



**IMPROVED MAINTENANCE SYSTEMS FOR DISTRICT ROADS IN  
TANZANIA  
AFCAP/TAN/019**

**Final Report**

**February 2013**

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

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## List of Abbreviations and Acronyms

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ADRICS	Annual District Roads Inventory and Condition Survey
AFCAP	Africa Community Access Programme
ATTI	Appropriate Technology Training Institute
CBO	Community Based Organisation
CDO	Community Development Officer
CRB	Contractors Registration Board
D.C.	District Council
DE	District Engineer
DEO	District Engineers Office
DFID	Department for International Development (UK)
DROMAS	District Road Management System
F.Y.	Financial Year
GBP	Great Britain pound
ILO	International Labour Office
ITT	I.T. Transport Limited
LGA	Local Government Authority
LGRICS	Local Government Road Inventory and Condition Survey
M.C.	Municipal Council
ME	Municipal Engineer
Mio.	Million
PMMR	Performance Based Management and Maintenance of Roads
PMO-RALG	Prime Minister's Office – Regional Administration and Local Government
PPRA	Public Procurement Regulatory Authority
RFB	Road Fund Board
SSATP	Sub-Saharan Africa Transport Programme
TANROADS	Tanzania National Roads Agency
TASAF	Tanzania Social Action Fund
TOR	Terms of Reference
TShs	Tanzanian shilling
USD	United States Dollar

### CURRENCY

#### Approximate Currency Equivalents (as of November 2012)

1 USD = 1,588 TShs

1 GBP = 2,524 TShs

## Executive Summary

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- This is the final report of the AFCAP Study into Improved Maintenance Systems for District Roads in Tanzania. The Study was carried out between February 2010 and December 2012.
- The main objectives of the Study were directed towards developing appropriate methods of organising and implementing the maintenance of district roads by gaining a greater understanding of the nature of existing maintenance systems and developing more efficient and effective maintenance operations on district roads in Tanzania.
- The study was carried out in three districts in Dodoma Region - Mpwapwa, Bahi and Dodoma Municipal. It was found that a major limitation of the existing method of district road maintenance was that this was carried out by means of short single contracts rather than longer-term continuous operations. Therefore, the following three alternative contracting systems were tested:
  - i) Area based long-term framework contracts (Bahi and Mpwapwa),
  - ii) Performance based management and maintenance of roads (PMMR) contracts, (Dodoma Municipal), and
  - iii) Community contracts (Mpwapwa).
- Two rounds of framework contracts were tested in Bahi District. The first were carried out between January and October 2011 and the second between February and October 2012. For each round, three area-based framework contracts were awarded covering the whole district. Tendering and procurement delays at the Council level were a feature of the implementation in this district as in the other districts. This is the reason that the contracts commenced relatively late in the financial year<sup>1</sup>. However, the results of the implementation were good and the District Engineer's Office noted the main advantages as:
  - Reduced time and effort in contract preparation due to fewer contracts;
  - Flexibility in directing which activities the contractor should carry out.
- Due to difficulties in obtaining responsive tenders in the first year, only one round of PMMR contracts were carried out by Dodoma Municipal Council. This proved a more complicated and difficult type of contract to explain to district staff and contractors. However, the implementation proceeded well and the Council were interested in continuing with this system in future years.
- The implementation of the small-scale framework contracts in Mpwapwa District were affected by bureaucratic delays and staffing problems. For these reasons, the contracts were only implemented in the second year and for a shorter duration than originally planned. A system of quotations was used with the aim of speeding up the process of procuring contractors. However, this did not noticeably reduce the time taken to award the contracts due to other factors. Nor were any of the contracts awarded to labour-based contractors, as originally expected.

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<sup>1</sup> The financial year commenced on 1<sup>st</sup> July.

- The community contracts for routine maintenance in Mpwapwa Districts were the most successful of the alternative road maintenance systems tested. Four contracts were awarded – one to a Village Government and three to Community Based Organisations (CBOs). The road sections ranged from 4 to 12 kilometres in length. The results on the roads were good and the villagers and district authorities highly satisfied.
- The main conclusions of the Study were:
  - Changes to contract systems could provide more continuous attention to the maintenance of roads than the short duration contracts currently used. This would result in quicker attention to road damage and thereby produce higher service levels for road users.

But also,

- Equal or greater potential gains in efficiency and effectiveness could be brought about by improving the efficiency and reducing the bureaucratic delays in the institutions responsible for implementing district road maintenance contracts, primarily the Councils.
- The main conclusions on each of the alternative systems of maintenance tested were:
  - Framework contracts work well for both small and larger networks of rural roads. Once established these could simplify procurement and contract administration, give flexibility in directing contractors and provide continuous attention to a specified network of roads. Supervision requirements are more onerous than the existing short-term contracts used by districts. This form of contract could apply to a wide range of district road types from higher volume distributors to lower volume feeder roads. However, it could be difficult to apply to roads in very poor or bad condition.
  - Performance - based (PMMR) contracts take more time and effort to introduce than framework contracts and require extensive sensitisation of district staff, local councillors, village leaders and contractors. Once operational and full functioning (see the Road Maintenance Contracting Manual for the prerequisites for this), they have the potential to reduce contract management and site supervision time for the District Engineer's Office. It was concluded that this system is most applicable to higher-trafficked roads that are already in fair to good condition. This is because these roads usually have more uniform standards and it is easier to specify the required service levels.
  - Community Contracts, especially using CBOs, work well and are popular with local people and local government authorities. Some organisation and effort is required to mobilise communities and provide a small amount of technical and administrative training. This requires inputs from the District Engineer's Office and the District Community Development Office. Once operational, this form of contract works well with strong incentives for the CBO to maintain the road to a good standard. It is applicable to all district roads but particularly to the more remote links connecting villages at the extremities of the rural road network where contractors are reluctant to operate. The potential for replication and job creation is considerable as CBOs could feasibly carry out routine maintenance on a large part of the district road network in Tanzania of 58,000 kilometres.

- The conclusions related to district road maintenance in general were:
  - There is no apparent shortage of contractors available to carry out district road maintenance work although their level of skill needs enhancing.
  - An increased level of supervision of district roadworks would be beneficial. Problems with shortages of district staff and transport could be overcome by engaging consultants or contracting qualified individuals for site supervision.
  - Improvements in communications between the District Engineers' Offices and other stakeholders would reduce the risk of misunderstandings and conflicts. This could be by setting up district road committees, organising regular periodic briefings, etc.
  - The increased use of labour-based contractors for district road maintenance and improvements requires pro-active measures to reduce or remove existing barriers to their involvement.
  - The timing of the preparation, tendering and award of maintenance and spot improvement works needs to be re-organised so that the works are carried out during the optimum construction season.
  
- The recommended issues for further research and follow-up include:
  - Study of how community contracts can be taken to full-scale including how the roll-out should be undertaken. This could involve piloting the full roll-out in one or more districts.
  - Further testing and refinement of the use of framework and PMMR contracts for district roads.
  - A short but detailed study into the contract procurement process at district level in order to establish how to make the system more efficient and more transparent.
  - A study into why labour-based contracting is not taking off in Sub-Saharan Africa and why previous studies<sup>2</sup> on this have not had the desired effect. The study should be centred on the trained labour-based contractors themselves in order to establish why trained labour-based contractors do not win work after the external support to a programme ends. This could be carried out in Tanzania and/or other Sub-Saharan countries.
  - Further testing and development of the method of monitoring changes in road condition based on average travel speed using a GPS.
  - Further dissemination of alternative methods of road maintenance based on the Maintenance Operations Manual.

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<sup>2</sup> For example, Stock and de Veen (1996). Expanding Labor-based Methods for Road Works in Africa. SSATP Working Paper No 22.

## 1.0 INTRODUCTION

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### 1.1 Background

This report describes the Africa Community Access Programme (AFCAP) Study into Improved Maintenance Systems for District Roads in Tanzania. The Study was carried out in the period February 2010 to November 2012. Support from AFCAP for the Study had been requested by Tanzania's Prime Minister's Office – Regional Administration and Local Government (PMO-RALG). This is the body that provides support and coordination to the over 132 semi-autonomous, Local Councils in Tanzania.

There had been a substantial increase in funding for road maintenance in the Councils through the national Road Fund<sup>3</sup>. PMO-RALG was concerned to ensure that this funding was spent as efficiently as possible for the preservation of the rural road networks under the responsibility of the Councils. These were the tertiary level roads providing links within Council areas. Higher levels of the network, regional and national roads, were under the responsibility of the Tanzania National Roads Agency (TANROADS) and were not part of the Study.

According to the Terms of Reference (TOR), the overall objective of the Study was:

- “to understand the nature of existing maintenance systems and
- to develop more efficient and effective maintenance operations on district roads in Tanzania”.

Furthermore, the TOR stated: “The research project will increase understanding of constraints at the district level to organising effective road maintenance. The project will inform PMO-RALG and the districts on appropriate methods of organising and implementing maintenance of district roads.”

And,

“Different methods of organising road maintenance will be established under the research project in pilot districts in order to test the efficiency and effectiveness of a variety of approaches over a two year period.” Annex 1 contains the full Terms of Reference.

### 1.2 Study Team

The Study Team comprised three consultants:

Project Manager/Road Maintenance Expert: Gary Taylor (ITT)

Field Engineer/Trainer: Abdul Awadh (ITT)

Social Development/Institutional Behaviour Specialist: Elizabeth Temu (Ambicon)

PMO-RALG and the District Engineers' staff in the pilot districts also played a major role in the implementation of the study, as described in Chapter 3.

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<sup>3</sup> In the late 1990s and before the introduction of Road Fund allocations to Councils, the typical amount received by rural councils for road maintenance was about USD 20,000. In 2011, this typical amount was around USD 600,000.

### **1.3 Layout of the Report**

This report is organised in six chapters:

Chapter 2 describes the initial stages of the Study when the three pilot districts were identified, the detailed design of the Study was agreed and a baseline and institutional assessments carried out in the pilot districts.

Chapter 3 describes the implementation of the maintenance works including the identification of roads for maintenance, preparation of tender documents, procurement of contractors and implementation of the contracts.

Chapter 4 describes the main findings.

Chapter 5 gives the conclusions and recommendations of the Study

Chapter 6 gives suggestions for further research in Tanzania and elsewhere in sub-Saharan Africa to build on the findings of the present Study. It also recommends some follow-up activities related to the Study.

## 2.0 STUDY DESIGN STAGE

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### 2.1 Selection of Districts

At the time of commencement of the Study, PMO-RALG had shortlisted seven Councils as potential pilot districts. This was based on the Councils' expressed keenness to participate in the Study and by logistical considerations. Six of the districts were in Dodoma Region and one in Coast Region. The Consultants were tasked with recommending three of these Councils for inclusion in the Study.

In mid-February 2010, the Study Team held an initial meeting with representatives of the potential pilot districts in Dodoma. During this meeting the aims of the Study were explained, the overall methodology described and questions from the district representatives answered. The Study Team together with PMO-RALG staff then visited all seven Councils. The team collected basic information on each district, its road network, road funding and the capacity of the district engineers' offices and local contractors. An initial reconnaissance report was produced in early March 2010 giving recommendations on the selection of the three pilot districts. Annex 2 contains the Reconnaissance Report.

In making their recommendations on the selection of pilot districts, the Study Team used these three criteria:

- Adequate capacity – the study depended on significant involvement of district staff;
- Logistics – there was a need to consider good access and reasonable proximity of the districts to each other;
- Geographical variation – the pilot study needed to provide some variation in environments either within or between districts.

The selected districts were Bahi District Council, Mpwapwa District Council and Dodoma Municipal Council – all in Dodoma Region. This choice was confirmed by PMO-RALG and AFCAP on 9<sup>th</sup> March 2010.

The three selected pilot districts provided a mixture of urban, peri-urban, small township and rural environments. They also contained a mixture of flat, rolling and hilly terrain. Because all the districts were from the same Region, the peoples and climate were similar. However, there was a mixture of pastoralist and farming areas. The total length of the designated council road networks was 1,811 kilometres. This included 119 kilometres of urban roads. Only 24 kilometres were paved. The remainder were gravel or earth surfaced.

### 2.2 Inception Phase

An Inception Report<sup>4</sup> was produced in April 2010. This included comments on the Study TOR and a literature review of rural road maintenance describing the evolution of approaches to road maintenance in sub-Saharan Africa. It also included a review of existing maintenance activities for tertiary roads in Tanzania and made some preliminary suggestions for different maintenance options to be tested.

The Study Team observed that one of the identified deficiencies of the existing maintenance practices was that maintenance works contracts were carried out only over a short period of

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<sup>4</sup> See Annex 4 for a list of all reports produced by the Study.

the year –typically 3 months. Because this work was not well coordinated with the rainy season and for the rest of the year no maintenance was carried out, the roads were vulnerable to damage that would not receive attention for a considerable number of months. This indicated that longer term road maintenance contracts should be investigated under the Study.

During the inception phase, the Study Team conducted a workshop in PMO-RALG offices with the District Engineers' staff in Dodoma Region. The main problems with road maintenance as perceived by the participants (see Box 1) were external issues that were largely outside their control.

**Box 1: Main Problems with Road Maintenance as perceived by District Engineer's staff**

- Limited budget
- Political interference
- Lack of motivated staff (low salary; lack of accommodation)
- No community participation
- Labour-based methods not fully used
- Lack of experienced contractors
- Lack of equipment
- Erosion problems
- Lack of gravel material
- Unsteady flow of funds
- Lack of expertise in bridge maintenance

### 2.3 Identification of Options

Although the Inception Report provided suggestions for maintenance options to be tested, the final decision was made in a participatory way during a Design Options Workshop held in Dodoma on 30<sup>th</sup> June 2010. The four selected options to be tested were:

1. **Small contracts for extended periods:** The use of small registered contractors (classes 6 and 7 in the Tanzanian system) and specialist labour-based contractors for maintenance of specific road(s) with extended contract durations of up to one year.
2. **Area based framework contracts:** Bigger contractors covering more than one road (a network of roads) for an extended period of up to one year. Work orders to be used to instruct the contractor on what needs to be done periodically.
3. **Performance based contracts:** Bigger contractors with a contract covering more than one road (a network of roads) for an extended period of up to one year and monthly payments made to the contractor based on maintaining the standard of the network at a specified level.
4. **Community contracts:** Contracts awarded to communities living close to the road maintenance works. In one version (4A) the contract was to be with village governments and in an alternative version (4B) the contract was to be with an existing or specially established community-based organisation (CBO). These

contracts were not to be awarded on competitive basis and pre-established maintenance rates were to be used to pay the communities. The duration for the contracts was also to be up to one year.

Table 2.1 shows how these systems were allocated to the pilot districts.

**Table 2.1: Maintenance Systems Tested in Each District**

Pilot District	Maintenance System(s) to be tested
Mpwapwa District Council	1. Small contracts for extended periods 4. Community contracts
Bahi District Council	2. Area based framework contracts
Dodoma M.C.(to cover the rural network only)	3. Area based performance contracts

A Design Report recorded the decisions made on the Study Design. This report also gave details of implementation arrangements (e.g. packaging of contracts, bar chart work programme, etc.) in each pilot District. The Design Report Annexes contained contract document templates for the options to be tested.

The draft Design Report was issued in July 2010. It was finalised in November 2010 after incorporation of the comments received.

#### 2.4 Baseline and Institutional Studies

In parallel with the preparation of the Design Report, an assessment was carried out of the institutional arrangements and nature of organisational behaviour in road sector institutions in the pilot districts. The Social Development Specialist on the team participated in the visits for the initial selection of the districts. This was followed up by a visit to assess the existing capacities, linkages and internal communications in the selected pilot districts. A more in-depth visit in Mpwapwa district focused on the modalities for involving communities in road maintenance including an assessment of previous community-driven initiatives to improve rural access. At this stage, there were preliminary discussions with the CDOs in the selected districts on the methodology for impact monitoring.

The aim of the assessment was to provide an understanding of how institutional factors contributed positively or negatively to District Road Maintenance systems in order to provide an input towards an improved system of road maintenance (in terms of efficiency and effectiveness). This assessment covered a number of important areas including:

- An analysis of both primary and secondary stakeholders in the districts.  
The findings revealed that the primary stakeholders, e.g. communities (road and transport users) and transport operators, were not directly involved in the processes of road maintenance.
- An assessment of some of the organizational as well as social-cultural aspects including attitudes and perceptions of some of the key stakeholders in road maintenance.

The findings revealed that the existing general perception was that road maintenance was the Government's responsibility; and the politicians always kept

on promising the electorate that the government will maintain roads. This was the reason why there was a lot of political interference in the districts' plans and priorities. There was also a lack of clear communication lines between the District Engineers' office and the politicians as well as other stakeholders. Suspicion and lack of trust prevailed due to limited interaction between the District Engineer's office and stakeholders such as the contractors and the communities. There was a lack of motivation among District staff (engineering department) since they lacked incentives to perform such as job security and decent housing.

- An analysis of community involvement and participation in road maintenance.

This found that communities were not directly involved in district road maintenance. Local Tanzania Social Action Fund experience showed that communities could be involved in road maintenance works where they had a clear benefit. The report recommended the process to be followed in involving the communities in the pilot road maintenance activities (see Box 2).

#### **Box 2: Required Steps to Involve Communities**

- Village Awareness meetings and briefings on the concept of Community Contracting.
- Community Development Officer and the District Engineer's technician to facilitate the Village Communities in undertaking a capacity assessment of CBOs or Village Governments using the following criteria:
  - CBO to be registered with the District Local Government as a legal entity, in order to carry out responsibilities associated with the contract;
  - If a Village Government- The Village to have a Committee of members to be responsible for the execution of project;
  - Have a bank account with signatories in order to receive and make payments;
  - Be fully represented by all the Primary Groups of the community; i.e. Women, Men, Youth ;
  - CBO members (not more than 25) to be vetted by the Village Council (Assembly) meeting;
  - Appointment of a roads committee 3-4 member by the Village Government to monitor road works on a voluntary basis.
- Training of CBO/ Village Govt on contract execution by DE/Technician.
- Training on record keeping by Community Development Officer.
- Signing of contract with District Council.
- Monitoring of the Community contracts by the Technician, the CDOs and the Village Road Committee;
- Executing timely payments by the DE office.

**(N.B.** In the target areas, there were no registered and active CBOs. So the Village Governments facilitated meetings where members including men, women and youth were vetted. During these meetings, the Community Development Officer and the technician were present. The CDO facilitated the vetted members on how to write a constitution for registration with the district.)

The report made several recommendations aimed at improving communication and building “genuine” partnerships to enhance collaboration between district/private sector/communities/civil societies in order to facilitate local ‘ownership’ over processes of road maintenance. This was to encourage the active involvement of stakeholders in the process. In addition to the involvement of communities described above, the following recommendations were made:

- Establishment of clear communication lines between the District Engineers’ office, the local politicians and other stakeholders.
- Setting up of District Roads Committees as a starting point in easing the district-level communication problems.
- Providing for higher stakeholder participation in the design and implementation of road maintenance projects.

In May 2011, the Social Development Specialist worked with the CDOs in all three pilot districts to set-up a baseline for measuring the impact of the road maintenance activities. The key baseline findings were that in all the districts the lack of efficient transport was a major constraint to the marketing of crops and goods as well as to access to essential community services such as schools and health services. Children had to travel long distances to schools. During the rainy season some children did not go to school at all because culverts and bridges were washed away. Travelling long distances on foot or by bicycle to markets, health dispensaries and other services was also expressed as a major constraint to effective time use, particularly by women.

In September 2012, a follow-up was carried out by the Social Development specialist who established the main impacts through focal group discussions and key stakeholders interviews. The main findings are summarised in chapter 4.

The draft Institutional Arrangements and Nature of Organisational Behaviour in Road Sector Institutions Report was issued in July 2010. It was finalised in November 2010 after incorporation of the comments received. The Baseline Survey for Monitoring and Community Mobilization for Community Contracts Report was issued in August 2011.

## 3.0 IMPLEMENTATION STAGE

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### 3.1 Identification, Preparation and Tendering of Contracts

The maintenance contracts to be included in the Study were prepared by the District Councils with support from the Study Consultants. Although the contract documents were specific for the Study, all other procedures for preparing, tendering and awarding of contracts followed normal local government procedures. Similarly, payments for these contracts were made from the local government's road fund account following normal government procedures and regulations.

There were different rates of progress and success in each district. The first year contracts (2010/11) were constrained by the fact that the District Councils had already prepared their Annual Work Programmes and Budgets before the Study Design had been completed. However, it was decided to proceed with the Study contracts in the first year without changing the budgets or, to the extent possible, the selected roads for maintenance. This led to some complications in the implementation of the Study, particularly in Mpwapwa District, as described below.

### 3.2 Implementation of the Study Maintenance Contracts

#### Bahi District Council

In Bahi District, an area-based framework contract approach was used. The district road network was organised into three areas with one maintenance contract for each package<sup>5</sup>. In the first year, a total of 316 kilometres of roads were included in the packages. They ranged in size from 83 to 137 kilometres. The contracts covered primarily routine maintenance, spot improvements and some culverting and drift replacement. The contract periods were 8 months.

In the second year, the same three areas were used for the contract packages. A total of 195 kilometres were covered with routine maintenance, spot improvements and a small amount (6km) of periodic maintenance. The contract periods were 10 months.

Delays in the commencement of works due to procurement and other factors was a major feature of the implementation of the works in this district as in other districts. The first year contracts were prepared in September 2010<sup>6</sup>; the advertising for tenders took place in October 2010; tenders were received and evaluated in November 2010; and the contracts were awarded in December 2010. However, because the rainy season in Dodoma Region starts in December and ends in April, the commencement of two of the three packages was then delayed until April 2011. Problems with release of the budget to the districts such that a significant portion of the annual funds for roads had not been released by May 2011<sup>7</sup>, further delayed the progress of the works.

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<sup>5</sup> See Map in Annex 3A.

<sup>6</sup> The Tanzanian financial year commences on 1<sup>st</sup> July. The last month of the financial year is June. Usually, all payments cease by mid June to allow closing of the annual accounts.

<sup>7</sup> There had been an error in drawing up the Annual Budgets for LGA roads resulting in a mismatch between different budget lines. This took time to sort out. Approval to the necessary budget changes permitting release of the road funds to the Councils was only received from the Ministry of Finance close to the end of the financial year.

In the second year, despite the fact that there was more time for planning of the works, the implementation programme was no earlier. Tenders were received on 21st November 2011 and evaluated by 5<sup>th</sup> December 2011. The District Tender Board met on 30<sup>th</sup> December 2011 and awarded the three contracts, which were signed on 13th January 2012. Works commenced soon after contract signing. The dates of commencement and completion of the works are included in the details in Table 3.1 below.

**Table 3.1: Contract Implementation Details – Bahi District**

	Northern Package	Central Package	Southern Package
<b>Year 1 (2010-11)</b>			
Length (km)	137.2	55.9	93.7
Commencement of works	Jun 2011	Jan 2011	Apr 2011
Completion of works	Oct 2011	Oct 2011	Oct 2011
No of work orders	1	3	2
Total cost (Tsh)	216,425,600	239,183,300	151,625,100
<b>Year 2 (2011-12)</b>			
Length (km)	83.3	48.4	60.9
Commencement of works	Feb 2012	Feb 2012	Feb 2012
Completion of works	Sep 2012	Oct 2012	Oct 2012
No of work orders	2	2	2
Total Cost (Tsh)	163,064,000	186,407,100	199,452,158

From Table 3.1, it can be seen that the completion of the contracts occurred in September or October for both years irrespective of the commencement or size of the contract. This is 3-4 months after the end of the financial year for which the works had been planned. The main explanations for this appear to be (a) delays in procurement and (b) the occurrence of the rainy season, which disrupts works up to the end of April each year. The months of June to September are the cooler season when the weather is dry but the soils are still moist from the preceding rains. This is the optimum season for most road construction activities and the period of the highest rates of progress on roadworks.

The implementation of the works in the framework contracts was directed by work orders issued to the contractor periodically by the District Engineer's office. These specified the type and amount of work to be carried out in the forthcoming period based on the items in the contract Bills of Quantities. The intention was that this would give flexibility to the District Engineer to select the most appropriate works to be carried out given the actual road condition and the season of the year. This was only partly successful in practice because the frequency of issuing work orders was low. Table 3.1 shows that the number of work orders per contract was a maximum of three. In one case, only one work order was issued making the contract little different from a normal non-framework contract.

Supervision of the works by the District Engineer's staff was a challenge due to a shortage of transport and of personnel. Typically, one of the District Engineer's technicians was posted to site to supervise the works. However, the works within one contract were widely scattered across the network. This made it difficult for the technicians to closely supervise all the works because activities in different locations were often carried out simultaneously.

The District Engineer did not have time to visit the sites frequently and this lack of high level supervision contributed to an overall lack of tight quality control. The observed quality of the works was variable although, eventually, it was generally satisfactory. It was noted that the District Engineer's staff sometimes appeared reluctant to refuse to accept low-quality work by the contractors.

On completion of the second and final round of Study contracts, the Bahi District Engineer's staff had proposed continuing the system for a further year but making slightly smaller framework contract areas to involve more contractors. However, this was vetoed by the Council. The reason given was that one of the second-year framework contracts was still not completed by November 2012. This was because the contractor's Managing Director had fallen ill and travelled to India for treatment. Consequently, all maintenance activities had halted as there was no one able to take decisions on his behalf. The Council members were frustrated by being committed to a form of contract that they perceived to be inflexible and difficult to terminate.

### Dodoma Municipal Council

Dodoma Municipal Council was significantly different to the other two pilot districts because it contained a significant urban road network, as shown by Table 3.2 below. This urban network was growing steadily as part of the ongoing Capital City Development Programme. However, the AFCAP Study focused on the rural road network of district and feeder roads that encircled the urban area of Dodoma City and comprised over 75% of the Council's total road network length.

**Table 3.2: Dodoma M.C. Road Network**

Type	Length km	Pro- portion
Urban	119	23%
District	227	43%
Feeder	178	34%
Total	524	100%

Another important difference of the Dodoma M.C. compared to the other Study districts was the larger number of engineers, four compared to two and one in Bahi and Mpwapwa respectively. The Road Fund allocation to Dodoma M.C. was also significantly higher than for Bahi and Mpwapwa. A full comparison is given in Annex 2 of this report.

The system of road maintenance contract tested in Dodoma M.C. was Performance-based Management and Maintenance of Roads (PMMR). This was a more complicated system than the others to be tested and less familiar to Council Engineers. Therefore, it was decided that this was best tested in the Council with relatively better resources and technical skills. Moreover, it was decided to only test this on one part of the Council's rural road network<sup>8</sup>.

Identification of the rural roads to be included in the first year of the Study proceeded fairly smoothly. A network of 12 roads totalling 139 kilometres in length were selected in the area around Hombolo, to the north-east of Dodoma city. The condition of these roads varied across the whole range from "good" to "bad". The planned duration of the contract was nine months (December 2010 to August 2011). The planned contract included an initial

<sup>8</sup> See Map in Annex 3C.

three-month period of culvert, bridge and spot improvements to bring all the roads to a maintainable condition followed by routine maintenance. The regular routine maintenance was to be paid at a flat monthly rate dependant on achieving a specified level of condition on all the roads.

Because of the innovative nature of this approach for district roads in Tanzania, there were extensive discussions between the Study Team's Field Engineer and the Council staff during the planning and preparation of the contract. TANROADS was also consulted regarding its ongoing experience of the use of PMMR contracts. All interested local contractors were invited to a pre-bid meeting during which the system was described in detail and questions were answered. Five contractors attended the pre-bid meeting held in mid November 2010. By the tender deadline of the end of November, only two bids were received. One of the bids was found to be non-responsive due to missing documents and the other had unrealistically high monthly rates for the routine maintenance activity.

After consultations with PMO-RALG, it was decided to proceed with the improvement works part only of the planned contract. Consequently, the PMMR trial was postponed until the second year of the Study after further sensitisation of contractors and Council staff.

For the second year of the study, a new set of roads was selected. This comprised five roads totalling 60 kilometres in length. A sensitisation seminar was held in July 2011 attended by 14 staff from contractors and three from the Council Engineer's office. Many questions were asked during the seminar and the indication was that contractors were becoming more familiar and interested in the PMMR concept.

Five contractors purchased the tender documents and four bids were received by the deadline of 20<sup>th</sup> September 2011. Evaluation of the bids was completed in early November 2011 and a 10-month contract was signed and commenced on 29<sup>th</sup> November 2011.

The problems encountered during implementation were (a) further bottlenecks were identified during construction that needed attention (these were included in the following year's programme); and (b) there was a low understanding of maintenance by contractor's personnel, especially during the initial stages of the contract. These were relatively minor issues and the works were completed satisfactorily by September 2012. Already by June 2012, all roads were accessible, the drainage systems were clear and a comfortable average travel speed of 40 kilometres per hour was achievable – indicating that the key service levels were being met.

The Dodoma M.C. considered the results good and planned a similar long term performance based contract in financial year 2012/13.

### **Mpwapwa District Council**

Two types of maintenance contract were tested in Mpwapwa District:

- 'Small contracts for extended periods (framework contracts)' on some of the important district roads and;
- 'Community contracts' on selected feeder roads.

Compared to the other two Study Councils, Mpwapwa was more typical of a rural council in Tanzania. It was two hour's drive from the District Headquarters of Mpwapwa to the regional centre of Dodoma and more than one hour's drive to a national paved road. In

addition, many parts of the district road network were several hours' drive from the District Headquarters.

The maintenance systems to be tested were more similar to existing Council procedures, i.e. using small local contractors and using communities, compared to those in the other Study councils. This was expected to lead to more straightforward implementation. However, this proved not to be the case. Implementation revealed institutional problems in the district council including bureaucratic delays, poor internal communication and weaknesses in management. These overshadowed the implementation of the Study and led to abandonment of the first year programme. Fortunately, implementation proceeded more smoothly in the second year although not without some disruption and delays, as described below.

Overall, implementation in this district did reveal some of the difficulties in implementing roadworks at the district level and contributed significantly to the TOR objective of gaining a greater "understanding of constraints at the district level to organising effective road maintenance".

#### Small Framework contracts

During the first year of the Study (FY 2010/11), five packages of roads totalling 432 kilometres in length were identified for small scale framework contracts. The plan was to procure several medium to small contractors through quotations and competitive bidding involving the registered contractors of the lowest classes 6 and 7, as well as specialist labour-based contractors. There were recently trained labour-based contractors based in Dodoma Region and PMO-RALG was keen for these to obtain more experience. The 'work scheduling' approach<sup>9</sup> was to be used and the contracts were to be for periods of between six and nine months.

Preparations of the contracts proceeded fairly smoothly and by October 2010, 75% of the roads had been surveyed. However, from October onwards progress halted and, in mid November 2010, the District Engineer was suspended from work for reasons unconnected with the AFCAP Study. This caused serious disruption to the Study implementation. For FY2010/11, the district authorities decided unilaterally to abandon the Study plans and implemented road maintenance works using conventional contracts as in previous years. The suspension of the District Engineer lasted for over a year. He was then reinstated but, sadly, died shortly afterwards. Therefore, for the majority of the AFCAP Study period Mpwapwa District was without a District Engineer. This situation was exacerbated by one of the senior technicians departing for long term training.

After discussions between PMO-RALG and the Mpwapwa District Authorities in February 2011, it was re-confirmed that the AFCAP Study should continue in the District. Accordingly, in the second year of the Study (FY 2011/12), a more modest programme of small scale contracts was prepared. This was initially in four packages with a total length of 249 kilometres but later reduced by the Council to two packages with a total length of 110 kilometres.

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<sup>9</sup> This is the use of periodic work orders by the DEO to direct the maintenance activities to carry out within the framework of the overall Bills of Quantities.

The scale of the works was such that the estimated cost of each package fell within the level at which contractors could be procured by a minimum of three quotations<sup>10</sup> instead of by competitive bidding and this was the procurement system used. It was expected that this would simplify the procurement procedure and reduce the time required to procure contractors. However, there were further delays due to the changes in the District's Annual Workplan and staff shortages in the District Engineer's office. Consequently, the preparation of the Bills of Quantities and call for quotations, initially planned for July/August 2011, eventually took place in January 2012. After further delays in the bid evaluation process, the District Tender Board approved the award of the contracts in late March 2012 and two six-month contracts were signed on the 20<sup>th</sup> April 2012.

Representatives of eight contractors attended the pre-bid meeting. Five quotations were received by the deadline of 9<sup>th</sup> February 2012. The two successful bids were both similar in total (Tsh 96 million and Tsh 97 million) and just within the quotation limit of Tsh 100 million. These contracts were successfully concluded on 20<sup>th</sup> October 2012.

No significant delays were experienced in execution of the works ordered under the two work orders issued in May and July. Although it took a while for the District Engineers' technical staff to understand the concept, they managed to administer the contracts. A visual inspection of some of the roads in November 2012 noted significant improvement in the passability due to the spot improvement and routine maintenance works carried out.

### Community contracts

Despite a series of setbacks, the community contracts proved one of the most successful of the maintenance system trials. Eventually, in the second year of the Study, four community contracts for routine maintenance of a total of 38.3 kilometres of road were carried out, three by Community-Based Organisations (CBOs) and one by a Village Government. Details of these are given in Table 3.3 below.

**Table 3.3: List of Community Contracts**

s/n	Road name	Length km	Contract amount Tsh million	Contract with:
1	Makutupa - Bumira	4.3	2.1	CBO
2	Pwaga - Kitati	10.0	4.7	CBO
3	Lumuma - Kizi	12.0	10.5	Village Government
4	Kizi - Mbuga	12.0	10.5	CBO

The planned community contracts for the first year of the Study did not take off partly due to the problems in Mpwapwa District described above and partly due to a lack of clarity over the legality of community contractors working on public roads. On this latter point, the 'Contractor Registration Board Act No. 17 of 1997' required all firms that were awarded public funded contracts to be registered with the Board. However, the registration process was geared towards established contractors and not CBOs. Despite this regulation, CBOs

<sup>10</sup> The maximum level for procurement by quotation was TSH 100 million (approximately USD 60,000)

had regularly carried out works at district level on public buildings and other public schemes without any legal challenge. Moreover, under the Tanzania Social Action Fund, community groups were frequently carrying out works on local roads. This issue was not fully resolved during the Study Period but there was eventually an agreement that the AFCAP trial on community contracts should go ahead.

The process of identifying suitable community contracts and mobilising the communities for the second year programme commenced in the period April to June 2011. This included holding sensitisation seminars for the relevant communities. CBOs were formed in four villages and registered with the District Authorities to undertake road maintenance works, although later one road was dropped and only three CBOs were awarded contracts. Each CBO opened a bank account for the road maintenance works. The District Community Development Office staff was fully involved with this process. The main activities they carried out were:

- initial assessment of the communities willingness to participate;
- assessment of the communities capacity to participate and identification of any capacity building needs;
- assistance in setting up new Community Based Organisations, including registering at the district headquarters setting up bank accounts and organisational procedures;
- monitoring of the operations and performance of the community organisation.

The community contract works were for routine maintenance on roads that were already at least in fair condition. A simplified contract document was drawn up in Swahili (see the Maintenance Operations Manual) for signing between the community organisations and the District Executive Director.

A delay occurred between July 2011 and March 2012 in the procurement of hand tools for the community groups. The agreement was that the District Authorities would procure the required hand tools for the groups and deduct the cost from their contract payments. The total cost of each set of hand tools was about Tsh 385,000 (approximately USD 240). Firstly, the District Authorities had to wait for the new allocation of Road Fund monies for the 2011/12 financial year. Then, the process of procuring the hand tools commenced in December 2011. This was only completed and the hand tools delivered by 26<sup>th</sup> March 2012.

Awarding of the community contracts, handing over of the hand tools and the initial training of the community groups took place in early April 2012. Due to the delay in awarding the contracts, the duration was reduced from the originally planned 10 months to 6 months.

The training of the community groups in April 2012 comprised a short (less than one-day) field training. However, this proved inadequate and the training was repeated in May 2012 over a period of two days - one day orientation and theory and the second day practical on the road. The training focused on the simple operations concerned with routine road maintenance for unpaved roads including vegetation control, clearing the drainage system and how to repair the road surface.

After the training in May 2012, the implementation went smoothly. The main problem encountered was a delay in payments to the community groups by the District Council. This was due to technical problems with the Council's new accounting system. The only other

problem mentioned by the community groups was the poor quality of some of the hand tools.

By the end of the contract periods in late October 2012, all community routine maintenance contracts had been well-executed. The maintained road sections were in good to very good condition. As a result, traffic on these roads had increased as had the frequency of public transport. Indications by the District Council that they might continue such contracts in the future were met with high enthusiasm by the existing groups and many more local people were requesting the chance to participate in similar routine maintenance CBOs.

## 4 FINDINGS

The main findings of the Study are divided into general findings related to the maintenance of district roads in Tanzania and specific findings related to the different systems of maintenance contracts that were tested.

### 4.1 General Findings

The general findings relate to all systems of maintenance tested and, in some cases, to the way that maintenance was conventionally organised by local councils in Tanzania. They address the first TOR objective of understanding “the nature of existing maintenance systems”. But also they have important lessons for the second TOR objective of developing “more efficient and effective maintenance operations on district roads in Tanzania”.

#### Zonal Seminars

During the four Zonal Dissemination seminars held with all regions and districts in December 2012, various general issues were raised by the participants that related to the use of the alternative systems of maintenance contracts tested. These are listed in Box 3 below.

#### **Box 3: General issues raised by Participants to the Zonal Dissemination Seminars held in December 2012.**

- Other council stakeholders including councillors and the Council Management Team not conversant with the systems and they could object using them,
- Not sure if Road Fund Board (RFB) will have no objection to use these systems,
- The unstable flow of funds from RFB could result in delayed payments and eventual claims for interests,
- As the systems require more visits to sites by the supervising staff, the current levels of staff, supervision vehicles and supervision funds will not suffice,
- Contractors not knowing the systems and may fail to deliver,
- Lack/shortage of capable contractors to undertake long term contracts,
- RFB requirement of LGAs spending more than 85% of the allocated budget by end of June discourages use of long term contracts. In many cases contracts are awarded after October.
- Maintenance systems could be better set for carrying out by labour-based contractors.
- Training to all stakeholders (not only District Engineers’ staff) should be emphasised.
- Initial improvement works are required for the PMMR system for those roads that are in poor condition.
- The construction cost per kilometre was an issue discussed.
- Concern was raised about the possibility of reduced monthly payments for non-compliant work on a PMMR contract leading to unspent funds at the end of the financial year.

Some of the comments raised by the stakeholders can be resolved such as objections to the use of these systems by different organisations or groups. Points such as the need for more supervision resources are a recurring issue even under the current systems. Some of the issues are discussed further below. In the Study Team’s opinion, there were no issues raised that were impossible to solve.

#### Road Condition

An important finding was that, despite various shortcomings of road maintenance that are discussed below, the overall condition of district roads improved in Bahi and Dodoma Council areas. The

largest improvement was in Bahi District where there was the Study's largest maintenance intervention as it covered the whole network over a period of two years. The road condition in Mpwapwa District declined slightly. This is where there were difficulties due to the lack of a District Engineer and the AFCAP Study intervention was the least. The Study Team made regular visits to the district roads in the three pilot districts in the period from February 2010 to November 2012. There was a noticeable improvement in the overall condition of the road networks where the AFCAP study operated. Therefore, the findings below focus on the issue of whether the same investment in these road networks could have brought even greater improvements to the road networks.

The only regular reported measurement of the change in the district road network condition is the Annual District Roads Inventory and Condition Survey. The reported data for the three pilot districts is given below.

**Table 4.1: Road Network Condition**

District	Good	Fair	Poor
Bahi - Feb2010	58%	23%	19%
Mpwapwa - Feb2010	44%	22%	34%
Dodoma - Feb2010	31%	8%	61%
Bahi - Nov2012	73%	16%	11%
Mpwapwa - Nov2012	41%	25%	34%
Dodoma - Nov2012	39%	15%	47%

The Study Team did test the monitoring of road condition by average travel speed using GPS measurements. The approach was similar to that previously developed in Mozambique<sup>11</sup>. Initial measurements of a number of roads were made before improvement and maintenance in April 2011. During this process, the approach was modified slightly and the system of data collection and analysis was documented (see Annex 4 for reference to the reports produced).

The system of field measurement and subsequent analysis proved problematic as it required a level of skill in GPS use and data analysis that was not available at district level. Consequently, the information of post maintenance condition was not systematically recorded. However, detailed analysis by the Study Team of one road in Bahi District did demonstrate the feasibility of the approach for monitoring changes in road condition due to road maintenance and spot improvements. Annex 5 contains more details.

## Impact

Focus group discussions near the end of the Study in September 2012 confirmed that all types of maintenance contract had brought about more reliable access. It was also reported that public transport services were more available compared to the situation before. Villagers informed the Study Team that passenger vehicles (daladals) had started to stay overnight in some villages so that they began their route in the morning from the villages to the towns, which was much more convenient for villagers. This was because they could make their journeys to local centres early in the morning and return the same day. This was not the case before this project started as the transport operators were concerned that their vehicles might become stranded due to the poor state of the roads.

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<sup>11</sup> Development of an Index for Monitoring the Condition of Low-Traffic Unpaved Roads, AFCAP/Moz/017, October 2009.

There was an increase in all types of vehicles using the road - both motor vehicles (e.g. 4wd, trucks; saloon cars, etc.) and non-motorised transport (mainly bicycles). More trucks were visiting the villages to collect produce from the farmers.

Although the travel time to markets, schools, healthcare facilities etc. had been reduced significantly due to the improved condition of the roads, there had not been a corresponding reduction in passenger fares or goods transport tariffs. The reason given was that any savings had been offset by the rising price of fuel.

## Planning

The Study Team noted some lack of clarity in the way that roads for maintenance were selected and prioritised. Although, the identification of which roads to maintain were not part of the Study, this issue related to a general finding on the ambiguity in the use of the Road Fund allocations. By statute, the Road Fund allocations were for the maintenance of roads. However, because there was no separate regular capital funding for district road improvements, the Road Fund allocations were effectively the budget for all roadworks activities in the districts i.e. both road maintenance and road improvements.

This ambiguity had contributed to a lack of distinction between road maintenance activities and road improvement activities. Consequently, contracts for roadworks on district roads typically contained a mixture of maintenance and spot improvement activities. Furthermore, these contracts were perceived by Council staff as one-off projects. This was a challenge to the Study Team's effort to establish the concept of maintenance and maintenance contracts as a continuous activity.

By the end of the Study, the Council staff's perception of maintenance as a one-off activity had not changed significantly. However, there were positive aspects to the Councils' approach because:

- The levels of traffic on most district roads were not high enough to economically justify upgrading roads to fully engineered standard.
- A large part of the economic benefit achievable from road improvement was obtainable by spot improvement to increase passability i.e. spot improvement produced high benefit/cost ratios.
- The available financial resources for district roads would only have been sufficient to fully upgrade a small portion of the network.

Consequently, District Engineers were allocating the scarce financial resources across the district road network in a mixture of road maintenance and spot improvement measures to achieve the maximum impact in terms of (a) keeping roads open and (b) increasing basic access and passability. This can be considered to be an effective use of funds where it is not economically feasible to first rehabilitate all roads to fully engineered standard and then establish regular maintenance.

Guidelines from PMO-RALG and the Road Fund Board provide the technical criteria to be followed by Council Engineers in drawing up annual maintenance plans. However, at the district level and because the investments cover both road maintenance and spot improvements, this has to be combined with the priorities identified by local communities (and local politicians) at district level through bottom up planning procedures<sup>12</sup> and currently there is no standard formula for this. Because the local Council ultimately approves the Annual Workplan for district roads, it was at the Council level that plans produced by the District Engineers' Office based on technical criteria were sometimes modified by locally-identified priorities. Therefore, the finally approved district annual road maintenance plans were a compromise between optimum technical efficiency and locally perceived priorities.

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<sup>12</sup> Bottom up planning forms the basic building block of devolved development planning in Tanzania.

## DROMAS

According to the Study TOR, maintenance plans were to be based on the District Road Maintenance Planning System (DROMAS). However, the computerised part of this planning system was found to be not operating in any of the pilot districts. Furthermore, some of the road condition surveys were unreliable and no traffic counts were carried out. These were both part of the DROMAS system. The Study findings and conclusions on the DROMAS system are summarised in Box 4.

### **Box 4: Findings on the District Road Management System (DROMAS)**

The background to DROMAS was given in the Study Terms of Reference. These stated that:

“The network condition has now been updated by the LGAs to form the basis for their annual work plans using the Annual District Roads Inventory and Condition Survey (ADRICS). The implementation of ADRICS results in the accumulation of a significant amount of data. The management of this data and subsequent selection and prioritisation of district road works is carried out using a computer-based District Road Management System (DROMAS).”

And,

“The project will build on existing initiatives to improve district road maintenance, including systems already under development in PMO-RALG (ADRICS/DROMAS), those used by TANROADS, and approaches developed by organisations such as ILO that have provided support to the sector in recent years. (It is noted that the roll out of ADRICS/DROMAS has recently been completed to all 132 Councils through training of the technical staff. This initiative utilised significant effort and resources since 2002/2003, when DROMAS was launched through the joint efforts of the Government and Development Partners. It is desirable to improve on what has been established with ADRICS/DROMAS, unless there are convincing reasons for considering alternative planning systems.)”

However, it was found that DROMAS did not operate in the pilot districts for a variety of reasons. These included “bugs” in the programme such that the computer system did not function as intended at Council level. Furthermore, the central level modules of the system were incomplete meaning that even if DROMAS data had been available from Councils, there was no means of processing this at central level.

Consequently, the planning of road maintenance was informed by the annual district road condition survey (ADRICS) but depended primarily on the District Engineers’ proposals and the Council Members’ consideration of these. The ADRICS itself was found to be only weakly executed. The most frequently quoted reasons for this were the lack of adequate staff, field allowances and field transport.

The District Engineers proposals were based on the guidelines produced by PMO-RALG in consultation with the Road Fund. Those in operation at the time of the study were reported by PMO-RALG to be:

1. All roads in good and fair condition to receive 100% of the required funds for routine maintenance (there is an implicit assumption that this would require 50% of the allocated district budget).
2. Roads in fair and poor condition to receive 10% to allocated district budget for periodic maintenance.
3. Roads in poor condition to receive 25% of the allocated district budget for spot improvements.
4. Structures (culverts and bridges) to receive 10% of the allocated district budget.

These technically sound guidelines were moderated by local political factors. These introduced some equity of resources over the district’s wards as well as directing attention to high local priorities that

might not otherwise have featured in the plans.

From investigations at district level, the overall conclusions of the Study Team were:

- DROMAS did not function and should be ignored.
- ADRICS provided a useful starting point but the road condition information needed careful checking.
- Despite deficiencies and some lack of transparency, the Council level planning system produced priorities that combined local level priorities with technical efficiency.

## Procurement

A common finding in all three pilot districts was that there were delays in the procurement of contractors. The procedure for procurement was clearly laid down by the Public Procurement Regulatory Authority (PPRA). It was in the implementation of the procedures that problems occurred. The reasons for delays were:

- Contrary to PMO-RALG guidelines, little preparation of contracts was carried out in the pilot districts until the Road Fund allocations for the new financial year were received in the district. The first allocations did not arrive before September each year i.e. the third month of the financial year. The PMO-RALG guidelines stated that contracts should be prepared and tenders launched in advance of receipt of the funds. It is only the signing of the contracts that had to await the arrival of funds. However, District Executive Directors were reluctant to approve any spending relating to the current year's contracts until the funds were in the district account. This included relatively minor funds for field surveys, contract preparation and the purchase of handtools for community contracts.
- Even after receipt of funds in the district, the District Engineer's staff was constrained by shortages of transport and field allowances to carry out field surveys. In addition, the technical staff was frequently occupied with other non-road related work.
- In most cases, the bids received were above the minimum number of three i.e. there was no apparent shortage of available local contractors interested in bidding. However, there was a problem with some bids being non-compliant and hence disqualified from the evaluation.
- The evaluation of bids was sometimes delayed by the availability of the evaluation team members.
- There were frequent delays in convening the District Tender Board to review and approve the evaluations. This was due to the non-availability of Board members due to their other commitments and problems over expenses for holding the meetings.
- The award and signing of the contracts was sometimes delayed by the non-availability of Council staff.
- The end result of the preceding factors was that contracts were typically signed shortly before the onset of the rainy season at the end of December. Due to heavy rains, the contractors either proceeded slowly or delayed mobilisation until the end of the rains in about April. This left only just over two months before the end of the financial year on 30<sup>th</sup> June.

Consequently, the progress on contracts was often well below that planned by the financial year end. Fortunately and unlike other government funding, road fund allocations can be rolled over from

one year to the next. Therefore, a significant portion of the previous year's annual maintenance plans was carried forward to the first few months of the new financial year. It is for this reason that many of the contracts under the AFCAP Study were completed around September and October.

### Timing of Roadworks

Related to the above issues, an important finding was that the carrying out of maintenance and spot improvement works on district roads was determined by (a) when funds arrived in the district and (b) the length of time taken for the procurement process. This frequently resulted in contracts being awarded and carried out in the rainy season from December to April<sup>13</sup>. A more logical timetable would have been for contracts to be issued so that most of the work on district roads could be carried out in the cool, post-rainy season.

The whole phasing of works at the local level leads to work contracts for district roads frequently being issued during the rains – usually the worst time of year to start certain activities such as those involving earthworks or new cross drainage. The conclusion is that the timing of district road contract preparation and planning requires re-organising such that each activity is carried out at the optimum time of year. Table 4.2 indicates how some of the different types of roadworks should be prioritised according to season.

**Table 4.2: Main Types of Roadworks by Season**

Season	Main type of roadworks
Pre-rains: hot dry season	Drainage structures, especially those requiring work in river beds.
Rainy season	Regular maintenance to keep roads passable.
Post-rains - cool season	Roadworks requiring earthworks and gravelling such as road rehabilitation and spot improvement.

The optimum timing of work activities in Table 4.2 should determine when contracts are prepared, tendered and signed. Based on the experience of the Study, seven months should be allowed for this process – prepare (3 months); tender and evaluation (3 months); signing and mobilisation (1 month). In Dodoma Region, where the Study was carried out, the rainy season is from December to April; the cool, post rains from May to August and the hot, dry season from September to November. Figure 4.1 shows in bar chart form a timetable for contract preparation and implementation that fits with the optimum construction seasons for the three main types of activities carried out on district roads.

**Figure 4.1: Timetable for Contract Preparation & Implementation**

Season	cool/dry		warm/dry			rains				cool/dry		
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Financial Year months	1	2	3	4	5	6	7	8	9	10	11	12
<b>Contract prep/sign:</b>												
Routine maintenance	prep.	tender		sign							prepare	
Spot Imp./Per.mtce.				prepare		tender		sign				
Bridge and culverting works	tend.	sign						prepare			tender	
<b>Contract implementation</b>												
Routine maintenance						prepare						
Spot Imp./Per.mtce.	prepare										prepare	
Bridge and culverting works			prepare									

It can be seen from Figure 4.1 that the preparation and tendering of the three types of activities can be carried out at different times of the year, thereby spreading the work of the District Engineer's Office. The implementation of routine maintenance and bridge/culverting contracts can be completed within the Tanzanian financial year. However, spot improvement and periodic maintenance works are likely to be only about 40% complete by the end of the financial year with

<sup>13</sup> The timing of the rainy season differs in different parts of Tanzania.

final completion by September. This has implications for the setting of annual targets for physical progress.

### Site Supervision

Inadequate supervision of works by the District Engineer's Office was found to be an issue due to a shortage of staff and transport. The shortage of staff is not only due to insufficient numbers. The District Engineer's office also has responsibility for a large number of public buildings as well as the road network. Moreover, the staff is frequently called to district meetings at short notice. Supervision transport typically comprises one pick-up type vehicle and one or more motorcycles. However, this transport was not used exclusively for roads. Moreover, the vehicles were often out of order for long periods due to delays in the funding and organising of vehicle maintenance and repairs.

None of the contract systems were reported to significantly reduce site supervision time for District Engineers' staff and most were reported to require an increase. This was partly because the systems were unfamiliar and needed more attention from the District Engineer's staff. It was also partly because the contracts tested had longer durations than conventional contracts and therefore required supervision over a longer period.

## 4.2 Specific Findings

In addition to the general findings above, there were a number of findings related to the specific maintenance systems that were tested. These findings were based on the Study Team's observations and feedback from District Engineers' staff and other stakeholders.

### Small contracts for extended periods

Small contracts for extended periods were tested in the second year of the Study in Mpwawa District. Two such contracts were awarded on a quotation basis. In both cases, quotations were invited from eight eligible bidders. Five contractors responded with quotations – the same five for both contracts. Two contractors were from Dodoma Region, one from Morogoro, one from Dar es Salaam and one from Tanga.

There are a large number of local contractors based in Dodoma Region. However, it was found that the preference of the district authorities was to invite quotations from contractors who were already known to them, even if the contractor's home base was in another region.

All quotations received were around the Engineer's Estimate of just under Tsh 100 million (USD 67,000 approx.). However, over half of the quotations were above Tsh 100 million, which is the upper threshold for awarding contracts by quotation. It appears that the bidders were not aware of this limit.

In prior discussions between the District Authorities, the Study Team and PMO-RALG, it had been hoped that these contracts would provide an opportunity for work for the recently trained labour-based contractors who were based within the Region. However, no labour-based contractors participated. This issue was discussed in the stakeholder workshop in Dodoma in November 2012 where the reasons given that few labour-based contractors were engaged for maintenance contracts in the districts in Tanzania included (a) packaging of contracts too large (b) contract documents not appropriate and (c) priority of district authorities was always to implement the works quickly. More details are given in Box 5.

**Box 5: Why did we not get any labour-based contractors? The views of stakeholders in the consultative workshop held on 15<sup>th</sup> November 2012**

Reasons identified during group work were:

- The volume of most of the contracts was bigger than required to be carried out by labour-based contractors i.e. a problem of packaging.
- Contract documents did not favour labour-based technology. Most documents were for equipment based contracts. DE's not using the contract forms developed for labour-based technology by ATTI etc<sup>14</sup>. Need more dissemination of the LB contract documents. (PPRA website does not have these standard documents).
- Absorption factor as per the Annual Plan of Action is also a limiting factor for use of labour-based technology (speed of performing the job) Pressure is on the achievement of 85% spending by the FY end. Because of late award of contracts, the time to complete the works is often short.
- LGAs also want to see fast progress of the works.
- Financial capacities of labour-based contractors are a problem – it is not easy to access financial institutions/bonds to get the Advance payment.

During a plenary discussion in the workshop, it was recommended that there should be more promotion of labour-based technology and more sensitisation of Councils.

There are some findings relating to the area-based framework contracts given below that also apply to the smaller framework contracts.

**Area based framework contracts.**

Area-based framework contracts were tested in Bahi District in years 1 and 2 of the study. This was the only system where two rounds of contracts were tested.

There was a good response from contractors to the invitation to bid for the three packages offered each year. The major reservation of the district authorities to this system was that only three contractors were successful in obtaining road contracts with the district. This compared with a typical number of 6 to 10 contracts awarded in previous years. Therefore, a number of contractors were left without road contracts in the two years of the Study. Moreover, as noted above, one of the three contracts in the second year was seriously delayed due to illness of the contractor and Councillors were frustrated by a perceived lack of flexibility in the contract system. For this reason, it was proposed by the participants to the November 2012 stakeholders' workshop that any continuation of this system should be based on a larger number of smaller packages.

Somewhat in contradiction to the findings above, the District Engineer's staff noted the savings in management effort by having fewer contracts. They also appreciated the flexibility of the system of work orders that allowed them to direct the contractor to priority work activities at any particular time. A fuller description of the feedback received from the district is given in Box 6.

The Study Team found that, because only a few work orders were issued, the flexibility of the system was not fully exploited. Also, because the duration of the contracts was reduced due to the delays in issuing contracts, the ability to have a contractor responsible for a network of roads throughout the year was not fully realised.

It was expected that the framework contracts would simplify and therefore reduce the time taken for procurement of contracts. During the Study, the finding was that this proved not to be the case as bureaucratic delays proved more significant than any potential saving due to changes in the type of contract. The major problem was the inefficiency, mainly at district level, in operating the

<sup>14</sup> Labour-based contracts are still viewed as special in the Councils and not part of the mainstream methods of contracting. Therefore, the DEO is reluctant to depart from using the conventional contract forms.

procedures already in place. If this could be overcome, it appears likely that framework contracts would produce faster procurement with less management time for district engineers' staff, as noted in the feedback from the districts.

#### **Box 6: Feedback from the District Engineer's Office on the Experience of Framework Contracts**

##### **Advantages:**

As expressed by the District Engineers office:

- **Easier to manage fewer contracts** (unlike the existing system) in terms of:
  - Advertisement /Procurement process- is done only once; hence less costly in terms of finance and human resources especially since the engineers are already overwhelmed with many other construction projects apart from roads.
  - Work order- in case of any emergency it is easier to give directions there and then.
  - Employment creation- Communities are very positive about the contractor hiring local people to be engaged in routine maintenance.
  
- **Duration of contracts**

It was suggested by the district engineers and technicians that the contracts should be extended for more than one year instead of only six months to one year; this would be cheaper in the long run because, for example, potholes attended earlier are less costly the following year.

##### **Challenges:**

- **During tendering process**

The preliminary costs of mobilisation and demobilisation were not included by the contractors because this is a new method that they were not used to. Although they were educated on this in the pre-bidding meeting, however, they did not understand and they did not include these costs in the bid for fear of not offering a competitive price and not able to win the tender.
- **Political Interference**

Councillors did not really understand the system of issuing work orders, especially after the rains. During these periods (after heavy rains), every councillor wanted roads in their ward to be given priority; but because of limited resources, work orders were issued to the areas that had been more badly damaged than others- however, this brought some conflicts; as one Councillor met at Bahi Makulu said..."we give advice to the contractors when we see them performing poor quality works on the roads, but our advice is not taken..."; the Councillor continued, .....we have discussed this issue in the District Council meetings, but the problem continues".

Likewise the village authorities also complained that the contractors did not report to all the villages as expected. Although this was a good idea in principle, it was challenging for the contractor to report to every village where the road passed. It should have been the duty of the Councillor to inform the village heads about these projects because they were the first ones to know and had an obligation to inform accordingly.

#### **Performance Based Contracts**

A system of performance based contracts for district roads was tested in the rural part of Dodoma M.C. One contract covering a part of the rural road network was prepared for both years of the Study. The contracts comprised initial improvement works to bring the network of roads to a consistent and maintainable standard followed by routine maintenance in subsequent months. In the first year, sensible bids were not obtained. Therefore, the test covered the second year contract only.

One of the main findings was that this was the most difficult form of contract to explain to both the district authorities and the contractors. This was the main reason that sensible bids were not received for the first year contract. Several sensitisation seminars and pre-bid meetings were required.

One of the problems experienced in preparing these contracts was the difficulty in defining the required service levels. This was because most district roads were not fully engineered and therefore did not have a uniform engineering standard throughout their length. Nor would it have been economically or financially feasible to bring all the roads to a fully engineered standard. However, specifications were developed by the Study Team together with the Council's Engineering staff and these appear to have operated reasonably well during implementation (see Maintenance Contracting Manual for details).

Despite these problems and slightly contrary to the pre-study expectations, the experience of the second year contract was positive and the Council expressed the wish to continue with this form of contract in future years.

The conclusion of the stakeholders in the Dodoma stakeholders meeting in November 2012 was that there were difficulties both of implementation and understanding of this system. For implementation, specifying a uniform standard to which the road should be maintained was challenging for roads that were only spot improved. It was also difficult for Councillors and local people to understand the system of fixed monthly payments whereby a contractor could be paid in a month when little work was carried out. The view was that this system was most applicable to higher trafficked roads that had been rehabilitated to a uniform standard and for which a contract could be given for up to 1-2 years.

### Community Contracts

The main findings on community contracts were that this system:

- produced good results for routine maintenance works on roads that had already been spot improved;
- was enthusiastically received by communities, road users and local councils.

There were strong incentives for the community groups to perform well. This was because they were the ultimate beneficiaries of the improved roads, their work was closely monitored by both road users and other community members and they gained paid employment in areas where such opportunities were few. The work was so popular that indications by the Council that they might continue the system after the end of the Study period was met by large numbers of community members wishing to join routine maintenance groups.

In comparing the contracting of Village Governments and CBOs, the finding was that CBOs were preferred. This was despite the fact the Village Governments were already legally established bodies whereas CBOs needed to be established for each maintenance contract<sup>15</sup>. This was because the system of using Village Governments was seen by some as unsustainable due to (a) a lack of ownership by villagers and (b) the bureaucracy that is always there in local government. A further issue was that monies received by Village Government went into their general funds and it was not clear what proportion was paid to the villagers who carried out the routine road maintenance work.

There were three main challenges/weaknesses in the community contracting system revealed by the Study.

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<sup>15</sup> However, the Study established that the process of registering CBOs with the Council and drawing up contracts can be done within a short period of time.

- Firstly, as mentioned above, there was some confusion over the legality of contracting communities to carry out works on public roads. This is an issue that requires further investigation and action to remove any uncertainty for Councils wishing to use community contracts for roadworks in the future.
- Secondly, the success of this form of contract rests fundamentally on prompt payments to the CBOs or Village Governments. This is because the villagers working in the groups require payment on time of their monthly wages. This was understood by all stakeholders before the contracts were issued. Nevertheless, there were delays in payment by the District Council due to problems with the introduction of a new accounting system. Fortunately, this was resolved before it totally disrupted the trial contracts. It was also described as an unusual and one-off situation. However, this did reveal how quickly this system could fail if payments are delayed.
- Thirdly, it was decided that the District Council would organise the purchase of the hand tools and give these to the groups at the commencement of the contracts. The cost of the hand tools was then to be deducted from the contract payments. This was to avoid a situation where groups were unable to start work due to a lack of suitable tools. However, this did not work well and the procurement of the hand tools took a considerable time due to bureaucratic delays in the Council. Moreover, the quality of some of the hand tools was poor and they rapidly became unusable. The CBOs expressed the opinion that they should have had more involvement in the hand tool procurement.

It was also found that neither the CBOs nor the Village Governments kept any financial records. As soon as they received the payments through the bank, they withdrew the money and divided it among themselves. They kept records of how much work was done by an individual for the purpose of wage payments only. Hence, they need some training and capacity building in this area. The District Community Development Officers had agreed to train the CBO in Kitati Village, but this did not happen.

The overall finding was that community contracts for road maintenance using CBOs was successful despite the various challenges encountered. This was mainly due to the high enthusiasm for this approach from villagers and the District Council. The particular experience of one contract is described in Box 7 below.

#### **Box 7: An Example of Routine Maintenance by a CBO**

Kitati Village in Mpwapwa District formed a Community Based Organisation (CBO) to carry out routine maintenance works on the 10.2 kilometre long district road connecting to their village. The CBO had 25 members of whom 6 were women. Between April and October 2012 they carried out routine maintenance works including ditch cleaning, culvert cleaning, minor pothole patching and vegetation control.

Users of the road noticed a significant improvement in the road condition. There were four mini-buses per day using the road. The bus owners were so pleased with the results of the CBO's work that they transported the workers along the road to their working areas for free. A larger, 26-seater bus has started operating since the road condition was improved.

The District Council made the initial purchase of hand tools with agreement that the cost would be recovered from the CBO later. Before starting the work, the CBO members received three days of training. Payment to the CBO was made monthly based on an average routine maintenance cost per kilometre set by PMO-RALG. This was Tsh 862,500 per month (approximately \$560 per month) for the whole road length.

The contract has ended recently but the District Council plans to award another contract soon. Now many villagers are keen to join a CBO for road maintenance works.

## 4.2 Costs per Kilometre

All the maintenance contracts tested included spot improvement works and some included drainage structure work. This makes the comparison of costs per kilometre difficult. However, the main finding was that the costs per kilometre of the various maintenance systems tested were not significantly different from the normal averages for conventional contracts let by the Councils. The analysis of the actual costs is shown in Tables 4.3 to 4.6 below.

**Table 4.3: Cost per km of Area-based Framework Contracts in Bahi**

	Northern Package	Central Package	Southern Package	Northern Package	Central Package	Southern Package
	Tsh 000/km			USD/km		
Year 1	1,577	4,279	1,618	1,052	2,853	1,079
Year 2	1,958	3,851	3,275	1,305	2,568	2,183

**Table 4.4: Cost per km of Small-scale Framework Contracts in Mpwapwa**

	Length km	Cost per km Tsh 000	Cost per km USD
Package No. 1	67	1,432	955
Package No. 2	43	2,259	1,506

**Table 4.5: Cost per km of PMMR Contract in Dodoma**

	PMMR contract		
	Length km	Tsh 000/km	USD/km
Year 2	62.7	2,794	1,863

**Table 4.6: Cost per km of Community Contracts in Mpwapwa**

Road name	Length km	Cost per km Tsh 000	Cost per km USD
Makutupa - Bumira	4.3	488	326
Pwaga - Kitati	10.0	470	313
Lumuma - Kizi	12.0	875	583
Kizi - Mbuga	12.0	875	583

The average budget cost per kilometre used in Tanzania for spot improvement and periodic maintenance was Tsh 4 million and 8 million per kilometre respectively (USD 2,700 and 5,300). The figure for routine maintenance was Tsh 1 million per kilometre (USD 670 per km). Tables 4.3 and 4.4 show that the costs per kilometre of framework contracts were around USD 1,500. These contracts included both spot improvement and routine maintenance works. Where the figure was higher, e.g. the Central Package in Table 4.3 and package 2 in Table 4.4, was explained by the inclusion of drainage structure works in the contracts. The average framework contract costs per kilometre were generally lower in comparison with existing conventional contracts. The main reason for this appeared to be that the framework contracts covered greater lengths of the network with less intensive spot improvement works.

The PMMR contract in Dodoma included a more significant component of spot improvement works to bring the roads into maintainable condition. This is the main reason that the cost per kilometre for the PMMR contract was higher than the average for the framework contracts. However, the cost per kilometre of about USD 1,863 (Table 4.5) was still relatively modest.

The community contracts were primarily for routine maintenance works over a period of six months. The variations in costs per kilometre reflected the three terrain types – flat, rolling and hilly/mountainous (two of the roads were in particularly steep areas). If the costs per kilometre in Table 4.6 were doubled to allow for 12 months of routine maintenance, the average would be in the range USD 600 to 1,200 per kilometre and reasonably similar to that used for normal budgeting by Councils.

## 5 CONCLUSIONS AND RECOMMENDATIONS

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### 5.1 Conclusions

One of the major observations of the Study is that the steady investment from the Road Fund is producing positive results in terms of year on year improvements to the condition of district roads in the pilot districts. However, more could be achieved and there appears to be scope for improving the efficiency and effectiveness of district road maintenance in Tanzania.

Some of the potential improvements could be brought about by changes to the systems used for road maintenance contracts such as those tested under the AFCAP Study. In particular,

- Changes to contract systems could provide more continuous attention to the maintenance of roads than the short duration contracts currently used. This would result in quicker attention to road damage and thereby produce higher service levels for road users.

But also,

- Significant potential gains in efficiency and effectiveness could be brought about by improving the efficiency and reducing the bureaucratic delays in the institutions responsible for implementing district road maintenance contracts, primarily the Councils.

A number of general conclusions below are followed by specific conclusions on the alternative systems tested by the Study.

#### General Conclusions

At the start of the Study, the Study Team was told that there was a **shortage of contractors** in some areas. However, no shortage was encountered and it was concluded that this may be less of a problem than stated. There were many local contractors located within Dodoma Region and many others willing to travel from other regions for work. However, there were problems with some contractors (a) submitting non-compliant bids and (b) not understanding how to carry out the work to the required standard, indicating that training or mentoring of local contractors would be beneficial.

The low level of **supervision of works** by the District Engineer's Office is an issue. The conclusion is that more staff and transport would alleviate the situation. However, because site supervision is only required for certain periods of the year and requires dedicated staff and transport, using locally-hired consultants could be an option. This could be a local consulting firm or an experienced individual hired on a contract basis for a short period. More strict supervision of contractors and less willingness to accept sub-standard work would contribute to better quality roads and better quality contractors.

**Communications** between the District Engineers Office and the district executive, the local councillors and local people was sometimes found to be a problem. It was concluded that any measures to improve communication would be beneficial. This might be through periodic briefings, road committees, greater use of notice-boards, etc. However, as a note of caution, the Study Team found it difficult to organise briefing meetings with Councillors and other council staff during the Study. This was partly logistical as it was difficult to find a time when all the individuals were available. There was also a loss of interest from those invited when it was discovered that there were no allowances for attending.

On **labour-based contractors**, the conclusion was that these will not obtain work without some positive discrimination in their favour. As a minimum, appropriate packaging of works and

appropriate contract documents for labour-based contractors should be applied. For smaller works by quotation, labour-based contractors should be invited to submit quotations. The major reason given for not using labour-based contractors was that they do not carry out the contracts quickly enough. A better planning of works such that contracts were issued earlier in the financial year could avoid the need for very short contract periods.

The current **phasing of the maintenance works** in Councils is determined by the arrival of the new financial year's funds in the districts, which is about September each year. As explained above, this leads to contracts being awarded at a time of the year when the rainy season is about to start. Consequently, implementation is often delayed so that the contracts are only completed in the first quarter of the new financial year. The conclusion is that the timetable for the preparation of contracts should be adjusted such that contracts are carried out during the optimum construction season (ref. to figure 4.1 above). This would reduce the delays in implementing contracts and contribute to better quality works. The existing PMO-RALG guidelines on the preparation of contracts in advance of the start of the financial year should be adjusted in light of the information above (Table 4.2 and Figure 4.1). They should then be re-issued to all Councils ensuring that they are clearly communicated to District Executive Directors as well as Council Engineers. This is included in the follow up actions in Section 6.2 of this report.

### Specific Conclusions

On the alternative contracting systems tested, there was no one system that was found to be clearly superior to any other in all cases. The conclusion was that each system could provide the most appropriate and most effective solution depending on the situation. Therefore, the Maintenance Contract Manual can be used by District Engineers as a guide to both select and apply the type of maintenance contract appropriate to each given situation. The summarised conclusions on each system are listed below.

- Framework contracts – these work well for both small and larger networks of rural roads.
  - Once established these could simplify procurement and contract administration as well as providing continuous attention to a specified network of roads.
  - Using a system of work orders within contracts provides flexibility for the District Engineer to decide which operations need to be prioritised at different times of the year.
  - There is a continuous obligation on the District Engineer's staff to monitor the works, measure what has been achieved since the last work order and direct what should be carried out in the next work order. This could be seen as a heavy burden in terms of supervision time and transport requirements. However, this could equally well be seen as what is necessary for adequate site supervision.
  - Based on the feedback from stakeholders, it appears unlikely that one framework contract for a whole district network would be acceptable locally. The preference was for more than three per district. However, longer durations than those tested i.e. up to one year would be preferred.
  - This form of contract can apply to a wide range of district road types from higher volume distributors to lower volume feeder roads. However, it could be difficult to apply to roads in very poor or bad condition.

- Performance - based contracts take more time and effort to introduce than framework contracts but with the potential to reduce contract management time by avoiding the need for re-measurement of the works during implementation.
  - Introduction of this system requires extensive sensitisation of district staff, both technical and administrative as well as Councillors and local village leaders. It also requires thorough orientation for all potential bidders.
  - Once operational and full functioning, the onus is put on the contractor to maintain the assigned road network to the required condition according to the service levels defined in the contract. This reduces the supervision work of the District Engineer's office and helps to ensure maintenance of a constant road condition for the road user.
  - It was concluded that this system is most applicable to higher-trafficked roads that are already in fair to good condition. This is because it is easier to specify the required service levels.
- Community Contracts – these work well and are popular with local people and local government.
  - Mobilisation of communities is required to identify or encourage the setting up of dedicated CBOs. This requires coordination between the District Engineers Office and the District Community Development Office.
  - Two days of technical training of CBOs was found to be adequate for routine road maintenance works – one day orientation and one day of fieldwork. This can be carried out by the District Engineer's staff.
  - Training is also required to ensure that the CBOs maintain records of monies received and paid out. This should be carried out by the District Community Development Office.
  - CBOs should either procure the hand tools themselves or be involved with the procurement of hand tools that ultimately they will own<sup>16</sup>.
  - Once operational, this form of contract works well with strong incentives for the CBO to maintain the road to a good standard.
  - It is applicable to all district roads but particularly to the more remote links connecting villages at the extremities of the rural road network where contractors are reluctant to operate.
  - By their nature, these contracts are labour intensive and create employment in rural areas. One CBO employs 25 people and can maintain about 10 kilometres of road. Therefore, each kilometre creates jobs for 2.5 people, although this would not be full-time work throughout the year.
  - The potential for replication is considerable as CBOs could feasibly carry out routine maintenance on a large part of the district road network in Tanzania of 58,000 kilometres.

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<sup>16</sup> There are good international guidelines on appropriate hand tool specification for roadworks including ILOs Guide to hand tools for Labour-based roadworks.

## 5.2 Recommendations

Based on the findings and conclusions, the main recommendations of the Study Team are:

- All Council Engineers should be made aware of the alternative systems for contracting maintenance by issuing the Maintenance Contracting Manual and following this up with guidelines, seminars and training. The strengths and weaknesses of each system and its particular application should be discussed. There should also be awareness raising with Councillors and other Council staff on these alternative maintenance systems.
- The use of CBOs for routine maintenance and minor works should be extended to cover as much of the rural road network as possible. This will require a major effort in mobilising communities and providing some initial training. However, if implemented widely, there will be economies of scale in the mobilisation and training as well as benefits from the demonstration effect of existing CBOs on new CBOs. An important precondition to this is that the legality of using CBOs for such work should be settled.
- Pro-active measures should be taken to ensure that more contracts are awarded to labour-based contractors. Much of the work that is contracted at district level is suitable for labour-based contractors but inappropriate packaging of works, inappropriate contract documents and a high emphasis put on speed of construction are just some of the barriers to their involvement. Solutions should be found such that these barriers can be reduced.
- The phasing of district road maintenance (and spot improvements) should be re-examined and reorganised such that the works are carried out at the technically optimum time of the year. This will need revised guidelines to Councils as well as revised targets in terms of what work should be completed by the end of the financial year.
- The use of consultants for site supervision of works should be tested in order to reduce the burden on the District Engineers Office of shortage of staff time and transport. This could be either a local consulting firm or an experienced individual hired on a contract basis.
- District road committees comprising representative from the Council, local businesses, road users and local people should be set up to improve communications between the District Engineers' offices and these stakeholders on road related issues.

## 6 FURTHER RESEARCH AND FOLLOW-UP

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### 6.1 Further Research in Tanzania and elsewhere

The Study carried out was one of the first to examine in detail the processes and procedures for maintaining tertiary roads under the responsibility of local Councils in Tanzania. There were a number of issues that were not fully resolved by the Study and some new issues that emerged. These warrant further investigation. They are:

- The Study revealed a large potential for greater community involvement in rural road maintenance in Tanzania. The Study results were positive but on a small scale. Further follow-up is necessary to capitalise on these positive findings. The next step in the research is how the use of CBOs for road maintenance could be brought to large scale – something that has often proved difficult with research. This could be by trialling the approach at full scale in one or more districts. The aim should be to carry out a trial with high impact and profile. The end result could be a road map to guide the adoption of this approach in a wide range of local Councils in Tanzania. This research could also be extended to other countries in the Region.
- Further research is required into the use of framework contracts for district roads. Based on the experience of the AFCAP Study, the focus should be on contracts slightly smaller than that used in Bahi district – perhaps five to ten per district with a value of around USD 100-150,000. The contracts should include spot improvements and maintenance activities. The system of work orders should be continued. The aim should be further refinement of the Maintenance Operations Manual.
- Further research into the testing of performance-based contracts for district level roads is required. This is in particular to establish the appropriate service levels to use for unpaved roads that are not fully engineered throughout. A start was made in the current Study but this needs to be tested further and in different environments to establish robust guidelines.
- Measures to improve communications with stakeholders on roadworks activities appear to have the potential to resolve conflicts that occur at district level and thereby increase the efficiency and effectiveness of road maintenance works. The use of district road committees and other measures to involve councillors and communities in the monitoring of roadworks in a structured way should be tested. One of the aims should be to avoid non-District Engineer staff giving instructions directly to contractors.
- Many of the delays encountered in the implementation of the study occurred in the preparation and tendering of the contracts. A short but more detailed study focusing on the time taken at each stage of the contract preparation and procurement process would assist in identifying the feasibility of reducing these delays. The study should establish the stages of the process; the time taken for each stage; areas where savings in time could realistically be made including any recommendations on streamlining the existing system. The study should also pay due attention to transparency as this would not only highlight where delays occur but also support improved governance.

- The Study found that, although there are many trained labour-based contractors in Tanzania, they do not win work from Councils easily. The same has been found in other areas of Tanzania and in other sub-Saharan countries i.e. providing training and registration for labour-based contractors does not result in them winning work afterwards. The Study Team suggests that the reasons for this should be investigated by surveying existing labour-based contractors as well as their potential clients in order to identify the barriers to their entry into the market. The starting point for the research should be a series of detailed interviews with ex-labour-based contractors. This could be in Tanzania and/or in other sub-Saharan African countries where extensive training of labour-based contractors has previously been carried out. The aim should be to identify the ways in which these barriers could be reduced or removed. The current system of focusing support on the supply of labour-based contractors does not appear to work and the findings of Stock and de Veen<sup>17</sup> in 1996 have not been pursued.
- The system of using GPS travel speed for monitoring road surface should be investigated further. The Study found that the system can be effective for measuring the change in road condition before and after maintenance and spot improvements works. However, it needs further refinement such that the field measurements are made more straightforward and the analysis more automated.

## 6.2 Other Follow-up Activities

There are a number of activities required to follow-up on the Study. These are:

- Dissemination of the Maintenance Contracting Manual: although zonal seminars have been held involving representative from all local councils, this needs to be taken further. More training of District Engineers' staff in the alternative systems of maintenance should be given based on the Manual. This could be through existing institutions such as ATTI or ESAMI. There also needs to be a wide sensitisation of councillors and other stakeholders on these alternative systems to explain their advantages.
- A high priority activity is to regularise the use of CBOs in the maintenance of local council roads. This process should be led by PMO-RALG but involve the Contractor's Registration Board, the Road Fund Board and the Public Procurement Regulatory Authority. This should be resolvable by agreeing and issuing guidelines to Councils on the use of CBOs for roadworks. These guidelines should specify how the CBOs are to be engaged and in what circumstances. Any limitations on the works that can be carried out by the CBOs should be clearly stated.
- PMO-RALG guidelines on the timing of contract preparations should be further refined in order to ensure contractors are engaged to carry out different roadworks in the optimum construction seasons. Ideally the guidelines should indicate the timing for procurement and implementation of activities on district roads to fit the

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<sup>17</sup> Stock and de Veen (1996). Expanding Labor-based Methods for Road Works in Africa. SSATP Working Paper No 22.

best construction seasons. These guidelines should be used by PMO-RALG and RFB to adjust the physical progress targets to be achieved by the end of the financial year.

- There are indications from all three pilot Councils that they may continue with the use of the alternative maintenance systems tested under the Study in the coming years. PMO-RALG should monitor these activities and make any adjustment to the Maintenance Contracting Manual based on the lessons learned.

For ease of monitoring, these activities are summarised in the proposed Action Plan below.

**Table 6.1: Action Plan for Follow-up Activities**

<b>Activity</b>	<b>Responsible</b>	<b>Proposed Timing</b>
Dissemination of the Maintenance Contracting Manual	PMO-RALG	Jul 2013 – Jun 2014
Regularise the use of CBOs for road maintenance	PMO-RALG/RFB/CRB/PPRA	Apr- Jun 2013
Adjust guidelines on the timing of roadworks on district roads	PMO-RALG	Jun 2013
Monitor the continued use of alternative maintenance systems in pilot districts	PMO-RALG	Jul 2013 – Jun 2014

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## ***Annexes***

## Annex 1: Terms of Reference

### Improved Maintenance Systems for District Roads in Tanzania

#### Background

Tanzania aspires to become a medium developed country by 2025. The Tanzania Development Vision 2025 accords high priority to infrastructure development because of its importance to social and economic development. The Vision puts great emphasis on the development of rural roads as absolutely essential for promoting rural development. The Government considers that no sustainable and meaningful socio-economic development can take place in rural areas while the condition of the roads is poor.

The Prime Minister's Office-Regional Administration & Local Government (PMO-RALG) has therefore developed the Local Government Transport Programme (LGTP). The LGTP forms the framework for all transport projects within the local government system. The LGTP constitutes a comprehensive sector-wide approach and is part of the overall transport investment framework, which addresses rural and urban transport infrastructure and services. The first phase of the LGTP is set to run from July 2007 to June 2012, having a budget of USD 430 million over 5 years.

The local government authorities (LGAs), with support from the PMO-RALG, are responsible for managing the classified local road network of 56,600 km. The classified local road network consists of about 29,500 km of district roads, 21,200 of feeder roads, and 5,900 km of urban roads. About 46,400 km are earth roads, 9,400 km gravel roads, and 800 km paved roads. It is estimated by PMO-RALG that less than 10% of the local road network has been built to minimum engineering standards with camber, side drains and cross drainage. Nevertheless, about 55% of the local road network is believed to be in good or fair condition, since unformed earth tracks provide an adequate level of access for the very low traffic volumes in many areas.

Due to previous uncertainty regarding the extent and condition of the local road network a nationwide Local Government Road Inventory and Condition Survey (LG-RICS) was undertaken during 2005-2006 with support from the World Bank. The purpose was to establish a baseline inventory and condition of the road networks under the responsibility of the Local Government Authorities (LGAs). Maps of the LGA road networks were established using GIS. The network condition has now been updated by the LGAs to form the basis for their annual work plans using the Annual District Roads Inventory and Condition Survey (ADRICS). The implementation of ADRICS results in the accumulation of a significant amount of data. The management of this data and subsequent selection and prioritisation of district road works is carried out using a computer-based District Road Management System (DROMAS).

The goal of the LGTP is to support national policies and strategies on rural development and poverty alleviation through capacity building and improvement of rural transport infrastructure. The programme is supporting capacity development at all levels within local and national governments and in the private sector. Support to Local Government Authorities (LGAs) will enhance their capacity for planning, design, tendering, contracting, monitoring, and evaluating road development and maintenance programmes. Private sector involvement in implementing road work contracts will increase, and the capacity of the PMO-RALG will be enhanced in order to support the LGAs in managing the network.

It is PMO-RALG's general responsibility to provide national level coordination for programmes implemented at the local government level, including local roads. PMO-RALG gives guidance and

support to the councils, acting as a compiler, distiller and disseminator of project based experience as well as bringing in expertise and experience. However, PMO-RALG does not have executive powers over local government authorities to implement infrastructure projects.

A Transport Infrastructure Unit (TIU) in the PMO-RALG Department for Sector Coordination is the focal point for the coordination and monitoring of roadworks by the LGAs. This unit distributes and monitors the use of funds for road works in the LGAs, and conducts the national coordination of the Village Travel and Transport Programme and the Local Government Transport Programme (LGTP). The Transport Infrastructure Unit is housed at central level in Dodoma.

Allocations to local authorities for road maintenance have increased considerably in recent years. Total allocations for the financial year 2008-2009 includes Tsh 65 billion (including 10% for development works) from the Roads Fund and Tsh 25 billion from the government and development partners for spot improvements through the LGTP. These funds are shared between 132 LGAs. The increase in allocations for road maintenance has been accompanied by increased capacity in the districts to organise maintenance. For example, remuneration for Council Engineers has improved, leading to an overall improvement in performance. The Council Engineer is not only responsible for roads, but also other areas such as council buildings and mechanical equipment. The Council Engineer is the head of his unit and member of the Council Management Team. It is noted, however, that the Council Engineer's subordinates are yet to enjoy salary increases, and the Regional Supervising Engineers under PMO-RALG, who monitor the Councils, now receive lower remuneration than the Council Engineers.

Capacity building activities for the districts are being carried out by PMO-RALG and funded from the above mentioned allocations, but there is still significant scope for improving the efficiency of district road maintenance. At present a significant proportion of the maintenance funds are used for spot improvements and minor rehabilitation works simply to maintain basic access. Road maintenance, as per definition, is not a significant feature of most district annual road maintenance programmes. This is partly because only about 14% of district roads are believed to be in good (maintainable) condition.

The recent increase in maintenance funds will result in an increase in the level of investment in local roads through road upgrading and spot improvements works. The focus of the districts' annual work plans will therefore need to shift in the next few years to the preservation of these investments through routine maintenance.

The Africa Community Access Programme<sup>18</sup> (AFCAP) has been requested by PMO-RALG to assist with the implementation of a research project to develop more efficient and effective maintenance systems for district roads in Tanzania. 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 research project will increase understanding of constraints at the district level to organising effective road maintenance. The project will inform PMO-RALG and the districts on appropriate methods of organising and implementing maintenance of district roads. The project will build on existing initiatives to improve district road maintenance, including systems already under

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<sup>18</sup> AFCAP is funded by the UK Department for International Development (DFID). The management of AFCAP has been contracted by DFID to Crown Agents. See [www.afcap.org](http://www.afcap.org)

development in PMO-RALG (ADRICS/DROMAS), those used by TANROADS, and approaches developed by organisations such as ILO that have provided support to the sector in recent years.

(It is noted that the roll out of ADRICS/DROMAS has recently been completed to all 132 Councils through training of the technical staff. This initiative utilised significant effort and resources since 2002/2003, when DROMAS was launched through the joint efforts of the Government and Development Partners. It is desirable to improve on what has been established with ADRICS/DROMAS, unless there are convincing reasons for considering alternative planning systems).

Different methods of organising road maintenance will be established under the research project in pilot districts in order to test the efficiency and effectiveness of a variety of approaches over a two year period. Conclusions will be drawn through monitoring of the implementation of the maintenance systems, monitoring road condition in the pilot districts over the project period, as well as the impact of changing road conditions on social and economic activity. Whilst the focus of the project is on the maintenance of rural roads, recommendations should also be provided for the maintenance of roads in rural growth centres.

The findings of the research activities will be disseminated through a series of training workshops and the publication of a consolidated district road maintenance manual. The project will contribute to more efficient use of existing maintenance allocations on a national basis, with significant social and economic benefits accruing to local communities as a result of improved and more reliable road access.

## Objectives

The overall objective of the assignment is to understand the nature of existing maintenance systems and to develop more efficient and effective maintenance operations on district roads in Tanzania.

## Scope of the Services

The consultant will:

### Baseline position

1. **Literature Review.** Undertake a review of both published and unpublished literature to establish the existing level of knowledge about rural road maintenance and management systems within Tanzanian and the East Africa region, including the role of road sector institutions within decentralised government structures.
2. **Selection of Districts.** Assist PMO-RALG to select three districts for establishing pilot maintenance systems for district roads. Visit a short-list of districts compiled by PMO-RALG following consultations with the LGAs. The selection of districts should take into account logistical considerations for routine visits by PMO-RALG and consultant staff, as well as the varying capacity of district councils to organise maintenance works. Other factors such as variations in the size and geography of districts, the extent of the district road network, local political structures, the demand on district resources from other sectors, and performance based on the recent findings of the Technical Audit, should also be considered. Priority should be given to Councils that have been producing Annual Work Programmes and Budgets using ADRICS/DROMAS.
3. **Evaluate Existing Approaches.** Assess the efficiency and effectiveness of the existing approach to road maintenance employed by each of the participating districts. Identify any particular constraints to maintaining roads in the districts such as difficult materials conditions and difficult terrain, poor condition of the existing network, lack of contracting

capacity in the district, inadequate mapping and road condition data etc. Understand the nature of organisational behaviour in road sector institutions within each of the selected districts including: educational levels, skills and experience of staff, relationships with political decision-making structures (both formal and informal), interaction with professionals within other sectors, and interaction with community groups.

4. **Identify Options.** Identify alternative maintenance systems that could be appropriate to conditions in the pilot districts and would address shortcomings observed in the existing systems. These could include lengthmen systems, gang-based systems, use of tractor-based technologies, etc. Provide advice on appropriate procurement procedures, including forms of contract, taking into account recent World Bank initiatives to promote performance based specifications, the successful use of area based approaches and method specifications in Zimbabwe and Mozambique, framework contracts, and traditional approaches using re-measured quantities and unit rates, etc. Identify ways that elected council members can participate constructively in the preparation of annual maintenance plans and oversight of the works. Identify ways that small local contractors could participate in road maintenance works, and how road works financed by TASAF<sup>19</sup> and other NGOs could be integrated into the annual maintenance plans.
5. **Develop Monitoring Framework.** Prepare a monitoring framework for the pilot districts including all baseline data to be collected in the design phase, and additional measurements, performance indicators, costs and other data to be collected over a two year period. The monitoring framework should take into account indicators included in the Performance Agreement between the Road Fund Board (RFB) and PMO-RALG for FY 2008/09, as well as the recommendations of the RFB's Technical Audit Manual, which was prepared with assistance from JICA, and the role of RS Engineers in monitoring the Councils. In addition a more in-depth monitoring process should be established that assesses, from a qualitative and quantitative perspective, the impact of the intervention on the district institutions (relationships between district level professionals and community and political institutions, interaction between other professionals in the district and the capacity, skills and experience of the district staff). Develop survey instruments and other specific monitoring methods that may be needed. Assist the districts in the routine collection of the data.

#### **Design and implement interventions**

6. **Design Workshop.** Discuss the maintenance systems options at a stakeholders design workshop organised in conjunction with PMO-RALG. The workshop will be attended by elected officials and senior officials from the participating districts, as well as the district engineers.
7. **Prepare Maintenance Plans.** Assist the participating districts to prepare a two year programme of prioritised maintenance and spot improvement works. Funding for the maintenance will be provided by the Road Fund and the LGTP under their normal allocation procedures. A small additional allocation will be made to the districts from the LGTP as an incentive to participate and to cover any additional costs of participating in the research project.
8. **Select Contractors.** Assist the districts to prepare tender dossiers for two-year maintenance contracts that employ the agreed approaches. Assist the districts to select appropriate forms of contract, and to prepare specifications and bills of quantities. Assist the districts to evaluate the tenders and to select contractors for the maintenance works.
9. **Training of Council Staff and Contractors.** Provide training and support to the council engineers responsible for supervising the maintenance works. Include other council staff in

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<sup>19</sup> Tanzania Social Action Fund.

the training programme including the Director, Accountants, Supplies Officers, Legal officers and Economists/Planners, who are involved in the management of the road network. Provide guidance to the contractors undertaking the works including: pre-tender meetings to provide information and guidance to interested or short-listed bidders (small local contractors); short technical training courses before the commencement of the works on the detailed requirements and expectations of the contract; on-site advice and mentoring.

### **Monitor and evaluate intervention**

10. **Data Collection and Analysis.** Collect data on the impact of the interventions. Train district staff on data collection techniques. Analyse the data and draw conclusions on which maintenance systems are likely to be most efficient, effective and sustainable when rolled out on a national basis in Tanzania. Provide recommendations on the influence of institutional factors in the performance of maintenance systems. Provide recommendations to PMO-RALG and the Road Fund on the optimal level of funding required by districts for annual maintenance and spot improvement works.
11. **Site Visits.** Participate in site visits to the pilot districts with officials from PMO-RALG, Ministry of Infrastructure Development, the Road Fund, as well as other stakeholders from the government, private sector and donor community.
12. **Maintenance Manual.** Prepare a maintenance manual for district roads in Tanzania. The manual should be based on existing PMO-RALG manuals, as well as the TANROADS maintenance manual and manuals prepared by ILO for the contractor development programme in Mwanza Region. The manual should cover all aspects of the planning and execution of maintenance and spot improvements on district roads.
13. **Dissemination Workshops.** Conduct four zonal workshops in order to disseminate the findings and outputs of the research programme.

### **Transfer of Knowledge/Training**

Capacity building and transfer of knowledge are key components of this assignment. The consultant is required to work in close collaboration with local partners including PMO-RALG, the Roads Fund Board, ATTI<sup>20</sup>, LGAs, and local contractors. The assignment is also a component of a set of inter-related projects across Africa as part of the AFCAP programme. The consultant will be required to share and exchange knowledge and experiences between other projects within the AFCAP programme.

### **Minimum Experience requirements**

It is envisaged that the assignment will be carried out by a team of a minimum of three individuals. The team should include a project manager/road maintenance expert, a social development specialist, and an experienced field engineer. The consultant may propose other experts to provide specialised short term inputs.

The team must possess the following skills and experience:

- i. The design and implementation of research programmes for low volume rural roads in Africa
- ii. Engineering research skills including data collection, analysis and documentation

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<sup>20</sup> The Appropriate Technology Training Institute (ATTI) is a Government Institution under the Ministry of Infrastructure Development with the objective of developing courses and carrying out training on the use of appropriate technology methods in road construction, rehabilitation and maintenance through Labour Based Technology.

- iii. Social research skills (both quantitative and qualitative) on understanding institutional and organisational behaviour in sub-Saharan Africa, particularly at a decentralised local authority level
- iv. Knowledge, experience and understanding of alternative systems for maintaining low traffic district roads in Africa
- v. The use of labour-based technologies and tractor based technologies for district road maintenance
- vi. Procurement, preparation of maintenance programmes and budgets, and supervision of maintenance works
- vii. Decentralisation and institutional arrangements for district management
- viii. Good communication skills, training, and preparation of manuals
- ix. Experience of working at district road level in Tanzania is not essential, but would be of significant advantage.
- x. Swahili capability would be an advantage for the Social Development/Institutional Behaviour Specialist and Field Engineer/Trainer.

### **Consultant Inputs and Responsibilities**

The following are estimated time inputs by the consultant team:

- Project Manager/Road Maintenance Expert: 6 months
- Social Development/Institutional behaviour specialist (and other short-term specialists): 6 months
- Field Engineer/Trainer: 18 months.

It is envisaged that the Project Manager will take overall responsibility for client liaison, planning and programming, evaluation of existing maintenance systems, design of the monitoring framework, quality control and reporting. The Project Manager's inputs will be on a part time basis, with up to six visits to Tanzania over the project period.

The Social Development Expert will also provide part time inputs, with up to four visits over the project period. The Social Development specialist will provide training to district staff in the collection of data for the social/institutional monitoring work.

The Field Engineer will work closely with district engineering staff for the collection of data, training of contractors and supervision of the works. The Field Engineer will also assist in the preparation of annual programmes and budgets and in the procurement of maintenance contracts. It is expected that the Field Engineer will work full time on the project for the first year and visit each participating district three times during the second year.

All team members will participate in the dissemination activities.

### **Assignment Period**

The total duration of the assignment is expected to be 30 months. The following key dates are expected to be achieved:

- Selection of participating districts, analysis of options for maintenance systems and preparation of tender dossiers: within 3 months of the start date.
- Submission of the draft Maintenance Manual: within 28 months of the start date.
- Submission of the draft Final Report: within 28 months of the start date.

### **Facilities, services and resources to be provided by the Consultant and Host Agency**

The consultant is responsible for providing all transport and accommodation required by their staff in Tanzania. The consultant is also responsible for providing office equipment including computers, printers, copiers, etc., as well as office consumables and communications.

PMO-RALG will:

- Assist where possible with any approvals needed for the consultant or their staff to operate in Tanzania.
- Liaise with the LGAs for all aspects of the implementation of the project, and will ensure that funding is in place for the maintenance activities.
- Provide limited office space for the consultant's team at their premises in Dodoma.
- Assist the consultant to organise site visits and the workshops as part of the design and dissemination phase.
- Provide transport to the field for their own staff, where this cannot be shared with the consultant.
- Provide accommodation and subsistence for their staff while in the field.

The districts will provide:

- Staff for the design and supervision of maintenance and for data collection during the monitoring phase.
- Transport to the field for their own staff, where this cannot be shared with the consultant.
- Subsistence for their staff while in the field.

### **Reporting**

The consultant will submit the following reports:

- i. An Inception Report, including the final selection of participating districts, assessment of existing maintenance systems, and recommendations for new systems to be introduced under the project. The report should also include a report on the design workshop, the draft monitoring framework for the pilot districts, and the work plan for the remainder of the assignment. To be submitted within two months of the start date.
- ii. An Institutional Analysis report, including a review of knowledge on local authority institutional behaviour in the East Africa region and a baseline understanding of the behaviour of institutions within the districts selected; their interaction with political structures and other professional institutions within the area. To be submitted within three months of the start date.
- iii. A Design Report, including prioritised 2-year maintenance plans for the participating districts and tender dossiers to be used for the procurement of the maintenance contractors. To be submitted within three months of the start date.
- iv. Brief quarterly reports summarising project activities and achievements, difficulties experienced, and an updated work plan for the remainder of the project. The first quarterly report should be submitted three months after submission of the draft Design Report.

- v. At the end of the second year of maintenance, a draft Final Report detailing the completed maintenance and spot improvements works, observations during the project period, analysis of data collected and recommendations for future research and other follow-up activities.
- vi. A draft Maintenance Manual for District Roads, to be submitted with the draft Final Report.
- vii. Final versions of the Final Report and Maintenance Manual to be submitted within 30 months of the start date.

All reports and manuals should be submitted in English. Hard copies of all documents should be provided to PMO-RALG (3 copies), the participating districts (2 copies) and the Road Fund Board (1 copy). AFCAP management requires only electronic copies of reports.

#### **Assignment management and administration**

The Research Consultant will liaise with the Coordinator of the Transport Infrastructure Unit within PMO-RALG for all technical, logistical and programming aspects of the assignment.

The consultant will report to the Technical Manager of the Africa Community Access Programme (AFCAP) for all technical aspects of the implementation of the project and submission of deliverables. For all contractual and administrative matters the Consultant will report to the AFCAP Procurement Manager.

## Annex 2: Reconnaissance Report on Potential Pilot Districts (March 2010)

### 1 Visits

An initial visit was made to 7 districts that had been proposed by PMO-RALG as candidates for pilot districts under the AFCAP's Improved Maintenance Systems for District Roads in Tanzania. In each district both the District Executive Director and the District Engineer were visited. In some cases, the acting officer was met.

Basic information on the district, its road network, road funding and the capacity of the district engineers office and local contractors was collected. The list of districts, dates visited and team members are shown in Table 1. The list of persons met is given in Attachment 1. A comprehensive list of the data collected is summarised in Attachment 2.

Table 1: Districts Visited

District	Date visited	Team members
Dodoma M.C.	19/02/2010	GT; AA; ET; NK
Bahi	19/02/2010	GT; AA; ET; NK
Chamwino	19/02/2010	GT; AA; ET; NK
Kondoa	22/02/2010	GT; AA; ET; NK
Mpwapwa	23/02/2010	GT; AA; ET; HL
Kongwa	23/02/2010	GT; AA; ET; HL
Kibaha T.C	24/02/2010	GT; ET

Key:

GT	Gary Taylor
AA	Abdul Awadh
ET	Elizabeth Temu
NK	Niels Kofoed
HL	Hilary Lyimo

### 2 Staffing

All candidate districts had at least one engineer in post except Chamwino D.C. The Chamwino District Executive Director was awaiting the arrival of a new District Engineer<sup>21</sup>, which is expected shortly. In addition, Chamwino D.C. was in the process of recruiting a second engineer to assist the District Engineer.

All Districts had a number of technicians. In a few cases, there was a dedicated Roads Technician. However, in most cases the technicians were engaged with both roads and buildings activities depending on the workload.

Staffing of the candidate districts is generally typical for most rural district councils in Tanzania. Dodoma M.C. is an exception with more engineers (4) and a larger workload.

### 3 Transport and Equipment

All candidate districts except Dodoma M.C. had a fairly new pick up for the use of the District Engineer. The District Engineers offices in Mpwapwa D.C., Kongwa D.C. and Kibaha T.C. had

<sup>21</sup> These are centrally appointed.

motorcycles although some were out of service. In all districts there is some pooling of available transport for the use of district staff. The lack of supervision transport was reported to be a problem in all districts. However, transport was available although sometimes with delays. This is typical for most Local Government authorities (LGAs) in Tanzania.

All districts had computers available and in use.

#### 4 Availability of Contractors

No district had any major problems in attracting contractors. Those districts with offices in Dodoma City had many contractors based locally. Kibaha T.C. had many contractors based close by in Dar es Salaam as well as 11 contractors based in the district. Kondoa and Mpwapwa had a small number of locally based registered contractors. Only Kongwa District had no locally based contractors although there is good access to the district for Dodoma based contractors.

There is a national programme of training for labour-based contractors that is currently in progress. There are already newly trained labour-based contractors in Kondoa, Mpwapwa and Kongwa.

Most of the road work in the candidate districts is procured on open tender with national advertising. Although locally-based contractors win some of the work, contractors from as far away as Arusha and Dar es Salaam have also won tenders in all districts.

Typically, the majority of the roadwork in the annual programme in each district is packaged into 5-10 lots. A small amount of minor works is awarded on a quotation basis. Packaging of the works is organised to ensure that it is reasonably attractive to a large range of contractors.

#### 5 Road Networks

Bahi, Chamwino, Kondoa, Mpwapwa and Kongwa Districts had similar road networks comprising predominantly earth roads in rural areas. There are a few gravel roads and short lengths of township roads. Their total network of district and feeder roads<sup>22</sup> range in length from 537km to 821km. This is fairly typical for most rural LGAs.

The road networks of Dodoma M.C. and Kibaha T.C. are different and have considerable lengths of urban roads although relatively short sections are paved. Dodoma M.C. covers a wide area and includes a significant rural hinterland to the city and this has a network of district and feeder roads comparable in length to some smaller rural districts. Kibaha is an emerging urban district and many of its urban roads resemble district and feeder roads. It has only a very short length of paved road.

#### 6 Funding

The major source of funding for roadworks in all districts was the Road Fund. The total annual funds for roadworks for financial year 2009-10 for the five rural districts range from Tsh 908 million to Tsh 1,273 million. This is equivalent to an average of over USD 1,000 per kilometre per year. The funds are used for maintenance, spot improvement and minor repairs/upgrading.

Dodoma M.C. has significant additional funds directed towards the development of the Capital's urban roads. In addition, other programmes such as under the Capital Development Authority are involved in building new roads or upgrading existing roads that are then handed over to the Dodoma M.C. for maintenance. The total funding for roadworks per km per year is over double that for other districts.

Kibaha T.C. has a smaller network and proportionately less funding. There is some additional funding (about Tsh 90 million per year) for the development of roads in new settlement areas.

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<sup>22</sup> Note that the terminology for tertiary roads has changed in the recent Road Act. However, most districts still use the terms district and feeder roads.

TASAF, the LG Capital Development Grant and LG own funds sometimes feature in the budget for roads but not every year. The amounts are relatively small. The Village Travel and Transport Programme is funded in Chamwino only. It is not clear how much of this funding is directed towards roadworks as opposed to means of transport, not transport intervention and support activities.

Apart from the special case of Dodoma M.C., there is no significant development funding for roads in any of the candidate districts. For this reason, the Road Fund monies are used for both pure maintenance and minor repairs and rehabilitation work. This is the situation in most LGAs in Tanzania.

## 7 Selection of Districts

The attributes above are summarised in the Table in attachment 2. Three districts are required for the AFCAP pilot project. The following three key criteria were chosen by the Consultants for the selection process:

- Adequate capacity – the study will depend on significant involvement of district staff;
- Logistics – there is a need to consider good access and reasonable proximity of the districts to each other;
- Geographical variation – the pilot study should provide some variation in environments either within or between districts.

### *Adequate Capacity*

The Consultants assessment of the capacity of each district is shown in Table 2 below. This is mainly based on the capacity of the District Engineer's Office and in particular the staffing. A score of "0" indicates inadequate capacity and "3" good capacity. No district is assessed as having inadequate capacity. Chamwino is scored low due to the current lack of engineers. This is expected to be remedied soon.

Table 2: District Capacity

District	Capacity
Dodoma M.C.	3
Bahi	3
Chamwino	1
Kondoa	2
Mpwapwa	2
Kongwa	3
Kibaha T.C	2

### *Logistics*

The logistics have been assessed with reference to the geographical location. This is measured in terms of hours driving from Dodoma City Centre and also to other possible districts.

Kibaha T.C. is a special case and is not included. It can be accessed easily from Dar es Salaam (<1 hour) as well as en-route between Dodoma and Dar es Salaam. From the point of view of logistics, the consultants assess that there is no serious problem with Kibaha except that it cannot be visited in combination with any of the other districts and falls under a different region for coordination purposes.

Table 3: Location- Logistics

District	Dist(hr)
Dodoma M.C.	<1
Bahi	1
Chamwino	1
Kondoa	3.5
Mpwapwa	3.5
Kongwa	2
Kibaha T.C	-

The three districts centred around Dodoma present no access/logistical problems. Kondoa and Mpwapwa have similar driving times from Dodoma but in opposite directions. This suggests that one of these districts could be selected both not both, if logistics/access are considered.

#### *Geographical Variation*

The Consultants have grouped the candidate districts into three categories:

- Urban - Dodoma M.C.; Kibaha T.C.
- Rural: close access – Bahi; Chamwino
- Rural: less close access – Kondoa; Kongwa; Mpwapwa

For maximum variation, one pilot district from each category should be selected. However, if the focus is on rural districts, then category 1 should be excluded.

#### *Consultants Recommendations*

Based on the above assessment, the Consultants have two sets of recommendations.

#### **Recommendation 1: focuses in rural districts.**

1. Mpwapwa
2. Bahi
3. Chamwino (subject to successful recruitment of engineers)

#### **Recommendation 2: includes all 7 candidates.**

1. Dodoma M.C.
2. Bahi
3. Mpwapwa

It can be seen that Mpwapwa and Bahi appear in both sets of recommendations. Therefore, in the Consultant's recommended selection, the only debate is over the 3<sup>rd</sup> pilot project. From a technical point of view, all the other 5 districts are possible.

GAT/8.3.10

## Attachment 1: List of Persons Met

**LIST OF PEOPLE MET**

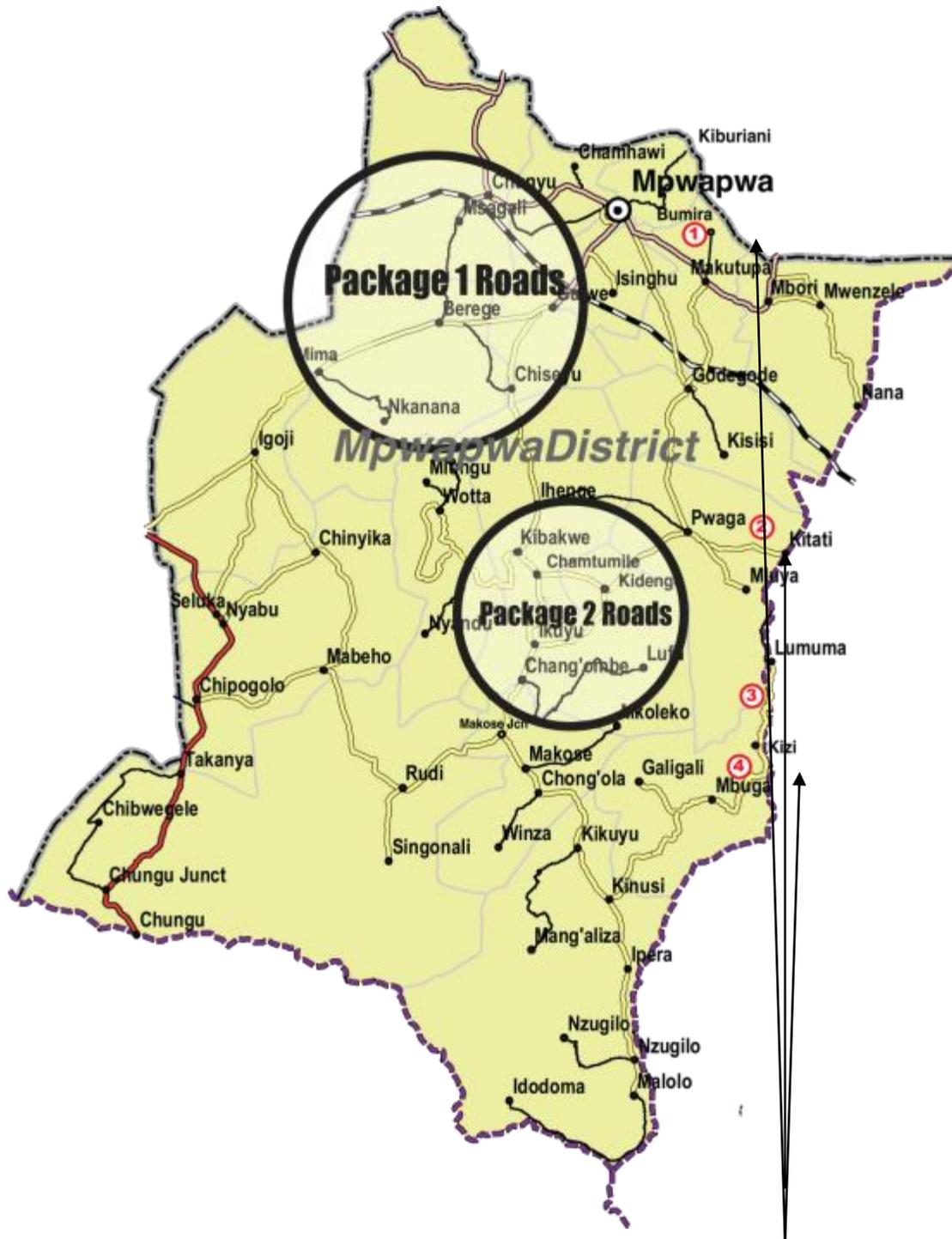
<b>s/n</b>	<b>Name</b>	<b>Authority</b>	<b>Title</b>	<b>Tel contact</b>
1	D.B. Shemangale	PMO-RALG	Principal Engineer	0754 851384
2	Hilary Lyimo	PMO-RALG	Principal Engineer	0713 540072
3	Niels Kofoed	PMO-RALG	Technical Advisor	0754 788396
4	M.M. Mkwakwata	Dodoma RAS	RS Engineer	0715 586521
5	Luseko Kilembe	Dodoma MC	For Mun. Engineer	0784 828107
6	Dr. Cyrialis Mutabuzi	Dodoma MC	Ag. Municipal Director	0754 307768
7	Makoi Kisare	Dodoma MC	Engineer	0754 941560
8	Renal J. Barehi	Dodoma MC	Engineer	0756 325882
9	Baltazar A. Ngowi	Chamwino DC	Ag. Dist Exec Director	0787 666140
10	James M. Lukindo	Chamwino DC	Ag. District Engineer	0713 496674
11	Shama S. Amanzi	Chamwino DC	Technician	0754 286916
12	Makandi Mange	Chamwino DC	Technician	0754 754185
13	Frank Ernest	Bahi DC	Dist Executive Director	0784 846934
14	Bolti Idrissa	Bahi DC	For District Engineer	0714 580582
15	Elias A. Mihwaro	Bahi DC	District Engineer	0762 655797
16	John Isidori Mwalongo	Konoda DC	Dist Executive Director	0784 546464
17	Ibrahim Mkangalla	Konoda DC	District Engineer	0714 943845
18	Gervas Amata	Konoda DC	Ag. Dist Plan Officer	0784 546464
19	Daniel J Mwiru	Konoda DC	Technician	0784 582499
20	Andrew Chezue	Mpwapwa DC	Ag. Dist Exec Director	0784 378554
21	K.M. Kayungi	Mpwapwa DC	District Engineer	0784 912717
22	Mbwana Mbwana	Kongwa DC	Ag. Dist Exec Director	0784 827880
23	E.Y. Lyimo	Kongwa DC	Ag. District Engineer	0713 176200
24	Delphinus Rulagirwa	Kongwa DC	Technician	0787 320839
25	Margareth Nyalile	Kibaha TC	Town Director	0784294277
26	Ezekiel Kunyaranyara	Kibaha TC	Town Engineer	0784 544945

## Attachment 2: List of District Attributes

	Dodoma M.C.	Bahi	Chamwino	Kondoa	Mpwapwa	Kongwa	Kibaha T.C
	1	2	3	4	5	6	7
<b>Staffing:</b>							
Engineers	4	2	0 (+2)	1	1	2	1
Quantity Surveyors	0	1	1	0	0	0	0
Full technicians	2 (+2)	4	4	2 (+2)	4 (+1)	5	1 (+1)
Assistant technicians			3				
<b>Transport</b>							
pickup	0	1	1	1	1	1	1
motorcycles	1	0	0	0	1 (+1)	(1)	1
<b>Computer eqpt.</b>							
desktop PC	some	1	1	2	3	0	1
laptops		2	2	1	1	2	1
printers		?	?	2	3	1	1
<b>Private sector</b>							
availability of contractors	ok	ok	ok	3(+4LB)	3(+3LB)	0(+3LB)	11
availability of equipment	ok	ok	ok				ok
<b>Network (km):</b>							
Urban	119	0	0	0	0	0	300
District	227	203	64	?	320	314	0
Feeder	178	334	528	?	430	342	0
<b>Total km</b>	<b>524</b>	<b>537</b>	<b>592</b>	<b>821</b>	<b>750</b>	<b>656</b>	<b>300</b>
Paved	24						5
Gravel	248						65
Earth	252						230
<b>Funding (Tsh million):</b>							
Road Fund	1,500	683	903	794	948	895	312
LGTP (spot imp.)		(225)	72	(149)	(275)	(155)	(62)
VTTP			35	0	0	0	
Own Funds							55
CDG					50		0
TASAF	some			(192)		0	0
other	500						(90)
<b>Total Tsh mill.</b>	<b>2,000</b>	<b>908</b>	<b>1,010</b>	<b>1,135</b>	<b>1,273</b>	<b>1,050</b>	<b>519</b>
USD 000 [XR=1300]	1,538	698	777	873	979	808	399
USD/km (RF only)	2,202	978	1,173	744	972	1,049	800
USD/km (All funds)	2,936	1,301	1,312	1,063	1,306	1,231	1,331
<b>no of contr. packages</b>	<b>?</b>	<b>?</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>6</b>	<b>7</b>



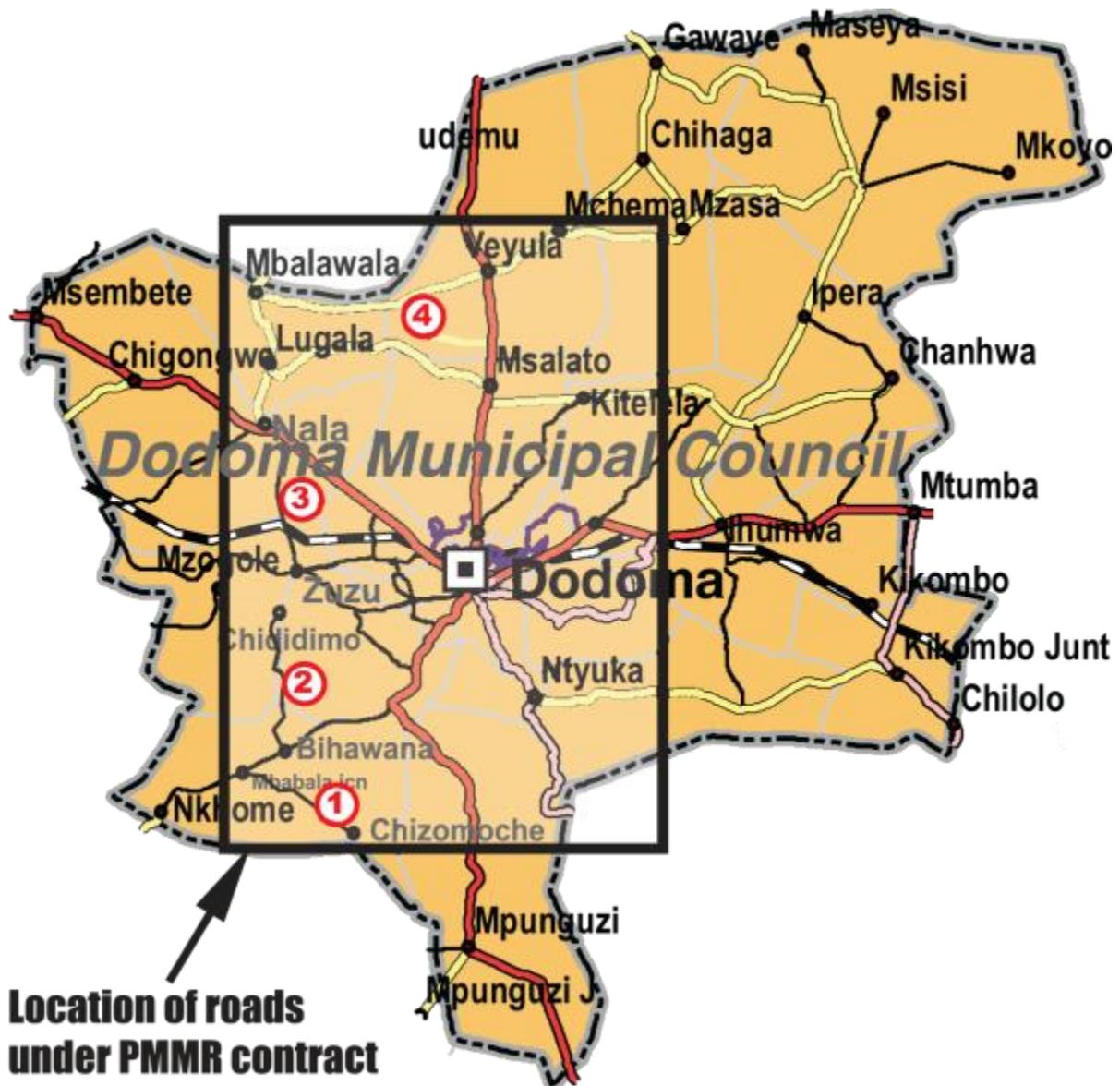
### Annex 3B - Mpwapwa District Map



Roads for community contracts are numbered 1 to 4

Two frameworks contracts are for roads in Package Nos 1 and 2

### Annex 3C - Dodoma Municipal Map



## **Annex 4 – List of Reports Produced during the Study**

1. Reconnaissance Report on Potential Pilot Districts, March 2010.
2. Inception Report, April 2010.
3. Design Options Workshop Report, July 2010.
4. Design Options Report, November 2010.
5. Institutional Assessment and Nature of Organisational Behaviour in Road Sector Institutions in Selected Districts, November 2010.
6. Alternative Approaches to District Road Maintenance, Paper presented at the First AFCAP Practitioners Conference Addis Ababa, November 2010.
7. Note on GPS surveys and results, April 2011.
8. Monitoring the Condition of Rural Roads Using GPS Condition Surveys, April 2011.
9. Baseline Survey for Monitoring and Community Mobilization for Community Contracts, August 2011.
10. Quarterly Progress Reports 1 to 7, February 2010 to July 2012
11. Note on Progress as of End of October 2012.
12. Note on Institutional and Social Development Conclusions on the different Maintenance Systems.
13. Stakeholder Meeting Report, November 2012.
14. Report on Zonal Dissemination Seminars, December 2012.
15. Maintenance Contracting Manual, February 2013.

## Annex 5 – GPS Road Condition Surveys

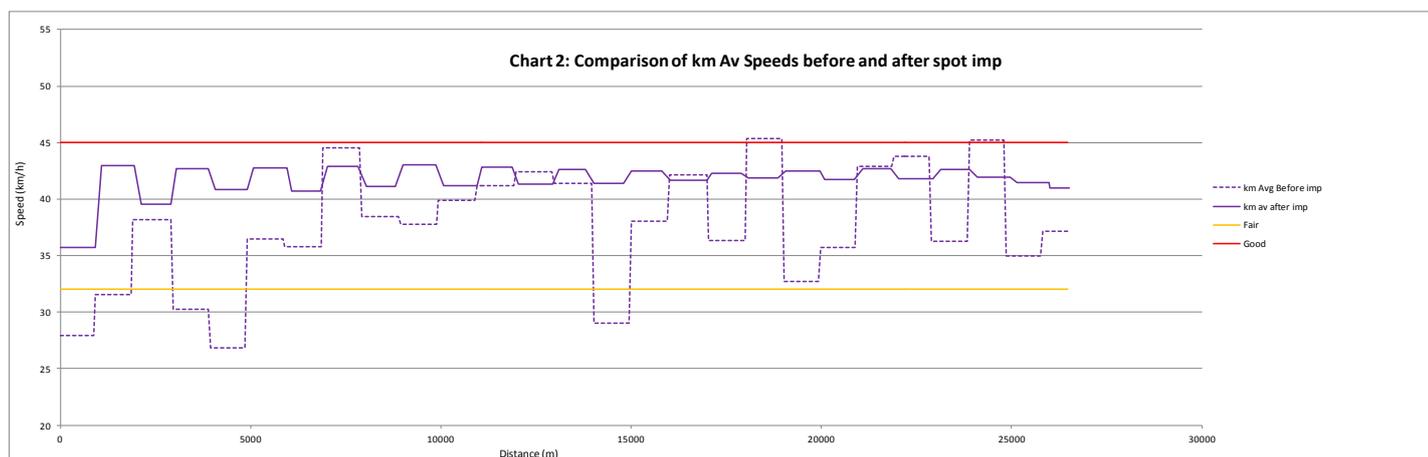
In April 2011, the GPS road condition monitoring technique, as described in the AFCAP Report “Development of an Index for Monitoring the Condition of Low-Traffic Unpaved Roads”, October 2009, was trialled in Bahi District. This was to establish baseline conditions for the rural roads to be maintained under the project. At the same time the survey procedure was tested in a different environment from the previous AFCAP Study<sup>23</sup>.

In April 2011, a trial condition survey of 16 roads in Bahi District, Tanzania was carried out using GPS equipment to measure speed as a 4x4 vehicle was driven along each road. The trip computer on the GPS was used during the survey to record various items on a survey logging form:

- Start time
- End time
- Total length
- Start and end of sections where non-road related delays occurred.

Due to a shortage of necessary skills, the survey was only repeated on one road in November 2012. This was for the 26.5 kilometre long Lamaiti – Bahi road that was part of the Northern Package of Bahi framework contracts.

The chart below shows the average speed over each kilometre of the road before and after two rounds of intervention comprising routine maintenance with some spot improvements. The dashed line shows the average speeds before the interventions and the solid (castellated) line after. The improvement in speed is noticeable. The horizontal lines at 32 and 45 kilometres per hour represent the assumed average speeds achievable on roads in fair and good condition respectively.



The results demonstrate that the system gives a useful measure of surface condition. However, for a complete picture of the road condition, the state of the off road works especially drainage would need to be included.

As a result of the improved serviceability of the road, there were three buses per day on the road in November 2012 whereas there had been none in April 2011.

<sup>23</sup> The AFCAP report referred to a study in Mozambique.