



**ERA**  
**Ethiopian Roads**  
**Authority**

# Wereda and Community Roads Maintenance and Asset Management Strategy

February 2010





## Contents

List of Abbreviations .....	ii
Glossary.....	iii
1 Preface .....	1
2 Strategy Overview.....	2
3 Institutional Arrangements.....	4
3.1 Organisation for Road Maintenance.....	4
3.2 Training for Road Maintenance .....	5
3.3 Planning for Road Maintenance .....	6
4 Financing .....	9
4.1 Source of Funds.....	9
4.2 Maintenance Funding Needs .....	9
4.3 Reporting and Auditing .....	9
5 Technical .....	11
5.1 Road Standards .....	11
5.2 Choice of Technology.....	11
5.3 Method of Implementation .....	11
5.4 Spot Upgrading .....	13
Annex 1 Road Inventory.....	15
Annex 2 Access Standards.....	16

## List of Abbreviations

BoWUD	Bureau of Works and Urban Development
ERA	Ethiopian Roads Authority
ETB	Ethiopian Birr
Km	Kilometre
MoWUD	Ministry of Works and Urban Development
n.a.	Not applicable
PSNP	Productive Safety Net Programme
RRA	Regional Road Authority
TI-UP	Technology, Infrastructure and Urban Planning (Resource Centre)
URRAP	Universal Rural Road Access Programme
vpd	Vehicles per day
WIDP	Wereda Integrated Development Plan

## Glossary

All weather road	A road that is usually passable to motorised traffic in both wet and dry weather.
Asset management	A systematic process of effectively maintaining, upgrading and operating assets, combining engineering principles with sound business practice and economic rationale, and providing the tools to facilitate a more organised and flexible approach to making decisions necessary to achieve the public's expectations.
Block grants	A sum of money granted by the national government to regional or wereda administration with only general provisions as to the way it is to be spent.
Cross Drainage	Culverts, drifts and other structures that channel surface water across the road line.
Dry weather road	A road that is usually only passable to motorised traffic in dry weather. This could be because of a soft and slippery road surface and/or streams that are not passable after heavy rain.
Emergency Maintenance	Maintenance and repairs of an urgent and unforeseen nature often required to re-open or keep open a road. This includes clearing landslips that block or partially block the road, repairing collapsed culverts , etc.
Labour-based	A technology that applies a labour/equipment mix that gives priority to labour, supplementing it with appropriate equipment where necessary for reasons of quality or cost.
Lengthperson	An individual given responsibility for the maintenance of a specified section or length of road over an extended period of time (usually at least one year).
Periodic maintenance	Activities on a section of road at regular and relatively long intervals (3-8 years) with the aim of preserving the structural integrity of the road. The operations require the mobilisation of equipment and skilled personnel. In the context of low-volume roads, typical works include the re-shaping of the road and side ditches and the repair of structures. If a gravel surface is provided, replenishing and re-compacting the gravel layer is included.
Routine maintenance	Routine maintenance comprises a range of small scale and simple activities - usually carried out at least once a year - but usually widely dispersed. Typical activities include roadside verge clearing

and cutting back encroaching vegetation, cleaning of silted ditches and culverts, patching and pothole repair, and light grading/reshaping of unsealed surfaces.

#### Spot repairs

Repairs to a road that are carried out in one or more short sections or “spots” only. This could include the repair of the road surface, the road shoulders, the side ditches or the cross drainage structures and associated embankments.

# 1 Preface

Ethiopia has an extensive tertiary network of wereda and community roads. There is no precise measurement of the length of this network but it has been estimated to be at least 90,000 kilometres in length. The majority of the roads have an earth surface and only a very small proportion have been constructed to fully engineered standard i.e. with a standard cross section, drainage works, etc. For this reason, most of the roads are only reliably passable in dry weather.

These roads are important for the local movement of goods and people between villages and markets. They connect the wereda centre to kebele centres and link with the primary and secondary road network. They also connect villages with the kebele centres and with neighbouring villages.

Some kebele centres and many villages do not have a motorable road connection. Programmes such as the Productive Safety Nets Programme (PSNP) are steadily adding to the network of wereda and community roads by the construction of new roads. However, the roads built under these projects are typically poorly designed or constructed and often do not last more than one year.

The Universal Rural Roads Access Programme (URRAP), commencing in 2010, will complete the missing links to currently unconnected kebele centres and as well as upgrade existing wereda roads to all weather standard. These roads will be built to a higher standard than PSNP roads and will need to be maintained to preserve the significant investments made. A complementary activity to constructing new roads is to improve the passability of existing tracks by upgrading spots that are currently impassable during adverse weather conditions. These activities are small scale, locally identified and can thus be considered as part of a road maintenance strategy.

A major problem with the current wereda and community roads is the almost complete lack of maintenance. Consequently, many roads that have been constructed or improved under projects have fallen back into a state of disrepair. The underlying issue leading to this situation is a lack of clarity about who is responsible for maintaining this network, from where the resources for maintenance should be sourced and the details of how maintenance should be carried out. For this reason, the Ethiopian Roads Authority decided that an operational maintenance and asset management policy for wereda and community roads was necessary.

In 2008, Consultants were appointed through the Ti-UP Resource centre funded by DFID to assist in the process of preparing a maintenance and asset management policy and strategy. An Inception Report was produced in late 2008. This was followed by an identification of the key issues and options based on various meetings and discussions at federal, regional and wereda levels. This was documented in an Issues and Options Report that was discussed in a stakeholder workshop in July 2009.

This document describes how the Wereda and Community Roads Maintenance and Asset Management Policy will be achieved. It should be read in conjunction with the separate Policy Document, the Issues and Options Paper and the stakeholder workshop report. The main focus is maintenance. However, it is also an asset management strategy inasmuch as the upgrading of spots that are currently difficult or impossible to pass is included with maintenance activities. Regions and weredas vary significantly throughout Ethiopia. It is expected that the details of the strategy may have to be modified to the particular conditions of each region and each wereda.

## 2 Strategy Overview

The objective of the maintenance and asset management strategy is to meet the policy of ensuring continuous safe and reliable passage of traffic on the wereda and community roads network. This has to be achieved in a way that is technically and institutionally feasible, economically efficient and financially affordable.

### *Length of Network*

The network has not been precisely measured but is extensive and likely to continue to grow as kebele and village centres that are currently not accessible by motorised traffic are connected by new roads. The Government policy is that all kebele centres should be connected to the main road network by a motorable all-weather road. A Universal Rural Road Access Programme (URRAP) is under development to deliver this objective in a period of five years from mid 2010. In addition, programmes such as the Productive Safety Nets Programme, the Local Investment Grant/Protection of Basic Services and the Agricultural Growth Programme are likely to contribute to the improvement of local roads. Because of these programmes, the length of improved roads is expected to increase significantly over the next five years both by the improvement of unimproved roads and the construction of new roads to currently unconnected kebele centres and villages. Consequently, **the strategy for maintenance must take into account the current and expected changes in the length of improved and unimproved roads over time.**

### *Unimproved Roads*

Only a small proportion of the wereda network is currently constructed to consistent engineering standards. Most of the network comprises earth roads that are either unimproved or partially improved. Much of the movement of goods and people on the network is by foot or animal transport and motorised traffic is limited. The strategy for maintenance of the unimproved roads focuses on maintaining passability for existing traffic rather than working to a particular engineering standard. All year round access may not always be achievable on these roads but it is the ultimate aim. Decreasing the period in which unimproved roads are not passable may be achieved through the programmes of road improvement described above or by incremental improvements such as the upgrading of spots that are difficult to pass during maintenance operations, if resources allow. Thus, maintenance activities on unimproved roads could be mixed with incremental improvements in the form of preventative maintenance measures. For example, the filling of erosion channels in the road surface could be combined with the excavation of side drains to prevent or reduce future erosion.

### *Improved Roads*

A different maintenance strategy is required for roads already built to consistent engineering standards. Currently, the length of improved roads is estimated to be only about 10% of the total network length. However, as described above, this length is likely to increase significantly in the next few years. The maintenance strategy for these improved roads must ensure the safe passage of traffic but should also seek to preserve the investment made in improving the road. This requires a well planned programme of regular routine and periodic maintenance. Therefore, an important step in developing plans for maintenance is to separate the network into improved and unimproved links.



### *Resources*

To date, the resources regularly applied for maintenance of wereda and community roads have been minimal. This situation is expected to improve but the mobilising of resources will take time and will probably always be limited for this part of the network. The strategy must take this into account by **identifying approaches that are affordable**. Where mobilising adequate resources may take some time, **transition arrangements** may be needed.

### *Technology*

Maintenance of the network presents particular challenges due to its extensive length, the scattered and remote nature of the maintenance work required and the limited resources that are available and economically justifiable. Moreover, some upgrading work will be mixed with the operations so that the activities will not be pure maintenance. For these reasons, **the maintenance strategy requires approaches and techniques that are non-conventional and, in some cases, innovative**.

### *Summary*

In summary, the key issues for the proposed strategy are:

- Identifying the network including improved and unimproved roads;
- Applying a systematic approach to improved roads that ensures safe passage and preserves the investment;
- Focusing on maintaining access only on the unimproved roads with some upgrading of spots that are difficult to pass, if resources permit;
- Applying approaches that take into account the low motorised traffic, extensive earth surfacing and other particular features of the network and the limitation on resources;
- Strengthen technical capacity, particularly at the wereda level, to implement and manage the strategy.

### 3 Institutional Arrangements

#### 3.1 Organisation for Road Maintenance

Good planning and management of road maintenance is one of the keys to achieving the policy objective within the constraints identified above. This presents challenges to the existing institutional arrangements. Some changes are required to meet the objectives.

The focus for planning and managing the maintenance of the wereda and community roads network will be the **wereda level**. The most significant institutional changes will be at this level where a new tertiary roads administration will be strengthened or created. Technical and other backstopping support will be provided by the regional level. The regional level will also be responsible for communications between wereda and federal levels. The federal level will direct the overall technical standards to be applied to wereda and community roads and produce and disseminate guidelines for implementation of the maintenance strategy. Training will be organised at regional or federal level as appropriate.

Currently in most weredas, a road desk, (consisting of up to 5 persons but more typically of three) reports to the Wereda Administrator through the Head of the Agriculture and Rural Development Office. Because the role of the wereda road engineer/technician will increase in the future, the current institutional arrangements require upgrading. It is proposed that a Works Officer post should be created in each Wereda to provide leadership for the Roads Desk. Assuming that the Works Officer is an engineer or has engineering training, he or she should assist the wereda in all works related fields.

In the current system, each level of government is autonomous. However, the organisation at each level has its counterpart at the other levels. Thus, the Finance Officer at wereda level relates to the Bureau of Finance at regional level and the Ministry of Finance at federal level, as shown in Figure 1 below. The possible location and vertical linkage of a Works Officer post at wereda level is indicated in the Figure.

National Government				
Min. of Finance	Min. of Agric and Rural Development	Ministry of Health	Ministry of Education	MoWUD + ERA Technical Assistance
Regional Government				
Bureau of Finance	Bureau of Agric. And Rural Dev.	Bureau of Health	Bureau of Education	BoWUD + Regional Roads Authority Technical Assistance
Wereda Administration				
Finance Officer	Agriculture Officer	Health Officer	Education Officer	Works Officer + Wereda Road Office

**Fig 1: Sector-wide Governance Structures**

As it may take time to establish the Works Office with staffing and resources, the transitional arrangement will be for road desks to continue with the management of local road networks. Technical and management support will be provided from regional level through Regional Road Authorities or, in regions where these do not exist, similar suitable bodies. Under the transitional arrangements, ERA will

continue to provide overall coordination at federal level and set technical standards. During the process of transition, the line of command at wereda level may be changed such that of the Head of the Road Desk reports directly to the Wereda Administrator.

#### *Management of Wereda Roads*

The Wereda administration will be directly responsible for the maintenance of the wereda roads. This will include carrying out the annual planning and budgeting, mobilising the necessary resources, and organising and managing the implementation.

#### *Management of Community Roads*

The beneficiary communities, represented by the Kebele Administrations and Village Development Committees, will be responsible for maintenance of the community roads (kebele and village roads). They may form a special subcommittee to oversee community road maintenance. The kebele administration will assist with coordination of the maintenance of the community roads. The wereda administration will provide technical advice as required.

### **3.2 Training for Road Maintenance**

The federal level will be responsible for the overall planning and coordination of training including organising the development of the necessary training materials and the training of trainers. The three main groups requiring training will be:

- **Wereda level technical staff including Works Officer**– some may already have received some training. Ultimately, all technical staff should have received at least basic training in maintenance techniques and project and contract management.
- **Local small-scale contractors** – these may be existing building contractors requiring some re-orientation only. Most maintenance operations are relatively simple and the technical training should be short. Training in preparing bids and managing contracts should also be included.
- **Community level foremen** will be locally based and available for paid work with contractors or directly from the wereda and for unpaid community works. They would receive basic training only and this could be by temporary attachment to ongoing maintenance works.

The regional level will coordinate and organise the training of wereda level technical staff. Wereda level technical staff will organise the training of locally based small-scale contractors and community level foreman. The type of training to be offered to each group is indicated in Figure 2 below.

The Groups in figure 2 constitute the main focus of technical training. The numbers requiring training are likely to be substantial. The typical numbers per wereda are 3 technical staff, 5 small-scale contractors and 10-20 community-level foremen. Assuming 700 weredas, the total numbers would be:

Wereda technical staff:	2,100
Small-scale contractors:	3,500
Community-level foreman:	10,000 (approximately)

Group	Role/training content	Organisation of training
wereda level technical staff	Planning and managing routine and periodic maintenance including contract administration.	Class-based training at regional and national level supplemented by ad-hoc training at wereda level
locally based small-scale contractors	Organising, controlling and carrying out routine and periodic maintenance works and minor works such as culvert construction	Mainly on-site training by wereda technical staff
community level foreman	Organising, controlling and carrying out routine and periodic maintenance works and minor works such as culvert construction	Mainly on-site training by wereda technical staff or by attachment to ongoing works sites

**Fig 2: Training for Wereda and Community Roads Maintenance**

The training of small scale contractors can benefit from the lessons learnt in the Housing Development Project under MoWUD during which a similar larger scale programme of small-scale contractor development. Lessons from other countries are that small-scale contractors respond well to prompt payment, continuity of work, simple contractual arrangements and close supervision. If these factors are in place, they should only require relatively short on-the-job training.

Training will also be required for similar groups for road improvement works under the URRAP. Therefore, close coordination is required between this and the training for maintenance. For this reason, the details of training for maintenance work should only be finalised once the training plans for URRAP are known.

### 3.3 Planning for Road Maintenance

The planning for maintenance of the wereda and community roads will be integrated into the wereda annual plans. There will be a separate annual road maintenance plan for each wereda. These will be consolidated and summarised at regional and federal levels for overall planning and monitoring purposes.

Led by the Works Officer, the wereda authorities will be responsible for preparing a road plan for their wereda. This will form the basis for preparing road maintenance plans. The steps required to produce a wereda road plan are shown in Box 1. Where a Wereda Integrated Development Plan (WIDP) exists, much of the necessary information will already be available.

#### **Box 1: Steps to produce a wereda road plan**

- Each wereda should establish a list of roads within the wereda. These should be indicated on a **wereda road map**.
- Each road link should be classified as a wereda road, kebele road or village road according to its function using the following definitions:
  - *Wereda roads* – roads connecting Kebele centres and facilities of socio-economic importance with the Wereda HQs or the nearest all-weather road

- *Kebele roads* – roads connecting villages with the Kebele Centres
  - *Village roads* – roads connecting villages with other villages
- Basic information on the road location and characteristics should be collected and recorded for each road in a **wereda road inventory**. The minimum and desirable information for the inventory is shown in Annex 1. This must indicate whether the existing road is “improved” or “unimproved”.
  - The kebele administration and village development committees should provide information on the community road network.
  - The wereda road map and road inventory should be checked and updated at least once each year and copied to the regional administration.

The wereda Road Desk will be responsible for preparing the annual wereda road maintenance plan. The plan will be in two parts – wereda roads and community roads. These will be further subdivided into improved roads and unimproved roads. The general procedure is described in Box 2.

**Box 2: Steps to produce a wereda road maintenance plan**

- The road desk should prepare a road condition survey for all road links.
  - For improved wereda roads, this should be detailed such that routine and periodic maintenance plans can be drawn up.
  - For unimproved wereda roads, a list of essential and desirable (preventative) maintenance measures should be listed.
  - For community roads a simple condition survey based on the level of access will usually be sufficient (see Annex 2 for proposed access levels).
- Based on the condition survey, the road desk should prepare a costed workplan for the following operations:
  - Routine maintenance of improved wereda roads.
  - Periodic maintenance of improved wereda roads.
  - Minimum maintenance to preserve passability on unimproved wereda roads.
  - Desirable preventative maintenance/minor improvements to unimproved wereda roads.
- For community roads, the kebeles should indicate to the road desk how each community road in their area will be maintained and who will be responsible. This should then be incorporated into the plan. Where outside resources or assistance are required from the wereda authorities,

this should be clearly identified and included in the budgets.

- The planning should be based on a network approach whereby works on one link are coordinated with its connecting links.

Because resources are likely to be limited, prioritisation of operations will be necessary. The following priority order should be followed for wereda roads:

1. Routine maintenance of improved wereda roads
2. Minimum maintenance to preserve passability on unimproved wereda roads
3. Periodic maintenance of improved wereda roads
4. Desirable preventative maintenance/minor improvements to unimproved wereda roads.

The basic access and routine maintenance of community roads will be mainly carried out by community labour. The community, as the principal users and beneficiaries of the roads, will be responsible for setting their own maintenance priorities. However, the following priority order is advised:

1. Routine maintenance of improved community roads
2. Minimum maintenance to preserve passability on unimproved community roads
3. Desirable preventative maintenance/minor improvements to unimproved community roads
4. Periodic maintenance of improved community roads.

## 4 Financing

### 4.1 Source of Funds

The source of funds for maintenance of the wereda and community roads will be as follows:

	Basic access maint.	Routine maint.	Periodic maint.
Wereda roads:			
Improved	n.a.	Road Fund + Wereda & Regional contributions	
Unimproved	Road Fund + Wereda & Regional contributions	n.a.	n.a.
Community roads:			
Improved	n.a.	Community	Wereda+Community
Unimproved	Community	n.a.	n.a.

Note: "Basic access maintenance" comprises minimum maintenance for passability and desirable preventative maintenance.

The existing block grants to weredas cover administrative costs with minimal amounts for works. The new Local Investment Grants will eventually provide weredas with funding for roadworks as well as other development activities.

Weredas will prioritise PSNP and other similar funding to achieve the annual wereda road plan and create more sustainable road infrastructure.

It is expected to take time for the Road Fund to mobilise the additional resources necessary to contribute to the maintenance of wereda roads. For this reason, during a transitional period of about five years, the majority of the funding for maintenance of wereda and community roads will come from regional contributions, wereda funds and community contributions.

### 4.2 Maintenance Funding Needs

An overall estimate of the maintenance funding needs of the road network is required. This is for strategic planning purposes only and not for detailed wereda plans and budget. Annual plans produced at wereda level will be the primary means of drawing up accurate year by year budgets as described above. For this reason a maintenance cost study is urgently needed.

### 4.3 Reporting and Auditing

The wereda authorities shall prepare monthly, quarterly and annual reports of the maintenance activities. These should follow government procedures and may be incorporated into standard wereda reports also covering other activities. However, as a minimum the reports should contain the following details:

- Financial progress against budget;
- Physical progress against workplan targets;
- Costs per kilometre against original budget;
- Explanation of variances between actual and planned progress.

The reports will be compiled and consolidated at regional level for overall monitoring purposes. Reports will also be copied to the Road Fund and other Federal institutions with an interest in the sub-sector.

Maintenance activities will be subject to the normal government auditing procedures.



## **5 Technical**

### **5.1 Road Standards**

The immediate objective of road maintenance works on wereda and community roads is to restore the road to its original condition including the original engineering standards. Therefore, for most maintenance works the road width and other standards should be as for the original road. Only where minor upgrading works or preventative maintenance measures form part of the maintenance activities should new engineering standards be adopted. In these cases the standards should be based on the system of design standards set by the ERA. In the ERA system, the selected standard for each road is based on the expected level of motorised traffic.

The standards most likely to be appropriate for wereda and community roads are available in the ERA design guidelines. For roads that are to be designated “all-weather”, an improved surface e.g. gravel or similar, will be required unless the in situ material is gravel.

Where a section of minor upgrading work is carried out as part of the maintenance works e.g. raising an embankment over low-lying ground, the standards for this section should be those appropriate for the road if it was to be fully upgraded. Therefore, if the road is upgraded in the future, the works carried out will not become redundant.

The quality of works, particularly where carried out by contractors, shall be checked on completion and before acceptance of the work. Checks should include physical dimensions, thickness of material provided, and, where appropriate, the quality of materials used.

For simple maintenance works on unimproved community roads, the standard will be measured in terms of passability. The access standards given in Annex 2 will be used.

### **5.2 Choice of Technology**

The choice of technology used for maintenance works will maximise the use of local resources including locally available materials and local labour. The work required will typically be scattered and small-scale. Using local resources will avoid the high mobilisation costs and logistical support problems associated with the use of heavy construction equipment in remote rural areas. It will also support the local economy by providing employment and incomes in areas where there are few such other opportunities.

Therefore, labour based and local resource based techniques will be the technology used for most maintenance works on wereda and community roads.

### **5.3 Method of Implementation**

A variety of methods of implementation will be used for carrying out maintenance works dependent on the type of work and local conditions. The main methods are described in Box 3.

### **Box 3: Methods of Implementation of Maintenance Works**

- Direct Labour
  - Labour is directly employed and supervised by the wereda authorities or community representatives.
- Lengthperson.
  - An individual is assigned a specific section of road to maintain. Payment can be based either on the specific work carried out (input-based) or performance achieved (output-based). The method can be adapted such that payment is made to a group of lengthpersons in which case this is similar to a small contract. This eases the supervision and administration burden.
- Local contractor
  - Contracts for maintenance works can be awarded to local small-scale contractors. There are a number of variations on standard measured contracts that can be used for small-scale maintenance works including term contracts (the contract period and unit rates are agreed in the contract but the quantity of work is only specified during the contract period) and performance based contracts (payment is based on maintaining a specified level of service for the road section).
- Community Contract
  - A contract for maintenance works is awarded to a community group (usually based at the works location). Usually a nominated group leader takes responsibility for delivering the works. Payment is often lump sum on successful completion of the works.

#### *Routine Maintenance*

For the routine maintenance of improved wereda roads, the preferred method of implementation will be (in order of preference):

- Lengthperson
- Local contractor
- Direct labour
- Community contract

For the routine maintenance of improved community roads, the implementation will be organised and carried out by the local communities using local resources. Because this work has to fit in with other obligations of the community, the maintenance work will usually be carried out intermittently.

#### *Periodic Maintenance*

Periodic maintenance of improved wereda roads will be pre-planned activities based on detailed surveys and measured amounts of work. The preferred method of implementation will be (in order of preference):

- Local contractor
- Direct labour

The periodic maintenance of improved community roads will also be based on specified works. The preferred method of implementation will be (in order of preference):

- Community contract
- Local contractor
- Direct labour

#### *Basic Access Maintenance*

For basic access maintenance of unimproved wereda roads, the method of implementation will usually be by intermittent interventions to ensure that the road remains open to traffic. This could be organised by direct labour or local contracts. Lengthpersons may also be used during certain periods of the year, e.g. rainy season, to ensure the prompt removal of obstacles and the filling of rain cuts that could prevent the safe passage of traffic.

For basic access maintenance of unimproved community roads, the implementation will be similar to that for routine maintenance. It will be organised and carried out by the local communities usually on an intermittent basis.

## **5.4 Spot Upgrading**

Although not strictly a maintenance activity, the upgrading of spots will be included in the maintenance strategy. There will be three justifications for spot upgrading. These are:

- Improving safety
- Improving passability
- Improving environmental management

The upgrading of spots will usually be integrated into the maintenance activities. In this case, they will be carried out at the same time and by the same method of implementation as the maintenance works. For larger or more complicated works, they will be carried out either as small contracts or, where contractors are not available, by direct labour.

#### *Cross Drainage Structures*

One of the most critical items for spot upgrading is the building of small stream crossings and other cross drainage structures. A large number of these are required on the unimproved network to improve safety and extend the period during which these roads are passable. For this reason, a separate programme of cross drainage structures installation is proposed. The ERA and RRAs will be responsible

for drawing up standard designs and contract documents. The wereda administration, in consultation with the communities and road users, will be responsible for identifying a prioritised list of cross drainage structures in each wereda. The wereda road desk will be responsible for carrying out site surveys and collecting sufficient data to enable cost estimates and contract documents to be prepared. Implementation will be by contract, using local small-scale contractors. The exception will be for complicated structures for which RRA and ERA advice will be sought on the choice of contractors.

#### *Road Surfacing*

The achievement of “all-weather” access on the wereda road network is one of the key objectives of the policy of asset management and maintenance. In many cases this will require either partial or full surfacing of the existing earth surface wereda roads to enable motorised traffic to pass in wet weather. Applying a gravel surface will be the usual method of improving the road surface where this is necessary. However, in many parts of Ethiopia, gravel is either not available or in short supply. This is a situation that has been encountered in other countries and there has been considerable recent research on alternative surfacing for low volume roads including in Ethiopia. The strategy towards surfacing for the achievement of all-weather access will observe the recommendations of this research.

#### *Environmental Protection*

All upgrading works will take account of protecting or improving the environment. For example, the control of road surface water will be carried out in a way that both improves the passability of the road but also safely channels the water into existing water courses. This will minimise erosion and promote soil conservation.

## Annex 1 Road Inventory

<b>ROAD INVENTORY INFORMATION REQUIREMENTS – Motorable Roads</b>		
<b>Minimum (essential)</b>		
Road name	Unique reference	
Start point/end point	Precise definition (GPS if possible)	
Classification	According to function	
Length	To nearest 0.1 km	
Map location	Sketch map or (better) GPS track	
Road surface type	Earth, gravel, etc.	
<b>Desirable (if possible)</b>		
Road width	Running surface width in metres	
Side drains	Existing or not	
Existing structures	Culverts, etc.	
Strip map	Showing major features e.g. clinics, schools, village markets, etc.	
Passability	Passable all year, dry season only, etc.	
Existing traffic level	Estimate based on ranges e.g. 0-10 vpd, etc	
Missing structures	e.g. streams with no bridge	

<b>ROAD INVENTORY INFORMATION REQUIREMENTS – Non-Motorable Roads, tracks and paths</b>		
<b>Minimum (essential)</b>		
Road/path name	Unique reference	
Start point/end point	Defined start and end points (GPS if possible)	
Classification	According to function	
<b>Desirable (if possible)</b>		
Length	In kilometres	
Map location	Sketch map	
Strip map	Showing major features e.g. clinics, schools, village markets, etc.	
Passability	Notes on passability for different users e.g. passable all year for animal transport, dry season only, etc.	
Existing traffic	Type of traffic – pedestrians, donkeys, bicycles, cars, etc with approximate daily amount if possible	

## Annex 2 Access Standards

### Simple Access Standards

Standard	Description
<b>All-weather</b>	Passable in all weathers by normal traffic. Closed only in exceptional weather conditions.
<b>All-season</b>	Passable in both dry and wet seasons although liable to closure for short periods (max. 2-3 days) after very heavy rain.
<b>Dry-season</b>	Passable to normal traffic in the dry season. Not usually passable in the wet season.
<b>Impassable</b>	Not passable to normal traffic at any time of the year.

These standards can be used to describe the passability or condition of community roads for which no detailed information is available.