%
COMOROS	380	0.1	160	1,350	600	1,950	1,230	580	1,810	3,760	2.35%	1.58%
ZIMBABWE	590	-1.5	5,265	7,185	5,150	12,335	36,600	1,080	37,680	50,015	0.95%	0.25%
SWAZILAND	700	1.3	496			2,850	0	8,810	8,810	11,660	2.35%	2.35%
BOTSWANA	1,030	9.0	1,175	1,990	5,025	7,015	19,840	0	19,840	26,855	2.29%	0.60%
MAURITIUS	1,470	4.4	1,524			3,500						
WESTERN AFRICA												
CHAD	150	2.5	805	2,860		2,860			8,300			
GUINEA-BISSAU	170	-2.8	152	550	0	550						
BURKINA	170	-0.6	1,426	2,000		2,000						
EQUAT. GUINEA	180 *	NA	67									
MALI	200	0.0	1,576	3,800	0	3,800	26,100	11,900	38,000	41,800	2.65%	1.00%
THE GAMBIA	220	-4.0	177	532	414	946	7,488	0	7,488	8,434	4.76%	0.53%
NIGER	280	-5.3	1,898	4,480	1,560	6,040	17,190	9,000	26,190	32,230	1.70%	0.79%
SIERRA LEONE	300	-2.5	1,172									
TOGO	300	-3.5	963	2,430	6,080	8,510	7,640	12,100	19,740	28,250	2.93%	2.14%
BENIN	300	-0.6	1,315	5,620	7,180	12,800						
C.A.R.	330	-0.5	912									
GUINEA	330 *	NA	1,947	2,100	0	2,100	0	13,000	13,000	15,100	0.78%	0.78%
NIGERIA	370	-5.0	39,533	55,000	0	55,000		78,715	78,715	133,715	0.33%	
GHANA	390	-2.0	5,328	6,000	5,148	11,148	0	20,000	20,000	31,148	0.58%	0.58%
LIBERIA	440	-5.2	1,030									
MAURITANIA	440	-1.5	816			1,400						
SENEGAL	510	0.1	3,545			8,000			25,330	33,330	0.94%	
IVORY COAST	750	-3.0	8,262	21,087	26,960	48,047						
CONGO	880	0.3	1,761			6,660				25,800	1.85%	
CAMEROON	960	4.2	10,441			42,000			263,000	305,000	2.92%	
GABON	2,750	-3.5	2,890			5,290	3,390	5,930	9,320	14,610	0.51%	0.39%

Estimated Total Road Expenditures in Sub-Saharan Africa: US\$1.54 billion (1.1% of GNP)

**SUB-SAHARAN AFRICA TRANSPORT PROGRAM
ROAD MAINTENANCE INITIATIVE**

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