



Rural Transport Services in Africa



*Lessons from appraisal surveys
in Burkina Faso, Cameroon, Tanzania and Zambia*

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Burkina Faso, Cameroon, Tanzania and Zambia*

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Photos taken during the survey work in Burkina Faso, Cameroon, Tanzania and Zambia

ACRONYMS, ABBREVIATIONS, EXCHANGE RATES, WEBSITES

C	degrees Celsius
4x4	four wheel drive vehicle
cc	cubic centimeter
CTA	Technical Centre for Agricultural and Rural Cooperation, The Netherlands
DRC	Democratic Republic of Congo
eg	for example
FCFA	CFA Franc (originally <i>Franc de la Communauté française d'Afrique</i>) XOF = West Africa FCFA (Burkina Faso). XAF = Central Africa FCFA (Cameroon) USD 1 = 525 FCFA (approx) at time of survey
GIS	Geographical Information Systems
GPS	Global Positioning System
HIV/Aids	human immunodeficiency virus / acquired immunodeficiency syndrome
hr	hour
IFRTD	International Forum for Rural Transport and Development (Secretariat in London, UK)
i.e.	that is to say
IMT	Intermediate means of transport
kg	kilogram
km	kilometer
m	meter
mm	millimeter
NGO	non-governmental organization
ORH	Operational Research in Health Ltd (UK consultancy firm)
PAC	Practical Action Consulting, UK
Pax	passengers
PRSP	Poverty Reduction Strategy Paper
RAMP	Rural Access and Mobility Programme
RTTP	Rural Travel and Transport Program
sq km	square kilometer
SSATP	Sub-Saharan Africa Transport Policy Program, World Bank, Washington DC, USA
SUMATRA	Surface and Marine Transport Regulatory Authority, Tanzania
t	ton
T	Trunk road
TB	tuberculosis
ton-km	ton-kilometer
Tsh, TZS	Tanzania shilling. USD 1 = TZS 1100 (approx) at time of survey
UK	United Kingdom (of Great Britain and Northern Ireland)
US, USA	United States of America
USB	universal serial bus (for computer peripherals)
USD	United States Dollar

VAT value added tax
WSPimc WSP International Management Consulting (WSP is the name of a group of companies)
ZK, ZMK Zambian Kwacha. USD 1 = 4800 ZMK (approx) at time of survey

Websites The following websites concern the organizations mentioned in this report. Some of the documents and reports cited here can be seen and downloaded from these sites.
www.worldbank.org/afr/ssatp
www.ifrtd.org
www.animaltraction.org
www.practicalactionconsulting.org
www.wspgroup.com/imc

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Paul Starkey, was the team leader and had the responsibility of writing this document. The surveys reported here were based on a methodology developed by a nine-person team and were implemented team members in four countries. This report is based on important inputs from all members of the team. Therefore the first acknowledgement goes to the whole team, comprising Paul Starkey (Team Leader, UK), Peter Njenga (IFRTD, Kenya), Stephen Newport (WSPimc, UK), Abdul Awadh (Tanzania), Gnderman Sirpé (Burkina Faso), Guy Kemtsop (Cameroon), Henry Musonda (Zambia), Liz Tapper (PAC, UK) and Paul Murray (ORH, UK). Priyanthi Fernando (WSP, Sri Lanka) was actively involved in preparing the research proposal and she participated in the initial email discussions. She also provided valuable comments on the methodology and this report.

The team undertook its planning and review workshops in Ethiopia and Kenya, and were able to benefit from exchanging ideas with the Ethiopia National Forum for Rural Transport and Development, the Ethiopian Roads Authority, the World Bank, the Kenya National Forum Group, Practical Action and Kendat.

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Paul Starkey

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CHAPTER 1: SUMMARY

Background to study

Rural transport services for passengers and goods need to be improved to stimulate rural economies and reduce poverty. Appropriate policy action to stimulate change must be based on a good understanding of the existing situation and the various limiting factors.

The Sub-Saharan African Transport Policy Program (SSATP, managed by the World Bank) commissioned a study to develop and test a methodology for the rapid assessment of rural transport systems. The guidelines specified passenger and freight transport for distances of 5–200 km, encompassing much rural transport, but excluding within-village transport, long-distance national transport and international corridors. Under a contract implemented by Practical Action Consulting in 2005, a multidisciplinary team met in Ethiopia to devise the survey methodology. Four national experts and the team leader implemented the methodology in selected regions of Burkina Faso, Cameroon, Tanzania and Zambia. The team reconvened in Kenya to review the methodological lessons and the survey findings.

The methodology developed

The methodology developed has been described in detail in another SSATP publication (Starkey, 2007). Different transport hub and spoke patterns form the basis of all rural transport systems and these patterns must be understood and described. The rapid appraisal survey is stratified by hub system (provincial/regional, district/market and village hubs) and by remoteness. Participative interviews are held with transport regulators, operators, users and support services. Users surveyed must include adequate numbers of women (at least 40%), people in remote areas (15%) and people disadvantaged in various ways (age, disabilities, minorities, ill-health, extreme poverty). As the survey progresses, information from the different interviews and field observations is triangulated so that anomalies can be investigated immediately. Traffic counts are undertaken on selected representative spokes, chosen by hub type and remoteness. Data is collected on passenger and freight tariffs and the operating cost of motor vehicles and intermediate means of transport (IMTs).

Using this methodology, five pilot surveys were undertaken and the full survey reports are available in hardcopy and on the internet. This report summarizes important issues emerging from these five surveys, and goes on to discuss the implications. All figures quoted here are order-of-magnitude estimations and/or approximations, based on the 2005 surveys.

Survey results from Boucle du Mouhoun, Burkina Faso

The Boucle du Mouhoun region has 1.4 million people and represents 12% of Burkina Faso by area and population. It is semi-arid and most people engage in small-scale farming. There are 1200 km

of recognized roads, many in poor condition. None are paved. The motorized transport fleet is small and old, with total investment cost of USD 1.5 million. It comprises 50 rural taxis (midi-buses and pickups, always overcrowded) and 30 large trucks carrying mixed loads with people on top. Most vehicles operate to and/or from Dédougou, the regional transport hub. There are five smaller hubs. Most villages do not have public transport services as buses and taxis only operate along a small number of main roads. Passenger fares are USD 0.05–0.11 per km, with higher fares on shorter journeys on poor roads. In the north, transport by horse bus is cheaper. Freight costs by large truck are USD 0.15–0.22 per ton-km. Prices are higher for goods carried short distances or transported by rural taxi or horse bus. Bicycles, animal drawn carts and small motorcycles are extremely important. There are 220,000 IMTs with a total investment cost of USD 35 million. Many people travel 10–80 km to reach periodic markets, often along ‘invisible’ tracks that are not part of the road network. Most medium distance journeys (10–40 km) are made by IMTs. Women use about 20% of bicycles and donkey carts. Local production of bicycles and motorcycles is unsustainable due to cheap Chinese imports. National policies have little impact on rural transport services. Transport operators must comply with regulations concerning documentation and tax, but tariffs are not regulated. Safety regulations are widely ignored. Motor transport services seem locked in a vicious circle of low investment, low profitability, low transport frequency and low economic demand. IMTs could increase further through de-taxation of imports.

Survey results from Southern Province, Cameroon

The Southern Province represents 10% of Cameroon by area and contains 500,000 people, 3% of the national population. Lying in the humid forest zone, its economy is dominated by agriculture and forestry. It has 4300 km of roads of which 12% are good quality paved national spokes linking regional towns with Yaoundé and Douala. These roads are busy with inter-urban traffic. Other roads have infrequent traffic and half are in poor condition. There are 650 rural taxis (minibuses and cars) that are the main means of medium distance (20–60 km) transport. Passenger fares range from USD 0.02 per km for long distance journeys on good roads to USD 0.09 per km for short journeys on poor roads. Most rural taxis operate to/from the regional town Ebolowa or four other significant transport hubs. Most villages have at least one public transport service a day. New transport franchises operating from private terminals have proved successful on inter-urban routes and are starting to develop on rural routes. There are also 110 trucks and 80 buses in operation. The fleet is old and represents USD 3 million of investment. There are no work animals in the humid zone. There are few bicycles partly due to their high cost. Recent years have seen a rapid growth in cheap motorcycles imported from China. Almost 20,000 motorcycles are used, representing an investment of USD 13 million. Motorcycles provide important, profitable transport services for short-to-medium distances (1–30 km) in urban and rural areas. Motorcycle taxis charge about USD 0.15–0.20 per km. Freight charges vary greatly, from USD 0.09 per ton-km (long-distance truck, full load) to USD 1.00 per ton-km (rural taxi, small load, short distance, poor road) and up several dollars per ton-km for small motorcycle loads on poor roads. Transport operators face many bureaucratic requirements to conform to vehicle regulations and they are frustrated by the many control barriers along the roads. These do not strictly enforce regulations but daily barrier payments (bribes) increase vehicle operating costs. There is little evidence that national transport policies affect transport service provision directly. However, national transport policies on prioritizing road

rehabilitation are being implemented. The region provides some clear examples of fares and transport frequency on poor roads changing in response to road improvements and deterioration.

Survey results from Iringa Region of Tanzania

The Iringa Region has a population of 1.5 million, and represents 6% of Tanzania by area and 5% by population. It is topographically varied, with mountains in the south. The economy is based on smallholder agriculture. The road network is dominated by a bifurcating spine of paved national road, which carries most of the traffic in the region. Other roads are unpaved, and about half the 7000 km are in poor condition. The regional transport service fleet comprises buses (25), minibuses (45), rural taxis (30) and trucks (75). Most operate to/from Iringa or one of five transport hubs along the trunk roads. There are three minor hubs away from the corridors. Buses and minibuses operate to regulated timetables, but rural taxis do not. Many villages have a once-a-day motorized service, but remote villages have no motorized transport. Fares range from USD 0.02 per km (long distance, good road) to USD 0.06 per km (short distance, poor road). The trucks provide mixed transport notably for periodic markets, charging USD 0.10–0.50 per ton-km depending on load and distance. The total fleet represents an investment of USD 1.5 million. Bicycles are increasing, with 65,000 in use, primarily by men. Some bicycle taxi services exist, charging about USD 0.04 per km. Pack donkeys and animal drawn carts are locally important. Private motorcycle use is low. USD 6 million have been invested in IMTs. Inadequate motorized transport services away from trunk roads are associated with low profitability, poor roads and low rural incomes. People often walk or cycle long distances to markets and services. A legal, regulatory and institutional framework exists for rural transport services but safety regulations are only weakly enforced in the rural areas. Little is done to stimulate improved transport services or greater use of IMTs.

Survey results from Singida Region of Tanzania

The Singida Region has a population of 1.1 million and represents 4% of Tanzania by population and 5% by area. The main activity is small-scale mixed farming in semi-arid conditions. The road system is dominated by a transport corridor (Dar es Salaam to Burundi) running from southeast to northwest. This is being paved. National roads also link Singida town with regions to the northeast and southwest. There are 3000 km of unpaved roads with half in poor condition. Singida and Manyoni are the dominant transport hubs. Most rural transport services begin or end in one of these towns. There are three smaller hubs including the district town of Kiomboi. Passenger prices range from USD 0.02–0.05 per km. The regional transport fleet is small and old and worth less than USD 1 million. It comprises 30 trucks, 20 buses, 25 rural taxis and 10 minibuses (a small number due to poor roads). There are few private motorcycles. Away from national roads little motorized traffic circulates. Freight transport is not readily available, but hire of a rural taxi cost about USD 0.50 per ton-km. There are 60,000 bicycles, one per four households. With little affordable motorized transport, walking and cycling are the main means for medium distance (10–40 km) rural transport. Bicycle journeys of 10 km are common and journeys up to 50 km are not unusual. Only 7% of bicycle journeys recorded involved women. Bicycle taxi services have started, and these charge similar prices to rural taxis for passengers and freight. Ox-drawn carts (13,000) are widely used and donkeys are important in some locations. Six million dollars have been invested in IMTs.

Many people attend periodic markets, arriving by foot, bicycle, cart or rural taxi. Traders travel in heavily laden buses and trucks. These sometimes travel in circuits of markets, causing an HIV/Aids risk yet to be addressed. There is a regulatory framework controlling roads and transport services. Bus timetables are a popular result of regulation, but traffic safety enforcement is weak. The government aims to stimulate rural transport by improving roads and all stakeholders agree with this. Increasing the numbers of IMTs by de-taxation could also improve rural transport.

Survey results from Luapula Province of Zambia

Luapula Province has 800,000 people and represents 7% of Zambia by area and population. A quarter of Luapula is water, with two large lakes, rivers and swamps. Fishing, small-scale farming and marketing provide most work. Much transport relates to fish trading (which stops for three months each year). Government transport policies primarily concern roads but there is some light regulation and taxation of motorized transport services although fares and timetables are not regulated. The policy of increasing IMTs has not yet been implemented in the province. Parastatal organizations provide limited large-scale ferry services on the big lakes. The road network comprises a bifurcating spine of 600 km of tar road that connects the province to Lusaka and the Copperbelt. The rest of the network comprises 2300 km of unpaved roads, most in poor condition. Most traffic circulates on the paved spine. Some roads (including one regional spoke) have no regular motorized transport. The regional fleet comprises minibuses (65), rural taxis (65), trucks (50) and buses (15), representing an investment of USD 2 million. Most operate to or from the provincial capital (Mansa) or the fishing ports (Samfya, Nchelenge). There are two minor transport hubs. Fares are mainly in the range USD 0.02–0.07 per km, with the cheaper prices for long-distance travel on good roads. Freight carried by rural taxi varies greatly, from USD 0.50–2.50 per ton-km, with high prices for short distances on poor roads. Freight carried by truck costs USD 0.30–1.00 per ton-km along the fish spokes, but is not available elsewhere. Small boats provide essential rural transport around the lakes, islands, rivers and swamps. Passenger fares are around USD 0.10 per km and freight about USD 1.00 per ton-km for fresh fish. On land, bicycles are the main means of transport. The 80,000 bicycles represent an investment of USD 7 million. Bicycles and spares are expensive and most bicycles lack brakes. People ride bicycles long distances with tens of thousands of journeys each year in excess of 50 km. Bicycle taxis regularly carry people distances over 70 km, due to the lack of motorized transport. Fares are USD 0.03–0.20 per km for passengers, and USD 0.70–4.00 per ton-km for small loads. Women ride bicycles, but bicycle price and scarcity (one bicycle per three households) limit who can benefit. There are few work animals. There are few motorcycles, but long-distance bicycle taxis suggest a potential niche for motorcycles. People said they need better roads, predictable motorized transport services and cheaper bicycles.

Key issues emerging from the surveys

Many findings were common to all areas surveyed and these included the poverty of rural transport systems, the small size and old age of motorized transport fleets, poor safety standards and the great importance of IMTs. Some findings were specific to certain areas, and these include new transport franchises, water transport, motorcycle services and regulatory corruption. The low level of transport services and the importance of IMTs surprised the survey team. Many people think the roads

they use to visit a rural area represent 'rural transport'. However, such approach roads are not typical of rural areas, as they are busy transport corridors that are part of the national hub and spoke system.

Based on the various survey findings, twenty issues are highlighted, each with a general recommendation relevant to policy formulation. These recommendations can be made specific when adapted to the unique transport situation of a country. These relate to:

- Understanding of rural transport systems (poverty implications, infrastructure needs, hubs, fluctuations, low investment in motorized services, importance of IMTs)
- Regulating rural transport (transport associations, control barriers, routes, timetables, safety and enforcement)
- Promoting rural transport services (transport firms, mixed transport, consolidating demand and participatory planning, reducing prices of IMTs)
- Crosscutting issues in rural transport (education, health services, gender, HIV/Aids and mobile phones).

Conclusions and follow-ups

There is need for informed decision making. The methodology developed and used for these surveys will allow policy makers to quickly and easily obtain a reliable picture of the status of rural transport and ways of overcoming key constraints. Such results can then be used for evidence-based decision-making.

Intermediate means of transport, particularly bicycles and motorcycles, are extremely important, and offer great growth potential. They are sometimes 'invisible' to policy-makers, but rural women and men need them to reduce their isolation and poverty. Fiscal policies should encourage their use so rural people can increase their productivity and quality of life.

Improved infrastructure for motorized and non-motorized transport is vital. Year-round access is particularly important for poor people. Road maintenance work needs to be cost-effective and sustainable, with local stakeholders involved in prioritizing for spot improvements.

Improving roads is not sufficient to ensure reliable and predictable services in most rural areas that have low densities of transport demand. Local collaboration and participative planning is required involving all types of transport users, operators and regulators to ensure consolidated transport demand that will allow profitable transport operations. Such collaboration and consolidation should start a virtuous spiral of increasing transport services stimulating increasing demand, greater competition and lower prices.

National and local governments should provide enabling environments, regulation for appropriate standards while encouraging the private sector to provide good services. Policies should stimulate greater, better, safer and dependable rural transport services. Small initiatives and incentives can

have a profound impact on rural transport and the lives of rural women, men and children, reducing poverty, stimulating economic growth and meeting the millennium development goals.

Follow-up suggestions include surveys in other countries (adapted to local circumstances), preparing supporting resources, developing hub-mapping and modeling as a planning tool, testing ways of consolidating transport demand, adapting the methodology for healthcare, and stimulating international debate on policy options for improving rural transport services.

CHAPTER 2: BACKGROUND AND INTRODUCTION

AIM OF STUDY AND TERMS OF REFERENCE

Rural transport services are often inadequate. Passenger and goods transport needs improving to stimulate rural economies and reduce poverty. Understanding existing rural transport systems and constraining factors is a precondition for appropriate policy action.

This report presents the results and conclusions of a study undertaken for the Sub Saharan Africa Transport Policy Program (SSATP) administered by the World Bank. It was contracted to Intermediate Technology Consultants (subsequently known as Practical Action Consulting, www.practicalactionconsulting.org), working with WSPimc (www.wspgroup.com/imc) and members of the International Forum for Rural Transport and Development (IFRTD, www.ifrtd.org).

The report author led an international team including consultants from Burkina Faso, Cameroon, Tanzania and Zambia where the fieldwork for the study was carried out. The team comprised Paul Starkey (Team Leader, UK), Peter Njenga (IFRTD, Kenya), Stephen Newport (WSPimc, UK), Abdul Awadh (Tanzania), Gnderman Sirpé (Burkina Faso), Guy Kemtsop (Cameroon), Henry Musonda (Zambia), Liz Tapper (Practical Action Consulting, UK) and Paul Murray (ORH, UK). Most members of team had collaborated previously through the networking activities of the IFRTD and its associated national networks.

The purpose of the study was to develop and test a methodology for the rapid assessment of the provision of rural transport services in developing countries. In this context, rural transport services were defined to include both passenger and freight transport services operating in the range 5–200 km. This allowed the study to concentrate on transport supply and demand for medium-distance journeys within rural areas. The study did not include short-distance transport within villages or long-distance transport along national and international transport corridors.

The aim was to develop a methodology that would allow researchers and transport planners to obtain, in a relatively short time, an understanding of the existing rural transport situation and provide information that could assist with policy formulation in these countries. It was envisaged that the challenging task would involve obtaining estimates of the existing motorized and non-motorized services and their costs, the demand for transport services for economic requirement as well as for social, health, educational and community reasons. It would also involve assessing rapidly the regulatory situation and it would provide some suggestions of ways by which the various services could be improved.

PLANNING AND IMPLEMENTING THE SURVEYS

Members of the team met in Ethiopia from 4–8 April 2005 to agree a working methodology and prepare associated data sheets. During the planning workshop, the team exchanged ideas with members of the Ethiopia National Forum for Rural Transport and Development and staff of the Ethiopian Roads Authority and the World Bank. Before and after the workshop, there were field visits that provided valuable insights into the practicalities of meeting stakeholders and obtaining information on key rural transport issues. Some of the observations from the Ethiopian field visits have been carried forward into the lessons learned from the study.

The choice of the four countries selected for the pilot studies had been predetermined in the Terms of Reference. The team established selection criteria for the areas within the countries to be surveyed. They recommended that the study area should be representative or typical of the country or an ecological zone, should be large enough to have a clearly identifiable transport system and should comprise one or more administrative divisions. For these pilot studies, the team wanted to survey a range of transport types in a variety of ecological conditions, and this affected which survey areas were chosen.

In Burkina Faso, the Boucle du Mouhoun region in the semi-arid northwest of the country was selected. It had clear associations between the transport catchment area and the administrative boundaries. Cameroon is a very diverse country, and a survey in the semi-arid north would yield very different results from one in the forest zone. For reasons of balance with the other surveys, it was agreed to survey a humid forest zone in the francophone part of the country, and the Southern Province was selected. In Zambia, Luapula Province was selected primarily because of the importance of water transport systems that did not figure strongly in the other survey areas. In Tanzania, the main choice was between Singida and Iringa Regions. It was agreed to try to rapidly survey both regions (without additional time or resources) to see how this affected the breadth and depth of the survey. In practice, it proved rather unsatisfactory to carry out two ‘half surveys’ as logistical constraints made it necessary to concentrate on the more accessible areas.

During April to August 2005, the national experts carried out the surveys in collaboration with the team leader. All researchers needed to visit the study areas twice, for visits of seven to ten days. Each travelled about 3000 kilometers in total. Time was also required to contact officials in the capital city. The team leader spent about two weeks in each country with the national experts. Together they visited the regions, conducted interviews, met officials and observed transport services in operation. They jointly reviewed the methodology and initial survey findings and the implications of these for improving rural transport services in their respective countries. The team reconvened in Kenya to review the methodological lessons and the findings of the different surveys.

Each consultant responsible for undertaking the surveys prepared a detailed report following the guidelines built into the methodology. These reports contain the main survey results, including the points of view of the various stakeholders (users, operators, regulators, service providers). They contain summaries of the traffic counts as well as estimates of regional transport fleets and vehicle operating costs. Each consultant has summarized the regulatory environment and made various

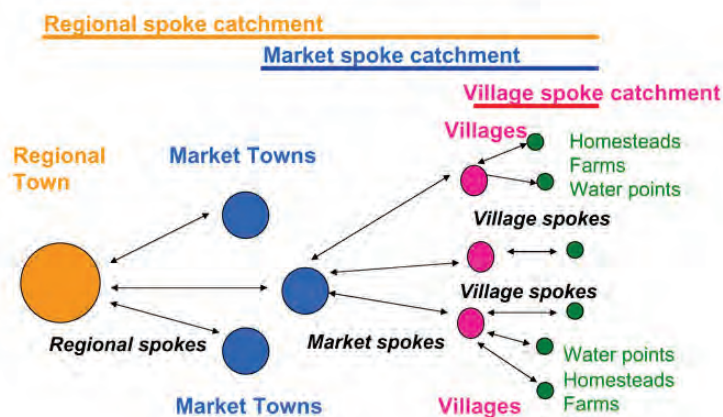
suggestions for improving the rural transport services in the area they surveyed. These reports have been reproduced for distribution within the respective countries, and are also available to download from the internet. The titles of the reports are provided in the references and the relevant websites are provided with the Acronyms at the front of this document.

THE METHODOLOGY DEVELOPED

The methodology developed has been published by SSATP as the working paper. ‘The rapid assessment of rural transport services: a methodology for the rapid acquisition of the key understanding required for informed transport planning’ to which the reader is referred. It was agreed from the outset that the methodology would be primarily qualitative. It would facilitate an in-depth understanding of the issues rather than collecting statistically significant data. The latter would require much more time and resources. However, the methodology would produce some valuable *order of magnitude* estimates relating to movement of people and goods, the costs of transport, the transport trends and the problems and solutions from the point of view of various key stakeholders.

The methodology is based on understanding the transport hub and spoke systems in the designated area. Rural transport systems operate on hub and spoke systems at several levels. Key rural transport hubs are provincial/regional towns, market towns and villages. The various spokes and hubs have characteristic combinations of transport, including trucks, buses, minibuses, pickups and intermediate means of transport. Motorized public transport services in a region operate to and from a finite number of hubs (and in rural Africa, this number can be quite small). Figure 2.1 provides a simplified model of part of a hub and spoke system. The hub and spoke model and its relevance to rural communities, transport corridors and transport planning is discussed in more detail in the main document describing the methodology (Starkey, 2007).

Figure 2.1: Conceptual model of a segment from a regional transport hub system



A region, representing about 5% of the country, is chosen where the transport catchment area corresponds approximately to administrative boundaries. The methodology involves surveying transport types, operators, users and regulators at sampled hubs and spokes, stratified by hub hierarchy and remoteness. Interviews are held with the regulatory authorities (local government, police) at provincial, district and village levels. Operators, suppliers and repairers of transport devices (motorized, passenger and freight) are interviewed and operating costs and fares recorded. Important supporting services are also contacted (financial services, NGOs, development projects). Interviews are conducted with users (and potential users) of transport including farmers, traders, employees, household managers, school authorities, pupils, health service providers, patients and marginalized people. Five interviews (at least two with women) are needed per stakeholder category and are stratified for isolation. Traffic counts (including pedestrians and IMTs and disaggregated for gender) are carried out on selected provincial, market and village spokes on market and non-market days.

The information has to be collected using participatory, inclusive and gender sensitive techniques that lead to an understanding of the transport system from the perspective of all the key stakeholders. One transport expert (or a small team of professionals) undertakes all the semi-structured ('rapid rural appraisal') interviews. Enumerators are not used for interviews. As the survey progresses, information from different sources is triangulated and anomalies investigated. Survey guidelines stress the importance of poverty focus and crosscutting gender, safety and HIV/Aids issues. Complementary national level document reviews and interviews ascertain the positions of key institutional stakeholders, the policy and regulatory frameworks and the availability of relevant data. Many results can be presented in graphical form and computer-generated maps can be used as models in subsequent planning. The methodology requires two months to implement (including planning and reporting) and provides a rapid overview of rural transport systems, highlighting key constraints, stakeholder views and proposals for improvements.

THE LESSONS LEARNED FROM THE SURVEYS

This document contains selected observations from the five surveys undertaken in four countries together with a discussion of their implications for rural transport services. Chapters 3–7 provide some of the findings of each survey, highlighting key issues. These overview chapters contain selected observations thought to be of particular relevance to the debate on rural transport systems. They do not summarize all the issues and information gained in the surveys. In this way, this document complements the five detailed survey reports, but is not a substitute for them.

The figures quoted relating to various transport costs are estimations or approximations based on the survey findings. Since 2005, there have been some changes in exchange rates, fuel prices, taxes and other costs. It is believed the figures quoted still give valid 'order-of-magnitude' indications of costs and prices and that the comparisons and conclusions made here are still broadly valid. Naturally, up-to-date data should be used in transport planning and decision making.

In Chapter 8, twenty topics arising from the surveys are discussed. These have been selected as issues that are particularly interesting and relevant to the debate on how rural transport services can

be improved. In the conclusions (Chapter 9), five key implications of the work are presented, together with several proposals for follow-up actions.

One great strength of the survey methodology developed is that it allows the collection in a short time of very many observations and opinions. These can be usefully reported to illustrate genuine issues that can be investigated in more depth at a later date. The author is aware that to present such information in this report could create problems if people were to quote them out of context. While it is perfectly correct to report here examples where informants have provided thought-provoking information, these should not be interpreted to represent 'typical' African conditions. Various informants have described travelling 200 km by bicycle, spending one third of operating costs as bribes and having 100 passengers hanging onto the top of a truck. These are legitimate and valuable examples that illustrate genuine transport problems. While they may be 'typical' of certain situations in specific locations, they certainly do not represent what is 'typical' for an average rural person in any of the countries.

SPECIFIC FOLLOW-UP INITIATIVES

The aim of the study was to provide a mechanism by which decision making relating to rural transport can be informed relatively quickly and at an affordable cost. It is hoped that the methodology developed will be locally adapted and used in many countries in Africa, Asia and Latin America.

A further aim of the study and this report has been to highlight some options and mechanisms for improving the quantity and quality of rural transport. This report does not claim to provide the answers to rural transport problems (universal solutions would be inappropriate since rural transport services are very situation-specific). Rather this report wishes to start a new debate on how rural transport services can be improved and made sustainable, in order to reduce poverty, improve livelihoods, increase economic growth and provide better access to health, education and other services. It will be up to you, the reader, to engage in the debate, move it forward, and help fulfill the vision of a virtuous circle of improving rural transport and a better quality of life for rural families.

CHAPTER 3: A RAPID ASSESSMENT OF TRANSPORT SERVICES IN BOUCLE DU MOUHOUN, BURKINA FASO

summarized by Paul Starkey and Gnanderman Sirpé

INTRODUCTION TO BOUCLE DU MOUHOUN

Burkina Faso has an area of 274,200 sq km and a population of about 13 million. It is divided into 13 regions, 45 provinces and 350 departments. The Boucle du Mouhoun, in the northwest of the country (see Figure 3.1), has an area of 35,000 sq km (about 13% of the country). The population is about 1.4 million (2002) or about 11% of the population of Burkina. The average population density is about 40 persons per square kilometer.



Figure 3.1. Sketch of Burkina Faso showing Boucle du Mouhoun

The region has six towns, 47 rural areas (communes) and 1042 villages. The regional capital is Dédougou, the sixth largest town in Burkina Faso, with a population of about 50,000. There are six provinces (see Table 3.1), each with a small market town as an administrative centre, and these towns have populations of about 20–30,000 people.

Table 3.1 The six provinces of the Boucle du Mouhoun region of Burkina Faso

<i>Province</i>	<i>Population (1998)</i>	<i>Administrative town</i>
Balé	170,000	Boromo
Banwa	220,000	Solenzo
Kossi	220,000	Nouna
Mouhoun	250,000	Dédougou
Nayala	140,000	Toma
Sourou	200,000	Tougan
Total (Boucle du Mouhoun)	1,200,000	Dédougou

Agriculture is the main economic activity in the area. The rainfall varies from 500 mm in the north to 1000 mm in the south of the region. Cotton is the main economic crop, but cereal production is also very important, with sorghum a major crop as well as millet, finger millet and maize. Cereal production is estimated at half a million tons a year, or 17% of the national production. Livestock are important, with significant populations of cattle (settled and transhumant), sheep and goats.

ROAD NETWORK, CONDITION AND HUB AND SPOKE SYSTEMS

The regional capital, Dédougou is the main transport hub, situated in the centre of the province (see Figure 3.2). There are radiating provincial spoke roads going to and from the five main market towns and national spoke roads to and from the two main national cities of Ouagadougou (225 km to the east) and Bobo-Dioulasso (180 km to the southwest). One of the market towns (Boromo) is situated on the main Ouagadougou and Bobo-Dioulasso transport corridor. The regional spoke to Djibasso continues into Mali, and carries a small amount of international traffic.

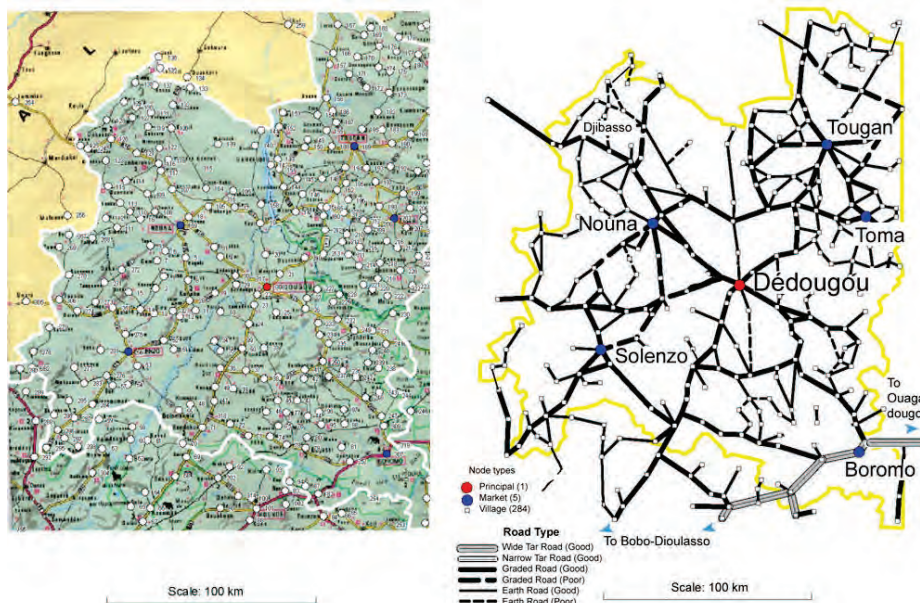


Figure 3.2. Boucle du Mouhoun region showing settlements (left) and the hub and spoke systems of the roads (right)

At present, none of the regional spoke roads are paved, although 44 km of the tarred national road linking Ouagadougou and Bobo-Dioulasso transits through the region at Boromo in the southeast. A national tar road linking Dédougou with Bobo-Dioulasso (180 km) is under construction. The regional road network comprises 1220 km of graded roads, ranging from good to very poor. Many roads are badly corrugated, due to heavy trucks such as those of the cotton company. Many of the smaller roads are impassable to large motorized transport in the rainy season from July to Septem-

ber. There are rain barriers to stop heavy vehicles travelling on the roads immediately after heavy rain, but these are not always effective. There are very many tracks, paths and cycleways that link villages to other villages and to the road network. All transport operators and rural people complained about the state of the roads, but the Director of Transport argued the situation was not bad, considering the maintenance budget and traffic volumes.

TRANSPORT SERVICE HUBS, PROVINCIAL FLEET AND TRAFFIC FLOWS

National transport to Ouagadougou and Bobo-Dioulasso (buses, lorries and bush taxis) operate from Dédougou and most regional towns. A local businessman has invested in a private bus terminal (Liza Transport) offering daily services (passengers, mail and money) to national cities with onward international connections.

There is some cross-border transport with Mali, including dry season corridor transport of fuel tankers from Togo to Mali. The cotton company, Sofitex, has a large transport operation, with imported fertilizer from Togo and cotton exports. Its large articulated trucks do not generally transport passengers or other goods, and their main local impact is road wear and corrugation.

Each sub region ('province') has an administrative centre in a market town that acts as a small transport hub. There are also other important rural markets. The biggest is at Djibasso (northwest), a small town that has a large market every Thursday, attracting thousands of people, the majority of whom travel by intermediate means of transport. On market days, an estimated 3000 bicycles, 1500 carts and 300 motorcycles bring people and goods to the market for distances of up to 80 kilometers. About thirty rural taxis and trucks also serve this market. There are many smaller but important rural markets that have not developed into towns, and so are not obvious from road maps. Some are held in small villages but attract hundreds of people from tens of kilometers away, often travelling on unmapped tracks by bicycle, cart or foot.

Between the various towns in the region, there are three main types of public transport. Most are over twenty years old.

- Small bush taxis, such as Peugeot pickups
- Larger bush taxis, mini-buses and the old 20–30-seater Renault Super Goellette midi-buses without glass windows
- Large trucks, known generally as ten-ton trucks, including old Mercedes lorries.

The rural taxis, large and small operate on standard routes throughout the year, subject to road conditions. The operators of the larger trucks (to which bush taxi drivers aspire) are more opportunistic. In the dry season they enter villages so that they, or contracting grain traders, can purchase grains and transport these to the north of the country. Trucks from the north also come into the region in the dry season to transport grains. Poor roads mean that trucks cannot enter villages in the rainy season, and they seek out other routes and markets. Wherever they go, they carry large numbers of people, sitting on of the sacks (or hanging off the sides when all the sacks are occupied).

It is common for these trucks to transport fifty passengers, and one hundred passengers are not unusual. Bicycles are sometimes carried free of charge and hang off the sides.

Intermediate means of transport are very important. Bicycles are the most common, with one regional estimate of 100–130 bicycles per 100 households. At markets, it is usual to see several hundred bicycles parked. Small motorcycles are also important, but less common. At markets, around 20–50 motorcycles may be parked. Donkey carts are widely used, mainly for intra-village and farm-village transport, but also for travelling to and from markets. Between twenty and fifty donkey carts may be seen at a typical, medium-sized periodic market. There are also ox and horse carts. In the north, public services using horses pulling four-wheel wagons are increasing.

A summary of the regional fleet is given in Table 3.2, together with estimates of values (cost of acquisition). Investment in intermediate means of transport is very much greater than the investment in vehicles used for motorized transport services. According to estimates, the regional fleet of motor transport cost about USD 1.6 million (the purchase price of the second hand trucks and taxis). Investment in intermediate means of transport has been much greater, at about USD 35 million (the overall purchase price of the very many bicycles, carts and motorcycles).

Table 3.2 Estimates of the transport fleet operating in Boucle du Mouhoun

<i>Transport type</i>	<i>Estimated numbers</i>	<i>Unit value (USD)</i>	<i>Overall value (USD million)</i>
Trucks	30	32000	1.0
Buses (20+ seats)	30	12000	0.4
Rural taxis and minibuses	20	12000	0.3
<i>Subtotal: Large motorized</i>	80		1.6
Motorcycles	10,000	800	8.0
Animal-drawn carts	10,000	250	2.5
Bicycles	200,000	120	24.0
<i>Subtotal: IMTs</i>	220,000		34.5

Notes: estimates based on field observations. These figures are for vehicles mainly used for transport of people and goods within the area on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars, the fleet of vehicles operated by the cotton company and vehicles that only enter for seasonal markets. Bicycle numbers based on socio-economic surveys that suggest 100–130 bicycles per 100 households. Carts estimated at average of ten carts per village.

Transport periodicity and seasons

Traffic flows in the region are greatly influenced by periodic markets, by the annual rains and by the seasonal produce harvests. There is a complex system of markets, some of which are held daily, every three days, every five days or weekly. Some markets attract thousands of people, the majority of whom travel by intermediate means of transport or on foot. An example of the surge of traffic associated with markets was seen on a small track leading to Djibasso market. On a normal day, there would be only about thirty animal-drawn carts on this track. However on the day of the large Djibasso market, the survey counted a twenty-five fold increase in traffic, with 370 donkey carts,

300 horse carts, 36 ox carts and 25 horse wagons (with four wheels). Similarly, on the main road to Djibasso, there is very little motorized transport for most of the week, but a surge of trucks, buses and rural taxis on the market day.

During the rainy season, many of the minor roads become impassable for several weeks. Even on main roads, vehicles can become stuck and journey times increase. This means that motorized traffic in the rainy season is less than in the dry season. After the harvest, when the rains have stopped and the road have become passable, trucks from other regions arrive with buyers to purchase sorghum, millet and maize. Motorized traffic in the region is greater in December than it is in August.

Traffic flows and patterns

An idea of the regional traffic flows in the Boucle du Mouhoun region of Burkina Faso can be gained from Figure 3.3 which summarizes some of the information gained from the traffic counts. The tables provide indicative figures of daily traffic along representative spokes (not necessarily at the actual points indicated). As noted above, most roads show considerable periodicity associated with seasons and markets, and so a market day might have much more traffic and a non-market day less.

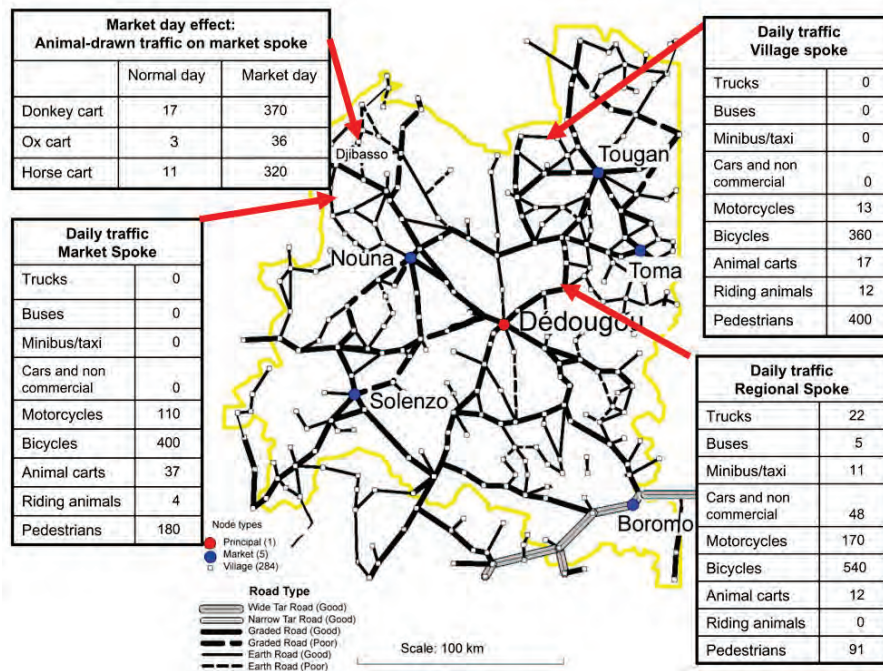


Figure 3.3. Illustrative daily traffic flows in Boucle du Mouhoun region.

Schematic map of road system showing 'typical' traffic flows (from various count locations, averaging market and non-market days) and counting in both directions.

Large motorized vehicles (trucks, buses, rural taxis and cars) are largely confined to the main regional spokes. On the minor roads and tracks (village and market spokes) the commonest means of transport are bicycles, small motorcycles and animal-drawn carts. Unless villages lie on main roads,

they are unlikely to have any public transport services. The villages will be visited occasionally by traders, government/NGO vehicles and rural taxis chartered by a resident or relative.

The gender-disaggregated counts showed that about a quarter (24%) of the 2000 bicycles counted were ridden by women, but only 2% of the 600 motorcycles were. In urban areas, including Dédougou, the proportion of women riding motorcycles is much higher than this. Women were driving 13% of the 900 animal-drawn carts counted. There were no clear gender-related patterns in the pedestrians and their loads: about half of pedestrians were women, and they were equally likely as men to be carrying small or large loads.

TRANSPORT POLICY AND REGULATORY ENVIRONMENT

Transport policy

At the national level, there exist policies concerning national transport, international transport links and rural transport. Emphasis is on ensuring access to international ports, further developing the network of paved national roads and ensuring the maintenance of rural roads. An updated Road Fund system has been established, but is not yet running. This fund is only intended for the maintenance of the main classified roads, and is not designed to fund the smaller unclassified roads and tracks and cycle ways. While there is a Rural Travel and Transport Program, it is small and has had little impact on the Boucle de Mouhoun Region. There are no active policies or programs concerned with rural passenger transport, rural freight transport or the use of intermediate means of transport. These are left to the private sector, with relatively little planning or regulation.

Regulatory framework

The regulation of road transport within Burkina Faso is determined by the legislation AN IV-023/CNR/TRANS of 6 February 1987. The framework allows anyone to start a public transport service for passengers and freight, providing they conform to the various regulations. The first requirement is an operating license ('carte de transport') which is valid throughout the country and issued by the Ministry of Infrastructure, Transport and Housing. All public transport vehicles must have two types of insurance, third party (civile) and transport operators insurance (*Assurance à responsabilité contractuelle*). Vehicles require an annual certificate of fitness issued by the local office of the Ministry of Infrastructure, Transport and Housing. Transporters also have to pay local fees for using the transport terminal (parking dues) as well as local taxes. The government has introduced a transport tax determined by vehicle size rather than earnings. This transport sector tax (*Contribution du secteur transport*) replaces three previous taxes known as *Patente*, *Bénéfice Industriel et Commercial* (BIC) and *impôt forfaitaire sur le revenu* (IFR). Drivers must have a personal driving permit, appropriate to the vehicle. Examples of the official costs of complying with these regulations are given in Table 3.3.

Table 3.3 Some costs of complying with transport regulations in Burkina Faso

Regulatory requirement	Rural Taxi (pickup)		Truck (10 tons)	
	FCFA	USD	FCFA	USD
Registration certificate	8,000	16	8,000	16
License	10,500	21	15,000	30
Insurance Third Party	100,000	200	150,000	300
Insurance Operators	100,000	200	146,000	292
Parking fees	2,500	5	2,500	5
Annual technical test	24,000	48	20,000	400
Tax: Transport sector	80,000	160	80,000	160
Total	325,000	650	421,000	843

The personnel of five ministries are involved in enforcing the regulations:

- transport ministry, responsible for vehicle testing and control barriers.
- local government authorities (le *ministère de l'Administration territoriale*)
- defense ministry (responsible for the paramilitary gendarmes)
- justice ministry (responsible for police and courts)
- ministry of finance (responsible for tax collection and customs).

While it is illegal for freight vehicles to carry passengers, such transport is very important for people in the Boucle du Mouhoun region of Burkina Faso. Because the regulating authorities (traffic police and gendarmes) understand this (and use such lorry transport services themselves when required), there are few attempts to prohibit these transport services. There are also various safety regulations concerning vehicle speeds, vehicle condition and numbers of passengers, but these are widely ignored in the rural areas.

There is no regulation for prices, but buses and rural taxis have to apply to operate on specific routes. This is controlled by the local transport authorities in discussion with the local transport association. The association also controls queuing for loads in the urban terminals controlled by the local authorities, but in the Boucle du Mouhoun Region, the association is not very dynamic or powerful. One private terminal of high standards has been established in Dédougou by Liza Transport, and this is not regulated in collaboration with the transport association.

Most intermediate means of transport are for personal use, and do not provide recognized transport services. There is little or no regulation of intermediate means of transport, although motor-cycles are required to have registration, licensing and insurance.

Barriers and 'tips'

The regional roads have various control barriers, including police, customs and forestry. These seldom delay private vehicles but transport operators must stop, and it is customary to pay something, generally 500 or 1000 FCFA (USD 1–2). The bigger transporters pay more. On the Dédougou

/Djibasso road there is normally little traffic and only one barrier for most of the time, but five appear for the busy market day. Transporters considered the charges paid at barriers to be a normal part of daily life: a routine cost rather than an unfair tax on their livelihoods. While transporters accept the principle of rain barriers that temporarily close roads after heavy rain, trucks in a hurry are probably able to make small payments to barrier staff to encourage lax enforcement.

Costs of passenger and freight transport

Figure 3.4.illustrates some of the passenger fares and freight charges for different transport types and road types in the region. These are examined in more detail in the subsequent sections.

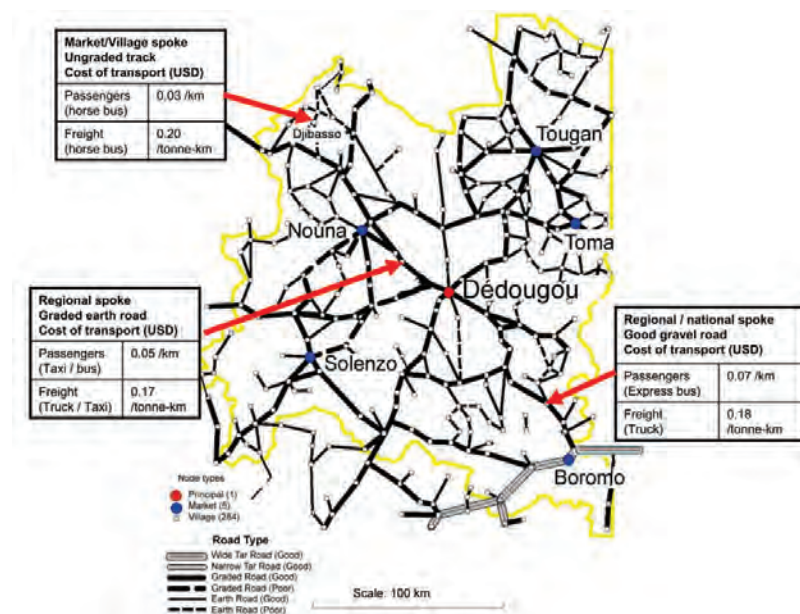


Figure 3.4. Illustrative passenger and freight tariffs for various vehicles operating on different spokes in the Boucle du Mouhoun region of Burkina Faso. See associated text and tables for further information.

Examples of some of the costs of passenger transport in the Boucle du Mouhoun region of Burkina Faso are given in Table 3.4. It must be stressed that there are very few regular public transport services of any type. Along the main inter-urban routes there are some express buses and minibuses, charging about USD 0.08 per kilometer. On the same routes and other main regional spokes there are irregular rural buses, rural taxis and large trucks that carry passengers for similar prices of USD 5–11 cents per kilometer. Prices tend to be stepped in units of 500 FCFA (USD 1), and the higher prices tend to be just after a ‘step’ (notably when the price doubles from 500 to 1000 FCFA between two ‘fare stages’).

In the north of the region, there are horse cart services, and these generally charge less at USD 2–3 cents per kilometer, with much smaller fare steps of 25 FCFA (USD 5 cents). However, the great majority of people in the region do not have access to public transport, as most village and market spoke roads and tracks have no regular transport services operating. It is perhaps surprising that informal professional transport services based on bicycles and motorcycles have not developed.

People in many villages stressed the importance of such vehicles for urgent travel, but there were no formal tariffs for such transport, and if money was paid, it was intended to cover the cost of fuel. The only services based on intermediate means of transport are the horse buses and these have clear tariffs, known by operators and users, for passengers and freight.

Table 3.4 Examples of passenger fares in the Boucle du Mouhoun region of Burkina Faso

<i>Transport Type</i>	<i>Start</i>	<i>Finish</i>	<i>Spoke type and road construction</i>	<i>Distance km</i>	<i>Price FCFA</i>	<i>Price / km USD cents</i>
<i>Rural taxi</i>	Nouna	Djibasso	Regional, graded	60	1500	5
	Dédougou	Nouna	Regional, graded	55	1500	5
	Solenzo	Dédougou	Regional, graded	87	3000	7
	Daboura	Solenzo	Regional, graded	18	1000	11
	Dédougou	Safané	Regional, graded	47	2000	9
<i>Express bus</i>	Safané	Siby	Regional, graded	43	2000	9
	Dédougou	Boromo	Regional, graded	110	3000	5
	Dédougou	Tchériba	Regional, graded	42	1500	7
	Dédougou	Bourasso	Regional, graded	55	2000	7
	Dédougou	Nouna	Regional, graded	57	2000	7
<i>Horse cart</i>	Nouna	Dokuy	Market, earth	45	500	2
	Nouna	Djibasso	Regional, graded	60	500	2
	Dokuy	Soun	Market, earth	5	75	3
	Dokuy	Ilabelokolon	Market, earth	8	100	3
	Djibasso	Bwankuy	Market, earth	7	75	2
	Djibasso	Nairena	Market, earth	4	50	3

Note: the practice of fixing fares in increments of 500 FCFA (USD 1) for motorized public transport creates some pricing anomalies

Examples of some of the costs of freight transport in the Boucle du Mouhoun region of Burkina Faso are given in Table 3.5. Most people in the region do not have access to freight transport services. In the dry season, trucks owned or hired by grain traders travel to villages to purchase harvested produce, but for most of the year neither trucks nor rural taxis enter villages away from the main roads. On the main regional spokes, there are bus, truck and rural taxi services that will carry baggage and produce, and the cost is in the region of USD 0.15–0.22 per ton-kilometer. On the small tracks in the north, horse carts will carry freight for about USD 0.15–0.30 per ton-kilometer. In most of the region, agricultural produce and purchased goods are carried by people themselves or on intermediate means of transport (carts, cycles, motorcycles) to which most families have access. If someone has a major load of produce, they have to travel to a town to negotiate the hire of a pickup or truck, which might cost USD 0.50–2.00 per vehicle kilometer, depending on vehicle type, load and distances. A recent detailed study showed the cost per ton-kilometer for agricultural produce varied greatly with type of vehicle, distance and age of vehicle, with large vehicles cheaper per ton (if a full load), and short distances being up to ten times more expensive per ton-kilometer than long runs. This study found the mean cost of rural freight transport was USD 0.36 per ton-kilometer by pickup and USD 0.22 per ton-kilometer by truck, with lower prices charged by the older vehicles (Sirpé, 2002). These figures are in line with the costs cited by respondents.

Table 3.5 Examples of freight costs in Boucle du Mouhoun region of Burkina Faso for transporting 100 kg sack of grain

<i>Mode of transport</i>	<i>Start</i>	<i>Finish</i>	<i>Spoke/road type</i>	<i>Distance</i>	<i>Price per ton-km</i>		
					<i>Price</i>	<i>CFA</i>	<i>USD</i>
Truck	Solenzo	Dédougou	Regional, graded	87	700	80	0.15
	Nouna	Djibasso	Regional, graded	60	600	100	0.19
	Dédougou	Nouna	Regional, graded	55	500	91	0.17
	Dédougou	Kara	Regional, graded	22	250	114	0.22
Horse cart	Djibasso	Pia	Market, earth track	14	250	179	0.34
	Djibasso	Bomborokoura	Market, earth track	50	300	60	0.11

KEY OBSERVATIONS AND LESSONS LEARNED

Urban-rural differences

While the region is reasonably ‘typical’ of the rural areas of Burkina Faso, rural Burkina Faso is very different from the country’s two large urban centers. One estimate suggests that 70% of the country’s motorized vehicles operate in and around Ouagadougou (population 1.5 million), and 20% operate in and around Bobo-Dioulasso (population 400,000). The remaining ten percent of the national fleet operates in the rural areas (population 11 million).

The towns in Boucle du Mouhoun are all small (generally 30,000 or fewer people). Most of the traffic in the towns comprises two-wheeled transport: bicycles, motorcycles and donkey carts. Women use a relatively high proportion of these (perhaps one third). In rural areas, women also use these transport types, but the proportion of women users is much lower.

Importance of markets and the ‘invisibility’ of some hubs and spokes

The Boucle du Mouhoun region has a complex and effective system of markets, some operating daily (Dédougou town), some weekly (Djibasso) and some on three or five day cycles. Most villages are within ‘reasonable’ cycling distance (up to 50 km) of two or three markets. The region has low levels of motorized transport, high ownership of intermediate means of transport and flat, savannah conditions that allow simple paths and tracks to be developed and kept open by regular use. Local paths and cycle ways that are not on regional road maps are very important for the movement of people and goods. A relatively high proportion of medium distance (5 to 80 km) regional transport takes place on such tracks that may be ‘invisible’ from the main road network.

Rural people consider themselves in relation to several hubs, of which some are permanent administrative hubs and others are temporary market hubs, which may be reached by cart and cycle tracks of up to 80 km passing through the ‘bush’. Since some of these markets and tracks are not obvious

from the regional road maps, it appears that the mental ‘maps’ of the area according to rural people may differ from the formal maps used by the regional authorities. Effectively some important hub and spoke market systems appear ‘invisible’ in regional road maps. Traffic counts on the main roads are likely to seriously underestimate the actual levels of mobility and trade in the rural areas.

Local production of bicycles and motorcycles

Burkina Faso is famous for having large numbers of bicycles and light motorcycles. In the capital, Ougadougou, there are some cycle lanes with special traffic lights that allow two-wheeled transport to cross some junctions separately from larger vehicles. One reason for the great ‘success’ of bicycles and motorcycles has been the local supply system (the relatively flat terrain and suitable climate are also considered positive factors).

Local factories produced bicycles and motorcycles of French designs (notably Peugeot). The bicycles and motorcycles were sold at relatively expensive prices (80,000 FCFA or USD160 for a bicycle), protected by customs tariffs. Imported bicycles had to pay 46% duty on a minimum customs value of USD 50, plus 18% VAT and so there was at least USD 30 of tax on an imported bicycle. As European prices increased, the components for bicycles were increasingly imported from India. In recent years, local production facilities have been unable to compete on price with Chinese bicycles and motorcycles and all local production has now stopped or is in the process of stopping. Most bicycles and motorcycles now arrive in boxes from China with all main parts assembled, for local final assembly.

The low cost of imported products means that it is hardly worth the cost and effort of nominal local manufacture that would allow a more favorable customs tariffs (26% rather than 46%). Some importers seem to be able to ‘negotiate’ favorable customs terms with ‘sympathetic’ customs officers. This means the actual tax paid is often below the official ‘protective’ tariff. Importers see little or no advantage in incurring the various expenses associated with local production.

The bicycle and motorcycle markets in Burkina Faso appear set to become dominated by Chinese imports with prices falling. In addition to the small motorcycles widely in use, larger and more powerful 175 cc Chinese motorcycles (as used in Nigeria and Cameroon) are likely to increase also.

Importance of bicycles and potential for price reduction through de-taxing

In Burkina Faso, bicycles are means of transport and production for rural people. Women and men use bicycles to access farms, markets and services, improving the productivity and revenue of rural households. Although bicycles are common in Burkina Faso, they are still not widely owned by the poorest rural families due to their cost.

In recent years, prices have fallen (from 80,000 FCFA for locally produced Sifa bicycles to 25,000 FCFA for imported Chinese bicycles, ie, from USD 160 to USD 50). Nevertheless, bicycles are still expensive for rural women and men.

Burkina Faso could follow the 'pro-poor' policies of some other African states by removing import duties from bicycles altogether. Existing taxation on bicycles is high (it is estimated at USD 30, although given the present selling price of bicycles is now USD 50, it seems that this rate of tax is not always paid). The high price of bicycles is restricting the access of poor people to the productive advantages of bicycles. It is also encouraging importers to 'negotiate' lower tax bills, so that the government does not necessarily receive its high rate of tax. It is arguable that the government would benefit more, in the medium term, from the greater ability of poor people to produce more and access markets, using the benefits of bicycle transport.

Importance of animal power

Animal power is very important for rural transport throughout the Boucle du Mouhoun region, with the numbers of carts and work animals greater in the northern areas. Donkey carts are used in and around most villages. Ox carts are used in smaller numbers throughout the region. Horse carts tend to be used only in the north which is drier. Horses are fast, but relatively expensive. Horses are not as robust as the cheaper donkeys. Oxen may be slower, but they are strong and appreciate in value as they grow larger. Some donkeys and horses (and a few camels) are used for riding, and some donkeys are used for pack transport. Because of the diversity of animal power technologies (different species, types of cart and numbers of animals in use), the traffic count forms used for the surveys had to be modified to capture the variety of transport systems using work animals.

In the northern markets much of the transport between villages and markets (distances of between 10 and 80 km) is based on animal-drawn carts. The carts transport grains, fuel wood, people, building materials and manufactured goods. Animal drawn carts are quite expensive, and more people would use and own carts if they were cheaper, or if rural credit were available to purchase them.

Transport services provided by intermediate means of transport

Burkina Faso has large numbers of two-wheeled intermediate means of transport including bicycles, motorcycles and animal-drawn carts. These are mainly owned and operated by individuals for their own use. There are few, if any, public transport services based on two-wheeled transport (bicycles, motorcycles or carts).

Two-wheel animal drawn carts are mainly operated for family use, and the transport of other people and their goods is generally based more on favors than financial considerations. In the north of the country, some transporters use four-wheeled wagons ('buses') that are pulled by horses. These often operate on a commercial fare-paying basis, with distinct prices for passengers and for goods over various distances. The use of such four-wheel horse 'buses' appears profitable and numbers are increasing.

In nearby Nigeria and Cameroon, motorcycle taxis are common in both urban and rural areas. In East Africa, bicycle taxis are common in some rural areas. In several African countries, people operate animal drawn carts (particularly horse carts) as income-generating transport services. There appears to be little, if any, evidence of such services in Burkina Faso. Motorcycle taxis have not become established even in the city of Ouagadougou. One reason given is that it is demeaning to

transport someone for money. Another possibility is that the common motorcycles and ‘moby-lettes’ are relatively underpowered for such services. With cheap 175 cc Chinese motorcycles now coming into Burkina Faso, there may be more scope for commercial rural transport services based on motorcycles.

Motorized transport operators

While some new transport enterprises owning several vehicles operate on inter-urban and international routes elsewhere in Burkina Faso, only one transport firm (Liza Transport) operates in the Boucle de Mouhoun. This mainly provides national-level transport services, although people are able to travel within the region, to and from the towns and large villages that situated along the operating routes.

Private individuals, as opposed to larger transport firms, own most of the motor vehicles that provide transport services within the region. Some vehicles are owner operated and some have hired drivers. Very few transporters own more than one vehicle. The fact that transport provision is mainly in the informal sector (‘artisanal’) industry restricts the development of ‘economies of scale’. Small-scale transporters cannot spread their operating costs and risks across several vehicles and routes, and therefore try to ensure they make an operating profit on each and every journey, even if this means waiting a long time for a full load.

Most transport operators in the region are running very old vehicles. It was difficult to obtain accurate figures on transport costs, as most owners do not use (or understand) the planning tools, record keeping, accounting systems and budgeting techniques used by formal sector transporters. Operators claim that their incomes from transport are low, and that it would be difficult to replace their vehicles if they were to breakdown completely. It appears that the investment cost of the vehicles has often come from non-transport income (e.g., relatives abroad, trading profits).

There is a syndicate of transport operators, but its officials admitted it was not very strong, and not all transporters paid their dues. It organized queuing for loads in Dédougou, and some other transport terminals, although this was not always very strict. Due to low demand at the urban terminals, transport operators often left without a full load, hoping to pick up custom along the route. In general, there seemed to be little concern about competition, despite the fact that an itinerant ten-ton lorry could pick up a large number of passengers along a roadside.

Gender and transport

In much of the world, including most African countries, men are the main operators of transport devices, including intermediate means of transport. In some countries it is unusual to see women riding bicycles, motorcycles and animal drawn vehicles. This is not the case in Burkina Faso.

In urban areas (including Ouagadougou and small towns like Dédougou), women ride a relatively high proportion (perhaps one third) of all bicycles and motorcycles. In rural areas the proportion is lower, but it is still common to see women on bicycles. Men own most rural bicycles so that rural women riding bicycles are generally riding the bicycle of their husband (or a male relative). Most

rural women would like to own bicycles, but they are relatively expensive, and women have less access to money than men. Some women cycle thirty kilometers or more to sell goods, to access shops and medical services and to visit friends and family.

Not many rural women ride motorcycles. The number of rural motorcycles is very small – some villages visited only had between two and five motorcycles, compared with thirty to sixty bicycles. Some of these urban-based women have bought their own motorcycles, using income from their small commercial enterprises (trading, making clothes or selling food).

Women operate carts pulled by donkeys in many parts of the country. In the northwest of the Boucle du Mouhoun region, women also operate carts pulled by oxen and by horses. Most carts are purchased and owned by men.

Safety

Large buses operate on national routes, but pickups, lorries and ‘mixed transport’ midi-buses provide most transport on the regional and local routes. Thus most large-scale rural transport is ‘mixed’ transport, with goods and people in the same vehicle. All parties accept that this is not ideal, but is inevitable in present circumstances. When trying to gauge the maximum payload of the motorized transport, the operators gave the classic response ‘a bush taxi is never full, there is always room for one more person!’

Women travelling on top of the 10-ton lorries generally sit in the middle and this is clearly safer for them and the baby that is often with them. Men are more likely to travel unaccompanied and are willing to sit on the edge of the trucks and the roofs of the bush taxis.

Very few bicycles have front brakes. The cost of brake blocks (50 FCFA or USD 10 cents) seems cheap, but rural people do not seem to regard this as an important purchase, and use their sandals for braking.

Microcredit

Most rural people do not have access to credit to buy means of transport. There are two NGO initiatives that could help to improve the situation. *Les Caisses Villageoises d’Epargne et de Crédit Autogérées* (CVECA) is a network of autonomous village savings and loans banks established with the help of the French NGO *Centre international de développement et de recherche* (CIDR) with funding from the European Union. Such banks mobilize local savings, and allow them to be used for rural loans, including loans to buy means of transport. *L’association pour le développement de la région de Toma* (ADRTom) in Nayala province, launched a scheme to assist women (and men) to buy second-hand bicycles donated from Europe. It has imported three containers of 600 bicycles, but its cash-flow problems mean that men (who can pay cash) are increasingly the beneficiaries rather than women (who generally need credit). Both NGOs recognize the importance of means of transport for improving rural livelihoods and incomes.

Transport for health services and for education

In the rural areas, people use whatever transport is available to access health services, for routine visits or for emergencies. On the main roads, people may travel by lorry or bush taxi to medical centers and hospitals. However, most people do not have reliable access to any form of four-wheeled transport, and so they may travel on bicycles, motorcycles or animal drawn carts, with hand-carried stretchers for the very sick.

Most children walk to primary school. Many would like to use bicycles, but they are generally unaffordable for use by children. Secondary schools are generally on the outskirts of towns, and people from far away villages find accommodation with the town. It is quite common for children to cycle to secondary school, but distances are seldom more than five kilometers.

Transport for handicapped people

Tricycles for handicapped people are relatively common in Burkina Faso, and they can be seen in rural and urban areas. They are generally donated by local charities and religious organizations. It appears that men mainly operate them, which suggests that women with similar handicaps may have greater transport problems.

One handicapped person living in a village was interviewed. He would sometimes travel by bush taxi to town. The bush taxi charged to carry the tricycle (2 dollars for the passenger, 1 dollar for the tricycle). Due to the high cost of transport, and his low income (he repaired watches and torches), he sometimes travelled long distances by his hand-operated tricycle to save the fare. Most years he had travelled to Bobo-Dioulassou (about 180 km), taking four days each way and staying in villages.

CONCLUSIONS

The Boucle du Mouhoun region has a small and quite old fleet of motorized public transport vehicles, comprising about 50 rural taxis (pickups, small buses) and 30 large lorries. These operate from Dédougou and five market hubs. Poor infrastructure particularly in the rainy season is a major constraint to motorized transport services.

There is little evidence that national or local policies or regulatory systems have significant impact on rural transport services. There seems to be a vicious circle of low investment, low profitability, low transport frequency and low economic demand. Evidence from intercity transport, in Burkina Faso and elsewhere, suggests that transport demand can be consolidated and can grow with investment in new and predictable services.

Intermediate means of transport, notably bicycles, animal drawn carts and motorcycles, are extremely important, for both rural women and rural men, for distances up to 80 km. Although rural people have invested heavily in intermediate means of transport, their relatively high cost and the lack of access to credit is restricting their ownership in the villages, particularly for women. Increasing access to intermediate means of transport through lower prices and/or greater availability of

rural credit, should significantly improve rural livelihoods and access to important services (notably health and education).

In the Boucle du Mouhoun region, a significant proportion of regional transport (inter-village and village-to-market journeys) is conducted on small tracks rather than the main roads. The pattern of these tracks, and the complex system of markets is not clear from conventional road maps. Future transport planning should consider the importance of these tracks and intermediate means of transport and involve local communities in participatory discussions relating to infrastructure and the different means of transport.

CHAPTER 4: A RAPID ASSESSMENT OF TRANSPORT SERVICES IN THE SOUTHERN PROVINCE OF CAMEROON

summarised by Paul Starkey and Guy Kemtsop

INTRODUCTION TO THE SOUTHERN PROVINCE

The Southern Province of Cameroon covers an area of 47,190 km sq and has a population of about 500,000, of which 350,000 (63,000 families) live in rural areas. It is one of the ten provinces of the country, and although it represents 10% in area, it contains only 3% of the national population. The Province is divided into four divisions (Dja et Lobo, Mvila, Ocean and Vallée du Ntem), 22 subdivisions (each with one town) and 1185 villages. The capital of the province is the town of Ebolowa, which has a population of about 90,000 people. The province is bounded by the Atlantic in the west, the Littoral and Centre Provinces to the north and the Eastern Province to the East. Its southern boundary borders Equatorial Guinea, Gabon and Congo. Figure 4.1 shows the location of the Southern Province, its divisions and main towns.



Figure 4.1. Sketch map of Cameroon showing the Southern Province (left) and sketch map of the Southern Province showing its four divisions and main towns (right)

The province has about 900 primary schools and 125 secondary schools, including private schools. Almost all children attend primary school, but only one third go on to secondary school. There are nine health districts, each with a hospital or large health centre and a total of 226 health centers, of which about 30% are private (mainly run by churches).

The climate is warm (about 24°C) and humid, and the natural vegetation is tropical forest. Annual rainfall is 1200–2000 mm, with two rainy seasons (March to May and September to November). Most of the land is undulating hills, covered with forests with small-scale farm plantations within five kilometers of villages and some larger scale agro-industrial plantations (rubber, oil palm).

Forestry remains an important industry, even though many of the more valuable trees have already been extracted. The forests provide the hunting and gathering livelihoods of the small populations of Baka and Beyeele (Pygmy) ethnic groups. Agriculture is extremely important for rural people, and women are mainly responsible for growing and marketing the major food crops (yams, cassava, other root crops and plantains). Men tend to be responsible for the main cash crops that include cocoa, coffee, oil palm and rubber. Cocoa is particularly important, and much farm income is gained between September and December, at the time when itinerant cocoa buyers visit the villages. Most household capital expenditure, such as the purchase of bicycles and motorcycles, occurs immediately after receipt of cocoa revenue.

There are almost no large livestock (cattle, donkeys) and livestock production is mainly household poultry and a few pigs, sheep and goats. Hunting is important, and 'bushmeat' is commonly eaten, with some informal supplies to urban areas. Fishing is important on the Atlantic coast and along some rivers. Although there are many rivers that have fishing canoes and there is no long distance water transport in the province.

While all towns have electricity and telephone services, most villages do not. There is a very rapid increase in the ownership and use of mobile telephones, although coverage is still mainly in and around the towns.

ROAD NETWORK, CONDITION AND HUB AND SPOKE SYSTEMS

The road network in the Southern Province comprises 4300 kilometers of road, of which 12% are tarred. The roads are categorized as national (1106 km, 26%), provincial (368 km, 8%), district (960 km, 22%) and rural (1855 km, 44%). The ministry of public works considers that 45% of the network is in bad condition. Some roads are impassable during the rainy seasons, and a small number of rural roads are totally impassable. The ministry of health suggests that several health areas in the Southern Province are unreachable by its vehicles.

The main tar roads are based on the national hub and spoke system, with paved roads to the national capital of Yaoundé and the principal port of Douala. One good quality tar road runs from Yaoundé to Ebolowa and onto Amban and the Gabon border. A branch from this road passes to Sangmélina (good tar), and on towards Djoum and the border with Congo (graded earth road). The other main tar road passes from the Yaoundé-Douala highway and goes to the port and oil terminal of Kribi. This means that the pattern of good quality roads reinforces national rather than regional connectivity. The Ocean division (and the port of Kribi) and the Dja and Lobo division (and the town of Sangmélina) are connected to the national capital by good roads, but to the provincial capital (Ebolowa) by graded roads. This is shown in Figures 4.2 and 4.3.

This pattern of tarred roads means that the provincial capital of Ebolowa is connected to two important towns (Kribi and Sangmélima) by tar roads (good but longer) and by gravel roads (poor but shorter). Ebolowa and Kribi are connected via the Yaoundé-Douala highway (about 460 km) as well as by the unpaved direct route (170 km). Ebolowa and Sangmélima are connected via the converging tar roads that go in the direction of Yaoundé (distance via tar 242 km) as well as by the direct route (117 km). In both cases, the tar road allows faster speeds, greater comfort and a dependable arrival time. They do however take longer (if conditions are good on the gravel road) and use more fuel. No commercial operators travel to Kribi by the long tar road, but some private cars and civil servants opt for this route. Commercial mini-bus services tried to operate to Sangmélima via the longer tar route, but fuel costs were higher and most passengers were not prepared to pay extra to travel in comfort.

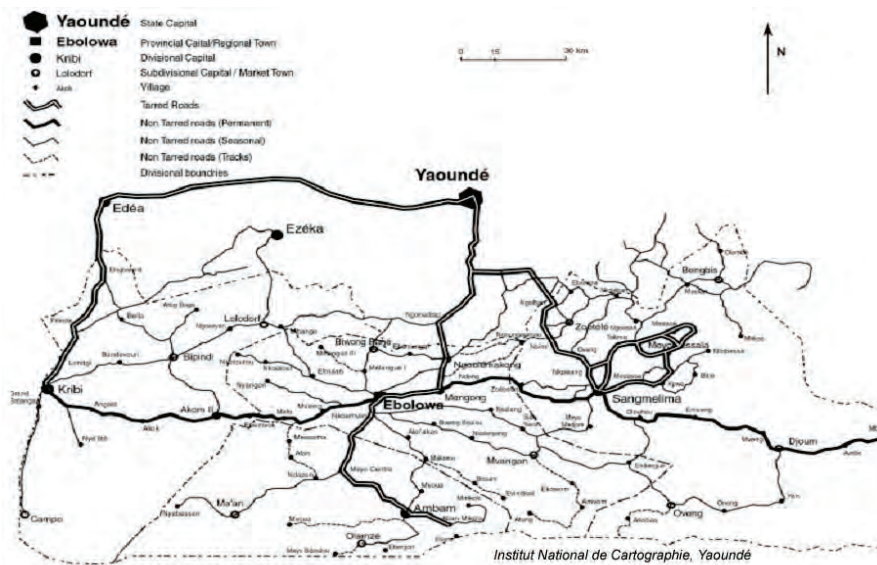


Figure 4.2. Diagram of the road network in the Southern Province showing also the Yaoundé-Douala highway to the north.

While the roads in the Southern Province are dominated by the national hub and spoke system, there is a clear regional hub and spoke system based on the Ebolowa hub. There are several key market town hubs, including Kribi, Sangmélima and Amban (all divisional towns). Other hubs are smaller, but important for their periodic markets, and these include Aban Miko'o, Djoum, Ma'an, Mvangan and Olamze.

Many of the smaller roads connect with the main roads in more than one place. They form a network offering several options for travelling between two locations. This is important when roads become blocked or temporarily impassable. Some of the route alternatives and circuits can be seen in the schematic diagram in Figure 4.3.

Figure 4.3. Schematic diagram of the road network in the Southern Province showing also the Yaoundé-Douala highway to the north.



Interconnectivity and high transport accessibility index

Another characteristic of the province is that almost most villages are located on the road network (although not necessarily on passable roads). Only a few people (foresters, hunters, fisher folk and Pygmy communities) live away from the roads. This means that there are very few genuine ‘village spokes’ (routes between large villages and small outlying villages). Most routes linking villages are part of the provincial road network, and the traffic on them is a mixture of short-distance inter-village transport and longer distance transport (village to market town, and market town to provincial town). This virtual absence of village spokes appears characteristic of the forest zone, with its low density of population and small number of settlements. It is unlikely that a similar situation would be found in the savannah zone in the north of Cameroon.

The fact that most villages lie on the road network and that rural taxis operate on most roads (going from/to one of the towns) means that most people in the province live very close to a ‘bus stop’. Mean distance from a bus stop is one of the international indicators of transport accessibility. Judged by this indicator, Southern Cameroon would therefore have an exceptionally high quality of transport, although taking into account low transport frequency, overcrowding, high prices and impassable roads, the reality is quite different.

Effect of road quality on transport services

The existence of alternative routes provides examples of the effect of road condition on rural transport services. In one example there are two routes covering the 40 km between Zoébéfam and the town of Sangmélina. There is the main national road (in poor condition) and a newly graded feeder road (in much better condition). Rural taxis and one transport agency have started to use the new route for some of their trips and this has dramatically increased traffic on the new road. For the villages on the ‘new’ route, transport fares have gone down by 50% and people’s mobility has in-

creased (with more trips to market each month). On the poor quality national road, rural taxis have decreased and some transport prices have increased. Surprisingly, motorcycles have decreased on the better road and increased on the poorer road, suggesting they cannot compete directly with four-wheel taxis over such distances, unless taxi frequency is very low.

In a second example, there are two ways of travel from Oveng to Sangmélima. The direct route (100 km) has some very difficult patches but passes many communities with transport needs. An alternative route is in better condition but has few villages with significant transport requirements and is twice the distance. The rural taxis all opt for the shorter distances and greater transport market, despite the bad state of the road.

Road sabotage

One strange phenomenon (reported and observed) is the deliberate sabotage of roads in villages. This causes accidents and vehicles may become stuck. It appears that the benefits to some villagers from their work in 'rescuing' vehicles are greater than the benefits from freely-passing traffic.

TRANSPORT SERVICE HUBS, PROVINCIAL FLEET AND TRAFFIC FLOWS

Much of the transport along the main roads is national-level transport, notably to and from the capital of Yaoundé and the port city of Douala. Transport agencies operate express bus and minibus services to Yaoundé from Ebolowa and all the main towns.

Although there are international boundaries with three countries, there is only a small amount of long-distance international traffic. Some trucks carry produce from Cameroon to Gabon, including tomatoes from the northwestern highlands. Most other international traffic is relatively local cross-border trade, including trucks that bring produce to and from various periodic markets held in villages in Equatorial Guinea, Gabon, Congo and Cameroon that are close to the frontiers.

All the passenger and freight transport services that operate within the southern province operate to and from a small number of transport hubs, notably Ebolowa, Kribi, Sangmélima, Ambam and Djoum. Most motorized vehicles will go to and from one of these towns each day. Some vehicles will start their journeys from one of the 17 other divisional towns. These towns may act as secondary hubs particularly for motorcycle transport. Examples include Mintom, Oveng, Olamze, Ma'an and Mvangan.

Estimates of the numbers of vehicles operating in the Province are given in Table 4.1. The two most common vehicles are 650 rural taxis (including minibuses and old hatchback cars) and about 20,000 motorcycles. Some of the rural taxis operate on intercity routes and some of these motorcycles are based in the towns. The total capital investment in motorcycles is higher than that of all other vehicles because of their large numbers and the fact that most of these first enter the province as new vehicles. Most trucks, buses and rural taxis are bought into the province when they are already quite old.

Apart from the high number of motorcycles (one motorcycle per five families), there are very few intermediate means of transport. There are no work animals or animal drawn carts. Some locally made wooden ‘bicycles’ exist. These are pushed uphill and can be ridden as they coast downhill. They are used for short distance transport and for children’s recreation. Metal bicycles are rare, with only one bicycle per 45 families. Bicycles are difficult to obtain and very expensive, costing about 90,000 FCFA (USD 180) and this is half the price of a second hand motorcycle.

Table 4.1 Estimates of the transport fleet operating in Southern Province

<i>Transport type</i>	<i>Estimated numbers</i>	<i>Unit value (USD)</i>	<i>Overall value (USD million)</i>
Trucks (below three tons)	110	10,000	1.1
Buses (20+ seats)	80	6,000	0.5
Rural taxis including minibuses	650	2,000	1.3
<i>Subtotal: Large motorized</i>	840		2.8
Motorcycles	19,000	700	13.0
Bicycles	2,000	160	0.3
<i>Subtotal: IMTs</i>	21,000		13.3

Notes: rough order of magnitude estimates based on field observations. These figures are for vehicles mainly used for transport of people and goods within the area on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars. Values are based on the approximate investment made by the purchaser: most large motor vehicles used in the region were purchased when over ten years old, while most intermediate means of transport used in the region were purchased new.

Transport periodicity and seasons

Transport is affected by seasonality with several different influences. Although the main food crops (yams, plantains) grow throughout the year, there are annual variations associated with cash crops, particularly the cocoa marketing season. There are also annual religious festivals and national holidays that affect traffic. During the two rainy seasons, rural traffic is affected as small roads become difficult or impossible to pass. There are periodic markets (weekly or monthly) that cause local surges in traffic flows. There is also a significant ‘weekend’ effect throughout the province. People living in towns maintain strong ties with their traditional villages. Major ceremonies, including funerals and weddings are held in villages at weekends so that people living in towns can attend. It is not unusual for urban people to drive several hundred kilometers to their remote villages for important weekend events. Rich people often build an expensive house in their traditional villages.

The main food crops (tubers and plantains) grow throughout the province and are relatively heavy (high water content) and low value. This means that transporting them long distances is not profitable and they tend to be marketed quite locally. Women close to markets transport these products by back-pannier, handcart (close to market only), rural taxi or motorcycle taxi. Some rural taxis are crammed to overflowing with plantains. Women in the more remote villages seldom walk long distances with such products (they are too heavy for the distances and the value). For these people, the main marketing opportunities come at weekends, when urban people visit their villages, providing opportunities for roadside sales (plantains, tubers, bush meat). There are similar ‘opportunistic’

possibilities of selling such produce when vehicles enter the villages to purchase cocoa, coffee, latex rubber and palm oil.

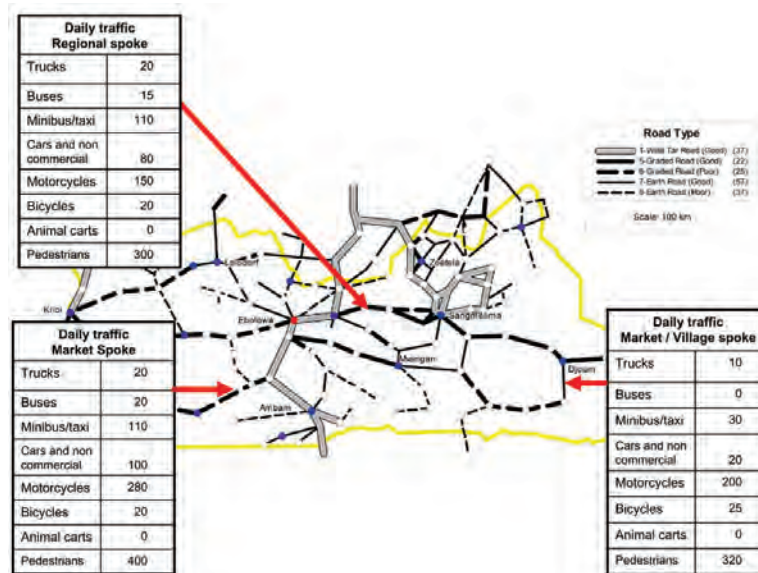
Traffic flows and patterns

An idea of the regional traffic flows in the Southern Province of Cameroon can be gained from Figure 4.4 which summarizes some of the information gained from the traffic counts. The tables provide indicative figures of daily traffic along representative spokes (not necessarily at the actual points indicated). As noted above, most roads show considerable periodicity, and so a market day might have more traffic and a non-market day less (details are provided in the full survey report).

Compared with the pilot surveys undertaken in other countries, the figures here show much higher levels of motorized transport. This partly reflects the national economic situation, the opportunities afforded by the forest, the relative proximity to the cities of Yaoundé and Douala and the strong family links that are maintained between urban people and their traditional villages. The traffic count figures on the various spokes do not show as much differentiation in traffic type and volume as were found in the pilot surveys in other countries. This is partly explained by the overlap in spoke function. Many roads thought to be primarily ‘market’ spokes were found to carry traffic of a local, provincial and national nature. Almost all villages lie on market or regional spokes and so there are few ‘village spokes’ which were defined in the survey methodology as tracks linking main villages to smaller villages and hamlets.

The gender-disaggregated counts showed that similar numbers of men and women were pedestrians, but that women were more likely to carry loads over 5 kg. Women frequently carry loads in special baskets supported on their backs. Bicycles, motorcycles and motor vehicles were mainly operated by men. In one traffic count location, five out of 32 counted bicycles were ridden by women.

Figure 4.4. Illustrative daily traffic flows in Southern Province, Cameroon. Schematic map of road system showing ‘typical’ traffic flows (averaging market and non-market days) and counting in both directions.



TRANSPORT POLICY AND REGULATORY ENVIRONMENT

Government policy and regulation

Cameroon has a rural transport policy that emphasizes the development and maintenance of rural infrastructure. A road fund has been set up and all road construction and maintenance work is now contacted out to the private sector. A system has been established for prioritizing roads at both national and decentralized levels, in order that scarce resources can be assigned to the roads that are seen to be important by local authorities and communities. The national poverty reduction strategy addresses transport issues, with emphasis on improving rural access through better roads. In the Southern Province, while there is widespread dissatisfaction with the state of the unpaved roads, there is evidence that the transport strategy is being implemented, and contracted maintenance work is being prioritized.

The national transport policy does refer to transport services and intermediate means of transport. In the Southern Province there is little evidence of any strategies relating to transport services or intermediate means of transport being implemented. The development of the use of motorcycles has occurred spontaneously. Some transport officials at national and provincial level appeared very negative about bicycles and their potential role in the Southern Province.

The Ministry of Transport has established control barriers on major roads to promote road safety and to control dangerous vehicle loads. However, genuine enforcement is minimal, and overloaded vehicles make payments in order to pass the barriers. Transport operators in Southern Cameroon have to deal with a range of other officials as well (police, paramilitary, customs, forestry) some of whom have control barriers on the main roads. These tend to intimidate transport operators, who often make small payments to allow them to pass through quickly. Because there are many barriers, the cost of these tips or bribes mounts up, as discussed below.

Transport associations exist in the main towns and control queuing in the council terminals. The development of transport agencies working from different terminals has reduced the importance of transport associations.

Regulatory processes

The Ministry of Transport regulates transport services, empowered by Law 2001/15 of the 23 July 2001 concerning land transport. All operators of passenger and freight transport services are regulated and required to travel with documents showing that they and their vehicles conform to the regulations, and that appropriate fees and taxes have been paid. At the numerous check points along the roads in the region, police and other officials regularly check documentation, and so most transport operators do carry valid documents. These include:

- Grey card issued by Ministry of Transport provincial office. This is the registration document issued to the vehicle.
- Personal driving license issued by Ministry of Transport provincial office.

- Operating permit of an appropriate categories issued by Ministry of Transport provincial office. Examples include:
 - 2nd category (vehicles of up to eight seats vehicles working within 40 km of the issuing town authorities, 7500 FCFA, USD 15)
 - 6th category (mixed transportation of people and freight between three divisions with modified lorries, 15000 FCFA, USD 30)
 - Motorcycle taxi (2000 FCFA, USD 4).
- Annual technical test certificate costing 3000 FCFA (USD 6) is required to all four wheel vehicles.
- Blue card issued by the Ministry of transport provincial office. This costs 15 000 FCFA (USD 30) for all four wheel vehicles and 4000 FCFA (USD 8) for motorcycles.
- Compulsory insurance certificate issued by a commercial insurance company. This annually costs 80,000 FCFA (USD 160) for most vehicles and 40,000 FCFA (USD 80) for motorcycle taxis.
- Pink card insurance, issued by a commercial insurance company, together with the insurance certificate. For all vehicles, the price is 1000 FCFA (USD 2).
- Local tax certificate issued by the local council offices. There are two main categories. ‘Tax in full discharge’ tax of 25,000 FCFA (USD 50) is paid by urban taxis and motorcycle taxis working within 40 km of the town. A much higher amount, up to 250,000 FCFA (USD 500) ‘Trading dues’ is paid by vehicles operating more than 40 km. The tax amount due is considered to be negotiable and the amount actually paid is said to vary greatly depending on the operator, the tax office and the individuals concerned.
- The road tax disc issued by Ministry of Transport provincial office
- Local council fees (applied for motorbikes only)
 - Daily operating fee 100 FCFA (USD 0.20)
 - Three-monthly fee: 2000 FCFA (USD 4)

Examples of the official costs of complying with these regulations are given in Table 4.2

‘Parking fees’ are imposed by local council authorities. Motorcycles taxis, which are the now the main means of public transport in urban and peri-urban areas in the Southern Province, have been specifically targeted with this tax, in order to regulate their numbers and gain local revenue.

Obtaining the necessary paperwork to comply with the all the regulations can be time-consuming and is not necessarily straightforward. Some people resort to paying ‘tips’ to facilitate the processes.

In addition to the paperwork and taxes, there are various regulations relating to the passengers fares, numbers of passengers allowed (in rural taxis, minibuses and motorcycles), axle limits, the separation of goods and passengers and the fitting and/or wearing of safety devises (reflectors, crash helmets, safety belts, high-visibility identification vests). There are special Ministry of Transport

checkpoints that are intended to enforce these regulations. However, the reality is that enforcement is very limited and localized, as will be discussed below.

Table 4.2 Some costs compliance with vehicle regulations

<i>Document</i>	<i>Motorcycle</i>	<i>Minibus</i>	<i>Light truck</i>
	<i>USD</i>	<i>USD</i>	<i>USD</i>
Registration certificate	40	100	200
License	60	100	130
Insurance	40	258	300
Local council operating fees	73	Not required	Not required
Parking fees	16	7	7
Local tax (trading dues)	40	100	300
Pink card	2	2	2
Blue card	4	32	30
Road tax disc	4	30	200
Annual technical test	Not required	10	10
Total	279	639	1179

Tolls, control barriers and safety

On the tarred national roads there are toll charges. For small vehicles these are 500 FCFA (USD 1). These appear to be efficiently collected, with no sign of avoidance or ‘negotiations’. The costs seem modest for drivers on the intercity routes who drive long distances on good roads. However, the operators of rural transport services do complain about the tolls. This is because the toll barriers are often situated close to towns, and rural taxis may have to pass through the toll barriers as they travel a short distance on the good road before branching off onto the unpaved routes leading to villages. Even if they officially operate on these minor roads, they still have to pay each time they pass the toll barrier (unlike bribe barriers where one payment a day is normally sufficient). Motorcycles do not pay charges.

Outside each town in the Southern Province of Cameroon is a series of control barriers, each set up separately by a different regulatory authority. Depending on the location, the authorities may include police, paramilitary, Ministry of Transport road safety, town council, customs or forestry. It is unusual for two authorities to share the same barrier. All vehicles providing public transport are stopped. Even if all papers are correct and the vehicle is immaculate, there is likely to be some fault found, which will be very time consuming to deal with. Some transport owners reported they never gave ‘tips’ to pass, but the great majority of transporters simply pay a fixed price (usually 1000 FCFA, about USD 2) to pass quickly. For example, an overloaded rural taxi with people sitting on the roof pays a fee at each barrier (including the ‘Road Safety’ barrier) and can pass. One payment a day is generally sufficient at each barrier, but with up to four different barriers outside each town on the main roads, the total payment mounts up. The overall importance of the bribes, in terms of vehicle running costs, varies with the route, the number of trips a day and the degree of overloading.

In some cases in the Southern Province, the cost of bribes was comparable to the cost of fuel, and this is shown in Figure 4.3.

The Ministry of Transport has a team of people to promote road safety. They mount barriers on main roads, and are meant to advise on a range of issues including seat belts, vehicle condition and safe loading. Advice is given, but there is little enforcement. From observations and traffic counts, it was estimated that rural minibuses and taxis generally operate with passenger loads 50% above their official seating capacity. It is generally agreed (by operators, regulators and passengers) that unsafe practices such as overloading are inevitable given the lack of transport and its high cost, relative to rural incomes.

On most earth and graded roads, there are rain barriers, operated by an agency of the ministry of public works. They are designed to stop heavy vehicles moving during and immediately after heavy rain, when the road surface is most vulnerable to damage. Few, if any, vehicle drivers like to wait at rain barriers, and commercial operators may lose valuable time or income by delaying their travel. Drivers therefore have a strong incentive to ignore the barriers, or bribe their way through them. Unlike the newly installed toll barriers on main roads (where salaried staff are supported by paramilitary authorities), the staff of rain barriers are largely unsupported, poorly paid and have little actual power. Therefore the rain barriers are largely ineffective.

Transport associations and agencies

In the Southern Province of Cameroon there are both transport associations and transport agencies (*Agence de voyage* in French). The associations, or syndicates, comprise operators of transport (mainly rural taxis, both cars and minibuses) that load at public transport terminals owned by town authorities. The associations are recognized by the local authorities and have the power to control queuing for loads at the main urban public terminals. They have little, if any, influence at the smaller hubs or at village stops. By organizing loading and queuing, the associations prevent anarchic scrambling for customers, but the queuing system means that customers and operators cannot really select each other. This lack of competition for customers (it is determined by the queue) means that operators have little incentive to provide a better vehicle or better service. This is particularly obvious in Southern Cameroon, where vehicles operated by association members are generally older and more battered, than the vehicles operated by the transport agencies.

There are two main types of transport agency operating in the Southern Province.

- **Private transport firms.** These are businesses that own fleets of buses and minibuses, and operate these from private terminals (bus stations). These mainly operate on long-distance inter-city routes with good infrastructure. These are similar to private bus companies in other countries.
- **Transport franchises.** These are private transport firms that offer franchises to other private transport operators to join them, to share their name and their transport terminals. These also operate from their own terminals where they arrange their own system of queuing. The existing franchises were each started by a transport operator who encouraged other transporters to join the franchise. Those joining kept ownership of their own vehicles but re-

painted them (taking on the ‘brand name’) and began to operate from the franchise’s own terminals (for a fixed cost and/or a percentage of takings). These transporters (the initiator and the subsequent partners) generally started as rural taxi operators, loading from the public terminals (with which they now compete). These franchises operate on the main inter-city transport routes (in competition with the bus companies) and also on some rural routes that have significant demand (in competition with rural taxis).

On the intercity routes, there is intense competition for the transport services and this is reflected in both prices and quality of service. Because the different transport agencies load at different terminals, the customer has to choose which terminal to go to. So people go to the terminal that provides them with the best price, quality, frequency and ‘brand image’. As a result, the travel firms provide newer and more comfortable vehicles, and better terminal facilities, and compete on price, frequency, security and ‘image’.

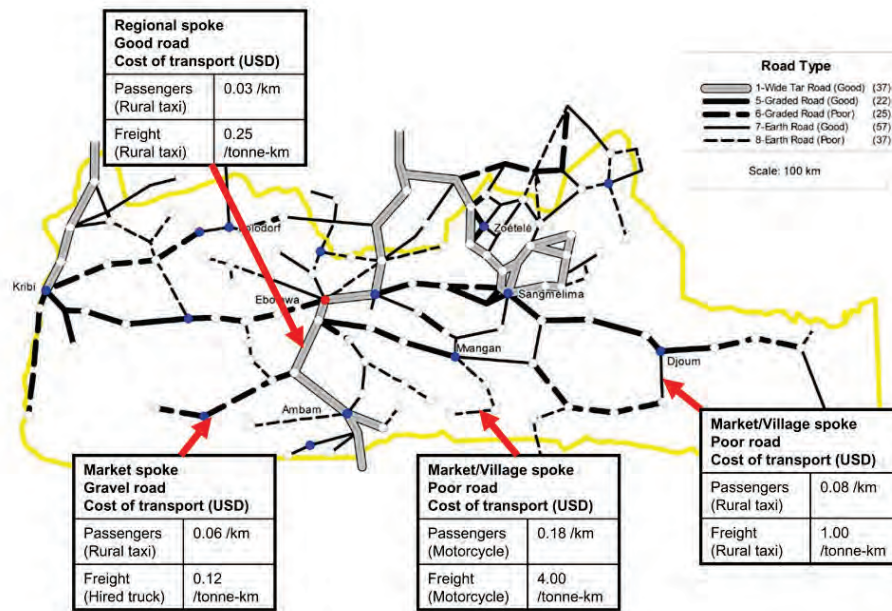
Only a few transport agencies operate on truly rural routes (as opposed to intercity routes). On some rural routes with plenty of transport demand, transport agencies, such as Kouma Voyages now encourage the passengers with better vehicles (generally minibuses), lower prices, better services and more secure terminals. All stakeholders agree that the transport agencies are having an effect on price, quality and reliability of rural transport services, and they are generating ‘brand loyalty’. At the urban terminal, one might expect that by dividing the passengers waiting for transport into three different queues (the council terminal and two different franchises) would increase average waiting times for everyone (and long waiting time is a major problem of rural transport). However, what appears to be happening is that when transport franchises start operating, the services improve and prices come down and the market increases, with more people travelling. In villages alongside transport routes, one might expect that people would invariably take the first vehicle to pass. However, people have been encouraged by lower prices, better vehicles and more regular and dependable services and have started to express strong brand loyalty.

There are not yet any transport franchises operating on rural routes with low transport demand. Only rural taxis that load in the council terminal operate on such routes, using old and battered vehicles. Motorcycle taxis may also operate on parts of such routes, but unlike rural taxis, motorcycles seldom travel long distances. The operators of rural taxis resent the fact that motorcycles (and some private cars) take away some of ‘their’ transport market.

Costs of passenger and freight transport

Figure 4.5 illustrates some of the passenger fares and freight charges for different transport types and road types in the region. These are examined in more detail in the subsequent sections.

Figure 4.5. Illustrative passenger and freight tariffs for various vehicles operating on different spokes in Southern Province, Cameroon. See associated text and tables for further information.



Some passenger transport prices are regulated and are equivalent to about USD 3 cents per kilometer. The actual prices charged vary from USD 2–9 cents per kilometer based on road type, traffic volume and distance. The higher prices are associated with poor roads, low traffic volume and short distances. Prices tend to be stepped in units of 500 FCFA (USD 1). Examples of prices and some of the contributory factors are illustrated in Table 4.3

Freight prices vary even more than passenger prices. The prices that are charged depend on the type of vehicle, the road and distance. The lowest prices per ton-kilometer are for long journeys in large trucks (about USD 10 cents per ton-kilometer). Rural taxis operating long distances charge about USD 15–30 cents per ton-kilometer. Motorcycles are much more expensive, with prices often in the range USD 0.50 to 5.00 per ton-kilometer. Short journeys on poor roads with relatively light loads (bunches of plantains) can be disproportionately expensive. This is exacerbated by the practice of fixing fares in increments of 500 FCFA (USD 1). For example, the cost of carrying a bunch of plantains on the mud road from Avebe-Esse to Sangmélima, a distance of 18 km is 1000 FCFA by motorcycle or 500 FCFA by rural taxi. This works out at USD 9.00 and USD 4.50 per ton-kilometer. Carrying bags of cement on the same route costs 1500 FCFA by motorcycle or 500 FCFA by taxi. This works out at USD 3.00 and USD 1.00 per ton-kilometer respectively. A fare of 500 FCFA for carrying a bag of cement in a taxi is charged on the Ebolowa-Amban route (90 km, tar), while 1000 FCFA is charged on the Ebolowa- Sangmélima route (117 km, graded). This works out at USD 0.22 and USD 0.34 per ton-kilometer respectively. Further examples of freight prices for different, distances, products and means of transport are given in Table 4.4.

Table 4.3 Examples of passenger fares by rural taxi and by motorcycle taxi in Southern Province, Cameroon

<i>Road type</i>	<i>Start</i>	<i>Finish</i>	<i>Distance km</i>	<i>Price FCFA</i>	<i>Price / km USD cents</i>
Rural taxi	Ambam	Meyo Centre	42	500	2
Main tar road, high traffic volume	Ambam	Ebolowa	90	1000	2
	Ebolowa	Meyo Centre	49	1000	4
Good road, low traffic volume	Ambam	Aban–Minkoo	27	1000	7
Good graded road, high traffic volume	Ebolowa	Akom ll	171	2000	2
	Ebolowa	Kribi	257	3500	3
	Ebolowa	Ma’an	121	2500	4
	Ebolowa	Nyabessan	157	3500	4
Poor road, low traffic volume	Ebolowa	Lolodorf	73	2000	5
	Ebolowa	Biwong Bane	30	1000	7
	Ambam	Ma’an	57	2000	7
	Ebolowa	Nkouékouk	60	2000	7
	Ebolowa	Mekomo	38	1500	8
	Ambam	Olamze	45	2000	9
Motorcycle taxi	Avebe-Esse	Sangmelima	18	1500	17
Poor road, low traffic volume	Sangmelima	Ngomeyap	22	2000	18

Note: the practice of fixing fares in increments of 500 FCFA (USD 1) creates some pricing anomalies

Table 4.4 Examples of freight costs in Southern Province, Cameroon

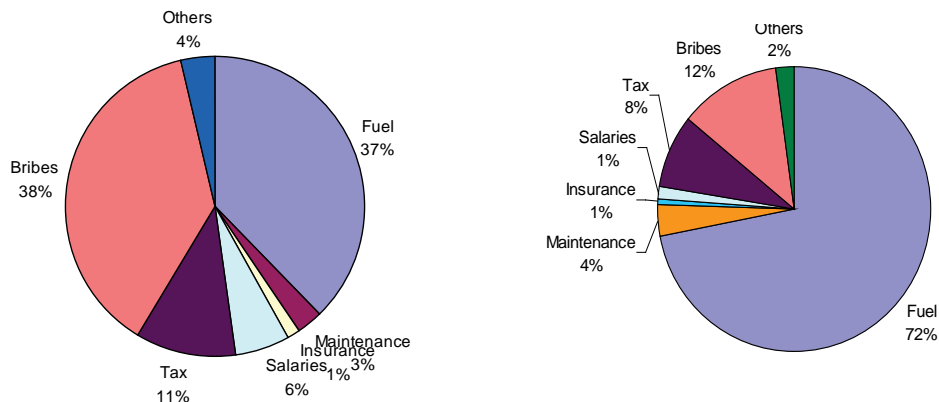
Mode of transport	Start	Finish	Spoke/road type	Distance Km	Price CFA	Price per ton-km	
						CFA	USD
100 kg sack of tubers							
<i>Rural taxi</i>							
	Avebe-Esse	Sangmélima	Market, poor earth	18	1000	556	1.06
	Ebolowa	Sangmélima	Regional, graded	117	1500	128	0.24
	Ebolowa	Ambam	Regional, tar	90	1300	144	0.28
<i>Freight truck (5 tons: hire of truck to carry 50 sacks)</i>							
	Ambam	Meyo Centre	Regional, tar	42	500	119	0.23
	Ebolowa	Ma'an	Regional, graded	121	700	58	0.11
	Ebolowa	Kribi	Regional, graded	257	1000	39	0.07
Bunch of plantains/bananas (8–15 kg)							
<i>Rural taxi</i>							
	Ma'an	Aban Miko'o	Market graded/tar	175	150	73	0.14
	Nyabessan	Aban Miko'o	Market graded/tar	225	180	68	0.13
	Ebolowa	Kribi	Regional, graded	257	500	165	0.31
<i>Freight truck (5 tons: hire of truck to carry 300–450 bunches)</i>							
	Ebolowa	Sangmelima	Regional, graded	117	300	218	0.42
	Ma'an	Aban Miko'o	Market graded/tar	175	100	49	0.09
	Nyabessan	Aban Miko'o	Market graded/tar	225	150	57	0.11
<i>Motorcycle</i>							
	Avebe-Esse	Sangmélima	Market, poor earth	18	1000	4722	8.99
	Ebolowa	Ambam	Regional, tar	90	500	472	0.90
	Sangmelima	Ngomeyap	Market, poor earth	22	500	1932	3.68
Bag of cement (50 kg)							
<i>Rural taxi</i>							
	Avebe-Esse	Sangmélima	Market, poor earth	18	500	556	1.06
	Ebolowa	Ambam	Regional, tar	90	500	111	0.21
	Ebolowa	Sangmélima	Regional, graded	117	1000	171	0.33
<i>Motorcycle</i>							
	Avebe-Esse	Sangmelima	Market, poor earth	18	1500	1667	3.17
	Ebolowa	Ambam	Regional, tar	90	1000	222	0.42
	Ebolowa	Sangmelima	Regional, graded	117	3000	513	0.98

Operator perspectives and cost of rural transport services

Some operators and regulators expressed the view that rural passenger transport is more of a social service than a business. Returns are low and high capital investment is not justified. Operators have to cover all costs, but their expectation of gaining income for re-investing is low.

All transport services are motorized, and operating costs include fixed costs (licensing, capital or depreciation and flat-rate taxation), and variable operating costs (fuel, barrier costs and repairs). Fuel is the biggest operating cost, but the cost of control barriers (tips, bribes and road tolls) is the second largest item of expenditure (see Figure 4.6). Operators of rural taxis consider the taxation system penalizes them, as they have to pay flat rate taxes. Those operating short distances (including motorcycles) pay modest local taxes (25,000 FCFA, about USD 50). Those operating more than 40 km, also pay trading taxes (ten times the local tax). This tax appears disproportionately high to the poorer rural taxi. There are also anomalies, with final payments based on ‘negotiation’. All operators consider their maintenance costs would go down if the roads were improved (and this was confirmed by the experiences of repairers). However, the reported cost of maintenance is significantly less than the reported cost of barrier payments. Reducing these could have a major effect on transport operating costs, prices and profitability.

Figure 4.6. Component proportions of operating costs for minibus (left) and motorcycle (right). Each based on figures provided by three informants. Total annual operating costs were about USD 7000 for the minibus and USD 4500 for the motorcycle.



SOME KEY OBSERVATIONS AND LESSONS LEARNED

Importance and profitability of motorcycles

Motorcycle taxis are increasing rapidly in Cameroon generally and in the Southern province in particular. There are estimated to be about 20,000 in the province. A large number are used as taxis, some are urban, some peri-urban and some rural-based. In Ebolowa town, members of the motorcycle taxi association increased from 200 to 1000 in the past four years. Most motorcycles operate within a twenty-kilometer radius of the various towns. Some are based at road junctions (small

transport hubs) where they complement rural taxis by taking passengers between villages and the main taxi routes. These services are increasingly important because conventional taxis have reduced their services on minor routes. Motorcycle taxis seldom transport people more than 30 km. Very few drivers or passengers wear crash helmets. Motorcycles frequently carry two passengers (in addition to the driver) and carrying three passengers is not unusual.

The rapid growth of motorcycles has been associated with a great drop in prices. A few years ago, motorcycles were mainly Japanese models that cost USD 2000. Now new motorcycles (125–175 cc) imported with China are widely available and come with numerous gadgets and accessories (including remote locking). The ones used by motorcycle taxis are mainly 175 cc machines costing about 400,000 FCFA (USD 800). Business people and civil servants living in towns purchase these for leasing to motorcycle operators. Operators have to pay the owners about 4000 FCFA (USD 8) if working in the towns and 8000 FCFA (USD 16) a day if operating on muddy rural roads. This means owners can recover their capital in 50 to 100 paid days, and they may well buy an additional motorcycle to lease out. Motorcycles generally last only a few months without major repairs, but in that time they have earned their owner and operator significant income. Motorcycles are sold for about half price after just six months. This puts second hand motorcycles in the reach of many more people. The buyers of older machines will face repair bills, and small repair facilities are increasing in the province. With competition in the urban areas high (waiting motorcycles at most corners) and fares low (100 FCFA or USD 0.20), rural motor taxis are increasingly attractive. Fares in rural areas are often 2000 FCFA (USD 4) for a journey of up to 20 km.

The rapid increase in the use of motorcycles is partly due to their low cost, their profitability and the way they are funded. Urban businesspeople or civil servants who have access to some capital or credit are the main people buying them. They make a profit, as do the operators, and so they continue to invest, and encourage others to do the same. This means that urban capital is being used to develop new rural transport services. The rapid spread of motorcycles may also be assisted by the relative freedom from regulation. For the moment, motorcycle operators do not pay road tolls or the high taxes paid by the operators of long-distance transport, although they may have to make payments (bribes) at control barriers and when stopped by urban police.

Expensive bicycles

Although some government officials were very negative about bicycles (saying that they were from ‘prehistory’), bicycles are actually owned in most villages and villagers stressed the potential value to them of bicycles. The existing bicycles are mainly used for journeys of 5–30 km between villages and towns, between villages and for access to local schools and medical facilities. Men mainly use them, but women said they could use them, and school children would like to use them. Some itinerant traders use bicycles. Bicycles are not available to purchase in the rural areas and even in towns there are very few suppliers and very high prices (90,000 FCFA, about USD 180). At this price (half the price of a used motorcycle) it is not surprising that there are few sales. The rapid reduction in prices associated with Chinese imports has not yet affected the bicycle market in Southern Cameroon. Prices are three times more than they need be. Villagers stated that if bicycles costing 30,000 FCFA (USD 60) were available to purchase at the time of the cocoa harvest, the number of bicycles in use

would increase. While bicycles are never likely to be as widespread as in the savannah zone (where they can be used along small paths) there is still great potential for greater use of bicycles along existing roads for inter-village transport and village-to-market transport of people and goods.

Transport for health and education and some gender issues

Health services and schools have very limited access to transport, and often have to make use of public transport and hired vehicles for obtaining supplies and transporting staff. In most cases, patients and pupils have to organize their own transport to access health and education services. This may involve walking or use of rural taxis or motorcycles. Women are particularly affected due to pregnancies and responsibilities for children's health and education. Bicycles could save students much travel time, but the use of bicycles by students is very low, due to their high cost and lack of availability.

In public transport, women passengers are given some preference in seat allocation, and women are not expected to travel on the roofs of vehicles. The traffic counts showed that similar numbers of men and woman walk along the roads, but that very few women ride bicycles or motorcycles (except as passengers). Women did express interest in owning and using bicycles and motorcycles.

CONCLUSIONS

It is generally agreed by all that rural transport services are unsatisfactory in the Southern Province of Cameroon, and one major reason for this is the poor state of the roads. When roads have been improved, transport services have increased and prices have been reduced. While transport services are poor, most people live on roads where rural taxis operate every day. People have problems in accessing health and education facilities and marketing food crops, and this particularly affects women.

All indications suggest that motorcycles will continue to expand in numbers and become increasingly important for rural transport in the coming years. One of the biggest problems with rural transport is the lack of rural credit or capital for investment in means of transport. This is still the case with bicycles, which are expensive relative to rural incomes. Removing duties and taxes should increase bicycle ownership. In the case of motorcycles, urban capital is being invested in motorcycles, with people leasing them to operators (urban and rural). As a critical mass of rural motorcycles and repairers develops, it will become increasingly feasible for some rural people to buy second hand motorcycles themselves (eg, after the cocoa harvest). While there is some urban investment rural in taxis (in particular the travel firms), the economic model is different, with more capital required, higher operational costs (including taxes, tolls and barriers) and greater regulation (with problems of compliance and/or avoidance). It is possible that the profitability of rural transport could change if low-cost Chinese vehicles (comparable to the motorcycles) were to become widely. However existing rural taxis are actually quite cheap to buy, as they are very old vehicles.

Informal payments made at control barriers contribute significantly to rural transport costs, and, in principle, improved governance (at all levels and in all services) could eliminate these. The apparent efficiency of toll barriers suggests that this could be possible.

The development of transport agencies, and their proven ability to raise standards and reduce prices along major transport routes provides a valuable model for rural transport. Ways of extending the process to routes with lower transport demand should be explored. Load consolidation appears practicable, if rural communities and transport agencies can agree appropriate prices and timetables. Regulatory mechanisms could involve making route licensing of popular inter-urban routes conditional on some service provision on less popular routes (perhaps with operator rotas). The tax system, considered a constraint for rural transport operators, could be used to provide incentives for those operating on difficult rural routes.

CHAPTER 5: A RAPID ASSESSMENT OF TRANSPORT SERVICES IN THE IRINGA REGION OF TANZANIA

summarised by Paul Starkey and Abdul Awadh

INTRODUCTION TO THE IRINGA REGION

The Iringa Region of Tanzania covers an area of about 59,000 sq km and has a population of 1,500,000. This represents about 6% of the country by area and 5% by population. It is divided into six districts comprising 33 divisions, 138 wards and 703 villages (see Table 5.1). It is a large and topographically diverse region stretching from central Tanzania to Lake Nyasa in the southwest (see Figure 5.1).

Table 5.1 The districts of Iringa with approximate population data (2002)

<i>District</i>	<i>Town</i>	<i>Area (sq km)</i>	<i>Villages</i>	<i>Households</i>	<i>Population</i>
Iringa Rural	Iringa	20,576	109	56,680	246,000
Mufindi	Mafinga	7,123	133	66,060	283,000
Njombe	Njombe	10,668	210	98,830	420,000
Ludewa	Ludewa	8,397	73	27,730	129,000
Makete	Makete	4,128	98	27,670	106,000
Kilolo	Kilolo	7,881	77	45,340	206,000
Iringa Urban	Iringa	4,287	3	24,510	107,000
Total		58,936	703	346,820	1,497,000

Iringa Region includes a dry plain to the north (altitude 600 m), a high plateau in the central part (1200–1600 m) and mountains in the south and southwest (altitude 1600–2700 m). Much of the land is agricultural (cropped and/or fallow) and there are large agro-industrial plantations in the central plateau, forestry plantations in the southwest and a large national park in the north. The climate is varied, with 500 mm of rain in the north, and up to 2000 mm of rain in the mountains. The main rainy season is November to May. Temperatures vary greatly with altitude, with relatively constant temperatures (18–28 °C) in the north but a more temperate climate, with frosts, in the southwestern mountains.

Figure 5.1. Sketch of Tanzania showing Iringa Region (left) and sketch of Iringa Region showing Districts (right)



The economy of the region is based primarily on agriculture, with more than 80% of its population depending directly or indirectly on farming. The main food crops grown in the region are maize, sorghum, beans, rice, potatoes and vegetables, while cash crops include coffee, tobacco, sunflower and vegetables. Livestock kept include poultry, cattle, goats, sheep, pigs and a small number of donkeys. Other economic activities include service provision, trading, fishing, forestry, mining and tourism.

The region has 812 primary schools, 72 secondary schools and one university college. It has 13 hospitals, 28 health centers and 256 dispensaries, with the government providing about two thirds of these services. While census figures suggest the mean distances to secondary schools and hospitals are 13 km and 19 km respectively, people in rural areas are often far from such facilities, and find them difficult to access. While the main population centers have access to electricity, piped water and mobile phones, most rural households lack these facilities.

ROAD NETWORK, CONDITION AND HUB AND SPOKE SYSTEMS

Road network and condition

Running through Iringa are 875 kilometers of national trunk roads, including the paved T1 Tan-Zam Highway, the paved T6 route to the south (Songea) and the unpaved T5 road linking Iringa with the capital, Dodoma. The other roads are unpaved, and include regional (1030 km), district (2190 km), feeder (2340 km) and unclassified/community roads (1900 km). About 45% of the rural roads are considered to be in poor condition. This is summarized in Table 5.2. While regional roads are 'all weather', some smaller roads are temporarily impassable in the rainy season.

In addition to the road network, there is the Tazara railway that passes through the region, providing important long-distance transport services. A relatively small number of people situated near the line use the railway to access regional markets and services.

Iringa Region borders the large Lake Nyasa in the remote southwest and water transport is important for communities living on the lakeshore. Unfortunately, the coastal transport on Lake Nyasa could not be included in this survey owing to logistical and time constraints.

The trunk roads are important transport corridors, carrying regional, national and international traffic. They form a clear framework for the entire regional transport network. This is illustrated in Figure 5.2.

Table 5.2 The classification and condition of roads in Iringa Region, Tanzania

Road class	Surface type	Length (km)	Condition
Trunk	Paved	479	Good
	Unpaved	396	50% good, 30% fair and 20% poor
Regional	Paved	2	Good
	Unpaved	1024	30% good, 40% fair and 30% poor
Urban	Paved	20	Good
	Unpaved	275	40% good, 40% fair and 20% poor
District	Unpaved	2190	
Feeder	Unpaved	2340	26% good, 28% fair and 46% poor
Total		6726	



Figure 5.2. Road and settlement patterns in Iringa, Tanzania

5.2a (left) Map showing Iringa Region in Tanzania with main roads and settlements.

5.2b (right) Schematic representation of resulting hub and spoke systems.

The grey roads joining the red (or grey) dots represent corridor transport (part of the national system).

The red (or grey) and the blue (or dark grey) dots are the main transport hubs.

TRANSPORT HUBS, SPOKES AND CORRIDORS

Iringa Region as a whole does not comprise one single transport catchment area. There are several clear hub and spoke systems, but their catchment areas do not always coincide with the regional and district boundaries. While the transport hub of Iringa town dominates the transport systems of the three northern districts, the three districts in the south also have strong transport links with the town of Mbeya (Mbeya Region) and to a lesser extent with Songea (Ruvuma Region).

Iringa town lies alongside the TanZam highway that links the port of Dar es Salaam with the large town of Mbeya and the landlocked country of Zambia. This good tar road forms a major national and international transport corridor, affecting the towns and villages that are close to it. Branching from this highway is a good road going south to Songea. The national road going north from Iringa to the political capital of Dodoma is unpaved. These national spoke roads with their intercity transport services provide a framework for long-distance transport within the region.

Most of the motorized transport vehicles operating within the region are based at the regional hub of Iringa town or one of the smaller transport hubs that lie along the main transport corridor. In some cases, the vehicles are based in an outlying town or village, but travel into their main transport hub daily. All these transport hubs (Iringa, Mafinga, Makambako and Njombe) have regulated bus terminals (managed by the local authorities) that are used by some national transport services (express intercity buses) and regional transport.

Iringa town is the major regional transport hub, with national transport links and daily regional transport services to each of the district towns. In addition, Iringa acts as the economic market town to many communities within the adjacent Iringa Rural, Kilolo and Mufindi Districts. Most of the transport services within these three districts operate to or from the Iringa hub. The small district/market town of Kilolo is not an important transport hub for motorized transport, and most motorized transport vehicles serving the villages around Kilolo are operating to and from the Iringa hub. This is also true of the small hub of Mtera on the Dodoma trunk road. Mafinga, the administrative town of Mufindi District, lies on the TanZam highway and does act as a small transport hub. While much of the traffic passing through the Mafinga bus station is interurban (notably to and from Iringa), some motorized transport services serve the surrounding villages. Similarly, the small market town of Ilula, on the transport corridor to the east of Iringa, is a stopping point for interurban services, with a small number of vehicles (freight and mixed) based there. Further southwest along the transport corridor is the small town of Makambako (a junction town with the Mbeya and Songea roads). This is a stopping point for the services on the transport corridor, with a small number of services to outlying villages.

Njombe, the administrative town of Njombe District is the second most important transport hub in the region, with inter-urban services (notably to Iringa, Mbeya and Songea) and many rural taxis (mainly minibuses) serving the surrounding areas, including the district towns of Makete and Ludewa. These small remote towns, located in mountainous areas with poor roads, are only minor hubs for motorized transport, as their districts have few motorized transport services. Makete and Ludewa have transport links with Njombe, Iringa and Mbeya. The market and junction village of

Ikonda on the Njombe-Makete road is a transport staging post, with some hub characteristics. It is the limit of passable road for minibuses and so 4x4s wait to take passengers onto Makete.

In addition to the motorized transport hubs, many junctions on the main corridor road are transport hubs for bicycle taxis. This is also true of many of the towns and larger villages that are not on the main road. In the lowland and plateau areas, these are often transport hubs for bicycle taxis or animal-drawn carts, while some towns in mountainous areas act as hubs for services provided by pack donkeys.

TRAFFIC PATTERNS AND THE PROVINCIAL FLEET

Traffic flows and patterns

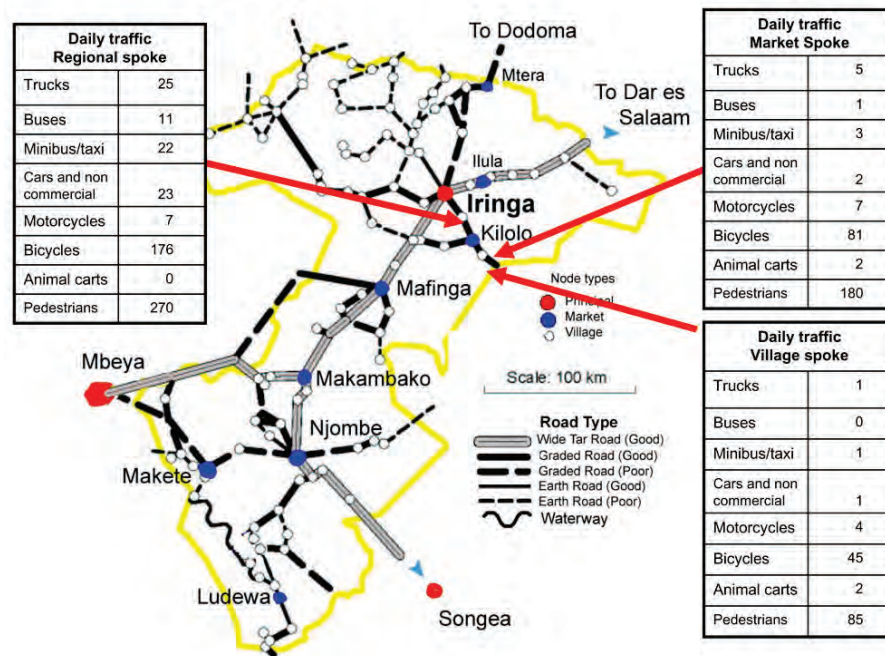
The busiest roads in the region are the tarred national roads that link Dar es Salaam with Mbeya and Songea which carry national transport and also some much regional transport (both inter-urban and rural). However, this survey concentrated on the traffic flows on regional, market and villages spokes away from the main transport corridor. Examples of typical traffic on three levels of transport spoke are shown in Figure 5.3. These illustrative figures derived from traffic counts at locations that were considered to be representative of the various types of spoke.

The survey and traffic counts suggested that most villages have some access to daily motorized transport, although the traffic frequency is low. The number of motor vehicles does not vary much from day to day. On the spokes counted, market days only caused a small (20%) increase in overall motorized traffic. There would be much bigger surges of traffic on the roads close to the major monthly markets that are held in the region. On the village and market spokes, there was a 40% increase in pedestrian and bicycle traffic on the days of the local markets. People reported that there was little seasonality in motorized traffic, as long as the roads remained open.

The traffic counts were disaggregated for gender, as far as practical. This revealed that just over half (57%) the 2400 pedestrians counted were female. About half of all pedestrians carried loads, with slightly more women than men walking without loads (60:40), and more men carrying loads in excess of 5 kg (60:40). Only 1% of the 1800 bicycles counted were ridden by women. The small number of motorcycles and animal drawn carts counted were all operated by men.

Bicycles are widely used for transporting passengers and loads. One quarter of all cycles counted was carrying passengers, and a further 35% of bicycles were carrying loads of more than 5 kg. In the area surveyed, the majority of bicycles were used by their owners for their own purposes and only a minority was hired for the day or operated as bicycle taxis.

Figure 5.3. Schematic map of hub and spoke system in Iringa region of Tanzania showing illustrative average traffic flow figures on various spokes (counting both directions).



Transport fleet

Buses (about 25, mainly old vehicles) and minibuses (about 45, more modern but well used) provide most of the public transport services. Also operating in the region are 75 trucks and about 30 rural taxis, including 4x4s (mainly very old Landrovers), pickups and a few estate cars. The trucks are particularly important for carrying goods (and some people) to and from the various periodic (daily, weekly and monthly) markets held in the region.

The main intermediate means of transport are bicycles. There are about 65,000 in use, and their numbers are increasing quite rapidly, partly as a result of cheaper Chinese bicycles now being available. They are found in all parts of the region, but numbers are low in the mountainous areas. They are used for personal mobility, marketing and transport services. Bicycle taxis and bicycle freight services are particularly common in the central plateau area around Makambako. Information from traffic counts suggested that more people use bicycles than any other form of rural transport. Bicycle journeys over 20 km are common and journeys of up to 50 km are not unusual. In all towns, and in some villages, people can hire bicycles by the hour or by the day.

Motorcycle numbers are very low, but may well increase in response to the availability of cheaper Chinese motorcycles. In much of the region, animal drawn carts are rare (due to topography, lack of tradition and lack of supply). Pack donkeys and donkey carts are locally important in some areas, notably in the flatter areas to the northeast of the region.

Rough estimates of the overall numbers of transport vehicles in use are given in Table 5.3. Due to the high numbers of intermediate means of transport, their total carrying capacity is much greater than motorized transport. In many rural locations, the total passenger-kilometers and ton-kilometers carried by intermediate means of transport exceed that carried by motorized transport. Overall investment in intermediate means of transport is estimated at about USD 6 million. In contrast, current investment in motorized transport services is only about USD 1.5 million.

Table 5.3 Estimates of the transport fleet operating in Iringa Region, Tanzania

<i>Transport type</i>	<i>Estimated numbers</i>	<i>Unit value USD</i>	<i>Overall value USD million</i>
Trucks	75	12000	0.9
Buses (20+ seats)	26	8000	0.2
Minibuses	45	4500	0.2
Rural taxis	32	2000	0.1
Subtotal: Large motorized	180		1.4
Motorcycles	250	900	0.2
Animal-drawn carts	8,000	200	1.6
Bicycles	65,000	60	3.9
Subtotal: IMTs	73,000		5.7

Notes: rough order-of-magnitude estimates based on field observations. These figures are for vehicles mainly used for transport of people and goods within the area on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars. Values are based on the approximate investment made by the purchaser: most large motor vehicles used in the region were purchased when over ten years old, while most IMTs used in the region were purchased new.

TRANSPORT POLICY AND REGULATORY ENVIRONMENT

Transport policy

Tanzania's national policy on Rural Transport includes improvement of rural transport infrastructure, promoting the use of non-motorized transport, organizing (through participatory approaches) the rural households to contribute to the improvement of the infrastructure and encouraging the private sector to participate in the provision of competitive and affordable rural transport services to rural communities. Tanzania's National Development Vision, National Strategy for Growth and Reduction of Poverty and Rural Development Policy all envisage improving rural infrastructure and transport to allow rural people greater access to markets and services.

Historically, under the Highways Ordinance, the government was directly responsible for planning, administering and managing the road network and for implementing construction and maintenance work. Over the years, the implementation of work has been increasingly contracted out to the private sector. Under the latest reorganization (Roads Act, 2003), the national government has only retained responsibility for planning and administrating the road network. It has delegated the management of national and regional roads to a national roads authority (Tanroads) and district, feeder

and community roads to local government authorities. A new category of 'community roads' may replace what have been called 'unclassified roads'.

At the regional level, the transport authorities were found to be concentrating on maintaining rural roads. There was little evidence of the policy to promote transport services and intermediate means of transport. There had been some investment in urban transport terminals, and some small projects to promote the use of donkeys and donkey carts.

Regulation of vehicles and transport services

The Surface and Marine Transport Regulatory Authority (SUMATRA) is a multi-sector regulatory agency established by Act of Parliament No 9 of 2001. It started its operations in 2004 and is responsible for regulating road, rail and water transport. In terms of land transport it is now responsible for:

- Registering and licensing commercial vehicles
- Determining, monitoring and regulating charges and tariffs for road transport services
- Formulating and reviewing codes of conduct for transport operators and users
- Liaising with Police, Ministry of Public Safety and Security and Ministry of Infrastructure Development on issues affecting road transport
- Developing rules and regulations in road transport
- Overseeing investigation in road transport accidents

As a relatively new authority, with wide responsibilities, it is only beginning to address its new regulatory roles, and most regulation of transport is still based on the procedures established under the Transport Licensing Act of 1973. This included a legal and regulatory framework for rural bus services (which now include minibuses). The Regional Licensing Authorities were given discretionary power to make licenses conditional on the operating to timetables on specific routes and charging fair and reasonable fares. The regulation of fares included the provision to set these at a level to 'prevent wasteful competition with alternative forms of transport'. Passengers were allowed to carry small amounts of luggage free of charge, with agreed tariffs for excess baggage. Under the discretionary powers, rural taxis (such as old Landrovers) could be licensed to operate without timetables on specific routes where there were no regular bus services. Large trucks were not recognized as passenger service vehicles and were not regulated for routes or timetables. Regulation for safety has been legislated for in other acts, and includes the condition that buses should not exceed 80 kph in rural areas.

Non-motorized means of transport (bicycles and carts) were not mentioned in the 1973 Transport Licensing Act and so have not been licensed or regulated. Motorcycles require licensing and insurance. Motorcycle taxi services have not developed yet, and motorcycles are not recognized as public service vehicles.

There are new proposals for a Transport (Road Passenger) Licensing Regulations Act (under discussion in 2007). This appears aimed mainly at urban and inter-urban services and includes many provisions relating to safety (working hours, no standing passengers, first aid kit), professional standards (uniforms, identification, ticketing), vehicles (age, seating capacity), passenger rights (20 kg baggage allowance), routes, fares and competition.

The existing costs of compliance with regulations include the cost of the operating licenses (issued by the regional transport licensing authorities), insurance and annual flat-rate tax. Examples of the costs of compliance with vehicle licensing regulations are given in Table 5.4.

Table 5.4 Costs compliance with vehicle regulation in Tanzania

<i>Document, fee or tax</i>	<i>Rural taxi</i>	<i>Bus</i>	<i>Light truck</i>
	<i>USD</i>	<i>USD</i>	<i>USD</i>
Driver license	9	9	9
Operating license	236	91	91
Insurance (Third party)	68	227	273
Local parking fees	11	11	11
Annual flat rate operating tax (based on vehicle capacity)	86	182	182
Total	411	520	565

Enforcement of regulation and barriers

While documents are regularly checked by traffic police, the enforcement of safety regulations is not strict, particularly in the more remote rural areas. Local authorities control the urban transport terminals, which may have barriers to ensure the appropriate parking/loading dues are paid and vehicle loads conform to regulations. However, all the stakeholders (operators, passengers, police, town authorities) are aware that vehicles may stop on the outskirts of the town to take additional passengers, in excess of the official limits. Barriers are also found at certain places along the roads for checking compliance with the regulations. However, operators and the enforcing officers often settle infringements with a small payment (Tsh 1000–5000 or USD 1–4). As there are relatively few barriers, the transport operators seemed to accept the system without much complaint. While the payments are technically bribes, the local term used for the payments (*chai* or tea) indicates the informality of the system.

Price regulation and transport associations

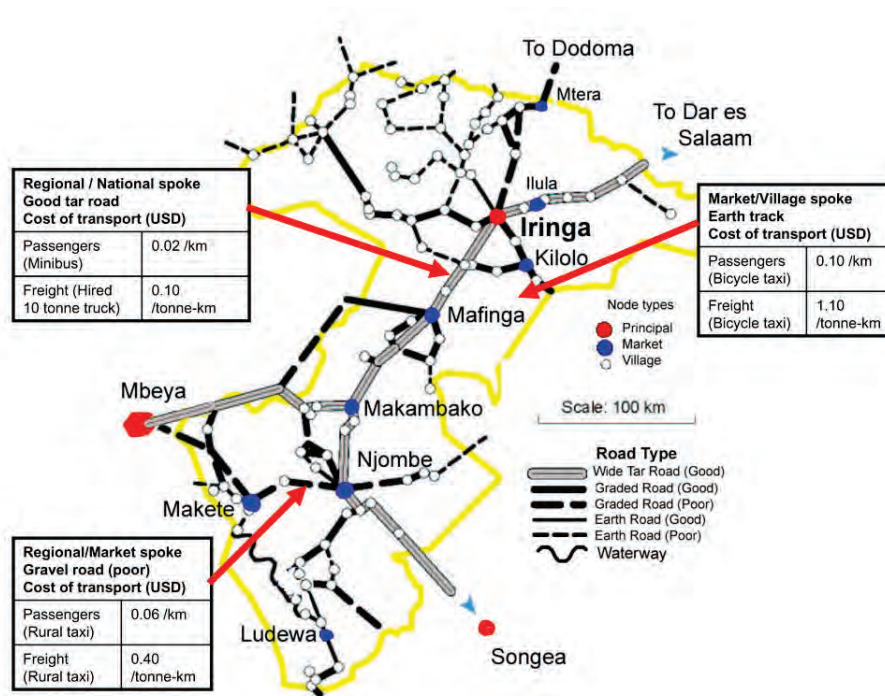
Price regulation has been built into vehicle licensing. It is a discretionary power that authorities generally use. The fixed prices are generally considered reasonable, but there is considerable frustration among operators when fuel prices rise ahead of fares.

Transport associations exist but are not very strong. Members are primarily bus operators who help supervise services and loading at the main hubs. They complain that some transport services (notably 4x4, pickups and trucks) are not highly regulated, and therefore provide ‘unfair’ competition.

COSTS OF PASSENGER AND FREIGHT TRANSPORT

Figure 5.4 illustrates some of the passenger fares and freight charges for different transport types and road types in the region. These are examined in more detail in the subsequent sections.

Figure 5.4. Schematic map of hub and spoke system in Iringa Region showing illustrative costs of passenger and freight transport on various spokes for different modes of transport. See associated text and tables for explanations and further information.



Some examples of passenger fares in Iringa Region are provided in Table 5.5. The lower prices, of USD 2 cents a kilometer are found on the long distance routes on the main roads. Due to price regulations, most rural bus and rural taxi services charge in the region of USD 3–5 cents a kilometer for both short and long-distance journeys. The highest prices are found on the poorest roads, and at USD 6 cents a kilometer, this is three times the price of the travel on the trunk roads. Bicycle taxis can be more expensive at about USD 10 cents a kilometer, but this varies with the area, terrain and distance. In most towns, people can hire bicycles by the hour or by the day.

Some examples of freight costs in Iringa Region are provided in Table 5.6. Rural taxis charge USD 0.35–0.80 per ton-km. It costs USD 0.50 per ton-km to hire a small truck to carry two tons of grain, but only USD 0.40 per ton-km if one fills a ten-ton truck. This short distance regional transport is four times more expensive than long distance national transport by large trucks. Transport by bi-

cycle is very variable, with ton-kilometer costs highly dependant on how much is carried (bicycles may carry 25–100 kg) as well as distance. In the Kilolo District, bicycle freight prices were about USD 1.00 per ton-km, but in flatter areas with many bicycle taxi services (such as around Makambako) prices may be significantly lower. People can also hire bicycles for the day for around TZS 2000 (USD 1.80), but the resulting freight costs will depend greatly on the load and the distance.

Table 5.5 Examples of passenger fares in Iringa Region, Tanzania

<i>Vehicle type</i>	<i>Start</i>	<i>Finish</i>	<i>Spoke type /condition</i>	<i>Distance</i>	<i>Fare</i>	<i>Fare per km</i>
				<i>Km</i>	<i>TZS</i>	<i>(USD cents)</i>
Express bus	Iringa	Dar es Salaam	National, tar	505	11000	2
Minibus	Iringa	Njombe	National/regional tar	290	5000	2
Local bus	Iringa	Mtera	National/regional, graded	120	4000	3
Local bus	Iringa	Kilolo	Regional, graded	38	1500	4
Local bus	Njombe	Makete	Regional, graded, poor	110	7000	6
4x4 taxi	Ikonda	Makete	Regional, graded, poor	30	2000	6
Bicycle taxi	Lulanzi	Kilolo	Market, earth	5	500	9
Bicycle taxi	Kihesa	Kilolo	Village, earth	8	1000	11
Bicycle taxi	Msosa	Mgowelo	Market, earth	15	2000	12

Table 5.6 Examples of freight costs in Iringa Region, Tanzania

<i>Start</i>	<i>Finish</i>	<i>Spoke/road type</i>	<i>Distance</i>	<i>Price</i>	<i>Price per km</i>	<i>Price per ton-km</i>
			<i>km</i>	<i>TZS</i>	<i>TZS</i>	<i>USD</i>
Rural taxi (100 kg sack)						
Kilolo	Iringa	Regional, earth	38	1500	39	0.36
Makete	Ikonda	Regional, earth	30	2500	83	0.76
Hire of small truck (20 bags x 100 kg maize)						
Lulanzi	Iringa	Regional, earth	43	45,000	1047	0.48
Hire of freight truck (Ten tons, 100 sacks of 100kg)						
Iringa	Dar es Salaam	National, tar	505	550,000	1090	0.10
Lulanzi	Iringa	Regional, graded	43	200,000	4651	0.42
Bicycle taxi (100 kg load)						
Lulanzi	Kilolo	Market, earth	5	500	100	0.91
Kihesa	Kilolo	Village, earth	8	1000	125	1.14
Msosa	Mgowelo	Market, earth	15	2000	133	1.21

The supply of rural transport services and operator perspectives

In Inruga Region, clear supply-side links can be seen between infrastructure, transport quality, service frequency and cost. The fares charged vary with road quality as well as distance: for example, it may cost USD 2.0 to travel for 65 km on good road, but USD 1.5 to travel 35 km on a rough road. Communities along the paved trunk roads benefit from relatively frequent minibuses. On poorer roads, only rural taxis (4x4s, pickups), trucks and buses operate. For example, between Njombe and Makete, minibuses travel only on the well-graded road as far as Ikonda. Large buses, trucks and 4x4s serve the more difficult section between Ikonda and Makete. On the most difficult roads, there are often no regular public transport services at all.

Operators of motorized transport consider poor road infrastructure to be the major constraint to their services. Poor roads increase journey times and wear and tear on vehicles. Most public service vehicles operating on poor roads are old, and operators say it is difficult to replace them, due to the low profitability of rural transport services. The low investment in rural transport vehicles contrasts with higher investment in the intercity services operating on paved roads (although there are major differences in the transport markets as well as road conditions).

SOME KEY OBSERVATIONS AND LESSONS LEARNED

Demand for rural transport services and user perspectives

Almost all rural people contacted considered lack of affordable motorized transport to be a serious constraint. It is common for women and men walk distances between 5 km to 20 km. Some people have to walk up to 40 km for the purposes of market access, work, education or even health care. Some walk because there is no alternative, but some walk because they can afford neither motorized transport, nor bicycles. In interviews, a wide range of people estimated that they spend about a quarter of their income on transport. The relative importance of walking, bicycles and motorized transport in Kilolo District is illustrated in Figure 5.5.

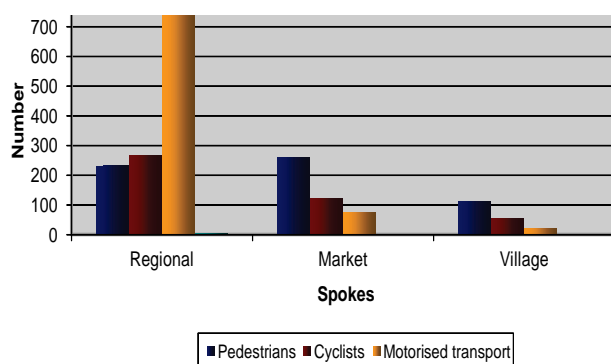


Figure 5.5. Numbers of people using various transport modes on roads in Iringa

The histograms, derived from traffic counts, show the numbers of people travelling distances of more than five kilometers by motorized transport, bicycles or walking on regional spoke roads (between Kilolo and Iringa), market town roads (between Kilolo and the villages Lulanzi and Lukani) and village roads (to/from Lulanzi and Lukani). The counts were undertaken in the Kilolo District, a hilly area relatively unfavorable to bicycles and with little use of animal power.

Relative to much of the region, Kilolo is well-connected, being only 38 km from Iringa, with a daily bus service along the gravel road costing TSh 1500 (USD 1.3). Nevertheless, many users surveyed (men and women who were farmers, traders, students, employees, etc) were unable to make regular use of the transport services due to their high price relative to incomes. They expressed ‘demand’ for transport in terms of advantages to them (marketing, trading, health, social visits) but not at the existing prices. Even salaried employees (teachers) talked of walking long distances due to the relatively high cost of transport. The use of bicycles was cited as one solution, but the cost of bicycle purchase was considered beyond the incomes of most people, particularly as credit was not available to allow the bicycle to be paid over time.

One feature of motorized transport favored by rural people was the relative reliability and predictability of rural buses on some of the routes. Because they operate to timetables, people know when buses are expected and can plan accordingly.

Gender issues

Women are particularly affected by the poor rural transport situation. This is associated with their gender-related roles (greater responsibility for children’s healthcare), their gender related financial and economic situation (less access to money) and their gender-related poor access to transport technologies. Women interviewed reported that they could not afford frequent journeys by motorized transport. Men own most intermediate means of transport and few women use bicycles. Some men and women considered this to be related to culture and tradition, but others said it was due to lack of access to bicycles (and to funds). In areas where bicycles are more common (such as around Ilula, Makambako and Njombe), the percentage of women riding bicycles seems to be increasing

from a low level, suggesting greater overall adoption of bicycles may lead to increasing use of bicycles by women.

Transport for health

Most rural people have to access health centers and hospitals by walking or using bicycles. Bicycles are used to transport some patients and government publicity posters illustrate a pregnant woman being pushed to hospital on a bicycle. Very sick people are carried on stretchers or local beds. For people living along routes with motorized transport, people may travel to hospital by bus or rural taxi (in very exceptional cases by ambulance). Public transport may also be used for transferring patients between health facilities. The high cost of using public transport to access healthcare is considered a constraint. Transport for old and handicapped people is particularly difficult, as these people cannot travel without the assistance of others. Few, if any, tricycles are available to allow such people to have mobility, and this may be associated with lack of supply, unaffordability and lack of appropriate infrastructure to allow tricycles to operate effectively.

Animal power

In the plains to the northeast of Iringa, there has been a long tradition of using donkeys as pack animals (although total numbers in use has not been high). The Village Travel and Transport Project has recently introduced donkey carts into this area. The Makete Integrated Rural Transport Project introduced pack donkeys in the 1980s, and these have become well established. Ox carts are used in small numbers in several areas. While some farmers already own cattle, it is difficult for them to obtain and afford carts. The recent project initiatives suggest that animal power can contribute towards rural transport in Iringa, and that project activities (assistance with credit and the supply of animals and carts) can lead to new adoption and sustained use.

HIV/AIDS

Levels of HIV/AIDS infection are high in some parts of Iringa Region, including Makete District. The reasons are complex and not fully understood, but may be linked to transport issues and temporary migration for work.

The system of monthly markets operating in the region may represent a risk. Some traders are young men who move from one market to another, spending nights in the various villages. It does not appear that there are specific campaigns to address this potential risk.

CONCLUSIONS

Transport services in the Iringa Region are strongly influenced by the national trunk roads that pass through the region and provide a framework for the regional network. Motorized transport services in the region all operate to and from a series of transport hubs located at towns along the main transport corridors. The regional fleet of transport vehicles is both old and small (fewer than 200

public transport vehicles and trucks). The low investment in regional transport is associated with low operational profitability, partly attributable to the poor state of secondary roads and partly associated with the low incomes of the rural population.

While efficient rural transport is considered a priority (in terms of national and regional policy), the only visible evidence for this is investment and gradual improvement in the rural infrastructure. It was widely agreed that the infrastructure is slowly improving and some transport problems decreasing. There exists a legal, regulatory and institutional framework for controlling rural transport services, but this is weakly enforced and little is done to stimulate or assist the development of improved motorized transport services.

While there have been some successful efforts to promote animal power for transport, there have been no attempts to promote bicycles or motorcycles. Bicycles are arguably the most important means of rural transport in the whole region, in terms of total private investment and day-to-day use for income generation and access to services. Bicycles and motorcycles are still expensive, relative to rural incomes and credit is generally unavailable. Removing import duties (currently 10% on bicycles and 25% on motorcycles) and VAT (20% on bicycles and motorcycles) would reduce the prices of these intermediate means of transport and allow more rapid adoption. Since intermediate means of transport are widely used as tools for income generation, increased economic activity in the region could offset the loss of tax revenue.

CHAPTER 6: A RAPID ASSESSMENT OF TRANSPORT SERVICES IN THE SINGIDA REGION OF TANZANIA

summarised by Paul Starkey and Abdul Awadh

INTRODUCTION TO THE SINGIDA REGION

The Singida Region in Tanzania covers an area of about 50,000 sq km and has a population of 1,100,000. This represents about 5% of the country by area and 4% by population. It is located in the centre of the country and is bordered by six other regions (see Figure 6.1a). Much of the region is undulating plateau (around 1000 meters high), with the higher (1500 m) Iramba plateau to the north. These both drop in the west to the Wambere valley.



Figure 6.1a (left). Sketch of Tanzania showing Singida Region
Figure 6.1b (right). Sketch of Singida Region showing rural districts

The region is divided into three rural districts (Figure 6.1b). Iramba District includes the northern plateau, while Singida Rural includes much of the central area. The southern half of the region comprises the large but sparsely populated Manyoni District. The districts and their populations are shown in Table 6.1

The region comprises semi-arid savannah, smallholder farmland (planted and fallow) and woodland. Annual rainfall is 500–800 mm, with the higher rains in the more fertile northern plateau and quite dry and sandy conditions in the south, much of which is a nature reserve. The rains are concentrated in the period December to April. Temperatures are fairly constant, ranging from 15°C to

30°C depending on the altitude and season. The period from May to October tends to be dry, dusty and windy.

Table 6.1 The districts of Singida Region with approximate population data (2002)

<i>District</i>	<i>Town</i>	<i>Area (sq km)</i>	<i>Villages</i>	<i>Households</i>	<i>Population</i>
Iramba	Kiomboi	7,900	118	71,680	368,000
Manyoni	Manyoni	28,620	76	42,890	206,000
Singida Rural	Singida	12,164	133	78,490	402,000
Singida Urban	Singida	657	19	24,510	115,000
Total		49,341	346	217,570	1,091,000

The region is quite poor with an economy based largely on small-scale mixed agriculture. Men and women work the land. The technologies are hand hoes and animal traction. The crops are maize, sorghum, millet, groundnuts, beans, rice, cassava and sweet potatoes. Cash crops include sunflower, cotton, tobacco and onions. Cattle, donkeys, sheep, goats, pigs and poultry are raised. Oxen are used for plowing and pulling carts, while donkeys are mainly used for pack transport. Fishing is important in some localities, including the shore of Lake Kitangiri. There are few industries, and most non-agricultural employment is associated with markets, retailing and service provision.

The region has 411 primary schools and 32 secondary schools. It has nine hospitals, 14 health centers and 138 dispensaries, with the government providing about two thirds of these services. While census figures suggest the mean distances to secondary schools and hospitals are 10 km and 13 km respectively, people in rural areas may find such facilities far away and difficult to access. There are few towns in Singida Region, but they all have reliable electricity, piped water and mobile phone access. Most rural households lack these facilities and only 5% of families have mains electricity.

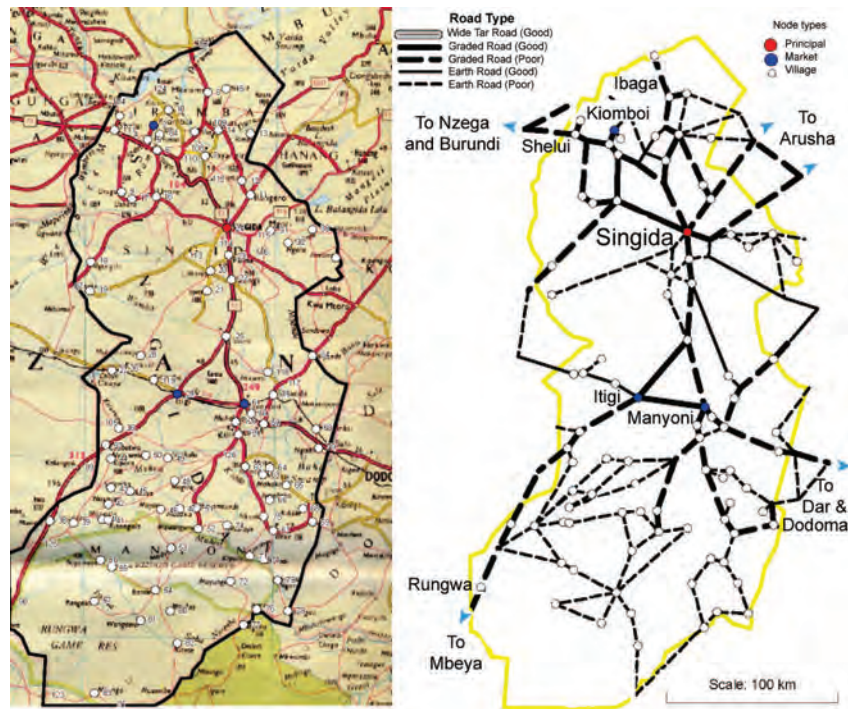
ROAD NETWORK, CONDITION AND HUB AND SPOKE SYSTEMS

Road network and condition

Running through Singida are 602 kilometers of national trunk roads. The main roads appear to form a large diagonal X, with Singida at the centre. The main national trunk road passing through Singida Region from southeast to northwest is the T3 international transport corridor that runs from Dar es Salaam to Burundi and Rwanda. This is in the process of being realigned and paved, but at the time of the survey it was rough and extremely dusty. Numerous large trucks and fuel tankers pass along this road, and there are also long distance buses. The other national trunk routes are unpaved and connect Singida with Arusha (T14 to the northeast) and Mbeya (T22 to the southwest).

All other roads are unpaved and the network comprises regional (797 km) and district and feeder roads (2152 km). The national and regional roads are passable throughout the year. About 50% of the district and feeder roads are considered to be in poor condition, and some become impassable in the rainy season. Figure 6.2 illustrates the road network.

Figure 6.2. Singida Region of Tanzania showing settlements (left) and the hub and spoke systems of the roads (right)



Rail and water transport links

In addition to the road network, a railway line passes through the region in the south (Manyoni, Itigi) with a branch to Singida town. This provides important long-distance transport services linking the region with Dodoma, Dar es Salaam, Tabora and many onward connections. The Singida line has three trains a week, and these trains link Manyoni (district town) to Singida (regional town) as well as providing longer distance travel opportunities. Some people in the villages served by railway stations are able to benefit from rail transport to access markets and healthcare, although most travel by road.

Around Lake Kitangiri, in the north of the region, small boats are important for fishing and for linking with the communities situated across the lake (in Shinyanga Region).

TRANSPORT HUBS, SPOKES AND CORRIDORS

In Singida Region, there are only a small number of transport hubs to and from which motorized transport operates on a daily basis. The major regional transport hub is Singida town, which is an important terminal for national level transport, with services to and from Arusha, Dodoma, Morogoro, Dar es Salaam, Mbeya, Nzega, Shinyanga and Mwanza. There are also local services to desti-

nations throughout the northern half of the region (Singida and Iramba Districts) as well as to some towns in Manyoni District.

The second hub is the crossroads town of Manyoni, which is the district headquarters of Manyoni District which comprises all the southern half of the region. Manyoni is an important stopping point for national bus services and national and international freight transport. It is also the district transport hub with local bus services to many villages, as well as regional routes to Singida (north), Dodoma (east), Tabora (west) and Mbeya (south). The Singida and Manyoni hubs account for most of the motorized transport services in the region, but there are a few smaller hubs.

The small town of Kiomboi is the administrative headquarters of Iramba District. Situated 21 km off the main corridor road and only 100 km from the important town of Singida, it is not yet sufficiently important economically to become a district level transport hub. It is a minor hub with services to and from Singida and various local villages and markets. Singida, Manyoni and Kiomboi all have bus stations controlled by the local authorities.

The village of Ibagu, in the northeast of Iramba District, is a small transport hub that has daily services to Singida (to the south), to nearby Haidom and to Arusha (350 km to the northeast). The transport and trading links between Iramba District and Arusha are quite strong, and the transport routes do not pass through Singida town. This provides a good example of villages that 'face two ways' in transport terms, with communities in Iramba District being part of the hub and spoke systems of both Singida and Arusha.

Other small transport hubs are Shelui (northwest on the trunk road to Shinyanga and Burundi) and Itigi (at the crossroads of the Singida-Mbeya and Dodoma-Tabora national roads).

In addition to the motorized transport hubs, some junctions on the main road are transport hubs for bicycle taxis. This is also true of some of the towns and larger villages that are not on the main road. These are often transport hubs for bicycle taxis, and in certain areas, for transport services provided by pack donkeys or animal-drawn carts.

TRAFFIC PATTERNS AND THE PROVINCIAL FLEET

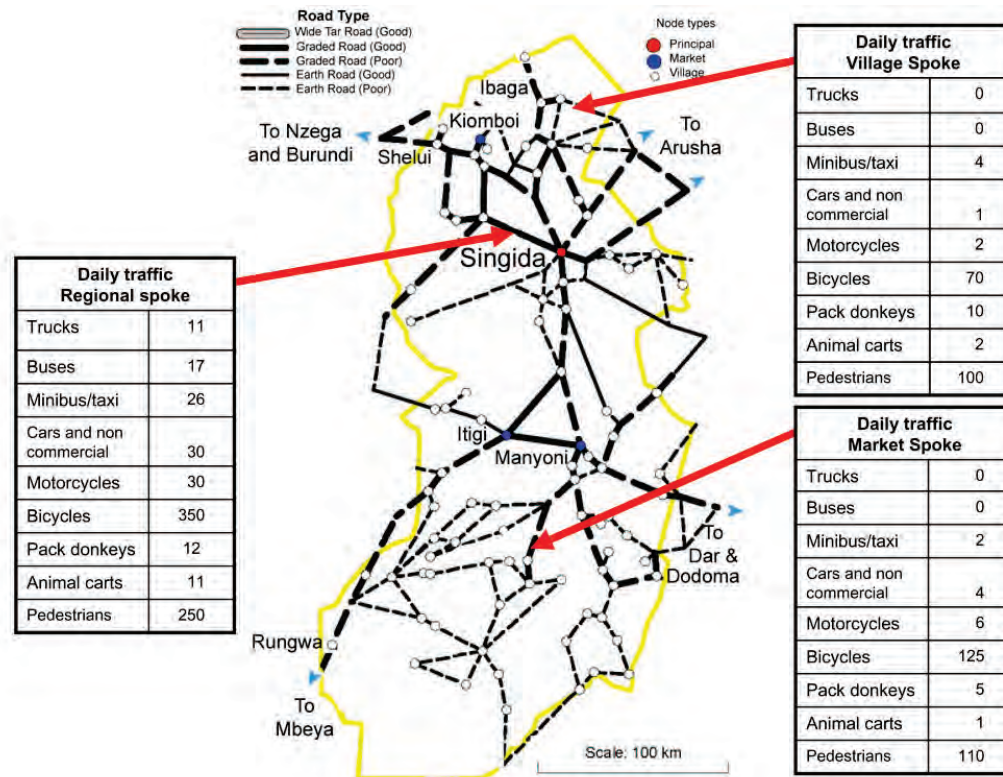
Traffic flows and patterns

The busiest road in the region is the national and international transport route passing southeast to northwest via Singida town. This is followed by the other main national route passing northeast to southwest also via Singida town. Although these routes also carry some regional level transport, much of the traffic is based on the national hub and spoke system, and so these were not included in the present study.

The traffic counts in Singida Region were carried out on representative regional, market and village spoke roads in the Iramba District. The data collected is summarized in Figure 6.3, which illustrates the pattern of transport movements on the various spokes. Broadly similar results would have been

obtained had the counts been undertaken in the other districts, provided they were not on national through routes or close to a large periodic market.

Figure 6.3. Schematic map of hub and spoke system in Singida Region of Tanzania showing illustrative average traffic flow figures on various spokes (counting both directions). For clarity, the arrows point to representative spokes (not



counting locations). See associated text for further explanation and information on gender disaggregation.

The survey and traffic counts suggested that most villages have some access to daily motorized transport, although the traffic frequency is generally low at one or two vehicles per day. This means that most local transport involves people travelling by bicycle or on foot. Motorized transport is particularly important for longer distance journeys on regional roads. While the number of motorized vehicles is low, even on regional spokes, the high capacity of buses means that most people travelling on regional roads do so by bus. This is illustrated in Figure 6.4.

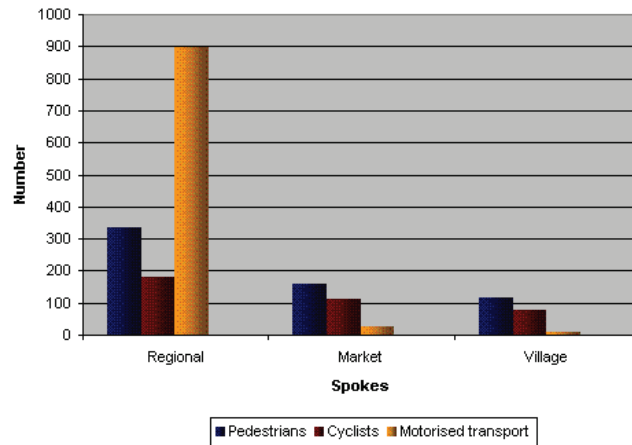


Figure 6.4. Daily passenger journeys by motor transport, bicycle and walking on regional, district and village spokes

The number of motor vehicles does not vary much from day to day. On the spokes counted, market days only caused a small (20%) increase in overall motorized traffic. There would be much bigger surges of traffic on the roads close to the major monthly markets that are held in the region. On the village and market spokes, there was a 35% increase in pedestrians and a 20% increase in bicycle traffic on the days of the local markets. People reported that there was little seasonality in passenger vehicles, as long as the roads remained open. However, after harvest, in the dry season, some additional trucks would visit villages to purchase grains.

The traffic counts were disaggregated for gender, as far as practical. This revealed that just over half (58%) the 2400 pedestrians counted were female. Just over half (56%) of all pedestrians carried loads, with 60% of women carrying loads and 51% of male pedestrians carrying loads. The proportions of pedestrians carrying loads increased on market day, with 65% of women and 60% of men carrying loads. Only 6% of the 2400 bicycles counted were ridden by women. The small number of motorcycles and animal drawn carts counted were all operated by men.

Bicycles are widely used for transporting passengers and loads. One third (36%) of all male cyclists counted were carrying passengers, and a further one third (29%) of male cyclists were carrying loads of more than 5 kg. One half of the women cyclists counted also used bicycles to carry passengers or loads: one quarter of women cyclists (27%) carried passengers and a further quarter (23%) carried loads greater than 5 kg. The relative importance of bicycles is illustrated in Figure 6.5

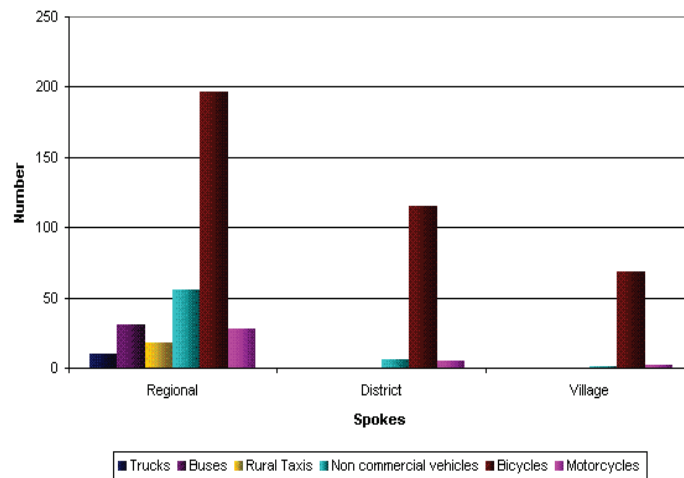


Figure 6.5. Examples of traffic movements on regional, district and village spokes in Iramba District, Singida, illustrating the relative importance of bicycles.

Transport fleet

Trucks (about 30), buses (about 17, mainly old vehicles), rural taxis (about 25) and minibuses (about ten) provide most of the rural transport services that operate within the region. The number of minibuses is low, and this probably reflects the poor condition of the roads mainly old. The rural taxis are 4x4s (mainly old Landrovers) and a few pickups. The trucks are particularly important for carrying goods (and some people) to and from the various periodic (daily, weekly and monthly) markets held in the region.

The main intermediate means of transport are bicycles. There are about 60,000 in use, which is about one bicycle per four households. Their numbers are increasing quite rapidly, partly as a result of cheaper Chinese bicycles now being available. They are found in all parts of the region and are used for personal mobility, marketing and transport services. Some bicycle taxi services have recently started, linking villages on feeder roads with transport services on major roads. Information from traffic counts suggested that more people use bicycles than any other form of rural transport. Bicycle journeys over 10 km are common and journeys of up to 50 km are not unusual. Only a few motorcycles are used, due to their high cost. Numbers may well increase in response to the recent availability of cheaper Chinese motorcycles.

There are estimated to be about 13,000 animal-drawn carts (one per fifteen rural households). Two, four or even six oxen pull these carts. Some people use pack donkeys and there are a small number of carts operated by donkeys using technologies similar to those with oxen (central cart shaft and yokes).

Rough estimates of the overall numbers of transport vehicles in use are given in Table 6.2. Due to the high numbers of intermediate means of transport, their total carrying capacity is much greater than motorized transport. In many rural locations, the total passenger-kilometers and ton-kilometers carried by intermediate means of transport exceed that carried by motorized transport.

Overall investment in intermediate means of transport is estimated at about USD 6 million. In contrast, current investment in motorized transport services is less than USD 1 million.

Table 6.2 Estimates of the transport fleet operating in Singida Region

<i>Transport type</i>	<i>Estimated numbers</i>	<i>Unit value (USD)</i>	<i>Overall value (USD million)</i>
Trucks	30	12000	0.4
Buses (20+ seats)	20	8000	0.2
Minibuses	10	4500	0.1
Rural taxis	25	2000	0.1
Subtotal: Large motorized	85		0.8
Motorcycles	160	900	0.1
Animal-drawn carts	3,000	200	2.6
Bicycles	60,000	60	3.6
Subtotal: IMTs	73,000		6.3

Notes: rough order-of-magnitude estimates based on field observations. These figures are for vehicles mainly used for transport of people and goods within the area on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars. Values are based on the approximate investment made by the purchaser: most large motor vehicles used in the region were purchased when over ten years old, while most intermediate means of transport used in the region were purchased new.

TRANSPORT POLICY AND REGULATORY ENVIRONMENT

Transport policy

Tanzania's national policy on Rural Transport includes improvement of rural transport infrastructure, promoting the use of non-motorized transport, organizing (through participatory approaches) the rural households to contribute to the improvement of the infrastructure and encouraging the private sector to participate in the provision of competitive and affordable rural transport services to rural communities. Tanzania's National Development Vision, National Strategy for Growth and Reduction of Poverty and Rural Development Policy all envisage improving rural infrastructure and transport to allow rural people greater access to markets and services.

Historically, under the Highways Ordinance, the government was directly responsible for planning, administering and managing the road network and for implementing construction and maintenance work. Over the years, the implementation of work has been increasingly contracted out to the private sector. Under the latest reorganization (Roads Act, 2003), the national government has only retained responsibility for planning and administrating the road network. It has delegated the management of national and regional roads to a national roads authority (Tanroads) and district, feeder and community roads to local government authorities. A new category of 'community roads' may replace what have been called 'unclassified roads'.

At the regional level, the transport authorities were found to be concentrating on maintaining rural roads. There was little evidence of the policy to promote transport services and intermediate means of transport. There had been some investment in urban transport terminals, and some small projects to promote the use of donkeys and donkey carts.

Regulation of vehicles and transport services

The Surface and Marine Transport Regulatory Authority (SUMATRA) is a multi-sector regulatory agency established by Act of Parliament No 9 of 2001. It started its operations in 2004 and is responsible for regulating road, rail and water transport. In terms of land transport it is now responsible for:

- Registering and licensing commercial vehicles
- Determining, monitoring and regulating charges and tariffs for road transport services
- Formulating and reviewing codes of conduct for transport operators and users
- Liaising with Police, Ministry of Public Safety and Security and Ministry of Infrastructure Development on issues affecting road transport
- Developing rules and regulations in road transport
- Overseeing investigation in road transport accidents

As a relatively new authority, with wide responsibilities, it is only beginning to address its new regulatory roles, and most regulation of transport is still based on the procedures established under the Transport Licensing Act of 1973. This included a legal and regulatory framework for rural bus services (which now include minibuses). The Regional Licensing Authorities were given discretionary power to make licenses conditional on the operating to timetables on specific routes and charging fair and reasonable fares. The regulation of fares included the provision to set these at a level to 'prevent wasteful competition with alternative forms of transport'. Passengers were allowed to carry small amounts of luggage free of charge, with agreed tariffs for excess baggage. Under the discretionary powers, rural taxis (such as old Landrovers) could be licensed to operate without timetables on specific routes where there were no regular bus services. Large trucks were not recognized as passenger service vehicles and were not regulated for routes or timetables. Regulation for safety has been legislated for in other acts, and includes the condition that buses should not exceed 80 kph in rural areas.

Non-motorized means of transport (bicycles and carts) were not mentioned in the 1973 Transport Licensing Act and so have not been licensed or regulated. Motorcycles require licensing and insurance. Motorcycle taxi services have not developed yet, and motorcycles are not recognized as public service vehicles.

There are new proposals for a Transport (Road Passenger) Licensing Regulations Act (under discussion in 2007). This appears aimed mainly at urban and inter-urban services and includes many provisions relating to safety (working hours, no standing passengers, first aid kit), professional standards (uniforms, identification, ticketing), vehicles (age, seating capacity), passenger rights (20 kg baggage allowance), routes, fares and competition.

The existing costs of compliance with regulations include the cost of the operating licenses (issued by the regional transport licensing authorities), insurance and annual flat-rate tax. Examples of the costs of compliance with vehicle licensing regulations are given in Table 6.3.

Table 6.3 Costs compliance with vehicle regulation in Tanzania

<i>Document, fee or tax</i>	<i>Rural taxi</i>	<i>Bus</i>	<i>Light truck</i>
	<i>USD</i>	<i>USD</i>	<i>USD</i>
Driver license	9	9	9
Operating license	236	91	91
Insurance (Third party)	68	227	273
Local parking fees	11	11	11
Annual flat rate operating tax (based on vehicle capacity)	86	182	182
Total	411	520	565

Enforcement of regulation and barriers

While documents are regularly checked by traffic police, the enforcement of safety regulations is not strict, particularly in the more remote rural areas. Local authorities control the urban transport terminals, which may have barriers to ensure the appropriate parking/loading dues are paid and vehicle loads conform to regulations. However, all the stakeholders (operators, passengers, police, town authorities) are aware that vehicles may stop on the outskirts of the town to take additional passengers, in excess of the official limits. Barriers are also found at certain places along the roads for checking compliance with the regulations. However, operators and the enforcing officers often settle infringements with a small payment (Tsh 1000–5000 or USD 1–4). As there are relatively few barriers, the transport operators seemed to accept the system without much complaint. While the payments are technically bribes, the local term used for the payments (*chai* or tea) indicates the informality of the system.

Price regulation and transport associations

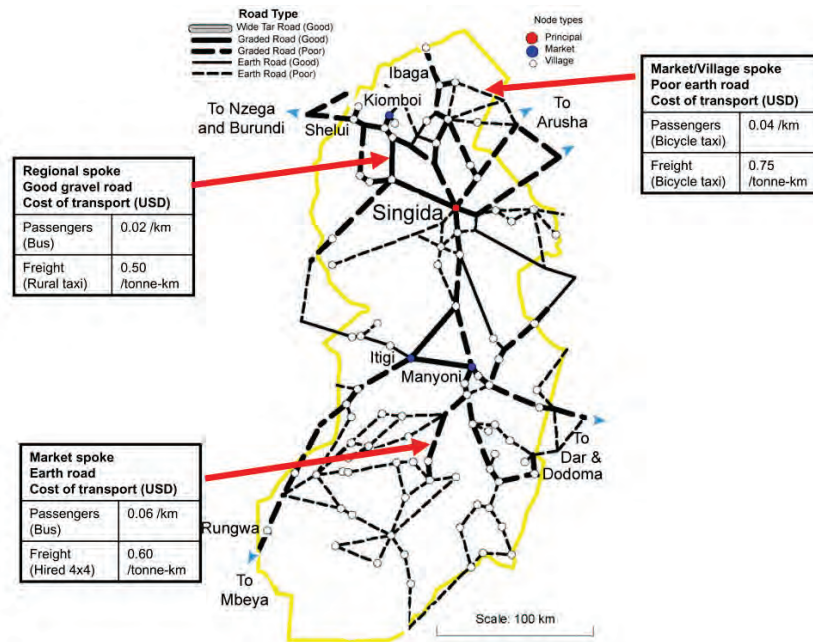
Price regulation has been built into vehicle licensing. It is a discretionary power that authorities generally use. The fixed prices are generally considered reasonable, but there is considerable frustration among operators when fuel prices rise ahead of fares.

Transport associations exist but are not very strong. Members are primarily bus operators who help to supervise services and loading at the main transport hubs. The transport association that exists in Singida town helps to regulate loading, but it is not officially recognized. Members complained that some transport services (notably 4x4s, pickups and trucks) are not so highly regulated as buses, and therefore provide ‘unfair’ competition.

COSTS OF PASSENGER AND FREIGHT TRANSPORT

Figure 6.6 illustrates some of the passenger fares and freight charges for different transport types and road types in the region. These are examined in more detail in the subsequent sections.

Figure 6.6. Schematic map of hub and spoke system in Singida Region showing illustrative costs of passenger and freight transport on various spokes for different modes of transport.



Some examples of passenger fares in Singida Region are provided in Table 6.4. The lower prices of USD 2 cents a kilometer are found on the long distance routes on the main roads. Due to price regulations, most rural bus and rural taxi services charge in the region of USD 3–5 cents a kilometer for both short and long-distance journeys. The highest prices are found on the poorest roads, and at USD 5 cents a kilometer, this is more than twice the price of the travel on the trunk roads. The fares charged by bicycle taxis are quite variable, but in the same order of magnitude as motorized services at USD 3-5 cents a kilometer. The hire of an ox cart to carry a sick person is TZS 2000 for a 10 km journey, which works out at USD 18 cents a kilometer.

Table 6.4 Examples of passenger fares in Singida Region, Tanzania

Vehicle type	Start	Finish	Spoke type /condition	Distance Km	Fare TZS	Fare per km (USD cents)
Local bus	Singida	Kiomboi	National, regional graded	110	3000	2
Local bus	Ibagha	Arusha	National, regional, graded	350	12000	3
Rural taxi	Singida	Ngamu	Regional, graded	56	2000	3
Bicycle taxi	Luono	Ibagha	Market, earth	35	1000	3
Local bus	Ibagha	Haidom	Market, earth	76	3000	4
Local bus	Ibagha	Singida	Market, earth	96	4000	4
Local bus	Manyoni	Heka	Market, earth	47	2000	4
Local bus	Manyoni	Sasilo	Market, earth	64	3000	4
Rural taxi	Singida	Makhandi	Market, earth	30	1500	5
Bicycle taxi	Kizaga	Ndago	Market, earth	18	1000	5

Some examples of freight costs in Singida Region are provided in Table 6.5. Rural taxi charge USD 0.30-60 per ton-km, with the higher prices for shorter distances. It costs USD 0.60-1.30 per ton-km to hire a pickup or 4x4 to carry a ton of grain, with the higher prices relating to shorter distances. Transport by intermediate means of transport is very variable, with ton-kilometer costs highly dependant on how much is carried (bicycles may carry 25-100 kg, ox carts 300-500 kg or more. However they are mainly of a similar order of magnitude to motorized costs.

Table 6.5 Examples of freight costs in Singida Region, Tanzania

<i>Start</i>	<i>Finish</i>	<i>Spoke/road type</i>	<i>Distance</i>	<i>Price</i>	<i>Price per km</i>	<i>Price per ton-km</i>
Rural taxi (100 kg sack)			<i>km</i>	<i>TZS</i>	<i>TZS</i>	<i>USD</i>
Kiomboi	Singida	Regional, graded	110	4000	36	0.33
Kiomboi	Misigiri	Regional, graded	21	1200	57	0.52
Ibaga	Haidom	Market, earth	70	4000	57	0.52
Kiomboi	Kisisiri	Market, earth	15	1000	67	0.61
Rural taxi pickup or 4x4 hired (10 sacks x 100 kg maize)						
Ibaga	Singida	Regional, earth	96	60,000	625	0.57
Kiomboi	Misigiri	Regional, graded	21	30,000	1429	1.30
Hire of freight truck (Ten tons, 100 sacks of 100kg)						
Singida	Chikada	Regional, earth	150	400,000	2667	0.24
Bicycle taxi (50 kg load)						
Luono	Ibaga	Market, earth	35	1000	29	0.52
Kizaga	Ndago	Market, earth	18	1000	56	1.01
Pack donkey (50 kg load) without operator						
Tulya	Kiomboi	Market, earth	10	1000	100	1.82
Pack donkey (50 kg load) with operator						
Tulya	Kiomboi	Market, earth	10	3000	300	5.45
Ox cart (500 kg load) with operator						
Tulya	Kiomboi	Market, earth	10	2000	200	0.36

SOME KEY OBSERVATIONS AND LESSONS LEARNED

Demand for rural transport services and user perspectives

Most rural people are farmers and a major transport need is for selling produce. Many sales take place in periodic markets, and produce is generally carried to market by head load, bicycle or ox cart. Traders in trucks visit the markets, and at harvest times they may also visit villages. Most people live close to small clinics and primary schools, but have to travel further to hospital and to secondary schools. People living on main transport routes may travel by bus or rural taxis, but most people in the villages will have to reach a main road by walking or travelling on bicycle (as rider or

passenger). Major reasons given for travelling by motorized transport include trading, family visits, obtaining goods and spare parts and for health treatment.

The main reasons given for not taking motorized transport were lack of affordability (it was cheaper to walk or to cycle) or lack of motor transport (there were few transport services on the small roads). Many pedestrians (women and men) said they would have preferred to travel by bicycle, but they did not have access to one.

The supply of rural transport services and operator perspectives

As noted, above, the total number of transport service vehicles operating in the region is small (fewer than 100) and many are more than 20 or 30 years old. Most transport operators claim that the profitability of transport is low, and so old vehicles cannot be replaced. Buses operate to timetables and are expected to depart on schedule, whether or not they are full. Old 4x4s act as rural taxis on fixed routes but no timetables. They are generally overloaded, often with people on the sides and roofs. Some trucks travel regularly to various markets, carrying vendors and their wares. Some also carry agricultural produce and livestock. Loads are piled high and many people ride on top. The main concern of transporters is the poor state of the roads and the price of fuel. Official regulations and occasional control barriers are not seen as a serious constraint.

Markets transport and HIV/Aids

Throughout the region, there are periodic markets, some weekly and some monthly. While agricultural produce and livestock are sold in parts of the markets, the markets are now dominated (in terms of sales area) by the sale of inexpensive clothing and household items. Traders also sell spare parts for bicycles. As an example, about 2000 people attend the monthly market in Gumanga village. Three quarters of these arrive on foot and about 350 travel by bicycle. The traders (about 150 in total) are mainly young men who travel to the market in several trucks and one old Landrover.

Vehicles leaving from Singida serve some markets through day trips. Other markets are supplied by small convoys of several trucks that travel around a circuit of markets. The itinerant system means that traders sleep in a different village after each market. This presents an HIV/Aids risk that does not appear to have been addressed yet, as there are no obvious signs of awareness campaigns linked to the markets. A schematic diagram of a market circuit is shown in Figure 6.7.

Figure 6.7. Schematic example of travel routes (blue lines) used to supply markets (M). The markets to the east and west of Singida are served by day trips, but the markets to the north in Iramba District are supplied in a circuit, with the trucks and their traders staying in the villages.



Bicycles

Bicycles are the most common and most versatile intermediate means of transport, and their numbers are increasing. On some rural roads, one can see smooth cycle routes worn by numerous passing bicycles. Bicycles carry a wide range of goods, and some carry passengers. Some people earn their livelihoods by transporting goods (fish, fuel wood, grains) or through itinerant services (mobile tailors, traders, repairers). Bicycle taxi services are a relatively recent development and they currently appear to be spreading.

Imported bicycle prices have been dropping in recent years, although at USD 80 for a Phoenix from China they are still expensive for rural people. Rural people have invested more than USD 3 million in the purchase of bicycles (around five times the value of the motorized transport fleet). Many more people (including women) would buy and use bicycles if they were cheaper.

Transport for health and for marginalized people

With so little motorized transport circulating in Singida, most people access health care by bicycle or on foot. A ministry of health poster shows a man pushing his pregnant wife on a bicycle to a health clinic. A blind woman interviewed was being taken 40 km by bicycle for eye treatment. A man with a bad leg was able to visit the local town on the back of a bicycle. There do not seem to be any tricycles for handicapped people: this seems to be due to their high cost, lack of local supply and rough infrastructure that is not well adapted to such technologies.

CONCLUSIONS

Travelling around Singida Region, one is made aware of the number of women and men without any means of transport, who are walking long distances, often with significant loads. These people need greater access to bicycles and to motorized transport services, in order that they can better reach markets and health services. Removing import duties (currently 10% on bicycles and 25% on motorcycles) and VAT (20% on bicycles and motorcycles) would reduce the prices of these intermediate means of transport and allow more rapid adoption.

People agree that the biggest problem is the poor infrastructure. There are long-term strategies in place to decentralize, prioritize and improve road maintenance practices. In the short term, existing bad road conditions discourage the private sector from providing rural transport services. High operating costs are passed onto passengers, and fares on bad roads are higher than those on good roads. A 30 km journey on a bad road in Singida costs about USD 1, while a comparable journey on a good road costs only USD 40 cents. The high cost reduces demand, and perpetuates a vicious circle of high cost and low demand and little investment in the aging transport fleet.

There is a legal, regulatory and institutional framework controlling rural transport services. However, the enforcement of the regulations is weak so that unsafe practices are tolerated in rural areas.

CHAPTER 7: A RAPID ASSESSMENT OF TRANSPORT SERVICES IN LUAPULA PROVINCE OF ZAMBIA

summarized by Paul Starkey and Henry M Musonda

INTRODUCTION TO LUAPULA PROVINCE

Zambia has an area of about 753,000 sq km and a population of about 11 million. Luapula Province in the north represents about 7% of the country, both in terms of area (50,600 sq km) and population (800,000). Luapula is located between Zambia's Northern Province (to the east) and the Democratic Republic of Congo (to the west). The Provincial town of Mansa (population about 42,000) lies approximately 700 km from Lusaka, the national capital. The locations of Luapula and its districts are shown in Figure 7.1 and the seven districts are listed in Table 7.1.



Figure 7.1. Sketch of Zambia showing Luapula Province (left) and sketch of Luapula showing Districts (right)

The province is quite flat, being on a plateau about 1500 meters above sea level. Rainfall is 1100 to 1500 mm, with the rainy season lasting from November to March. Annual mean temperatures are around 24 °C. Population densities are low. Communities are small and tend to be concentrated along roads, lakeshores and rivers. About one quarter of the province is covered with water, including Lake Mweru, Lake Bangweulu, the Luapula and Chambeshi rivers and several large swampy areas. The rest of the province comprises grassland and open woodland. Fishing is the main economic activity in the province and is central to many livelihoods (fishing, fish processing, trading and support services). While it is men who fish, both women and men are involved in fish marketing. To protect fish stocks, from December to March there is an annual prohibition of fishing. Dur-

ing this period, the whole economy of the province contracts noticeably. The other main activity is small scale, rain-fed farming, growing mainly cassava, maize and beans. Apart from household poultry, there are few livestock, and without readily available cattle or donkeys, there is very little animal traction.

Table 7.1 The seven districts of Luapula Province, Zambia

<i>District</i>	<i>Population</i>
Mansa	180,000
Samfya	164,000
Nchelenge	111,000
Milenge	29,000
Kawambwa	103,000
Mwense	106,000
Chiengi	84,000
Total (Luapula)	775,000

The whole of the western boundary of Luapula is an international frontier with the Democratic Republic of Congo, separated by Lake Mweru in the north and the Luapula River in the south. While small boats are used all along the boundary for informal cross-border trade, little traffic passes through the small number of formal frontier crossing points.

The province has 325 government primary schools, 35 secondary schools, 102 health centers and six hospitals. The province as a whole has ample electricity (with local hydro-electrical stations). All seven of the district towns are connected to the grid and so are some villages located close to pylon lines. However, most villages do not have electricity. Six of the seven district towns are connected to the land line telephone system, but Milenge does not have telephone connections. Mobile telephone systems are gradually being installed in the main towns (at the time of the survey only Mansa and Nchelenge were connected).

National policies concerning HIV/Aids include publicity and awareness posters. These are clearly evident on roadside signboards and notice boards in public buildings throughout the Province.

ROAD NETWORK, CONDITION AND HUB AND SPOKE SYSTEMS

Road network and condition

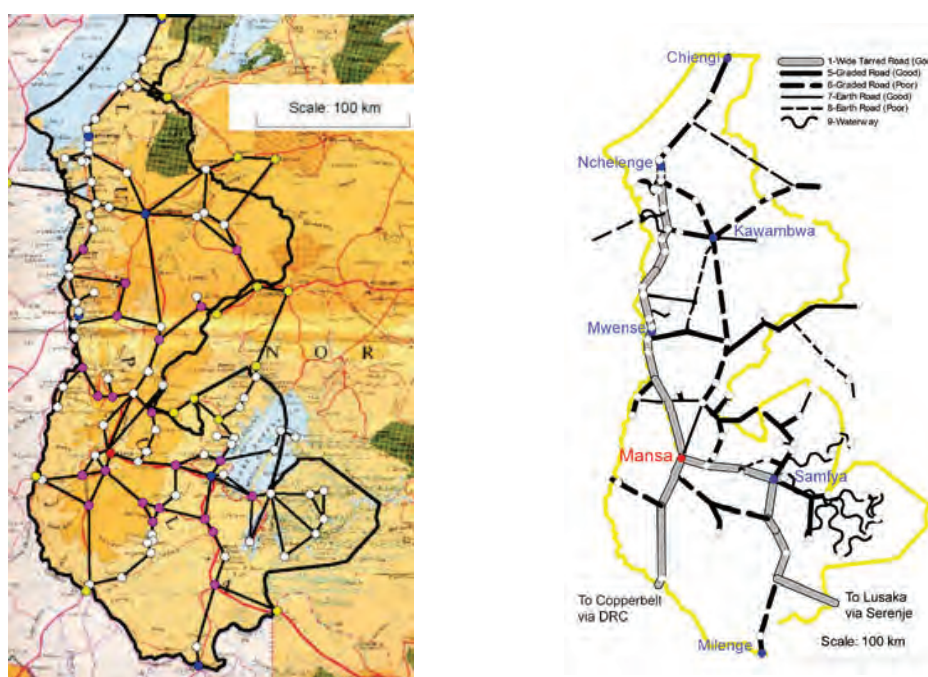
The road network is based on a central spine of good quality paved road. This includes the national road that links Lusaka with Mansa and continues north to Nchelenge (on Lake Mweru). There is another paved road linking Mansa with the border with the Democratic Republic of Congo (DRC) and the 'shortcut' route to the Zambian copperbelt (Mufulira, Kitwe and Ndola) via the unpaved 'pedicle' road. The rest of the network comprises about 2250 km of unpaved provincial and local roads, two thirds of which are considered by all concerned to be in poor condition. This is summarized in Table 7.2 and illustrated in Figure 7.2.

Table 7.2 Estimates of road type, condition and distance in Luapula Province, Zambia ¹

Road type and general condition	National km	Provincial km	Local km	Total km
Wide tar (good)	250	330	35	615
Wide tar (poor)	0	0	32	32
Engineered (good)	0	0	158	158
Engineered (poor)	0	0	2093	2093
Total	250	330	2318	2898

Estimates based on Road Development Agency information and field observations.

Figure 7.2. Luapula Province, Zambia, showing settlements (left) and the hub and spoke systems of the roads (right).



There is a huge contrast between the good quality paved roads and the rest of the network. Most people contacted (government, transport operators, transport users) considered that road conditions were deteriorating, with rough uneven surfaces that were slippery when wet and sometimes impassable. As a result, it was generally agreed that transport services were declining, and were only reliable on the main tar spine road. There were some specific problems of failed bridges and culverts. In one extreme example, the lack of a bridge at one location within Milenge District makes the direct 60 km road from Milenge to one health centre impassable, and the only motorable route involves travelling over 300 km via Mansa.

Water transport infrastructure and services

Water transport in Luapula Province is extremely important and can be separated into two distinct systems of transport: large scale and small scale. The small-scale transport comprises large numbers

of small boats (often called banana boats) made of wooden planks or fiberglass, and some simple dugout canoes. These are used for fishing and for transporting people and goods across rivers and the large lakes. They provide transport services for the communities living on the islands, the lake-shores and those swampy areas served by small waterways. A few boats have outboard motors, but most have paddles and/or long poles. These can take one or two days to reach their destinations, and as a consequence many of the communities served by rural waterways are extremely isolated from national and provincial services. A traffic count on a waterway approaching a village-based fish market recorded about 100 boats passing a day, about half of which were small canoes (carrying up to three people) and half were larger 'banana' boats (carrying an average of about 16 people). None of these were motorized. There is almost no infrastructure provision for small craft, and the banana boats operate from beaches near the towns and settlements they serve. The banana boats are very vulnerable in open water during rough conditions and storms. Operators complained of the lack of supply of fiberglass boats and the difficulty of obtaining fiberglass, resin and repair services. At present, fiberglass boats costing ZMK 7 million (USD 1500) are bought from Kafue (700 km).

The large-scale water transport comprises a small number of large steel boats with inboard diesel engines, providing passenger and freight ferry services. They are operated by the two governmental (parastatal) organizations, the Bangweulu and Mweru Water Transport Boards. The Bangweulu boat (almost 50 years old) is based at the small port constructed at Samfya and provides a passenger and freight service to the islands of Mbabala and Chishi and the town of Chilubi in the Northern Province. The service makes an operating loss and its budget is not sufficient to allow full compliance with all safety regulations. The boats of the Mweru Water Transport Board should operate from the small port at Nchelenge and serve the communities living on the Mweru islands. The old boats are no longer in active service, but two new ferries are due to be obtained soon. As there are no large-scale motorized boats on Lake Mweru, informal sector 'banana' boats provide the only transport services to the various island communities. Although such services are unofficial, government officers (health, education, security, revenue, legal) have to use them whenever their duties take them to the islands.

TRANSPORT HUBS, SPOKES AND CORRIDORS

Although Luapula has a long international border, this does not greatly affect traffic movements. Most cross-border trade between Zambia and the Congo takes place through the Copperbelt Province. A small number of copper-bearing trucks from Congo transit through Luapula. Most other trading with the Congo involves individuals using small boats, bicycles or rural taxis to carry fish, agricultural produce or goods.

Four levels of hub and spoke system can be clearly identified within Luapula Province.

- national hub and spoke system
- provincial hub and spoke system
- district hub and spoke systems
- village hub and spoke systems

The various hubs and spokes can be further classified in terms of the fishing and fish marketing economy that is so important in the province. At all levels in the hub and spoke hierarchy, 'fish spokes' carry significantly more traffic than the 'non-fish' or agricultural spokes.

The main north-south transport spine is one spoke of the national hub-and-spoke system. It is a clear transport corridor, influencing trading, settlement and transport patterns along its route. There is also the national road that links Mansa with the Copperbelt, via the pedicle road that passes through the Democratic Republic of the Congo (DRC). This is a much shorter link between Luapula and the Copperbelt: Mansa to Kitwe is 220 km via the DRC pedicle but 800 km via Serenje. Travelling to Lusaka via the pedicle is also shorter in distance: Mansa to Lusaka is 600 km via DRC pedicle but 820 km via Serenje. However, the DRC pedicle road is unpaved, with some delays at river crossings and some aggravation from the various control barriers within the DRC. At the time of the survey, much of the traffic used the long road via Serenje, but subsequent improvements in the pedicle road and reduced incidents of harassment led to greatly increased use of the pedicle route for both freight and passengers. By 2007, most transport services to the Copperbelt were using the pedicle route, but most transport services to Lusaka travelled via Serenje.

Express long-distance buses operate to timetables along these national roads to Lusaka and to the Copperbelt with several daily departures from Mansa, Samfya, Mwense and Nchelenge. Commercial long-distance trucks carrying fish also operate along these routes during the fish season.

Motorized land transport services that operate within the Luapula Province do so from a small number of transport hubs of which the provincial capital Mansa and the fish ports of Samfya and Nchelenge are the most important. A small number of vehicles (rural taxis and light trucks) operate from Kawambwa, Mwense and Chiengi. Although Milenge is the headquarters of a new district, it is not yet a transport hub, and there are no motorized vehicles that operate regular transport services to and from there.

Motorized transport services in Luapula are primarily national and provincial services, with transport to and from Mansa and the national road to Lusaka and the Copperbelt. Almost all the regular motorized transport movements in the province take place along the main paved road, and on the short side roads that link the paved road to fish markets or small towns (Chiengi and Kawambwa). The other roads are largely devoid of motorized rural transport services and any vehicles that do pass generally belong to government services or NGOs.

District level transport concerns movements between outlying villages and the seven districts towns (Mansa is both a district and provincial town). People travel to their district town (district hub) to access markets and various services including government financial offices, banks, hospitals and schools. Most of the district towns are economic market hubs, but Milenge has yet to develop in this way. With the exception of villages along the national transport corridor and villages along the fish market spokes, there is very little, if any, motorized transport along the district spokes, and transport is by foot or by bicycle.

Village level transport concerns movements between major villages (with some health facilities and a primary school) and outlying hamlets. With the exception of villages lying on national roads and market spokes, transport is by walking or by bicycle.

Similar hub and spoke patterns can be seen along the waterways. The district/market hubs for boats include the fish market hubs of Kashikishi/Nchelenge, Samfya and Chiengi and the smaller landing points of Shabo and Mpata. There are also village hubs within the swampy areas and around the islands, lake shores and riverbanks, with significant local transport taking place in canoes and non-motorized banana boats.

Traffic patterns and the provincial fleet

Traffic counts on the different types of road illustrated the low levels of transport, and the importance of the fish trade. On one provincial spoke, there were 70 motorized vehicles and several hundred bicycles a day on a 'fish' spoke but only four motorized vehicles and 25 bicycles on a long-distance 'agricultural' spoke (a road not associated with fish marketing). On many roads, there is no regular motorized public transport and the traffic consists entirely of bicycles and pedestrians. In this case, some of the bicycles act as bicycle taxis, and will be discussed later.

Examples of typical traffic along various spokes are shown in Figure 7.3. These are illustrative figures of the volumes of traffic. There is relatively little weekly seasonality, as most fish markets operate every day. However there are very significant annual changes, with motorized transport declining markedly in the closed season for fishing (December to March).

The traffic counts were disaggregated for gender, as far as practical. This revealed that about 40% of pedestrians were female, and about 20% of the 1400 bicycles counted were ridden by women. The proportion of women operating bicycles increases if one excludes bicycle taxis from the figures (these are all operated by men and were counted repeatedly on service routes).

Transport fleet

Overall, only about 200 transport service vehicles regularly operate in Luapula, and most of these are quite old. This is summarized in Table 7.3. The total investment in the 80,000 bicycles in use in Luapula is actually significantly greater than the total investment in motor vehicles used for public transport in the province.

Figure 7.3. Schematic map of hub and spoke system in Luapula Province, Zambia, showing illustrative average traffic flow figures on various spokes (counting both directions)

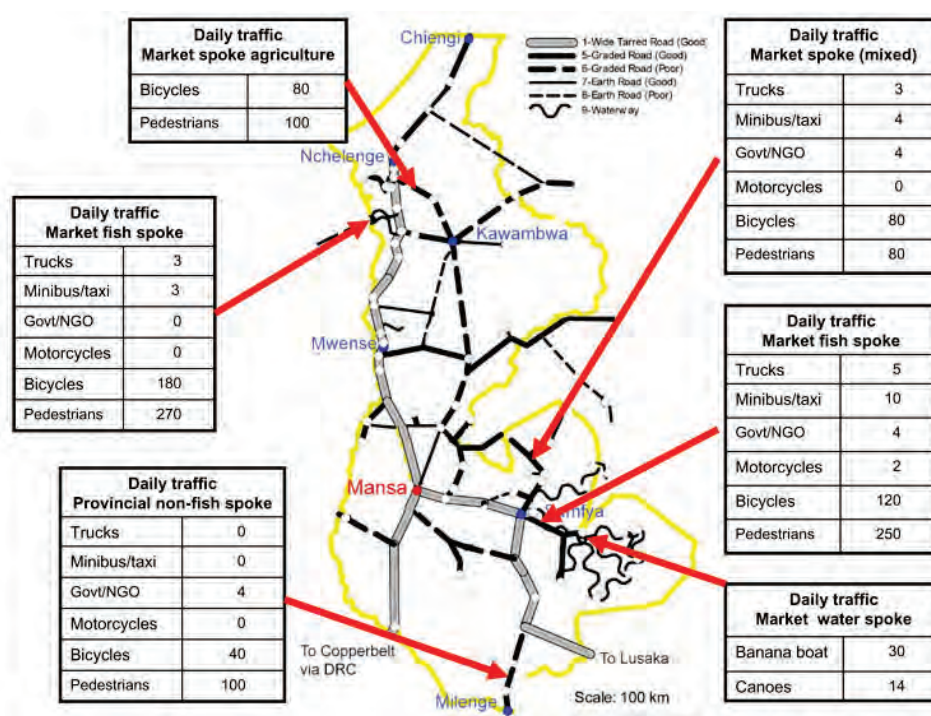


Table 7.3 Estimates of the land transport fleet operating in Luapula

Transport type	Estimated numbers	Unit value (USD)	Overall value (USD million)
Trucks	50	13000	0.6
Buses (20+ seats)	15	13000	0.2
Minibuses	65	7500	0.5
Rural taxis	65	7500	0.5
Subtotal: Large motorized	200		1.8
Motorcycles	12	2000	0.0
Animal-drawn carts	0	250	0.0
Bicycles	80,000	90	7.0
Subtotal: IMTs	80,000		7.0

Notes. Rough order-of-magnitude estimates and rounded values based on field observations. These figures are for vehicles mainly used for transport of people and goods within the province on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars. Values are based on the approximate investment made by the purchaser: most large motor vehicles used in the region were purchased when over ten years old, while most intermediate means of transport used in the region were purchased new.

TRANSPORT POLICY AND REGULATORY ENVIRONMENT

Transport policy

Zambia's Transport Policy, launched in 2003, established three agencies under the Ministry of Transport. These were set up under the amended Roads and Road Traffic Act CAP 464 of the Laws of Zambia. The Road Development Agency is responsible for the infrastructure and the Road Maintenance Initiative. The National Road Fund Agency supervises the raising and disbursement of funds for road construction and maintenance. The Road Transport and Safety Agency is responsible for regulating traffic and promoting safety. To date, emphasis in Luapula has been on improving infrastructure with no specific program for stimulating rural transport services. While there are regulations concerning public transport vehicles, there is little enforcement in rural areas. The national Poverty Reduction Strategy envisages improved rural mobility, primarily through improved infrastructure. The Rural Access and Mobility Programme (RAMP) will soon start a ten-year program that will include investments in small-scale infrastructure and waterways. This program will also promote intermediate means of transport, building on five small pilot district-level projects (none of which was in Luapula Province).

Regulation of road transport services

The Provincial Road Transport Commission regulates motor transport and transport services. All drivers are required to pass a driving test and obtain a driving license. All motor vehicles pay a road tax and are subject to annual inspection and testing. Passenger and freight vehicles may be limited to certain overall speed limits, in addition to the restrictions relating to urban areas and special road conditions. The commission also has to approve the seating capacity of vehicles and approve the routes for which a transport service operating license is issued. All vehicles have to have insurance, but the legal minimum is just Third Party, which does not cover passengers. Freight vehicles are not licensed to carry passengers, but trucks do carry passengers, particularly in remote rural areas. The front seats of vehicles have to be fitted with seat belts. A new local tax is charged daily for transport service vehicles. This works out at about USD 0.40 per day for a pickup operating as a rural taxi and USD 2.50 per day for a minibus. Examples of the costs of compliance with vehicle licensing regulations are given in Table 7.4.

Under the local government Act No. 22 of 1991, district authorities can designate and regulate transport terminals and impose terminal fees and operating levies. Districts do not yet regulate bicycles, but several authorities had considered this, as bicycles are operating transport services without paying local fees.

Table 7.4 Costs compliance with vehicle regulation

<i>Document, fee or tax</i>	<i>Rural taxi</i>	<i>Minibus</i>	<i>Light truck</i>
	<i>USD</i>	<i>USD</i>	<i>USD</i>
Driver license	19	19	19
Registration certificate	30	30	30
Operating license	30	30	30
Insurance (Third Party)	120	120	120
Operating fee	30	30	30
Road tax disc	48	48	48
Annual technical test	21	21	21
Daily local operating tax (annual total)	125	780	281
Total	423	1078	579

Price regulation and transport associations

There are no controls on passenger fares or on freight transport. There used to be national associations of transporters and users (United Transport and Taxis Association, Bus Driver and Motor Taxis Association and Passengers Transport Association). These were all ‘deregistered’ in 2003 as destabilizing influences on the country following protests over fuel price increases. Since then there has been no legal framework for transport associations, and no associations exist in Luapula. New guidelines for transport boards to represent transport interest groups were drawn up in 2005.

Enforcement

The enforcement of transport regulations is the responsibility of the police. There is little attention to the enforcement of speed limits. There are a small number of checkpoints where vehicle and operator licenses may be checked. Corruption at such barriers was not reported to be a serious problem, but enforcement of safety regulations is quite low (and overloaded vehicles may be allowed to pass). In 2005, an open truck carrying 110 secondary pupils turned over on a hilly bend 17 km from Kawambwa, and 45 students were killed. Press reports suggested the driver had just passed a police checkpoint and had paid a penalty fee of ZMK 60,000 (USD 12). He was allowed to pass with his overloaded truck. However, operators of rural transport in Luapula did not report any routine payments at control barriers.

Regulation of water transport

The two large lakes each have a regulatory authority: the Bangweulu and the Mweru Water Transport Boards. Under the amended Inland Water Shipping Act CAP 466 of the Laws of Zambia, these are responsible to the Department of Maritime and Inland Water Transport of the Ministry of Communications and Transport for regulating water transport. Safety regulations exist for both small scale and large scale water transport. Because both lakes are large, with waves, storms and

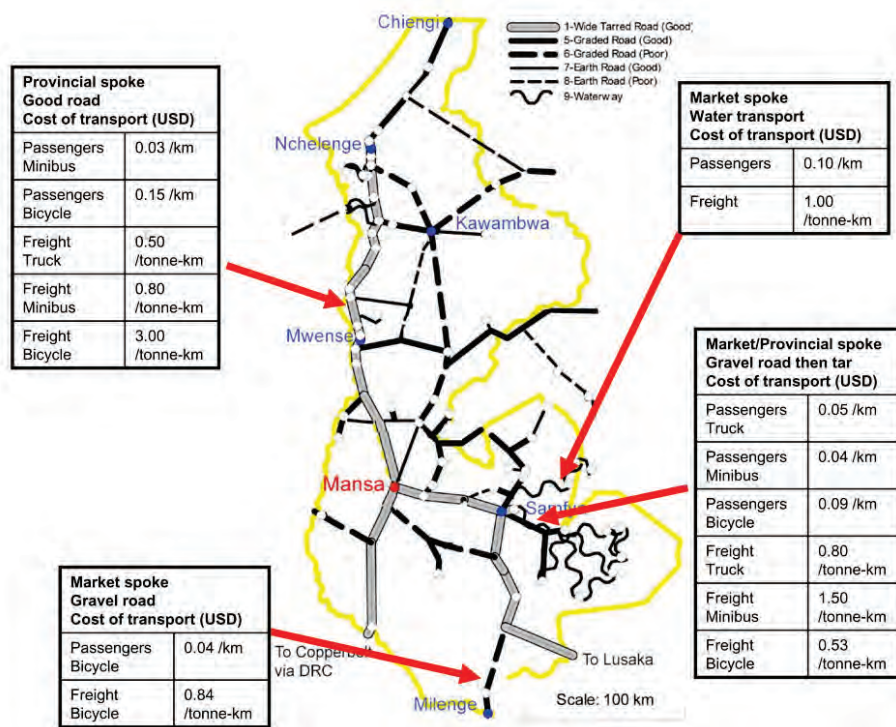
squalls, banana boats are not very safe for providing transport services. For this reason, it was made illegal to provide commercial transport services using banana boats. Officially they can only be used for fishing and personal transport. However, banana boat transport services are tolerated because there is no real alternative. The Lake Mweru does not have passenger ferries in operation (but they have been ordered). Lake Bangweulu has one old ferry operated by the parastatal board that provides an irregular service. It no longer meets safety regulations concerning fire extinguishers, life preserving devices and communications technologies, but it continues in use as it provides an essential service. The boards charge loading fees of ZMK 3,000–10,000 for banana boats.

Costs of passenger and freight transport

Figure 7.4 illustrates some of the passenger fares and freight charges for different transport types and road types in the region. These are examined in more detail in the subsequent sections.

Figure 7.4. Schematic map of hub and spoke system in Luapula Province, Zambia, showing illustrative costs of passenger and freight transport on various spokes for different modes of transport.

See associated text and tables for explanations and further information.



The cost of local passenger fares are deregulated and determined by the market. Table 7.5 gives examples of minibus and rural taxi passenger fares on various routes. For long-distance transport on good roads, costs are about USD 0.02 per kilometer. For shorter distances and transport roads that are poor or have little traffic, fares work out at USD 4–7 cents per kilometer. The practice of fixing fares in increments of ZMK 5000 (USD 1) creates some pricing anomalies, particularly for short

journeys. Fish trucks tend to charge passengers slightly more, because they provide relatively ‘express’ transport, with little waiting around.

Table 7.5 Examples of passenger fares by rural taxi in Luapula province, Zambia

<i>Road and transport type</i>	<i>Start</i>	<i>Finish</i>	<i>Distance km</i>	<i>Fare ZMK</i>	<i>Fare / km USD cents</i>
Main tar road	Kashikishi	Lusaka	940	100,000	2
<i>National transport</i>	Mansa	Lusaka	700	80,000	2
	Lubwe turn	Lusaka	650	75,000	2
	Kashikishi	Kitwe	408	55,000	3
Main tar road	Kashikishi	Mansa	240	40,000	3
<i>Provincial transport</i>	Mansa	Samfya	80	25,000	7
Poor road, low traffic volume	Milenge	Mansa (<i>service ceased</i>)	220	45,000	4
<i>Provincial/district transport</i>	Milenge	Tuta road Junction	74	25,000	7
	Kashikishi	Kawambwa	70	25,000	7
	Mpata	Samfya	24	5,000	4
	Samfya	Lubwe (<i>taxi</i>)	41	10,000	7
	Lubwe turn	Lubwe (<i>fish truck</i>)	30	15,000	10

Bicycle taxis are a major form of transport in Luapula. In many of the more remote villages (including Milenge District Town), they are the only form of public transport available. Table 7.6 gives examples of bicycle taxi fares on various routes. Prices are generally cheaper for long-distances. As with rural taxis, the practice of fixing fares in increments of ZMK 5000 (USD 1) creates some pricing anomalies, particularly for short journeys. Prices are mainly in the range USD 4–10 cents per kilometer, which is similar to the costs of rural taxis along minor roads. In many cases there is no direct competition between taxis and bicycles, as bicycles mainly operate where there is little or no motorized public transport.

There are two interesting examples of bicycle taxis operating along tar roads. In the first case, bicycle taxis operating the 40 km earth road from Mpanta to Samfya carrying fish traders and fish, continue on the tar road for another 90 km to Mansa, as the fish traders are confident of arriving in time at an affordable cost, despite the long and tiring bicycle journey. In the second case, bicycle taxis taking people along the 12 km from the village of Nsemiwe to the main road will continue along the tar road to Nchelenge (a further 16 km) for an additional fee. The extra distance is quite expensive (USD 20 cents a kilometer), but many people prefer this to waiting an uncertain time for a passing minibus.

Table 7.6 Examples of passenger fares by bicycle taxi in Luapula Province, Zambia

<i>Road type</i>	<i>Start</i>	<i>Finish</i>	<i>Distance km</i>	<i>Fare ZMK</i>	<i>Fare / km USD cents</i>
Good road, low volume traffic	Samfya	Mansa	90	15,000	3
	Nsemiwe junction	Nchelenge	16	15,000	20
Poor road, low traffic volume	Shanyemba	Kawambwa	76	25,000	7
	Milenge	Tuta (main road)	74	15,000	4
	Mpata	Samfya	40	10,000	5
	Nsemiwe	Kawambwa	20	15,000	16
	Nsemiwe	Main road	12	10,000	17
	Samfya	Lubwe	30	15,000	10

Transport by small ‘banana’ boats that are paddled by their operators (assisted by passengers) is very important to the communities living on the lakeshores, islands and in the swamp lands. Some journeys take two days to complete. Prices are in the region of USD 7–15 cents per kilometer, with shorter distances being proportionately more expensive, as shown in Table 7.7.

Table 7.7 Examples of passenger fares by small boat in Luapula Province, Zambia

<i>Transport and spoke type</i>	<i>Start</i>	<i>Finish</i>	<i>Distance km</i>	<i>Fare ZMK</i>	<i>Fare / km USD cents</i>
Human powered ‘banana boat’ on Nchelenge		Kilwa Island	33	15,000	9
Lake Mweru	Nchelenge	Chisenga Island	14	10,000	15
Human powered ‘banana boat’ on Samfya		Chilubi	55	25,000	9
Lake Bangweulu	Samfya	Mbabala Island	15	10,000	14
	Samfya	Chishi Island	45	15,000	7

There are four main means of freight transport in Luapula: trucks, rural taxis and minibuses, bicycle taxis and boats.

The cost of transport by banana boat varies from USD 0.80 to USD 3.00 per ton-kilometer for the transport of typical fish loads as shown in Table 7.8. The freight costs would be reduced for larger consolidated loads.

Examples of prices of land freight costs are given in Table 7.9. Prices for motor transport vary greatly, with long distance, national-level transport being cheapest (around USD 0.30–0.50 per ton-kilometer). The transport of dried fish is higher per ton-kilometer as it is a valuable and bulky lightweight product. Hiring a truck to carry fish costs about USD 0.70 per ton-kilometer, depending on the load carried. Short distant transport by rural taxi on poor roads is disproportionately expensive, with one example as high as USD 2.80 per ton-kilometer. The price of bicycle freight varied between USD 0.70 and USD 4.20 per ton-kilometer, with the cheaper prices for long-distance journeys (over 70 km).

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Table 7.8 Examples freight costs by small boat in Luapula Province

<i>Transport type</i>	<i>Start</i>	<i>Finish</i>	<i>Distance km</i>	<i>Fare ZMK</i>	<i>Price per km ZMK</i>	<i>Price per ton- km USD</i>
Cost of 25 kg fish basket by small boat	Nchelenge	Kilwa Island	33	5,000	152	1.26
	Nchelenge	Chisenga Island	14	5,000	357	2.98
	Samfya	Chilubi	55	5,000	91	0.76
	Samfya	Mbabala Island	15	5,000	333	2.78
	Samfya	Chishi Island	45	5,000	111	0.93
Hire of boat to carry 20 25-kg fish baskets	Nchelenge	Kilwa Island	33	100,000	3030	1.26
	Mpanta	Bangweulu swamp	15	30,000	2000	0.83

Table 7.9 Examples of freight costs in Luapula Province, Zambia

<i>Start</i>	<i>Finish</i>	<i>Spoke/road type</i>	<i>Distance km</i>	<i>Price ZMK</i>	<i>Price per km ZMK</i>	<i>Price per ton- km USD</i>
Rural taxi (25 kg fresh fish)						
Kashikishi	Lusaka	National, tar	940	50,000	53	0.44
Kashikishi	Kitwe	National, tar, earth	452	25,000	55	0.46
Kashikishi	Mansa	Regional, tar	212	20,000	94	0.79
Samfya	Mansa	Regional, tar	80	15,000	188	1.56
Mpanta	Samfya	Market, earth	48	10,000	208	1.74
Samfya junction	Lubwe	Market, earth	30	10,000	333	2.78
Freight truck hired (40 baskets x 25 kg fresh fish)						
Mansa	Kitwe	National, tar	240	1,000,000	1429	0.30
Kashikishi	Lusaka	National, tar, earth	940	3,000,000	3191	0.66
Mansa	Lusaka	National, tar	700	2,500,000	3571	0.74
Kashikishi	Kitwe	National, tar, earth	452	1,750,000	3872	0.81
Mpanta	Mansa	Regional, tar	128	500,000	3906	0.81
Samfya	Kitwe	National, tar, earth	320	1,500,000	4688	0.98
Bicycle taxi (50 kg load)						
Milenge	Samfya	Regional, earth/tar	148	25,000	169	0.70
Samfya	Mansa	Regional, tar	80	15,000	188	0.78
Milenge	Tuta junction	Regional, earth	74	15,000	203	0.84
Mpanta	Samfya	Market, earth	40	10,000	250	1.04
Nsemiwe	Nchelenge	Market, earth/tar	26	25,000	962	4.01
Nsemiwe	Kawambwa	Market, poor earth	20	20,000	1000	4.17
Light truck (50 kg bag of cassava or cement)						
Chembe	Ndola	National, earth, tar	168	12,000	71	0.30
Samfya	Kitwe	National, tar, earth	320	25,000	78	0.33
Luwingu	Kitwe	National, earth, tar	380	40,000	105	0.44
Kashikishi	Kitwe	National, tar	452	60,000	133	0.55
Kashikishi	Kitwe	National, tar	452	60,000	133	0.55
Light truck (50 kg bag of dried fish)						
Kashikishi	Kitwe	National, tar, earth	452	150,000	332	1.38

Operator perspectives and cost of rural transport services

All operators of motor transport complained of poor profitability and low economic demand. The more profitable services seemed to be the light trucks operating on fish routes. One private truck had tried to operate three times a week on the Milenge-Mansa route, charging ZMK 25,000 (about USD 5) to the main road (74 km) and ZMK 45,000 (about USD 10) to Mansa (240 km). The businessman had not found this profitable and so moved his vehicle to operate on a tar road serving a fish market.

Minibuses and rural taxis do not operate to timetables, but generally wait for a full load. Waiting and loading times can be long, several hours or even more than one day. Operators claim they need the income from all passengers to cover their costs, and so they wait for a full load. This has to be the case when owners insist that the drivers always submit funds based on a full load. However the effect of the long delays is a classic vicious spiral of unreliable supply causing reduced demand.

Minibus operators object to the passenger services offered by light trucks. Fish traders hire the trucks which depart as soon as the fish is loaded. However passengers are also carried, loading from the terminals and along the road. This improves transport availability (but not comfort) for those passengers in the trucks. Fish trucks take away passenger from the rural taxis, which have to wait even longer for their full load. Despite the lack of comfort, passengers like to travel in fish trucks because the time they spend waiting for transport is greatly reduced. Similarly, some people take bicycle taxis for uncomfortably long distances because of the uncertain time needed to wait for motorized transport.

Transport operators did not report any problems concerning regulation, harassment by enforcement officials or expected unofficial payments at the various control barriers in the province. Their main complaints were the poor roads and the cost of fuel.

SOME KEY OBSERVATIONS AND LESSONS LEARNED

Motorized transport, service predictability and vicious circles

The main types of motorized transport in Luapula are rural taxis (minibuses and pickups) and light trucks. Nearly all the motorized transport services in the province are associated with the profitable trade in fish, and operate on main roads between fish markets and the national and provincial transport hubs. During the months that the fish markets are closed, motorized transport decreases and the whole economy of the province shrinks.

Most of the communities in Luapula that have economies based on agriculture rather than fish do not have access to regular motorized transport services unless they are situated on a road serving a fish market. Without access to transport, rural people feel excluded from economic opportunities. With assured transport services (motorized by preference, bicycles when necessary), rural people say they could undertake many more productive and economic activities. For motorized transport, rural people need low prices, but just as important is a reliable and predictable service that allows

people to plan journeys. Rural women in particular stressed the importance of reliable transport: they cannot risk travelling if they cannot be sure that they will not be stranded. Women argued that a predictable twice-a-week service would be better for them economically than an uncertain daily one (as they would make a point of travelling on the day of the transport). However, for emergency travel for health care, a daily service would be better, even if it were unreliable.

Within Luapula Province there are plenty examples of the vicious circle of poor, unreliable motorized transport supply reducing already low transport demand to cause even worse transport services. This was reported by transport operators, transport users and government officials. Due to low demand, rural minibuses wait for hours for a full load, and due to the long waits many people do not travel. Due to the long waiting times, people take alternative transport modes (bicycle taxis or fish trucks) which are uncomfortable. This reduces the customers for minibuses and increases waiting times. There is an urgent need to get out of this spiral, and this is discussed below.

Importance of bicycles

Bicycles are the main land-based intermediate means of transport, and they are extremely important for rural transport, carrying people and goods. Although the price of bicycles has been high (ZMK 450, 000 or USD 95) there are estimated to be about 80,000 in use (representing a capital investment of USD 7 million). However many rural households that require bicycles do not own them due to their high price and the lack of credit to acquire them.

Bicycles are used for personal mobility, for trading and for providing services to other people. Some young men make their living by providing full-time rural taxis services using bicycles. Other bicycle-owning people will assist their neighbors by providing occasional lifts (sometimes paid, sometimes as a favor). Sometimes women or men with loads (fish, produce, goods) will hire two or three bicycle taxis to carry them and their loads. The distances regularly travelled by bicycle can be large (30–130 km) and examples are given in Box 7.1.

Box 7.1 Examples of long-distance cycle use in Luapula Province

- Mulunda-Kawamba (76 km each way). Teachers cycle this distance each month to collect salaries. Other people needing access to the town (selling produce, trading, administration, bank, medical, legal and social reasons) commonly hire cycle taxis (ZMK 25,000 or USD 6 each way) as there are no regular motorized taxis on this route.
- Mpanta-Samfya (40 km), Mpanta-Mansa (130 km). Several bicycle taxis operate on these routes, carrying people and loads of fish. The charge is ZMK 10,000 (about USD 2) for Mpanta-Samfya on an earth road with little traffic. To take people and fish all the way to Mansa costs ZMK 25,000 (about USD 5). The journey from Samfya to Mansa is along the main tar road, where rural taxis operate but are infrequent.
- Milenge-Main road (74 km). Milenge-Mansa (220 km). In the absence of motorized transport, bicycle taxis are the main way of travelling from Milenge to the road junction (cost ZMK 15,000, about USD 3). It is not unusual for people to cycle to Mansa for salaries or other business.
- Milenge-Ndola (130 km). Traders regular cycle to the Copperbelt, passing through the Congo. It is estimated that over 10,000 such trading trips are made each year.
- Nsemiwe-Nchelenge (28 km). In the absence of motorized transport, most movement of people and goods is by foot, bicycle or bicycle taxi. Bicycle taxis to the main road (12 km) cost ZMK 10,000 (about USD 2.5) but most people take the cycle taxis all the way to town as motorized services along the road are infrequent and expensive.

Bicycles are used for a variety of purposes and are perceived by rural people as important means of livelihood. For example, women in an isolated village argued that if they could obtain bicycles, they could sell agricultural produce, make goods for sale and trade and so earn a reasonable income. In this village, only some men (including a teacher, bicycle taxi operators and long-distance traders) owned bicycles. The nurse who visited for the under-fives clinic arrived by bicycle each month. A handicapped person was only able to travel outside the village on the back of someone's bicycle. Transport to hospitals is normally on bicycle, except in extreme cases when someone has to cycle to fetch a motorized ambulance. Bicycles have become vital to the economy of the village, but everyone agrees that more are needed.

Most bicycles are of the roadster type without gears. People find these cheaper to operate, with lower repair costs. A repairer confirmed this by pointing out a high proportion of his income came from repairing gears, even though most bicycles did not have gears.

Motorcycles

There are very few motorcycles in use. A small number of government agents use motorcycles in their duties, but there are not yet any private sector transport services based on motorcycles. In some other countries (notably Nigeria, Cameroon and Rwanda), the use of low cost Chinese motorcycles has increased rapidly, providing valuable rural transport services. Given the long distances currently being undertaken by bicycle taxis, and the amounts people appear able to pay, there may well be a niche for motorcycle taxi services in Luapula Province.

Animal powered carts

As there are very few cattle and even fewer donkeys, there is no significant use of animal drawn carts at present. While animal power could have a role in some of the villages, there seem no immediate prospects of promoting the widespread use of animal-drawn carts.

Transport for health and education

Everyone contacted who was concerned with health and educational services in Luapula Province (teachers, medical staff, patients and pupils) agreed that the scarcity of rural transport was a major constraint. Schools and health centers had problems obtaining supplies, and pupils, patients and staff had problems travelling to and from schools and health centers. Staff often had to be absent for at least two days a month to travel to collect salaries. There were some good emergency ambulance services, but most people travelled to health care by foot or on someone's bicycle. Transport problems lead to deaths not only due to failure to access medical treatment in emergencies, but also failure to return for routine treatment (especially TB). People suggested that better roads, more motorized transport services (including motorcycles and motorized boats) and more bicycles could improve the situation. Better rural banking services and better telephone services would also help the schools and rural health centers.

Population movements towards roadsides

For the past forty years, there has been a steady migration of people from traditional villages to live alongside the main paved road that runs through the province. People want to be on the roadside, and not simply close to the road. This has led to the creation of linear villages, with a single row of houses on each side of the road. Along the main road, there are areas with almost continuous strip settlement for over 30 km. While these are administered as independent villages (with their own primary schools, village stores and churches) there is often no open land separating them. One reason cited for the movement was that electricity is now available along much of the road, but this does not explain the linear nature of the settlements. Roadside trading and access to motorized transport is easy from roadside houses, but few people appear to make use of this proximity. People do make use the main road for walking, cycling and socializing, creating 'village high streets' stretching for tens of kilometers along a national trunk road. Although traffic volumes are not great, the local use of the paved road raises very many safety issues, with clear conflicts of interest between the residents and fast-moving traffic.

From the point of view of transport services, the linear settlements along the main roads mean that this significant proportion of the rural population has easy access to the small number of rural taxis that stop on demand and also to bicycle taxis that operate along the paved roads.

Influences of changing national corridor transport

The road infrastructure of Luapula is dominated by the bifurcating national spoke roads running to and from Lusaka (via Serenje) and to and from the Copperbelt (via the DRC pedicle road). During the survey, the pedicle route was little used, for reasons of road quality and aggravation at DRC check points. It has subsequently become more popular. With further bridge and road improvements it could become the main link between Luapula and the rest of Zambia, reducing traffic on the Mansa-Serenje road (with implications for the communities along that corridor). The great savings in distance offered by the pedicle route should lead to lower national level passenger and freight charges for services to and from Luapula. This should then influence prices, marketing and trading patterns within Luapula. The communities far from these corridors, such as the district town of Milenge, are not likely to see the effects of such changes at the provincial level. In the absence of motorized transport services to remote communities such as Milenge, long distance bicycle transport between Luapula and the Copperbelt may still be required.

Infrastructure for bicycles

Bicycle operators (private individuals and bicycle taxis) travelling to towns complained that it was difficult to find secure parking for bicycles. On one major cycle route (Milenge to the main road, 76 km) a local house at the main road junction now provides secure parking for bicycles (for a small fee). This allows people to cycle to the main road, and then take motorized transport to Samfya, Mansa or Lusaka. Further secure parking facilities for bicycles close to markets and transport terminals would encourage greater use of bicycles and the better integration of motorized and non-motorized transport systems.

Safety

There are significant safety issues relating to rural transport in Luapula. As noted above, the main paved road is now used as a series of village high streets lasting for tens of kilometers, with numerous pedestrians as well as cyclists. There are few traffic calming measures and as traffic levels are low, pedestrians and cyclists may be lulled into a false sense of security.

Along both the paved roads and small district roads, tall grass grows and overhangs the road. Eventually, all grass is cut manually, but before it is cleared the effective width of the road is greatly narrowed. Pedestrians and cyclists are unable to stay close to the road edge, and this risk is compounded by greatly reduced visibility for motorized vehicles.

Most bicycles in use lack effective brakes. Some cyclists use their feet to brake, and some try to turn the bicycle towards an upward slope. Emergency braking often involves falling off the bicycle. Brake blocks are expensive (ZMK 14,000 or USD 2 in Mansa) and this is given as one reason for lack of effective brakes. While many cyclists operate with due respect for motorized transport, some cause accidents by paying inadequate attention to fast moving traffic.

The banana boats are the main means of water transport on the lakes and rivers. In calm conditions and with small to medium loads they are very safe and stable. The lakes can get quite choppy on normal afternoons, and during storms and squalls conditions can be very dangerous, particularly if boats are heavily laden. Officially, for reasons of safety, banana boats are not permitted to operate commercial transport services. In practice, most water based rural transport services do use banana boats, as there are no real alternatives at present.

Non transport solution: ice plants to allow load consolidation

Time is of the essence for marketing fresh fish and this leads to transport problems. The problem is particularly serious for those with small loads of fish who cannot afford to arrange immediate transport by motorized vehicles. Such people sometimes hire three or four bicycles to transport the fish to a market (perhaps 40 to 120 km away). If there were simple ice plants in the main locations where fishermen land, the fish could be preserved in good condition until the combined load was sufficient to justify motorized transport.

CONCLUSIONS AND SOME POSSIBILITIES FOR IMPROVING RURAL TRANSPORT

From the survey and related discussions, several suggestions were made for improving rural transport services in Luapula. Some of these are listed here as possible options whose feasibility could be considered. The various initiatives proposed might be appropriate for implementation by private, government, NGO or community based sectors.

Developing predictable transport services

Transport operators, passengers and government officials were unanimous in the belief that one of the best ways to improve transport would be to improve rural roads. While there is much merit in this, there are many good examples in Luapula where the road condition is not the limiting factor for motorized rural transport services. Even the good tar road of the main north-south transport corridor does not have regular, reliable and affordable minibuses that take local passengers. People said they had to spend time and money hiring bicycle taxis to travel significant distances along this road, because they could not rely on motorized transport services. The road to Milenge, a new district town is a good gravel road, without any motor services. A commercial operator was unable to make a profit running a service along this road and up to Mansa (76 km on good gravel, 86 km on good tar) due to lack of apparent economic transport demand. Yet people in Milenge and along the route say they urgently need a motorized transport service.

Something needs to be done to change this vicious spiral of poor supply and demand into a virtuous spiral of increasing transport supply stimulating additional demand and economic growth. Ideas of how this could be achieved are given in Chapter 8, but the principle must be to harness and consolidate all weekly demand (from farmers, traders, schools, hospitals, government departments) into guaranteed and predictable services (weekly, twice weekly, daily or twice daily) that meet the average demand. The commercial operator must then be persuaded or contracted to run to the agreed timetable, whatever the degree of loading. The service provider must be convinced that the agreed average loading (which could be pre-paid) is sufficient for overall profitability, even if some trips are not profitable. Once regular services are operating, more people will start to use them.

It is therefore recommended to establish regular motorized transport services on all main routes in Luapula. There are various mechanisms by which this could be achieved, but the principle must involve joint planning involving operators and all sections of rural communities requiring transport, with community-guaranteed average or minimum income from 'ticket' sales.

Increasing bicycle and motorcycle use

For many residents of Luapula, bicycles are extremely important for enabling them to gain their livelihoods. For most people, these means of transport link them to the motorized transport hubs that are central to the fish trade and commercial economy. Very large distances (well over 100 km) are regularly being undertaken by bicycles and bicycle taxis (tens of thousands of such trips a year in the whole province). Medium distance (10–30 km) journeys are even more common.

The importance of bicycles, in general, and long-distance bicycle journeys, in particular, does not seem to be fully acknowledged by transport authorities at the national or provincial levels. Bicycles are important for rural livelihoods and should be encouraged. Women use bicycles, but not as much as men do, due to insufficient access to available bicycles.

Bicycles are expensive, costing about ZMK 400,000 (USD 90) for a basic 'roadster' bicycle without gears. The cost of brake blocks seems disproportionately expensive. Given the value of bicycles for mobility and livelihoods, ownership of bicycles is still relatively low (less than one in three rural

households). Their high cost and the lack of credit are cited as the main constraints. The use of bicycles could be improved by:

- Decreasing the cost of bicycles and spares by removing import duty (25%) and VAT (17.5%)
- Increasing availability of affordable brake blocks and encouraging working brakes on bicycles
- Providing secure parking facilities for bicycles
- Increasing rural banking facilities and credit availability for the purchase of bicycles.

Operators of long-distance cycle taxis services could be assisted to acquire motorcycles so they can provide more rapid services. One model of the profitability of motorcycle taxis is presented in Chapter 8.

Water transport and fish marketing

Banana boats are very widely used on the lakes, rivers and swamps of Luapula Province. The establishment of facilities for the local production and repair of fiberglass boats in Luapula should increase access to such vessels and make them easier to maintain. The provision of credit facilities to facilitate the purchase of such boats and safety devices should be encouraged. There may be scope to develop 'long-tail' propulsion units (as widely used in South East Asia), being cheaper and easier to maintain than conventional outboard motors.

The establishment of small ice plants at landing points and smaller markets would allow the consolidation of fish loads. This should benefit fishermen, fish traders and fish transporters.

Safety

Population settlement very close to main roads is an important feature of Luapula and appears to be increasing. The various implications of this, including the safety issues, need to be studied and addressed. Long grass should be removed from roadsides earlier in the season to improve the safety of pedestrians, cyclists and motorized vehicles.

CHAPTER 8: LESSONS AND IMPLICATIONS

CONTEXT AND CAVEAT

The pilot studies discussed here were carried out in five different regions in Burkina Faso, Cameroon, Tanzania and Zambia. There were widespread variations within and between the areas surveyed. The national researchers each implemented the methodology in slightly different ways. All surveys yielded much valuable information, some unique and some common to all the areas. Certain findings can be used immediately to help improve rural transport services. Other information and ideas can be followed-up with more detailed studies focusing on some pertinent issues that have been raised.

In all cases, the survey findings need to be assessed in their contexts by the various stakeholders. It may not be appropriate to try to generalize from context-specific observations or to extrapolate from small samples that were not statistically significant. Bearing in mind these words of caution, it is possible to review some clear lessons that have emerged. For each topic, a recommendation will be made that relating to transport policy. These will be phrased in quite general terms. It will be for the key stakeholders at local, regional or national level to determine the relevance of these recommendations to their own unique situations and, if they are appropriate, to adapt them accordingly.

UNDERSTANDING RURAL TRANSPORT SYSTEMS

Poverty, economic growth and private sector transport services

Improved rural transport is a prerequisite for poverty alleviation. The achievement of several millennium development goals, including those relating to health, maternal and child mortality and education, depend on better access to services, and this requires better transport infrastructure and better transport services.

Motorized rural transport services and intermediate means of transport are generally run and maintained by private operators within the informal sector. In most countries, governments have restricted their role in transport to maintaining road infrastructure (with problems), regulating against unsafe transport practices (with minimal enforcement) and taxing means of transport. Governments are not generally engaged in any proactive initiatives for increasing people's access to rural transport or providing incentives to improve rural transport services. This laissez-faire approach is clearly not working. It is preventing millions of people from being more productive, from contributing to local economies and from having better qualities of life through

improved access to income, health and education. Lack of transport services and intermediate means of transport is perpetuating rural poverty and limiting economic growth.

In all the areas surveyed, rural women and men complained that inadequate transport prevented them from increasing their productivity and improving their livelihoods. They said it was pointless to grow or make things for sale if there was no access to a suitable market. Because of poor transport, many rural people remain primarily subsistence farmers, with little impact on the regional economy.

The surveys provided examples of rural people becoming more productive when transport became more available. Productive rural people buy goods and services and pay taxes. It is in everyone's interest that rural people should be helped to be productive, by ensuring that there are dependable and affordable transport services in rural areas. Both motorized and non-motorized transport systems are needed. The surveys showed how intermediate means of transport (IMTs) are particularly important for rural women, men and children. Increasing access to IMTs, particularly bicycles, could contribute significantly to achieving the millennium development goals.

Recommendation

Consider improvements in rural transport infrastructure, transport services and intermediate means of transport as prerequisites for achieving rural growth and meeting the millennium development goals. Develop proactive transport policies and investments accordingly.

Transport hubs

The concept of transport hubs and spokes assists understanding rural transport and planning for optimized transport services. In most cases, there is a hierarchy of hubs, and it is possible to recognize four levels, each with particular characteristics.

- National hub, with high levels of traffic on the national (and international) inter-urban spokes.
- Regional/provincial hub, with daily motorized transport on main spokes to market towns
- District town/market hub with irregular motor transport on the village to market spokes and much use of intermediate means of transport
- Village hub with most transport on the homestead to village spokes involving walking and carrying and intermediate means of transport.

The national spokes act as 'transport corridors' and towns, villages and junctions along the transport corridor tend to develop as transport hubs. While national transport spokes greatly affect the rural areas they pass through, most long-distance traffic on them is inter-urban rather than rural transport. The main road connecting a regional hub to the capital city is primarily a spoke on the national hub system, and has significantly more traffic than the regional spokes.

Many people (including decision makers) overestimate rural transport services by thinking that this national spoke is typical of the region.

Rural transport services almost invariably operate to and from national, regional, market or village hubs. Motorized rural transport services generally operate from a small number of hubs (the regional town and a few market towns). By surveying each of these hubs, it is possible to obtain a very accurate picture of the transport services operating in an area including their routes, frequencies and charges and the concerns of their operators and passengers.

While the main transport hubs and spokes are likely to correspond to the road system, there may be other important processes in operation. 'Invisible' hubs and spokes can include periodic markets, footpaths, cycleways, small bridges, water transport and cross-border exchanges. Not all rural people will consider the regional town as their main transport destination. They may travel in the opposite direction for their markets, health facilities and services. This is frequently the case near regional or national boundaries. Transport planners should talk with rural people to understand their transport patterns and priorities.

Where possible, all data obtained during rural transport surveys should be geo-referenced using portable GPS (global positioning system) devices. Using mapping software and geographical information systems (GIS) technology, vector maps can be created of transport systems (infrastructure and traffic). Properties can be ascribed to the nodes (villages, towns, population size, socio-economic characteristics) and vectors (roads, tracks, traffic) to create computer models. These can be used for understanding existing transport systems, and comparing options for interventions relating to roads, transport services and optimal location of various services.

Recommendation

Planners, operators, regulators and user groups should use the hub and spoke concept to help understand and model rural transport systems and options for improving transport services.

Importance of infrastructure

All stakeholders, including transport operators, passengers and the regulatory authorities, consider that road quality is a crucial limiting factor to rural transport. Poor roads lead to

- long journey times
- unreliable services
- high operating costs
- high fares
- poor access to health (and consequently higher mortality)
- poor access to education (and consequently lower school attendance)
- low participation by rural people in the regional and national economy

The surveys provided examples where road improvements have led to improved services and lower fares, with greater access of villagers to markets and social services. Similarly, road deterioration has led to reduced services, higher fares and increased isolation from markets and services. In all regions surveyed, the authorities were having problems in funding the work required to maintain and improve the roads. The management of rain barriers was generally weak. In some countries, there were systems in place for local level prioritization of road maintenance and rehabilitation, but transport operators seldom felt involved in the processes.

Some communities are completely inaccessible for part of the year. Much investment in road maintenance serves to decrease journey times on major roads that are accessible but in poor condition. If greater weight were given to poverty reduction criteria, more funds might be allocated to strategic spot improvements that open blocked roads.

Infrastructure does not only concern roads. Most transport services operate from terminals (public or private) that require basic facilities for passengers (sanitation, security for luggage). Passengers in small boats may benefit from quays and loading ramps. Cyclists often need secure parking for bicycles around markets or transport terminals. Small bridges for pedestrians and cyclists reduce journey times and greatly increase safety.

Recommendation

Consider poverty reduction criteria in determining priorities for road funding, maintenance and rehabilitation and the provision of small scale infrastructure and involve rural stakeholders and transporters in the processes road prioritization and management.

Transport services fluctuate greatly

Rural transport services are not constant, but vary greatly, with daily, weekly, monthly and annual fluctuations. Periodic markets (weekly, monthly) cause major surges in traffic, as can holidays and festivals. Harvest times stimulate itinerant traders to visit rural areas (e.g., cocoa harvest in Cameroon) whereas closed seasons can significantly reduce transport (e.g., fish ban months in Zambia). Some roads are completely impassable during the rain seasons, bringing motorized traffic to a halt.

The fluctuations in traffic affect rural people, who may adjust their travelling, produce sales and family visits accordingly. Service providers (health, financial, training, extension advice) would do well to consider transport services and opportunities when devising their programs and their operational locations. For example, if specialized clinics are held on market days, more people may be able to access transport to attend. Transport authorities should build the various transport fluctuations into their planning models, as they could affect the prioritization of infrastructure improvements and transport service regulation.

Recommendation

Understand fluctuations in transport supply and demand and build these into transport planning models, road prioritization and the planning of service provision.

Low investment in motorized rural transport services

In all the countries visited, the great majority of all motor vehicles operate in and around the major cities. The fleets of transport service vehicles (buses, trucks, minibuses and rural taxis) that operate within rural areas are extremely small. Most vehicles are very old (often more than twenty years) and have been bought when they were already well used. The amount of capital invested in rural transport vehicles is therefore low, ranging from USD 1–10 per head of population. This is illustrated in Table 8.1.

Table 8.1 Some estimates of rural transport fleets

Region	Population	Regional fleet of motor transport vehicles	
		Numbers	Investment value (USD millions)
Mouhoun, Burkina Faso	1,400,000	80	1.5
Southern, Cameroon	500,000	830	5.0
Iringa, Tanzania	1,500,000	180	1.4
Luapula Zambia	800,000	180	1.7

Notes: Order-of-magnitude estimates based on field observations. These figures are for buses, mini-buses, trucks and rural taxis vehicles mainly used for the transport of people and goods within the area on a year-round basis. They exclude national and international level long-distance services, within-village transport, government and NGO vehicles and private cars. Values are based on the approximate investment made by the purchasers: most motor vehicles were purchased when over ten years old.

Rural transport services appear to have low profitability. Individuals operating within the informal sector generally provide them. There are few, or no, private transport firms operating in the formal sector (although such firms do operate on national and international routes).

The surveys did not identify any transport entrepreneurs who were investing significant income from profitable transport to build up large fleets of transport vehicles operating in rural areas. Such entrepreneurs may exist in urban and inter-urban transport markets, and in the special markets provided by motorcycles and transport agencies in Cameroon. Vehicles operating on inter-urban routes and along good national roads are generally in better condition. If a rural resident obtains a good vehicle, it will probably be operated on an inter-urban route or for trading, and not as a rural transport service. Most operators of rural taxis interviewed aspired to owning large trucks, rather than large buses.

Most rural vehicles appear to have been bought from non-transport income (trading, salaries, remittances from relatives). Operators say it is difficult to afford replacements, and this is borne out by the deterioration of vehicles. Rural transport operators generally consider themselves to be over taxed. Most have to pay a flat-rate amount that is not based on their operating profit.

It is difficult to obtain accurate estimates of running costs and income, partly because many costs are informal and unrecorded. It is rare for transport operators to be paid formal salaries. All inputs are kept to a minimum, including fuel, repairs and replacements. Most operators feel they have to cover their costs on each and every journey (whereas transport firms can afford to have unprofitable trips as long as average income is acceptable). This need to cover all costs prevents operators from keeping to fixed timetables and exacerbates the vicious circle of low transport demand and unreliable transport market.

Recommendation

Consider financial incentives (including tax incentives) to encourage investment to improve the quantity and quality of rural transport services.

INTERMEDIATE MEANS OF TRANSPORT

Importance of intermediate means of transport

The surveys all highlighted the immense importance of intermediate means of transport (IMTs) for rural transport. In all the countries studied, intermediate means of transport (bicycles, motorcycles and/or animal-drawn carts, depending on the local conditions) play an extremely important role in regional transport. For many rural people, the only way they can access markets, healthcare, education and financial services is by intermediate means of transport. These are commonly used for journeys of over twenty kilometers, and some people travel over one hundred kilometers using IMTs. Although intermediate means of transport are costly in rural areas, and expensive relative to local incomes, people have been investing in them. The amount of capital invested in intermediate means of transport ranged from USD 3–15 per head of population, and was in all cases greater than the total invested in large-scale transport service vehicles. This is illustrated in Table 8.2.

Table 8.2 Some estimates of intermediate means of transport (IMTs)

Region	Population	Regional fleet of IMTs ^a	
		Numbers	Investment value (USD millions)
Mouhoun, Burkina Faso	1,400,000	220,000	35
Southern, Cameroon	500,000	21,000	14
Iringa, Tanzania	1,500,000	73,000	5
Luapula Zambia	800,000	80,000	8

Notes: Order-of-magnitude estimates based on field observations. Values are based on the approximate investment made by the purchasers: most IMTs were new when brought into the regions.

In all countries, there were major difference in the perceptions of the transport authorities and the rural populations concerning intermediate means of transport. The authorities tended to ignore IMTs and even despise them. The rural people considered them extremely important for their livelihoods and for accessing services.

Recommendation

Understand and acknowledge the importance of intermediate means of transport for rural people, and develop policies to facilitate their adoption and use.

Bicycles are tools for production and livelihoods

Bicycles are the most common and the most versatile intermediate means of transport. In most countries, the ownership and use of bicycles is increasing quite rapidly. As bicycles become more common, women make greater use of them. Rural people often consider bicycles as an important means of livelihood and as work tools that increase their productivity and their access to markets. They increase the weight and volume of goods that one person can carry to and from markets. They provide faster access to health, education and other services.

In most countries, medium-distance (20 km) journeys by bicycle are common and long-distance (80+ km) journeys by bicycle not unusual. Bicycle taxi services are increasing in some countries. In Zambia, very long distance journeys (over 100 km) by bicycle taxi were reported.

In all countries visited, bicycles were expensive, costing about USD 100–200. In some areas, there has been a vicious circle of high price, causing little apparent demand, little supply and few support services. Elsewhere, prices are falling, and this is stimulating greater adoption. The low cost of assembled or semi-assembled bicycles imported from Asia, means that local bicycle production is unrealistic. Local factories have been closing and the system of importing bicycles in cartons of three or five is favoring decentralized assembly. The cost of Chinese or Indian bicycles on the international market is about USD 25. Import duties and VAT may add USD 10–20 to the cost of bicycle. With lower taxes, it is realistic to envisage bicycles costing USD 50–60 in rural areas. This would lead to much greater adoption, with resulting benefits to agricultural production, education and health. If men, women and students are to have greater access to bicycle transport, ownership may rise to several bicycles per household.

Most authorities contacted were unaware of the importance of bicycles, and some were quite scornful of them, considering them to be old-fashioned. Decision makers generally underestimate the productive value of bicycles. In all the countries visited, the authorities should aim for greater bicycle use and improved motorized transport services. As bicycles become common in rural areas, people find new and creative uses for bicycles, increasing local production and trade. De-taxing bicycles will reduce prices, increase adoption, stimulate the local economies and improve people's access to services.

Recommendation

Remove taxes and duties from bicycles and other intermediate means of transport: in the medium term the economic, health and educational benefits of the bicycles should more than compensate for the small revenue loss to governments.

Increase in motorcycles

Large-scale motorcycle production in China has led to a dramatic fall in the cost of imported motorcycles. These have typically fallen from about USD 2000 for a Japanese model, to USD 600 for a Chinese motorcycle. At this price more people can afford them, particularly if they can obtain income from marketing or providing transport services. There has been a huge increase in motorcycles in Cameroon (and neighboring Nigeria), and a significant increase in Burkina Faso. To date, their use in rural Tanzania and Zambia is minimal, but as a result of the surveys, the author predicts that rapid increases will follow in these and other countries. One reason for this prediction is the system of funding purchases that has proved effective in Cameroon. Subject to appropriate motorcycle prices and fares, it should also be viable elsewhere.

- An urban-based trader or civil servant buys a new motorcycle for USD 600
- This is hired to a young operator for USD 4–6 per day
- The young operator profits and gains employment by making eight journeys at USD 1 (for example)
- The owner recovers all capital in just three-to-six months
- The owner replaces the motorcycle every six months, selling for half price (USD 300)
- This creates a second-hand market for less wealthy people (who will also be faced with repair bills)
- Rural people gain a convenient and available transport service at prices they can afford (USD 1)
- As a critical mass of motorcycle users, suppliers and repairers develop, it becomes increasingly easy to adopt and run motorcycles, for private use as well as service provision.

Naturally, the owner does not need to be urban based, but there is often easier access to capital or credit in urban areas. In the first instance, the motorcycle transport services are most likely to develop in urban and peri-urban areas, but competition will encourage people to look for new transport markets in remoter, rural areas.

There are advantages and disadvantages of motorcycle transport services, but they do work, they do generate employment and they do provide transport services that benefit rural communities. Their load carrying ability is small, but is greater than a bicycle and they are much quicker than bicycle taxis. Over long distances, they cannot compete on price with trucks, buses and rural taxis. However they can complement such services, linking villages to junctions on the main roads.

Greater motorcycle use raises some environmental, safety and regulation issues (emissions, crash helmets, safe loads, safe driving techniques).

Recommendation

The development of motorcycle transport services will benefit rural areas and should be encouraged and regulated appropriately.

REGULATING RURAL TRANSPORT

Control barriers and enforcement

In all countries surveyed, there are control points for mandatory or random questioning. Traffic police, paramilitary forces, customs officers, market regulators (forestry, fish, livestock) or road safety officials may operate various controls. In some regions, such as Southern Cameroon, the roads close to towns have a series of control barriers, with several services acting separately.

In some countries, the barriers are used for legitimate control purposes, and unsafe or illegal loads are not allowed to pass. However, in most regions visited, the controlling officers accept tips or bribes to allow rapid transit, whatever the load or condition of the vehicle. In such circumstances, semi-formalized systems develop, with rural transport operators offering a standard payment each day at each barrier. The barriers are most active on lucrative routes, at peak times and when the officials feel most in need of 'tips' (towards the end of the month, and before public holidays). Transport operators are generally fairly tolerant of occasional barriers (they have become a normal part of life), but they do resent multiple barriers. In exceptional cases, operators considered that 'bribe' barriers accounted for one third of their operating costs, a figure comparable to their fuel costs. Naturally, these costs are passed on in the form of higher fares and tariffs, but unlike road tolls, they provide no benefits to the rural transport system.

Recommendation

Bribery at control barriers should be eliminated as it increases transport costs and reduces legitimate safety enforcement.

Transport associations and transport user groups

In many countries there are associations of transport operators. There may be separate associations for rural taxis, trucks, buses, bicycle taxis and motorcycle taxis. Their main role is to control loading and queuing at terminals, preventing anarchic squabbling for passengers or freight. They may agree prices and route allocation between members and/or with authorities. They may also discuss and help enforce safety regulations. Their role is partly anti-competitive, since the system of queuing means that passengers cannot easily choose 'better' operators or vehicles, and operators have few incentives to improve (they get a full load simply by waiting long enough in

the queue). Some associations have member support functions, such as bulk purchases, credit provision or sickness assistance.

While transport associations may have the capacity to be exclusive, anti-competitive cartels, this was not found to be the case in regions surveyed. Most associations contacted were quite weak and only operated at major hubs. Controlling queuing and prices does not mean that all competition is eliminated. Most transport operators try to gain customer loyalty in various ways, including price incentives. There is also competition between the different modes of transport (buses, rural taxis, trucks, motorcycles, bicycle taxis). In one country, Zambia, associations had been banned, primarily because of their participation in protests over fuel price increases.

While the survey team was well aware of the potential dangers of anti-competitive practices on rural transport, it saw little evidence any negative impact of the existing transport associations. In contrast, the team did see one positive example of how transport associations can collaborate with the authorities in regulating transport routes on a rotational basis. This system (observed during the planning workshop in Ethiopia) meant that all rural taxi operators had to have some days working on low demand routes in order to operate on other days on the more lucrative high-demand routes.

The survey team did not hear of any associations of transport users. User groups could have an important role in trying to consolidate local transport demand. User groups could discuss with transport operators and regulators issues relating to routes, timetables and fares and ways of improving transport safety, comfort and reliability.

Recommendation

Authorities should work with different transport associations and user representatives to stimulate and regulate appropriate, fair, competitive and improving transport services.

Routes and timetables

All stakeholders prefer dependable and predictable transport. Rural people, particularly women, said they would travel more if they could be certain of the arrival and departure times. Waiting for full loads at terminals makes travelling unpredictable and this reduces demand. The practice of waiting for full loads can be exacerbated by

- Mistrust (the owner knows the driver's income if there is a full load)
- Low liquidity (operators must profit on each and every journey and not 'on average')
- Low transport demand along the routes (which is a vicious circle as unpredictable services reduce demand)

In Tanzania, route regulation for buses includes the condition that they operate to timetables. This is beneficial for all and should be encouraged. The success of transport agencies in some countries, such as Cameroon, has been linked to timetabled and reliable services (initially on

inter-urban routes, and now on some rural routes). In Ethiopia, transport associations have worked with regulators to assign route rotas, so operators have to alternate profitable, high-demand routes with lower demand routes. This increases the predictability of transport services, to the benefit of all.

Recommendation

Transport authorities, in discussion with key stakeholders, should provide incentives (regulatory, financial or fiscal) for more predictable transport, encouraging operating to timetables and/or licenses that combine high-demand and low demand routes.

Safety

While all countries have regulations that prohibit unsafe transport practices, these are little enforced in rural areas. Important safety issues concern the transport infrastructure, the various vehicles, the systems of operation and the behavior of the various stakeholders. Common problems include:

- Inadequate infrastructure: potholes, dusty roads, long grass obscuring vision, lack of safety barriers, lack of livestock fencing, inadequate signs, lack of traffic calming measures, lack of special lanes for intermediate means of transport
- Unsafe vehicles: poor tyres, inadequate lights and reflectors (including carts), inadequate brakes (including bicycles)
- Unsafe loads: high and unstable freight, passengers on top of vehicles, mixed passengers and freight, passengers crowding driver (rural taxis and motorcycles), overloaded boats
- Unsafe behavior: high speed, alcohol/drugs, wrong side of road (IMTs), inadequate attention (drivers, pedestrians), lack of safety measures (seat belts, crash helmets, life vests).

While vehicle overloading (with passengers and/or freight) looks dramatic, driver errors (high speed, drugs/alcohol and/or inadequate attention) are arguably more dangerous for rural people. While no one likes to be involved in an accident, rural people seldom raise safety as a key issue. Transport availability and price are cited as major concerns. Security is an issue, and a gender-related one (women and young children seldom travel on top of rural taxis). It is also a poverty-related issue: many rural people cannot afford to invest in transport themselves, and accept the discomfort and indignity of unsafe transport because it is all that is available and affordable.

Since unsafe transport practices are generally illegal, there seldom need for new legislation. What is required is the promotion of greater safety awareness and behavior and the gradual increasing enforcement of realistic safety regulations. A context-sensitive approach is required as rapid enforcement of all existing safety regulations could significantly decrease rural transport services and/or increase prices. Recent experience in Kenya demonstrated that safety regulations in minibuses could be enforced, but that such measures had transport cost implications that affected poor people most. Where there is little rural transport, freight vehicles can have important roles in carrying passengers. Realistic safety regulations allowing some passenger/freight combi-

nations may be appropriate in such circumstances. In general, prohibitions should be accompanied by education on appropriate and affordable alternatives that are realistically available.

Recommendation

Promote safety awareness and education, and gradually enforce safety regulations that are affordable and appropriate considering the transport needs of poor rural people.

PROMOTING RURAL TRANSPORT SERVICES

Transport firms and franchises

In Cameroon, Burkina Faso and Tanzania new transport businesses have been established that operate from private transport terminals. The transport operators and the new terminals try to attract customers with improved waiting facilities, enhanced security, regular travel timetables and lower prices. Competition between transport firms improves standards, and has led to the adoption of more modern and comfortable vehicles, as well as the introduction of a range of courier services. Initial success came from the provision of long-distance, national and international travel, but the model is being copied for some rural transport services. In Cameroon, the firms may operate as franchises, with independent vehicle operators sharing the terminal, brand name and livery, in return for a fixed fee and/or percentage of the takings.

Intuitively, it would seem that dividing demand into two or more separate terminals would increase average waiting time (two or more vehicles are simultaneously waiting for a load). Surprisingly, this was not reported as a problem, and this may be due to an overall growth in the transport market caused by the better and cheaper services, and also due to the active role of agents and consolidators who promote the services.

Recommendation

Competing transport firms and franchises should be encouraged as they can stimulate lower prices while having a positive impact on transport quality and predictability.

Importance of rural freight transport

Rural freight transport is very important but regional fleets are generally quite small and seldom organized. Few rural transporters own many trucks. This suggests it is not a very profitable business. Some commodity buyers and retail outlets buy trucks to support their trading businesses. Some transport entrepreneurs buy trucks to operate as small transport businesses, responding opportunistically to various hire options. Some freight transport services gain important income from traders attending periodic markets and from produce buyers travelling around villages after harvest times.

Some truck operators ply regular routes, carrying freight and people. This is particularly common in areas with poor roads, where vehicles with low clearance may get stuck. Large trucks may carry as many as 100 people on top of a freight load. Despite the discomfort of standing in a truck, or sitting on sacks, some passengers prefer trucks to rural taxis as:

- Trucks travel when the freight is ready (rural taxis wait for a full load of passengers)
- Trucks allow passengers to carry larger loads (including bicycles)
- Trucks often get through in poor conditions
- Truck fares may be cheaper

It is rare for trucks to be licensed to carry people, and in most countries it is illegal to travel with 'mixed' loads of freight and passengers. In remote rural areas, authorities seldom try to stop passenger transport in trucks, as it is well known that there is a shortage of alternative transport modes. For remote communities, with low transport demand, mixed transport using pickups or light trucks to carry goods, produce and people may be the only viable transport system.

Recommendation

While separate passenger and freight services are preferable for comfort and safety, the benefits that trucks and pickups can provide for poor rural people through mixed transport should not be dismissed.

Participatory planning of transport services and load consolidation

All the stakeholders in rural transport (authorities, operators, users and support services) agree there is a need to improve the quantity and quality of rural transport services. They agree that good infrastructure is a crucial long-term issue but that the immediate concern is to find a way of providing predictable, dependable and affordable transport services now. It has been demonstrated in numerous ways that the transport market can grow in response to better services (frequency, reliability and quality) and/or lower prices. In rural areas there is need to start the processes (prime the pump) to start the virtuous circle of more transport supply leading to more transport demand and to greater economic (and social) activity. Where there is a low density of transport demand, there is a need to consolidate that demand. In the rural areas, this is seldom (if ever) done in systematic and participatory way. However, it should be possible, if someone takes the initiative and brings the key stakeholders together. It is suggested that the following process be tested in a location where there is no regular motorized transport service, but a clear need for one, for economic and social reasons. An example from the Zambia survey area would be the small town of Milenge, a district 'capital' 75 km from a main road, but with no regular service provided by buses or rural transport.

The key stakeholders (authorities, potential transport operators, potential users) need to meet together to plan for ways developing a predictable, timetabled service at an affordable cost for users while giving a satisfactory income for the operator. The stakeholders may need to:

- Agree the different types of transport needs that could be met by a new service (including transport for farmers, traders, health services, schools, store keepers, NGOs, women's groups, religious groups, etc).
- Agree minimum initial service requirements (eg, daily, twice weekly)
- Agree potential load, if assured service (including transport of people, goods, packages, documents, etc)
- Agree reasonable transport prices for this load (ticket costs, freight costs)
- Agree mechanisms for assuring an acceptable guaranteed income for transporters (eg, the community agrees to purchase a minimum number of seats each trip, so assuring a 'profitable' load)
- Agree appropriate vehicle type(s) to meet the diverse needs
- Agree routing arrangement, perhaps requiring transport operators to alternate between high demand and low demand routes
- Agree operators (existing operator on another route, the transport association of a nearby town, a local entrepreneur, store keeper, NGO, community group, etc).

The process may seem complicated to arrange but it could result in the beginnings of reliable transport services that allow rural communities to develop and thrive. The team members that conducted the surveys are convinced that in most rural communities visited there is the potential for economically viable transport services, provided that demand is consolidated and the service is predictable. Someone (local government, NGO, entrepreneur) needs to take the initiative to 'prime the pump'.

Recommendation

Test community collaboration and participatory planning to consolidate transport demand and ensure basic dependable transport services in rural areas and regulate as necessary.

CROSSCUTTING ISSUES IN RURAL TRANSPORT

Transport for education

Lack of affordable transport is a huge problem for rural schools. Most schools do not have their own vehicles for transporting teachers, pupils or supplies, and rural school bus services are rare or inexistent.

Primary schools are generally situated in villages so that access for pupils is mainly a constraint for families living in outlying villages and homesteads. However, transport problems seriously affect the running of rural primary schools. Education authorities experience problems in recruiting teachers. Teachers have great problems reaching the schools, receiving their salaries and

obtaining educational inputs. Some teachers reported they had to be absent for two days each month to travel by rural taxi or bicycle to obtain their salaries.

Secondary schools are often located in towns, and sometimes have boarding facilities for people living outside the town. Inadequate transport causes reduced attendance at secondary schools, particularly for poorer children who cannot afford boarding arrangements and cannot afford to buy bicycles.

Bicycles can greatly benefit both primary and secondary school pupils. Increasing access to bicycles is likely to increase school attendance by boys and girls and help meet the millennium development goal of universal primary education. Schools should take an integrated approach, combining promotion of bicycle use with safety training and secure parking facilities. Schools should work with parents, local bicycle suppliers and other stakeholders to explore options for funding the acquisition of bicycles (e.g., microcredit or hire-purchase arrangements).

Recommendation

Promote bicycle use by pupils in combination with safety training and appropriate parking facilities at schools.

Transport for health services

Transport is fundamental to the provision of health care. Women, children and men need to transport to access health services for both routine advice and emergency treatment. The health services themselves need transport to provide outreach services, to obtain supplies and to move patients within the healthcare system.

In rural areas, emergency ambulance services are rare or nonexistent. People travel for health care in whatever transport is available including buses, rural taxis, private cars, bicycles, animal-drawn carts and local stretchers. Clinics seldom have suitable transport for hospital referrals and referred patients may have to travel by public transport. Lack of suitable transport increases medical problems and mortality, particularly for children and pregnant women. Most affected are the poorest people who cannot afford to travel.

While medical services would benefit from more specialized vehicles, the sheer scale of health care needs mean that relatively few people can benefit from any one ambulance. Most people travel to clinics and hospitals in other forms of transport. Increasing access to rural taxis, bus services, bicycles and motorcycles will improve access to health care for the majority.

While health authorities, hospitals and clinics all complain of lack of transport, they seldom look at the existing transport resources in an area. Clinics and hospitals without adequate transport may be able to make better use of the existing private sector transport services in the area, including trucks, buses, rural taxis, motorcycles and bicycles. By combining medical transport needs with other transport requirements in the area, it may be possible to develop multipurpose

transport services, benefiting large numbers of people. Existing local transporters could also form a rota for providing transport for medical services.

Recommendation

Medical services, local communities and transporters (all types) should work together to plan and meet health transport needs, using a wide range of transport types.

Gender and transport

When travelling in rural transport, women may have some privileges, such as being provided with relatively safe seats (they are not expected to travel on the roof of taxis). However, women generally have greater transport problems than men. Rural transport services are generally unreliable and unpredictable. As a result, given their responsibilities and status, women may decide not to travel, rather than risk being stranded. This affects the ability of women to sell produce at distant markets and to benefit from such trade.

Women have special healthcare needs relating to pregnancy and childbirth. Women also tend to be the major carers, with particular responsibilities for ensuring the health and education of their families, and these responsibilities require travel to schools and health facilities. However, women have less access to means of transport and funds to afford transport. Most transport owners and operators of transport services and intermediate means of transport are men. Women may find themselves in a vicious circle, since by having less access to transport, they have less access to solutions to their transport problems (information, credit, income-generating options).

As ownership of transport devices (cars, motorcycles, bicycles, donkey carts) grows, women increasingly become users and beneficiaries of such transport. As the transport becomes more common, a critical mass of supporting services develops and the transport becomes easier to access (perhaps borrowed from male relatives). It then becomes increasingly acceptable and normal for women to use the technologies. In rural areas, it is quite unusual for women to ride bicycles when overall numbers of bicycles are low. As ownership increases, women's access to bicycles increases and quite quickly women start to make more and more use of bicycles. Bicycles can really empower poor rural women through increased mobility. They can act as 'levers of access' to economic, social and political opportunities. In some circumstances donkeys and motorcycles may also offer great benefits for women.

Recommendation

Treat the needs to increase access to intermediate means of transport and predictable motorized rural transport services as important gender-related issues that can empower women.

HIV/Aids and transport

Increasing rural transport services and mobility could favor the spread of HIV/Aids. On the other hand, regular and more predictable transport should reduce the likelihood of people being stranded overnight at transport terminals (high risk areas for HIV/Aids transmission). All situations of high risk, including transport terminals and truck stops, should be specifically targeted for awareness campaigns.

Period markets are not always targeted for HIV/Aids awareness campaigns, even though they may be important hubs for the spread of the disease. The system of traders going from market to market with overnight stops in the villages represents a clear HIV/Aids risk that needs to be addressed.

Recommendation

Consider the implications transport services and different market systems in spread of HIV/Aids and modify awareness campaigns appropriately.

Increasing importance of mobile phones for transport services

Mobile telephones are increasingly important as coverage increases. Due to decreasing prices, increased ownership and the growth of informal phone services (taxi phones), mobile phones have become extremely important to those communities in range. The operators of many different forms of transport (including trucks, buses, minibuses, rural taxis, motorcycles, bicycle taxis and small boats) use mobile phones to obtain information on road conditions, weather and traffic and to report problems and delays. Transport consolidators at terminals and in villages use mobile phones to link transporters and loads. Similarly, transport operators can inform clients of arrival times and ensure loads and people are ready. The combination of mobile phones and bus-based courier services is improving the speed of obtaining spare parts in rural areas, so reducing the 'down time' of transport operators. In medical emergencies, people with telephone access can contact an ambulance service or other transport operator.

Recommendation

The spread of mobile telephones is having a profound and beneficial effect on transport services, and a rapid increase in rural coverage should be encouraged.

CHAPTER 9: CONCLUSIONS AND IMPLICATIONS

METHODOLOGY

The methodology developed by the international team has been tested in four African countries and has already resulted in some valuable insights. The hub and spoke model is used to help understand the rural transport system and survey it in a relatively quick time. The survey involves contacting a wide range of key stakeholders (transport users, operators and regulators) and triangulating their different opinions. This allows the research team to build up an overall picture of the transport situation and the key constraints and opportunities. Further details obtained through geo-referenced personal observations and traffic counts on representative spokes help to develop and map a model of the rural transport system. This can then be used to inform decision making and help set priorities for appropriate interventions for improving rural mobility.

FINDINGS

The surveys produced a great deal of information that has been reported in detail in five reports and summarized here. Some findings were specific to certain countries (e.g., new transport franchises, water transport, regulatory corruption). Much was common to all countries (the poverty of rural transport systems, small and old motorized transport fleets, poor safety standards, importance of intermediate means of transport).

In all countries, rural people clearly stated that they wanted to improve their quality of life through access markets, health care, education and other services but they were frustrated by the lack of affordable transport. In all countries, there exists the rhetoric of poverty reduction policies at the level of central government and serious attempts to develop sustainable means of maintaining deteriorating road infrastructure at all levels of government. What is lacking are national policies and local practical actions to address the existing problems of inadequate transport services and insufficient means of transport. National and regional transport authorities have concentrated on infrastructure issues, and have insufficient understanding of the actual situation with rural transport services (hence a clear need for these surveys).

IMPLICATIONS

The surveys have resulted in many ideas for improving rural transport services that can be further explored and developed by governments and key stakeholders at national, regional and local levels. Twenty recommendations have been provided, some quite general and some specific.

Transport policy makers and supporting agencies in all countries should consider the following five lessons drawn from this work.

Need for informed decision making

Rural transport policy making need not take place in an uninformed context. Using the hub-spoke concept and participatory discussions with a wide range of stakeholders, policy makers can quickly and easily obtain a reliable picture of the status of rural transport and ways of overcoming key constraints. This can be used for evidence-based decision-making and integrated into map-based planning tools.

Importance of intermediate means of transport

Intermediate means of transport, particularly bicycles and motorcycles, are extremely important, and offer great potential for growth. While these may be 'invisible' to policy-makers living in cities, the importance of bicycles, motorcycles and work animals to rural women and men for reducing their isolation and poverty cannot be overemphasized. The country studies show that rural people have had to make considerable investments in intermediate means of transport, despite their poverty. It is important that fiscal policies and import regulations should encourage, rather than discourage, the growth of these means of transport that increase both the productivity and the quality of life of rural people.

Need to maintain rural infrastructure

Year-round road access is important and needs to be provided in a cost-effective and sustainable manner. Local people and transport operators should be involved in the prioritization of maintenance work. Poverty reduction criteria may favor spot improvements that keep small roads open. Transport infrastructure is not simply roads and bridges: it also includes transport terminals, quays, footbridges, cycleways, secure parking and safety provisions.

Consolidating transport demand

While rural infrastructure is important, the provision and maintenance of roads is clearly not enough to ensure that there are reliable and predictable transport services operating along the roads. Local collaboration and participative planning is required involving all types of transport users, operators and regulators to ensure consolidated transport demand that will allow profitable transport operations. Such collaboration should start a virtuous spiral of increasing transport services stimulating increasing demand, greater competition and lower prices.

Need for positive policies and practical actions

Means of transport and transport services are provided by the private sector. The role of national and local government is to provide an encouraging and enabling environment, while regulating for appropriate standards. Policies on transport, poverty reduction and economic growth should

all aim to stimulate greater, better and more dependable rural transport services. There is much scope for relatively small initiatives and incentives to have a profound affect on the lives of rural women, men and children, reducing poverty, stimulating economic growth and meeting the millennium development goals.

ANNEX : SOME SPECIFIC FOLLOW-UP SUGGESTIONS

Implement similar surveys in many African countries

The methodology used to produce this report has been proved in five locations and is now ready to be implemented elsewhere and locally adapted. It is proposed that similar surveys should be conducted in many countries. It is believed that all African countries could benefit from the valuable understanding of rural transport that such surveys could bring. In large and diverse countries, surveys should be conducted in more than one area.

Adapt and test methodology in Asia and Latin America

While the survey methodology used here was developed in Africa, it is based on participatory principles and techniques that should be universally valid. It is therefore recommended that it be tested in appropriate locations in Asia and Latin America, on the understanding that the local research team should always adapt the practical details of the survey to the prevailing conditions.

Develop resource materials and hold training workshops

To assist in the planning and implementation of such surveys, it is recommended that resource materials including practical guides be produced. National and international training workshops should be held to share the methodology.

Develop the hub mapping system as a planning tool

The hub mapping system could be developed further. A very valuable planning tool could be created using mapping software and adding key properties to the nodes (villages, services, population characteristics) and vectors (roads, spokes). This could be used for planning transport systems, optimizing key services (including health care) and prioritizing areas for poverty alleviation initiatives and hubs to stimulate economic growth.

Test the proposals for participatory transport planning

It has been suggested that in remote areas with no regular motorized transport services, it may be possible to bring the various stakeholders together to discuss ways of consolidating the genuine but dispersed transport demand to create predictable and viable transport services. This proposal should be tested in appropriate circumstances (perhaps using the facilitation and support of a local NGO) and lessons should be drawn that could help improve and increase transport services in other areas.

Annex : Some specific follow-up suggestions

Develop the methodology for use in other sectors

The tools used in the survey (observations, stakeholder interviews, joint analysis, mapping) could be developed for use to improve services in several sectors. For example, it could be used effectively to plan for improved access to health services, based on several different means of transport owned by medical services and also private operators.

Share and build upon the implications of the findings for policy and practical action

The surveys have already yielded ideas and information on some of the key issues and possible ways by which governments and other stakeholders could improve rural transport services. Some have been discussed here. More ideas will come from further survey work. There is already much information to inform an international debate, and start the national-level processes of turning ideas into policy and practical action. Key international players, such as the World Bank, the International Forum for Rural Transport and Development (IFRTD), bilateral donors and/or supporting organizations, could initiate the international debate. An electronic discussion leading up to an international workshop on the subject could be a suitable mechanism.

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