



AFCAP Workshop Summaries on Rural Infrastructure and Transport Services

6th Africa Transportation Technology Transfer (T²) Conference,
Gaborone, Botswana

4th to 8th March 2013

This project was funded by the Africa Community Access Programme (AFCAP) which promotes safe and sustainable access to markets, healthcare, education, employment and social and political networks for rural communities in Africa.

Launched in June 2008 and managed by Crown Agents, the five year-long, UK government (DFID) funded project, supports research and knowledge sharing between participating countries to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources.

The programme is currently active in Ethiopia, Kenya, Ghana, Malawi, Mozambique, Tanzania, Zambia, South Africa, Democratic Republic of Congo and South Sudan and is developing relationships with a number of other countries and regional organisations across Africa.

This material has been funded by UKaid from the Department for International Development, however the views expressed do not necessarily reflect the department's or the managing agent's official policies.

For further information visit <https://www.afcap.org>

Executive Summary

This report presents the detailed outcomes of the AFCAP workshops on rural road infrastructure and transport services for improved access and mobility at the 6th Africa Transportation Technology Transfer (T²) conference. Highlights and agreements from the workshops were:

Road Infrastructure

- The designs for low volume sealed roads (LVSR) should move away from the current soaked subgrade California Bearing Ratio (CBR) designs and be based on the DCP (Dynamic Cone Penetrometer)/Dynamic Cone Penetrometer Number (DN) value at the prevailing equilibrium moisture content.
- Providing costs were not prohibitive, the overriding criteria for geometric design should be the provision of safety measures.
- Current economic models were not totally appropriate for use with low volume roads, but in the absence of anything better, these tools had to be used for economic analysis. Further research is required.
- Cost Benefit Analysis tools should be developed to estimate economic returns and benefits from investment in transport research projects with improved packaging and communication of the benefits to decision makers.
- More research is required into the use of emulsions for Otta Seals. Cold Mix Asphalt was a more preferred surfacing option compared to Otta Seals.

Transport Services

- More published research is required into the provision of transport services in conflict affected areas.
- Community engagement in road safety is critical for aspects such as improved safety education and inputs into safety standards for better low volume road designs.
- Advocacy is essential to promote the role of the transport sector and gain cross-sectoral recognition of its key role in achieving other development goals.
- It is imperative to get a transport indicator into the Post-Millennium Development Goals (Post MDG) and that an African lobbying initiative for a Post-MDG transport indicator is urgently established.

Table of Contents

1. Introduction.....	1
2. Structure of Workshops	1
2.1 Road Infrastructure.....	1
2.2 Transport Services.....	1
3 Workshop Summaries	2
3.1 Road Infrastructure.....	2
3.1.1 <i>Workshop 1.1 – Pavement Design for Low Volume Sealed Roads: Soaked CBR versus DN value</i>	<i>2</i>
3.1.2 <i>Workshop 1.5 – Geometric Design and Safety for Low Volume Roads.....</i>	<i>4</i>
3.1.3 <i>Workshop 1.6 – The Economics of Rural Roads.....</i>	<i>5</i>
3.1.4 <i>Workshop 1.7 – Thin Surfacing for Low Volume Sealed Roads: Pros and Cons of Available Options</i>	<i>5</i>
3.2 Transport Services.....	6
3.2.1 <i>Workshop 1.2 – Transport Services in Conflict-Affected Societies</i>	<i>6</i>
3.2.2 <i>Workshop 1.3 & 1.4 – Reducing Accident Rates in Rural Transport Services (including Field Visit).....</i>	<i>7</i>
3.2.3 <i>Workshop 1.8 – Performance Indicators for the Rural Transport Sector</i>	<i>8</i>
3.3 Cross-Sectoral Linkages.....	8
3.3.1 <i>Workshop 1.9 – Building Cross-Sectoral Linkages – Advocacy to Promote the Role of the Transport Sector in Development.....</i>	<i>8</i>

List of Appendices

Appendix A:	Facilitated Questions and Notes from Workshop 1.1 - Pavement Design for LVSRs: Soaked CBRs versus DN Values Workshop
Appendix B:	Facilitated Questions and Notes from Workshop 1.5 - Geometric Design and Safety for LVRR Workshop
Appendix C:	Facilitated Questions and Notes from Workshop 1.6 - The Economics of Rural Roads Workshop
Appendix D:	Facilitated Questions and Notes from Workshop 1.7 - Thin Surfacing for Low Volume Sealed roads: Pros and Cons of Available Options Workshop
Appendix E:	Facilitated Questions and Notes from Workshop 1.2 - Round Table Discussion on Transport Services in Conflict Affected Societies
Appendix F:	Facilitated Questions and Notes from Workshop 1.3 & 1.4 - Road Safety Outline Needs Assessment Report, Oodi and Matebele, Kgatleng District, Botswana
Appendix G:	Facilitated Questions and Notes from Workshop 1.8 - Performance indicators for rural transport services
Appendix H:	Facilitated Questions and Notes from Workshop 1.9 - Building Cross-Sectoral Linkages – Advocacy to Promote the Role of the Transport Sector in Development Workshop

List of Terms and Acronyms

AFCAP	Africa Community Access Programme
BS	British Standards
CBA	Cost-Benefit Analysis
CSIR	Council for Scientific and Industrial Research
DCP	Dynamic Cone Penetrometer
DFID	Department for International Development, UK
DN value	Penetration rate of the DCP in mm/blow
DRC	Democratic Republic of Congo
HDM 4	Highway Development and Management model
ICT	Information and Communication Technology
IFRTD	International Forum for Rural Transport and Development
IMTs	Intermediate Modes of Transport
LDC	Least Developed Countries
LVR	Low Volume Roads
LVRR	Low Volume Rural Roads
LVSR	Low Volume Sealed Roads
Post-MDG	Post Millennium Development Goals
RED	Roads Economic Decision model
RTSi	Rural Transport Service Indicator
SANS	South Africa National Standards
SEACAP	South East Asia Community Access Programme
SFRDP	Secondary and Feeder Roads Development Project
SSATP	Sub-Saharan Africa Transport Policy Program
T ²	Technology Transfer
TMH	Technical Methods for Highways
TRL	Transport Research Laboratory
UK	United Kingdom
VPD	Vehicles per day

1. Introduction

This report presents the outcomes of the AFCAP workshops presented at the 6th Africa Transportation Technology Transfer (T²) Conference held at the Grand Palm hotel and resort Gaborone, Botswana from 4th – 8th March 2013.

The below box provides an outline of the AFCAP workshops which were divided into issues related to Rural Infrastructure and Transport Services with the final cross-cutting workshop (No 1.9) dealing with cross sectoral linkages both internal and external to AFCAP.

AFCAP Workshops Presented at the Conference			
Road Infrastructure		Transport Services	
1.1	Pavement design for Low Volume Sealed Roads (LVSR): Soaked CBRs v DN values	1.2	Transport Services in Conflict Areas
1.5	Geometric Design and Safety for LVRs	1.3 & 1.4	Reducing accident rates in rural transport services
1.6	The economics of rural roads	1.8	Performance indicators for the rural transport sector
1.7	Thin surfacings for LVSRs: Pros and Cons of the available options		
1.9	Building Cross sectoral linkages – advocacy to promote the role of the transport sector in development		

2. Structure of Workshops

2.1 Road Infrastructure

The road infrastructure workshops and workshop 1.9 were all facilitated using the following structure:

1. Overview presentation by a lead presenter of the issues and challenges of the specific subject area under discussion¹;
2. Comments from a panel of 3 or 4 experts on the specific subject area outlining their sometimes conflicting views of the issues;
3. Specific questions related to the issues presented both by the presenter, the panel and the audience; and
4. Facilitated discussions around the questions posed.

2.2 Transport Services

The transport services workshops were facilitated using a different structure because numbers were relatively small and this enabled the provision of a roundtable setting following the initial presentation. This format made it relatively easy for all present to speak, including early career participants. The structure was as follows:

¹ Copies of all PowerPoint presentations are available from the AFCAP website www.afcap.org.

1. Overview: a formal presentation of the issues and challenges of the specific subject area under discussion²; and
2. Facilitated 'roundtable' discussion [following rearrangement of seating] in which all participants were encouraged to speak, where possible drawing on their personal experience/case study material of relevant issues.

Workshops 1.3/1.4 included a field visit. In this case the format was as follows:

1. Initial presentation and participant briefing;
2. Field visit, with data collection by participants;
3. Reporting back on data collected; and
4. Brief review discussion led by the lead facilitator.

3 Workshop Summaries

3.1 Road Infrastructure

The presentations for each workshop, along with the relevant response to the questions that were noted during the workshops, are shown in the respective Appendices referred to in the sub-sections which follow. The relevant points from the discussions are highlighted here.

3.1.1 *Workshop 1.1 – Pavement Design for Low Volume Sealed Roads: Soaked CBR versus DN value*

The overview presentation was given by Philip Paige-Green and the notes captured from the discussion based on questions posed to the workshop are given in Appendix A.

The panel of experts was:

- John Rolt;
- Gerrie Van Zyl;
- Kenneth Mukura; and
- Ignasio Ngoma.

The following is a summary of the discussion and outcomes from the workshop:

- There was general agreement that designs for low volume sealed roads (LVSR) should move away from the current soaked subgrade CBR designs and be based on the prevailing (generally unsoaked) equilibrium moisture content of the subgrade.
- A move towards unsoaked designs assumes good construction practice, appropriate drainage and timeous maintenance to maintain the pavement layers in their equilibrium (unsoaked) moisture condition.
- The proposed DCP/DN design method provides improved precision limits compared to the CBR test; the equipment is less expensive; it is quicker to undertake the test; and can be carried out both on site and in the laboratory. It was however noted that the precision limits of the DCP test will be less reliable for coarser granular materials and lightly stabilised materials but would still be better than the CBR on the same materials.

² Copies of all PowerPoint presentations are available from the AFCAP website www.afcap.org.

- The DCP method is as good as or better than any other method in taking into account variations in moisture content and provides data quickly for analysis.
- The method has been used generally for upgrading gravel roads to a paved standard where alignments are largely fixed, but the method can also be used for new LVSRs.
- The Council for Scientific and Industrial Research (CSIR) has studied 57 roads in different climatic areas and traffic regimes in South Africa, including high rainfall areas, in updating the DCP design catalogue. The catalogue was originally produced by Kleyn and van Zyl and further verified through work in Malawi. It was pointed out that none of the roads designed in South Africa with this method have failed.
- The proposed DCP thickness designs in the catalogue were thought to be appropriate for all countries. However, should road agencies require further verification of the catalogue for use in their countries; this should be done through a study of the performance of their existing older roads. The differences in CBR values obtained from the British Standard (BS) and Technical Methods for Highways (TMH)/South Africa National Standards (SANS) methods may account for some of the variation in the results proposed by TRL. (A BS CBR of 80% indicates a stronger materials than a SANS CBR of 80 as the compaction energy/unit volume in the BS test is less than in the SANS test).
- Reservations were expressed about the unsoaked designs for materials with lower DCP/DN values as well as the lower class roads with high DN values. Further work may be required to verify these designs.
- A standardised method for the laboratory DCP test is available (in the Malawi Manual) and was used in Malawi.
- Approximately 20% of the workshop participants felt that countries should move directly to the DCP/DN design method. The majority preferred to use the DCP/DN method in parallel with the CBR soaked design method until they have become more familiar with the outcomes of the DCP/DN design method. All agreed that the move to an unsoaked DCP design method was a move in the right direction.
- A move to the DCP/DN design method would require changes to standard specifications and the associated bidding documents.

3.1.2 Workshop 1.5 – Geometric Design and Safety for Low Volume Roads

The overview presentation was given by John Rolt and the notes captured from the discussion based on questions posed to the workshop are given in Appendix B.

The panel of experts was:

- Jon Hongve;
- Tom Bishop; and
- Dave Geilinger.

The following is a summary of the discussion and outcomes from the workshop:

- There was general agreement that a minimum width of running surface of 6m for a two-laned road should be used. It was pointed out that narrower roads tend to reduce driving speeds but upgrading from gravel to a paved road tends to increase driving speeds. It is also dependent on the type of vehicles using the road and the length of the road being constructed.
- There is currently inadequate data to make the best choice of road widths to provide appropriate improved safety levels.
- There was general agreement that the minimum width of a single lane road should be 4.5m, although 2m road widths have been used successfully in Asia. Single lane roads should be considered up to traffic levels of 50 to 75 vehicles per day (VPD).
- Designs need to take account of future traffic increases.
- Large radius horizontal curves are safer than smaller radius curves.
- Incorrect superelevations could make the curves unsafe.
- The friction factor used in the curve design is very variable. Additional safety can be built in to the design by adopting a conservative low value for the friction factor.
- Curves can be introduced to reduce speeds but warning signs and/or speed control measures are required. Theft and abuse of signs in rural areas is sometimes a problem.
- There is a 15% safety margin inherent in the design speeds.
- It was suggested that higher design speeds than a country's speed limit should be used especially in flat terrain. Design speeds should be higher on longer rural road sections, but reduced for roads passing through settlements and villages.
- Design speeds should be dictated by the terrain.
- It was agreed that any particular standard used for design should be the minimum standard to be achieved.
- It was agreed that all low volume rural roads should be capable of carrying the same "design" vehicle.
- Vehicle control "truck" barriers could be considered to protect roads against the use of large vehicles for which they were not designed.
- 1 000 motorcycles per day was the figure recommended to justify the addition of wider shoulders.
- Providing costs were not prohibitive the overriding criteria for geometric design should be the provision of adequate safety measures.

3.1.3 Workshop 1.6 – The Economics of Rural Roads

The overview presentation was given by John Hine and the notes captured from the discussion based on questions posed to the workshop are given in Appendix C.

The panel of experts was:

- Philip Paige-Green;
- Liz Jones; and
- Mike Pinard.

The following is a summary of the discussion and outcomes from the workshop:

- None of the participants felt that models such as those used in Highway Development and Management Model (HDM4), Roads Economic Decision model (RED) and SuperSurf were totally appropriate for use with low volume roads but in the absence of anything better, these tools had to be used for economic analysis. It was pointed out that models need to be customised for each country's specific situation.
- More appropriate models are required to take account of social benefits in economic appraisals and assumptions on maintenance costs are very often incorrect.
- Cost Benefit Analysis (CBA) is most appropriate as a ranking and prioritisation tool rather than as a tool for calculating an economic return. However, it may also be used to justify funding, particularly from donors, and help influence budget allocations. It may also be used for selecting the most appropriate and cost-effective engineering choice from competing options.
- In terms of the justification for research projects it was considered important to use CBA to estimate economic returns for a given investment. The evidence should also be packaged and communicated in a way that would be understood by political decision makers, donors and national treasuries who approve the research funding. Studies have already been undertaken to assess the benefits of road technology development and research programmes in South Africa and California which could be used as a foundation for assessing the benefits emanating from the AFCAP investment.
- It was suggested that technical personnel should be more involved in making policy decisions.

3.1.4 Workshop 1.7 – Thin Surfacing for Low Volume Sealed Roads: Pros and Cons of Available Options

The overview presentation was given by Jon Hongve and the notes captured from the discussion based on questions posed to the workshop are given in Appendix D.

The panel of experts was:

- Tony Greening;
- Kenneth Mukura; and
- Jasper Cook.

The following is a summary of the discussion and outcomes from the workshop:

- The benefits of using emulsions in terms of energy saving and health and safety considerations, especially in labour-based methods, can far outweigh the additional costs of emulsions compared to hot penetration grade bitumens. The use of hot

bitumen, cut-backs or emulsions will depend on the prevailing circumstances, availability of products, experience of the workforce and availability of equipment.

- Emulsions are currently not used for Otta Seals due to previously unsuccessful trials in Norway and the USA. However, it was felt that this could be a viable option and further research is required in this area. High levels of site supervision were recommended if this option is considered.
- Cold premix using emulsion and laid by a paver has already been successfully used in Mozambique.
- The majority of workshop participants preferred Cold Mix Asphalt to Otta Seals for low volume surfaced roads.
- If research and demonstration sections are constructed it is critically important that funding is available and planned for long-term monitoring of the sections to adequately assess performance in service.
- Sand seals (2mm) have been used successfully in the Kruger National Park under good management conditions and an optimum resealing programme. The second sand seal after eight months of service is critical to the ongoing good performance of the seal. Sand seals with armouring have also been successfully used in Mozambique.
- Sand seals constructed as initial seals on SEACAP (South East Asia Community Access Programme) projects failed within a few years leading to a recommendation that they should no longer be used in this way in most countries.
- Single seals were generally considered to be unacceptable as a first seal but have been laid in Zimbabwe using experienced personnel and performed well.
- While the majority of the workshop participants felt that the move to contractor-based systems was a positive move, it was accepted that previous work undertaken by force account had performed well and in many cases was superior to that being achieved by some private contractors. The added benefit of force account work was improved experiential training leading to improved national capacity for sealing works. There could therefore be a case for reintroducing some force account capacity in countries where this has been abolished.

3.2 Transport Services

The presentations for each workshop are shown in the respective Appendices referred to in the sub-sections which follow. The relevant points from the discussions are highlighted here.

3.2.1 *Workshop 1.2 – Transport Services in Conflict-Affected Societies*

The overview presentation was given by Nite Tanzarn.

The following is a summary of the discussion and outcomes from the workshop. Further information is available in Appendix E.

- Both the presentation and ensuing discussion emphasised the lack of transport-services published research about conflict-affected contexts: this is an area where research, including empirical case studies, is urgently needed.
- The roundtable allowed us to benefit from the numerous, diverse experiences of participants, including from Democratic Republic of Congo.

- On the basis of the experiences presented, the group made the following recommendations for transport service-related interventions in conflict, post-conflict and potential conflict situations:
 - Considering the limited knowledge on the subject, the participants agreed that there was a need for research to inform conflict mitigation and management in relation to transport services. This could be by way of case studies and/or networked research.
 - African governments should prioritise the sealing and maintenance of border roads to ensure quick security responses. The advantages would be twofold. One, sealed roads are more durable and two; it is difficult to place landmines under asphalt roads.
 - Promote the use of intermediate means of transport (IMTs) in conflict and post-conflict areas as these do not demand standard roads and many do not require fuel and other services.
 - Promote multipurpose means of transport which can carry people and goods as part of conflict/post-conflict logistical planning.
 - Advocate for transport to be declared as an essential service [as is the case in i.e. Kenya and Botswana] in marginal and conflict areas with the related minimum standards to meet citizens' accessibility and mobility rights.
 - Advocate for equitable transport policies and regulations.
 - Promote the use of Information and Communication Technology (ICT) such as satellite imagery to establish information on "no go" areas, mine fields etc.

3.2.2 Workshop 1.3 & 1.4 – Reducing Accident Rates in Rural Transport Services (including Field Visit)

The overview presentation was given by Tom Bishop of Amend.

The following is a brief summary of the activities and outcomes from the workshop. Fuller information, in the form of a feedback report to village communities where the field work was conducted, is presented in Appendix F.

- A field study was conducted by 35 participants in 2 peri-urban villages. It included interviews with local leaders, police, teachers, school pupils; a children's road safety test in school; household questionnaires about Road Traffic Injury; traffic and pedestrian counts; infrastructure/road use observation.
- Botswana good practice was discussed at the feedback session. This includes road safety committees from national to district level [at all levels of government] which are chaired by high-ranking officials; dedicated funding for community road safety activities including education; traffic parks in Gaborone for child education; a proportion of vehicle licensing funds go to government road safety activities. This prompted the question, how can such good practice be promoted across Sub-Saharan Africa?
- Following the workshop, twenty participants submitted a feedback form: these were overwhelmingly positive about the value of the field study, despite its short duration.
- Field findings from the study were discussed at the feedback session but will be presented back to both of the local communities where the study took place and to other local stakeholders. The findings were as follows:

- The importance of community engagement in road safety is evident. Much important information was obtained from the field interviews related to community road safety concerns, especially re recent road injuries outside the village area on paved roads and one local incident in which a child was injured.
- Strong local views were expressed concerning LVR road design – in particular, the need for speed bumps; minibuses speed restrictions; pedestrian walkways for protection [especially children]; better follow-up on school road safety education; educational campaigns targeted at adults.

3.2.3 *Workshop 1.8 – Performance Indicators for the Rural Transport Sector*

The overview presentation was given by Paul Starkey. This was followed by a round table discussion of the Indicators research to date. The following is a brief summary of the activities and outcomes from the workshop. Fuller information is presented in Appendix G.

- The aims of this AFCAP research project were presented, explaining the importance of developing and testing Transport Service Indicators which can be used as a complementary measure to the current widely used Rural Access Indicators. The research engages with Users, Operators, Regulators, Planners, Road Authorities and Development Agencies.
- The key features and findings of field research in Tanzania, Kenya and Cameroun were outlined. Photographic evidence was used to illustrate conditions in different contexts and the range of data being collected for the preparation of comprehensive indicator statistics.
- Ensuing discussion during the round table focused on clarification of project details and elaboration of questions concerning the major challenges that are currently being encountered in the project (without reaching any firm conclusions on these points). The questions discussed included:
 - How to capture the temporal variability of transport services, both weekly, and seasonally.
 - How to capture variable transport service provision along individual roads.
 - How to adequately incorporate motorcycle taxi services into the RTSi (Rural Transport Sector Indicators) - i.e. how to value their contribution, how to regulate these services, whether motorcycle-taxis are an acceptable form of transport.
 - Whether the RTSi has the potential to underpin a rights-based approach to transport planning
 - Whether transport services should be linked to road maintenance in performance-related contracts.

3.3 Cross-Sectoral Linkages

3.3.1 *Workshop 1.9 – Building Cross-Sectoral Linkages – Advocacy to Promote the Role of the Transport Sector in Development*

The overview presentation was given by Peter Njenga. This was followed by a short presentation from Paul Starkey on the RTSi project, for the benefit of those who were unable to participate in the previous day's session on RTSi (when there was a separate AFCAP infrastructure workshop in progress). The notes captured from the discussion based on questions posed to the workshop are given in Appendix H.

The panel of experts was:

- Camilla Lema;
- John Hine; and
- Marit Due Langaas.

The following is a summary of the discussion and outcomes from the workshop:

- Advocacy is essential to promote the role of the transport sector and gain cross-sectoral recognition of its key role in achieving other development goals. This will require champions and the identification of pathways to progress.
- Lack of communication between government and transport users militates against strong recognition of the key role of transport in service access. There is an adequate evidence base to support the transport argument.
- Some participants felt that it was sufficient to provide better roads and the private sector and communities would organise transport services. Others felt that the government should support rural transport through subsidies and regulations.
- Subsidy in the transport services sector is still a highly contentious issue because subsidies tend to be abused.
- Regulation of rural transport services is also a contentious issue because regulation presents a rent-seeking opportunity for local enforcement agencies. It was noted that corruption also occurs in the road construction industry.
- We need to promote transport issues cross-sectorally. This requires a) stronger within-sector and cross-sector recognition of the crucial interdependencies between roads and transport services and b) the need to bring other sectors into transport consultations.
- Above all, it is imperative that we get a transport indicator into the 'Post-Millennium Development Goals (MDGs)'. It is of the utmost urgency that an African/Least Development Countries (LDCs) lobbying initiative on a post MDG transport indicator is put in place, referencing **transport + services** (an accessibility index). IFRTD (International Forum for Rural Transport and Development) and Transport Research Laboratory (TRL) and others will be able to help facilitate the lobbying process.

Appendix A: Facilitated Questions and Notes from Workshop 1.1
Pavement Design for LVSRs: Soaked CBRs versus DN Values Workshop
Dr Phil Paige-Green
5 March 2013

1. Do we actually need soaked designs for LVRs?
(And what are the risks associated with a move towards unsoaked designs?)
 - TRL has advocated moving away from soaked subgrade CBRs for many years.
 - Soaked CBR tests take a long time to carry out, are expensive, and the soaked moisture condition is often not reflective of in-service moisture conditions; so it is time to move on.
 - What happens if moisture enters the pavements through cracks in the surfacing?
 - A soaked strength is an indicator of strength and we don't expect the base to be soaked in practice.
 - In some circumstances the base might wet up and should be designed for the soaked condition.
 - It has been agreed that this would work in certain situations.
 - It is assumed that effective maintenance is carried out.
2. Is the DCP-DN number a viable alternative?
(And what are the implications to current soaked CBR design catalogues?)
 - The method is only applicable to granular materials. It is not applicable to material used on upper layers on high traffic roads.
 - The DCP test might also be unreliable and might not have good reproducibility.
 - DCP tests are cheap and quick, so a lot of tests can be done. Unreasonable results can be easily excluded.
 - Changing standard specifications is a big step. Bidding documents need to be changed accordingly.
 - The DCP method can be used for new road construction, but in most cases the alignment of the road is already fixed and it will be used for upgrading gravel roads to paved roads.
3. Can we handle the in situ moisture variations adequately using the DCP?
 - The DCP method is as good, or better, than any other method in taking into account variations in moisture content.
 - There is general agreement that we can handle the in situ moisture variations adequately using the DCP.
 - The DCP method provides a lot of data for quickly flexible analysis.
4. Is the evidence from existing roads sufficient to move ahead with the DCP design method?
 - HVS testing on underlying layers on high volume roads is also relevant.
 - How much evidence is needed? None of the roads designed in South African with this method have failed.
 - The CSIR has studied 57 roads in different climatic areas in South Africa, including high rainfall areas in preparation of the DCP catalogue. The catalogue was verified through work in Malawi.
 - Road agencies can verify the catalogue by studying old roads.

- The CBR method has also been shown to be unreliable.
 - The key issue is, are the thickness designs in the catalogue appropriate for all countries?
5. Is the CBR test redundant?
- 20% would move to DCP/DN method.
 - The majority (30% - 40%) would prefer to use it in parallel with the CBR method.
 - Fairly confident that this is a move in the right direction.
6. Is the DCP/DN method standardised for use in laboratories?
- There is a standardised method created for Malawi.
 - The DCP method tests the full depth of the sample in the CBR mould.
 - We need to change because there have been failures of conventional design methods.
7. What happens when the surfacing cracks, water enters the pavement and soaks the top 20 mm of the base while the remaining depth of the base remains in an unsoaked condition? Should we not design for the soaked condition?
- The unsoaked DCP/DN LVSR design philosophy assumes the surfacing layer is waterproof; there is good drainage; and timeous maintenance to keep the pavement layers in their equilibrium moisture condition.

Appendix B: Facilitated Questions and Notes from Workshop 1.5

Geometric Design and Safety for LVRR Workshop

Dr John Rolt

6 March 2013

1. What should be the object height for designing crest curves?
 - *No comments.*
2. What should be the minimum width of running surface on 2-lane roads?
 - In the UK narrower roads tend to reduce driving speeds.
 - When roads are upgraded from gravel to paved standard the vehicles driving speed increases.
 - When we design a road, we have to think of future traffic increases.
 - The width may depend on the type of vehicles using the road.
 - The width of the road may depend on how long it is. Longer roads may be built to a higher standard.
 - Most people voted for a minimum width of 6 m.
 - There is inadequate data to make the best choice based on highest safety level.
3. What should be the width of single lane roads?
 - 4.5 m total road width should be a minimum.
 - Wider unpaved roads require more maintenance.
4. Are accidents on horizontal curves significant and how can we reduce them?
 - Large horizontal curves are safer.
 - Incorrect super-elevation can make curves unsafe.
 - Good driver training can contribute to fewer accidents.
 - Curves can be introduced to reduce speed, but warning signs are needed.
 - There is a 15% safety margin in design speeds, but the variations in the friction factor is more significant and its choice allows an additional safety factor to be introduced.

Additional Key Questions:

5. Do we agree that a 'standard' is the minimum to be achieved?
 - The standard should be reduced before reaching the black spot.
6. Are the proposed design speeds satisfactory?
 - Shouldn't the design speed be equal to the speed limit of the country, at least in flat terrain?
No.
 - Design speeds should be higher on longer roads than on short roads.
 - Design speeds should be reduced in settlements.
7. Do we want all our LVRRs to be capable of carrying the same 'design' vehicle?
 - Yes

8. At what traffic level should single lane roads be considered?
 - Variation of 50 to 75.
9. Should the design speed dictate the alignment or the alignment dictate the speed, ie: would a variable speed design not reduce construction costs on existing roads significantly?
 - Design speeds are dictated by terrain.
 - Speed environment should dictate design speed.
10. Vehicle control (truck) barriers – is this an option for Africa?
 - The road should be protected against use by vehicles for which it is not designed.
11. How many motor- and pedal-cycles does it take to add wider shoulders?
 - 1000 motorcycles per day (which is similar to the figure that John uses)
12. What is overriding criteria for geometric design – safety or cost?
 - Safety was the highest vote.

Appendix C: Facilitated Questions and Notes from Workshop 1.6
The Economics of Rural Roads Workshop
John Hine
6 March 2013

1. Are the current models for justifying investment in roads still suitable?
 - How can one ensure that the cost-benefit analysis is more influential?
 - Model needs to be customised to each country's situation.
 - Assumptions on maintenance costs are very often incorrect, eg: periodicity of resealing.
 - Need to look at types of vehicles using the road to estimate social benefits.
 - Maintenance management systems are often not updated regularly.
 - Are we using models that are for high volume roads to appraise low volume roads?
 - Should we use a producer surplus approach to the appraisal of low volume roads?
 - Traditional models do not take into account recent research on reducing training costs.
 - CBA might be more useful as a ranking tool than calculating an economic return.
 - More work should be done on estimating social benefits, eg: the value of trips for social purposes.
2. How can we better justify spending money on research?
 - By quantifying the benefits compared with the actual costs of the research.
 - We need engineers making policy decisions.
 - Travel time
 - Could returns have been proved on use the Heavy Vehicle Simulator?
 - TRL research in the 1980s in Botswana results in new specifications which allowed construction of roads in the Kalahari at much lower cost.
 - We have evidence but don't communicate it well.
 - We need to make sure the work we do is understood by non-engineering decision makers.
3. Although the Secondary and Feeder Roads Development Project (SFRDP) work did play some role in the development of HDM4 there is no mention of for example, Otta Seals, in the user manuals. Issues remain with the deterioration of low cost sealed roads. Can we manage the risk? How do we incorporate this work into an economic decision making model?
 - Not discussed.
4. Is there a need to improve the management of national gravel road networks?
 - There was general agreement that maintenance of gravel roads was sub-optimal because of low grading and regraveling frequencies. Hence there is a need to improve the management of these roads.
5. Is there a need for more research in establishing basic access? If yes, which subject areas require attention?
 - Does the roughness of the road affect the social benefits?
Social benefits are a particularly important issue for the provision of basic access which are not covered by conventional economic analysis. Social benefits are a less important issue when just roughness reduction is involved with no change in transport mode

6. What is the role of CBA? To get money from donors and influence budget allocations?
 - Yes
7. To prioritise investments?
 - Yes
8. To influence engineering choices?
 - Yes
9. Why 12% discount rate?
 - It is common to apply a 12% discount rate for the economic analysis of transport investment. This is a high threshold to achieve and may not reflect the opportunity cost of capital. Similarly, other sectors mostly do not have to meet this requirement.
10. Should HDM4 be used for low volume roads?
 - We need a more appropriate model for low volume roads.
11. Should we modify HDM4 – if so how?
 - Not discussed.
12. What are the issues with appraising low volume sealed roads?
 - Not discussed.
13. Are social benefits an issue?
 - Yes, we need to find ways of quantifying them.
14. Should we include wider economic benefits? When do they matter and if so how?
 - Not discussed.
15. Are paved roads more or less expensive to maintain than gravel roads?
 - The evidence from Ethiopia and Tanzania suggest that road authorities spend more per km on paved road maintenance. However, maintenance is not optimal. Hence, there is a need for more work in this area to provide a proper like-for-like comparison.

Appendix D: Facilitated Questions and Notes from Workshop 1.7
Thin Surfacing for Low Volume Sealed roads: Pros and Cons of Available Options Workshop
Jon Hongve
6 March 2013

1. Can we replace hot bitumen with emulsions?
 - If properly organised, labour based methods can achieve high productivity rates but is dependent on the attitudes towards these methods in the various countries.
 - The benefits of using emulsion eg: labour-based methods can outweigh the additional cost of emulsion.
 - Emulsions currently are not used in the construction of Otta Seals.
 - In many countries there is no local supplier of emulsions.
 - Yes, but not altogether and it will depend on the circumstances, experience, equipment available.
2. Will we achieve similar/adequate quality?
 - Trials in Vietnam showed no difference in quality.
 - The work from the force account was far superior to contracting out.
3. Should we develop emulsion based Otta Seals or similar quality Cold Mix Asphalt to retain the advantage of using natural/lower quality aggregates?
 - It was tried in Norway and the USA and was not a success.
 - It could work, but would require a high level of supervision on site.
 - More research is required in this area.
4. Should we develop cold Premix that can be laid by a paver?
 - It has been done in Mozambique with some modifications to the mix.
5. More Ideas:
 - Long term monitoring of research sections is critical.
6. Should we ban sand seals from future AFCAP research?
 - They can be used under good management conditions, eg: Kruger National Park (2mm and a second seal after 2 months and subsequent periodic sealing to build a thicker sand seal surfacing).
 - Sand seals have been used successfully with armouring in Mozambique.
 - In some places, sand is the only material available.
 - There is a difference from using sand seals of 2mm to that of 6mm.
 - Sand seal trials in Botswana failed because of cattle on the road.
7. Are single seals acceptable?
 - Single seals laid by experienced people in Zimbabwe have lasted a long time.

8. Do you prefer Cold Mix Asphalt or Otta Seals for LVSRs?

- Cold Mix Asphalt was the preferred choice.

9. Should government go back to force account?

- A small percentage chose to go back to force account.
- A larger percentage chose to keep the contractor-based system.
- In-house capacity should be retained by governments for research purposes, disaster management, emergency maintenance and rehabilitation and training.

Appendix E: Facilitated Questions and Notes from Workshop 1.2
Round Table Discussion on Transport Services in Conflict Affected Societies
Review by Nite Tanzarn
5 March 2013

The participants suggested that it is important to broaden the definition of and make a distinction between three aspects of conflict: i] conflict; ii] post-conflict; and iii] potential conflict situation, arguing that such a distinction underscores the importance of mitigating against potential conflict situations. Further, that transport [services] responses differ according to the situation. For instance, during the war the focus is on humanitarian assistance while investments in transport infrastructure are given priority post-conflict. In addition, countries which may not be categorised as typical conflict zones experience various forms of transport services-related clashes such as:

- a. Taxi wars in South Africa.
- b. Disrupted transport services as a result of the tensions associated with presidential campaigns and voting in countries such as Kenya.
- c. Resentment from citizens on account of high costs of transportation or inadequate transport.
- d. [Potential] dissent from service providers in respect of unfair regulations. For instance, the Government of Botswana's intention to get the transporters to decrease the fares and at the same time restricting their right to strike.

The participants made various recommendations to promote efficient and equitable transport services in all situations of conflict as follows:

- a. Considering the limited knowledge on the subject, the participants agreed that there was a need for research to inform conflict mitigation and management in relation to transport services. This could be by way of case studies and/or networked research.
- b. African governments should prioritise the sealing and maintenance of border roads to ensure quick security responses. The advantages would be twofold. One, sealed roads are more durable and two; it is difficult to place landmines under asphalt roads.
- c. Promote the use of intermediate means of transport [IMTs] in conflict and post-conflict areas as these do not demand standard roads and many do not require fuel and other services.
- d. Promote multipurpose means of transport which can carry people and goods as part of conflict/post-conflict logistical planning.
- e. Advocate for transport to be declared as an essential service [as is the case in i.e. Kenya and Botswana] in marginal and conflict areas with the related minimum standards to meet citizens' accessibility and mobility rights.
- f. Advocate for equitable transport policies and regulations.
- g. Promote the use of ICTs such as satellite imagery to establish information on "no go" areas, mine fields etc.

Conflict	Post-Conflict	Potentially Conflict Situations
Minimize the demand for transport through providing services in relation to redistributed population	Transport policy and planning informed by lessons learnt from conflict	Ensure/improve access through adequate and equitable infrastructure
Promote intermediate means of transport [IMTs]		Special protection of infrastructure and transport service provision
Plan for post conflict: infrastructure development and maintenance	Rapid intervention to facilitate access and emergency services/teams	Equitable transport policy and regulations and implementation – transporters and users
Monitor and assess using satellite imagery	Invest in long-term/durable infrastructure development to support transport services	
Use military engineers and forces to maintain and facilitate access, where appropriate	Promote multi-purpose passenger/freight vehicles	
Partnership between transport specialists and conflict resolution experts in action research and planning		
[Networked?] Research/case studies on transport and conflict		
Promote a rights-based approach to access and mobility regulation of minimum standards of transport services		
Provide transport-related information through social media/ICTs, champions		

Appendix F: Facilitated Questions and Notes from Workshop 1.3 & 1.4

Road Safety Outline Needs Assessment Report

Oodi and Matebele, Kgatleng District, Botswana

Tom Bishop, tbishop@amend.org, +255 715 461 322. 6 March 2013

Introduction

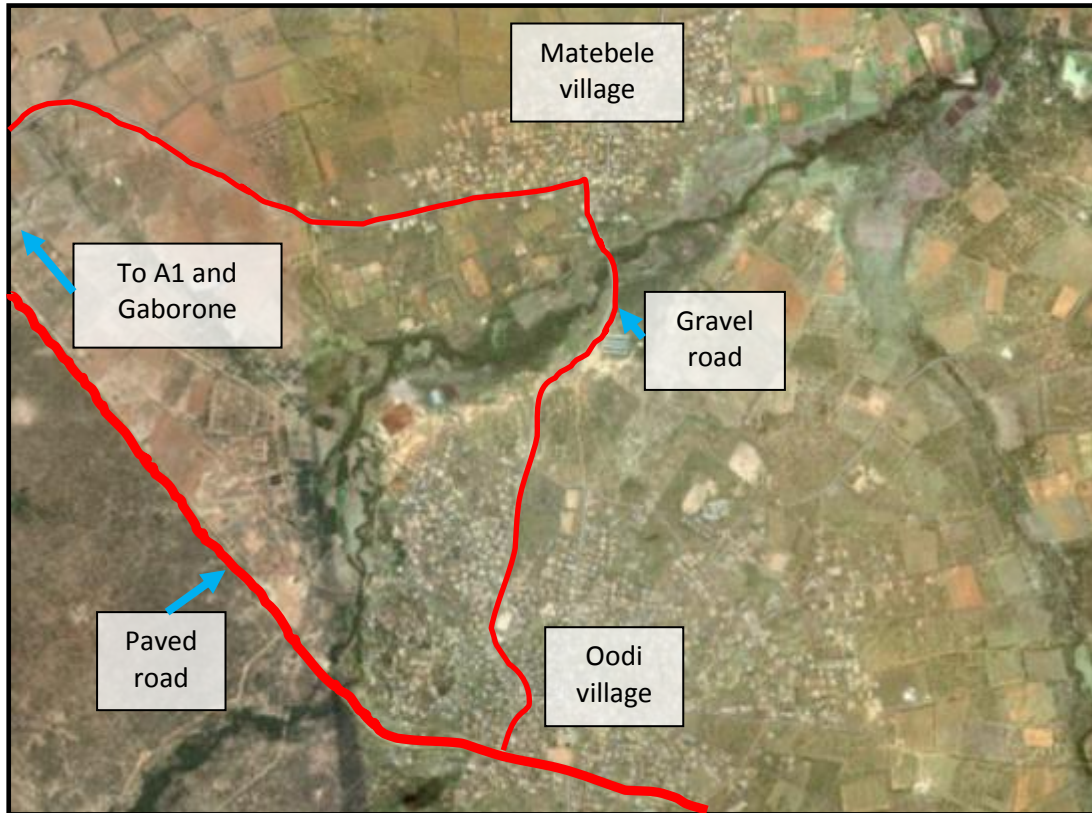
This report summarises the outline needs assessment of road safety issues in Oodi and Matabele, which was carried out by participants of a workshop facilitated by the Africa Community Access Programme (AFCAP) and road safety non-governmental organisation Amend, with the cooperation of Botswana's Department of Road Transport and Safety. This workshop was part of the 6th Africa Transportation Technology Transfer (T²) Conference, which was organised by the Association of Southern African National Road Agencies (ASANRA).

Globally, around 1.3 million people are killed and around 50 million people are injured on the roads annually. Around 90 percent of the deaths occur in low- and middle-income countries. The ten years from 2011 to 2020 has been declared the Decade of Action for Road Safety by the United Nations. As part of this, there is an ongoing drive to increase research and action aimed at reducing the number of deaths and injuries on the world's roads.

The aims of the AFCAP workshop included to obtain an understanding of the road safety issues in Oodi and Matebele, and based on this, to provide recommendations for improving road safety.

Oodi and Matebele are adjacent villages in the Kgatleng District of Botswana, approximately 20 kilometres north-east of the capital, Gaborone. They have populations of around 5,700 and 2,200 respectively, as per the 2011 Population and Housing Census.

The centres of the two villages are around 4 kilometres apart, with Matebele directly to the north of Oodi. They are linked by a gravel road. A paved road to the south and west of the villages provides access to the busy A1 highway which runs south west to Gaborone and north to the rest of the country. This is shown in the map below.



Methodology

A total of 36 workshop participants visited the two villages between 3 and 4pm on Tuesday 5th March 2013. At each village, the participants divided into pairs to undertake the following activities:

- Interviews with village chiefs
- Interviews with local police
- Interviews with head teachers and teachers of primary schools
- Interviews and knowledge tests with primary school pupils
- Interviews with road users
- Questionnaires with household members
- Traffic counts
- Observation of existing road infrastructure and road user behaviour

Each of these activities was designed to obtain information on road safety risks and the ideas of the local people on how to address those risks.

Findings

Below are summaries of the findings from each of the two villages.

Oodi

Road Use

Many pedestrians use the roads in and around the village. The 30-minute traffic count identified 24 pedestrians passing outside the village chief's office. The majority of these were children leaving school, and most of the others were young women. No adult males were seen.

Pedestrians appeared to walk randomly, without particular consideration for road safety. For example, they were seen walking on both sides of the road, some with their backs to oncoming traffic, and crossing at non-specific locations.

Most pupils from Oodi Primary School walk to school between 6.30 and 7.30am and walk home from school between 2.30 and 4.00pm.

The most common type of vehicle identified during the traffic count was minibus taxi, these making up 17 of the total 40 vehicles counted. Other vehicles seen were pick-up trucks, including some carrying passengers in the back, and saloon cars. One bicycle was seen.

Seatbelt use was observed to be low by both drivers and passengers.

Road Traffic Injuries

No injuries were identified as having taken place on the local roads around the village.

However, in just the short time of this site visit, two fatalities, one serious injury and two minor injuries were identified as having been suffered by members of the local community on other roads outside the village.

We were told about the death of a female pupil from Oodi Primary School, who died when the vehicle she was travelling in overturned. An adult male, who was seriously injured when a car he was travelling in was struck by a train, was taken to hospital in South Africa but later died. And a female student was hit by a car as she was crossing the road, injuring her legs and having to spend two nights in hospital as a result.

Both of the minor injuries had been suffered by passengers of minibuses. Both blamed the incident on overspeeding by the minibus driver.

Local police were unable to provide information on road traffic injuries at short notice, but said that in general there were only minor injuries on the local roads around the village.

Risks

Within the village, according to local people and the observations of the workshop's participants, the biggest road safety risk seems to be the high speeds used by some of the minibus taxis. Also, some minibuses were observed going the wrong way around the roundabout outside the chief's office, putting child pedestrians at risk.

The village chief was also concerned about drunk pedestrians walking along the local roads after leaving bars at the weekend.

Current Road Safety Initiatives

There are a small number of speed bumps around the village, designed to slow vehicles.

In Oodi Primary School, the head teacher told us about a road safety education programme, through which the District Council and local police provide both practical and theoretical education to pupils, as well as road safety sensitisation for parents three times a year. However, other teachers suggested that closer follow-up could be made to ensure that this programme was delivered as intended.

The head teacher suggested that the programme could be improved through the use of more and better teaching materials, including video. She also suggested that more efforts should be made to educate the adult population to road safety issues, for example through media campaigns and a regular radio broadcast.

Matebele

Road Use

A total of 31 vehicles was counted passing close to the chief's office during a 45-minute traffic count. Of these, 12 were pick-up trucks, 10 were saloon cars and 9 were minibus taxis.

No pedestrian count was carried out, although many child pedestrians were seen leaving Matebele Primary School between around 3 and 4pm.

Road Traffic Injuries

The week before the road safety needs assessment at Matebele, a pupil from Matebele Primary School was injured on the road outside the school. The boy was frightened by a cockerel while walking home, jumped into the road and was hit by a car. He injured his arm and spent three days at home, unable to attend school.

A total of four other injuries were identified as having been suffered by people living in Matebele, with the incidents taking place on roads outside the village. Three of these injuries were suffered by adults (two male and one female), with the fourth being suffered by a boy. Three of the injuries were suffered when the victims were hit by vehicles when walking alongside the road. The fourth was suffered while the victim was travelling in a minibus taxi. All four required hospital treatment.

Local police told us about two recent minor accidents in the Matebele area.

Risks

Overspeeding and drink-driving were identified as the biggest risks on the roads in and around Matebele village. Many people, including the chief's assistant, identified that these contributed to serious road safety risks, especially to pedestrians, including children.

Potholes in local roads were also identified as creating risk, as they lead to erratic and unpredictable behaviour of drivers.

A narrow bridge to the south of Matebele, on the road to Oodi, poses risks if vehicles approach it coming from opposite directions. There are no signs to warn drivers of the presence of the bridge and the need to reduce speed.

Animals on the road were also identified as creating risk, especially at night as they cannot easily be seen.

Current Road Safety Initiatives

The local police provide community road safety education through 'Kgotla' (local administration) meetings, although these are not well attended.

Road safety education is provided to all pupils at Matebele Primary School. The school's head teacher is in the process of arranging for pupils to visit the dedicated Children's Traffic School in Gaborone.

Recommendations

Below, based on the findings of the outline needs assessment, are a number of practical recommendations for improving road safety in and around the villages of Oodi and Matebele.

However, it must be noted that before any of these recommendations be implemented, further investigations should be carried out.

Speed Bumps

Speed bumps could be installed close to the roundabout in Oodi and the primary school in Matebele, in order to reduce vehicle speeds.

Signage

Any new speed bumps should be accompanied by signs warning drivers of their presence.

New signs could also be erected close to the villages' schools, warning drivers of the presence of children, and at the narrow bridge close to Matebele, warning drivers to reduce their speed.

Signs could also be used to warn drivers of the possibility of animals in the road and of an uneven road surface.

Road Safety Education in Schools

While road safety is being taught in the villages' primary schools, it seems as if closer follow-up could be made on this to ensure that it is being taught regularly and according to schedule, including practical demonstrations. This education should focus on how to use roads safely as a pedestrian, teaching, for example, which side of the road to walk and how to choose a safe place to cross.

An increased number of and better quality teaching materials could increase the effectiveness of the lessons.

Regular visits to the Children's Traffic School should be made.

Road Safety Awareness Campaigns

While children are receiving road safety lessons in schools, adults do not currently have the same access to important safety messages. Road safety awareness campaigns could be carried out at the local level, for example through the Kgotla, and at regional and national level, for example through television, radio and newspapers.

Example target audiences and messages for such campaigns are:

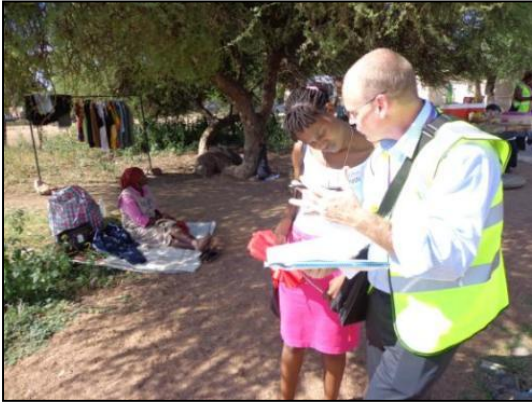
- Anti drink-driving, targeted at drivers and passengers
- Anti-speeding and reckless driving, especially targeted at drivers of minibus taxis

- Seatbelt use, targeted at drivers and passengers
- Consideration of pedestrians, especially children, targeted at all drivers
- Safe walking and crossing, targeted at adult pedestrians

Police Presence and Enforcement of Laws

A more visual police presence in and around the villages could reduce the risks associated with reckless driving, especially by minibus taxi drivers. Enforcement of laws, with the issuing of fines and/or other penalties, could act as a deterrent to dangerous driving behaviour.

Photos



A workshop participant interviewing a member of the local community while waiting to board a minibus taxi in Oodi



A traffic and pedestrian count being carried out outside the chief's office in Oodi



An interview with a teacher at Oodi Primary School



A pupil taking a road safety knowledge test at Oodi Primary School



Collecting road traffic data at Matebele



Discussions with a teacher at Matebele Primary School



Pupils sit the road safety knowledge test at Matebele Primary School



Traffic and road safety data collection at Matebele: some members of the research team

Appendix G: Facilitated Questions and Notes from Workshop 1.8

Performance indicators for rural transport services

Paul Starkey

Team Leader, AFCAP – IFRTD Research Project

Rural transport services are vital because people do not have their own means of motorised transport and depend on public transport to reach markets, education, health care and other social and economic necessities. However, transport services vary greatly in price, frequency, reliability, comfort and safety and many roads do not have adequate transport services. In Luapula, Zambia, some motorable roads only have bicycle taxis as transport services. In Bagamoyo District, Tanzania, the only transport services on district roads are motorcycle taxis (buses and minibuses only operate on the national and regional roads). In Northern Cameroon, there are about 5000 km of local motorable roads on which conventional transport services (passenger trucks and minibuses) only operate on market days. On other days, the only transport services available are provided by motorcycle taxis.

Road investments are based on the assumption that they will lead to better transport services. The Rural Access Index (RAI), promoted by the World Bank, estimates the proportion of people living within two kilometres of a motorable road. However such roads may or may not have adequate transport services. The RAI is unresponsive to improvements in road quality or transport services. There is need for a complementary access indicator to 'measure' rural transport services. This should be responsive to changes in transport services due to policy initiatives and improvements in road quality.

The Rural transport services indicator research project is funded by AFCAP and implemented by a team assembled by the International Forum for Rural Transport and Development (IFRTD). It aims to identify, develop, test and share rural transport services indicators relevant to the key stakeholders, including rural people, transport operators, regulators, planners, roads authorities and development agencies. Running from April 2012 to April 2013, it has been field testing its methodologies in Tanzania, Kenya and Cameroon. It is trying to find ways to 'measure' the quantity, quality and appropriateness of transport services in order to compare them over time and space, so that needs and priorities can be identified and changes to transport infrastructure and policies can be monitored and evaluated.

Data collected is disaggregated by transport type and by gender, with special note being made of issues relating to old people, children and people with disabilities. Examples were provided of key operational statistics, including fares, freight costs, frequency, safety, compliance with regulations and the contribution to development of different services. For example, on the Bagamoyo-Mlandizi regional road in Tanzania, minibuses provide eight travel opportunities per day and charge 3 cents USD per kilometre. Motorcycle taxis are available at any time at roadside hubs or by mobile phone call. However, they are much more expensive (15 cents USD per kilometre) and less safe. People are dissatisfied with motorcycle fares but very satisfied with their convenience, journey time and development impacts. Despite their small capacity, their numbers and frequency of travel mean they account for 25% of the annual passenger market and 15% of the annual freight market, on that regional road. Their contribution to the transport market is even higher on the smaller roads of that district.

Various challenging issues in assessing rural transport services were presented and discussed. Some of these relate to the great variations in transport characteristics (eg, motorcycle versus large bus) and operational frequencies (changes due to seasonality and to markets). Even individual roads of

10-20 km are not homogenous, and the location of traffic count stations can greatly influence the apparent traffic volumes (greater traffic nearer urban hubs and also nearer small local hubs where motorcycle taxis operate). In Northern Cameroon, the transport services may be very busy one day a week. On one road there were about 2500 passenger places on market day (including in multipurpose trucks and minibuses) and only 500 on normal days (and these were all on motorcycles). In such circumstances, any average traffic figures may have little meaning.

One of the key issues identified by the research has been the rapid expansion and increasing importance of motorcycle taxis in Cameroon, Kenya and Tanzania in the past few years. Several other African countries, including Nigeria, Uganda and Rwanda have also experienced rapid growth in motorcycle taxis, as have several countries in Asia and Latin America. However, several countries (including Botswana, South Africa and Lesotho) have not (yet) experienced any spontaneous development of motorcycle taxi services. Where they do operate, motorcycle taxis often provide crucial transport services, being highly flexible, contactable by mobile phones and taking people beyond the road to their villages. However they are often unregulated, accident-prone, expensive and not suitable for all transport needs. One key issue for discussion in many countries is whether or not motorcycle taxis can be considered appropriate rural transport services, or whether people have a 'right' to 'better' transport services. If they are not 'acceptable', how should they be replaced on the roads where they are the only form of transport services?

The presenter suggested that other issues for discussion might include:

- The most important performance indicators for rural transport services. Examples might include actual fare price, frequency (travel opportunities per day), daily capacity relative to population, journey time (including waiting time), reliable daily return possibilities (a key gender issue), small freight potential and price, space/comfort and safety.
- Whether performance indicators could be used to set at acceptable standards for rural transport services, in terms of frequency, costs and safety and, if so, who should be responsible for defining and enforcing these.
- Whether performance-related maintenance contracts could include provision for basic transport services provision.
- Whether and how transport services indicators could be used to improve road planning and evaluation

The presentation, illustrated by many photos, stimulated much discussion, with all people present contributing to the debate. The issue of motorcycle taxis was controversial, as some people (notably those from Botswana and other southern African countries without experience of motorcycle taxis) arguing that they should not be considered appropriate transport services. Participants more familiar with motorcycle taxis reinforced the major benefits they were providing to a wide range of rural stakeholders. Improving their safety was an agreed priority for all.

It was generally agreed that rural transport services did need improving and that indicators could be very useful to help facilitate this, provided they were sufficiently simple to understand and to 'measure' by local stakeholders. However, it was recognised that the highly complex and variable nature of existing transport services provided significant challenges in determining exactly what constituted acceptable transport services frequency and quality. Education, capacity building and participatory processes would be needed to develop appropriate ways of facilitating the necessary improvements in transport services. These would have to be acceptable to the users, the operators, the regulating authorities and those promoting social and economic development.

Appendix H: Facilitated Questions and Notes from Workshop 1.9
Building Cross-Sectoral Linkages – Advocacy to Promote the Role of the Transport Sector in
Development Workshop
Peter Njenga/Paul Starkey 7 March 2013

1. Are African governments serious about promoting rural transport improvements?
(What can African governments do apart from promoting rural transport improvements?)
 - There is a lack of communication between the government and the users of the transport services.
 - Government could provide subsidies for rural transport.
 - Government could increase its regulation of rural transport to improve safety and transport tariffs.
 - Subsidies can be abused and regulations become rent-seeking opportunities.
 - The World Bank and the IMF are against subsidies.
 - Once the roads are ok, people will normally provide their own transport, but this does not always happen.
2. How can the transport sector increase its internal integration and integration with other sectors?
 - The sector-wide approach adopted by governments constrains inter-sector integration, but in some countries, there is increasing communication interaction between ministries.
 - We need to bring more people into discussion. Our meetings tend to be attended by the same people.
 - There is very little interaction with government transport regulators.
 - Conferences like T² provide opportunities for people to interact.
 - Non-transport people on AFCAP Steering Group.
 - Need to include China in discussions as they are major investors in road infrastructure.
 - We need to invite officials from the Ministry of Transport to the conferences.
3. How can we play a role in developing the post MDG development priorities?
 - We need champions for the transport sector and we need to identify the pathways to progress.
 - We have to be active in communicating with other sectors.
 - We need to get across that isolation as a key contributor to poverty.
 - We need to improve our database to measure the state of the transport sector.
 - Governments need to lobby at an international level for inclusion of a transport indicator in the post MDG priorities.
 - Organisations like IFRTD, TRL, AFCAP and Sub-Saharan Africa Transport Policy Program (SSATP) can also lobby and should launch a campaign immediately.
4. Do we need improved indicators for the rural transport sector?
 - We may need to include an indicator for urban transport.
 - We need a basic benchmark for an acceptable level of accessibility.
 - The indicator should measure access to basic services.
 - Geographic Information System-based indicators might be easier to monitor.

5. Vote: Rural Access Indicator with improvements incorporating appropriate transport services should be adopted as the post MDG indicator.

➤ It was unanimously agreed.