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# Transport and the Village

*Findings from African Village-Level  
Travel and Transport Surveys  
and Related Studies*



*Ian Barwell*

WORLD BANK DISCUSSION PAPER NO. 344

*Africa Region Series*

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Travel and Transport Surveys  
and Related Studies*

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*Ian Barwell*

*The World Bank  
Washington, D.C.*

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## FOREWORD

Over the last ten years there has been a growing awareness that rural transport concerns more than just roads. In this report, the rural transport concept, which is still relatively new, is extended to include concerns of household access to domestic, economic and social facilities. To enhance existing knowledge of local transport in rural Africa, village-level travel and transport surveys and related case studies have been carried out under the Rural Travel and Transport Project (RTTP). The findings are synthesized here together with the assessed implications for policy formulation, institutional arrangements and planning for rural transport.

The RTTP is a component of the Sub-Saharan Africa Transport Policy Program (SSATP) which is a collaborative effort between many bilateral and multilateral organizations aiming to assist governments to formulate and implement improved transport policies. It is supported by the Governments of Denmark, Norway, Sweden and Switzerland, and this paper results from a collaborative effort with the International Labour Organisation. The RTTP combines research with dissemination through country policy and strategy development, and lends support to pilot projects. Previous papers of the RTTP include technical papers on *Rural Roads in Sub-Saharan Africa* and *Intermediate Means of Transport in Sub-Saharan Africa*. Future papers will cover issues such as the use of intermediate technology means of transport, institutional framework for rural transport infrastructure, rural transport planning, and the use of labor-based work methods in rural roads construction and maintenance.

The overall image which emerges from the surveys related to the present study is one of rural isolation and unproductive use of limited resources. The African farmer largely inhabits a walking world. Access to rural transport services are poor. Only rarely do rural people visit the world outside their most immediate locality. Women are the principal transporters with the typical female's carrying effort in the survey areas being equivalent to carrying a 20 kilogram load over a distance of 1 to 5 kilometers daily. The average time rural adults spend daily on transport--between 1 and 2.5 hours--is, however, not more than many people in industrial countries devote to traveling to and from paid employment. The main differences are that (a) transport efficiency in Africa is very low with the time and effort invested achieving little more than meeting the household's needs for survival, and (b) transport is a drain on labor which is the principal factor of production of most rural households.

It is clear that the extremely poor state of the off-road transport system in Africa acts as a powerful brake on agricultural productivity and growth. Improved accessibility will reduce the economic costs of moving goods from local markets and ease the barriers to social facilities. This will contribute to economic growth and enhanced social well-being. The challenges are many and considerable. National governments should provide a policy

environment conducive to the development of local-level infrastructure. Communities and local governments need to assert themselves to assume management responsibilities. Donors should identify ways in which they can effectively support the build-up of capacity at the local levels and design instruments through which they can respond to demand-driven requests for improvements in locally-managed infrastructure.

A handwritten signature in black ink, appearing to read 'K. M. Cleaver', with a long horizontal flourish extending to the right.

Kevin M. Cleaver  
Director  
Technical Department  
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## **ABSTRACT**

In the past, efforts to improve rural transport principally focused on building and maintaining roads. Limited attention was devoted to the whole complex of rural access, mobility and household transport. Village-level transport is important in this and is an indispensable element for meeting the basic subsistence needs of rural households. This paper, prepared under the Rural Travel and Transport Project (RTTP) of the Sub-Saharan Africa Transport Policy Program (SSATP), focuses on local-level transport in rural Africa. Household surveys and case studies on intermediate means of transport (IMT) and the role of transport in women's lives were carried out to enhance the understanding of the circumstances under which local-level transport imposes a constraint, of the nature of that constraint, and of the appropriate measures to alleviate the constraint.

The paper examines the multi-sectoral implication of rural transport and the related issues in policy formulation, institutional structures and planning. It defines a range of policy measures which would facilitate an effective response to rural transport needs. It also advocates a more integrated approach to rural transport planning at the local level, and recommends that accessibility be considered in the design of many types of development projects and programs. This report presents a synthesis of the key findings from the research, and an agenda for governments, donor agencies and NGOs aiming to improve rural mobility and access in SSA.

## **ACKNOWLEDGMENTS**

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## **EXECUTIVE SUMMARY**

As part of the Rural Travel and Transport Project (RTTP) of the Sub-Saharan Africa Transport Policy Program (SSATP), the World Bank commissioned a research study on the potential for improvements in the level of access of rural populations in Sub-Saharan Africa (SSA) to economic and social services. The research has led to recommendations for approaches to improve rural transport services, and for adopting intermediate technologies to increase personal mobility and agricultural production.

This report synthesizes the key findings and recommendations from research comprising five village-level surveys of household travel and transport demands, carried out in three countries—Burkina Faso, Uganda and Zambia. It identifies the circumstances under, and the means by which, sustainable improvements can be made in the level of access to rural economic and social services; and examines the institutional, policy and planning implications for governments in SSA as well as for donor agencies.

### **HOUSEHOLD TRAVEL AND TRANSPORT PATTERNS**

The surveys attempted to develop an understanding of the time and effort spent on transport in the context of overall household labor allocation and of the outputs achieved from the inputs to transports. They also sought to analyze local-level rural transport as a factor and constraint in agricultural development and in the utilization of essential services. These surveys were complemented by case studies to investigate the issues related to transport in women's daily lives and the role of Intermediate Means of Transport (IMT) in improving mobility and addressing local-level transport constraints. The five study areas and the villages within each area were selected so as to offer different characteristics of mobility and accessibility. Thus, the five areas contain examples of dispersed settlements and low population densities as well as nucleated settlements with relatively high population densities. Within the villages, the households surveyed had widely varying household sizes and compositions.

Across the five study areas the average time spent on travel (personal movement) and transport (the carrying of good and commodities) ranged from 1,125 to 2,700 hours per rural household per annum, or 0.8 to 2.5 hours per adult per day. In the households studied, the economic activities are mainly agriculture, predominantly subsistence agriculture as evidenced by the fact that between 23 percent and 60 percent do not sell any of their main crop and between 56 percent and 87 percent do not sell any of their secondary crop. Only in two areas, does travel and transport associated with productive household activities constitute the second most important component in terms of time spent. This reflects the emphasis in these two areas on agriculture as the income-generating strategy, and the adoption of modern, input-intensive, surplus-producing farming systems. In two of the other areas, agriculture is essentially a subsistence activity since the physical environment or political/economic conditions limit productive potential, and in the last the peri-urban location offers more attractive income-earning options to many households.

Eighty-seven percent of household travel and transport takes place on foot. While IMT are available, their use for domestic transport is limited. Consequently, the physical burden of transporting loads is considerable, ranging from 28-64 ton-km per household per annum. The overall impression from the village studies is one of rural isolation. Some people use IMT for agricultural transport tasks and for personal travel, but travel using the 'rural road and motor vehicle' system is limited.

## **WOMEN AND RURAL TRANSPORT**

Being responsible for domestic activities and contributing to agricultural tasks, it is women who bear the greater part of the transport burden. Throughout SSA, women contribute at least 65 percent of the household time spent on travel and transport, and more than 65 percent of the effort. Across the five study areas, the average adult female spends 1.0 - 2.7 hours per day on transport (the higher figure representing 23 percent of active time), the effort being equivalent to carrying a load of 20kg over a distance of 1.4 - 5.3 km every day. Given their other demanding responsibilities, the burden of these essential transport tasks imposes a particular constraint on the allocation of the female household labor resource to other more productive or socially beneficial activities.

The distance to sources of water and firewood is a critical factor in determining the scale of transport tasks for women and consumption of water tends to decrease when the source is more than 1 km away. Also, the greater the number of female adults in a household, the less the time and effort spent by each woman on transport. Daughters contribute to domestic transport work, particularly at times of peak labor demand, and this can constrain their attendance at school.

There are strong cultural constraints to the use of IMT by women in SSA. The studies found a few examples of women using bicycles and donkey-carts, but on the whole, use of IMT by women to alleviate their transport burden is rare. In specific circumstances, men, using IMT, will take over responsibility for tasks which are traditionally performed by women. However, no examples were found of men using IMT to collect water for domestic consumption, although the use of IMT for transport of water for construction purposes is quite common. When sources of firewood are very distant, there is some evidence of men using IMT to collect the fuel. This only occurs when the opportunity cost of the time spent by women on this task becomes high, or if the distance is so great that it is physically difficult for women to carry out the work.

## **THE ROLE AND ECONOMICS OF INTERMEDIATE MEANS OF TRANSPORT**

Ownership of IMT by rural households in SSA is significant, the most common in the study areas being bicycles and donkey/ox-drawn carts, along with some small motorcycles and wheelbarrows. Other IMT found in rural SSA include pack donkeys, ox-drawn sledges and bicycle trailers. Bicycles and motorcycles are used for personal travel, predominantly by men, to facilities outside the village, to a workplace, and for social reasons. Bicycles are also used, and are economically effective, for small enterprise activities such as trading in crops, beer and other goods, and in one area of Uganda, to provide passenger-carrying services.

Where crop marketing involves the local sale of small quantities of crops, these may be carried to market by bicycle. The economics of the bicycle-based matoke and beer trade in Uganda are clearly advantageous as shown in Chapter 4.

Ox- and donkey-carts perform two main functions—movement of agricultural inputs (particularly fertilizer) from a depot to the fields, and transport of harvested crops back to the store and to a local point of sale such as a buying point. Carts may also be used for firewood collection in specific circumstances, and for the transport of building materials. Carts typically generate a high return on investment for the owners as shown in the economic analysis of the owning and operating of ox-drawn carts in Chapter 4. Transport becomes a constraint to increased crop production and marketing when the time and effort needed for agricultural transport tasks exceeds the household labor resource available at periods of peak activity. The use of IMT is one response to this constraint as it may be seen as releasing latent factors of production, particularly land (by allowing a larger area to be cultivated) and labor (by generating a substantial increase in labor productivity at periods of peak activity). The use of IMT has the additional advantage of reducing crop losses at harvest-time. In one area, which lacks the IMT that would improve access to land, farmers have adopted a dispersed settlement pattern in order to live within walking distance of their land. However, this results in poor access to social facilities within the community and to marketing channels.

## **THE ROLE OF RURAL ROADS AND TRANSPORT SERVICES**

Since very few rural households in SSA own conventional, four-wheeled motor vehicles, it is through the use of transport services provided by motor vehicle that they benefit from the rural road network. Access to 'for hire' passenger transport services for rural people is poor. Bus services mainly operate on main roads remote from most villages, capacity is limited, and the services tend to fill up at the start of the journey. Arguably, in many parts of Africa, informal, and often illegal, passenger services are more easily available than formal, licensed services. Typically, except for those living within the ambit of large urban centers, rural people use passenger transport services only rarely. A small minority of rural people—e.g. local businessmen and government officials—make more frequent use of these services. Use of 'for-hire' cargo transport services is also limited. There are examples of their use to take crops in bulk to market, or in certain circumstances to carry bulk harvested crops from the field. However, investing in the hire of a truck for marketing involves a degree of risk, and it is often necessary to travel to a distant urban center to hire the vehicle because the service is not available locally.

The village-level studies show that proximity to an active local urban center and to a main road, complemented by good rural road access, has a positive influence on the level of household income. However, in any given area, only a small minority of communities can be in this fortunate position. More generally, for two of the areas producing large quantities of low unit-value surplus crops, the highest agricultural incomes were concentrated, to a statistically significant degree, in the villages with the best road access. The agricultural function of these access roads is to allow passage by motor vehicle at critical times in the agricultural cycle. This does not necessarily mean all-weather access.

## **RURAL TRANSPORT AND ACCESS TO SERVICES IN SSA**

A variety of interventions exist for improving physical accessibility in rural SSA. One can intervene to increase the level of mobility of rural people to reach a particular facility (a market, health clinic, etc.) or one can intervene to bring the facility closer to the community, i.e. site facilities closer to rural communities. Mobility can be enhanced by improving transport infrastructure and/or access to means of transport. Good physical accessibility to basic, daily needed facilities such as potable water, medicines etc. can best be provided in nucleated villages. This can, however, be in conflict with the need for good access to land. In one study area this issue has been resolved by well-served nucleated settlements where people make extensive use of IMT for agricultural tasks. Provision of facilities such as improved sources of water and firewood closer to rural communities have the advantage over IMT promotion of potentially benefiting all members of the community and not just those who can afford to buy or rent IMT.

The surveys have identified the five principal rural transport problems in SSA. The first one is the problem of water and firewood collection which can be most effectively addressed by the location and maintenance of sources of water and firewood close to the household, the use of fuel-efficient stoves, the improvement of footpaths and the use of IMT.

The second and third problems are the transport constraints to increased crop production and marketing. These are most effectively alleviated by increased use of IMT, first for load-carrying at peak periods (e.g. animal-drawn carts) and then for personal travel to more distant fields (e.g. bicycles). Footpath improvements, and delivery of farm inputs by motor vehicle along rural roads, are complementary measures. The benefits of alleviating this transport constraint are increased agricultural production and incomes.

The fourth problem concerns access to social facilities, and can be effectively addressed through providing additional facilities closer to communities and through the upgrading of existing services. However, considerations of economic efficiency, financial viability and operational effectiveness all influence the degree of spatial distribution of rural services that can be achieved. Spatial distribution is likely to be the poorest in areas of low population density. In planning the location of facilities, there is a need to adopt a spatial planning approach that aims to maximize the improvement in accessibility.

The last problem relates to the role of rural transport in non-agricultural income generation. The use of IMT increases the efficiency of personal travel, allows the transport of accompanying goods, and facilitates local-level income-generating activities in the form of travel to and from paid employment and trading and operation of small businesses.

## **TOWARD A RURAL TRANSPORT STRATEGY**

Rural transport is relevant to a number of key rural development issues, and there are a wide range of institutional stakeholders in the sector. It is recommended that SSA governments and donor agencies develop explicit rural transport strategies and that governments clearly define the responsibilities of different agencies. The definition of rural transport strategies will provide the framework to develop institutional capability. But before strategies can be defined, policies must be developed.

A wide range of policy issues have been defined to facilitate an effective response to rural transport needs including measures in the fiscal and regulatory fields; measures to encourage involvement by the private sector, NGOs and community-based organizations; reforms to increase the effectiveness of extension and community development services; measures to increase the availability of rural credit; and the adoption of more effective procedures for the planning of social and economic facilities.

Policy reform, deregulation and financing measures will all reduce constraints to the operation of rural transport services. There is a need to support innovative approaches to the provision of local-level rural transport services. The findings indicate that, because transport impacts on so many aspects of rural development, accessibility concerns should be considered in the preparation of any sectoral or multi-sectoral project.

The employment of local labor for road improvement should be encouraged, but an important issue is to define the conditions necessary for the emergence of viable local contracting industries that use labor-based work methods because they are competitive with equipment-based ones. Further investigation is also required of the key considerations in the design of the institutional framework, and of a planning system, for rural transport which encompasses the different levels of government as well as stakeholder participation.



## **1. INTRODUCTION**

### **The Sub-Saharan Africa Transport Policy Program (SSATP)**

The inefficiency of the transport sector in Sub-Saharan Africa (SSA) is an impediment to economic growth. The aims of the Sub-Saharan Africa Transport Policy Program (SSATP), which is structured into a series of discrete components examining different aspects of the transport sector, are to promote and assist African governments in improving transport efficiency and sustainability through policy reform and institutional improvements, and identify measures to improve the planning, design and appraisal of transport investments.

### **The Rural Travel and Transport Program (RTTP)**

The Rural Travel and Transport Program (RTTP) of the SSATP is concerned with transport at the local level where it has the most direct influence on economic, particularly agricultural, and social development in SSA. The specific objectives of the RTTP are to:

- (i) Develop and disseminate improved policies to plan, finance, build and maintain rural roads; and
- (ii) Recommend approaches to the improvement of rural transport services, and to the adoption of intermediate technologies to increase personal mobility and agricultural production.

This report, which focuses on rural mobility, accessibility and transport services, addresses the second objective which is concerned with the local-level transport demands of rural households. The purpose of the report is to recommend approaches to the improvement of rural transport services, and to the adoption of intermediate technologies, to increase personal mobility and agricultural production.

### **Village-Level Travel and Transport Surveys (VLTTS) and Related Case Studies**

Earlier work had indicated that rural households in SSA devote significant time and effort to rural transport, much of it in and around the village, on foot, and to meet domestic and subsistence needs. The work suggested that this time and effort spent on transport was a constraint to the optimal exploitation of agricultural and social opportunities. It also suggested that a major part of the transport burden falls on women and that the development and use of intermediate means of transport (IMT) (see Box 1) was much less in SSA than in other parts of the developing world, particularly Asia, where motorized as well as non-motorized IMT have evolved (see Box 2). The work had, however, been too limited to provide a sufficient understanding of the circumstances under which local-level transport imposes a constraint, of the nature of that constraint, and of the appropriate measures to alleviate that constraint. A series of Village-Level Travel and Transport Surveys and Related Case Studies have therefore been carried out to help increase that understanding.



The work program comprised five Village-Level Travel and Transport Surveys (VLTTS) carried out in three countries—Burkina Faso, Uganda and Zambia—complemented by a series of case studies to investigate key aspects of local-level rural transport in SSA. The aim of the investigations was to:

- (i) Develop an understanding of the time and effort spent on transport in the context of overall household labor allocation, and of the outputs achieved from the inputs to transport.
- (ii) Analyze local-level transport, and the time spent, as a factor and constraint in agricultural development and in the utilization of essential services.
- (iii) Understand the role of transport in women's daily lives and the impact upon women of improvements in mobility and accessibility, given that a major part of the transport burden falls to women.
- (iv) Assess the role of IMT in improving mobility and addressing local-level transport constraints as well as the policy, institutional and implementation requirements for developing the use of IMT.

A series of reports have been prepared on the results and findings from the Village-Level Travel and Transport Surveys and the Related Case Studies (see Box 3). This report presents a synthesis of the key findings from the research, and an agenda for governments, donor agencies and NGOs aiming to improve rural mobility and access in SSA.

### ***Structure of the Report***

The report is structured in two parts. Part 1 presents the findings of the research. Four chapters (Chapters 2-5) summarize the key findings on:

- Household Travel and Transport Patterns
- Women and Rural Transport
- The Role and Economics of Intermediate Means of Transport
- The Role of Rural Roads and Transport Services

Part 2 presents the conclusions and implications of these findings in respect of improving access to economic and social services in rural SSA. Chapter 6 presents a framework for improving rural access to economic and social services. This framework identifies the elements of accessibility, and the five areas for intervention, as: (a) rural roads; (b) footpaths and tracks; (c) intermediate means of transport; (d) motorized transport services; and (e) siting of facilities. The chapter then prioritizes these elements for addressing access to the following activities: (a) water and firewood collection; (b) crop production; (c) crop marketing; (d) access to economic and social services; and (e) non-agricultural income generation. Chapter 7 examines some institutional and policy implications of these findings.