THE FEDERAL REPUBLIC OF ETHIOPIA

ETHIOPIAN ROAD AUTHORITY

PREPARATION OF MANUALS AND STANDARD BIDDING DOCUMENTS FOR LOW VOLUME ROADS IN ETHIOPIA

(Contract Reference: AFCAP/ETH/005)

FIRST WORKSHOP REPORT

EXECUTIVE HOTEL, ADAMA

23 – 26 November 2009

Submitted to: Ethiopian Road Authority
Addis Ababa

Attention: The Director General

Submitted by: AFCAP Core Management Unit
Crown Agents
St Nicholas House
Sutton
Surrey SM1 1EL
UK

Report No: CAEth/04 **06 December 2009**

TABLE OF CONTENTS

1 INTRODUCTION 4

1.1 National Participation Approach 4

1.2 Report Objectives 5

2 THE "MANUALS" PROJECT WORKSHOP 5

2.2 Workshop Objectives 5

2.3 Workshop Participants 5

2.4 Workshop Programme 6

2.5 Opening Session 6

2.6 Background Presentations 7

2.7 Regional Feedback 8

2.8 Identified Challenges, Concerns and Solutions 9

2.9 Agreements and Actions from the "Manuals" Workshop 13

3 SITE VISIT 14

3.1 Summary of Experiences and Lessons Learned from the site visit 15

3.1.1 Wereda Experience 15

3.1.2 General Lessons Learned 15

3.1.3 Technical Lessons Learned 16

4 WORKSHOP SUMMARY OF THE REVIEW OF SURFACE TREATMENT PRACTICE 17

10.1 Presentations 17

10.2 Ethiopian Experience of Surface Treatment Practice and Performance 17

10.3 Recommendations and Actions 18

LIST OF TABLES:

Table 1: Summary of workshop attendance 6
Table 2: Summary of Road Authority Presemtations 9
Table 3: Summary of main Regional Challenges 10
Table 4: Summary of Identified Challenges, Concerns and Solutions 11
Table 5: Revised Workshop Schedule 14
Table 6: Responsibilitiesfor Provision of Information to the Core Team 14

LIST OF APPENDICES:

Appendix 1: Overview of the Project to Develop a Design Manual, Specifications, Detailed Drawings and Bidding Documents for Low Volume Roads – Les Sampson
Appendix 2: Overview of Current Manuals, Specifications and Bidding Documents – Ato Daniel Nebro
Appendix 3: Overview of TRL Projects in Ethiopia – Tony Greening
Appendix 4: Workshop Programme
Appendix 5: List of Participants
Appendix 6: Presentation by Oromiya RRA
Appendix 7: Presentation by Southern RRA
Appendix 8: Presentation by Gambella RRA
Appendix 9: Presentation by Benishangul-Gumus RRA
Appendix 10: Presentation on behalf of Dire Dawa RA
Appendix 11: Reforms in the Kenya Roads Sub-Sector
Appendix 12: Background to the Gimbichu District Administration Community Road by Oromiya RRA
Appendix 13: Response from the Core Team to Geometric Design Issues – John Rolt
Appendix 14: Response from the Core Team to Pavement Design and Materials Issues – Mike Pinard
Appendix 15: Feedback on the Findings from the Investigation of Surface Treatment Performance in Ethiopia – Kim Neaylon & Gerrie van Zyl
Appendix 16: Asphaltic Concrete – A Panacea for Thin Surfacing Problems – John Rolt
Appendix 17: Selection and Options for Appropriate Sealing of Roads – Mike Pinard
Appendix 18: Response by the Project Team to the Ethiopian Experiences of Surface Treatment Practice and Performance – Kim Neaylon & Gerrie van Zyl

LIST OF DEFINITIONS OF TERMS AND ACRONYMS

Acronyms:

AASHTO		American Association of State Highway and Transportation Officials
AFCAP	:	Africa Community Access Programme
AIDS	:	Acquired Immune Deficiency Syndrome *or* Acquired Immunodeficiency Syndrome
CMG	:	Crown Agents Core Management Group
COLTO		Commission of Land Transport Officials (South Africa)
DFID	:	UK Government's Department of International Development
ERA	:	Ethiopian Road Authority
ERTTP	:	Ethiopian Rural Travel and Transport Programme
HIV	:	Human immunodeficiency virus
ICB	:	International Competitive Bidding
IDA	:	International Development Agency
gTKP	:	Global Transport Knowledge Partnership
MWUD	:	Ministry of Works and Urban Design
NCT	:	National Competitive Tendering
ORRA	:	Oromiya Regional Roads Authority
PSNP	:	Productive Safety Net Programme
RRA	:	Regional Roads Agency
RSC	:	Research Steering Committee
ToR	:	Terms of Reference
TRL	:	Transport Research Laboratory
vpd	:	vehicles per day
UK	:	United Kingdom
USA	:	United States of America

Definition of Terms:

"Manual"	refers to the design manual for low volume roads to be prepared as part of the project.
'Manuals" project	refers to project for the preparation of a design manual, specifications, detailed drawings and bidding documents for low volume roads.
"Documentation"	refers to all documentation to be prepared and revised as part of this project and will include the design manual, standard technical specifications, bill of quantities, detailed drawings and bidding documents.
"Low Volume Roads"	for the purpose of this project, low volume roads are defined as any roads carrying up to 300 vehicles per day.
"Cross-cutting Issues"	refers to all issues that could have an impact on the proposed designs and would include areas such as policy demands, construction management and approach, maintenance constraints, environmental protection and management, employment law and opportunity, gender balance, HIV/AIDS and other social impacts and externalities.
"Core Team"	refers to the team of consultants (Technical Director, Contract Expert and Lead Authors) and the AFCAP technical manager responsible for the delivery of the project.

1 INTRODUCTION

The Africa Community Access Programme (AFCAP) is a research programme funded by the UK Government's Department of International Development (DFID) for safe and sustainable rural access in Africa. AFCAP is being managed by a Crown Agents Core Management Group (CMG). As part of the programme, AFCAP has been asked by the Ethiopian Road Authority (ERA) to assist in the "Preparation of a Manual, Specifications and Standard Bidding Documents for Low Volume Roads" in Ethiopia.

Currently ERA and the Regional Road Authorities (RRAs) use a series of "Design Manuals, Standard Contract Documents and Specifications" produced in 2002. While it has been recognised that these documents are more relevant to roads carrying relatively higher volumes of traffic mainly under the authority of ERA, it is the intention of this project to add to the above series to provide specific guidance in the use of more appropriate technologies for the various categories of low volume roads. The low volume road design manual and bidding documents produced as part of this project will be in addition to the existing series of manuals and bidding documents. However, the existing series of documents will form the foundation for the new design manual and bidding documents. Relevant clauses and sections in the current series of manuals will be retained and/or cross-referenced where appropriate, while other new or updated sections detailing more appropriate technologies for low volume roads will be added based on local and international practice. The associated revision and updating of the standard specifications and detailed drawings will supersede and replace the 2002 document.

1.1 National Participation Approach

As part of the methodology outlined in the project Inception Report, the participation of national experts and practitioners was seen as a critical input to the project. This will provide crucial information to the core team and gives ownership of the process to the ultimate beneficiaries. To facilitate the approach, a series of regional workshops are being organised that:

- Allows the core team close interact with a wide cross-section of national experts and practitioners.
- Gathers information and experience on the challenges and constraints facing the provisions of low volume roads.
- Captures innovative and appropriate technologies that have been successfully tested and adopted in Ethiopia, although in practice, these may fall outside currently accepted standards and specifications.
- Provides an opportunity for the core team to explain and introduce alternative but appropriate technologies for low volume roads that, based on international best practice, may be suitable for implementation in Ethiopia.

The first four 3 or 4-day workshops will be structured to promote the following:

- Identification of problematic aspects of the current documentation related to their appropriateness for application to low volume roads;
- Information sharing on appropriate local and international practices that should be included in the final documents;
- Development of teamwork and understanding between the core team and national experts.
- National ownership at all levels of the process and the resulting documentation.

A fifth workshop has been scheduled to review and agree the draft documents comprising the low volume roads design manual, bidding documents and the associated changes to the specifications and detailed drawings.

1.2 Report Objectives

This report provides a record of the discussions and outcomes from the first project workshop held in Adama at the Executive hotel from 23 – 26 November 2009. It should be noted that the first three days of the workshop were specific to this project while the final day of the workshop was dedicated to feedback from a parallel project that provides a "Review of Surface Treatment Practice in Ethiopia". The findings of the "Review of Surface Treatment Practice in Ethiopia" project will have a direct impact on the revised specifications, the low volume roads design manual and bidding documents being developed as part of this project.

2 THE "MANUALS" PROJECT WORKSHOP

The Technical Director and Lead Facilitator for the project, Mr Les Sampson, gave an overview of the project to develop a design manual, specifications, detailed drawings and bidding documents for low volume roads. Mr Sampson explained the background, objectives and process for the workshop, and gave an outline of the programme including the "Surface Treatment" workshop on the final day. The presentation is shown in Appendix 1.

2.2 Workshop Objectives

The specific objectives of the workshop were to:

- Gather information on approaches on local best-practice for low volume road provision;
- Capture other local and international innovative designs and standards that may be considered more appropriate than those currently specified;
- Ensure road authorities and stakeholders take ownership of the documents at the outset;
- Promote information sharing and cross-fertilisation of ideas across regional boundaries;
- Provide international comment on the current documentation and introduce other appropriate methodologies;
- Build a team of national and international experts to develop the manuals and other associated documentation.

2.3 Workshop Participants

Letters of invitation were sent by ERA to the Regional Road Authorities, relevant members of the ERA staff and other organisations and individuals who could provide the essential inputs to the project.

Table 1 shows a summary of the attendees for the low volume roads workshop (days 1 to 3) and the attendance for the "Surface Treatment" workshop (day 4). The figures have been compiled from the signed attendance register that was circulated daily at the workshop.

Table 1 Summary of Workshop Attendance		
Organisation	**"Manuals" Workshop 23-25 Nov 09**	**"Surface Treatment" Workshop 26 Nov 09**
Ethiopian Road Authority	7	17
Oromiya RRA	6	6
Afar RRA	3	3
Southern RRA	3	3
Harari RA	1	1
Amhara RRA	3	3
Somali RRA	3	3
Dire Dawa RRA	3	3
Benishangul-Gumuz RRA	2	2
Gambella RRA	1	1
Tigray	0	0
Contractors	1	3
Consultants	3	13
Kenyan delegation	5	0
AFCAP Core Team/Surface Treatment experts	7	9
Others	5	4
TOTAL	**53**	**71**

The full list of participants for the 4 days of the workshop and their contact details are provided in Appendix 5. It should be noted that some participants attended for the first 3 days of the low volume roads workshop and others joined the workshop on the final day for the feedback on surface treatment practice in Ethiopia. In total 85 participants attended some part of the workshop event.

2.4 Workshop Programme

The programme for the first workshop including the workshop on feedback from the "Review of Surface Treatment Practice in Ethiopia" is given in Appendix 4.

2.5 Opening Session

Following a traditional blessing, the workshop was formally opened with a welcome address by Ato Hussein Galgalo, General Manager, of the Oromiya Regional Roads Authority.

This was followed by an address from the Director General of ERA, Ato Zaid W Gebriel. In his address the Director General emphasised the importance of the project and its series of workshops to the government and the country. The following were highlighted:

- Ethiopia faces immense challenges with regard to the provision of all types of road.
- The performance of the economy and service sector relies heavily on the availability and satisfactory performance of the roads.
- Adequate access to roads is essential for:
    - Connecting citizens to essential services;
    - Giving citizens the opportunity to better themselves;
    - Allowing each and every citizen an opportunity to participate in the growth of the country.

The Director General considered that the workshop series for "The Preparation of a Manual, Specification and Standard Bidding Documents for Low Volume Roads" was an excellent example of how the country's partnership with DFID/AFCAP should operate. The collective responsibility for the project to be taken by the assembled group of national and international experts was emphasised and would be strengthened through their contributions to the workshops, the experiences that would shared and the general support for each other and the core team as part of the process.

Thanks were extended to the Oromiya RRA for hosting both the first low volume roads workshop and the surface treatments workshop; and to the Administration of the Gimbichu Wereda for the arrangements during the technical site visit and inauguration of their recently completed community road project.

In conclusion, the Director General thanked DFID and AFCAP for their support and foresight in bringing this important and timely series of workshops to Ethiopia and looked forward to the Launch of the new manual for low volume roads in October 2010.

2.6 Background Presentations

A background presentation was given by Ato Daniel Nebro of ERA (Appendix 2) on the development and application of the 2002 series of manuals currently being used by ERA and the Regional Road Authorities. It was highlighted that the manuals and specifications should provide a cornerstone for the development of the low volume roads documents and that they should provide a common reference for future improvements. The current series were developed from the 1968 specifications and incorporated aspects from other regional and international documents including Kenya, Tanzania, TRL, AASHTO and South Africa. The current specification was derived from COLTO. As the design branch of ERA needed to be fully established, there was a delay in adopting the 2002 standards which were finally adopted in 2004.

Mr Tony Greening of TRL gave a presentation on the following associated projects completed or being undertaken by TRL in Ethiopia (Appendix 3):

- Labour-based engineering standards;
- Improving the performance of limestone wearing course and low cost surfacings in Ethipia's Southern region;
- Development of Pavement Designs and Specifications for Low Volume Roads through the construction and monitoring of demonstration sections in various regions of Ethiopia.

Other key points highlighted during the presentation were the effects of dust; accommodation of pedestrian and non-motorised traffic; and the use of a life-cycle approach in planning. The challenges of terrain, water-crossings and the rapid development of roughness on many of Ethiopia's gravel roads were also mentioned.

These documents and projects will provide valuable inputs into the documentation being produced as part of this project.

The following points were raised during the discussions:

- The design philosophy for low volume roads is multi-dimensional, requires experienced and innovative engineers to manage the risk, should be flexible and should promote the application of appropriate standards.
- A parallel cost-estimation manual is required.
- The low volume roads manual, specifications and other documents should be synchronised and harmonised with the current series.
- The documents should not be prescriptive and stifle innovation.
- The standards should reflect the minimum requirements.
- Where possible, the use of locally available materials should be promoted and long hauls avoided.
- An important element to address will be the ToR and requirements for the design consultant.
- Considerable thought should be given to Geometric Design and its implication on earthworks and other costs. The terrain in Ethiopia poses many challenges.
- The current site investigation, pavement design and geometric standard manuals are not appropriate for low volume roads.
- With regard to geometric design, on low volume roads, the composition and type of traffic using the road is a critical consideration as is the speed of the traffic.
- Due consideration must be given to pedestrian, non-motorised and intermediate means of transport. Roads should adopt affordable road safety features.
- The specifications and bill of quantities provide opportunity to include actions under the works contract on all relevant cross-cutting issues.
- Terminology such as "relaxed" or "lower" standards give negative perceptions and should be avoided.

2.7 Regional Feedback

As part of the invitation letter sent to the Regional Road Authorities, each Authority was invited to give a 20 minute presentation on their challenges, concerns and solutions to the provision of low volume roads in their regions with specific attention being given to the use of innovative, cost-effective designs not currently included in the current series of manuals and specification.

Table 2 summarises the types of presentations given by the respective road authorities. Where available the presentation is provided for reference in the Appendix indicated.

It should also be noted that in some instances, notification of the requirement for a regional presentation was too late to prepare a formal presentation. Opportunity will be provided in subsequent workshops to those regions willing to prepare a regional presentation for assistance to the core team.

Table 2 Summary of Road Authority Presentations			
Region/Authority	**Type of Presentation**	**Appendix**	**Comments**
Oromiya	Powerpoint slides	6	-
Southern	Powerpoint slides	7	-
Gambella	Verbal presentation	8	Presentation submitted for inclusion as a MS Word document
Benishangul-Gamuz	Powerpoint slides	9	-
Tigray	No presentation	-	Presentation to be prepared for next workshop
Amhara	Verbal presentation	-	Possible presentation at subsequent workshop
Harari	Verbal presentation	-	Possible presentation at subsequent workshop
Somali	Verbal Presentation	-	Possible presentation at subsequent workshop
Afar	Verbal Presentation	-	Possible presentation at subsequent workshop
Dire Dawa	Powerpoint presentation by Technical Director	10	Presentation to be prepared for next workshop

Table 3 provides a summary of the main regional challenges that were identified during the presentations. This table will be updated and revised after subsequent workshops based on additional information that will be provided.

A special presentation was also given by the Eng A M Osiro (General Manager of the Kenyan Rural Road Authority) of the Kenyan delegation on the road reform process in Kenya which is shown in Appendix 11. In identifying the main challenges for low volume road provision, design standards, funding, capacity, topography and climate were mentioned.

2.8 Identified Challenges, Concerns and Solutions

Table 4 shows a summary of the challenges, concerns and possible solutions that were captured by the core team from the facilitated discussions and includes those aspects raised in Table 3 by the representatives of the RRAs. The issues identified at the first workshop will be revisited at subsequent workshops based on further presentations that will be given by those Authorities who were not represented or may need to provide an updated presentation from their region.

Table 3 Summary of the Main Regional Challenges							
Issue	**Oromiya**	**SNNP**	**Gambella**	**BS-G**	**Amhara**	**Somali**	**Dire Dawa**
Topography	Yes	Yes		Yes	Yes		Yes
Natural Environment and Climate	Yes			Yes		Yes	
Dust	Yes						Yes
Poor/Lack of construction materials	Yes	Yes		Yes	Yes	Yes	Yes
Industry capacity & manpower	Yes	Yes	Yes			Yes	
Low road network coverage	Yes						
Maintenance	Yes						
Flooding			Yes				
Geotechnics				Yes	Yes		
Equipment				Yes		Yes	
Costs					Yes		
Construction water						Yes	
Security of Work						Yes	
Drainage Structures and water crossings							Yes

The issues and concerns have also been categorised into generic items that will be addressed in the documentation from the project and a member(s) of the core team has been assigned responsibility to give attention to a specific issues in the various documents that will be produced.

An indication is also provided of where specific items will be dealt with in subsequent workshop. The number shown in the column indicates whether the item will be dealt with in workshop 2, 3 or 4 as shown in Table 4. Where an item is shown as “2, 3, 4”, it is a cross cutting issue that will be considered throughout all the remaining workshops.

All of the core team provided verbal and Powerpoint response to some of the issues raised in Tables 3 and 4. The presentations by John Rolt on Geometric Design issues and Mike Pinard on Pavement design and Materials are shown in Appendix 13 and Appendix 14 respectively.

Further issues related to specifications, detailed drawings and bidding documents will be covered by Bob Carson in all subsequent workshops.

Table 4 Summary of Identified Challenges, Focus Areas and Solutions		
Item	**Wkshp No.**	**Identified Issues**
Terminology	**1**	Upper traffic limit for LVRs with respect to ADT and ESAs *(MP)*
		Clarification of all-weather passibility (basic access v full access) *(JR)*
		Need for indicating need for new LVR in relation to existing LVR documentation (address in preamble)
Geometric Design	**2**	Too conservative designs (Ato Daniel for clarification) *(JR)*
		Current standards do not cater for safety *(JR)*
		Design approach – traffic volume v traffic type *(JR)*
		Inadequate information on traffic mix - how to access it *(JR)*
		Problem of high cost of earthworks for lower standard roads (DS 5-10) *(JR)*
		Clarification of DS7 v DS8 *(JR)*
Drainage Design	**2**	Need for appropriate, low cost drainage structures *(JR)*
		Erosion and scouring *(JR)*
		Flooding *(JR)*
		Information on Gabion Fords *(JR)*
Pavement Design	**3**	Upgradability (drainage, pavement layers, etc) and criteria for that *(MP)*
		Clarity on traffic growth rates *(JR)*
		Clarification on use of pavement design methods *(MP)*
Materials	**3**	Problem soils (eg: black cotton soils, erodible soils, dispersive and collapsing soils) *(MP/LA)*
		Compaction of sand *(MP)*
		Testing standards (BS, AST, etc) *(MP)*
		Need to utilise locally available materials *(MP)*
		Lack of suitable materials *(LA)*
		Materials classification *(MP)*
Surfacing	**3**	Need for low cost surfacing options *(MP)*
		Information on cobblestones *(MP)*
Geotechnics	**4**	Slope stability and retaining structures *(LA)*
		Information on successful bio-engineering methods, including bamboo in terracing *(LA)*
Site Investigations	**4**	Interface with planning (differences for HVRs and LVRs) *(MP/LA)*
Maintenance	**2, 3, 4**	Need for maintenance specifications *(BC)*
		Need to consider performance-based maintenance v in-house force account maintenance
Funding	**2, 3, 4**	Inclusion of cost estimation in manual *(BC)*
		Inadequacy of funding (cross-cutting issue?) *(BC)*
		Inadequate funding for maintenance *(BC)*

Item	Wkshp No.	Identified Issues
Construction	**2, 3, 4**	Compaction *(MP)*
		Optimisation of labour in all designs *(BC)*
		Poor workmanship *(LA/BC)*
		Lack of water for compaction *(MP)*
Specifications	**2, 3, 4**	Quality assurance and quality control *(BC/MP)*
		Inappropriateness of some specifications (eg: use of materials not compliant with current specifications *(MP)*
		Application of current specifications *(BC)*
		Review of current specifications for limited general updating *(BC)*
Contract Documentation	**2, 3, 4**	Lack of provision for contractors to propose alternatives (innovation) *(BC)*
		Need to fit manuals into existing Conditions of Contract
Environmental	**2, 3, 4**	Impact of dust *(MP)*
		Borrow pit reinstatement *(MP)*
		Effect of topography and terrain - clarification *(LA)*
		Climatic classification *(JR/LA)*
Safety	**2, 3, 4**	Road furniture and traffic signage *(BC)*
		Need for integrated approach from planning through design, construction, etc.
Social	**2, 3, 4**	Need to incorporate social dimensions *(BC)*
Consulting Issues	**2, 3, 4**	Shortage of human resources *(BC)*
		Terms of Reference and form of agreement to guide consultants *(BC)*
Contracting Issues	**2, 3, 4**	Inadequacy of SME contracting capacity *(BC)*
		Shortage of human resources *(BC)*
Institutional (Government/Client) - Legal	**2, 3, 4**	Need to deal with risk sharing between parties
		Need to fit manuals into existing conditions of contract
Institutional (Government/Client) - Organisational	**2, 3, 4**	
Institutional (Government/Client) - Management	**2, 3, 4**	Lack of adequate management systems *(BC)*
		Inadequate project data documentation *(BC)*
		Post-project evaluations of consultants and contractors by the client *(BC)*
institutional (Government/Client) - Human Resources	**2, 3, 4**	Shortage of human resources (BC)
Standard Drawings	**2, 3, 4**	Requirement for revised detailed drawings (clarification) *(BC)*
Miscellaneous	**2, 3, 4**	Need for feasibility and route selection *(BC)*
		Need to highlight success stories

2.9 Agreements and Actions from the "Manuals" Workshop

The following was agreed at the workshop:

- For the purposes of the design manual, bidding documents and updated specifications and detailed drawings, low volume roads would be considered as all categories of roads carrying up to 300 vehicles per day.
- A questionnaire will be prepared by the core team and sent by ERA to the local experts attending the workshop and other identified experts by 15 December 2009. The purpose of the questionnaire is to gather additional information that may be useful to project based on the outcomes of the first workshop and identify individuals who could provide local expert inputs into subsequent workshops. The questionnaires need to be completed and returned to ERA by 4 January 2010 for consolidation by the Core Team before the next workshop of 18 – 22 January 2010.
- Workshop 2 will be held in Dire Dawa from 18 – 20 January 2010 and will focus on Geometric Design and Drainage issues with an appropriate site visit being arranged for Tuesday 19 January 2010. More information on changes to the specifications and bidding documents will also be provided at this workshop. Consideration should be given to the inclusion of presentations from the project team appointed to develop recommendations on appropriate low cost drainage structures that will impact on the documentation from this project.
- Workshop 3 was changed to Awassa in February 2010 and will concentrate on Pavement Design and Materials. This site visit will include a visit to the SNNP-RRA demonstration site close to Awassa.
- Workshop 4 will be held in Bahir Dar and will concentrate on Geotechnics, Site Investigation and problem soils.
- The programmes for Workshops 3 and 4 would be kept flexible dependent on the outcomes from Workshop 2. The detailed programme for Workshop 2 and subsequent workshops will be influenced by feedback from the questionnaire and will be finalised closer to the date of the next workshop.
- The revised schedule of subsequent workshops will be as shown in Table 5.

In addition, the following other issues were noted:

- While the project will add to and in some cases make correction to the existing specifications, a request was made to carry out a full review and update of all of the manuals in the ERA series, all specifications and detailed drawings and all supporting documentation.
- Given the valuable contribution from colleagues from Kenya, due consideration should be given to extending invitation to targeted individuals from neighbouring countries.

The actions and responsibilities shown in Table 6 were also agreed for the collection of additional information by the Core team.

Table 5 Revised Workshop Schedule				
Workshop	**Week of**	**Region**	**Venue**	**Status**
1	23-26 Nov '09	Oromiya	Executive hotel, Adama	Completed
2	18-22 Jan '10	Dire Dawa	Blossom hotel (with additional accommodation in the Selam hotel)	Agreed
3	15-19 Feb '10	Southern	Workshop venue to be finalised. Accommodation at Lewi hotel in Awassa	To be finalised
4	15-19 Mar '10	Amhara	Kuriftu hotel (with additional accommodation at Abay Minsch hotel) in Bahir Dar	To be finalised
5	1-3 June '10	Tigray	To be confirmed	To be finalised
6	12-16 July '10	Dates reserved for possible 2nd feedback workshop		
Launch	Week of 4 Oct '10	Venue to be confirmed in Addis Ababa		

Table 6 Responsibilities for Provision of Information to Core Team		
Information required	**Core team member**	**Contact person**
Traffic counts and traffic composition	John Rolt	Ato Muse
Performance of gravel roads in mountainous areas	John Rolt	Ato Muse
Black cotton soils (design & construction)	Mike Pinard/ Lulseged Ayalew	Ato Efrem
Gabion Fords (design & construction)	John Rolt	W/t Mulu
Cobblestone pavements	Mike Pinard	Ato Beneyam
1968 specifications	Bob Carson	Ato Daniel Nebro
All other specifications between 1968 & 2001	Bob Carson	Ato Daniel Nebro
Conditions of contract in use in Ethiopia	Bob Carson	All - questionnaire
Community agreements	Bob Carson	All - questionnaire
Axle load information	Mike Pinard	Ato Haddis
Axle load regulations	Mike Pinard	Ato Haddis
Road safety – current status	All	TBA
Environmental practice	All	Ato Abdissa
Bio-engineering	Lulseged Ayalew	Gambella, Benishangul-Gumuz Tigray representatives
Maintenance specifications	Bob Carson	Ato Haddis

3 SITE VISIT

Day 2 of the workshop was dedicated to a site visit and inauguration of a Community Road in the Gimbichu Wereda approximately 100 kms for Adama. The site visit was preceded at the end of day 1 by a verbal overview presentation by Ato Lema, the Gimbichu District Administrator

and a slide presentation on the background, design and construction of the road and drainage structures by Ato Iffa of the Oromiya Regional Road Authority (Appendix 12).

3.1 Summary of Experiences and Lessons Learned from the site visit

The following lessons learned and issues were captured as part of a facilitated discussion related to the site visit. The information provided during the site visit and the list compiled below will provide input into the design manuals, specifications, detailed drawings and bidding documents for community road provision.

The project may not be an example of best practice as it does not meet basic minimum standards. However, the road is an excellent example of what can be achieved by communities to provide improved access without any technical engineering input. Improved technical support and guidance will improve the final product and attention should be given to this aspect in the documentation produced from the project.

3.1.1 Wereda Experience

- Full commitment from the District Administration was required.
- Full community participation and commitment is essential:
    - Communities can be self-dependent;
    - Communities can raise financing; 75% of project finances provided by the community;
    - Unity and strength of the community is essential;
    - Good leadership and governance is the catalyst;
    - A machine-based approach was adopted; local labour was fully engaged on agricultural activities.
- Locally available materials were used although haul distances for gravel were high. (up to 40 kms)
- The road provides an example of construction challenges over black cotton soils.
- Due recognition was given to the need for cross-drainage structures.
- The potential and requirements for upgrading was considered during the design and construction of the road.
- Appropriate geometric standards were used.
- The need for technical support from the regional government was needed but not provided. In hindsight, this support is essential, especially if the road will ultimately become the responsibility of the regional road authority.
    - 50 engineers are being identified by the Oromiya RRA for support to the districts.
    - Technical challenges for the wereda would have been better managed had timely technical support been provided.
- The wereda experienced problems in planning the construction.

3.1.2 General Lessons Learned

- A formal system for financial management is required.
- Administrative contracting needs attention.
- Project data handling and improved reporting structures need to be developed.

- Monitoring and evaluation needs to be improved.
- Formal feedback structures to the community on problems need to be in place.
- Community participation guidelines should be developed for use in the design and construction of community roads.
- Familiarisation with the safety net programme and with the ERTTP is required.
- Formal contract documentation should be produced.
- Other examples of best-practice for community roads should be considered in future workshops.

3.1.3 Technical Lessons Learned

- Minimum requirements for low volume roads of this nature should be available.
- 4.5m carriage-way width and the design of cross-drainage structures need attention.
- Basic access approach compared with all weather access needs to be understood.
- Problems were encountered with quality control during construction.
- Optimal use needs to be made of all available resources (human and equipment).
- Community training to foreman level is required.
- Need for traffic limitation.
- Compaction and the effects of oversize need further consideration to improve the final surface and riding quality of the road.
- The need for a good crown on the road to dispel water was emphasised.
- Environmental protection in terms of drainage, soil erosion and aesthetics needs further guidance.
- A targeted intervention approach is needed for roads of this standard.

4 WORKSHOP SUMMARY OF THE REVIEW OF SURFACE TREATMENT PRACTICE

As stated earlier, the findings on the review of surface treatment practice in Ethiopia will have a significant input into the recommended designs and specifications for surface treatments that will be included in the documentation from this project. Hence, it was considered appropriate to arrange a feedback workshop on this project in association with the "Manuals" workshop. The programme for the workshop is shown in Appendix 2.

10.1 Presentations

The following presentations were given at the workshop and are attached in the relevant Appendices:

- Feedback on the findings of the "Investigation of Surface Treatment Performance in Ethiopia" by Kym Neaylon and Gerrie van Zyl (Appendix 15)
- Asphaltic concrete – A panacea for thin surfacing problems by John Rolt (Appendix 16)
- Selection and Options for appropriate sealing of roads by Mike Pinard (Appendix 17)
- Response by the international experts on the Ethiopian Experience of Surface Treatment Practice and performance by Kym Neaylon and Gerrie van Zyl(Appendix 18)

10.2 Ethiopian Experience of Surface Treatment Practice and Performance

The following issues and experiences were captured as part of the facilitated discussions on surface treatment practice in Ethiopia:

- Quality of the base course and its influence on performance.
    - Density at construction
    - Effect of surface hardness (top 25mm)
- Stiff sub-base required to ensure adequate compaction of the base.
- Cost effective alternative surfacings compared with gravel.
    - Effect on durability
    - Effect on performance
- Appropriate and timeous routine and periodic maintenance is required.
- Ethiopian costs of seals v asphalts need to be considered compared to international figures.
- Control of overloading will affect the performance of the surfacing.
- Quality of workmanship and skill needs attention.
- Good quality assurance and control is required.
- Effect of stabilised base v unstabilised base (cost comparison with AC) – life-cycle analysis required.
- Modification of designs related to climate and rainfall is required.
- HDM 4 used for planning and prioritisation (cost analysis of proposed designs).
    - Flexibility to change during project cycle.
- Practical training will improve current practice in Ethiopia.
    - Any construction or maintenance of bituminous products.
- Effect of tyre pressures on performance need to be considered.
- Linkage with the manuals project is essential.

- Need for multi-pronged approach addressing workmanship, specifications and training. This process is urgent and requires accelerated actions.
- Further assessment of cost comparisons required.
- Performance comparisons in different parts of the country related to climate and terrain is required.
- Effect of different binders (cutback v penetration) should be investigated and recommendations provided.
- An investigation of what makes surface treatment expensive in Ethiopia is required.
- High costs linked to earthworks and terrain are the major component of the construction costs in Ethiopia.
- Abnormal profit margins expected by contractors are restrictive.
- Higher risk of failure equates to higher cost.

10.3 Recommendations and Actions

Based on the inputs from the local experts at the workshop and the sharing of experiences by the participants, it was agreed that valuable insights had been gained by the project team to allow them to finalise the report and recommendations related to practice and appropriate specifications for surface treatments in Ethiopia.

It was also proposed by the World Bank representative that a similar workshop be organised to investigate experiences and concerns related to asphaltic concrete practice in Ethiopia.

Appendix 1

Overview of the Project to Develop a Design Manual, Specifications, Detailed Drawing and Bidding Documents for Low Volume Roads

Les Sampson

Appendix 2

Overview of Current Manuals, Specifications and Bidding Documents

Ato Daniel Nebro

Appendix 3

Overview of TRL projects in Ethiopia

Tony Greening

Appendix 4

Workshop Programme

Appendix 5

List of Participants

Appendix 6

Presentation by Oromiya RRA

Appendix 7

Presentation by Southern RRA

Appendix 8

Presentation by Gambella RRA

Appendix 9

Presentation by Benishangul-Gumuz RRA

Appendix 10

Presentation on behalf of Dire Dawa RA

Appendix 11

Reforms in the Kenyan Road Sub-Sector

Appendix 12

Background to the Gimbichu District Administration Community Road by Oromiya RRA

Appendix 13

Response from the Core Team to Geometric design Issues

John Rolt

Appendix 14

Response from Core Team to Pavement Design and Materials Issues

Mike Pinard

Appendix 15

Feedback on the Findings from the Investigation of Surface Treatment Performance in Ethiopia

Kym Neaylon and Gerrie van Zyl

Appendix 16

Asphaltic Concrete – A Panacea for Thin Surfacing Problems

John Rolt

Appendix 17

Selection and Options for Appropriate Sealing of Roads

Mike Pinard

Appendix 18

Response by the Project Team to the Ethiopian Experiences of Surface Treatment Practice and Performance

Kym Neaylon and Gerrie van Zyl