Economic Growth through Effective Road Asset Management

Workshop Report (Final)

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The views in this document are those of the authors and they do not necessarily reflect the views of the Research for Community Access Partnership (ReCAP), or Cardno Emerging Markets (UK) Ltd for whom the document was prepared.

Cover Image: Scenes from the Workshop and Conference

<table>
<thead>
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Abstract

The Africa Community Access Programme (AFCAP) is funding a research and capacity building project on asset management for rural roads. The purpose of the project is to achieve economic and social benefits for local communities in rural areas as a result of improved performance in road asset management.

The project is currently in the Formulation Phase and a draft Design Report has been submitted. The key recommendations within this report were discussed at a stakeholder workshop on 15th March 2016 during the ‘International Conference on Transport and Road Research’ in Mombasa, Kenya.

The workshop was attended by about 75 practitioners from Kenya, regional states, south Asia and Europe. Participants included government officials and representatives of academia and the private sector. The workshop format included presentations by experts on the Roughton team and a representative from the Western Cape. The presentations were followed by a discussion period, with several contributions made by the participants. The discussion was constrained by 1) inadequate time for the workshop and 2) most of the participants having little previous exposure to asset management approaches for rural roads.

Despite the view of one delegate that the proposed approaches were too sophisticated for most African countries, there was strong feedback from other participants that African countries should aspire to the standards set internationally and in the Western Cape.

Key Words

Rural Roads, Maintenance, Asset Management, Capacity Development
### Acronyms, Units and Currencies

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>$</td>
<td>United States Dollars</td>
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<tr>
<td>AFCAP</td>
<td>Africa Community Access Partnership</td>
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<td>AM</td>
<td>Asset Management</td>
</tr>
<tr>
<td>ARMFA</td>
<td>African Road Maintenance Fund Association</td>
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<tr>
<td>ASCAP</td>
<td>Asia Community Access Partnership</td>
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<td>BADEA</td>
<td>Arab Bank for Economic Development in Africa.</td>
</tr>
<tr>
<td>CDS</td>
<td>Civil Design Solutions</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for Further International Development</td>
</tr>
<tr>
<td>DM</td>
<td>District Municipality</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GPS</td>
<td>Global positioning system</td>
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<tr>
<td>IAMM</td>
<td>Infrastructure Asset Management Manual</td>
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<td>ILO</td>
<td>International Labour Organization</td>
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<tr>
<td>IQL</td>
<td>Information Quality Level</td>
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<td>LVR</td>
<td>Low Volume Road</td>
</tr>
<tr>
<td>PMU</td>
<td>Project Management Unit</td>
</tr>
<tr>
<td>PO-RALG</td>
<td>President’s Office – Regional Administration and Local Government</td>
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<tr>
<td>RAI</td>
<td>Rural Access Index</td>
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<tr>
<td>ReCAP</td>
<td>Research for Community Access Partnership</td>
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<tr>
<td>RI</td>
<td>Roughton International</td>
</tr>
<tr>
<td>SDG</td>
<td>Strategic Development Goal</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom (of Great Britain and Northern Ireland)</td>
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<td>UKAid</td>
<td>United Kingdom Aid (Department for International Development, UK)</td>
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<td>UoB</td>
<td>University of Birmingham</td>
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Executive Summary

The Africa Community Access Programme (AFCAP) is funding a research and capacity building project on asset management for rural roads. The purpose of the project is to achieve economic and social benefits for local communities in rural areas as a result of improved performance in road asset management. Cardno has signed a contract with Roughton International Limited (RIL) to provide technical input and project management services for the project. Three regions within sub-Sahara Africa will participate in the project and a fourth (the Western Cape Province of South Africa) will provide a benchmark for best practice.

The existing capacity in rural roads agencies in Africa is generally low and an innovative approach is required to achieve the project objectives. The project methodology will use an evidence-based approach to changing the mind set of policy makers and targeted support at the implementation level. The performance of the participating roads agencies will be measured against a new framework for evaluating road agency performance in asset management that is being developed as part of the study. The findings of the evaluation will be discussed with road sector stakeholders in the project areas and in regional meetings of the participating countries. This is expected to act as an influencing strategy to improve performance in road asset management and, ultimately, to achieve home-grown and sustainable improvements to the management of rural roads.

The project is currently in the Formulation Phase and a draft Design Report has been submitted. The key recommendations within the draft report were discussed at a stakeholder workshop on 15th March 2016 in Mombasa, Kenya. The purpose of the workshop was to obtain feedback from practitioners on the proposed project approach. The workshop was attended by about 75 participants from Kenya, regional states, south Asia and Europe. Participants included government officials and representatives of academia and the private sector.

The workshop format included presentations by experts on the Roughton team and a representative from the Western Cape. The presentations were followed by a discussion period. The discussion was unfortunately constrained by 1) inadequate time for the workshop and 2) most of the participants having little previous exposure to asset management approaches for rural roads.

A view was expressed during the discussion period that the proposed approaches might be too sophisticated for African countries. However there was strong feedback from other participants that African countries should aspire to the standards set internationally and in the Western Cape. It was evident that the proposed approaches will need to be framed in a way which can be easily understood by practitioners, and the benefits of improved asset management clearly demonstrated to key sector stakeholders.
1 Introduction

1.1 Background to the Project

The importance of road maintenance for economic and social development and for the preservation of investment in road infrastructure is now widely recognized. Nevertheless, many road authorities worldwide continue to under-invest in road maintenance or are implementing inefficient road maintenance management. Recognising poor road conditions to be a barrier to economic growth and poverty reduction, many countries in sub-Saharan Africa introduced a commercialized approach to road management in the 1990s and 2000s. This resulted in major road sector reforms including the development of road funds and semi-autonomous road authorities. These reforms are regarded as being at least partially successful, despite significant challenges, and have resulted in a reduction in under-funding of maintenance and a partial arrest of declines in the quality of trunk road networks.

However, the benefits from the road sectors reforms in SSA have been mainly associated with strategic road networks. Far less progress has been made with respect to rural road networks, where the benefits from investment in maintenance are less tangible but equally significant. This can be attributed to a number of reasons including insufficient road maintenance budgets, the lack of justification for funding rural road maintenance where social benefits are more significant than economic benefits, loss of institutional memory, ineffective rural road asset management practices, inappropriate institutional arrangements, lack of a maintenance culture, political interference, etc.

To address this the Africa Community Access Partnership (AFCAP) is funding a research and capacity building project to achieve economic and social benefits for local communities in rural areas through improved road asset management. Cardno Emerging Markets is managing AFCAP on behalf of the Department for International Development (DFID). Cardno has signed a contract with Roughton International Limited (RIL) of UK to provide consultancy services for the delivery of the project.

The project is known as ‘Economic Growth through Effective Road Asset Management – GEM’ and will initially be implemented in sub-Sahara Africa. The purpose of the project is to achieve economic and social benefits for local communities as a result of improved performance in road asset management. Three regions within sub-Sahara Africa will participate in the project and a fourth (the Western Cape Province of South Africa) will provide a benchmark for best practice.

1.2 Objectives of the Project

The objectives of the project are as follows:

1. Review literature and reports on existing and recent road management and maintenance programmes and identify ‘what works’ and ‘what doesn’t work’ in the type of environment likely to be encountered in the project area.
1. Develop a framework for measuring performance in road asset management appropriate to sub-national rural road networks and apply it in selected project areas.

2. Develop simple and appropriate tools for monitoring road condition and apply them in the project areas.

3. Develop simple indicators of economic and social impact of rural roads and monitor them in the project areas.

4. Achieve incremental (and measurable) improvements to road asset management performance in the project areas over a three year period.

1.3 Approach

The approach to the project is intended to foster self-reliance in road agencies in the project areas and encourage greater accountability to road users and other sector stakeholders. It provides flexibility and space for the participating road agencies and their stakeholders to determine their own destinies. The approach focuses more on improved performance in road asset management than on any specific or pre-conceived road asset management system or institutional, management and funding arrangements. Support to this process will be provided through demand-led technical and managerial assistance.

1.4 Project Phases

The project is being implemented in phases. The current consultancy contract covers the 5-month Formulation Phase. During this phase the project team is required to develop a detailed methodology for implementation of the project. If the Formulation Phase is successful it will be followed by the Implementation Phase. This will include periodic monitoring of asset management performance in the participating project areas, sharing of the outcome of the monitoring between the project areas and technical assistance to improve current practices. Dissemination of the research findings will take place in parallel with the implementation and at the end of the project.

The Formulation Phase includes a process for the identification and selection of the three participating countries. Within each country it will be necessary to identify an appropriate project area and a rural roads network which will form the basis for the research activities.

1.5 Purpose of this Report

A project workshop was held during the prestigious ‘International Conference on Transport and Road Research’ in Mombasa, Kenya, from 15th to 17th March 2016. The purpose of the workshop was to present formally the proposed approach to be adopted on the project so that the team could receive constructive views from the audience of practicing road network managers, engineers and rural transport professionals. A paper describing the project was presented during a conference plenary session prior to the workshop to ensure wider awareness of the project.
This report includes a summary of the workshop proceedings and its outcome. It includes a summary of presentations made by the consultancy team, feedback from participants during the discussion period and an analysis of participant responses through a feedback questionnaire. The feedback received during the workshop will influence the final design of the project and the method of implementation.
2 Structure of the Workshop

2.1 Title of the Workshop

The title of the workshop was “A New Specification for the Effective Management of Rural Roads”. This reflected the initial intention to focus the discussion on the new framework for assessing road agency performance that is being developed as part of the project. A decision was subsequently made to broaden the workshop theme to include a summary of the literature review carried out on existing rural road management practices in Africa and the approach to defining indicators of social and economic impact of rural roads in the project areas.

2.2 Objectives of Workshop

The main objective of the workshop was to present a draft “Framework for Assessing Rural Road Agency Performance in Asset Management” and obtain feedback from technical experts, road maintenance and rural transport practitioners and other stakeholders. The feedback from participants will inform the finalisation of the draft framework for trialling in the four participating countries.

The workshop was also intended to contribute to increased awareness amongst stakeholders in the region of the AFCAP project and its aims, approach and implementation plan. This would enhance interest and ownership of the project amongst government officials, development partners and practitioners, and contribute to its successful outcome, including possible scaling up and roll out across the region.

2.3 Workshop methodology

The workshop included four formal presentations and an open discussion period. The first presentation provided a summary of key issues arising from the literature review of current practice in rural road management in the region. The second presentation summarised current road asset management practice in the Western Cape. The third presentation outlined the proposed approach to monitoring social and economic impacts of roads in the project areas, and the fourth presentation (for which a written paper was provided) outlined the proposed assessment framework.

The PowerPoint presentations used by each of the presenters are included in Annex B. Delegates were given hard copies of the questions comprising the draft assessment framework for their comment.

The following questions were developed to guide the discussion period. They were intended to stimulate thought and discussion, rather than to capture any specific information.

- Do you have any issues, associated with what we have presented, which you would wish to be clarified?
• Do you have any comments on the overall approach in developing the framework (i.e. consideration of the 6 building blocks and determining, from AM standards, a set of criteria by which Rural Road AM can be assessed)?
• In addition to the 6 Building Blocks (Political, Organisational, Financial, Managerial, Operational, Technical) are there any others you think need to be considered?
• From your experience, or knowledge, what are the 3 most important factors affecting the sustainable rural road asset management?
• Do you have any comments regarding how well you believe the suggested approach may be received in road administrations?

Unfortunately it was not possible to discuss these questions due to time constraints. However partial responses to some of the issues were received during the general discussion period.

2.4 Workshop Programme

The following was the programme of activities for the workshop. The workshop began at about 16:40 as a result of general time overruns within the conference, and finished at about 18:40. It was evident that at least one additional hour was required to fully achieve the workshop objectives, but it was not possible to continue beyond 18:40 due to other evening activities.

<table>
<thead>
<tr>
<th>Time (planned)</th>
<th>Item</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:00 – 16:05</td>
<td>Introduction of participants and the research project</td>
<td>RG</td>
</tr>
<tr>
<td>16:05 – 16:15</td>
<td>Maintenance of Rural Roads in Africa: 2015 Status Update.</td>
<td>KG</td>
</tr>
<tr>
<td>16:15 – 16:35</td>
<td>Asset Management Systems for Rural Roads in the Western Cape</td>
<td>MH</td>
</tr>
<tr>
<td>16:35 – 16:40</td>
<td>Clarifications on the presentations</td>
<td>RG/KG/MH</td>
</tr>
<tr>
<td>16:40 – 16:50</td>
<td>Monitoring Economic and Social Impacts of Rural Roads – Proposed Indicators</td>
<td>CL</td>
</tr>
<tr>
<td>16:50 – 17:10</td>
<td>Framework for Rural Road Asset Management Performance</td>
<td>MB</td>
</tr>
<tr>
<td>17:10 – 17:50</td>
<td>Facilitated discussion with questions/comments from the participants.</td>
<td>RG</td>
</tr>
<tr>
<td>17:50 – 18:00</td>
<td>Summary of key points arising</td>
<td>MB</td>
</tr>
</tbody>
</table>

KEY:
RG: Rob Geddes (Facilitator)
KG: Kingstone Gongera (Presenter)
MH: Mervyn Henderson (Presenter)
CL: Camilla Lema (Presenter)
MB: Michael Burrow (Presenter)
3 Summary of Discussion and Participant Feedback

3.1 Key Issues Arising

The following key issues arose during the technical presentations and the discussion period.

- Effective road asset management depends on having the right people in the organisation. They must be appropriately qualified and experienced. They must receive training and skills development.
- Inadequate funding is a challenge for many countries in the effective AM of rural roads.
- Continual research and development are needed within the asset management organisation.
- Knowledge management is important within the organisation to avoid “reinventing the wheel”.
- A champion within the organisation is essential for the success of the asset management; they must have a passion for asset management.
- Good quality data are essential for effective road asset management.
- The asset management system should be kept as simple as possible.
- In some countries there is a need for a change in the mentality of the people towards maintaining roads. This starts with a national pride and sense of belonging, which may be absent in some post-conflict societies.
- The road asset management systems currently implemented in the Western Cape might be too complex for many other African countries.
- The success of the road asset management system in the Western Cape was seen as a result of political support and assignment of dedicated staff.
- Recent technological innovations (e.g. smart phones) can be used effectively by semi-literate people to collect data for the asset management.
- It is expected that the proposed self-assessment of road asset management performance in the participating areas will assist to identify areas where improvements can be made.
- A related project on rural road asset management is being carried out in Lao PDR and could provide lessons for the AFCAP project. The project includes factors to strengthen the climate resilience of the roads. The GEM project should establish links with the ReCAP climate resilience research project.\(^1\)
- The GEM project should establish links to the ReCAP project on high tech road condition monitoring.\(^2\)

---

1. The project is known as "Climate Adaptation: Risk Management and Resilience Optimisation for Vulnerable Rural Road Access".
2. This project is known as “The use of appropriate high-tech solutions for road network and condition analysis, with a focus on satellite imagery”.
Will the GEM project duration be sufficient to monitor long term impacts? For example gravel loss on unpaved roads may only be evident over a relatively long period of time.

### 3.2 Analysis of Participant Evaluation Forms

Feedback was obtained from 27 of the workshop participants. This was based on a standard evaluation form prepared by ReCAP management. The form is included in Annex A. Forms were submitted by about one-third of those present. Some forms were incomplete with some questions left blank. The evaluation scores and comments are summarised in Table 2.

#### Table 2: Workshop Evaluation Scores

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<tr>
<th>Questions</th>
<th>Number of responses</th>
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<tr>
<td>No</td>
<td>Rating score</td>
<td>A=5</td>
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<tr>
<td>2 Overall impression</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>3 Meeting expectations</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>4 Usefulness of workshop</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>5 Meeting workshop objectives</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>6 Usefulness of introduction</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>7 Impression of MRRA presentation</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>8 Impression of presentation on draft spec.</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>9 Impression of panel discussion</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>10 Usefulness of discussion</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>12 Workshop facilitation</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>13 Workshop schedule / timetable</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>14 Logistical organisation</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>15 Hotel workshop facilities</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>16 Pre-workshop information</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Average of all scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Three things learned</td>
<td>Role of effective road asset management in economic growth (x7)</td>
<td></td>
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<td>Importance of road maintenance in road management (x6)</td>
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<td></td>
<td>Practical indicators for impact of roads (x6)</td>
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<td></td>
<td>Status update on road maintenance performance in Africa (x6)</td>
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<td>Western Cape is a benchmark for road asset management practice (x3)</td>
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<td></td>
<td>The conceptual model for road asset management (x2)</td>
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<td></td>
<td>There is more emphasis on road development than maintenance (x2)</td>
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<td></td>
<td>Political interference is a major hindrance (x2)</td>
<td></td>
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<tr>
<td></td>
<td>Research on innovations in road management not given enough attention (x2)</td>
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<tr>
<td></td>
<td>Draft specification for road asset management and its use as self-assessment tool (x2)</td>
<td></td>
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<td></td>
<td>Road funds not supporting rural roads (x2)</td>
<td></td>
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<tr>
<td></td>
<td>Need to stakeholder engagement in road asset management (x2)</td>
<td></td>
</tr>
</tbody>
</table>
| 17 | What were the best and most useful aspects of the workshop? | Overall awareness of the way of thinking about rural road maintenance and new thinking on asset management (x4)  
Asset management and introduction to the specification (x2)  
Knowledgeable and experienced presenters (x2)  
Good workshop venue (x2)  
Interaction of the best brains in research on roads; mastery of workshop content by presenters.  
Internal communication was good; resource persons knowledgeable and experienced.  
Presentation on W Cape asset management system was valuable.  
Good explanation of what is possible and necessary.  
Realisation of the need to involve stakeholders including politicians so they can champion the allocation of resources for maintenance.  
Case studies of road maintenance in Africa  
Brain storming session on improvements to proposals (x2). |
| 18 | How could the workshop have been improved? | More time for the workshop (x6)  
More time for presentations (x4)  
More time for discussion (x2)  
More prior information (x2)  
Improved time management (x2)  
Use of video for case studies |
| 19 | Any other comments? | More similar conferences (x2)  
Immediate uptake of lessons learned from research (x2)  
Increase time available for the session; dialogues should continue after the workshop.  
Hold regular transport research conferences.  
Conduct a simplified version of the workshop with top management of roads authorities, the decision makers who are not necessarily technical to empower them with knowledge to make a stronger case for AM to politicians and financiers.  
On the asset management self-assessment form include section on institutional capacity and staff awareness on maintenance. |

### 3.3 Summary of Participants’ Comments

The average score of 3.9 for questions 2 to 16 indicates a general overall satisfaction with the content and conduct of the workshop. The lowest scores were given for Question 13: Workshop schedule/timetable. There were also some low scores given for the discussion...
period, which probably relate to the limited time available. In the written comments under question 18 several participants called for more time for the workshop, more time for presentations and more time for discussion.

The comments received under questions 1 and 16 show that many of the participants appreciated exposure to asset management issues for rural roads and the important of road maintenance. The value of research in rural roads was acknowledged by participants as well as the importance of the uptake of research findings. There were several positive comments related to the high quality of the presentations and the technical competence and experience of the presenters. The work being done on road asset management at the UoB and in the Western Cape were specifically mentioned. There was strong interest shown by the participants in learning more about asset management approaches for rural roads and for using such approaches to influence senior decision makers, politicians and financiers on the allocation of more funds for maintenance.

3.4 Incorporating the outcomes of the workshop into the project design

The feedback received during the workshop will be incorporated into the design of the project in the following ways:

1. The approaches to rural road asset management will be framed in a way which can be easily understood by practitioners, in particular through appropriate design and thorough field testing of the road agency self-assessment questionnaire.

2. The indicators of social and economic impacts of roads will be designed to ensure that the benefits of improved asset management are clearly demonstrated to key sector stakeholders, particularly government decision makers.

3. The research study outcomes and the approach adopted in the participating countries will be disseminated to as many rural road agency managers and practitioners as possible (within budget constraints). This includes practitioners in SE Asia.
Annex A: Evaluation Questionnaire

Please see the following page.
Workshop on
A New Framework for the Effective Management of Rural Roads
15 March 2016, Mombasa, Kenya
EVALUATION FORM
Please fill in this anonymous evaluation form so we can learn from your opinions

1. Please note down three things that you have learned during this workshop.
   a) 

   b) 

   c) 

Please evaluate the programme elements, by circling one of the letters A to E or Z. 
A = Very useful, very good; B = useful, good; C = OK; D = rather weak; E = very poor 
Z = absent - Other additional written comments welcome!! Use back if not enough space.

2. What is your overall impression of this workshop?
   ☺- A - B - C - D - E - Z

3. How far did the workshop meet your expectations?
   ☺- A - B - C - D - E - Z

4. How useful was the workshop to you?
   ☺- A - B - C - D - E - Z

5. How far did the workshop meet its objectives?
   ☺- A - B - C - D - E - Z

6. How useful was the Introduction to workshop themes, issues and outputs?
   ☺- A - B - C - D - E - Z

7. What was your impression of the presentation on Maintenance of Rural Roads in Africa: 2015 Status Update?
   ☺- A - B - C - D - E - Z

8. What was your impression of the presentation on Draft Framework?
   ☺- A - B - C - D - E - Z

9. What was your impression of the panel discussion?
   ☺- A - B - C - D - E - Z

10. How useful was the facilitated discussion with questions/comments from the participants?
    ☺- A - B - C - D - E - Z

11. How do you rate the summary of key points arising from the workshop?
    ☺- A - B - C - D - E - Z
12. How do you rate the workshop facilitation?

13. How do you rate the Workshop schedule / timetable?

14. What was your impression of the logistical organisation of the workshop?

15. How were the workshop facilities provided by the Sarova Whitesands Hotel?

16. What was your impression of the pre-workshop information send out to you?

17. What were the best and most useful aspects of the workshop?
   (please use overleaf if space is not enough)

18. How could the workshop have been improved? (please use overleaf if space is not enough)

19. Have you any other comments? (please use overleaf if space is not enough)

Thank you for your comments and suggestions!
Annex B: Presentations

Please see the following page.
A New Framework for the Effective Management of Rural Roads

International Conference on Transport and Road Research
Project Workshop 15th March 2016
Introduction to Workshop
Rob Geddes

Project Structure

Implementation Phase

STAGE 1
- Identify target road networks
- Conduct self assessments and baseline studies
- Report in PIT

STAGE 2
- Technical assistance.

STAGE 3
- Repeat the self assessments and performance monitoring
- Report in PIT

Workshop Programme

<table>
<thead>
<tr>
<th>Item</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction of participants and the research project</td>
</tr>
<tr>
<td>2</td>
<td>Maintenance of Rural Roads in Africa: 2015 Status Update.</td>
</tr>
<tr>
<td>3</td>
<td>Monitoring social and economic impacts of rural roads</td>
</tr>
<tr>
<td>4</td>
<td>Asset Management Systems for Rural Roads in the W. Cape</td>
</tr>
<tr>
<td>5</td>
<td>Framework for Self Assessment of Performance in Rural Roads Asset Management &amp; Questionnaire</td>
</tr>
<tr>
<td>6</td>
<td>Facilitated discussion with questions/comments from the participants.</td>
</tr>
<tr>
<td>8</td>
<td>Summary of key points arising</td>
</tr>
</tbody>
</table>
Economic Growth through Effective Road Asset Management (GEM)

International Conference on Transport and Road Research
15th to 17th March 2016
RN Geddes and SK Gongera

Literature review

• Many African countries gained independence in the 1950s and 1960s.
• Governments embarked on provision of access for both regional and rural road access.
• By 1980 over 2 million km of roads with an asset value of US$150 billion was constructed. (World Bank 1995).
• However by 1990 over 33% of the asset value was lost due to lack of routine and periodic maintenance.

Case studies – Ethiopia
• In 2010 Ethiopia launched URRAP to construct 70,000km of rural roads connecting all villages (5 year programme – US$1 billion).
• By 2015 no maintenance funding had been allocated to the completed roads, further road network expansion was planned.
Literature review

Malawi
A number of initiatives were undertaken:
- 1975 – 1995 DRIMP
- 1982 – 1990 VARBAU
- 1994 – 2009 MRTTP
- 2001 – 2004 GoM/EU PWP
- 2004 – 2011 GoM/EU IGWP
All these programmes were run with parallel PMU management structures from the funding partners. This resulted in limited local capacity development and lack of ownership. Programmes were not sustainable after the departure of PMUs.

Literature review

Mozambique
- Road maintenance is managed by provincial delegations supported by private consultants.
- Annual plans and programmes are coordinated at Head Office by the Directorate for maintenance
- All works are outsourced to private contractors
- Contracts are too small and short term (1-2 years). This requires huge administrative structures to manage numerous contracts
- ANE has a full complement of procurement staff at Head Office, a similar structure at Provincial level while Road fund has an equally large compliment of staff to manage payments. Consultants provide technical support to the management and supervision of contracts.
- This is a huge overhead that requires trimming.

Literature review

Tanzania
- Tanroads is in charge of regional and trunk roads
- District councils are responsible for rural roads – 108 000km
The District councils are constrained by:
- Limited budget and unsteady flow of funds
- Political interference
- Lack of motivated staff (low salary, lack of accommodation)
- Lack of equipment for road maintenance
- Erosion problems on unpaved roads
- Lack of gravel material

Literature review

Uganda
- Received funding from ADB and BADEA for road construction and improvement.
- DANIDA provided capacity building support for development of small scale contractors, and maintenance work was outsourced.
- However inadequate funding constrained the contracting and govt opted to revert back to force account.
- However the new policy undermined the gains of the contracting and the re introduction of force account was constrained by lack of equipment, poor funding and low capacity.
- Govt is currently discussing forming a District Urban Community Access Road Authority to look after rural roads.
### Literature review

**Zimbabwe**
- In 1980 embarked on a rural road programme involving the planning, construction of 25,000km of rural roads.
- Construction was partly donor funded while maintenance was fully funded by GoZ. (Donor condition for funding construction).
- Maintenance was done using tractor based technology through a semi autonomous govt agency.
- By 2000, donor support ended, roads reached design life and were due for periodic maintenance.
- Equipment was due for replacement, and the local currency started falling rapidly.
- Govt abandoned the tractor technology and opted for motorized graders.
- Road fund support was not adequate to support the new initiative.

### Literature review

**Western Cape in South Africa**
- Maintains 10,500km of unpaved road
- Enjoys high level political support for road maintenance
- Has developed in house efficient maintenance management systems over time. (30 years)
- Guided by long term strategic plans (five year strategy plans)
- Aspires to provide world class service to road users.
- Fully accountable to stakeholders

A good example of sustainable road maintenance practices in Africa.

### Literature review

**Summary of findings:**
- From the literature review, there are very few examples of sustainable asset management practices in sub Saharan Africa
- Govt tend to favour new construction and neglect/ underfund maintenance
- Political interference is common and undermines efficiency
- Contracting out of maintenance work has not resulted in improved capacity within the private sector; this is largely due to the small contracts and short term duration. This limits contractors in expanding their human and capital capacity.
- Bureaucratic procurement procedures undermine continuity of maintenance works
- Generally inadequate funding for road maintenance in general and low priority in particular for rural roads has remained a major handicap to improving rural access.

### Literature review: What is the way forward?

*We cannot solve our problems with the same thinking with which we created them.*

---

*Albert Einstein*
Literature review

Thank you for listening...

Any questions?
How can we maximise value from our assets by optimising cost, performance and risk?

Introduction

The Western Cape has a network of paved and unpaved roads that promotes and supports economic development.

- Nearly 62% or 10,042 km of the road network can be considered low volume roads (AADT < 250 vpd).
- Unpaved (gravel) roads are nearly 60%, or 9,908 km of the network.
- Unmanaged minor unpaved roads: 15,398 km.

Table: AADT classification of paved roads

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single 1</td>
<td>2.3%</td>
</tr>
<tr>
<td>Double 2</td>
<td>0.3%</td>
</tr>
<tr>
<td>Single 3</td>
<td>57.2%</td>
</tr>
</tbody>
</table>

Graph: Bar chart showing distribution of road categories.
Traffic on the Western Cape road network - AADT

<table>
<thead>
<tr>
<th>Cat.</th>
<th>AADT Km</th>
<th>% Km</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>&gt;500</td>
<td>1019</td>
</tr>
<tr>
<td>S1</td>
<td>501-500</td>
<td>2722</td>
</tr>
<tr>
<td>T0</td>
<td>301-500</td>
<td>1611</td>
</tr>
<tr>
<td>T1</td>
<td>1501-3000</td>
<td>1990</td>
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<td>T2</td>
<td>1501-5000</td>
<td>1475</td>
</tr>
<tr>
<td>T3</td>
<td>5001-10000</td>
<td>323</td>
</tr>
<tr>
<td>T4</td>
<td>10001-20000</td>
<td>217</td>
</tr>
<tr>
<td>T5</td>
<td>&gt;20000</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>16242</td>
</tr>
</tbody>
</table>

Context: Asset management big picture

The Big Picture & Maximise value of the network

Line-of-sight for users

Preservation of the Western Cape network 2014

VALUE

Cost Risk Performance

Maximise value of the network for users

Institute of Asset Management, UK.

Conceptual model for road asset management

Road System Performance

Asset Capacity Asset Use Asset Condition Physical Treatments Management of Use

Asset Management Strategies

Community Benefits

Strategy development

Strategy implementation
Institutional framework

Western Cape institutional framework

Purpose
- Manage & maintain roads and grow the economy

Structure & strategies to support this purpose using AM best practice
- Planning
  - Road System Management Strategy (to be developed)
  - New & upgrading of roads - Investment strategy (to be developed)
  - Road use management - Road Use strategies including safety
- Program development, systems and sustainability - Preservation strategy - well developed
- Project and program management - Roads Investment Plan
- Design
  - Pavements
  - Bridges
  - Geometrics
  - Traffic engineering including signs

Delivery
- Departmental construction & maintenance
  - District Roads Engineers (2) & District Municipalities (5) (agents)
  - Plant management
- Contract construction & maintenance

Business processes established

- What and how do we do things?
- People - qualified and experienced
- Succession planning
- Training & skills development
- Ongoing learning
- Research & development
- Knowledge management

Systems supporting asset management
Information systems and decision support tools

- Information is fundamental to asset management and, as illustrated in the figure, is used in all AM Phases to inform decisions and quantify the results of implementation.
- Essential information includes road asset inventories, asset condition, historical records of construction and maintenance, traffic and other road use data, unit costs, etc.
- This data then helps inform the analyses and decisions taken throughout the asset management process.

Activities and processes for preservation of the network

- **Data Management**
  - **Data Collection**
  - **Traffic & Condition surveys**
  - **Condition description**
  - **Deterioration modeling**
  - **Presentation**
  - **Final prioritization**

- **Project Planning**
  - **Detailed investigation and design**
  - **Fund allocation**

- **Maintenance/rehabilitation or upgrading**
  - **Project Planning**
  - **On-site verification and additional information**

- **Strategic & Tactical analyses**
  - **Optimized funding and distribution**
  - **Impact analyses**

- **Referencing & Inventory**
  - **Maintenance/ rehabilitation or upgrading**

History of system development in the WC

- In 1980 the then Department of Roads of the Cape Provincial Administration (CPA) recognized the need to develop formal procedures that use objective data on which to base maintenance strategy & policy, and identify & prioritise rehabilitation & reseal projects.
  - This is a strategic approach to asset management and has defined & refined the preservation strategy of the Branch for the last 30+ yrs
  - Supported by Branch Management

- Systems Subdirectorate champions & manages the integrated systems

- Regular data collection with quality control measures

- Ongoing improvements to achieve compliance with THM22 – Asset Management (based on SANS ISO55000)

- Ongoing broadening of the scope of information systems
Asset Management Maturity in the WC

AASHTO maturity self assessment in July 2015
• Provides direction for improvements
• Desirable rating of at least 3

Self Assessment - Summary

<table>
<thead>
<tr>
<th>Part A: Policy Guidance</th>
<th>Part B: Planning and Programming</th>
<th>Part C: Program Delivery</th>
<th>Part D: Information and Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Assessment Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

© Western Cape Government 2012 | Asset Management in the Western Cape, South Africa
Initiatives supporting asset management of the unpaved road network

Welcome to the world of unpaved roads! Better Together

Feedback from a road user: Fasten your bra straps and take out your false teeth. The road is stuffed.

Unpaved road initiative

How are we achieving this?

First: knowing what we want to achieve: our objectives!
Second: implementing strategies that are:
- cost effective
- have a long life
- an appropriate Level of Service to adequate accessibility and mobility
- promotes safety
- reduces costs for the road user & the Branch
- supports the outcome of increased economic development in under-developed areas

Third: maintaining alignment, know as 'line-of-sight' from the Branch's objectives all the way down to activities on the road.
Gaps in previous approach

Gaps identified
- No champion and support for driving the maintenance of the unpaved road network
- Asset management framework requires revision and revitalisation
- Legalisation of material sources (borrow pits)

Actions...
- Champion appointed
- 4 consulting engineers appointed to assist
  - Specific deliverables defined
- Asset management framework redefined to include level of service
- Strategy formulated
  - 3 levels of focus: strategic, tactical and operational
- Action plan prepared…

Some project deliverables

Strategic deliverables
- Strategic Plan for material sources
- Application of a Level of Service to every road
- Upgrades to the Gravel Roads Maintenance Management System (GROMAMAS) and the Materials Information Management System (MIMS)

Tactical deliverables
- Proven material sources complying with legal requirements
- Data input to the Materials Information System
- Designs for maintenance
- Feasibility studies for upgrading to paved standards
- New blading optimisation module for GROMAMAS

Operational deliverables
- Quality control and input of data to GROMAMAS
- Mining & rehabilitation of materials sources according to regulations
Challenges & Opportunities

Critical success factors

- Keep it simple!
- Management support
- Well developed strategies, planning and programming
- Dedicated systems support unit
- Champions for AM
- Standardised & formalised business processes
- Regular data collection & quality control
- Continuous system maintenance and improvement
- A structure that facilitates integration of all units to achieve an organisation’s objectives
- Specialist input when required

Challenges & opportunities

Challenges for implementing AM

- Human resource challenges
  - Sustainability: less than a critical mass of people who understand the big picture of asset management and can champion AM in the Branch
  - Big gap in experience between young engineers & management
  - Aging management with no succession plan

Opportunities

- Support by Management for ongoing implementation of good AM practice and information systems
- Receptive young engineers who can learn about AM

Thank you
Asset management

'A coordinated activity of an organisation to realise value from assets'

An asset is an ‘item, thing or entity that has potential or actual value to an organization’

- Asset management translates the organisation’s objectives into asset-related decisions, plans and activities, using a risk-based approach and enables an organisation to realise value from assets in the achievement of its objectives
- Asset management seeks to optimise the allocation of investment across a portfolio of assets to meet the requirements of the asset stakeholders
- Fundamental to asset management is the balancing of investments required to maintain the level of service provided by existing assets with investments required to meet future capacity demand
- Good Asset Management involves the optimising of cost, risks, performance, resources and benefits over the whole asset life, within any absolute constraints
Economic Growth Through Effective Road Asset Management

Monitoring Economic and Social Impacts of Rural Roads – Proposed Indicators

International Conference on Transport & Road Research
Prepared by: Camilla Lema, Rural Transport Economist

Introduction

- About 34% of rural population in Africa live within 2 km of an all-season road.
- Efficient and reliable rural transport infrastructure will lead to improved mobility, access to socioeconomic services and opportunities, and generally improved conditions for economic growth and poverty reduction.
- Socioeconomic benefits of rural roads improvements are quite obvious, but considered to be difficult to justify. Conventional methods of valuation are inadequate to capture benefits in low traffic volumes and non-economic benefits.

Purpose and Objective

- **Purpose** - to achieve economic and social benefits for local communities in rural areas as a result of improved performance in road asset management.
- **Objective** - to develop simple indicators of economic and social impact of rural roads and monitor them in the project areas.
- **Scope**: Result-based impact assessment directly related to road network condition (i.e. direct traffic and transport benefits) for the lifetime of the project.
  - Routine monitoring and measurement of results by the road agency (e.g. traffic counts, level of service)
  - Stand-alone time-bound research projects on social and economic impacts (e.g. cost to farmers as a result of rough roads)

Approach

- **Aim** - to provide a good indication of how to monitor/measure systematically the possible outcomes of well maintained rural roads. To serve as an influencing evidence-based strategy to improve rural road agency performance and to influence political leaders to give greater priority for rural road network management.
- **Definition of indicators** – to be aligned with investment policies and development objectives for rural roads in the participating countries. Results to contribute to future development planning and investment decisions for rural roads.
- **Process** - to be undertaken in close collaboration with, and be led by the participating road agencies in order to tap into the available and potential in-country capacities and resources for impacts monitoring and evaluation.
Proposed Menu of Indicators – result-based impact assessment

- **Transport infrastructure:**
  - **Output indicator** - length of rural road maintained as a proportion of the project network
  - **Outcome indicators** –
    - road condition (roughness index)
    - level of service (e.g. elimination of road closures / reduction in travel days lost)
  - direct employment creation in road maintenance (gender disaggregated worker-days/km of road maintained)

Proposed Indicators cont.

- **Transport services:**
  - **Outcome indicators**
    - traffic levels (traffic counts)
    - traffic composition (cars, light/heavy trucks, buses, IMTs, motorcycles, bicycles, commercial/non-commercial)
    - vehicle operating costs
    - Road safety (accident incidents/rates)
  - **Impact indicators**
    - availability of public transport and usage, frequency
    - access to transport services (average time to reach public transport)
    - fares on public transport
    - availability of freight transport
    - freight transport cost savings
    - change in transport modes (passengers and freight)
    - travel time savings

THANK YOU

ASANTENI
Specification for Rural Road Asset Management Performance

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Tasks of a road network
To encourage economic and social development
WHILST
Using a small proportion of the G.N.P
Road Commercialization

- Road Bank Report (1985)
  - Heggie and Vickers

“Commercial Management and Financing of Roads” by World Bank, Washington

Factors and Components

Technical Factors
- Technical: ability to undertake physical or engineering activities
  - Availability and use of data and systems, materials and supplies, plant and equipment
  - Controls and audit

Institutional Factors
- Institutional: organisational, managerial arrangements, finance, human resources
  - Powers of the administration, mission and objectives, roles of staff
  - Finance and resource management

External Factors
- External: the way in which the organisation operates
  - Legal and regulatory framework

"Systematic and co-ordinated activities and practices through which an organisation optimally manages its physical assets, and their associated performance, risk and expenditures over their life-cycle for the purposes of achieving its organisational strategic plan.” PAS 55
ROAD CONDITION ENGINEERING DECISIONS

LOCAL DISTRICT ENGINEER

PROJECTED ROAD CONDITION

ACTUAL CONDITION

ECONOMICS DECISIONS

AID AGENCY POLICY COMMITTEE TREASURY

PROJECTED ROUTE/NETWORK CONDITION

PRIMARY CONDITION ASSESSMENT

DIAGNOSTICS

SECONDARY / STRUCTURAL INVENTORY

TREATMENT SELECTION

TREATMENT SELECTION

PRIORITISATION

ROAD WORKS

AUDIT

TECHNICAL FINANCIAL

COSTS INCURRED BY OTHERS

Accidents

Time

Lack of social benefit

Environment

Opportunity cost

Vehicle operators

DIRECT COSTS

Construction

Maintenance

INVENTORY

PRIMARY CONDITION ASSESSMENT

SECONDARY / STRUCTURAL

DIAGNOSTICS

TREATMENT SELECTION

PRIORITISATION

ROAD WORKS

AUDIT

TECHNICAL FINANCIAL

PROJECT MODEL (ENGINEERING)

NETWORK MODEL (ECONOMIC)

INVENTORY

PRIMARY CONDITION ASSESSMENT

SECONDARY / STRUCTURAL

DIAGNOSTICS

TREATMENT SELECTION

PRIORITISATION

ROAD WORKS

AUDIT

TECHNICAL FINANCIAL

NETWORK MODEL (ECONOMIC)

INVENTORY

PRIMARY CONDITION ASSESSMENT

SECONDARY / STRUCTURAL

DIAGNOSTICS

TREATMENT SELECTION

PRIORITISATION

ROAD WORKS

AUDIT

TECHNICAL FINANCIAL

PROJECT MODEL (ENGINEERING)

NETWORK MODEL (ECONOMIC)
Thank you for listening

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