

Africa Community Access Programme (AFCAP)

***Output and Performance
Based Road Contracts
In Zambia***

**MALAWI STUDY TOUR
REPORT**

November 2009

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Introduction

1. Introduction

Background

The Government of Malawi, in collaboration with development partners, is undertaking the rehabilitation and upgrading of a core network of approximately 10,000 kilometres of district roads. This core network will be managed by the Malawi Road Authority at Head Office level and through their zonal structures. The roads in the core network will be constructed mainly to an engineered earth standard, with gravel wearing courses provided only in areas where insitu soils are weak. Most insitu soils in Malawi are relatively stable at low traffic levels. Higher-level interventions such as concrete slabs and bituminous seals will be provided on vulnerable sections such as steep slopes, and through villages where dust is a significant factor affecting the local community.

The establishment of an effective maintenance system on this network is critical to the sustainability of the programme. A study tour was recently undertaken to Mozambique to review the area based road maintenance system that uses tractor-based technologies. This system was initially developed in Zimbabwe. The system has been highly effective for the maintenance of unpaved roads where it has been well managed. There is also considerable interest in the region in using output and performance based specifications as a basis for routine maintenance contracts.

The Malawi Road Authority is currently introducing performance-based specifications to some activities under its annual term maintenance contracts. Zambia has more than three years of experience with the implementation of Output and Performance Based Road Maintenance contracts (OPRC) on unpaved roads. The lessons learned in Zambia are relevant to the debate on an appropriate maintenance system for unpaved roads in Malawi. This debate is considering the available choices between implementation technologies, management arrangements, forms of contract and specifications.

The Africa Community Access Programme (AFCAP) was asked by the Malawi Roads Authority to support a study tour of Zambia to obtain first hand information on the implementation of OPRCs. The concept of the study tour was agreed by the Zambia Road Development Agency (RDA), who acted as the Host. AFCAP agreed to engage a consultant to facilitate the study tour on behalf of the Malawi Road Authority and RDA.

AFCAP is a research programme funded by the UK government, which is promoting safe and sustainable rural access in Africa. AFCAP supports knowledge sharing between participating countries in order to enhance the uptake of low cost, proven solutions for rural access that maximise the use of local resources.

The study tour will assist the Government of Malawi with the design of an effective maintenance system for unpaved roads. First hand knowledge gained during the study tour will enable more accurate projections of the management and institutional capacity requirements for an OPRC maintenance system, as well as its likely cost. A secondary objective of the study tour was to encourage dialogue in Zambia on the strengths and weaknesses of the OPRC system, and how it fits into RDA's long-term maintenance plans.

Objective

The objective of the study tour was to identify lessons learned from the implementation of OPRCs for the maintenance of unpaved roads in Zambia, and how these affect the design of an appropriate maintenance system for unpaved roads in Malawi.

ASCO (Z) Ltd., a firm of consulting engineers based in Zambia, was appointed to facilitate the study tour. Activities included the following:

- Arrange for the participation of representatives of RDA, NRFA, local consultants and contractors in the field visit and workshop. ·
- Arrange hotel facilities, site visits in the field and discussion forum in Eastern Province.
- Arrange accommodation in Lusaka, together with a cocktail party.
- Arrange and facilitate a one-day workshop in Lusaka.
- Provide logistical support.
- Prepare a short study tour report including a summary of activities, presentations and discussions, a summary of main issues identified and recommendations for further discussions on district road maintenance in both RDA and the Malawi Road Authority.

The study tour was undertaken from 2nd to 6th November 2009. There were eight participants from Malawi - from the Roads Authority, the Ministry of Transport, the Ministry of Local Government and the Roads Fund Administration. The timetable was as follows:

Date	Description
Mon 2 nd Nov	All travel to Katete
Tues 3 rd Nov	Introductory meeting, field visit to OPRC roads, and debriefing session attended by Malawi contingent, Road Development Agency (Zambia), AFCAP Technical Manager and ASCO Consultants
Wed 4 th Nov	Travel to Lusaka, Cocktail function in evening attended by Malawi contingent, RDA, AFCAP, consultants and contractors
Thurs 5 th Nov	One day workshop (refer to report)
Fri 6 th Nov	Malawi contingent return to Malawi

This report provides a brief summary of events.

Report on Field Visit to Katete

2.0 Report on Field Visit to Katete

2.1 The participants

The participants represented the following bodies:

AFCAP
Malawi Roads Authority
Roads Fund Administration, Malawi
MOTP&PI, Malawi
MOLG&RD, Malawi
INSTAP TA to Roads Authority, Malawi
Road Development Authority, Zambia
Jiangxi Huachang, Contractors
ASCO (Z) Ltd, Consultants

2.2 The programme

2.2.1 Start-up Meeting

The programme started with a meeting in the conference room of Mphangwe Hotel in Katete. Participants were introduced. AFCAP outlined the purpose of the Malawi mission i.e. to learn from the Zambian experience of Output and Performance Based Contracts (OPRC) contracts. This was following a similar mission to Mozambique to learn from the types of maintenance contracts in that country.

ASCO outlined the background to their involvement in OPRC contracts in Zambia, which included supervision of one of the 1st generation OPRC contracts which was let in 2006 and is due for completion in 2010. The so-called 2nd generation OPRC contracts had been designed by taking account of the lessons learnt from the first generation works, and consisted of 4 distinct contracts under the auspice of the World Bank funded Agricultural Development Support Programme (ADSP). All of these contracts were won by 2 Chinese Contractors. ASCO is the consultant supervising Lot 3 Chipata/Katete and Lot 4 Lundazi and another consultant is supervising work on Lot 1 Chongwe and Lot 2 Choma. The subject of the start-up meeting was Lot 3 Chipata/Katete.

The contract includes 12 roads in Katete District and 8 roads in Chipata. There are a total of 389km to be maintained out of which 92km have been earmarked for full rehabilitation. The start date was March 2009 and the full improvement works are scheduled for completion by the end of 2009. The contract is due for completion in February 2014. The Contract value is approximately K39 billion or just in excess of 10 million dollars.

ASCO described the system of the Contractor's Road Maintenance Unit and the preparation of the Monthly Statement and described the performance indicators. Following some discussion, it was agreed to proceed with the site visit.

2.2.2 Site Visit

A visit was made to the Contractor's camp and the culvert-making process was inspected. There are many, predominantly 900mm diameter culverts to be installed throughout the contract.

Visits were made to some of the loops in Katete district. Generally the roads passed through populated areas of smallholding farms, villages and social amenities. The trip started at the R306 and RD412 roads (refer to map). These are roads under maintenance in the contract but not yet worked on by the Contractor. They are in poor condition, having previously been rehabilitated under an International Labour Organisation (ILO) sponsored intervention up to

10 years previously and have a carriageway width of 4m. The standard carriageway width for the roads under this contract is 5.5m. The tour moved to RD592/2 and it was clear that there was much encroachment of vegetation on the existing carriageway.

A section of RD411 was inspected – this road has undergone full improvement works and is now in very good condition. RD687 was inspected – a portion of this road is destined for full improvement works and another portion is due for maintenance only. It was noted that the portion due for maintenance was in extremely poor condition.

2.2.2 Report back Meeting

A further discussion was held at Mphangwe Hotel in Katete. ASCO outlined the various indicators of performance and how they are measured in practice. A discussion was held on the impressions gained from the site visit.

2.2.3 Travel to Lusaka and Cocktail Function

Following the site visit the participants travelled to Lusaka on 4th November. A cocktail function was held in the Chrismar Hotel in the evening, which was attended by the Malawi contingent, together by representatives of the Road Development Agency, National Road Fund Agency, World Bank, Contractors and Consultants.

3

Workshop Report

3. WORKSHOP REPORT

3.1 Introduction

The workshop was held at the Chrismar Hotel. It was attended by representatives of the following:

- AFCAP
- Malawi Delegation, comprising
 - Malawi Roads Authority
 - Malawi Roads Fund Administration
 - MOTP&PI, Malawi
 - MOLG&RD, Malawi
 - INSTAP TA to Roads Authority, Malawi
- Zambia Delegation, comprising stakeholders involved in OPRC contracts as follows:
 - Road Development Agency
 - National Road Fund Agency
 - Contractors
 - Consultants

A total of 29 participants were recorded. Others, (including the World Bank representative), attended the cocktail function but were unable to attend the workshop. The organisers were satisfied that the participants were representative of OPRC in Zambia.

3.2 Workshop Proceedings

The workshop followed the agenda as contained in **Annex II**. PowerPoint presentations were used in most cases. Refer to **Annex III** for a summary of the PowerPoint presentations. The following is a brief synopsis of events:

3.2.1 Opening Remarks

Introductions were held and the purpose of the workshop was outlined.

3.2.2 Status of OPRC in Zambia (RDA)

The RDA outlined that a total of 10 contracts had been awarded under the 1st generation OPRC contracts (in 2006), which covered 3,372km in all 9 provinces in Zambia. The funding for rehabilitation was provided by the EU. So far a total of 3 contracts have been terminated. It was clear that the contractors that had not performed were lacking in capacity and resources, but that those contracts that had managed to continue are successful. The 1st generation contracts were audited and lessons were learnt in the formulation of new contracts (2nd generation). These are being implemented through World Bank funding under the auspices of the Agricultural Development Support Programme (ADSP) of the Ministry of Agriculture and Cooperatives (MACO). An extensive design was incorporated into this process and contracts were awarded for 5 districts in Zambia.

The comment was made that in the case of one of the 1st generation contracts that was terminated, the roads were virtually inaccessible at the start of the contract and the Contractor's price was far too low.

3.2.3 Situation in Malawi (RA)

The Director of Maintenance gave an outline of the situation in Malawi, which included the setting up of the Road Fund and Road Authority and the overall development of the road sector reforms. The Core Road Network comprises 15,431km with 75% unpaved roads, though the intention is to add a further 10,000km of unpaved, mainly district, roads to this core network. The objective of the Malawian delegation was to learn from the experience of their Zambian counterparts and to introduce OPRC on at least a pilot basis using funds generated by the Road Fund. The Director questioned whether the Zambia Government was

prepared to finance OPRCs from their own resources, and it was clarified that the maintenance costs of the 1st generation OPRC were funded by the Zambian Road Fund, and that the intention is to renew these contracts when they expire in 2010.

3.2.4 AFCAP Presentation

The Technical Manager gave a presentation on the activities of AFCAP in five African countries. AFCAP is funded by DFID and the programme is managed by Crown Agents. AFCAP is supporting research activities and knowledge sharing in order to promote optimal and cost-effective solutions for road maintenance. A brief discussion was held on the perceived merits of labour-based and community-based road maintenance options.

3.2.5 A Consultant's Perspective

Following tea-break, a presentation was given by ASCO giving an outline of their experiences in OPRC generation 1 and 2 and outlining the strengths and weaknesses of both types of Contracts. The weaknesses tend to be the lack of familiarity of contractor's with the requirements despite sensitisation workshops that had been held prior to the launch of tenders. The strengths tend to be in terms of the stable employment offered by continuity of work and reduced procurement and administration costs. The contracts have also had a relatively high impact as borne out by baseline and impact monitoring studies.

A suggestion was made that OPRC bids should be evaluated technically to ensure that the contractor's methodology for completing the initial improvement phase, as well as the maintenance, are sound, and that the contractor would have sufficient resources at their disposal.

3.2.6 2007 OPRC Audit

A brief discussion was held on the recommendations contained in the 2007 audit of the OPRC Contracts. Recommendations included simplifying roughness measurement by use of a Bump Integrator (or Accelerometer), to specify the vehicle required for the site inspections, and to elaborate training courses for OPRC. Training was recognised to be an important aspect and it was suggested that this training should be carried out in the provinces. It was mentioned that in Malawi the Public Works Programme utilised area-based maintenance clubs, which might be considered a form of performance based maintenance system.

3.2.7 Evaluation Form and Study Tour Observations

Finally the workshop evaluated the Zambia OPRCs against 12 characteristics of successful routine maintenance systems. These criteria were initially generated through an evaluation of the successful area based maintenance system operated by the District Development Fund in Zimbabwe. The intention of the evaluation was to provide analysis and guidance that could be used by both Zambian and Malawian delegations in the design of OPRCs and other forms of maintenance systems. The outcome of the discussion is recorded in the table below.

The main observations from the visit can be summarised as follows:

1. The Zambia OPRCs have resulted in significant improvements to a substantial length of unpaved rural road, with resultant benefits to local communities.
2. The OPRC system is efficient because it requires minimal involvement of the client and supervising consultant once the contract has entered the maintenance phase. The contractor is able to optimize the maintenance inputs to reduce costs, yet still achieving the minimum required performance standard. The multi-annual contract reduces procurement costs.
3. The large scale OPRCs implemented in Zambia are suitable only for large contractors due to the significant component of improvement works. All of the national contractors that participated in the first generation contracts failed, mainly due to

- inadequate resources and underpricing of the improvement component.
4. The involvement of small local contractors depends on them negotiating sub-contracts with the main contractor during the maintenance phase. This has occurred under the 1st generation OPRCs, but is not a requirement of the contract.
 5. Subsequent OPRCs on the same roads will likely not include significant improvement works because these works have already been done. The current system is not building national capacity to take over the maintenance of these roads.
 6. There is scope within the OPRC system to incorporate more appropriate light equipment and labour in the maintenance phase, but this has not been actively pursued.
 7. Joint ventures between contractors and consultants are desirable. The consultant is able to assist the contractor to achieve appropriate standards on the improvement works and to optimize maintenance inputs. A contractor/consultant JV was successful on one 1st generation OPRC, but consortia that bid for the 2nd generation OPRCs were unsuccessful. It should be noted that none of the 1st generation contractors were successful in their bids for the 2nd generation contracts.
 8. It is important to achieve the right balance between billed improvement works and improvement works that are paid for as maintenance. The inclusion of improvement works that are not billed separately is seen as an incentive to keep the contractor on site for the full duration of the contract.
 9. It was evident that the OPRC contractor for Chipata/Katete Districts has underpriced the improvement works. The contractor was not familiar with the OPRC approach and evidently did not undertake a detailed inspection of the roads before submitting his bid. The contractor seems able to absorb these losses, but there are delays in the implementation.
 10. The decision by the RDA to enforce a minimum width of 5.5 metres on district roads has added significantly to the contractor's work load. Some of the roads in Katete were constructed to a width of 4 metres under a labour-based contractor development programme in the early 2000s. The widening of these roads is paid for as "maintenance" under the OPRC. This appears to be compounding the contractor's progress.

AFRICA COMMUNITY ACCESS PROGRAMME (AFCAP) STUDY TOUR OF MALAWI ROAD SECTOR REPRESENTATIVES TO ZAMBIA OUTPUT AND PERFORMANCE BASED ROAD MAINTENANCE PROGRAMME NOVEMBER 2009

EVALUATION FORMAT

This evaluation framework has been developed to assist the study tour group in drawing useful experiences from the Zambia visit. It is based on the identified reasons for success of the Zimbabwe DDF rural road maintenance operation, which is seen as a cost effective and highly resilient routine maintenance system.

KEY ASPECT	FEATURE OF ZAMBIA OPRC?	COMMENTS RELEVANT TO APPLICATION IN MALAWI
1. Funding: <i>Government has been convinced of the importance of Routine Maintenance and is willing to fund it sufficiently.</i>	Too early to say regarding funding of full OPRCs. RDA already has routine maintenance contracts on paved roads using performance-based specs. RF is funding rehab and upgrading works, so can finance OPRCs.	Still discussing whether Malawi will adopt performance based specs. Still improving district road network to maintainable condition. Mechanism is in place to fund OPRCs through Road Fund (including improvement works). Government does seem to be aware of the importance of road maintenance.
2. Technology: <i>Maximises the use of appropriate, low-cost, local-resource-based technologies (regional equipment manufacture & local labour).</i>	Needs heavy equipment for improvement phase. Contractor decides what equipment to use for routine maintenance. Some routine maintenance has been subcontracted to local firms (1 st generation OPRCs). Where this does not take place there is a concern about long-term sustainability of the system.	Contractor should have a choice of technology but RF favours the use of small local contractors and light equipment for routine maintenance. Therefore require smaller contract packages.
3. Strategy: <i>Roads are initially brought to a "Maintainable" condition under a separate operation.</i>	Improvement and routine maintenance included in same contract. OPRC approach can avoid lengthy design phase before construction/maintenance starts (Design and Build). Too much improvement work was classified as maintenance on 2 nd generation OPRCs. Contractors possibly not being fairly reimbursed.	Careful selection of roads for OPRCs necessary so as not to have too much rehab/improvement before commencement of routine maintenance activities. Or improvement works to be paid for separately as a rehab contract.
4. Strategy: <i>Routine Maintenance is carried out as a 'Routine' activity. Once set up it is a logistical, rather than technical challenge.</i>	Contractor only paid if service level achieved. Routine maintenance becomes easier where improvement works are done to good standards. Technical input on site reduces over time with long-term contracts. OPRC concept includes incentive for contractor to do high quality initial improvements. Periodic visits only required by RDA and supervising consultants.	RA favours multi-year contracts. Possibly 3 years for first phase. Followed by longer contracts. Have to check that funding mechanisms can be put in place for multi year contracts. RF thought this should not be a problem For routine maintenance-Local people either men or women can be engage for routine maintenance work. Local representatives can be involved in this regard by making a group with low income village people. Some road length can be provided for maintenance. In another project "Small Scale Water Resources Project"(SSWRP)- the beneficiaries maintain the operation and Maintenances Program by sharing money after completion of sluice gate or rubber dam project for Irrigation purposes. For road project maintenance work can be attractive by tree plantation along the roadside sharing agreement with client and workers.
5. Flexibility: <i>System is adapted to local and seasonal maintenance</i>	OPRC contractor must be flexible to ensure payment. Contract has provision for emergencies (separate payment on day work	RA supports flexible approach and having contractor permanently on site.

requirements. Sufficient flexibility to tackle emergencies.	rates).	
6. Management: Efficient organisation & management systems result in low management costs.	OPRC has lower overall management costs. Small inputs by consultant and client. Contractor optimizes management to reduce costs. Lower overall procurement costs with multi year contracts.	
7. Management: System is freed from bureaucratic constraints of the civil service.	OPRC is implemented mainly by the private sector.	
8. Management: Managers able to motivate staff to achieve performance. Field managers involved in work planning.	Contractors should have internal management systems to maximize efficiency. Contractors should include consultant firm on management team. Contractor/consultant JVs are desirable, but none bid successfully for 2 nd generation contracts.	Good managerial skills appear to be necessary for OPRC work. This may limit small indigenous contractors from participating.
9. Human Resource Development: Ongoing programme of training & re-training.	Up to contractors to train staff. Multi annual contracts favour in house training. Contractors and consultants need training on OPRC approach. Foreign/larger contractors could be required to include and train local subcontractors. Or a separate training consultancy could be organized by client. Contractor/consultant JVs allow for better training.	INSTAP Project will initially assist with contractor and consultant training.
10. Equipment: Effective equipment funding and replacement policy. Effective maintenance results in long equipment operating lives (about 10,000 hours per tractor).	It is in the interest of the contractor to maintain the equipment. The minimum equipment requirements are set out in the contract but this has proved inadequate, leading to delays in the improvement phase.	Realistic minimum equipment requirements should be set out in contract. Include in training so that contractors able to plan their equipment requirements. Concern though over equipment not being fully utilised as it has to be available throughout the contract period.
11. Cost effectiveness: The system is more cost effective for maintenance of the roads than other options.	Large maintenance contracts have generally been found to be cost effective, but initial OPRCs might not be cost effective due to the inexperience of the bidders. Contractors can innovate and therefore might offer lower costs on subsequent contracts. Most of the cost on 1 st and 2 nd generation OPRCs has been in improvement works because roads were in poor condition. No current information is available on actual routine maintenance costs after improvement. It would be possible to estimate this by observing contractors inputs on site.	
12. Monitoring: Effective performance monitoring enables improvements to the system.	RDA is learning by doing. RDA is leading and participating in regular technical reviews and audits.	

ANY FURTHER COMMENTS OR OBSERVATIONS OF RELEVANCE TO THE DEVELOPMENT OF THE MALAWI UNPAVED ROAD PROGRAMME (MURP)?

1. OPRCs can include social components e.g. HIV awareness, road safety, personnel safety. These should be billed separately.
2. There is a critical balance between billed improvement works and improvement works that are paid for as maintenance. Under the first generation OPRCs the contractor was required to determine the split between improvement and maintenance works, and to prepare his own BOQs. Contractors that underestimated the initial requirements were at a significant disadvantage. Under the 2nd generation OPRCs some of the improvement works were billed separately, though the contracts also include significant improvement work that is paid for as maintenance. The inclusion of improvement works that are not billed separately is seen as an

- incentive to keep the contractor on site for the full duration of the contract.
3. Subsequent OPRCs on the same roads will presumably not include significant improvement works because these have already been done. Large international contractors might therefore not be attracted. The current system is not building national capacity to take over the works.

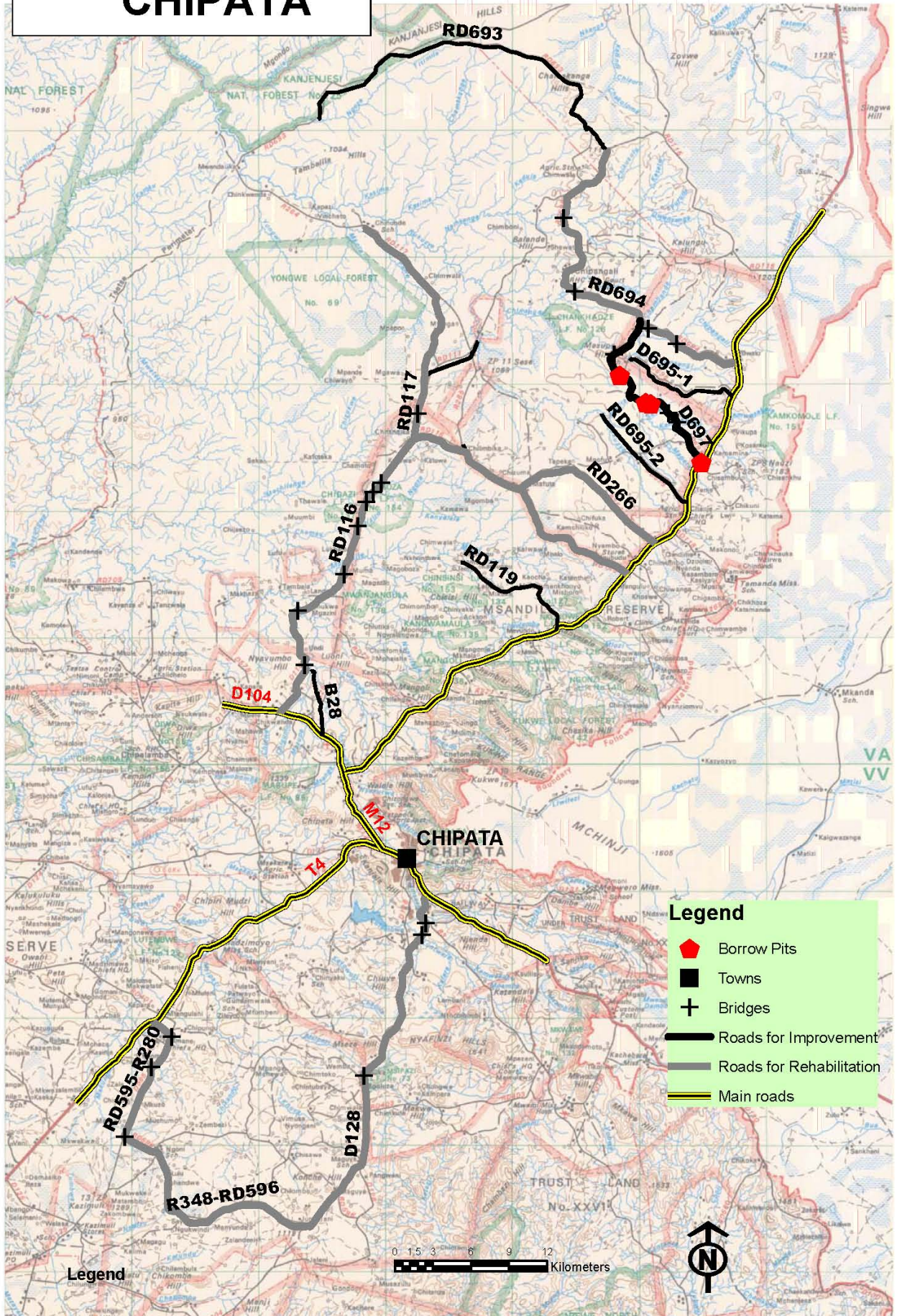
3.2.8 Workshop Closure

The workshop was formally closed by RDA at 13.15 hours. Participants were thanked and it was hoped that a Zambian delegation could visit Malawi in future in order to learn from their experiences of OPRC in the future. All agreed that this had been a very worthwhile exchange of views.

Annex I

Katete – Site Location Map

CHIPATA



Legend

- ◆ Borrow Pits
- Towns
- +
 Bridges
- Roads for Improvement
- Roads for Rehabilitation
- Main roads

Legend

0 3 6 9 12 Kilometers



KATETE

Legend

Borrow Pits

TYPE

Existing

New

Towns

District capital

Small town

Bridge

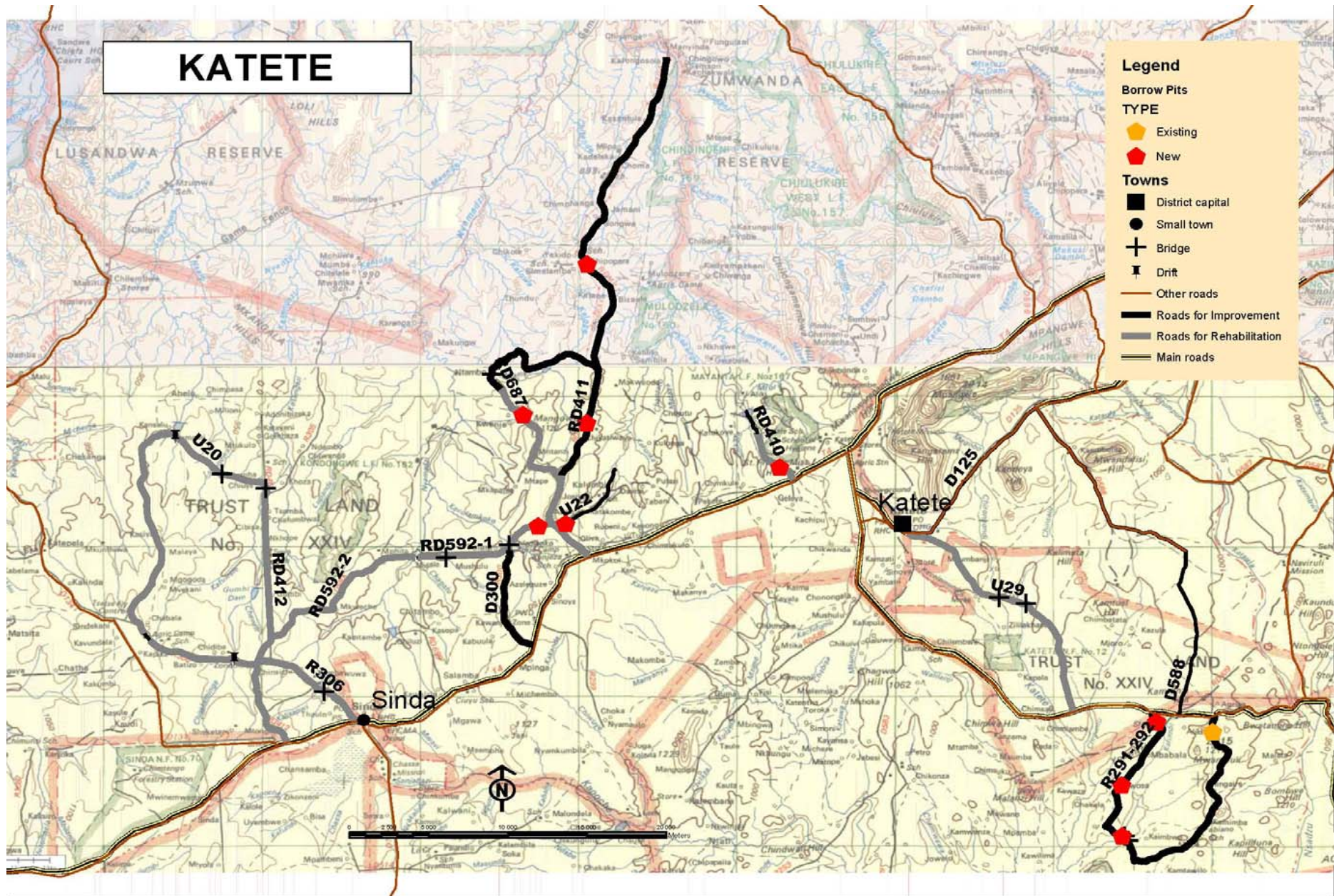
Drift

Other roads

Roads for Improvement

Roads for Rehabilitation

Main roads



Annex II

Workshop Agenda

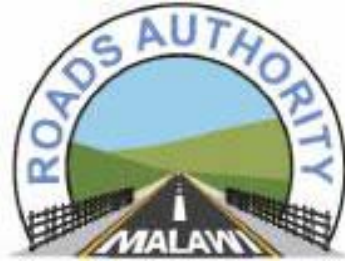
**MALAWI/ZAMBIA OPRC STUDY TOUR – ONE DAY WORKSHOP ON 5TH
NOVEMBER 2009**

AGENDA

Time	Activity
08.00 – 08.30	Registration
08.30	Welcome (RDA)
08.40	Overview of current status of OPRCs in Zambia (RDA) Discussion
09.10	Presentation by Malawi Delegation Discussion
10:00 – 10:30	Coffee
10.30	Presentation of AFCAP Discussion
11.00	Contractor's perspective Discussion
11.30	Consultant's Perspective Discussion
13:00 – 14:00	Lunch
14:00 – 17:00	This is an informal session and will cover (amongst others) Observations from site visit Documents Costs
17:00	Closing Remarks (RDA)

ANNEX III

WORKSHOP POWERPOINT PRESENTATIONS



Accelerating Malawi's Economic Growth

DEVELOPMENT OF MALAWI RURAL ROAD PROGRAMME

**PRESENTATION TO ZAMBIA STUDY
TOUR TEAM – 5th November 2009**

NATIONAL TRANSPORT POLICY



Accelerating Malawi's
economic growth

- **Overall Policy Goal**
 - Coordinated transport environment that fosters
 - Safe
 - Competitive
 - Financially sustainable
 - Environmentally friendly
- **Road Transport Policy Goal**
 - Creation of environment that meets current and future needs through the provision of
 - Adequate
 - Safe
 - Reliable
 - Efficient
 - Economical

ROAD SECTOR REFORMS



Accelerating Malawi's
economic growth

- Prior to 1998, road maintenance and construction was largely under the Ministry of Works and Supplies (now Ministry of Transport and Public Infrastructure) with funding based on appropriations from the Ministry of Finance.
- However, allocation of financial resources to the road sector did not match with the maintenance requirements on the ground due to poor state of the country's economy and competing demands from other sectors. As a result, service delivery on road infrastructure development and management deteriorated considerably, a situation that manifested in the poor state of the road infrastructure during the early 1990s.

ROAD SECTOR REFORMS (CONT'D)



Accelerating Malawi's
economic growth

- This led to road sector reforms, which were set in motion by Road Maintenance Initiative (RMI) Studies in 1995 following Government decision to effectively address road infrastructure development, management, and funding problems.
- The principle was to sustain the road network investment through a targeted approach to revenue generation from the road users and the establishment of an agency outside the public service to manage the road network and account for the resources against tangible achievements in road infrastructure development and management

ROAD SECTOR REFORMS (CONT'D)



Accelerating Malawi's
economic growth

- Continuing reforms in 2006, aimed at improving accountability and transparency, resulted in the separation of the National Roads Authority into Roads Authority (Act No. 3 of 2006) and Roads Fund Administration (Act No. 4 of 2006). The Boards for these organisations were appointed in November 2006, and the new organisations were fully established by 1 July 2007.

ROADS AUTHORITY ESTABLISHMENT



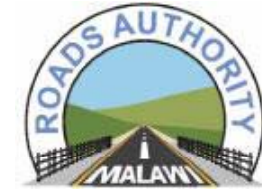
Accelerating Malawi's
economic growth

- The Board comprises 10 members including 2 Ex officio members.

Altogether the Roads Authority has 96 members of staff.

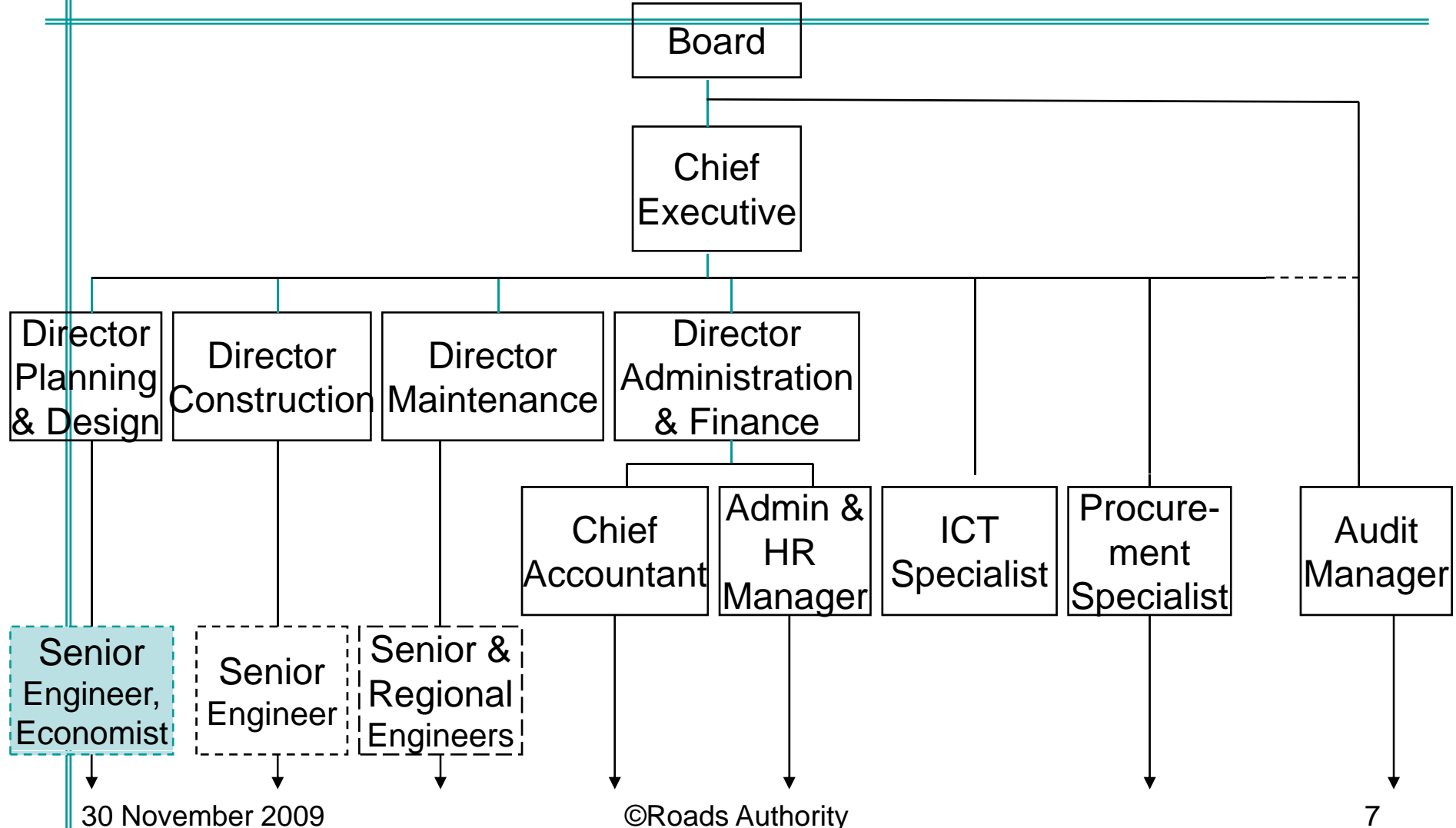
1. Head Office has a total of 51 members of staff including
2. Regional Office – North, has a total 12 members of staff including 1 Regional Engineer, 2 Maintenance Engineers, 3 Road Inspectors (Each assigned specific Districts to oversee)
3. Regional Office – Centre has 14 members of staff including 1 Regional Engineer, 2 Maintenance Engineers, 4 Road Inspectors
4. Regional Office – South has 19 members of staff including 1 Regional Engineer, 3 Maintenance Engineers, 5 Road Inspectors

ROADS AUTHORITY ESTABLISHMENT (CONT'D)



Accelerating Malawi's
economic growth

ROADS AUTHORITY MANAGEMENT



30 November 2009

©Roads Authority

7

PURPOSE OF THE ROADS AUTHORITY



Accelerating Malawi's
economic growth

The purpose of the Authority shall be to:

- (a) ensure that public roads are constructed, maintained or rehabilitated at all times

- (b) advise the Minister and, where appropriate, the Minister responsible for Local Government on the preparation and the efficient and effective implementation of the annual national roads programme.

ROAD INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT



Accelerating Malawi's
economic growth

- Currently the implementation of the road infrastructure development and management programmes is based on the NRA's 5 Year (2006 – 2011) Rolling Strategic and Business Plan *under review*) and the Road Sector Programme (*under review*) that answers the Malawi Growth and Development Strategy which underscores the fact that effective transport infrastructure is a prerequisite to sustainable economic growth.
- In accordance with Roads Authority and Roads Fund Administration Acts roads projects are contained in the Annual National Roads Programme (ANRP) which is approved by the Minister responsible for public roads by March.
- In the preparation of the ANRP, the Roads Authority consults and liaises with the stakeholders including local assemblies and Roads Fund Administration. **Only projects appearing in the ANRP can be funded by Roads Fund Administration**

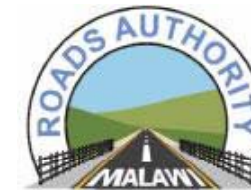
ROAD INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (CONT'D)



Accelerating Malawi's
economic growth

- The major guiding principle in the road investment infrastructure management and development to ensure that good roads remain good. Therefore routine and periodic maintenance interventions are of paramount importance.
- However, some roads are not in a condition where routine or periodic maintenance is effective or economic. Hence rehabilitation (backlog maintenance).
- In order to answer to MGDS, earth roads have to be upgraded to bitumen standards. Hence studies for economic appraisals and upgrading projects of economically, socially and strategically justified roads

ROAD INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (CONT'D)



Accelerating Malawi's
economic growth

PUBLIC ROAD NETWORK

Road Class	Pavement Type		Total (km)
	<i>Paved (km)</i>	<i>Unpaved (km)</i>	
Main	2,809	548	3,357
Secondary	407	2,718	3,125
Tertiary	44	4,077	4,121
District	15	3,485	3,500
Urban	770	578	1,348
Total	4,045	11,406	15,451

About 75% of the network is unpaved. From recent reclassification studies, approximately 10,000km will be added to the public roads network

ROAD INFRASTRUCTURE DEVELOPMENT AND MANAGEMENT (CONT'D)



Accelerating Malawi's
economic growth

CURRENT AND DESIRED ROAD INFRASTRUCTURE STATUS

- **Current condition**
 - Paved - 79% good, 19% fair and 2% poor
 - Unpaved – 14% good, 46% fair and 40% poor
- **Desired Condition by 2011 (*under review*)**
 - Paved - 81% good and 19% fair
 - Unpaved – 50% good, 40% fair and 10% poor

2009/10 ANNUAL NATIONAL ROADS PROGRAMME SUMMARY



Accelerating Malawi's
economic growth

RECURRENT PROGRAMMES

- Planning and Design Services
- Maintenance and Rehabilitation
- Routine Maintenance (Performance based)
- Grading and Reshaping
- Spot Rehabilitation of Earth Roads
- Spot Periodic and Rehabilitation of Paved Roads
- Routine Pothole Patching
- Timber Bridges Replacement with Concrete

2009/10 ANNUAL NATIONAL ROADS PROGRAMME SUMMARY (CONT'D)



Accelerating Malawi's
economic growth

- Routine Road Marking
- Road Reserve Demarcation
- Accident Spot Improvement
- Routine Road Signs Replacement
- Routine Spot Repairs
- Community Roads (Routine and Periodic)
- Special Backlog Maintenance of Urban Paved Roads
- Road Condition Assessment, Traffic Survey and Road Inventory
- Research and Development

2009/10 ANNUAL NATIONAL ROADS PROGRAMME SUMMARY (CONT'D)



Accelerating Malawi's
economic growth

DEVELOPMENT

- Periodic Maintenance
- Rehabilitation
- Upgrading
- Feasibility and Design Studies

IMPLEMENTATION OF ANNUAL NATIONAL ROADS PROGRAMME



Accelerating Malawi's
economic growth

- All works projects including supervision and road studies are outsourced
- Roads Authority (RA) plans, prepares road works programmes for construction, rehabilitation and maintenance annually
- RA packages works and tenders them out and enters into contract with contractors and consultants on behalf of Government

CHALLENGES AND PROPOSED INTERVENTIONS



Accelerating Malawi's
economic growth

- Vandalism of road furniture
 - Impacts
 - Road safety compromised
 - Replacement deprives other roads scarce resources
 - Proposed interventions
 - Sensitization at local level

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

- **Encroachment into road reserve**
 - **Impacts**
 - **Unnecessary and costly compensation**
 - **Delayed implementation of projects**
 - **Proposed interventions**
 - **Sensitization at local level**

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

- **High construction and maintenance needs**
 - **Impacts**
 - Increased backlog maintenance
 - High vehicle operating costs
 - Reduced economic activities
 - **Proposed interventions**
 - Increased funding level from existing local revenue bases
 - Consider introducing other revenue bases
 - Increased government appropriation
 - Develop innovative low-cost options

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

- **Weak construction industry**
 - Impacts
 - Delayed implementation of projects
 - Inability to adopt new and cost-effective construction techniques
 - Compromised quality of finished works
 - **Proposed interventions**
 - Empower contractors to acquire plant and equipment through
 - Deliberate work continuity
 - Government guaranteed Loan facilities
 - Re-introduction of diploma/technician courses at the University

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

- **Surtax charges on road works**
 - Impacts
 - Resources earmarked for road works less by surtax percentage (16.5%) in real terms
 - **Proposed interventions**
 - Road works to be exempted from surtax since the Roads Fund is already a tax

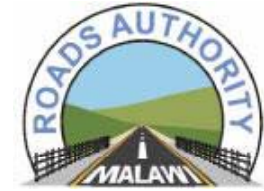
CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

- **Stakeholder input**
 - Impacts
 - Delayed implementation of projects
 - Compromised quality of works due to either no plans or hastened planning
 - Costly projects when planning comes after tendering process
 - Departure from planned programmes
 - **Proposed interventions**
 - Stakeholder input to come at projects' identification and planning stage

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

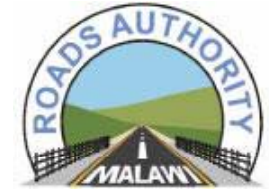
- **Role of Assemblies as Road Agencies as part of the decentralization process**
 - Impacts
 - Roads Authority's lacking concentrated efforts on public road network
 - High priority roads suffering at the expense of undesignated roads
 - **Proposed interventions**
 - Decentralization process to be concluded for Assemblies to start working as Road Agencies
 - Establish a proper allocation of resources amongst different classes of roads

CHALLENGES AND PROPOSED INTERVENTIONS Cont..



Accelerating Malawi's
economic growth

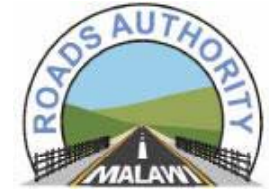
- **Non-programmed projects**
 - Impacts
 - Programmed projects suffer
 - **Proposed interventions**
 - All non-programmed projects to come with funding



Accelerating Malawi's
economic growth

END OF PRESENTATION

Thank you all for your attention



Accelerating Malawi's
economic growth

Questions and comments



The Africa Community Access Programme (AFCAP)

Zambia Study Tour Workshop

5th November 2009

What is AFCAP?

- AFCAP is a UK government (DFID) funded knowledge and research programme for Africa
- AFCAP uses research evidence to promote sustainable, least-cost, all-weather, locally-owned access for rural communities.
- Mozambique, Ethiopia, Tanzania, Kenya and Malawi are the first countries to participate
- Dissemination of AFCAP outputs on a wider scale, including through regional organisations (e.g. SADC), international conferences
- AFCAP has a budget of £7.5million over 5 years from 2008 (small but strategic contribution)
- Crown Agents management team.

AFCAP Four Way Test

**Does the project
have strong local
ownership?**

**Does the project
include mainly
research or
knowledge
dissemination?**

**Will the project
contribute to
sustainable
improvements to
rural transport?**

**Will the project
contribute to
building national
or regional
capacity?**

Main Areas of Demand

- Design standards for low volume roads
- Use of marginal materials in road construction
- Dealing with black cotton soils and sand
- Assessing proprietary chemical stabilisers
- Maintenance systems for low volume roads
- Capacity development in local road construction industry
- Improving accessibility in rural areas including transport services.
- Developing solutions to overcome access constraints to health services

Output 1: Verification and mainstreaming innovative approaches and good practice on rural road infrastructure and transport services:

- Demonstration sites
- Design standards
- Specifications



Review of Surface Dressing Practice in Ethiopia



Aggregate stripping due to poor binder transverse distribution

- Failure of surfacing dressings is leading to increased use of asphaltic concrete surfacing at considerable additional cost.
- AFCAP is providing Australian and South African expertise for diagnostic study.
- Initial findings show deficiencies in standard specifications and poor workmanship
- Initial recommendations:
 - Revision of standard specifications
 - Training programmes for contractors and supervisors.

Road Maintenance Systems



Malawi Unpaved Rural Roads Programme

- Upgrade 10,000km district roads to engineered earth standard.
- Requirement for effective maintenance system.

AFCAP Support

- Study tour to maintenance camps in Mozambique.
- Input from Zimbabwe DDF.
- Study tour to Output and Performance Based contracts in Zambia.
- Facilitation of in-house discussions in Malawi Road Authority.

ASANRA Guideline for the Use of Sand in Road Construction



- Sands are the most prevalent material in Kalahari and Namib deserts and along the eastern coast of SADC region.
- Traditional road building materials not available in these areas.
- Technical review of existing research and experience.
- Review of Botswana sand classification system including extensive sampling and testing of sands in the region.
- Preparation of draft guideline.

Output 2: Training to enhance and support local capacity building

- Training national contractors in Mozambique, Tanzania and Ethiopia
- Training component of consultative workshops for Ethiopia LVR design manual and specifications.
- Production of training materials for surface treatments in Ethiopia.

Output 3: Knowledge sharing to build national research capacity and increase options available to practitioners

- Workshops
- Seminars
- Study tours
- University participation



Summary

- AFCAP is active in Mozambique, Ethiopia, Malawi, Tanzania and Kenya but dissemination of AFCAP outputs will reach many other countries in Africa
- AFCAP support is expected to bring significant benefits to participating countries
- AFCAP outputs comprise:
 - Verification and mainstreaming of best practice on provision of rural road
 - Training to enhance capacity building
 - Knowledge sharing to build national research capacity and increase options available to practitioners.



The Africa Community Access Programme (AFCAP)

The End

Technical Audit of OPRC Contracts
funded by the EU under Sector
Budget Support

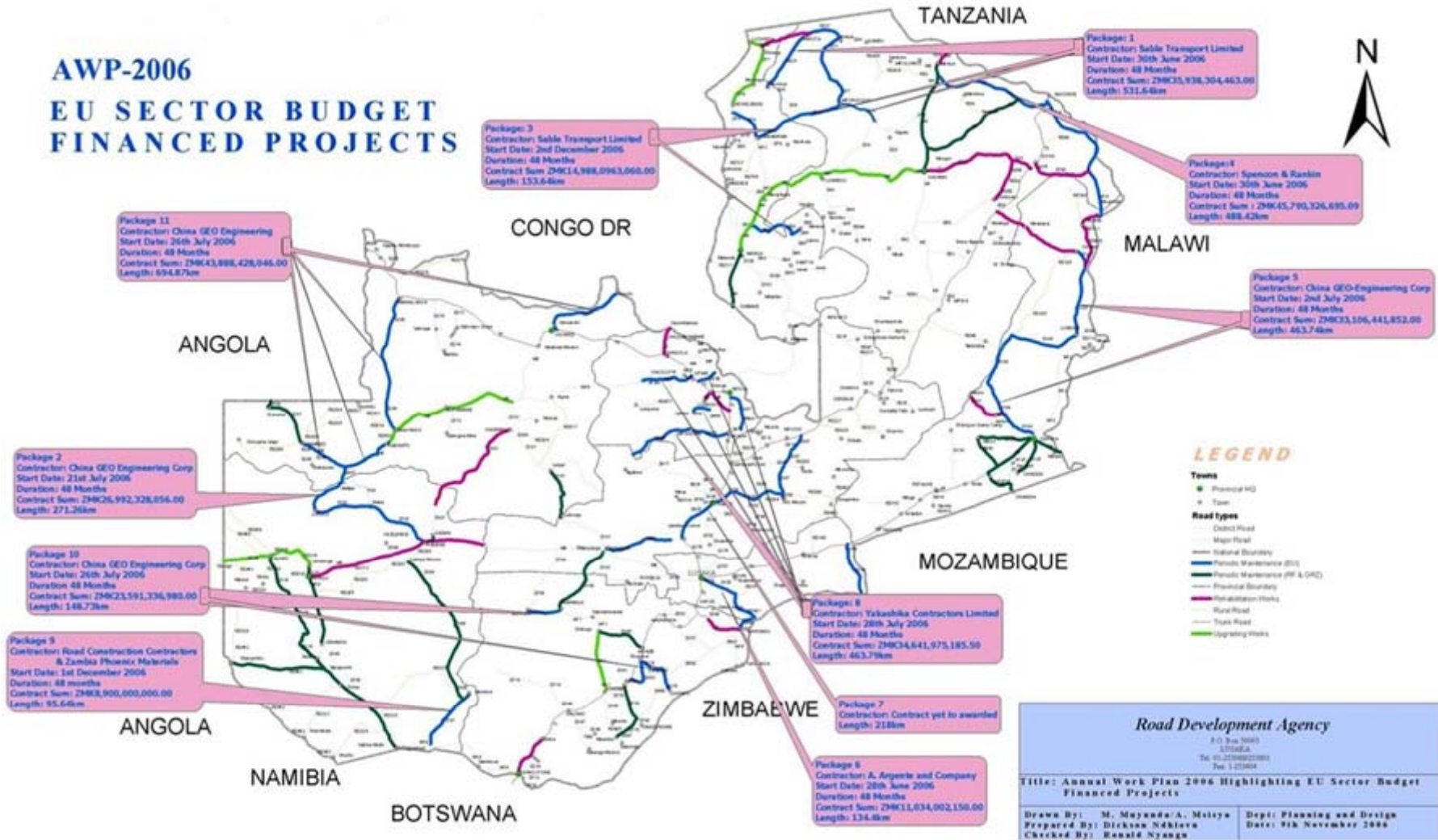
Preliminary Findings

RN Geddes

29 June 2007

(Revised November 2009)

AWP-2006 EU SECTOR BUDGET FINANCED PROJECTS



Quality of Work

- All of the roads were in very bad condition
- Some necessary works are not done due to no provision in the Contract
- Concerns about gravel quality
- Very slow progress on some packages – normally linked to amount allowed for rehabilitation and length of road
- Quality of work is generally acceptable – level of service criteria are largely being achieved
- Contractors seem to understand the OPRC concept and are trying to optimising their inputs yet still achieve the required level of service .











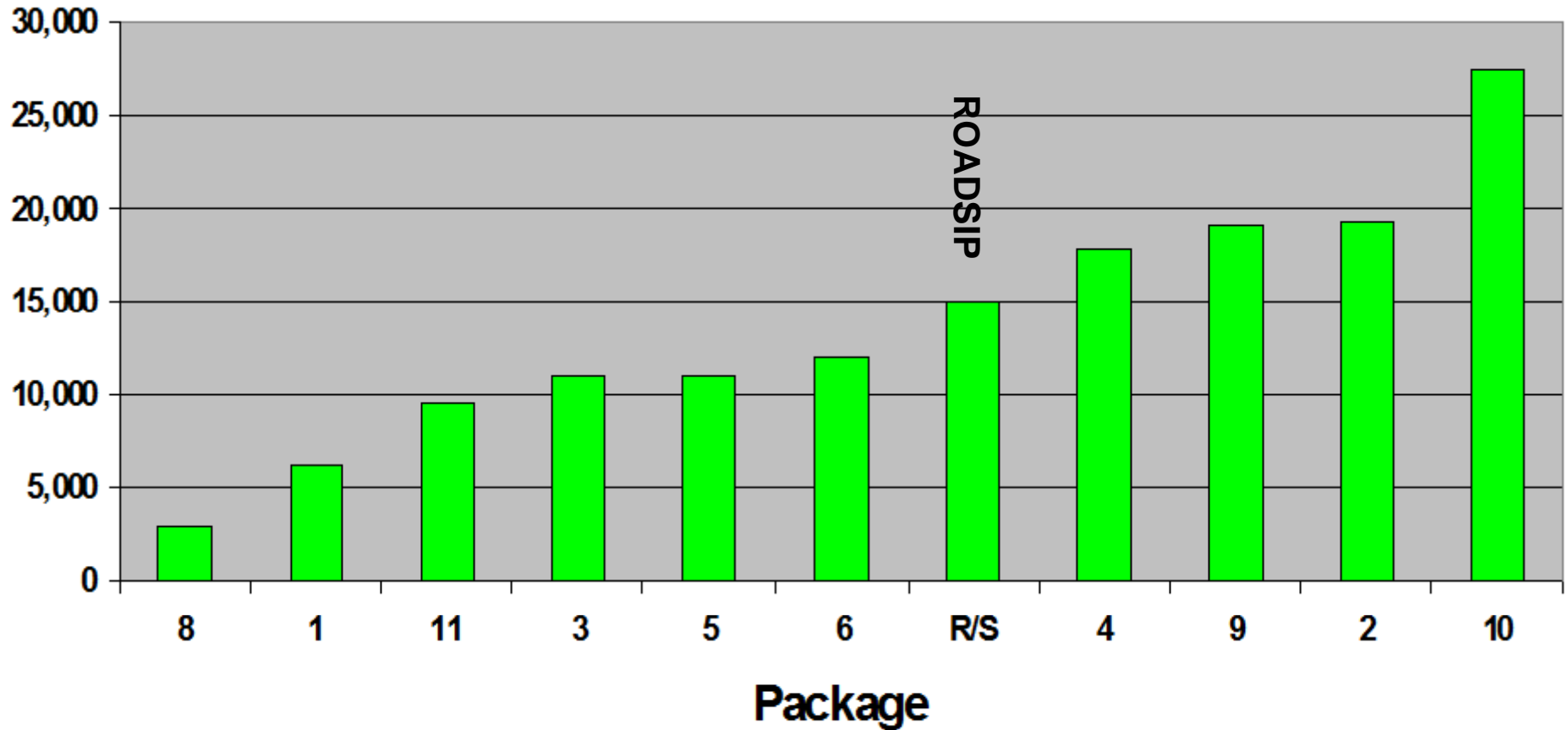
Recommendations on Quality

- If OPRC contracts include significant rehabilitation, this should be designed by the Client and full BoQs included in the tender
- Otherwise undertake rehabilitation through a conventional contract
- In either case undertake detailed designs and materials investigations before launching the contract.

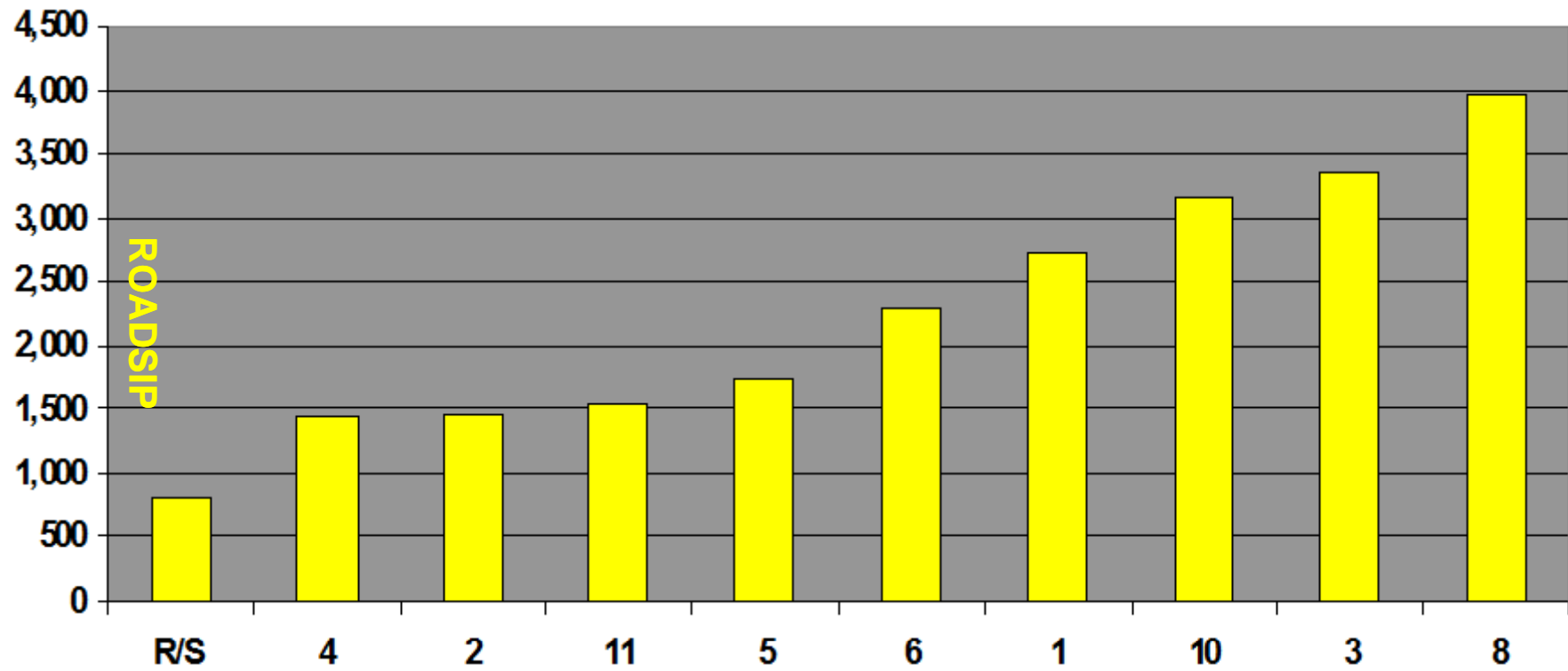
Value for Money

- Large variation in contract values:
 - Rehabilitation varies from \$3,000/km to 27,400/km.

Cost/km Rehabilitation (\$)



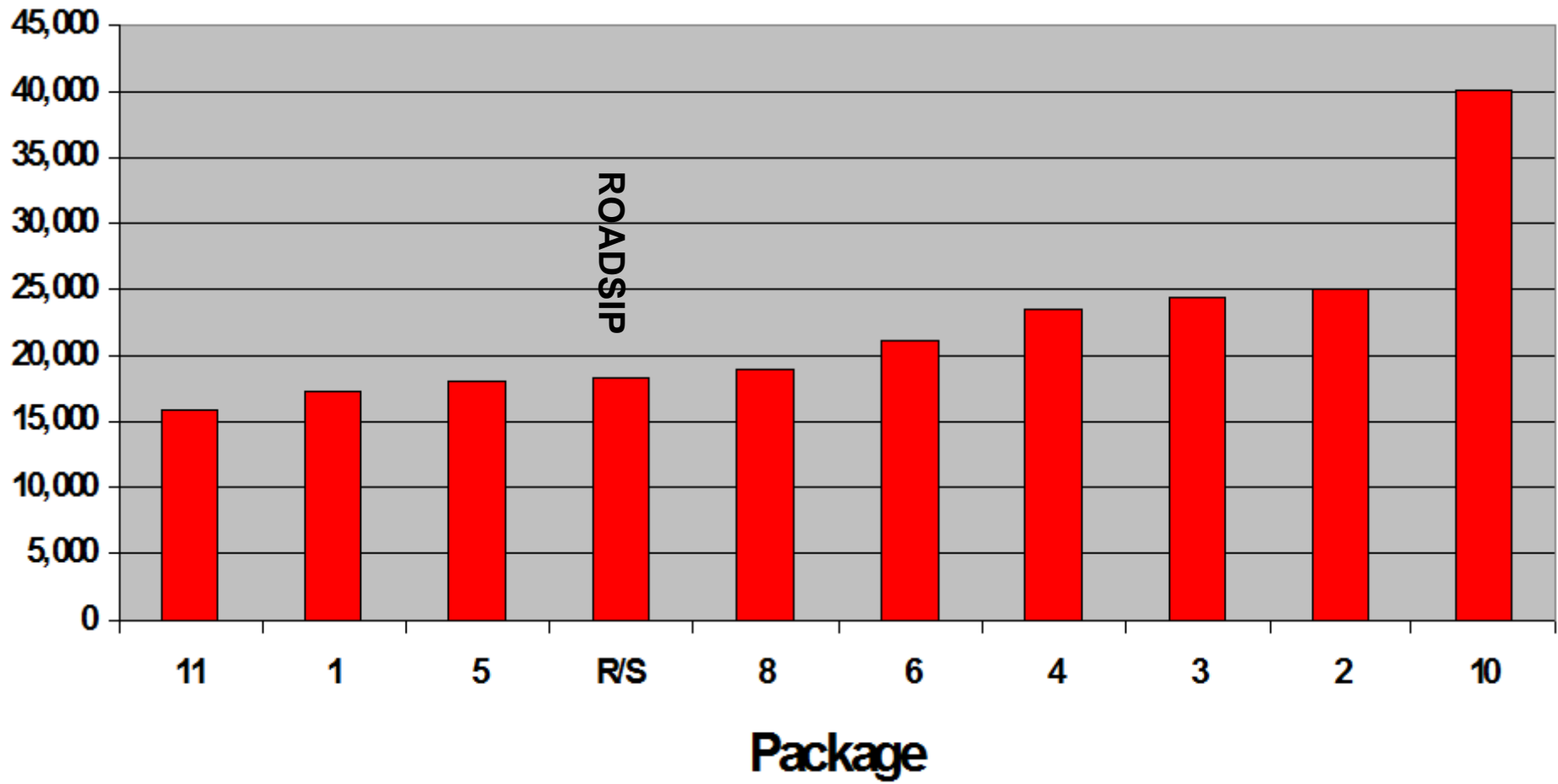
Cost/km/yr maintenance (\$)



Package

Average = \$2400/km/year

Cost per km total (\$)



Sustainability

- If maintenance cost is \$2,400/km/year, total cost to Road Fund to maintain all District Roads is \$33 million.
- How could costs be reduced?
 - Reduce contractor's risk in pricing rehabilitation (better project preparation)
 - Reduce geographical spread of roads
 - Introduce alternative maintenance technologies
 - Sub-contracting to local firms
 - Reduce reliance on gravel roads.



Verification Process

- Assessment of level of service is subjective and depends on cooperation between contractor and consultant.

Recommendations for Verification Process

- Streamline compliance criteria - introduce Bump Integrators?
- Decide whether the road should have a standard cross-section
- Decide whether some minimum thickness of gravel is required
- Specify more common type of vehicle for verification testing (not Toyota Landcruiser)
- Provide training to contractors and consultants on verification process to ensure common understanding.

Technical Audit of OPRC Contracts
funded by the EU under Sector
Budget Support

Preliminary Findings

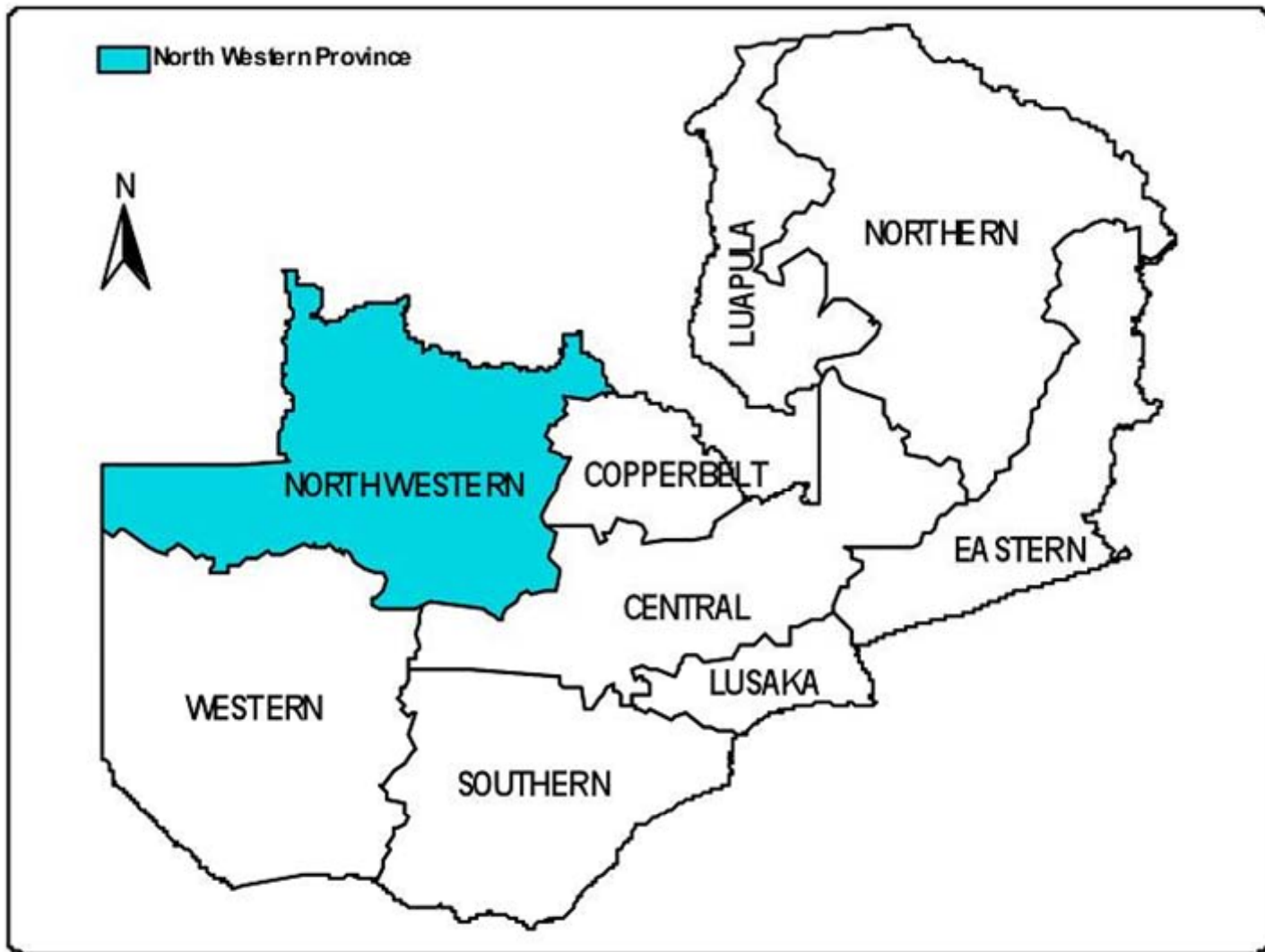
END

OPRC ZAMBIA/MALAWI STUDY TOUR

Workshop 5th
November 2009 at
Chrismar Hotel

OPRC – ‘1ST GENERATION’

- 11 Contracts (5 year)
- All Provinces
- 8 Contracts still running (to 2010)



OPRC 1ST GENERATION - WEAKNESSES

- Lack of familiarity with new concept
- Poor design
- Lack of supervision initially
- Less emphasis on maintenance
- Audit review – lessons learnt

OPRC 1ST GENERATION - STRENGTHS

- Steady employment
- Low administration
- High Impact

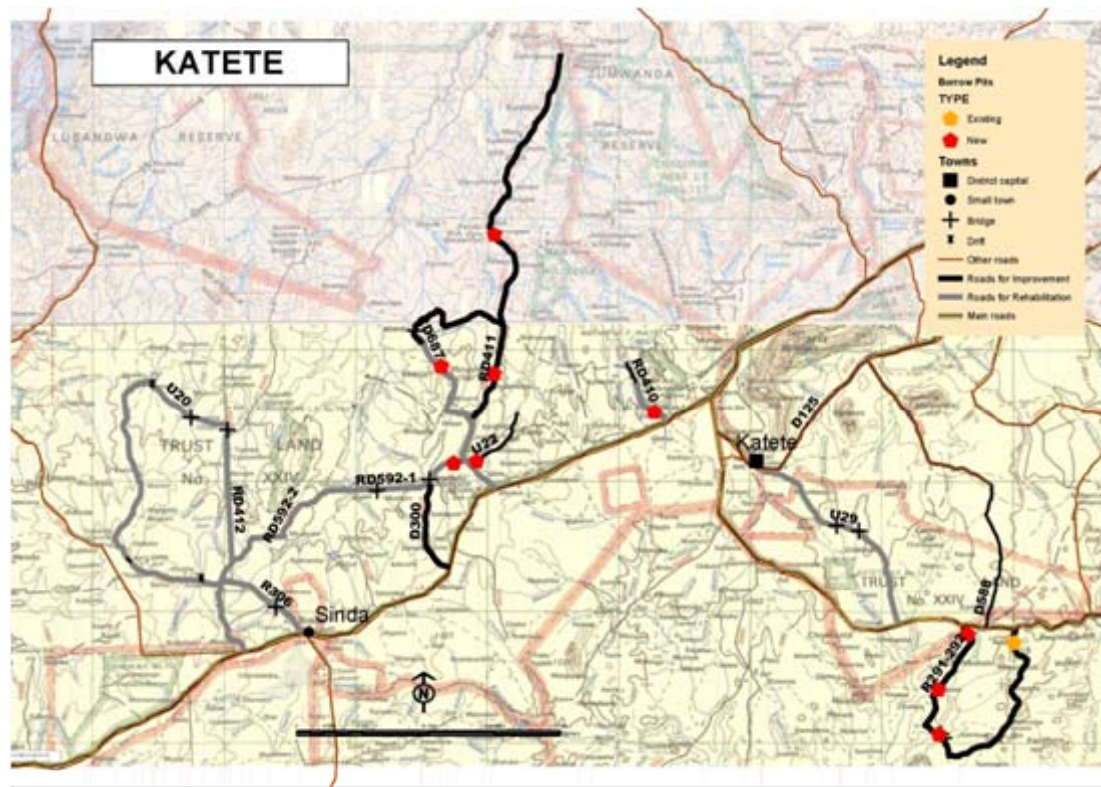
OPRC - IMPACT MONITORING



OPRC 2ND GENERATION

- Agricultural Development Support Programme
- 4 Contracts
 - Katete/Chipata
 - Lundazi
 - Chongwe
 - Choma

OPRC – CHIPATA/KATETE



OPRC – CHIPATA/KATETE

- 2 Components
 - Conventional Rehabilitation 92km
 - Maintenance (Performance Based) 389km
- Cost US\$10 million
- Start Date March 2009
- Completion Date March 2014
- Contractor Jiangxi Huachang

OPRC – CHIPATA/KATETE



OPRC – CHIPATA/KATETE



OPRC 2ND GENERATION - WEAKNESSES

- Complicated Document
- Lack of Familiarity
- Favouring local contractors?
- Sustainability?

OPRC 2ND GENERATION - STRENGTHS

- Better design
- High impact expected

OPRC

**THE JURY'S
OUT!**

ANNEX IV

LIST OF PARTICIPANTS

OPRC MALAWI STUDY TOUR

Field Visit to Katete on 3rd November 2009

LIST OF ATTENDEES

No	Name	Organisation	email
01	Adrian Mthini	Malawi Roads Authority	amthini@nramw.com
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11	Pang Yankum	Jiangxi Huachang	
12	Mr. Tu	Jiangxi Huachang	
13	Rob Geddes	AFCAP	rgeddes@africaonline.co.zw
14	Adilson Vilinga	ASCO (Z) Ltd	adilsonvilinga@gmail.com
15	John Murphy	ASCO (Z) Ltd	asco@zamnet.zm

Workshop at Chrismar Hotel on 5th November 2009

LIST OF ATTENDEES

No	Name	Organisation	email
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11	Hamed Javaheri	Rankin	0977 787924
12	J. Mulenga	Prisco	0977 390119
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24	Pang Yankum	Jiangxi Huachang	
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26	Rob Geddes	AFCAP	rgeddes@africaonline.co.zw
27	Adilson Vilinga	ASCO (Z) Ltd	adilsonvilinga@gmail.com
28	Nancy Chituta	ASCO (Z) Ltd	
29	John Murphy	ASCO (Z) Ltd	asco@zamnet.zm

ANNEX V

PHOTOGRAPHS

OPRC Malawi Study Tour – Visit to Katete on 3rd November 2009
SAMPLE PHOTOGRAPHS



Plate 1 – Contractor's Camp in Katete – making of 900mm diameter culverts in progress



Plate 2 – Contractor's Camp in Katete – storage of 900mm Culverts



Plate 3 – R306 – Road due for maintenance formerly upgraded through ILO intervention



Plate 4 – RD412 – also due for maintenance



Plate 5 – RD592/2 – due for maintenance – narrow carriageway



Plate 6 – RD411 junction – full improvement of 30km stretch of road

OPRC Malawi Study Tour – Visit to Katete on 3rd November 2009
SAMPLE PHOTOGRAPHS



Plate 7 – RD687 – section due for full improvement (bush clearing and formation levelling has taken place



Plate 8 – RD687 – section due for maintenance, some of which is in very poor condition



Plate 9 – Wrap-up Meeting at Mphangwe Hotel, Katete on 3rd November 2009



Plate 10 – Mr Mthine, Malawi Road Authority presenting at workshop



Plate 11 – Mr Geddes, AFCAP, presenting at workshop