

## **CHAPTER 7**

# **KRB OPERABILITY AND SYSTEMIC REFORM**

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### **7.1 General**

The KRB Act was enacted on 1<sup>st</sup> July 2000 and the establishment of the KRB system itself is still in progress. Changes or adjustments towards establishing the new system should take place step by step in order to avoid confusion and counterproductive results. Accordingly, a transition period for the KRB to become fully operational is necessary. It is assumed that a minimum of three years is needed for this to be realized. In this chapter, a total of eight sections on the recommended roles and functions, etc., of the KRB and road agencies in this period are explained below.

### **7.2 Roles and Functions**

#### **7.2.1 KRB**

The role and duties of KRB are defined in Section 8 of the KRB Act and are as described below.

- (1) To oversee the road network in Kenya and thereby coordinate its development, rehabilitation, and maintenance and to be the principal adviser to the Government on all matters related thereto.
- (2) To coordinate the implementation of all policies relating to the development, rehabilitation and maintenance of the road network with a view of achieving efficiency, cost effectiveness and safety.
- (3) To administer the Funds derived from the fuel levy and any other funds that may accrue to it.
- (4) To determine the allocation of financial resources from the Funds or from any other source available to the Board.
- (5) To monitor the operation or activities undertaken by various road agencies in the works of development, rehabilitation and maintenance and evaluate them.
- (6) To ensure that all procurements for the works shall be conducted in accordance with the guidelines and/or criteria which might be set out by the Board.
- (7) To recommend to the Government the appropriate levels of road user charges, fines, penalties, levies and any sums required to be collected under the Road Maintenance Levy Act, 1993.
- (8) To advise the Minister in connection with following issues:
  - (a) Necessary studies for promoting the development, rehabilitation and maintenance

of the roads.

- (b) Classification of roads, specifications, design standards
- (c) Limitation of vehicle weight, axle load, type of vehicles, size etc. for protecting the road.
- (d) Training method and/or system of human resources for the road development, rehabilitation and maintenance.

In addition to the roles listed above, KRB should take responsibility in conducting and leading the road agencies concerning the following issues:

- (9) Sorting out of the laws and acts that conflict with the KRB Act.
- (10) Setting up the rules and regulations for the operation of road maintenance works
- (11) Creation of committees in the KRB (such as a Laws and Acts Committee, Funds Appropriation Committee, and Inspection and Audit Committee).
- (12) Reaching agreements with the relevant ministries, authorities and boards concerning issues such as the allocation of CESS and LATF, jurisdictional arrangements, etc.
- (13) Giving advice and leading RD towards re-structuring its organization to play its new role (e.g., revamping the structure from a district basis to a regional basis).
- (14) Giving advice to road agencies under KRB about the preparation of annual work plans, programming of training plans for staff and engineers, etc.
- (15) Establishing strategies and measures to foster private contractors, especially petty contractors.
- (16) Examining and building a road maintenance system to utilize private consultants for supervisory work, road inspection, and other works such as design and planning.

As for sub-agencies, the additional roles of the KRB are as follows:

- (17) Promulgation of rules stipulating the conditions for designation.
- (18) Approval of designations either with or without conditions.
- (19) Forwarding of monies directly to sub-agencies.
- (20) Monitoring and auditing of sub-agencies.
- (21) Liaisoning with the DRCs in respect to residual non-executive functions.

The fundamental role and functions of KRB are the management of funds for road works and the supervision of road agency performance throughout the country. Road works include maintenance, development, and construction. Although the fuel levy fund is only for road maintenance and repair work, there are no restrictions on the usage of funds from sources other

than the fuel levy. Also, the KRB Act includes road development and construction as part of the purview of the KRB. However, as mentioned previously, the emphasis now, given the lack of funding, should be on maintenance.

### **7.2.2 RD**

RD, which consists of five branches, has been one of the key departments under MORPW. Except for RD's maintenance branch, the other four branches have no direct relation with road maintenance work.

ISG recommended in Section 6.1 of its report that RD be responsible only for Class A, B and C roads. The other roads (Class D and E roads and SPRs) would be transferred to the DRCs, which shall be set up as specified under the KRB Act. This recommendation is quite reasonable, since Class A, B and C roads serve as international and national trunk roads, they should be maintained by one road agency with funds from the fuel levy fund.

For RD to be restructured as a road agency to handle only Class A, B and C roads, the existing organization of RD shall be revamped and simplified. Based on the Government's policy to focus on district development, a district-based maintenance system had been set up. In line with the simplification of RD, however, this shall be changed to a regional-based system. The role and functions of RD as a road agency as specified in the KRB Act are listed below.

- (1) Drawing up of road maintenance programs and submitting them to KRB.
- (2) Implementation of road maintenance works on the basis of approved plans.
- (3) Liquidate disbursed funds from the KRB.

### **7.2.3 DRCs**

ISG recommended that DRCs be responsible for the maintenance of Class D and E roads, SPRs, and unclassified roads. Accordingly, the total road length under this arrangement reaches 183,655 km, meaning that each DRC will be responsible on average for 2,623 km of road. Even if this figure includes rural and farm roads with low traffic volumes, this amount of road is too much for individual DRCs to handle. Consideration of this issue is important for properly organizing DRCs. The major role and functions of DRCs as specified in the KRB Act are listed below.

- (1) Drawing up of road maintenance programs and submitting them to KRB.
- (2) Implementation of road maintenance works basis of approved work plans.

- (3) Liquidate disbursed funds from the KRB.

However, the present status of the DRCs does not allow them to execute items (2) and (3). Until their legal status is fully resolved, the work required of DRCs for items (2) and (3) will be carried out by sub-agencies. The role and functions of DRCs in the transition period are listed below.

- (1) Arrange for the designations of competent road sub-agencies.
- (2) Generate the road maintenance plans and programming.
- (3) Monitor the performance of the sub-agencies.
- (4) Conduct any other necessary work to ensure the smooth implementation of road maintenance in districts.

#### **7.2.4 KWS & Other Road Agencies**

KWS is one of the road agencies defined under the KRB Act in Clause 18. However, the amount of funding that KWS is to receive is not specified anywhere in the Act. This should be rectified by having KRB being able to allocate funds to KWS directly to maintain classified/unclassified roads that cross KWS territories, instead of having the KWS go through the more circuitous route of requesting this money via the RD or DRCs. Of course, the KWS should continue to fund park roads with the money it receives from park entrance fees.

The Forest Department (FD), which comes under the Ministry of Environment and Natural Resources, the Ports Authority (PA), and those local organizations in charge of city and town roads under the Ministry of Local Government are in a situation similar to that of the KWS. That is, they are unable to receive funding directly from the KRB. In the ISG's Implementation Report, there are no comments about the FD or PA. It is recommended that KRB also be able to allocate funds directly to these organizations by perhaps having the MORPW and DRCs entrust the relevant roads that fall under the purview of these organizations to them.

### **7.3 Organizational Setup**

#### **7.3.1 KRB**

The KRB Act defined the composition of the KRB as follows:

1. The **Chairman** (shall be appointed by the President)
2. The **Executive Director** (shall be recruited through public advertisement)

3. Eight Board **members** shall be recruited from the following organizations:

- 1) The Institute of Engineers of Kenya
- 2) The Automobile Association of Kenya
- 3) The National Chamber of Commerce and Industry
- 4) The Institute of Surveyors of Kenya
- 5) The Kenya National Farmers Union
- 6) The Kenya Association of Tour Operators
- 7) The Institute of Certified Public Accountants of Kenya
- 8) The Kenya Transport Association

President Moi appointed the former chairman of the Institute of Engineers of Kenya as the Chairman of KRB.

In addition to the above appointments, the following individuals are also to sit on the Board:

- 1) The Permanent Secretaries of Ministry of Road and Public Works
- 2) The Permanent Secretary of Ministry of Information, Transport and Communication
- 3) The Permanent Secretary of Ministry of Local Government
- 4) The Permanent Secretary of Ministry of Finance and Planning
- 5) The Permanent Secretary of Ministry of Tourism, Trade and Industry

In total, 15 individuals sit on the Board. However, it should be remembered that the Board itself is incapable of performing all the functions required of it as an organization to manage roads funding. That is, some professional staff will be necessary in order for KRB to fulfill its role properly. The recommended organizational setup for the KRB is as shown in Figure 7.3.1 and includes the following major components:

- 1) Planning, Policy and Operations
- 2) Technical Compliance (includes auditing and inspection functions)
- 3) Finance and Administration (includes auditing function)

It should be noted that KRB, after two years, was able to fully staff itself as of July 2002.

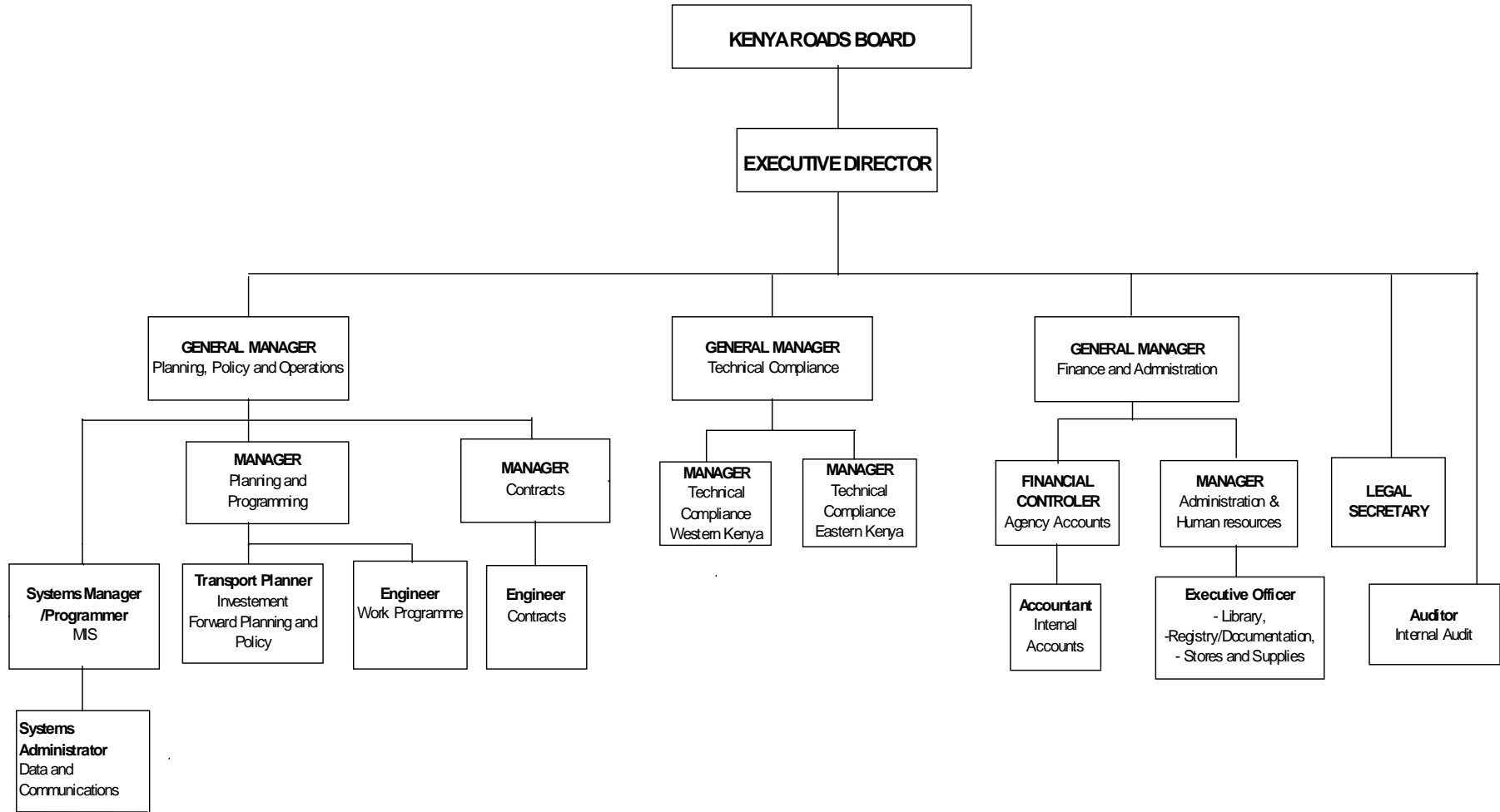


Figure 7.3.1 Organization of KRB

### 7.3.2 RD

RD is one of the key departments in MORPW and consists of five branches: Planning, Design, Bridges, Technical Administration, and Maintenance. Although RD is specified as a road agency under the KRB Act, its relationship with MORPW has not been clearly defined. As far as funding is concerned, RD is entitled to receive monies from KRB to carry out its road maintenance work.

MORPW District Roads Engineers (DREs) have been playing a key role in district road maintenance activities. DREs are also mentioned in Clause 17(4) of the KRB Act as key members of the DRCs. This means that DREs nominally belong to two different agencies, i.e., the RD and DRCs. No explanation about this is contained in the Act. On the other hand, ISG recommended in its report that “The position of the District Roads Engineers, the assistant to the DRE and Accountant in-charge shall be filled through advertisement in the press“. This indicates that DREs working for the DRCs are not one and the same as those working for RD. The ISG did, however, recommend that the DREs of MORPW work for DRCs temporarily. This arrangement would greatly assist the newly created DRCs. It is suggested hereby in this report that the DREs of MORPW be transferred to the DRCs through open recruitment, since the restructuring and simplification of RD’s organization will reduce the number of maintenance personnel necessary for RD.

If the necessary number of maintenance offices for RD are calculated on the assumption that the amount of road to be managed by one maintenance office is about 1,500 km in length, a total of 9 (maximum of 10) works offices would be needed. Locations of these offices are decided based on provincial headquarters. However, further study is necessary to take into account the character of international/national trunk roads together with economic and political factors.

International/national trunk roads should be adequately maintained not only for economic reasons, but also for political and administrative reasons as well, which includes preserving good relations with surrounding countries. In addition to this, RD must have an independent accounting system. The Technical Division of RD must also develop maintenance techniques to obtain greater value for money for the funds it receives, monitor the performance of regional offices, etc.

Based on the above concepts, the recommended organization for RD is as shown in Figure 7.3.2.



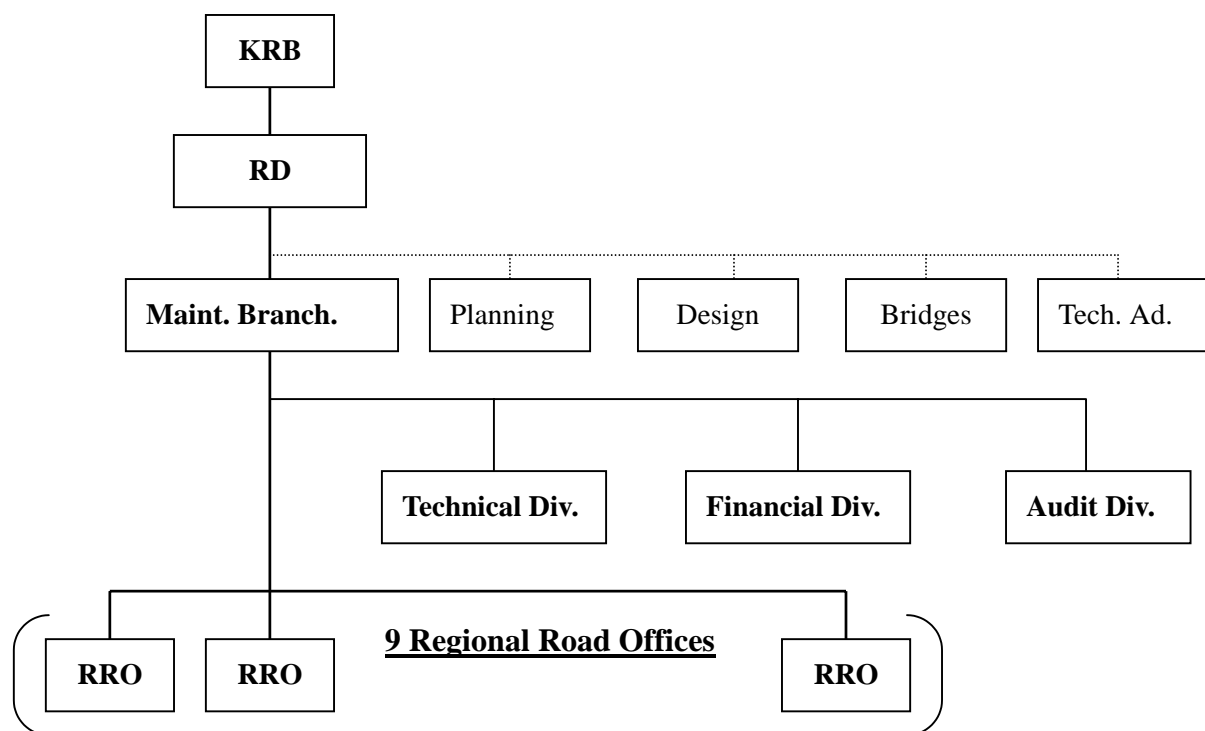


Figure 7.3.2 RD Organizational Chart

### 7.3.3 DRCs

DRCs must be established in accordance with Clause 17 of the KRB Act. The members that will compose a DRC as specified in the Act are quoted hereunder.

- (1) The chairman or mayor of every local authority in a district
- (2) All Members of Parliament (MP) from a district
- (3) The District Commissioner (DC) of a district
- (4) The District Roads Engineer (DRE) in charge of a district
- (5) Two other members co-opted by the Committee to represent such special interests as the Committee may determine.

*Note that the High Court decided that MPs cannot sit on DRCs as presently constituted (see the daily newspaper "NATION", February 14, 2001). Because of this, sub-agencies, as explained in the previous chapter, are considered as a way to solve this problem. ISG recommended that a "Temporary Technical Unit", staffed by officers including DREs seconded from government departments, carry out roads works in the districts. This arrangement is quite reasonable and this report suggests that it be maintained permanently.*

In any case, a DRC is a committee and not an actual implementation agency. Accordingly, DRCs shall have professional staff come under the DREs to serve as support staff. In this regard, the ISG recommended in 6.4.3 of its report that the minimum core staff of a DRC consist of the following personnel:

- (1) One DRE
- (2) One DRE assistant
- (3) One road inspector per constituency in each district
- (4) Two secretaries
- (5) Two accountants
- (6) Four sub-ordinate staff

The number of engineers and support staff could be decided by the chairperson in each DRC based on the amount of work in a district.

- (1) The role of a technical section: Compile data related to roads managed by a DRC, file annual work plans, record the amount of funding and its disbursement, etc.
- (2) The role of a financial section: Compile budgetary data and its disbursement records, etc.
- (3) The role of auditing section: Check the disbursement data for each DRC report and file them.

The proposed organizational chart for DRCs is presented in Figure 7.3.3.

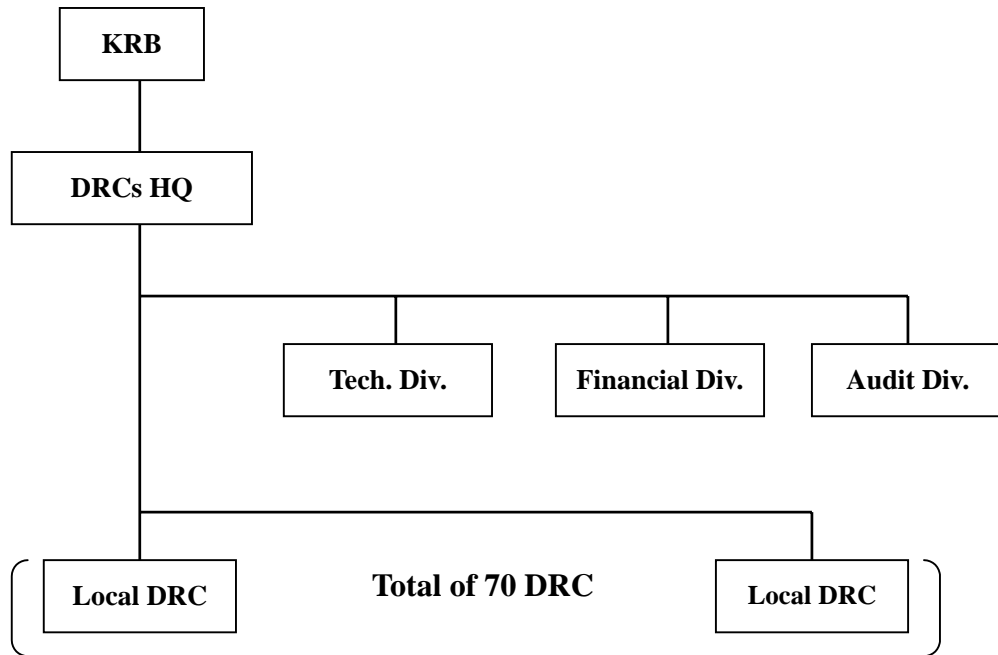


Figure 7.3.3 DRC Organizational Chart

### 7.3.4 KWS & Other Road Agencies

As previously mentioned, the road maintenance units of KWS, MOLG, FD, etc. will be entrusted with roads that naturally come under their purview by the MORPW and DRCs. Figure 7.3.4 shows the proposed organizational chart for this setup.

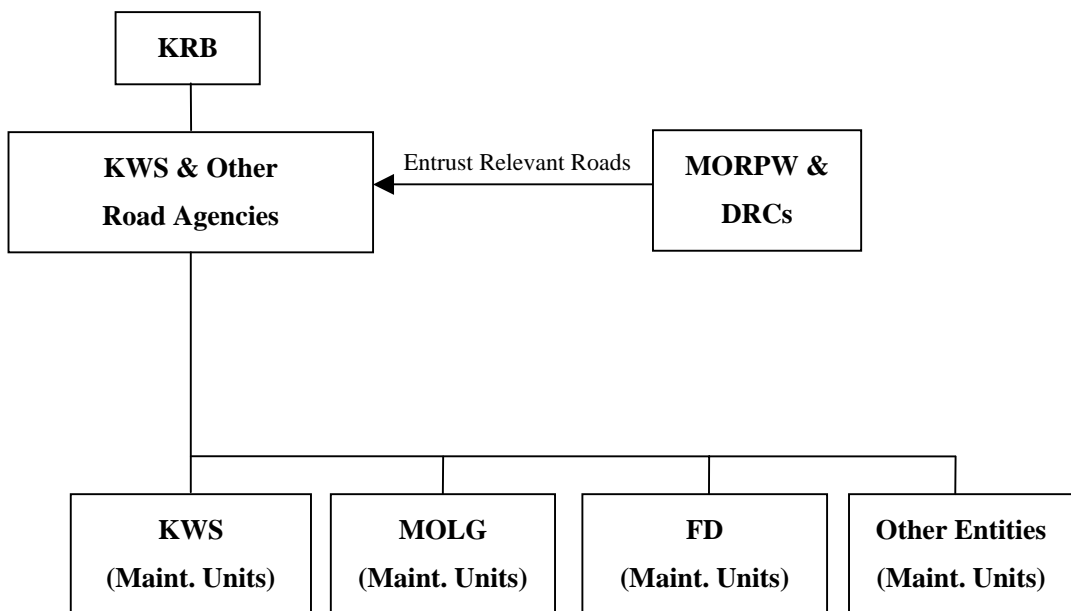


Figure 7.3.4 Organizational Chart for KWS & Other Road Agencies

## **7.4 Relationship between KRB and the Road Agencies**

### **7.4.1 General**

Until the KRB Act, RD had been in charge of managing the classified road network, while the local authorities under the MOLG were in charge of maintaining the unclassified road network. With the passage of the Act, the role of the local authorities, as well as who would manage the CESS and LATF, became unclear. Furthermore, the Act did not sufficiently define and specify the status of DRCs or define the portions of the road network that each road agency would be responsible for. Accordingly, it is important that KRB take the initiative to rectify any shortcomings that arise from the Act in order to make the new road maintenance system fully operational.

Below, the major items requiring resolution to realize the KRB in its entirety are discussed.

### **7.4.2 Relationship with MORPW**

KRB has the status of being a government entity and it has been temporally positioned under MORPW. Therefore, KRB has a duty to also report and make recommendations to the Minister of MORPW.

It was recommended by the ISG that RD under the KRB system manage Class A, B and C roads, which comprise the international and/ national trunk road network. On the other hand, RD had until now been managing the entire classified road network, which includes Class D and E roads and SPRs in addition to the Class A, B, and C roads. The ISG recommendation is quite reasonable, but the existing capacity of RD greatly exceeds the demands of its new responsibilities. That is, the current total length of classified road is 63,942 km, while the length of Class A through C roads is only 14,322 km. This means that RD is only responsible for about 22% of its previous workload. Accordingly, it is necessary that RD be restructured and simplified from a district-based to a region-based organization. In this regard, staff and equipment presently held by DWOs shall be re-organized, transferred, or seconded to roads agencies or maintenance offices.

### **7.4.3 Relationship with MOLG**

There is no direct relationship between the KRB and MOLG under the Act. However, coordination should be considered regarding the treatment of CESS and LATF, road sub-agencies, etc.

If DRCs have to manage the unclassified road network, as well as Class D and E roads and SPRs, some monies from the CESS should be allocated to the DRCs to ensure the adequate maintenance of rural roads (especially, the crucial farm-to-market roads). This is reasonable given that the precise purpose of the CESS is to maintain roads connecting agricultural producing areas.

Although the LATF can be used for an array of needs, it has been used in the past to also repair both urban and rural unclassified roads by the local authorities. Accordingly, coordination between the KRB and the MOLG, regarding the use of these funds for road maintenance, would be beneficial for both parties.

Finally, rights-of-way and the authority to manage road maintenance on-site need to be clarified among the KRB, DRCs, and local authorities before DRCs become fully operational.

### **7.4.4 KWS**

KWS is a little different from the other road agencies in regards to funding and its obligations as a road agency. KWS can collect fees and/or charges from visitors and disburse these funds for road maintenance, which is similar to a private business enterprise. Another thing to note is that the Act does not specify the allocation of funds from the KRB as in the case of the DRCs. Some KWS officials are highly concerned about this point. Likewise, the relationship with KRB is also not completely clear.

## 7.5 Road Maintenance System Setup

### 7.5.1 Planning

#### (1) General

To plan road maintenance works, the following procedure is generally adopted.

- (1) Confirm the amount of funding available.
- (2) After confirmation of fund availability, draw up actual work plans based on updated road inspection data, the availability of equipment and workers, etc.
- (3) Allocate the available funds for repair work, annual routine maintenance, periodic maintenance, etc.

In general, updated road inventory data is the key for drawing up maintenance programs. That is, based on recent inspection data, road segments where maintenance works are needed are selected and then the necessary costs for execution estimated. The details of the work procedure for routine maintenance works are listed as follows:

- (1) Conduct visual inspections of the road condition and note the location for work needed.  
For this purpose, referring to a vehicle or motorcycle's odometer is useful.
- (2) List up necessary work content by segment and estimate work costs.
- (3) Check the availability of funds and decide work priority.
- (4) Check on the availability of labor, tools, and equipment.
- (5) Compare the total costs for force-account or contract-out and decide the execution method
- (6) Execute
- (7) Monitoring and evaluate work accomplished with work planned.
- (8) Report and file.

A sample of a road **inspection sheet** is shown in Figure 7.5.1. (The formatting of this sheet, etc., shall be in line with KRB recommendations contained in 7.8 (7)). A visual data sheet is quite convenient for selecting road segments where repair or maintenance work is needed.

The procedure for determining the annual maintenance program is as shown in Table 7.5.1. This is a sample that clearly illustrates the constraints faced by work due to funding availability. Work will then be prioritized by the engineer in accordance with the degree of road deterioration, the importance of a particular road's serviceability, etc.

Name of Road:

Code Number:

District:

Province:

Kilometerage: km - km

Name of Inspector:

Position:

Date:

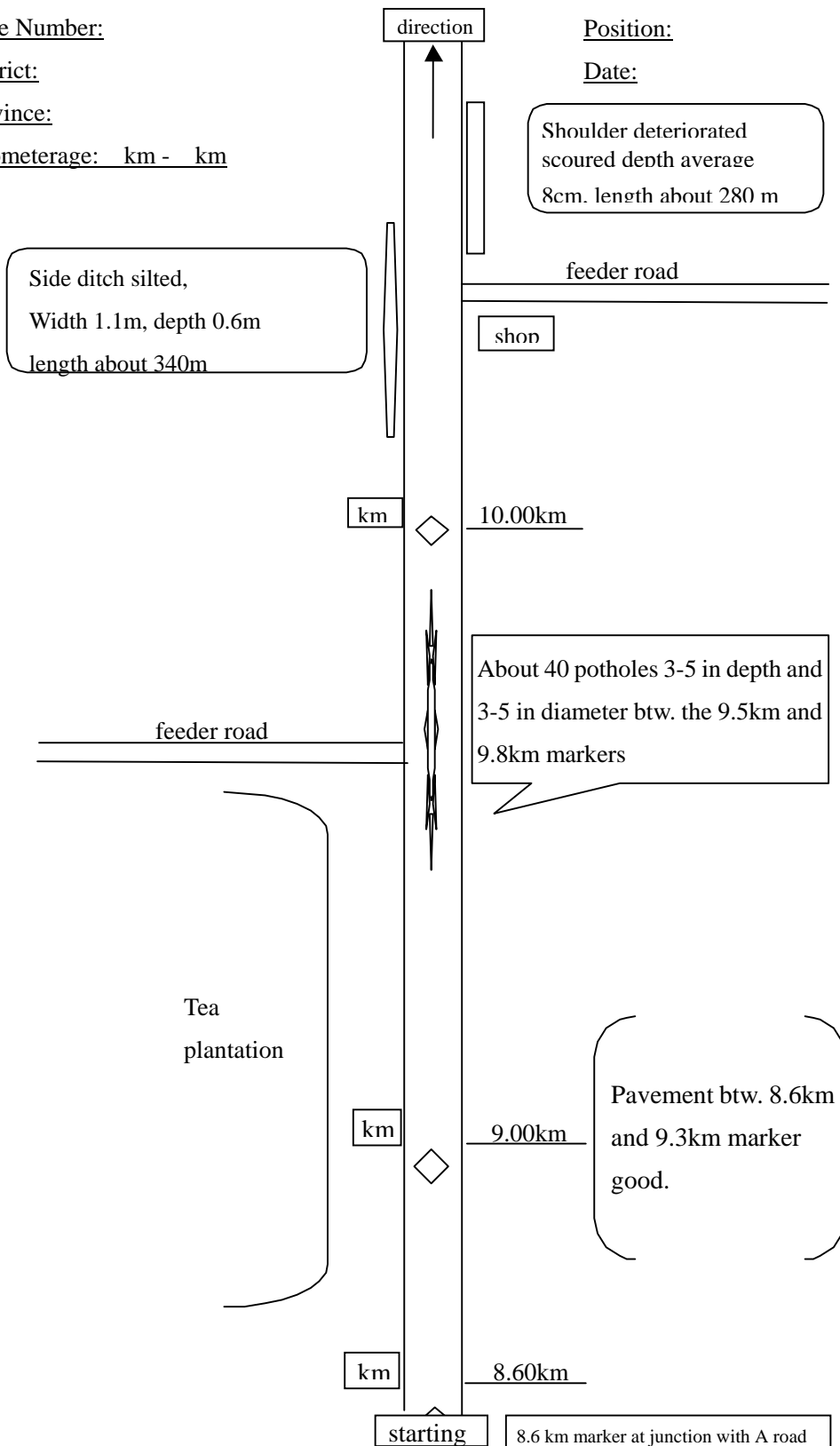


Figure 7.5.1 Road Inspection Sheet (Sample)

Table 7.5.1 Work Program Sheet

| Name of Road | Code No. | Work Contents  | Quantity | Unit           | Rate                 | Estimated | Accumulated | Priority | Work No. |
|--------------|----------|----------------|----------|----------------|----------------------|-----------|-------------|----------|----------|
| AAAAA        | XXXXXX   | Patching       | aaa      | m <sup>2</sup> |                      | 459,222   | 459,222     | 1        | }        |
|              |          | Bush clearing  | bbb      | m <sup>2</sup> |                      | 23,500    | 1,445,432   | 4        |          |
|              |          | Ditch clearing | ccc      | m              |                      | 22,000    | 1,443,932   | 3        |          |
| BBBBB        | YYYYY    | Patching       | ddd      | m <sup>2</sup> |                      | 482,650   | 1,926,082   | 5        |          |
|              |          |                |          |                |                      |           |             |          |          |
| CCCCC        | ZZZZZ    | Patching       | eee      | m <sup>2</sup> |                      | 332,255   | 1,441,932   | 2        | }        |
|              |          |                |          |                |                      |           |             |          |          |
| Budget Line  |          |                |          |                |                      |           |             |          |          |
|              |          |                |          |                | Work not implemented |           |             | 6<br>7   | }        |
|              |          |                |          |                |                      |           |             |          |          |



## **(2) Routine Maintenance**

The annual maintenance program shall be submitted to KRB for approval at least six months prior to the next fiscal year as defined in Section 19 (2) of the Act. This means that road inspection should be carried out before the end of the calendar year. However, since the rainy season usually comes in the months of April and/or May, the damage that might be caused by heavy rain cannot be predicted at the time of the preparation of the annual maintenance plans. Therefore, a reserve or contingency should be set a side for this purpose in the annual programs.

At present, most of the KRB fund comes from road-user contributions via the fuel levy. This means that priority in the usage of KRB funds should be given to roads with high traffic volumes, meaning basically the national trunk road network and major feeder road network. On the other hand, funds from the CESS and LATF should be used for the unclassified road network, with the CESS focusing on the financing of farm-to-market roads. Priority here should be based not on traffic volume only, but on the importance of providing access to facilities to encourage socio-economic development.

## **(3) Repair Works**

There are two types of repair work: annually programmed work and emergency work. Road segments where repair work is needed but left undone because of funding constraints shall be given priority in the following year's program. The planning procedure is similar to that explained in Clause (a).

On the other hand, urgent repair work, because of the danger or importance of the road involved, shall be executed as soon as possible taking into consideration site conditions. To satisfy this requirement, reserves of money should be kept on hand to ensure that damaged road segments are not left un-repaired for long periods of time. This is especially important in the case of disasters and emergencies.

## **(4) Periodic Maintenance**

Periodic road maintenance is of course important as one type of road maintenance. However, the costs for periodic maintenance work are almost the same as road rehabilitation work. Accordingly, periodic maintenance is usually carried out based on medium- or long-term road maintenance plans.

Carrying out periodic maintenance annually on a segment basis is un-economical because of the equipment mobilization, etc., required. It is suggested then that periodic maintenance be executed every several years for a large number of road segments.

## **7.5.2 Work Execution**

### **(1) General**

Routine maintenance and partial repair work could be pre-arranged under the annual programs based on the inventory and inspection data.

The government of Kenya adopted “the Roads 2000 Program” as its basic policy for road maintenance works and a “Roads 2000 Work Manual” was drafted in January 1996. The manual describes technical operation procedures, the responsibility of engineers and workers, organization for execution, etc. On the other hand, this manual and others like it have not been used much. The reasons for this are unclear, but it is important that the KRB establish a standard and enforce it.

### **(2) Main Works and Procedures**

Road maintenance and repair works are generally carried out via the following procedures described hereunder.

#### **i) Routine maintenance**

The works and procedures for routine maintenance are as listed hereunder.

- 1) Confirm the road conditions with inventory and inspection data.
- 2) Select the segments and determine the work contents.
- 3) Estimate the direct and administrative costs of maintenance work.
- 4) Listing and prioritize works and confirm availability of funds.
- 5) Draw up implementation plan.
- 6) Obtain approval for work plans.
- 7) Carry out bidding or give the order for force-account work.
- 8) Execute
- 9) Monitor, inspect, and evaluate work performance.
- 10) Record, report, and file results.

ii) Periodic Maintenance

Periodic road maintenance, in engineering terms, is categorized as a maintenance activity but is significantly different from routine maintenance. The work content of periodic maintenance consists of such activities as resealing of paved road, re-gravelling of gravel roads, etc. The cost per unit length of road for periodic maintenance is usually several times that of the costs of routine maintenance work. Accordingly, securing the funds for periodic maintenance is an important issue.

Planning periodic maintenance, such as the resealing or overlaying of a paved road, is done using data obtained from on-site tests such as surface deflection tests, CBR tests, etc. It should also be mentioned that in the case of periodic maintenance, it is usually uneconomic to execute work over short sections, meaning that large-scale contracts are preferable for cost-efficiency reasons.

iii) Urgent Maintenance (urgent repair works)

Urgent repair works means that it is absolutely essential to repair a road segment, due usually to damage inflicted by bad weather or some other disaster, without which the roads are impassable or extremely dangerous.

This work cannot be pre-planned because of its random character, so immediate on-site inspection by an engineer and the calling in of contractors to execute the necessary work immediately is executed as described below.

- 1) On-site inspection by the engineer
- 2) Schematic design of repair work
- 3) Rough cost estimate
- 4) Confirmation of availability of funding
- 5) Approval of works
- 6) Invitation to suitable contractors and confirmation of work procedures
- 7) Execution using private contractors and /or force-account labor
- 8) Supervision and recording
- 9) Reporting and filing of results

### **(3) Selection of Execution Method**

Until recent times, routine maintenance works for roads were generally executed by force account in Kenya. However, owing to mostly to reasons of cost-effectiveness, the force-account method is gradually being phased out in favor of contracting out to private contractors. Indeed,

most routine maintenance works are nowadays contracted out.

#### (4) Selection of Contractor

As for the selection of a road maintenance work method, the most essential factor is cost effectiveness. On the other hand, poverty reduction is also an important policy of the Government. Therefore, manual labor, especially in rural areas, shall be utilized for roads work whenever possible, as long as it is cost-effective.

However, there are not enough contractors at present, especially in rural areas. Thus, such measures as giving incentives to attract people and businesses to become contractors should be taken by KRB to increase the number of petty contractors across the country. Instead of employing permanent force-account labor, road agencies can utilize private petty labor when and as they see fit to meet their maintenance needs, reducing direct costs as well as overhead.

One way to increase the number of petty contractors would be to join several lengthmen together. They then could share tools and equipment. Then, once the petty contractors are sufficiently strong, they could become small-scale or medium-scale contractors.

Lengthmen, petty contractors, and medium-scale contractors might be suitable for the works shown in the table below.

**Table 7.5.2 Works and Type of Contractor for Routine Maintenance**

| CATEGORIES          | EARTH ROAD | GRAVEL ROAD | PAVED ROAD |
|---------------------|------------|-------------|------------|
| Bush cleaning       | l-m, p-c   | l-m, p-c    | l-m, p-c   |
| Ditch cleaning      | l-m, p-c   | l-m, p-c    | l-m, p-c   |
| Culvert cleaning    | l-m, p-c   | l-m, p-c    | l-m, p-c   |
| Fill and compact    | p-c        | p-c         | p-c        |
| Street cleaning     | p-c        | p-c         | p-c        |
| Pot-hole patching   | p-c        | p-c         | p-c        |
| Shoulder reshaping  | p-c, s-c   | p-c, m-c    | p-c, s-c   |
| Road marking        | ***        | ***         | s-c        |
| Repair of structure | s-c        | s-c         | s-c        |

**Note:** l-m: lengthman method, p-c: petty contractor; s-c: small-scale contractor

**Lengthman:** yearly contract with monthly payments, maximum work area of 5 km.

**Petty contractor:** yearly contract with monthly payments, maximum work area less than 100 km.

**Small-scale contractor:** contract by bidding, work area defined by contract.

To foster the growth of petty contractors, some incentives, such as advance payment (for example, 20 % of the contract amount), fair wage rate, regular monthly payments, leasing system for necessary tools and light equipment, need to be given. Advance payments can be recouped by deducting from monthly payments.

### **(5) Contract Types**

There are several types of contracts, such as the “Daily Fixed-Rate Contract”, “Cost Reimbursement Contract”, “Lump-Sum Contract”, and “Performance-Based Contract”. Depending on the work conditions and the volume of work being carried out, the most suitable type of contract should be chosen.

### **(6) Work Procedure and Bidding**

Based on the work plan approved by KRB, the road agency shall prepare bid documents (including drawings, bills of quantity, and specifications). An advertisement will invite interested contractors and the pre-qualifications shall be carried out and evaluated. Qualified contractors, a minimum of five to seven, shall be called for a pre-bid conference and given documents describing the work contents, time schedule, etc. After bidding and the award of the contract is decided, the notice to proceed shall be given to the awarded contractor and he shall submit a work implementation plan describing key staff, list of equipment, location of work offices, work schedule, etc. After approval of the implementation plan, the contractor shall commence work. The general procedure for road works on a contract basis is described below and illustrated in Figure 7.5.3.

- 1) Road maintenance work plan is drawn up by a road agency and approved by KRB.
- 2) After KRB'S approval, the road agency advertises the project in the press for interested contractors. Interested contractors submit their pre-qualification documents for evaluation.
- 3) The road agency evaluates the PQ-documents and decides on a short-list of contractors (i.e., 5 to 7 firms).
- 4) After short-listed contractors are approved by KRB, the road agency invites the contractors to a pre-bid conference.
- 5) Bid documents are generally sealed until the bid envelope is opened. After the confirmation of the bidders' qualifications, the sealed documents are opened by the road agency.
- 6) After the confirmation of the correctness of the bidding documents, bids are disclosed to all the bidders.
- 7) The lowest bidder will be awarded the contract provided that the bid documents are properly

- and correctly prepared by the bidder in accordance with the bidding conditions.
- 8) The bid results are evaluated and after KRB's concurrence, the road agency contracts with the awarded firm.
  - 9) After the contract documents come legally into force, the contractor shall submit his acceptance to the road agency. After this, the road agency issues the notice to proceed.
  - 10) The awarded contractor implements the work program and continues until completion, which is then checked by the road agency for adherence to work specifications.

In the case of a small contract, some processes such as advertising, PQ, pre-bid conferences, and detailed bid evaluations might be simplified and/or eliminated for the convenience of the road agency and contractors.

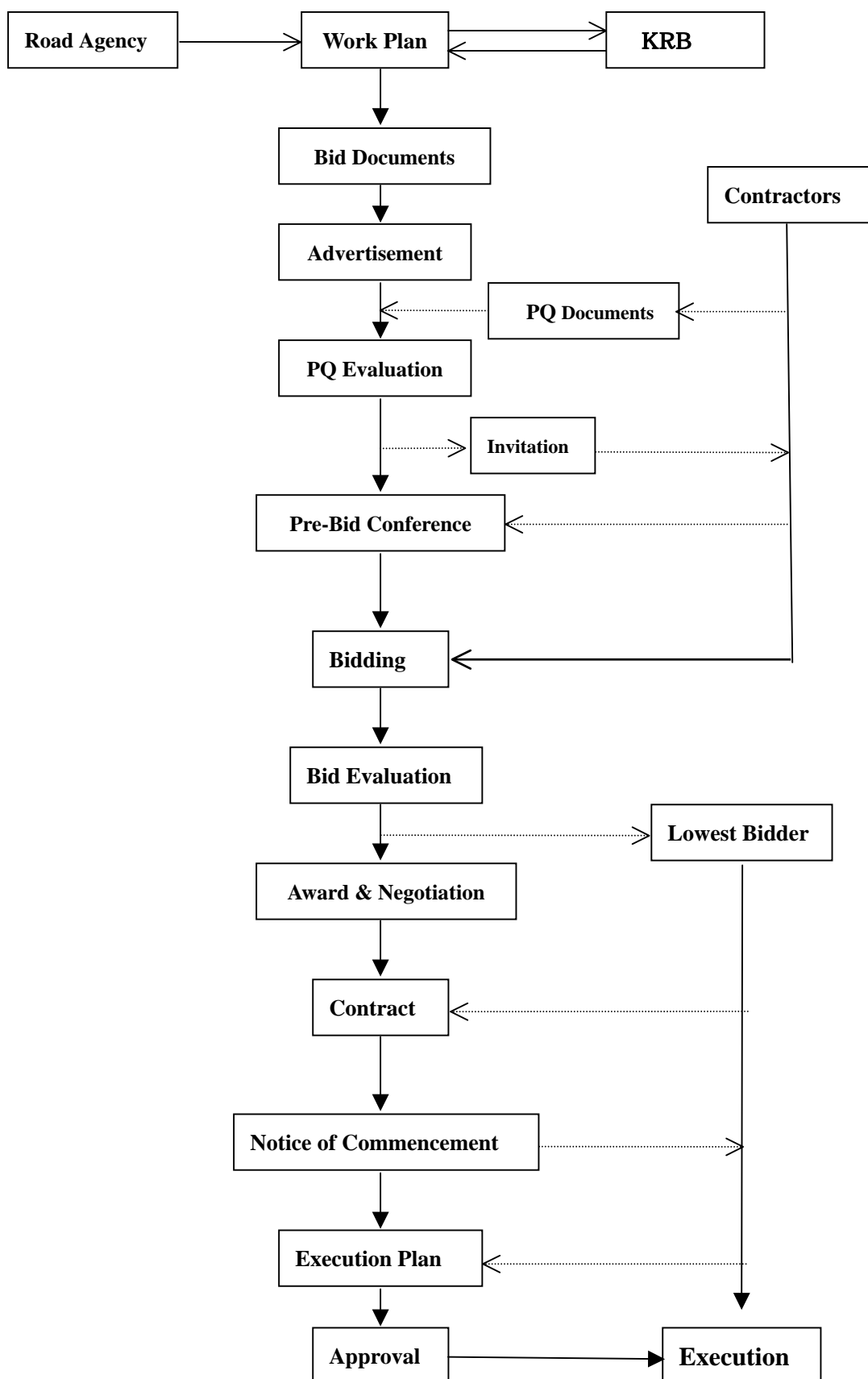
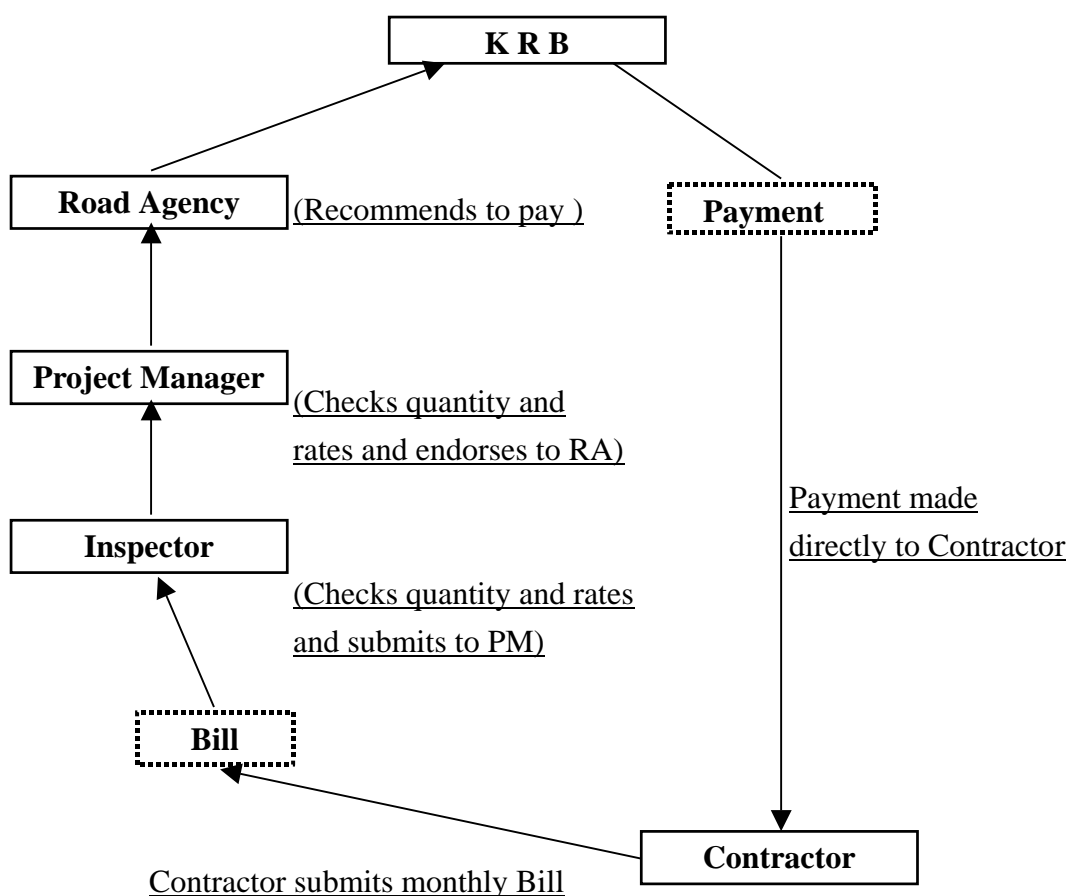


Figure 7.5.3 Typical Work Process on a Contract-out Basis

**(7) Payment Method**

The general payment process from the client to the contractor is as presented in Figure 7.5.4. Inspectors shall carefully check monthly work accomplished. After confirmation, the bill for payment shall be forwarded to the KRB through the inspectors, project managers or road agency head. Finally, the check shall be endorsed by KRB for payment, and the Finance Division of KRB shall make direct payment to the contractor and is not to go through any intermediaries. The important thing is quick action and no delay in payment to contractors.

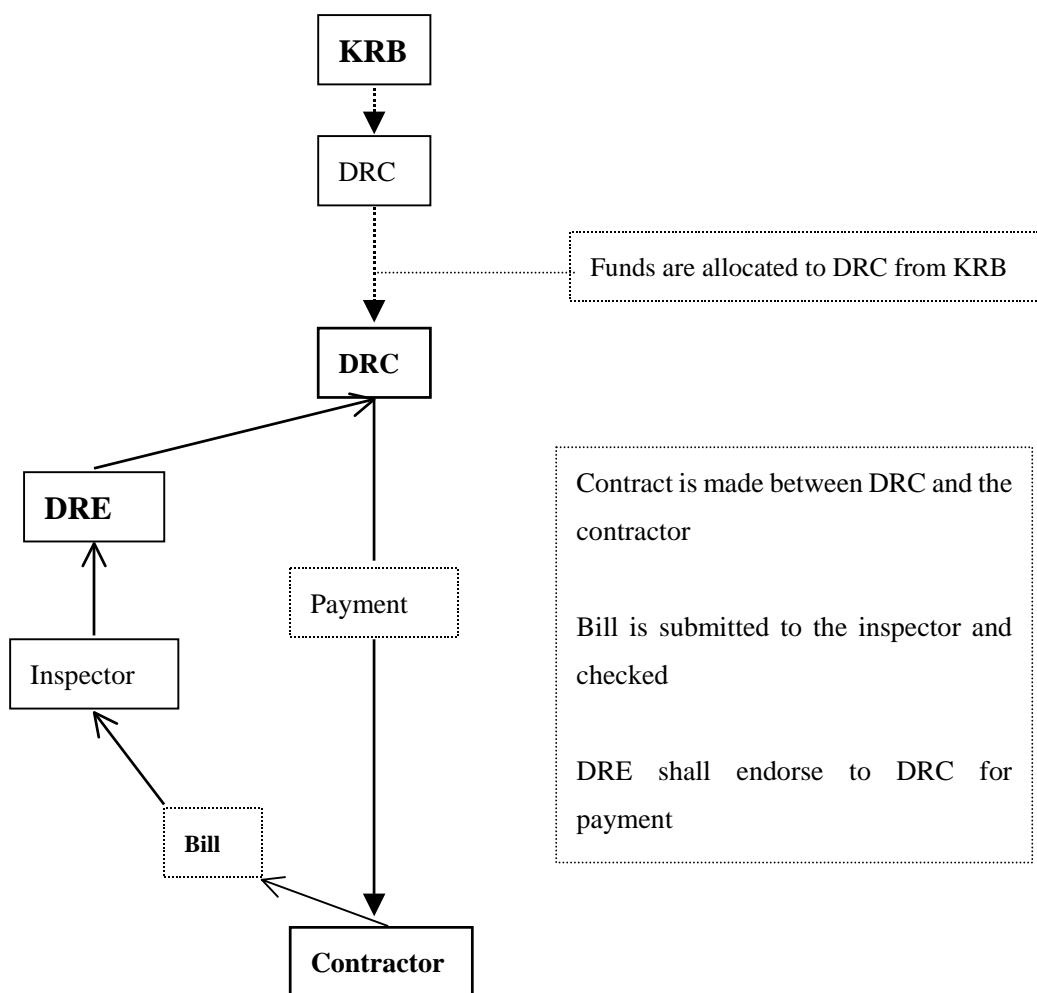


**Figure 7.5.4 Billing and Payment Process**  
(For RD and Large contracts)

The above basic payment flow cannot be applied to all contracts, since the amount of work involved would be impossible for KRB to handle. Therefore, a simplified method shall be introduced. There will be many contracts at the DRC level, and the vast majority of these will probably be rather small. Accordingly, KRB shall empower DRCs to manage these small (petty)

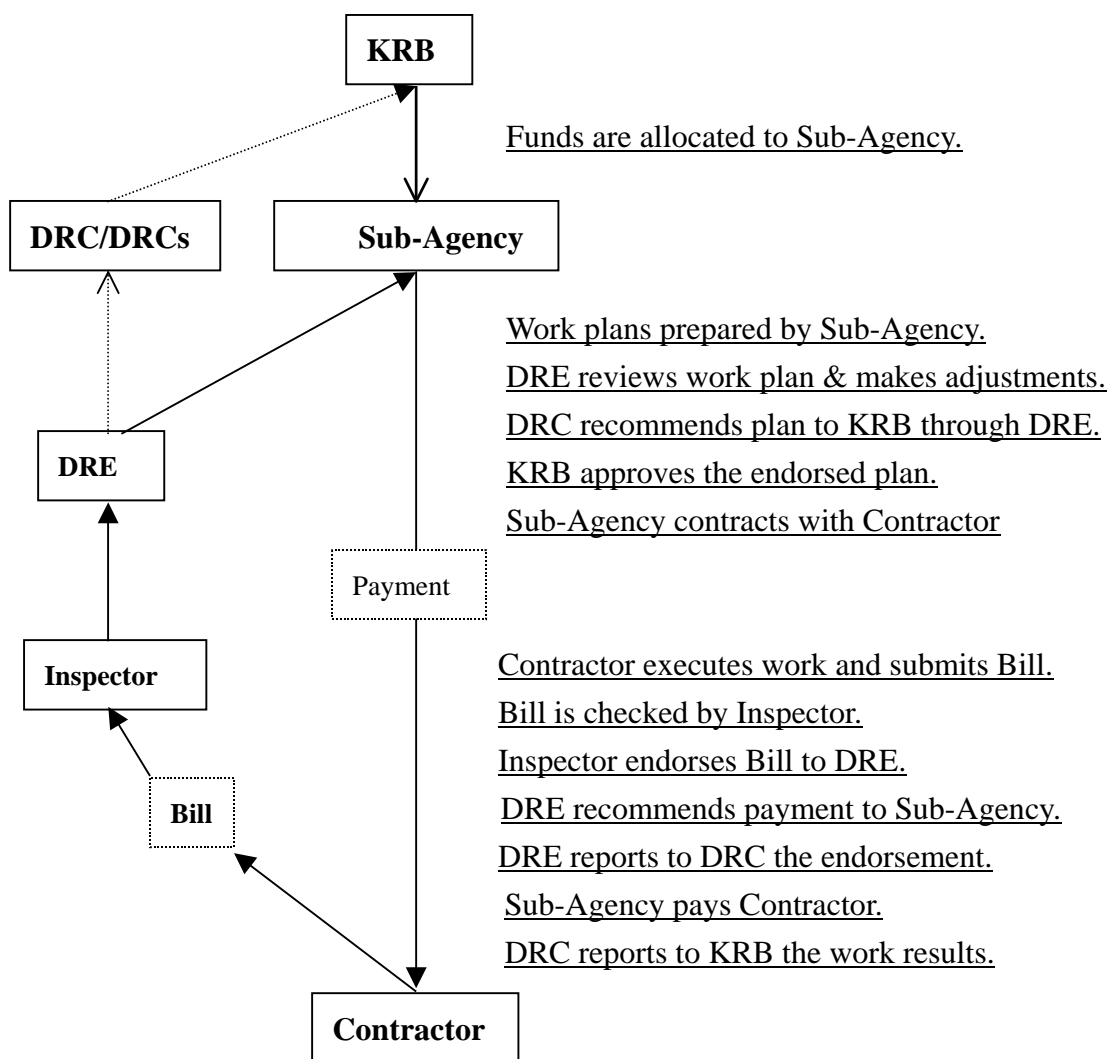


contracts and payments after becoming legal road agencies in the future. A petty contract will be defined via some arbitrary ceiling (e.g., Ksh. 30 million). Any project that exceeds this ceiling shall be directly managed by the KRB. Figure 7.5.5 (1) shows the payment procedure for petty contracts under the control of the DRCs.



**Figure 7.5.5 (1) Payment Procedure under DRCs**

Until the DRCs are legally recognized road implementation agencies, a sub-agency system will be adopted. In this case, DRCs do not manage the works, make contracts, or disburse payments. A DRC is allowed only to evaluate work plans, monitor execution, check invoices, and endorse invoices to sub-agencies. In this case, the payment procedure is as shown in Figure 7.5.5 (2).



**Figure 7.5.5 (2) Payment Procedure under Sub-Agencies**

### 7.5.3 Supervising and Monitoring

#### (1) Supervision

Regarding the execution of road maintenance works, there are many steps to supervise, such as the planning stage, execution stage, and evaluation stage. Technical aspects, cost, and quality are important matters requiring supervising. The engineer is responsible for supervising the following work.

(i) Planning Stage

The major works in the planning stage are as listed below.

- (a) Road inventory
- (b) Reconfirmation of inventory date via road inspection
- (c) Determination of the work priority
- (d) Estimation of the work costs
- (e) Identification of priorities
- (f) Establishment of work program and time schedule

(ii) Execution Stage

- (g) Monitoring and work inspection.

(iii) Evaluation Stage

- (h) Checking actual work accomplishments
- (i) Evaluation of results
- (j) Internal audit

Concerning the specifications of road maintenance works, it would be desirable for KRB to establish “**standard specifications**” to define the road maintenance activities together with the measurement method, tolerance and payment mode. At present, these specifications seem to be unavailable in MORPW and MOLG, except for design specifications. Many work manuals and handbooks are available, but no standard specification for road maintenance works is available. Without specifications, the proper inspection and/or supervision cannot be executed.

## **(2) Monitoring**

All activities concerning road maintenance works, such as work execution, site inspection, and material testing, shall be strictly monitored by an engineer or designated official. This is important to ensure the quality of maintenance works. The engineer and/or designated official shall be experienced enough to judge the appropriateness of the work executed in order carry out the monitoring properly.

The quality of materials used for maintenance works shall be confirmed via material tests during the inspection of work execution.

## 7.5.4 Evaluation and Auditing

### (1) General

Evaluation will be carried out by comparing actual work accomplished with work planned as specified in the contract (e.g., work specifications, bill of quantities, time schedule, etc). Furthermore, the contractor's execution process and worker behavior will also be evaluated in terms of whether there have been any accidents, damage to third parties, the responses for avoiding damages, etc.

A fair evaluation is important for road agencies in order to obtain the trust of contractors. Disclosing evaluation results to contractors will also induce competitiveness among them as well, which will result in better quality work and more efficient use of funds. The results of the annual performance of road agencies should also be disclosed openly to foster competition among agencies to ensure that the Kenyan public is getting value for their money.

Taking into consideration the limited number of engineers and staff that DRC possesses, it is recommended that KRB guide DRC in the utilization of **private consultants** on a contractual basis for site inspection, monitoring, supervision, etc. Once consultants develop the skills necessary for these works, DRC will be able to employ them at any time when needed. This means that the cost for supervisory work and other tasks could be greatly reduced as compared to employing permanent engineers and officials for this purpose. Of course, the availability of local consultants is limited in number at present, but by giving a chance to the existing consultants it may induce more newcomers in this field. The reference data related to this system is detailed in the report "Road Sector Institutional Study, Final Report", which was prepared by the consultant "bmb" and submitted to MORPW in April 1999.

### (2) Evaluation

The evaluation of the work performed and accomplished is an important activity relating to the usage of funds. Both financial and technical aspects shall be carefully evaluated. All work contents, quantities and costs shall be inspected and checked by supervisors, comparing the actual work accomplished with the work planned. This will be the basis for evaluation.

### **(3) Auditing**

Auditing is usually carried out upon completion of work or after a fiscal year is over. The work of inspection and auditing are quite similar but the frequency for execution different. There are usually two kinds of auditing: internal and external. An internal audit means that a road agency conducts by itself a check of all its disbursements, which is then counterchecked by the KRB. An external audit means that usually the Controller and Auditor General will check on all procurements and work execution carried out by government units, of which the KRB is one.

The results of audits shall be properly compiled and submitted to the Board for approval.

### **7.5.5 Contract Documents**

#### **(1) General**

With the policy to move from Force Account to Contracting, in the long term, the majority of maintenance works will be procured by contracting. The process of procurement involves the whole process of publicizing the maintenance works, bidding and evaluation to select a suitable contractor to execute the works and providing the appropriate legal framework and technical specifications to ensure that the maintenance work can be done to the specified quality, at cost effective prices and at the appropriate time.

Where the private sector is relied upon to execute maintenance works, the bidding and contract documents are the foundation of the procurement process. In developing the bidding documents, the key issues are:

- Developing complete and concise instructions for bidders with the objective of attracting the highest quality and widest range of bidders
- Adopting the appropriate general conditions of contract
- Preparing special conditions of contract that are applicable to maintenance works as opposed to construction contracts
- Developing effective bills of quantities (or other form of measurement)
- Preparing and including technical specifications for maintenance activities
- Including measurement procedures and supervision instructions that avoid collusion and adversarial situations.
- Developing several types of contracts to encourage the capability of small/medium-scale contractors, especially labor-based / labor-based equipment-supported contractors. The

contracts should take account of the Contracting Policy in our report that is aimed at minimizing the administration for the road agencies.

It is strongly recommended that the KRB Secretariat must develop a procurement system such that a uniform procurement procedure can be used by all road agencies and sub-agencies across the country.

Table 7.5.3 shows an example of a full set of bidding documents.

**Table 7.5.3 Typical Example of Bidding Documents**

| Volume   | Section No | Title                                   |
|----------|------------|---|
| Volume 1 | Section 1  | • Invitation for Bids                   |
|          |            | • Instructions to Bidders               |
|          |            | • Bidding Data                          |
|          | Section 2  | • Conditions of particular Application  |
|          | Section 3  | • General Conditions of Contract        |
| Volume 2 | Section 4  | • Form of Bid                           |
|          |            | • Appendix to Bid                       |
|          |            | • Bid Security                          |
|          |            | • Schedules                             |
|          | Section 5  | • Bill of Quantities                    |
|          |            | • Sample Form of Agreement              |
|          |            | • Sample Performance Securities         |
|          |            | • Sample Advance Payment Bank Guarantee |
|          | Section 7  | • Drawings                              |
| Volume 3 |            | • Specifications                        |

Source: Road Maintenance, Work Procurement, Ghana Highway Authority, February 2001

## **(2) Available Documents**

During the course of our study, we have been provided with a number of documents that are either in use or in draft in readiness for use. Table 7.5.4 lists all the relevant documents. And title pages and tables of contents of these documents are attached in Appendix 7.6.1.

In addition to the documents listed in Table 7.5.4 , there is also the FIDIC Short Form of Contract, which is in use in some African countries.

The KRB Secretariat should review the above documents, with the help of contract specialists, to decide on the most appropriate documents for use in Kenya. It may also be necessary for the final documents to be reviewed by construction lawyers before being put into use. To assist in this task, the KRB may wish to refer to the following paper:

‘Technical Brief No 5, Contract Documents for Small Contracts in the Road Sector  
Published by the International Labor Organization (ILO)  
Advisory Support, Information Services, and Training (ASIST)  
Nairobi, Kenya’

This publication is reproduced from a paper prepared for the Seventh Regional Seminar for Labor-Based Practitioners held in Lusaka, Zambia in October 1999 and gives useful information and comparisons of documents prepared by FIDIC (short and long form), World Bank, NEC short contract and ICE Minor Works Contract.

**Table 7.5.4 Schedule of Available Contract Documents**

|    | <b>Source</b>                                       | <b>Title</b>  | <b>Comment</b>   |
|----|---|---|--|
| 1  | Ministry of Public Works and Housing                | Labor-Based Routine Maintenance 'Draft'                                 | Form of Agreement<br>Conditions of Contract<br>Bills of Quantities<br>Specifications<br>Schedule of Tools Supplied to the Contractor<br>Half Yearly Work Plan<br>Form of Performance Bond Guarantee  |
| 2  | Ministry of Roads and Public Works Roads Department | Labor-Based Routine Maintenance 'Draft'                                 | Updated version of 1   |
| 3  | Ministry of Local Government (KUTIP)                | Model Document<br>Routine Maintenance Contracts                         | Invitation for Bids<br>Instructions to Bidders<br>Draft Form of Agreement and Guarantees<br>Conditions of Contract<br>Specifications<br>List of Drawings<br>Bill of Quantities<br>Forms to be completed by Bidders                             |
| 4  | Ministry of Local Government (KUTIP)                | Model Document<br>Hire of Labor for Maintenance during the year         | Invitation to Tender<br>Form of Agreement<br>Conditions of Contract<br>Form of tender  |
| 5  | Ministry of Local Government (KUTIP)                | Model Document<br>Hire of Road Maintenance Equipment for the year       | Invitation to Tender<br>Conditions of Contract<br>Specifications<br>Form of Tender   |
| 6  | Ministry of Local Government (KUTIP)                | Model Document for Supply of Road Maintenance Materials for the year    | As 4   |
| 7  | Ministry of Local Government (KUTIP)                | Drawings  | Standard Detail drawings   |
| 8  | United Republic of Tanzania                         | Model Contract Document (for a Term Maintenance Contract)               | Form of Agreement<br>Conditions of Contract<br>Specifications<br>Drawings<br>Bill of Quantities  |
| 9  | World Bank  | Procurement of Works<br>Smaller Contracts<br>Standard Bidding Documents | Invitation for Bids<br>Instructions to Bidders<br>Forms of Bid<br>Qualification Information<br>Letter of Acceptance Agreement<br>Conditions of Contract<br>Contract Data<br>Specifications<br>Drawings<br>Bill of Quantities<br>Security Forms |
| 10 | Department of Feeder Roads, Ghana                   | Feeder Road Maintenance Contract Document                               | Articles of Agreement<br>Daywork Schedule<br>Price Adjustment Formulae   |



As the production of practical contract documents will be a very important element in the KRB process, **donor support for this review may be appropriate**. However, the World Bank has already funded the preparation of the model documents under KUTIP for MOLG.

The Department of Feeder Roads, Ghana has produced a set of Road Maintenance Operations Manuals to ensure that consistent procedures are used throughout the country. Their Maintenance Management Manual, which is one of the operations manuals, includes a set of Activity Specifications. There is a single A4 sheet activity specification for each maintenance activity. This covers:

- Description and Purpose
- Performance and Scheduling Considerations
- Typical Crew
- Approved Equipment
- Approved Material
- Approved Work Method
- Technical Specification
- Method of Measurement

The Operations Manuals should also be reviewed by KRB as these may prove to be very useful in Kenya. Following discussions in the Manuals Working Group, it was agreed that the Activity Specifications would be very useful for Kenya and these will be included in the Maintenance Manuals.

## **7.5.6 Maintenance Equipment**

### **(1) Institutional and Organizational Set-up for MTD**

Existing road maintenance agencies (such as the Roads Department and KWS) under the KRB system already have equipped administrative offices, workshops, and staff for the management of equipment. The District Roads Committees (DRCs), on the other hand, are new and therefore should consider how to obtain the required equipment for their road maintenance needs. Furthermore, other roads agencies such as the Forest Department (FD) and Ministry of Local Government have all experienced the same problems regarding the management of equipment as stated in Chapter 3.

The Mechanical and Transport Department (MTD) possesses the biggest potential for providing equipment services in Kenya. However, the MTD also faces serious problems due to a lack of funding, which has resulted in a decrease in the quality of the services that MTD provides. At present, it is impossible for MTD to meet all of the demands of users (note: RD is by far MTD's biggest customer). Below, the Study puts forth a proposal to improve this situation.

### **(2) Proposal**

It is proposed that the MTD be commercialized and reorganized into an autonomous organization under the MORPW during a transition period of three years. After that, based on the performance of the MTD during that period, the privatization of MTD into a completely independent entity can be considered. Details on the actions that should be taken during the transition period are described below.

#### **1) Retrenchment of the MTD**

At present, MTD provides services to 3325 pieces of equipment. It has been estimated, on the other hand, that the desirable amount of equipment needed for providing the most efficient service (i.e., the Desirable Case) is only 3066 pieces (see Table 3.6.8). Given that there is a huge gap between the cost needed for this desirable amount of equipment and the actual budget allocated, it is realistically impossible to sustain the Desirable Case. That is, the actual budget allocated (Ksh. 156,162,804) is only 5.8% of the cost of the Desirable Case (Ksh. 2,690,650,000). The Study proposes here that retrenchment of the MTD be carried out.

### **Retrenchment of Equipment**

In order to bridge the above-mentioned financial gap, the Study calculated trial estimates for reductions in the total number of pieces of equipment. The totals applied for these estimates are 2000, 1500, 1000, and 500. To work out the number of individual pieces of equipment by type for these revised totals, the following formula is used:

$$\text{Amt. of an equip. type for revised Desirable Case} = \text{Amt. of an equip. type for original Desirable Case} \times \frac{\text{New Total}}{3066}$$

The results of these calculations are as shown in Table 7.5.5.

**Table 7.5.5 Revision of Desirable Case Equipment Amounts**

| Item                       | Original desirable No. | Trial-2000 | Trial-1500 | Trial-1000 | Trial-500 |
|----------------------------|------------------------|------------|------------|------------|-----------|
| Flat bed                   | 97                     | 63         | 47         | 32         | 16        |
| Tipper truck               | 230                    | 150        | 113        | 75         | 38        |
| Agricultural tractor (4x2) | 404                    | 264        | 198        | 132        | 66        |
| Agricultural tractor (4x4) | 140                    | 91         | 68         | 46         | 23        |
| Supervision vehicle        | 388                    | 253        | 190        | 127        | 63        |
| Crawler tractor            | 45                     | 29         | 22         | 15         | 7         |
| Motor grader               | 248                    | 162        | 121        | 81         | 40        |
| Pedestrian roller          | 140                    | 91         | 68         | 46         | 23        |
| Steel wheeled roller       | 70                     | 46         | 34         | 23         | 11        |
| Pneumatic tyred roller     | 26                     | 17         | 13         | 8          | 4         |
| Bitumen distributor        | 26                     | 17         | 13         | 8          | 4         |
| Bitumen premix             | 8                      | 5          | 4          | 3          | 1         |
| Asphalt paver/finisher     | 4                      | 3          | 2          | 1          | 1         |
| Road marking machine       | 7                      | 5          | 3          | 2          | 1         |
| Concrete mixer             | 70                     | 46         | 34         | 23         | 11        |
| Generator                  | 70                     | 46         | 34         | 23         | 11        |
| Compressor                 | 18                     | 12         | 9          | 6          | 3         |
| Water tanker               | 70                     | 46         | 34         | 23         | 11        |
| Bitumen hand sprayer       | 70                     | 46         | 34         | 23         | 11        |
| Mechanical broom           | 27                     | 18         | 13         | 9          | 4         |
| Water trailer              | 70                     | 46         | 34         | 23         | 11        |
| Prime mover/Tractor        | 9                      | 6          | 4          | 3          | 1         |
| Towed trailer              | 431                    | 281        | 211        | 141        | 70        |
| Wheel loader               | 70                     | 46         | 34         | 23         | 11        |
| Excavator                  | 9                      | 6          | 4          | 3          | 1         |
| Fuel tanker                | 70                     | 46         | 34         | 23         | 11        |
| Towed roller               | 70                     | 46         | 34         | 23         | 11        |
| Water pump                 | 70                     | 46         | 34         | 23         | 11        |
| Mobile crane               | 3                      | 2          | 1          | 1          | 1         |
| Mobile workshop            | 70                     | 36         | 34         | 23         | 11        |
| Service vehicle            | 18                     | 12         | 9          | 6          | 3         |
| Heavy trailer              | 18                     | 12         | 9          | 6          | 3         |
| Total                      | 3066                   | 2000       | 1500       | 1000       | 500       |

The costs for the 3-year transition period are worked out by comparing the revised Desirable Case numbers and the sum of the pieces of equipment in a 'serviceable' and 'under-repair' status in Table 3.6.8.

In the case where

$$\text{revised desirable number} > \text{'serviceable'} + \text{'under repair'},$$

the number of additional pieces of equipment purchased will be as follows:

$$\text{new purchases} = \text{revised desirable number} - (\text{'serviceable'} + \text{'under repair'}).$$

On the other hand, in the case where

$$\text{revised desirable number} < \text{'serviceable'} + \text{'under repair'},$$

the purchase of additional items of equipment is not necessary.

Furthermore, when there is a positive value for

$$\text{surplus} = (\text{'serviceable'} + \text{'under repair'}) - \text{revised desirable number},$$

the excess can sold as surplus equipment. In this case, the unit values applied for sales are as shown below.

$$\text{'serviceable'}: (\text{unit cost of purchase}) \times 0.15$$

$$\text{'under repair'}: (\text{unit cost of purchase}) \times 0.075$$

'Unserviceable' equipment can also be sold as surplus equipment using the unit values shown in Table 3.6.6.

Regarding the purchasing of equipment, provision for replacement should be provided for. Therefore, the recommended amount that should be set aside annually is as follows:

$$\frac{\text{Revised Desirable No.} \times \text{Unit Costs to Obtain New Equipment (see Table 3.6.6)}}{15 \text{ years}}$$

This has been included as an undiscounted cost and all estimated costs are calculated using an inflation rate of 5% per year.

The purchase of new equipment and the rehabilitation of equipment 'under repair' are spread

over a 3-year period. The purchased/rehabilitated equipment is shifted to a 'serviceable' status in the next year and the unit costs for maintenance applied.

The results of the estimation process described above are summarized in Table 7.5.6 to 7.5.10 and a detailed breakdown is given in Appendix 7.7.1 to 7.7.4.

**Table 7.5.6 Estimated Expenses for 2000 Pieces of Equipment (unit: Ksh.)**

| Item                                   | Year 1        | Year 2        | Year 3        | Total         |
|--|---------------|---------------|---------------|---------------|
| Purchasing of Equipment                | 665,090,000   | 698,340,000   | 733,260,000   | 2,096,690,000 |
| Maintaining of Equipment               | 432,630,000   | 692,410,000   | 977,080,000   | 2,102,120,000 |
| Rehabilitation of Equipment            | 249,500,000   | 261,980,000   | 275,080,000   | 786,560,000   |
| Provision for Replacement of Equipment | 557,650,000   | 557,650,000   | 557,650,000   | 1,672,940,000 |
| Total                                  | 1,904,870,000 | 2,210,380,000 | 2,543,070,000 | 6,658,310,000 |

**Table 7.5.7 Estimated Expenses for 1500 Pieces of Equipment (unit: Ksh.)**

| Item                                   | Year 1        | Year 2        | Year 3        | Total         |
|--|---------------|---------------|---------------|---------------|
| Purchasing of Equipment                | 226,320,000   | 237,640,000   | 249,520,000   | 713,480,000   |
| Maintaining of Equipment               | 431,310,000   | 594,040,000   | 771,970,000   | 1,797,320,000 |
| Rehabilitation of Equipment            | 188,560,000   | 197,990,000   | 207,880,000   | 594,430,000   |
| Provision for Replacement of Equipment | 418,240,000   | 418,240,000   | 418,240,000   | 1,254,710,000 |
| Total                                  | 1,264,430,000 | 1,447,900,000 | 1,647,610,000 | 4,359,930,000 |

**Table 7.5.8 Estimated Expenses for 1000 Pieces of Equipment (unit: Ksh.)**

| Item                                   | Year 1      | Year 2      | Year 3        | Total         |
|--|-------------|-------------|---------------|---------------|
| Purchasing of Equipment                | 107,100,000 | 112,450,000 | 118,080,000   | 337,630,000   |
| Maintaining of Equipment               | 411,980,000 | 484,400,000 | 563,030,000   | 1,459,410,000 |
| Rehabilitation of Equipment            | 63,890,000  | 67,080,000  | 70,440,000    | 201,410,000   |
| Provision for Replacement of Equipment | 278,820,000 | 278,820,000 | 278,820,000   | 836,470,000   |
| Total                                  | 861,790,000 | 942,760,000 | 1,030,370,000 | 2,834,920,000 |

**Table 7.5.9 Estimated Expenses for 500 Pieces of Equipment (unit: Ksh.)**

| Item                                   | Year 1             | Year 2             | Year 3             | Total                |
|--|--------------------|--------------------|--------------------|----------------------|
| Purchasing of Equipment                | 41,180,000         | 43,240,000         | 45,400,000         | 129,820,000          |
| Maintaining of Equipment               | 249,430,000        | 270,980,000        | 294,060,000        | 814,470,000          |
| Rehabilitation of Equipment            | 6,020,000          | 6,320,000          | 6,630,000          | 18,970,000           |
| Provision for Replacement of Equipment | 139,410,000        | 139,410,000        | 139,410,000        | 418,240,000          |
| <b>Total</b>                           | <b>436,040,000</b> | <b>459,950,000</b> | <b>485,500,000</b> | <b>1,381,490,000</b> |

**Table 7.5.10 Comparison of Expenses for Different Equipment Totals (unit: Ksh.)**

| Pieces of Equipment                      | Year 1        | Year 2        | Year 3        | Total          | % (Trial /Original) |
|--|---------------|---------------|---------------|----------------|---------------------|
| Original Desirable Case<br>(3066 pieces) | 3,410,060,000 | 4,180,630,000 | 4,814,990,000 | 12,405,680,000 | 100.0               |
| 2000 pieces                              | 1,904,870,000 | 2,210,380,000 | 2,543,070,000 | 6,443,840,000  | 51.9                |
| 1500 pieces                              | 1,264,430,000 | 1,447,900,000 | 1,647,610,000 | 4,359,930,000  | 35.1                |
| 1000 pieces                              | 861,790,000   | 942,760,000   | 1,030,370,000 | 2,834,920,000  | 22.9                |
| 500 pieces                               | 436,040,000   | 459,950,000   | 485,500,000   | 1,381,490,000  | 11.1                |

From the comparison in Table 7.5.10, it can be seen that a reduction in the number of pieces of equipment is very effective for cost reduction. That is, a decrease in equipment to approximately 16% of the original (i.e., 3066 pieces/500 pieces), brought costs down to 11.1% of the original estimate.

In addition to carrying out trial cost estimates for reductions in the total amount of equipment, the value of sales of surplus equipment is also worked out as shown in Table 7.5.11, with a detailed breakdown contained in Appendix 7.7.1 to 7.7.4.

**Table 7.5.11 Estimated Value of Sales of Surplus Equipment (unit: Ksh.)**

| Pieces of Equipment    | Pieces of Equipment Sold |              |               | Total Value |
|------------------------|--------------------------|--------------|---------------|-------------|
|                        | Serviceable              | Under Repair | Unserviceable |             |
| Original (3066 pieces) | 0                        | 0            | 1773          | 187,650,000 |
| 2000 pieces            | 0                        | 144          | 1773          | 214,470,000 |
| 1500 pieces            | 5                        | 345          | 1773          | 274,120,000 |
| 1000 pieces            | 125                      | 571          | 1773          | 415,550,000 |
| 500 pieces             | 438                      | 661          | 1773          | 646,530,000 |

As a result of selling surplus equipment after retrenchment to 500 pieces of equipment, revenue of Ksh. 646,530,000 can be expected.

### **Retrenchment of Staff**

In fiscal year 2000, the amount requested for staff wages was Ksh. 277,603,234. On the other hand, only Ksh. 191,173,853 was actually allocated for this purpose. In addition to this, with the large retrenchment of equipment, many workshops in the provinces/districts can be abolished or merged with other workshops. Due to these reasons, a reduction in the number of staff will be necessary.

### **Establishment of Regional/Sub-regional Mechanical Workshops**

The current Provincial Mechanical Workshops (PMW) and District Mechanical Workshops (DMW) shall be replaced by Regional Mechanical Workshops (RMW) and Sub-regional Mechanical Workshops (SRMW). RMW shall be established at the same locations as the Regional Road Offices (RROs) of the Roads Department (RD) while RROs are proposed to establish on the basis of provincial headquarters, since it is expected that the RROs will be the prime clients of the MTD. Basically, a RMW shall handle 2 SRMWs in its jurisdiction.

Existing PMW equipment shall be transferred to the RMWs. Furthermore, SRMWs will come under the charge of the RMWs, and the existing equipment of DMWs will be transferred to SRMWs.

Due to this, the existing 70 DMWs shall be replaced by 16 - 20 SRMWs to achieve a highly effective cost reduction regarding workshop management.



## 2) Leasing Revenue

The leasing of equipment is the only permanent revenue source for the commercialized MTD. In recent years, however, MTD has received no revenue from this activity due mostly to non-payment. The Study estimated the potential leasing revenue using records from the PWOs/DWOs for fiscal year 2000. In this estimate, the lease rates proposed by MTD are applied (see Table 7.5.12). Some pieces of equipment have different capacities and are in varying condition. Consequently, the rate chargeable would vary based on these parameters. For simplicity, when preparing the estimate, these items have been lumped together and an average charge rate calculated. These rates include renewal, insurance, repair/maintenance, fuel, lubricant and overhead costs of 10%. The results of this estimate are summarized in Table 7.5.13 and a detailed breakdown attached in Appendix 7.7.5.

**Table 7.5.12 Proposed Leasing Rates (unit: Ksh.)**

| Item                       | unit | Renewal  | Insurance | Repair & Maintenance | Fuel     | Lubricant | Overhead (10%) | Total           |
|----------------------------|------|----------|-----------|----------------------|----------|-----------|----------------|-----------------|
| Flat bed                   | km   | 34.12    | 3.44      | 20.78                | 13.98    | 2.80      | 8.20           | <b>83.32</b>    |
| Tipper truck               | km   | 36.88    | 4.12      | 24.95                | 15.58    | 3.13      | 9.16           | <b>93.81</b>    |
| Agricultural tractor (4x2) | hr   | 375.70   | 34.85     | 205.00               | 315.00   | 63.00     | 113.74         | <b>1,107.29</b> |
| Agricultural tractor (4x4) | hr   | 516.85   | 51.80     | 308.83               | 441.00   | 88.20     | 154.65         | <b>1,561.32</b> |
| Supervision vehicle        | km   | 21.20    | 2.13      | 9.45                 | 7.78     | 1.56      | 4.84           | <b>46.95</b>    |
| Crawler tractor            | hr   | 2,627.62 | 330.12    | 2,040.00             | 1,562.40 | 312.44    | 705.28         | <b>7,577.86</b> |
| Motor grader               | hr   | 1,725.00 | 189.75    | 1,150.00             | 556.50   | 111.30    | 391.26         | <b>4,123.81</b> |
| Pedestrian roller          | hr   | 281.30   | 20.30     | 112.50               | 126.00   | 25.20     | 65.50          | <b>630.80</b>   |
| Steel wheel roller         | hr   | 1,218.80 | 134.10    | 812.50               | 504.00   | 100.80    | 295.00         | <b>3,065.20</b> |
| Pneumatic roller           | hr   | 1,218.80 | 134.10    | 812.80               | 504.00   | 100.80    | 295.00         | <b>3,065.50</b> |
| Bitumen distributor        | hr   |          |           |                      |          |           |                | <b>249.68</b>   |
| Bitumen premix             | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Asphalt paver/finisher     | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Road marking machine       | hr   | 171.40   | 18.90     | 114.30               | 0.00     | 30.00     | 43.70          | <b>378.30</b>   |
| Concrete mixer             | hr   | 102.40   | 8.30      | 47.25                | 136.50   | 27.30     | 42.98          | <b>364.73</b>   |
| Generator                  | hr   | 333.90   | 35.27     | 212.23               | 462.00   | 92.40     | 122.54         | <b>1,258.34</b> |
| Compressor                 | hr   | 412.75   | 38.40     | 225.82               | 168.00   | 33.60     | 96.87          | <b>975.44</b>   |
| Water tanker               | km   | 25.55    | 2.90      | 17.60                | 12.25    | 2.45      | 6.65           | <b>67.40</b>    |
| Bitumen hand sprayer       | hr   | 93.80    | 6.80      | 37.50                | 0.00     | 10.00     | 23.80          | <b>171.90</b>   |
| Mechanical broom           | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Water trailer              | hr   | 79.80    | 7.70      | 45.60                | 0.00     | 15.00     | 26.35          | <b>174.45</b>   |
| Tractor                    | hr   | 1,235.75 | 148.50    | 907.50               | 819.00   | 163.80    | 344.80         | <b>3,619.35</b> |
| Recovery vehicle           | hr   | 556.80   | 81.05     | 431.15               | 447.00   | 89.40     | 197.74         | <b>1,803.14</b> |
| Towed trailer              | km   | 15.60    | 1.80      | 11.20                | 0.00     | 5.00      | 5.93           | <b>39.53</b>    |
| Wheel loader               | hr   | 1,627.50 | 204.75    | 1,260.00             | 462.00   | 92.40     | 386.28         | <b>4,032.93</b> |
| Excavator                  | hr   | 1,627.50 | 204.75    | 1,260.00             | 462.00   | 92.40     | 386.28         | <b>4,032.93</b> |
| Fuel tanker                | km   | 25.60    | 2.90      | 17.60                | 12.25    | 2.45      | 6.40           | <b>67.20</b>    |
| Towed roller               | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Water pump                 | hr   | 23.00    | 1.80      | 10.00                | 104.00   | 20.80     | 15.96          | <b>175.56</b>   |
| Mobile crane               | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Mobile workshop            | hr   |          |           |                      |          |           |                | <b>290.85</b>   |
| Service vehicle            | hr   |          |           |                      |          |           |                | <b>N/A</b>      |
| Heavy trailer              | hr   |          |           |                      |          |           |                | <b>194.18</b>   |

Source: Chief Mechanical and Transport Engineer's Office

Note: N/A means rate was not available.

Proposed rates for Bitumen distributor, Mobile workshop and Heavy trailer were not available; therefore, the estimates for these items were worked out using current rates.

**Table 7.5.13 Summary of Estimated Revenue by Province  
for FY 2000 (unit: Ksh.)**

| Province      | Pcs. of Leased Equipment | Estimated Revenue |
|---------------|--------------------------|-------------------|
| Nairobi       | 13                       | 19,953,044        |
| Central       | 79                       | 79,246,804        |
| Coast         | 44                       | 15,420,599        |
| Eastern       | 34                       | 28,597,415        |
| North Eastern | 28                       | 36,332,177        |
| Western       | 35                       | 60,451,259        |
| Rift Valley   | 60                       | 82,183,946        |
| Nyanza        | 62                       | 200,287,864       |
| Total         | 355                      | 522,473,109       |

Note: 355 units were leased with a serviceable stock of 865 units.

According to Table 7.5.13, total revenue of approximately Ksh. 522,473,109 should be possible for the MTD to achieve with the Roads Department as its customer. Leasing to other users (e.g., KWS, local authorities, Forest Department, private firms, etc.) makes it possible to increase this amount in the future. Note that the establishment and enforcement of rates are crucial.

### 3) Action Plan

During the 3-year transition period of re-organization, the following actions below should be taken.

#### (i) Retrenchment of current equipment stock

The MTD should retrench their stock of equipment from 3066 to 500 pieces during this period. As a result of this action, costs due to the purchasing of new equipment and the maintaining of existing equipment can be reduced drastically. The 500 pieces of equipment should be capable of providing the levels of service required by users (i.e., the RD) if the availability rate is sufficiently high (e.g., only a total of 355 items of equipment were leased in fiscal year 2000).

#### (ii) Sales of surplus equipment items

According to the above estimates, revenue of Ksh. 646,530,000 can be expected from the sales of surplus equipment, which will improve the financial status of the MTD and tide it over as it reorganizes its operation along commercial lines.

#### (iii) Rationalization of staff

Staff costs should be cut by 50% of the current amount requested (Ksh. 277,603,234) during the transition period. Any revenue surpluses during the transition period should be used for

compensation of retrenched staff.

(iv) Establishment of Regional/Sub-regional Mechanical Workshops

It is recommended that nine Regional Mechanical Workshops (RMW) and 16-20 Sub-regional Mechanical Workshops be established. This will greatly reduce the costs for maintaining workshops.

(v) Commencement of leasing system

This is the only permanent revenue source of a commercialized MTD. Therefore, leasing rates should be established immediately and stringently enforced. RD will still be the biggest user in the future, but there are many other potential users as well (e.g., DRCs, KWS, Forest Department, local authorities, agricultural authorities, and private firms).

Based on the above recommended actions, the estimated expenses and revenue over the 3-year transition period for MTD are as listed in Table 7.5.14.

**Table 7.5.14 Estimated Expenses/Revenues of MTD in Transition Period (unit: Ksh.)**

| Expense/Revenues | Item                                | Year 1              | Year 2               | Year 3               | Total                |
|------------------|-------------------------------------|---------------------|----------------------|----------------------|----------------------|
| Expenses         | Administration                      | 208,202,426         | 166,561,940          | 138,801,617          | 513,565,983          |
|                  | Purchasing/Maintaining of Equipment | 436,040,000         | 459,950,000          | 485,500,000          | 1,381,490,000        |
|                  | Total                               | 644,242,426         | 626,511,940          | 624,301,617          | 1,895,055,983        |
| Revenues         | Sales of Surplus Equipment          | 646,530,000         | -                    | -                    | 646,530,000          |
|                  | Leasing Fee                         | -                   | 600,844,075          | 690,970,687          | 1,291,814,762        |
|                  | Total                               | 646,530,000         | 600,844,075          | 690,970,687          | 1,938,344,762        |
| <b>Balance</b>   |                                     | <b>(+)2,287,574</b> | <b>(-)25,667,865</b> | <b>(+)66,669,070</b> | <b>(+)43,288,779</b> |

According to Table 7.5.14, administration costs are estimated to be as follows:

Year 1: Ksh. 208,202,426 (75% of amount requested in FY 2000)

Year 2: Ksh. 166,561,940 (60% of amount requested in FY 2000)

Year 3: Ksh. 138,801,617 (50% of amount requested in FY 2000)

On the other hand, revenue from leasing in Year1 is zero, since it is assumed that it will take 6 months to establish leasing procedures and rates. The leasing system will therefore commence in

Year 2. For Year 2 and 3, the revenue from leasing fees is estimated as follows:

Year 2: Ksh. 600,844,075 (115% of original estimate)

Year 3: Ksh. 699,970,687 (115% of Year 2)

The extra 15% will come from leasing revenue to be obtained from non-Roads Department clients.

The total balance over the transition period is an estimated surplus of Ksh. 43,288,779. This balance should be used for compensation of retrenched staff and saved for the replacement cost of equipment.

After the transition period and the introduction and implementation of commercial practices (i.e., commercialization) to MTD, the possible privatization of the regional RMWs and district SRMWs will be considered. This will further promote a competitive environment and thereby improve the levels of service provided by MTD.

#### 4) Implementation Schedule for Transition Period

Based on the above recommended actions, a 3-year implementation schedule to re-organize MTD during the transition period is proposed as shown in Figure 7.5.6.

| Action                               | Jul. 2001 | Jul. 2002 | Jul. 2003 | Jul. 2004 |
|--------------------------------------|-----------|-----------|-----------|-----------|
|                                      |           | Year 1    | Year 2    | Year 3    |
| Purchase/Rehabilitate Equipment      |           | ←————→    |           |           |
| Sell Surplus Equipment               |           | ←————→    |           |           |
| Rationalize Staff                    |           | ←————→    |           |           |
| Establish RMWs/SRMWs                 |           | ←————→    |           |           |
| Establish Leasing Rates & Procedures |           | ←————→    |           |           |
| Commence Leasing                     |           | ▲         |           |           |
| Complete Re-organization             |           |           |           | ▲         |

**Figure 7.5.6 Re-organization Implementation Schedule during Transition Period**

### **(3) Set-up of Network for Equipment Services**

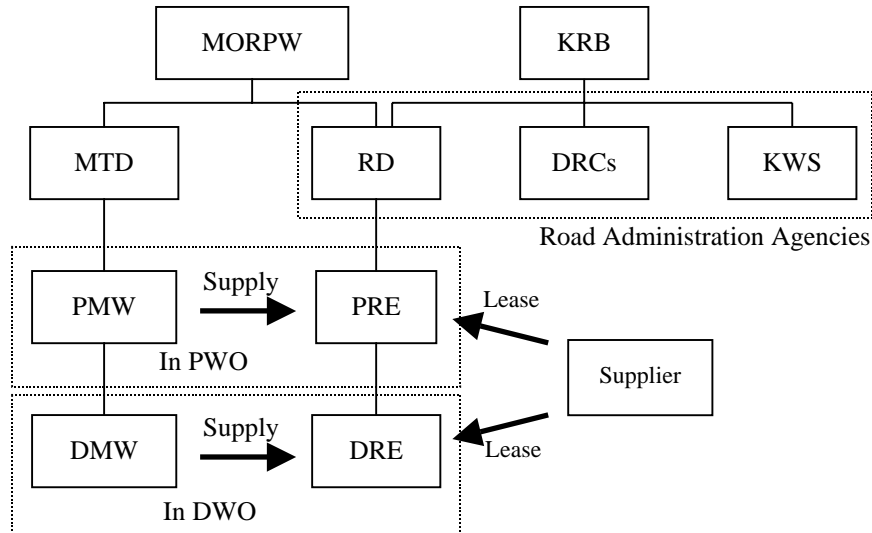
Establishment of Regional Mechanical Workshops (RMWs) / Sub-regional Mechanical Workshops (SRMWs) is proposed in sub-section (1) above. Generally, SRMWs will provide light equipment for labor-based equipment-supported work methods, while the RMWs will provide equipment for work requiring heavy and/or special equipment. The establishment of an equipment leasing system for private contractors is also proposed and is described below. This will be effective in fostering the growth of private contractors.

- (a) SRMWs shall lease/provide light equipment to small contractors and to road maintenance agencies.
- (b) RMWs shall lease/provide heavy/special equipment to medium-large contractors and to road maintenance agencies.

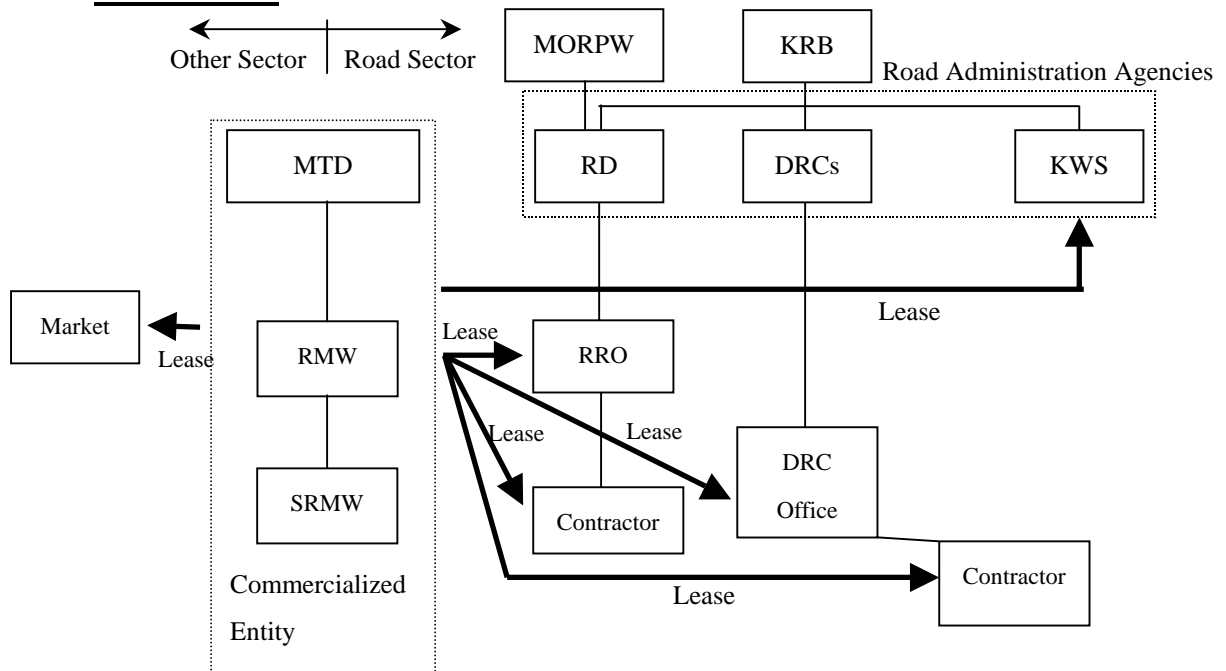
A key focus for the future MTD might be in geographical areas where the private sector is weak or unlikely to be able to operate efficiently (e.g., sparsely populated regions or high risk security areas). The supply of tools and light equipment for such locations will be necessary and there could be a long-term future for a reliable supplier of such equipment.

The change envisioned in the relationship between the equipment sector and road sector is as shown in Figure 7.5.7.

**At Present**



**Transition To**



**Note**

MORPW: Ministry of Roads and Public Works  
 KRB: Kenya Roads Board  
 MTD: Mechanical and Transport Department  
 RMW: Regional Mechanical Workshop (recommended)  
 SRMW: Sub-Regional Mechanical Workshop (recommended)  
 PMW: Provincial Mechanical Workshop  
 DMW: District Mechanical Workshop

PRE: Provincial Road Engineer  
 DRE: District Road Engineer  
 RD: Roads Department  
 DRCs: District Roads Committees  
 KWS: Kenya Wildlife Services  
 RRO: Regional Road Office  
 (recommended in Chap. 7.5.7)  
 PWO: Provincial Works Office  
 DWO: District Works Office

**Figure 7.5.7 Future Equipment Service Network**

#### **(4) Necessary Personnel and Equipment by Road Maintenance Activity**

Road maintenance implementation offices under the KRB agencies shall draw up work programs on maintenance equipment and forward it in advance to suppliers (e.g., MTD, RMWs, SRMWs and/or private firms). It will be necessary for suppliers to improve equipment availability to satisfy demand. The resources required for each road maintenance activity are described in Appendix 7.7.6.

##### **7.5.7 Materials**

The quality of materials is one of the crucial factors for road works. At present, the Materials Testing & Research Department (MTRD) under MORPW is the unit responsible for this work for the classified road network. Although MTRD is capable of satisfying the testing needs of the classified network, some organizational changes may be required for MTRD to handle the demands that will be made on it by the KRB road maintenance system, which will encompass both the classified and unclassified road network. That is, the KRB will require the MTRD to act as the agency responsible for ensuring the appropriate quality and quantity of works for the entire Kenyan road network, by making the executing roads works agencies accountable for performing work according to the specifications agreed to with the KRB for a predetermined amount of money. In other words, making sure that “value for money” is being obtained.

Black cotton clay is the most problematic soil layer in Kenya. Generally, this kind of soil layer is removed from roadbeds. However, in the case where the layer is extremely thick, it may be impossible to remove. Therefore, technologies to carry out measures such as pre-loading settlement, geo-textile netting, etc. should be developed in Kenya.

#### **7.6 Transition to Full KRB Operability**

##### **7.6.1 Transition Period**

The drastic changes to occur and occurring with the implementation of the new road maintenance system under KRB cannot be completed in a short time. Accordingly, a transition period is necessary for changing the system, adjusting existing laws and regulations, composing new organizations, recruiting and/or re-assigning engineers and staff, training these personnel, and setting up offices. The required time for each of these activities will vary. Some can be completed rather quickly, but others might require years.

Based on the above, the Study assumes that a minimum of three years, beginning 1<sup>st</sup> July 2002, which is when the KRB became fully staffed, will be required to make the KRB fully operational sometime by the end of 2005. It is crucial that this goal be attained, since the KRB is to be the linchpin of the Kenyan road maintenance system and its success will determine whether or not an effective road maintenance system can be realized.

### **7.6.2 Monitoring of Transition**

To detect the problems that the KRB system is encountering in its transition, the Study Team carried out a number of surveys and hearings, with the most recent being an extensive set of interviews in May and June of 2002 (for details see “Monitoring & Evaluation Results” in ANNEX 11 of Volume 3 of this report). This most recent work, as shown in Table 7.9.1, consisted of interviewing the KRB, district roads committees (DRCs), district roads engineers (DREs)/municipal engineers, and provincial roads engineers (PREs). As this table indicates, the Study Team met with many if not most of the major people involved in the operation of the KRB system.

**Table 7.6.1 Number and Type of Respondent**

| <b>Job Title of Interviewees/Respondents</b>   | <b>Number of Interviewees/Respondents</b> |
|--|---|
| Provincial Roads Engineer                      | 8   |
| District Roads Engineer                        | 48  |
| Member of District Roads Committee (excl. DRE) | 7   |
| <b>Total</b>                                   | <b>63</b>                                 |

Based on the above, together with previous work that the Study Team has carried out, obstacles to the success of the KRB are described in the next section.

### **7.6.3 Obstacles to the KRB System**

Although the Kenyan Parliament passed the KRB Act in 1999, the KRB itself was not fully staffed and outfitted until July 2002, and has only been in partial operation since November 2001. Even though only a short time has passed since becoming partially operational, the KRB’s activities have resulted in monies being distributed to the constituencies of all 70 districts in Kenya for road maintenance, something that rarely if ever occurred previously, resulting in the KRB being highly evaluated. Despite this initial good start, the KRB is still not fully operational and this next year will determine to a great extent whether or not it the



reform of the road maintenance system is a success. The obstacles still facing the KRB are categorized into 6 items and are described in detail below

### **(1) Funding**

Under the KRB Act, 57%, 40%, and 3% of the money collected from the Road Maintenance Levy Fund (RMLF) is supposed to go to the Roads Department (RD) of the Ministry of Roads and Public Works (MORPW), the DRCs, and to the KRB for administrative costs, respectively. Although money for road maintenance is now reaching the constituencies of all the 70 districts in Kenya, something that rarely if ever occurred previously, there are still problems and they are as follows:

- The above-mentioned 57% and 3% of KRB money is being distributed as originally intended under the KRB Act. The 40% that is supposed to be distributed to the DRCs is not being allocated as intended. That is, 24% of that 40%, which is supposed to be distributed equitably to the districts, is going to the RD to pay for a backlog of projects. In addition, no deadline has been given at present by the KRB for when this 24% will be returned to the DRCs.
- As for the 16% of the 40% that is to be distributed equally to all of the 210 constituencies in Kenya, this is being carried out as originally intended.
- On the other hand, even though the constituencies are receiving their 16%, the payments are irregular and in small chunks that make it difficult to carry out work efficiently. For example, the first payment of the 2001 fiscal year, which begins in July, was not disbursed until November. During these 5 months no work was being done. In addition, untimely disbursements affect areas with large seasonal changes, meaning that the lost time could even be greater.
- The Kenya Wildlife Service (KWS), since it is not eligible to directly receive funds under the KRB Act, has resulted in the KWS receiving no monies for the classified roads in its parks and for the classified roads that provide access to these parks.
- The towns and cities under the Ministry of Local Government (MOLG), which is not considered as a road agency under the KRB Act, have received very little or no money under the current KRB system. This is because the members of parliament are more interested in repairing roads in the residential areas of their constituencies where their voters are, resulting in the roads in inner cities and towns being neglected.

### **(2) Organizational Structure & Staffing**

The KRB system, due to its newness, still faces a number of problems in terms of organization and staffing and are as follows:

- Due to lack of staff in the KRB secretariat, no auditing or follow-up of work has been

carried out regarding the monies distributed by the KRB.

- On the other hand, although the KRB Act was passed into law approximately 2 years ago, the executive director of the secretariat was just appointed last November. Furthermore, KRB's secretariat will only be fully staffed starting from 1 July 2002. Therefore, the real test of whether or not the KRB system is a success will be this coming fiscal year of 2002/2003. It should be noted that even with these staffing restrictions, the KRB has carried out its work quite well.
- At the district level, almost none of the DRCs have offices of their own and many are using MORPW facilities. This can partly be attributed perhaps to a lack of consciousness of DRC members regarding the KRB concept, which encourages the DRCs to be an independent body.
- Almost none of the DRCs have hired any support staff, meaning that MORPW staff is being used to carry out DRC work. This presents problems in that the administrative costs for DRCs and the MORPW are difficult to separate, and there are cases where DRC money is being used to pay for unrelated MORPW overhead costs.
- Excluding the DREs, some DRC members are not aware of the operational details of the DRCs, indicating that the number of meetings for DRCs is insufficient (at present meetings are held quarterly), or that there is insufficient communication between DRC members.

### **(3) Maintenance Manuals**

The JICA Study Team submitted 500 sets of road maintenance manuals, which consist of an Execution Manual, Inspection Manual, and Evaluation Manual, in February 2002 to the MORPW for distribution to PREs, DREs, and other KRB stakeholders. The problems that have been detected in the Team's monitoring work regarding the manuals are as follows:

- The manuals have rarely been used due to a lack of communication between the man in the field and the agencies in Nairobi (i.e., MORPW and KRB).
- Many DREs have also stated a lack of funding for using the manuals. For example, it was mentioned that the frequency of inspection for certain maintenance activities is impossible due to a lack of vehicles and monies for their repair and operation.
- Also, from the Kenyan perspective, inspections seem meaningless since even if you carry them out you will not receive the necessary money to execute the required maintenance activities.
- Although DREs have attended workshops on the use of the maintenance manual, technicians have not received training and are therefore unable or reluctant to use the JICA manuals in the field.

#### **(4) Work Programs**

Under the KRB Act, work programs have to be submitted to the KRB in order for road agencies to receive funding. The problems that have been detected regarding these work programs are as follows:

- In the case of the DRCs, DREs draw up work programs that are transparent and reliable, due to the KRB giving a definitive budget. However, it has been also mentioned that the priorities for these work programs are sometimes influenced by politics too much as a result of the members of parliament (MPs) sitting on the DRCs.
- On the other hand, it has been mentioned by site staff that work programs for Class A, B, and C roads are not useful because they are not based on any clear budget. That is, the RD does not seem to provide in advance a budget for planning, resulting in some provinces/districts making unreasonable requests. Even when the work programs are reasonable, it is rare that the budget requested is received. This is acceptable if the reasons for receiving less are clear, but according to some people in the field, the RD does not or seems it cannot provide these reasons.
- The unit rates and description of maintenance activities are not standardized. This is important in order that everybody knows what is being referred to as well as whether or not the rates are reasonable.
- Most of the DREs said that they used no formulae in calculating the costs of maintenance activities, and usually based their figures on quotations from the private market.

#### **(5) Data**

Having the correct data, as well as the systems and software to store, analyse, and evaluate it, are crucial for the success of the KRB system. Some of the problems detected in respect to this are as follows:

- Almost all of the DREs had computers available to them. On the other hand, according to the DREs, the vast majority do not collect road condition data on a regular basis due to a lack of funds, and none of them collect traffic data.
- Furthermore, no database program has been made available (either from the KRB or the MORPW) to the DREs.
- Presently, there seems to be no system for collecting and sending data from the field to KRB or the road agencies, making it impossible for the KRB or the road agencies to know the needs of provinces/districts. In addition, there is of course no plan of action for updating data should it be collected.

## **(6) Work Execution & Auditing**

The work execution method and auditing work in progress or completed is vital to ensure that the KRB system function as intended. The problems detected in respect to this are as follows:

- Because of a lack of KRB staff, there has been no technical or financial auditing by the KRB for this past fiscal year, meaning that this has been no follow up to ensure that road agencies are performing as intended. This however should be remedied with the KRB having its full staff in place for the start of the new fiscal year on July 1<sup>st</sup>.
- DRC work is sometimes being executed using MORPW staff and resources. This is not ideal in that DRC monies are sometimes being diverted to pay for unrelated MORPW overhead costs.
- The untimely flow of cash, as well as the small disbursements, results in no work being done for months, adversely affecting the performance of the DRCs.
- Due to the inability of the Mechanical and Transport Depart to keep equipment operating or to replace obsolete equipment, makes it is necessary for DREs and PREs to contract out to private firms. This is expensive since the private construction market in Kenya as a whole is still underdeveloped.

### **7.6.4 Proposals for Removal of Obstacles Hindering Full Operation of KRB System**

Proposals for removing or eliminating the obstacles to the KRB system are described in the 6 items below, which will result in the necessary systemic reform to make the KRB fully operational.

#### **(1) Funding**

The success in having 16% of the RMLF distributed in a transparent manner to all of the 70 districts in Kenya is an excellent first step for the KRB towards operating as originally intended. However, the KBR and MORPW should try to set up a system that does not require going through the permanent secretary of the MORPW for the disbursement of monies to the DRCs or any other non-MORPW entities, since this just slows down the process unnecessarily. As a transition step this is perhaps okay, but it is recommended that the KRB try to remedy this problem by the end of fiscal year 2002.

- It is recommended that KRB clearly define when the DRCs are going to be receiving their remaining 24% of the 40% of the RMLF due to them during the fiscal year of 2002/2003. It is also recommended that the RD backlog of projects that the KRB agrees to finance exclude any cost variations (i.e., increases).
- It is recommended that KRB apply the criteria it has developed (see 6.6 of Chapter 6) for disbursing the above-mentioned 24% once it is made available, which is needed by the

DRCs to carry out important maintenance work that can not be addressed by the current 16% of the RMLF that they are receiving now. However, it should be recognized that the system for allocating money equitably may need fine tuning in order strike a balance between fairness and ease of understanding.

- Under the previous system, promised monies were sometimes never distributed. With the KRB system, the monies due to roads agencies are clear and the mechanism for disbursement relatively reliable, so this should present no problem. Based on this, it is recommended that consideration be given to allowing road agencies to proceed with their work when KRB funds disbursement is late so that maintenance work can be carried out efficiently.
- It is recommended that the KRB and MORPW, as well as any other related agencies, closely examine the proposal submitted by the KWS regarding classified roads that should be entrusted to it for maintenance so that the KWS can receive monies from the KRB beginning in fiscal year 2003/2004.
- It is recommended that the DRCs designate urban and town roads for the Ministry of Local Government (MOLG) to be responsible for under the KRB system so that the MOLG can receive the money it needs to maintain these roads, which are being neglected by the DRCs.

## **(2) Organization**

- It is recommended that the DRCs and MORPW effectively utilize existing organizations with sufficient capacity to act as sub-agencies to carry out maintenance work on their behalf. Examples of such organizations include the KWS, the city councils of Nairobi, Mombasa, Kisumu, El Doret, and Nakuru, and perhaps local producers of agricultural products such as coffee, tea, etc.
- It is recommended that the Mechanical and Transport Department (MTD) carry out its planned rationalization as quickly as possible by referring to the rationalization plan contained in the JICA Study Team's Final Report. It should be noted that the longer the MTD waits the less attractive it will become as an organization and the more difficult it will be to become autonomous entity. The above is crucial for assisting in the creation of a more competitive market in Kenya for the contracting out of maintenance equipment.
- With the termination of Swiss assistance, the Kisii Training Center is starting to experience financial difficulties. It is recommended that the Kisii Training Center draw up and implement a plan to become an autonomous entity so that it can deal with this problem in a proactive manner.

### **(3) Education**

- It is recommended that all road agencies send their engineers and technicians to the Kisii Training Center in the future to be trained in the use of the JICA road maintenance manuals, and that they provide feedback to Kisii one year after finishing to ensure that they are performing as intended.
- In addition to the above, it should be emphasized that the concept of the KRB is still not correctly understood by some of the road agencies and their staff. It is recommended that the KRB send out a memo clarifying and explaining its mission, vision, and strategy to all stakeholders, as well as hold regular meetings. The KRB should also, for example, send out a memo informing all stakeholders that the JICA road maintenance manuals are “ready for use”.

### **(4) Facilities/Equipment**

- It is recommended that the DRCs obtain their own facilities by the end of the 2002/2003 fiscal year, so that they may become more independent as originally intended under the KRB Act. This will require that the DRCs consider the staffing of these facilities. It is recommended that the KRB and the MORPW discuss staffing at the district level so there is no unnecessary overlapping. Ideally, this should result in a slimmer MORPW.
- It is recommended that all of the DRCs, each of which received a computer from KRB, link up with KRB and with each other via e-mail so that data and information can be reliably exchanged.

### **(5) Data**

- It is recommended that road condition and traffic data be obtained from all districts and sent to the KRB for planning purposes via a rapid condition survey. This is necessary since it seems that the current World Bank road condition survey will still take some time to complete. In addition, the World Bank survey is only for classified roads, which are less than half of the total road network. Data for the unclassified network is also necessary for proper planning.
- It is recommended that the KRB obtain information not only on road conditions and road traffic, but on road re-classification and kilometre markers as well (to be installed if necessary) in order to carry out planning.

### **(6) Communication**

- Communication between the KRB and the road agencies still has much to be desired and it is therefore recommended that a reporting system be set up. For example, it is suggested that the minutes of meetings of working committees (or at least a summary) be sent to all road agencies and their staff so that they understand what is going on and

to create a common understanding.

- It is recommended that a system for collecting, sending, and updating data be established between the KRB and the road agencies so that allocation of monies can be carried out accurately. According to KRB, the Swedish International Development Cooperation Agency (SIDA) will be providing funding for the implementation of a reporting and road maintenance work plan system.
- It is suggested that the KRB consider a system for updating and revising the road maintenance manuals to be submitted by the JICA Study Team in January 2003, so that important and timely changes can be made to the manuals as required.
- It is recommended that the manuals working group be the forum for further development of the manuals. This group should be lead by KRB and should involve all road agencies and interested parties. It might be beneficial to invite donors in the road sector such as SIDA and DANIDA to participate to ensure the manuals develop with full input from all those involved and that a single manual for Kenya is the outcome.

#### **(7) Maintenance Equipment & Materials**

It is proposed that the MTD be commercialized and reorganized into an autonomous organization under the MORPW during a transition period of three years. After that, based on the performance of the MTD during that period, the privatization of MTD into a completely independent entity can be considered. Details on the actions that should be taken during the transition period are described below.

## **CHAPTER 8**

### **DEVELOPMENT OF ROAD**

### **MAINTENANCE TRAINING PLAN AND**

### **CAPACITY BUILDING**



## CHAPTER 8 DEVELOPMENT OF ROAD MAINTENANCE TRAINING PLAN AND CAPACITY BUILDING

### 8.1 General

The phasing out of force-account work in favor of contracting out is an unstoppable process because of the gains in cost efficiency and the effectiveness of manpower usage. Therefore, the future of road maintenance rests on the development of private contractor capacity, especially small- to medium-scale contractors. In this regards, a training program for the development of the managerial capacity of officials and engineers and education for contractors are presented in this Chapter. The training plan advocates a combination of labor and light/intermediate equipment, with an emphasis on cost effectiveness. As well as being cost-effective, the approach is also in line with the Government's Road Sector Strategy and Poverty Reduction Strategy.

#### Subjects of Training

Training aims to develop capacity regarding project management, planning and programming, contracting, supervision, etc. related to road maintenance work. To commercialize maintenance work, skills different from force-account work are required. One of those skills is managerial capacity, and it is essential to district road engineers for preparing bid documents, making contracts, etc.

#### Promotion of Private Sector

Execution of road maintenance works by contract is generally more effective and less costly as compared to force-account work. Accordingly, the number of contractors should be increased and measures to promote the private sector implemented as quickly as possible. To achieve this, incentives, prompt payment, continuity of work, advance payment, etc. are required, and KRB should take the lead in introducing these measures.

### 8.2 Labor-Based Technology and Equipment-Based Technology

#### 8.2.1 Key Definition: Labor-Based Technology

For a lot of routine maintenance activities, an appropriate mix of labor and equipment is required to provide works of adequate quality in a cost-effective manner. A labor-based technology aims at applying a labor/equipment mix that gives priority to labor, **but supplements it with light/intermediate equipment** where necessary for reasons of quality or

cost. The term “labor-based” thus indicates that a flexible and optimal use is made of labor as the predominant resource, while cost-effectiveness and quality aspects are ensured. It is important to distinguish between an optimal (efficient) use of labor and a maximum (possibly inefficient) use of labor. The latter could degenerate into “make work” approaches where cost-effectiveness and quality aspects are ignored. Therefore, this Training Plan promotes an optimal use of labor. For purposes of clarity, labor-based technology can be more accurately defined as “**labor-based equipment-supported (LBES)**”.

Equipment-based technology is the opposite of LBES in that most of the work is done by labor-replacing equipment, supported by a small labor force.

### **8.2.2 Light/Intermediate Equipment**

In the context of using LBES technology for road maintenance, the main items of light/intermediate equipment that are needed are as follows:

- Tractor/Trailer.
- Towed Grader.
- Towed Roller.
- Towed Water Bowser.
- Pick-Up Truck.
- Pedestrian Roller.
- Towed Caravan (for the contractor’s supervisor).
- Tractor Attachments including a shovel.
- Pedestrian Bitumen Sprayer.
- Pedestrian Road Marker.

For a tractor/towed-equipment operation, maintenance back-up is good in Kenya because the agricultural sector uses tractors. Most, if not all, towed equipment is made locally. Imported tractor kits are assembled in Nakuru.

### **8.2.3 Comparison of Labor-Based and Equipment-Based Technology**

An optimal use of LBES technology can be applied to most routine maintenance activities, as follows:

**Table 8.2.1 Potential for LBES**

| <b>Routine Maintenance Activity</b> | <b>Potential for LBES</b> |
|-------------------------------------|---------------------------|
| Pothole patching                    | Good                      |
| Compaction                          | Fair                      |
| Ditch cleaning                      | Good                      |
| Cleaning culverts                   | Good                      |
| Structure repairs                   | Good                      |
| Scour repairs                       | Good                      |
| Grass cutting                       | Good                      |
| Bush clearing                       | Good                      |
| Haulage                             | Good for short distances  |
| Road line marking                   | Fair                      |
| Ditch cutting                       | Good for flat ditches     |

For periodic maintenance, equipment-based technology will be used for surface works on paved roads, but with LBES normally being preferred for the remaining periodic activities – namely, some of the surface works on unpaved roads and “off-carriageway” works on paved and unpaved roads. A comparative analysis of LBES versus equipment-based techniques carried out by the International Labor Organization (ILO) indicates that in most developing countries the break-even wage would not be higher than US\$ 4.00 per day – i.e., the wage level up to which LBES remained more competitive than equipment-based techniques. The minimum wage in Kenya is currently 132.00 shillings per day (slightly less than US\$ 2.00).

The above analysis demonstrates that LBES is the preferred way forward for routine road maintenance in Kenya, except in locations where labor is not generally available. Such locations include Garissa, Isiolo, Lamu, Mandera, Marsabit, Samburu, Tana River, Turkana, and Wajir. The use of LBES fits well with Kenya’s poverty reduction strategy, while at the same time being cost-effective. The LBES method would also save foreign currency in that less heavy equipment would be imported. The use of LBES also fits well with the fact that **unpaved roads** account for 86 percent of classified roads (km) and 98 percent of unclassified roads (km).

#### **8.2.4 Maintenance Activity and Type of Contractor for Routine Road Maintenance**

Under a regime of term contracts, it is likely that existing small/medium-scale contractors (often family-owned and mainly working in the building sub-sector) would enter the **routine road maintenance business** and act as main contractors (after receiving **LBES training**). Excluding perhaps districts with a very small road network, it is unlikely that the smallest contractors would be main contractors for the envisaged term contracts. There are two reasons for this:

- The smallest contractors would lack capacity and resources.
- If the contracts were packaged to suit the smallest contractors, there would be too many contracts for KRB/Road Agencies to handle.

In order to encourage the development of small-scale contractors, it is vital to promote sub-contracting. In many districts, including those where the Rural Access Roads Program (RARP) and Minor Roads Program (MRP) were carried out, there is good scope for small-scale contractors to emerge and be engaged as sub-contractors by medium-scale main contractors. It is considered that there will be four types of small/medium-scale contractors:

**Table 8.2.2 Types of Contractors**

| <b>Type of Contractor</b>   | <b>Maintenance Activity</b>                    |
|---|--|
| 1. Medium-scale (main contractor)   | LBES - labor with light/intermediate equipment |
| 2. Small-scale (possibly main contractor, with sub-contracting to category No. 3) | Labor with hand tools and a pick-up truck      |
| 3. Smallest (sub-contractor)  | Labor with hand tools (lengthmen)              |
| 4. Lorry owner (sub-contractor)   | Lorry-based haulage only                       |

In some of the smaller districts, Category 2 above might emerge as main contractors because a good amount of routine maintenance activities can be accomplished with just labor, hand tools and a pick-up truck. In general, Category 1 should be encouraged to sub-contract to Categories 2 and 3, perhaps with the main contractor (Category 1) supplying a truck when this is beyond the capacity of the sub-contractor.

### **8.2.5 Contracting Policy to Promote Small/Medium-Scale Contracting**

To promote small/medium-scale contracting, it will be necessary for KRB/Road Agencies to lay down a contracting policy, along the following lines:

- For routine maintenance, preference should be given to the use of LBES techniques except in areas where labor is not generally available. This preference can be realized by specifying the LBES method in the routine maintenance contract document. Also, the contract document should encourage the concept of sub-contracting from medium-scale to small-scale contractors.
- Contracting of routine maintenance should be separated from periodic maintenance. If the two are put together, medium-scale contractors will not be able to bid because they will not have the heavy equipment to undertake periodic maintenance surface works on paved roads.
- A policy governing term contracts needs to be developed – namely, defining network

lengths (minimum and maximum km) that strike a balance between the promotion of medium-scale contractors (with sub-contracting to small-scale outfits) and the need for KRB/Road Agencies to keep the number of contracts to a manageable level. The km definitions will have to reflect class of road and the length of a district's road network.

- In realizing the implementation of the above policy measures, a transition period will be necessary, to a greater or lesser extent depending on how fast the small/medium-scale contracting industry develops. In any event, it is likely that the big contractors will want to focus on Class A/B/C roads, especially on construction, rehabilitation and surface periodic maintenance.
- Standard contract documents need to be put in place for LBES works (simplified form of contract) and perhaps for equipment-based works (standardization nationwide).

### **8.3 Road Maintenance Training Plan**

#### **8.3.1 Introduction**

The Road Maintenance Training Plan has been designed to fit in with the new arrangements for undertaking road maintenance works – namely, KRB and the Road Agencies. The Training Plan shall take account of the key policy framework and directions that govern the roads sector. These are as follows:

- The Road Maintenance Initiative (RMI).
- The Strategic Plan for the Roads Sector.
- The Roads 2000 maintenance program.
- Kenya's Poverty Reduction Strategy.
- The vast majority of road maintenance works being contracted out to the private sector.
- Force Account being phased out but with some exceptions during the transitional period – namely, skeleton force-account units to cover emergencies, locations facing a security risk, and areas having a sparse population/lack of labor. Eventually, it is considered that force account can be completely phased out except in security-risk areas.

The Training Plan can be managed, executed and monitored by the Kisii Training Center (KTC), under the umbrella of the Kenya Institute of Highways and Building Technology (KIHBT). There will be three main ways of delivering training – courses held in Kisii, field activities across the country to compare Kisii best practice with ongoing maintenance works, and portable courses mostly held in provincial capitals.

Once finalized, it is intended that the Training Plan will be endorsed by KRB and circulated to

all road agencies. The Training Plan is a three-year revolving plan – to be updated annually and rolled forward one year. This first Training Plan covers the period from FY2002/03 to FY2004/05, as well as a six-month preparatory phase – January to June 2002. The Training Plan also includes a section on Private Sector Capacity Building (contracting). The scope of the Road Maintenance Training Plan only covers road agency staff and private contractors. Training and capacity building for KRB's secretariat are dealt with separately at the end of Chapter 8 because this matter will not be handled by KTC. Where the Training Plan mentions Road Agencies, this means the agencies for the transition period – namely, the four principal transition agencies are the Roads Department at provincial level, KWS, Roads Department at district level and Local Authorities (the last two acting as sub-agencies under DRCs). In any event, the final organizational outcome at district level will not affect the focus of training – namely, the contracting out of road maintenance works.

### **8.3.2 Road Agencies to be Trained**

In designing the Training Plan, it has been assumed that KRB/Road Agencies will wish to keep the number of road maintenance contracts to a manageable level by having term contracts (one year or longer) for routine maintenance works. The geographical scope of each term contract would be based on network characteristics and contractor capacity. However, it is important to recall that the policy directives, including the Strategic Plan for the Roads Sector, give great weight to the use of labor-based technology and the development of small/medium-scale contractors.

The extent to which roads are in a maintainable condition is very relevant to the formulation and management of term contracts. For classified roads, about 56,000 km are thought to be in a maintainable condition (7,000 km paved and 49,000 km unpaved). On average, this translates into 800 km of classified roads per district. For unclassified roads, about 63,000 km are thought to be in a maintainable condition (2,000 km paved and 61,000 km unpaved). On average, this comes to 900 km of unclassified roads per district.

Based on the above numbers, it seems that the maintenance of the paved network would be manageable under a regime of term contracts. The maintenance of unpaved roads poses more of a problem (110,000 km of unpaved roads compared with 9,000 km for paved roads). During the transition period, the best way forward for KRB would probably be to break down the term contracts into four broad categories, which would match the four main types of road agency/sub-agency and their respective work plans:

- Roads Department (province level) – Class A/B/C roads.
- Kenya Wildlife Service (KWS) – roads under KWS.
- Roads Department during transition period (district level) – Class D/E/Rural Access roads.
- Local Authorities during the transition period – local authority unclassified roads. This category houses the vast majority of kilometers, and holds the key to linking classified roads with rural access, untapped agricultural potential, employment creation and poverty reduction. For logistical reasons, it seems inevitable that this category would need to be sub-divided into urban works and rural works (i.e., term contracts for urban networks – municipalities/townships; and term contracts for rural networks – county councils). An alternative approach for local authority roads would be to formulate term contracts on the basis of the constituency boundary, but this would tend to create logistical/mobilization difficulties for contractors (i.e., trying to cover both urban and rural areas in one contract). This category also offers opportunities for community-based road maintenance works. Where local authorities lack capacity, RD staff (probably DREs) may have to assist with contract administration and supervision.

In addition to the four categories discussed above, it will also be important to bring Forest Department roads and sugar/tea/wheat roads into the picture.

### **8.3.3 Core Training Clients**

The demand for training will be driven largely by the upsurge in contracting out road maintenance activities and the reduction in force-account works.

KTC's core clients for training during the transition period will be:

- Labor-based, small-scale contractors (Categories 2 and 3, Table 8.2.2).
- LBES medium-scale contractors (Category 1, Table 8.2.2).
- Roads Department (RD) staff at province level.
- KWS staff.
- RD staff at district level.
- Local Authority (LA) Level – LA staff.
- Persons participating in community-based road maintenance projects in rural areas and in urban low-income settlements.
- Mechanical and Transport Department (MTD) staff – with a focus on equipment-based technology for selected periodic maintenance activities (e.g., surface works on paved roads) and routine maintenance works in sparsely populated areas (lack of labor) and in security risk areas where an equipment-based approach would result in quicker execution of works.

Although some training for local authorities is being provided under the World Bank's KUTIP project, the local authority level is still seen as a core client because of the need to reach sustainability beyond the scope of KUTIP. Non-core clients can be accommodated as necessary based on demand – namely, MORPW/RD Headquarters (e.g. for materials testing, road condition surveys and traffic counting), the Forest Department, the Sugar/Tea/Cereal/Coffee entities, and consulting firms interested in site supervision.

#### **8.3.4 Core Training Courses for Transition Road Agencies and MTD**

KTC's core training courses for road agencies and MTD will cover the following subjects (a combination of rapid refresher courses and 2 – 4 week full courses):

- Contract administration for RD – Class A/B/C roads.
- Site supervision for RD – Class A/B/C roads.
- Contract administration for RD district-level staff – Class D/E/Rural Access roads.
- Site supervision for RD district-level staff – Class D/E/Rural Access roads.
- KWS staff can join the RD courses.
- Contract administration for LA staff – local authority roads.
- Site supervision for LA staff – local authority roads.
- Mechanical (equipment-based) training for MTD staff – technical training for routine and periodic maintenance, as well as commercial training in the context of MTD becoming a provider and lessor of heavy-type equipment. As necessary, KWS can join the MTD courses. To provide a better focus for mechanical activities, equipment-based training will be shifted from Ngong to the Kisii campus.
- Road Agencies – courses for the preparation of road maintenance work plans.
- Road Agencies – classroom and site training for users of road maintenance manuals.

The main participants will be as follows:

- Province: Provincial Works Officers (PWOs), Provincial Roads Engineers (PREs), and materials and mechanical staff.
- District: District Works Officers (DWOs), District Roads Engineers (DREs), inspectors, and materials and mechanical staff.
- KWS staff.
- Local Authority (LA): LA engineers, roads foremen/materials persons, and perhaps some town clerks.
- Mechanical and Transport Department staff.



### 8.3.5 Core Training Courses for Small/Medium-Scale Contractors

KTC's core training courses for small/medium-scale contractors will cover the following subjects (courses of 2 to 4 weeks plus follow-up activities in the field, including trial contracts and mentorship):

- Contract and business management – for owners/senior members of firms.
- Sub-contracting.
- LBES operations.
- Maintenance of light/intermediate equipment.
- Operations using labor/hand tools (without light equipment).
- Site management – for contractors' site supervisors/foremen/headmen.
- Community-based road maintenance works in rural areas.
- Community-based road maintenance works in urban low-income settlements.

### 8.3.6 Training Courses Development

Virtually all of the core courses for road agency staff and contractors have already been developed by KTC, mostly over a long period of time with assistance from the ILO. The quality of the available courses is high, reflecting KTC's long partnership with the ILO. With the establishment of KRB, however, some refinements to the existing courses will need to be made to cover the concept of term contracts, sub-contracting, tailored technical/commercial courses for MTD staff, the preparation of road maintenance work plans and the use of road maintenance manuals. Examples of existing training modules are provided in Appendix 8.3.1. The courses for community-based road maintenance have been included in the core category because it is considered that this type of maintenance will be financed by KRB as part of the 16 % fuel levy allocation to constituencies. The other core courses relate to maintenance that will be financed by the 57 % allocation to RD (class A/B/C roads) and the 24 % allocation to the district level (all other roads).

For the training pertaining to the preparation of work plans (standard formats, unit rates for internal costing etc), it is intended that KTC would organize and execute the training through portable courses held at provincial centers (the course duration would be about two weeks). Concerning the training for using road maintenance manuals, KTC would hold classroom courses in Kisii (about two weeks), but supplemented by follow-up (site experience) activities in the field/provinces.

### 8.3.7 KTC - Proposed Preparatory Phase – January to June 2002

During the first quarter of 2002, KTC personnel will visit each province in order to carry out a training needs assessment. The assessment will concentrate on the Roads Department – namely RD’s provincial level staff (PWOs, PREs and lower levels) and district level staff (DWOs, DREs and lower levels). The assessment will determine two things – which staff need training (full courses or refreshers) and in what subjects (based on the core courses). Then a training program will be drawn up for fiscal years 2002/03 to 2004/05. The program will specify the persons to be trained and the timing of the training. Under the program, each province will be treated equally, rather than one or more provinces getting priority. The first year of the program will be specified in more detail than the other two years, leaving room for flexibility based on lessons learned during year one. Senior staff will be trained first in order to facilitate dissemination – from the top to the lower ranks. **This particular training program for RD will be priority number one.**

During the second quarter of 2002, KTC personnel will visit each province in order to hold seminars with district-level stakeholders (i.e., the district stakeholders would be invited to assemble in the provincial capital). The stakeholders would include: District Development Committees and DRC representatives, agricultural enterprises (e.g., coffee/sugar/tea/wheat representatives), potential small/medium-scale contractors, interested NGOs, RD staff, any ex-headmen/lengthmen, and other grass-root groups. The seminars would explain the new KRB arrangements and the need to develop small/medium-scale contracting. The training courses available to contractors would also be explained and publicity materials handed out for subsequent circulation in the districts. The Danida Roads 2000 project in the Coast Province provides some good insights into how to access the grass-roots level. Following the seminars, it is intended that KTC would be in a position to sketch out a training program for small/medium-scale contractors. **The program for developing private contractors will be priority number two.** It is considered that this training program would have to be prioritized in order to see which provinces should be addressed first. Factors for consideration will include: characteristics of the road network, topography, expected volume of road maintenance work to be contracted out, population density, availability of labor and agricultural potential.

### 8.3.8 Training Program for Local Authority Staff

In the first quarter of 2003, KTC will carry out a training needs assessment for local authority staff, and then a training program can be developed. This will be priority number three, reflecting that KTC cannot address everything at the same time. The starting point for the

training needs assessment will be MOLG's proposed road maintenance training plan that was prepared under KUTIP in January 2000. Despite being priority number three, it is likely that some training courses for local authority staff would still be provided by KTC in fiscal year 2002/03 (e.g., KUTIP-related training).

### **8.3.9 KTC Action Plan 2002**

#### **KTC Strategy**

Training at Kisii for persons from overseas is declining quite fast. Thus, it is an opportune moment for KTC to re-focus its strategy – namely, its core activity for the foreseeable future should be to provide training for Kenyan road agencies and Kenyan small/medium-scale contractors.

#### **Key Action**

Key action for 2002 is seen as follows:

- Carry out the training needs assessment for Roads Department (RD) staff, including the preparation of the necessary dissemination/publicity materials.
- Draw up a training program/schedule for RD staff for FY 2002/03 – this should cover all PWOs, PREs, DWOs and DREs – a total of about 156 persons to be trained in one year (2002/03). KWS staff would be invited to participate.
- Draw up a training program for other RD staff for FY 2002/03 – these persons would mainly be district level supervisors/inspectors. On average, each district has three of these people – giving a total training demand of about 210 persons. In FY 2002/03, KTC could train about 70 of these (one from each district), with the balance being covered in 2003/04 and 2004/05. Selection will be based on seniority (i.e. senior first). KWS staff would be invited to participate.
- At any one time KTC can accommodate 60 trainees on campus. Given this, a likely spread of courses in 2002/03 is as follows – two courses for the 16 PWOs/PREs (8 persons each time), four courses for the DWOs/DREs (35 persons each time), and two courses for the first batch of supervisors/inspectors (35 persons each time).
- Make all necessary refinements to the existing course materials (e.g., sub-contracting), and liaise with KRB with a view to getting standard contract documents (LBES and equipment-based). For a standard LBES contract document, a good starting point might be the short-form FIDIC document that was drafted in 1998.
- Visit provinces to hold seminars with district-level stakeholders, including the preparation of the necessary dissemination/publicity materials. Then, prepare a training program/schedule for small/medium-contractors for 2002/03. This area is less predictable than the

program for RD, but hopefully the picture will become clearer at and after the seminars. In any event, KTC has good experience of how to mobilize potential contractors (including the Danida Coast project).

### **8.3.10 Urgent Requirement for Training**

Now that the Swiss Agency for Development and Cooperation (SDC) has completed its support program, KTC needs a new avenue of assistance as soon as possible, probably arranged under KRB's umbrella. The main items for the assistance are as follows:

- Operating costs of field activities – site works/demonstrations, dissemination/publicity seminars and portable courses.
- Light equipment for LBES training.
- Hand tools for labor-only training.
- Heavy equipment for equipment-based training.
- Camping equipment for site works.
- Training aids and materials.
- Training of trainers.
- Consultancy inputs to supplement KTC resources.
- Inputs to facilitate private sector capacity building.
- Materials testing facilities.
- Bump integrators and towing vehicles.

### **8.3.11 Financing of Training**

KTC is currently preparing an indicative budget for FY 2002/03, as well as a broad estimate for a medium-term donor support program. These two forecasts will cover road maintenance training and some important elements of private sector capacity building (e.g., trial contracts, establishing KTC-controlled sites in the field, mentorship programs, etc).

At present, KIHBT has four sources of revenue:

- Government's general budget.
- Dutch formula by which 4 % of the cost of donor-financed projects is allocated to training (this is going down because donor projects are on hold).
- A portion of RD's 57 per cent fuel levy allocation.
- Fees paid by foreign and local students (this is also going down, particularly foreign fees).

Once the above-mentioned forecasts are ready, it is envisaged that KIHBT would hold discussions with KRB about the future financing of training (local funds and donor support) and

a gradual move towards putting training on a “fee for service” basis. This would facilitate sustainable training and assist KTC to reach a reasonable level of autonomy. It is envisaged that the fuel levy would finance the basic/recurrent costs of the core training courses held at Kisii. Accordingly, the areas for donor support focus on field activities and training equipment/materials.

## **8.4 Private Sector Capacity Building**

### **8.4.1 Guiding Principle**

Force account is being phased out for two reasons: firstly, the civil service downsizing program; and secondly the inherent inefficiency of works undertaken by force account. Therefore, the success of the new KRB system hinges on Kenya developing its own road maintenance contracting industry, especially small/medium-scale contracting.

### **8.4.2 Contractor Access to Resources**

#### **Access to Credit**

Access to credit is one of the major barriers to entry identified by small/medium-scale contractors in developing countries. Commercial banking procedures are often too rigid to be useful in extending credit to small/medium-scale enterprises. The failure of road agencies to meet their contractual obligations of making prompt payments could jeopardize the survival of small/medium-scale contractors. Local bank interest rates are generally high, and overdraft facilities are sometimes not a realistic option even where collateral/securities are available. Traditional systems of bonds and sureties are not very appropriate for minor works contracts, where the contracting agency’s actual risks are small.

Key guidelines are as follows:

- Commercial banks are generally reluctant to offer credit to small/medium-scale contractors without collateral or sureties (which contractors do not possess). Therefore, the Contractors Association, contracting agency and/or funding agency (in our case, KRB/Road Agencies) has an important role to play in assuming some of the financial risk. Also, small business credit agencies could be considered for playing a role in providing credit – for example, Kenya Rural Enterprise Program Bank (KREP Bank) might be a good starting point.
- Labor-based contractors usually require less start-up capital than equipment-based companies. For example, contract advances may be all that is necessary for some routine maintenance contracts, and regular interim payments for the payment of wages would go a

very long way in easing contractors' cash flow problems.

- At least during the transition period, KRB (probably through the Road Agencies) should consider giving credit guarantees to banks or suppliers basing on an evaluation result of the contractors capability and performance, and making direct payments to banks/creditors from interim certificates. Suppliers could supply items such as materials, tools, light equipment and pick-up trucks.
- Equipment suppliers and agents could be encouraged to operate hire-purchase agreements for contractors, if they were given suitable guarantees by KRB.

### **Access to Tools, Equipment and Spare Parts**

Access to tools, equipment and spare parts is a major issue for small/medium-scale contractors. Key guidelines are as follows:

- It is essential to ensure that appropriate plant and equipment in working order is available to all contractors, so that scarcity does not distort hiring costs. Most contractors aspire to own some equipment. However, the purchase of equipment implies a heavy financial burden on contractors, which is likely to necessitate a guaranteed workload to facilitate repayment. Therefore, purchase and lease options need to be balanced in terms of available funding, workload, access to finance and contractor capacity to grow.
- An advance mobilization payment of 10 – 20 % of the contract value could be considered for inclusion in the contract to provide the contractor with the opportunity to buy second-hand equipment. It could be stipulated that all or part of this advance payment would be payable to equipment suppliers only, on written justification by the contractor. This approach would provide a credit line to the contractor, while giving the option to prioritize the acquisition of essential equipment, as well as the types and models to purchase.
- In the context of private sector capacity building, KRB/Road Agencies have a responsibility for ensuring fair and reasonable financing terms and conditions for contractor access to equipment. Therefore, KRB/Road Agencies may need to provide certain guarantees to banks or suppliers in order to obtain reasonable terms and conditions.
- KRB/MTD could play a role in establishing a public or private sector plant pool facility to ensure equipment availability. This approach could be tried for heavy-type equipment, but is probably not suitable for the light/intermediate equipment that would be needed by small/medium-scale contractors.
- Equipment leasing companies could be established to provide a complete service to contractors.
- The local manufacture of light equipment and hand tools should be encouraged. This is likely to require positive action from KRB/Road Agencies in the form of raising awareness of the need for good-quality, well-designed hand tools and light equipment. Also,

procurement should be biased towards local suppliers, as long as these can provide quality items and back-up services.

- Discussions on the choice and comparative costs of equipment, as well as realistic equipment costing models, should be introduced during contractor training. This is essential to create an awareness of true equipment costs and to enable contractors to tender realistically and compare technology options.

### **Access to Materials**

Worldwide experience indicates that the transition from labor-only to fully-fledged contracting (supplying both labor and materials) is difficult for emerging contractors. To assist in this transition, KRB/Road Agencies may need to adopt short-term measures such as directly paying suppliers for materials delivered. In such cases an additional performance guarantee would be needed. In respect of access to materials, key guidelines are as follows:

- Sometimes materials are scarce. In such instances, KRB/Road Agencies may be able to issue permits to contractors for access to material supplies.
- Also, guarantees of payment could be given to private suppliers before supplying contractors.
- However, ultimately contractors need to operate in the realities of the materials market, and credit lines should be opened between suppliers and small/medium-scale contractors.
- Bulk buying by the Road Agencies will almost certainly have to be continued in the transition period. Also, contractors might be able to pool together in order to get discounted prices for materials.

### **Access to Works**

For facilitating contractor access to road maintenance works, key guidelines are as follows:

- Contractors with financial commitments (e.g. equipment loans they have been encouraged to take on) are likely to need special consideration for guaranteed work, at least for the period when they have to make loan repayments.
- KRB/Road Agencies could consider packaging works contracts to suit small/medium-scale contractors, as well as encouraging them to pool together in order to be able to bid for term contracts. However, a balance needs to be struck between promoting small/medium-scale contractors and the need to avoid thousands of micro-contracts that would be impossible for KRB/Road Agencies to manage. KTC will be able to advise KRB/Road Agencies on this critical issue. Also, large/general contractors could be encouraged to sub-contract to the small/medium-scale outfits.
- In the transition period, a specific allocation of road maintenance works could be made to LBES small/medium-scale contractors who have passed through a KTC training program –

for example by starting with D/E/Rural Access Roads and community-based works under the 16 per cent fuel levy allocation to constituencies.

- The need to improve the transparency of the legal environment and procedures should be looked at. A certain amount of protection of emerging contractors is likely to be required in the transition period. For example – after passing through the KTC training program and the successful completion of a trial contract, a new contractor should automatically be given a term contract of at least one year (probably fixed rates/engineer’s estimate) without having to submit a bid. Six months is not enough continuity, especially if the contractor needs to buy a pick-up truck and other items. In any event, one year is good because the new contractor would experience all the climatic seasons. Logically, the network location and length (km) of the first term contract should be decided by KTC and the respective road agency before the contractor commenced training.
- On expiry of the first term contract, the contractor would have to bid along with the competition. **In addition to access to credit, the matter of access to works (particularly the first term contract) is absolutely vital. Otherwise training is just wasted, as has been the case with the currently dormant Roads 2000 projects (excluding Danida). In other words, the process for realizing “access to works” needs to be institutionalized between KTC and KRB/road agencies.**
- One way to minimize the number of term contracts would be to put two or more small contractors together – starting from the initial KTC training and then right through to the end of the first term contract. A good starting point for implementing this concept would be routine road maintenance on Class D/E/Rural Access roads.
- In the initial stages of contractor development, it is unlikely that there can be a genuinely competitive bidding situation, because there will be more road maintenance works than available contractors. Also, a certain period of protection of trained contractors is needed for them to become established in the market. Competitive bidding, when introduced too early, can eliminate potentially competent contractors. Contractors all need good worksite experience (not less than 12 months) to gain sufficient practical information for the competitive bidding process. Accordingly, access to a first term contract can be regarded as being the final training/mentorship stage. Hopefully, this approach would not conflict with KRB/Road Agency procurement guidelines (i.e. training and the first contract are packaged together, without the contractor having to bid).

### **Access to Works - Specifications for Road Maintenance Works**

For a number of reasons, worldwide procurement procedures tend to be biased towards the use of equipment-based technology. Given the huge scope for the use of LBES technology in road maintenance works in Kenya, KRB/Road Agency tenders should be designed in such a way that



this bias is eliminated as much as possible from the procurement procedure. Technology-neutral specifications can be developed, as well as ones that specify LBES. The following guidelines are particularly important:

- The specifications should be such that they favor an optimum use of locally available materials, simple/light equipment, locally established firms and organizations, and the development of small/medium-scale firms. No compromise needs to be made on quality standards, although the specification should not unnecessarily overspecify quality and performance standards so that they can only be achieved by heavy equipment.
- To encourage small/medium-scale contractors, the use of method specifications could and should be considered. In this way, inexperienced contractors can be guided both on how to carry out the maintenance work and on the types of equipment/hand tools/labor to be used for each activity. In practice, this means that bill items should correspond as closely as possible with the way in which the work is actually carried out by the contractor.
- To encourage the use of LBES technology, tenders may also incorporate different billing methods and more detailed breakdowns of work items than are customary for equipment-based operations.

### **8.4.3 Enabling Environment for Contracting**

#### **Funding and Payment**

Worldwide experience indicates that:

- Irregularity of payments causes small/medium-scale contractors immediate problems with their labor force.
- Quality of work is often severely affected when the contractor spends much time chasing payments in the road agency office.
- The establishment of an effective payment system allowing timely and regular payments to small/medium-scale contractors increases the administrative workload for the road agency. Personnel need to be allocated for this purpose.
- Many payment certificates still require numerous different approval signatures. Localized approval for interim payments has proved successful.
- A road fund greatly facilitates cash flow and payment procedures.

Key guidelines are as follows:

- Small/medium-scale contractors can only operate if their labor force is paid regularly and promptly. Contractors should be paid as near their work locations as possible to avoid

essential site management time being wasted in chasing payments (preferably to the contractors local bank account).

- Monthly interim payments against the contractor's wage bill in the initial stages of a contract are effective in alleviating the contractor's cash flow problems, but controls are necessary.
- Recovery of money from contractors (e.g. equipment loan installments) may be institutionalized using the commercial banking system (preferably deductions at source).
- Contractual methods for LBES works may be made simpler than those for major works (e.g. interim payments could be on a percentage completion basis).
- Road agency personnel need to be made aware of their contractual obligations.
- Payment systems need to include appropriate audit and control mechanisms.

### **Audit and Control**

Key guidelines are as follows:

- Contractor training should include quality control aspects.
- Good quality control reporting systems should be developed and introduced.
- Independent financial and technical audits can be instrumental in improving and adapting administrative and monitoring procedures on a national scale, which will be important beyond the transition period.
- Method specifications may be more realistic for small/medium-scale contractors. Method specification arrangements should be supported by a technical performance audit system from the road agency using spot testing.
- A clear and simple specification of standards to be achieved will be essential.

### **Legal Rights and Obligations**

Key guidelines are as follows:

- Contractors' Associations can play a significant role in highlighting contractual issues for small/medium-scale contractors. Associations have better access to legal resources than individual contractors.
- The use of shortened, legally tested standard documentation is recommended.
- The roles, responsibilities and contractual risks of each party need to be clearly stated in the documentation and understood by all parties. Training is necessary for this.
- An appropriate dispute settlement system is needed to ensure that the contractor can exercise his or her legal rights without fear of future discrimination.

### **From Force Account to Contract Management**

Key guidelines are as follows:

- A radical change in philosophy and working practice is required to transform a force-account approach into a contract management approach. Clear roles, responsibilities and job descriptions for road agency staff should be defined and formalized as they carry legal implications.
- A structured training program for road agency staff will be required – for both technical and administrative staff.
- The technical part of the training would include – the process affecting technology choice, specifications for works, and work programming. The part dealing with contract management should cover – contract law, documentation, tendering process, quality control, and contract administration.
- Beyond the transition period, it will be necessary to develop and train local consultants in order to establish private sector capacity for supervision and complement the supervisory capacity of road agencies. Also, consultants might eventually be used for financial and technical audits.

#### **8.4.4 Transparent Contractor Registration and Evaluation System**

A contractor registration system serves the purpose of regulating and monitoring the industry in terms of codes of conduct and participation. Ideally, contractors should be registered with the KRB and/or a Contractors Association, with registration details being provided to the Road Agencies. To promote the small/medium-scale contracting sector, a separate classification for LBES contractors should be introduced so that these contractors are treated as a special category. A condition for LBES registration should be that the contractor has successfully participated in the KTC training program. Contractor capability and performance shall be evaluated regularly to ensure credibility.

#### **8.4.5 Contractors Association for Small/Medium-Scale Contractors**

To facilitate the development of the small/medium-scale contracting industry, it would be beneficial to establish a LBES Contractors' Association for small/medium-scale outfits who have passed through the KTC training program. It is envisaged that KRB would promote the establishment of the Association, but with KTC providing assistance for some of the preparatory work. It is also envisaged that the local ILO office will be able to provide advice and guidelines to KRB/KTC. The first members of the Association could be the small-scale contractors who have already been trained by KTC – namely, 86 in Coast Province (Danida), 26

in Central Province (Sida) and 14 others. The main preparatory steps are seen as follows:

- Visits to selected provinces/districts to hold discussions with stakeholders. The Coast Province would be a good start because the Danida project is ongoing. Stakeholders would include road agencies, district development committees, existing or potential small/medium-scale contractors, NGOs and coffee/sugar/tea/cereal entities.
- With the help of a lawyer, a draft charter would be prepared. The main role of the Association would be to promote the interests of small/medium-scale contractors including fair, transparent and streamlined procedures for contract awards and payments. The pooling/sharing of equipment would be another aim.
- An informal structure could be set up with interim office bearers and the first group of members.
- Sources of funds and membership conditions, as well as office accommodation and regional/provincial branches, would need to be decided.
- Eventually, registration and evaluation would be necessary with the Register of Companies and Societies.

## **8.5 KRB's Secretariat Capacity Building**

### **8.5.1 Background**

The Road Maintenance Training Plan that can be managed by KTC only covers road agency staff and small/medium-scale contractors. Capacity building for KRB's secretariat, including its business relations with road agencies, is a separate issue since the subject matters are quite different. For this capacity building, it is envisaged that donors would support tailored technical assistance (TA) projects.

### **8.5.2 Main Areas for Capacity Building**

The principal areas for KRB capacity building are summarized below:

- Development of funds allocation criteria.
- Development of procurement procedures.
- Development of payment systems.
- Design of a quality assurance system.
- Support to review axle load control.
- Development of standard contract documents.
- Design and installation of accounting, banking, and treasury management systems.
- Design and installation of management information systems.

- Support to set up and sustain financial and technical audits.
- Support to set up a contractor registration and evaluation system.
- Support to set up a road database.
- Support for launching and sustaining traffic count surveys.
- Possibly, support to set up a Contractors' Association.