Knowledge & Research

DFID Department For International Development

Transport

ISSUE 13 November 2001

■ VEHICLE EMISSIONS *Page 4*

■ RURAL TRANSPORT SERVICES IN INDIA *Page 5*

■ VEHICLE MAINTANENCE *Page 6*

■ RURAL WATER TRANSPORT *Page 7*

Editorial

- Following the success of the last edition of the DFID TRANSPORT newsletter, with its Focus on Africa, we are pleased here to highlight transport activities in India. This coincides with the PIARC/IRC seminar on Sustainable Development and Road Transport in New Delhi in November. A foreword has been provided by DFID India. and the national research institute, CRRI and an NGO have contributed articles on their work. The centre pages have been dedicated to Indian research and development projects and activities involving other leading centres of transport research in India.

It is planned that the next issue (May 2002) will have a focus on the Asian continent. I would be pleased to hear from you with contributions on research, implementation and dissemination activities in the Transport sector.

India's Challenge - Foreword by DFID India

The reduction of poverty in India remains one of the world's greatest challenges, with around 40% of its one billion population living on less than US$1 per day. Addressing this problem has been the key focus of Indian policy-makers for the last 50 years.

India's Union of 28 States and 7 Union Territories have substantial differences. Many States are larger than most countries and have populations from 20 to 100 million or more. They comprise a wide array of ethnic, linguistic, religious, social and regional differences. The Government of India has responded with greater transparency in governance and economic liberalisation, with enhanced legal foundation to local government and participation in local democracy and decision-making.

Inadequate and insufficient infrastructure is a constraint to economic growth, particularly in the transport, urban and power/ electricity sectors. There are also shortages of appropriately skilled and trained personnel.

The Ministry of Road Transport and Highways, formed in 2000 is responsible for policy and programmes on road transport, national highways and transport research. It is primarily responsible for construction and maintenance of over 57,000 km of national highways, a figure that is growing annually by almost 9%. All other roads fall within the jurisdiction of respective State Governments. Although the National Highways account for only 2% of the network, they carry over 40% of all motorised road traffic. Central grants are provided through a newly revised Central Road Fund (petrol/high speed diesel levy) and also for selected state roads of inter-state or economic importance. The Ministry is also responsible for evolving standards and specifications for roads and bridges in the country, besides acting as a repository of technical information and expertise in these fields.

A recently launched 13,259km national highways project envisages 4/6 lane development of highways connecting the major cities of Delhi, Mumbai, Chennai and Kolkata (the Golden Qualdrilateral) by 2003, and also 4/6 lanes for north-south and east-west corridors by 2007. Execution is being entrusted to the National Highways Authority of India, an autonomous body of the Ministry.

With economic liberalisation has come the opportunity for some limited Public-Private Partnerships. Around 20 BOT (Build, Operate, Transfer) projects have been undertaken with tolls being collected on 11 of these.

Rural road connectivity is recognised as being not only a key component of rural development in India, but also as an effective poverty reduction mechanism. Presently, about 40% of rural habitations are unconnected by all-weather roads. In August 2000, the Prime Minister of India announced a centrally sponsored scheme with the objective of, within three years, connecting every village with a population of more than 1000 through good all-weather roads. Upgrading existing roads is also envisaged.

The road traffic accident statistics for India are grim with recent estimates indicating around 85,000 people killed annually. Between 1980 and 1997, the accident rate per vehicle decreased by a factor of four although the numbers killed and injured increased almost three-fold The causes are complex, and the Ministry has a number of on-going programmes designed to address the problem.

The authors are Dr Yusaf Samiullah, DFID India's Senior Engineering and Environmental Adviser and Debashish Bhattacharjee, Engineering Adviser in DFIDI's West Bengal State Team. DFID India is the United Kingdom's largest overseas development programme, and approved grants of £105M last year. The authors are grateful to Mr S C Sharma, Director General (Road Development) & Secretary, Government of India, Ministry of Road Transport and Highways, for briefing on the activities of the Ministry. Views expressed in this article are those of the authors.

CRRI

The Central Road Research Institute (CRRI), established in 1952, is a constituent laboratory of the Council of Scientific & Industrial Research of Government of India. CRRI has the mission to deliver high quality and globally acceptable research and consultancy services to the profession in the major areas of road and road transportation technology. CRRI also has a unique role in the development of national standards and specifications (codes of practice) provided by Bureau of Indian Standards, Indian Roads Congress, and the Ministry of Road Transport and Highways.

CRRI has developed many new technologies by conducting extensive field trials on a wide variety of materials and techniques for use both in rural and urban areas of India. These include industrial and municipal wastes focussing on environmental concerns as well as economy in road construction. New block paving systems have been developed for desert areas and for high altitude and low temperature regions. For rural roads, a systematic network planning methodology based on functional accessibility has been formulated and is being followed in the current major rural connectivity programme of the Government of India.

For further information please contact : Professor P.K. Sikdar, Director, CRRI.
Fax: +91 11 6845943,
Email: Pksikdar@cscrri.ren.nic.in

IRTE

The Institute of Road Traffic Education (IRTE) is a non-government organisation based in New Delhi. It was formed in 1991 by an interdisciplinary group drawn from police, doctors, journalists, engineers, ex-servicemen, architects, and automobile experts. The vision of IRTE is to create a positive attitude of road culture in society and its mission is to strengthen the infrastructure of driver training, traffic engineering and road user awareness in India.

The IRTE is working with Institutions and the Government for :-

- developing enforcement technology systems
- introducing the traffic warden schemes
- school transport safety
- community involvement in roadside programme
- imparting training to traffic police
- analysis & research in road safety.

The IRTE receives support of the Ministry of Road Transport & Highways, Govt. of India in developing area specific literacy programs incorporating scientific studies of accident patterns.

For further information contact: Rohit Baluja, President, IRTE
Tel: +91 11 6816868
Email: safety@irte.com

Transferring road maintenance into the private sector

Identification of the different approaches adopted worldwide for increasing the use of the private sector for road maintenance and the necessary steps for the successful commercialisation of maintenance activities was the purpose of this DFID funded study. In addition to reducing the cost of maintaining road infrastructure, this approach can provide employment opportunities for a wider section of the community. The study was carried out jointly by TRL and the University of Birmingham.

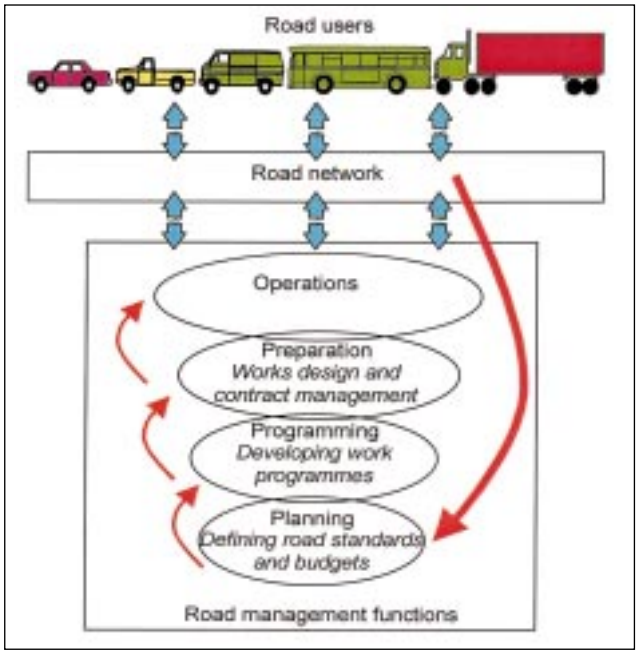
The research methodology consisted of a detailed review of published information supplemented by case studies in the UK, Colombia and Ghana. Various operational models that can be adopted for privatising road maintenance activities and their individual characteristics were identified. The problems of small-scale local contractors were examined together with issues associated with the transfer of risk from client to contractor.

The outcome of the study was a series of conclusions and recommendations, some of which were fairly straightforward and anticipated, others considerably less so. For example, competition was found to be more important than privatisation as a spur to efficiency, with public sector works units proving to be capable of competing successfully with the best contractors when given the chance to do so. 'Sustainable competition' together with clearly specified and enforced maintenance standards was found to be the key to overall cost savings. These savings ranged from 5% to 20% on the first 'round' of contracting but tended to be lower on subsequent occasions. Amongst a number of other conclusions, the danger of the development of private sector cartels or monopolies was also highlighted.

For further information contact: John Rolt, TRL
Tel: +44 (0)1344 770732
Email: international_enquiries@trl.co.uk

THE UNIVERSITY OF BIRMINGHAM

DFID Projects Reference: R6889: 'Transferring Road Maintenance into the Private Sector'
Theme Objective: T2



Road management functions in relation to the road network and users

Rural Transport Knowledge Base

The *Rural Transport Knowledge Base* document is a dissemination tool incorporating all issues of managing and financing rural transport. Compiled by TRL in association with the World Bank (technical support) and DFID (financial support), it contains over forty documents including empirical case studies. Structured in five modules, it reflects current thinking on socio-economic and infrastructural transport issues:

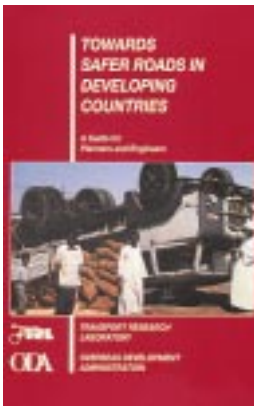
- Rural transport policies and strategies
- Planning, design, appraisal and implementation of rural transport infrastructure
- Managing and financing of rural transport infrastructure
- Rural transport services and intermediate means of transport (IMT's)
- Social and environmental issues of rural transport

The Knowledge Base is now available on CD and the Internet in English, French and Spanish

www.Transport-Links.org/KnowledgeBase.htm

For further information contact: Annabel Davis, TRL
Tel: +44 (0)1344 770398, Email: international_enquiries@trl.co.uk

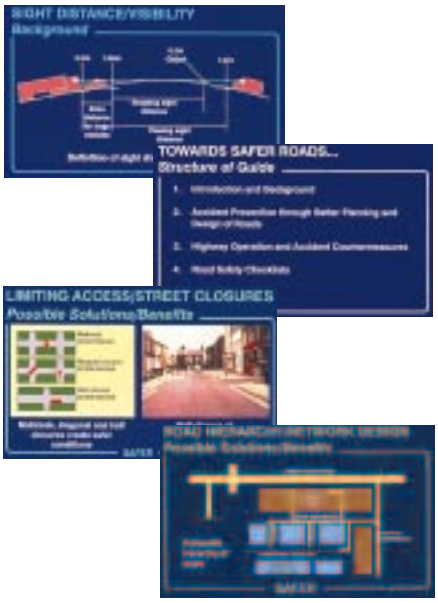
Towards Safer Roads lecturers slide pack now available on CD



The manual *Towards Safer Roads in Developing Countries* has proved to be highly successful, with some 9,000 copies being distributed to over 150 countries. Designed to change attitudes to road safety among planners and engineers, it was developed by TRL in collaboration with consultants Ross Silcock, with funding provided by DFID.

To give this further momentum, the team also developed a companion Slide Pack based on the guide. It is intended primarily as a teaching aid for lecturers in developing country universities, colleges and government training departments. TRL has now produced a CD of the Slide Pack containing over 200 slides, each with a slide descriptor sheet that includes Instructors Notes. It offers a rich and convenient source of material for lecturers when preparing courses on the principles of 'safety conscious' design and highway operation.

For further information contact international_enquiries@trl.co.uk.



The Anglo-Indian sustainable transport initiative

A relatively low rate of car ownership and high rate of public transport usage is a typical situation for many developing countries.

However, the growth rate in private vehicle ownership is beginning to rise rapidly. In response to this, the UK's Department of the Environment, Transport and the Regions (DETR) sought to provide an opportunity for the exchange of technical information arising from experiences in the UK. This has led to the development of a sustainable transport initiative with the Indian Ministry of Environment and Forests which, although centred on Delhi, could be equally applicable and beneficial to other Asian cities.

Delhi is recognised as one of the most polluted cities in the world, with respirable particulate concentrations in excess of four times the World Health Organisation (WHO) limits. Emissions from road transport are a significant and growing source of this pollution. The Delhi vehicle fleet is currently dominated by relatively old and polluting two and three wheelers, and a large number of diesel buses operating on high sulphur fuels with old engine technologies. The Municipal Government has implemented a programme to convert the vehicle fleet to run on compressed natural gas.

Lorry emissions in India

The initiative comprises four specific but inter-related workstreams:

- evaluation of alternative fuels and technology for urban buses
- development of a framework for enhanced inspection and maintenance centres
- framework for restructuring and optimising public transport
- development of an air quality management system.

Steering group members are drawn from various DETR divisions, TRL, the London Borough of Croydon and a number of Indian institutions. These include government ministries and police divisions, co-ordinated by the Tata Energy Research Institute. The majority of the research and development of the four workstreams will be undertaken by the local Indian institutions supported by UK international experience and expertise.

DETR is now DTLR (Department of Transport, Local Government and the Regions).

For further information contact Ian McCrae, TRL
Tel: +44 (0) 1344 770271
Email: international_enquiries@trl.co.uk

Using remote sensing to measure vehicle emissions

Typical traffic mix in an Indian city

Air pollution has a significant impact on public health. High concentrations in the UK are estimated to shorten the lives of thousands of people each year. In developing countries air pollution concentrations are estimated to be substantially worse, possibly up to ten times higher, and will undoubtedly have significant impacts on the levels of acute and chronic disease.

A project to develop an emission inventory to determine the relative contribution of transport using both conventional and remote sensing methods is currently being carried out by TRL, under its reinvestment programme. The study is being undertaken in the metropolitan area of Pune in collaboration with the Automotive Research Association of India, but the methodology should be applicable to any developing country.

The emission inventory will attempt to identify and list emissions, by pollutant, from transport and other activities within the area. The remote sensing survey will enable the emissions from many thousands of vehicles per day to be measured. It will identify high emitting vehicles and lead to the characterisation of vehicle fleet emissions. This will include vehicles powered by two stroke engines, which have particular health hazards and have not previously been subject to large-scale emissions measurement.

It is hoped that the identification of the most polluting and inefficient vehicles will assist in the development of improved inspection and maintenance strategies, leading to reduced air pollution.

For further information contact: Tim Pearce, TRL
Tel: +44 (0)1344 770339
Email: international_enquiries@trl.co.uk

HDM-4 training in India

A two week HDM-4 training course was held at the Central Road Research Institute (CRRI), New Delhi in April 2001. This course followed on from the Train the Trainers course held in Kuala Lumpur in June 2000 as part of the HDM-4 training and dissemination project funded by the Asian Development Bank (ADB). The course was delivered by trainers Dr Mukhopadhyay (CRRI) and Dr Veeraragavan (University of Bangalore) with support from the World Bank and the ADB funded project team from TRL, the University of Wolverhampton and the University of Birmingham.

A total of 14 senior road engineers and planners from both the public and private sectors attended the course with eleven delegates from India and the remainder from Nepal.

For further information contact: Greg Morosiuk, TRL,
Tel: +44 (0)1344 770036
Email: international_enquiries@trl.co.uk

Appropriate rural transport services in India

A study is being undertaken by one of the regional forums of the IFRTD (International Forum for Rural Transport and Development) in two states, Orissa and Rajasthan, in India. For both states, rural accessibility and the transport of produce to market are significant problems with high levels of produce lost both through lack of transport and poor infrastructure. This DFID-funded study aims to assess linkages between transport and poverty, identify appropriate rural transport services in these different climatic and topographical areas and find ways of improving them with subsequent benefits to rural livelihoods.

Both states have similar socio-economic and transport characteristics with high percentages of the population living in rural areas and with agriculture a key activity. Predominant transport modes are walking, headloading and non-motorised transport, including animal-drawn vehicles, bicycles and cycle rickshaws. In recent years jeeps, which can travel on earth roads, have become popular.

The project will focus on small landholder farmers and indigenous communities. It will consider the different transport requirements of women and men and recommend appropriate transport services which best meet their accessibility and mobility needs.

The project commences with a literature review and stakeholders workshops, which will direct the design of the field study. Dissemination of the findings will take place at a number of levels from district through to international level.

For further information contact: P. K. Pattanaik, Orissa Regional Forum for Rural Transport and Development,
Tel: +91 674 472785
Email: osvswa@hotmail.com or osvswa@rediffmail.com

DFID Project Reference: R8015 'Appropriate Rural Transport Services in Orissa and Rajasthan'
Theme Objective T3

IFRTD

Use of camel-cart in Rajasthan

Estimating crash costs

The ability to cost the economic impact of road traffic accidents (RTA's) is extremely important.

This information assists road safety agencies to deploy scarce funding for remedial action in the most efficient manner. The drain on national economies caused by road crashes may also be calculated more accurately using this information.

There tends to be a paucity of social and economic data required for calculating costs of RTA's in developing countries. The aim of this DFID-funded project is to identify practical and robust methods to obtain this information. Four case studies are being undertaken by Ross Silcock, a member of Babtie Group Ltd, and TRL, with local partners in South Africa, Ghana, Bangladesh and India. An important element will be to identify the wider social and economic impacts of crashes on the poor, which are believed to be significantly underestimated.

In India, the design of surveys are currently being finalised with the National Institute of Mental Health And Neuro-Sciences (NIMHANS). The main approach will be a household survey in urban and rural areas of Bangalore and Karnataka. The survey will identify levels of involvement of family members in road crashes, under reporting and direct costs incurred as well as the wider effects on family units. Supplementary surveys will identify institutional costs such as those incurred by the medical sector, the police, the legal sector and insurance and compensation companies. Information on vehicle repair expenditure will be obtained from transport operators and workshops directly.

The Human Capital method was identified as the most suitable to calculate crash costs in low income countries. Declines in economic output through lost workdays due to the death or incapacity of the injured is also accounted for in this method.

RTA's are a significant drain on national economies, typically wasting between 1% and 3% of GNP. This research will enable low income countries to make more realistic estimates of crash costs, enabling road safety funds to be spent more effectively.

For further information contact: David Silcock, Ross Silcock Babtie Group Ltd, Tel: +44 (0)20 76301422
Email: rsllondon@compuserve.com

DFID Projects Reference: R7780: 'Case Studies to Assess Methodology for Accident Costing'
Theme Objective: T1

Ross Silcock

Urban road safety management

Increased urbanisation encourages higher traffic speeds and increased traffic volumes. In many developing countries, these impacts combined with an environment of poor urban planning and high levels of congestion have lead to greater numbers of urban road accidents. This DFID-funded project was initiated to develop a more comprehensive approach to urban road and traffic management giving priority to improving the safety and quality of life for vulnerable road users.

The objective was to introduce effective urban safety management approaches for two areas in a sub-district of Bangalore, India and in Cirebon, Indonesia. Information was gathered from the community on existing safety problems, improvements they would like introduced and other schemes in the area that might impact on road safety. This information was supplemented by the analysis of traffic, accident and land use data to develop multi-sectoral improvement schemes for the local districts.

A key concern raised in Bangalore was the lack of pedestrian facilities. A local organisation, Bangalore Agenda Task Force with the support of the Global Road Safety Partnership, is now working with the private sector and local engineering government organisations to secure funding for the implementation of the road safety recommendations, including:

- better pedestrian crossing facilities
- improved condition and width of footpaths
- rephasing of traffic lights

Evaluation of the measures will compare the level of before and after accidents against those at a control site, and will include local interviews and behavioural surveys of the public to ascertain their response to the measures. With support from local partners in India and Indonesia, TRL aim to produce guidelines on how to introduce effective urban road safety management to cities in developing countries.

For further information contact: Stephanie Kirk, TRL
Tel: +44 (0)1344 770779
Email: international_enquiries@trl.co.uk

DFID Projects Reference: R7476: 'Development of an Urban Road Safety Management Approach'
Theme Objective: T1

TRL

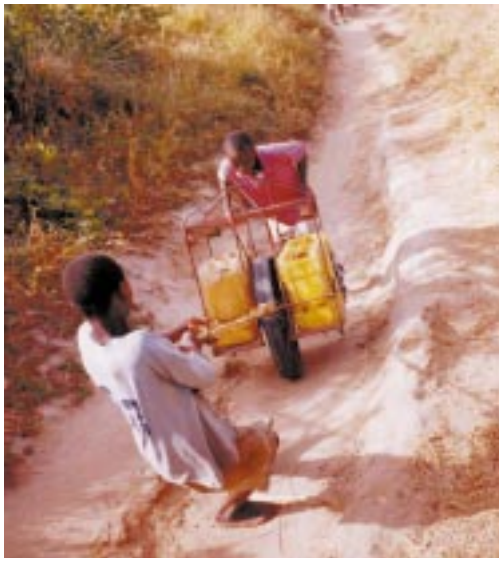
Analysis of traffic, accident and land use data

Low cost access to water

The collection of water is usually the major household transport burden in rural areas. It is invariably carried out by women and by headloading, typically taking three hours per day. Clearly the use of Intermediate Means of Transport (IMT) including wheelbarrows and handcarts could provide considerable time-savings that might be used more profitably.

This DFID funded project aimed to:

- develop a low-cost IMT for carrying water on rural footpaths
- assess attitudes of households to its use
- investigate ways of making it available



Wheelbarrow used for transit of water in Mtwara

A 'Chinese' type wheelbarrow was developed where water is carried each side of the wheel and bulky loads above the wheel. Wheelbarrows were introduced into five households in each of two villages in Mtwara, Tanzania.

The daily usage was high with up to 16 households using each barrow. The main use was for transporting water, the rest for produce and building materials. In one village five youths purchased barrows to sell water.

In spite of acknowledged benefits and an average time saving of 1.7 hours per day for collecting water, there was no demand to buy barrows due to low incomes. However, a survey indicated a good demand for hire on an hourly basis. Hire centres were set up in three villages, run by villagers for a fee, with rates of 100 TSh per hour for a barrow and 200TSh for a handcart (average income about 5400 TSh/month). The centres operated satisfactorily over 11 months but with low demand due to the very depressed local economy. The concept has good potential for providing affordable access to IMT, especially in favourable situations with adequate economic activity and access to central markets.

This was the second component of a study on low cost transport. The first, on access to health facilities, involving the testing of a motorcycle trailer-ambulance service, was described in Issue 10 (May 2000).

1US$=900TSh

For further information contact: Ron Dennis, IT Transport
Tel: +44 (0)1235 833753
Email: ron.dennis@ittransport.co.uk

DFID Projects Reference: R7157: 'Low Cost Transport for Access to Water and Health Facilities'
Theme Objective: T3

Improved vehicle maintenance relationships

Reductions in vehicle operating costs are one of the main benefits of road infrastructure improvements. For this reason, road roughness levels and their effects on vehicle maintenance costs are a major component of road investment models, such as HDM-4.

This DFID-funded project being carried out by TRL aims to analyse vehicle maintenance costs and relate them to road quality. *Roughness* is a traditional measure of road quality in developing countries and is usually given in terms of an IRI (International Roughness Index) statistic computed from the road profile or in terms of accumulated vertical displacements from a response type instrument such as the Bump Integrator. However, these measures can be misleading. Two roads with very different physical characteristics (e.g. a good surface road but with large potholes and another with general unevenness but no potholes) can have similar roughness values, yet, the impact of both roads on vehicles is very different.

An alternative approach to measuring road quality is being tested in this project using a TRL-designed logger. This records the vertical accelerations experienced on the axles, the speed at which the vehicle is travelling, and the vehicles position using a GPS. When data is downloaded, it is possible to link the accelerations suffered by vehicles with their speed and their precise location on the road network. This information can then be used to develop vehicle maintenance cost relationships.

Vehicle maintenance workshop

Data is being collected in India (with the help of the Central Institute of Road Transport in Pune), Indonesia (in co-ordination with the Institute for Road Engineering in Bandung) and Africa.

For further information contact Christian E. Dunkerley, TRL
Tel: +44 (0) 1344 770928
Email: international_enquiries@trl.co.uk

DFID Project Reference: R7456: 'Improved Vehicle Maintenance Cost Relationships'
Theme Objective: T2

Rural water transport

For the rural poor in many parts of the developing world, the transport services provided by informal, mechanised and non-mechanised inland water transport can be a principal means of affordable mobility and access. This mode is particularly important in the wet season, when other transport options are at their least reliable.

The IFRTD Secretariat, supported by DFID's Knowledge and Research Programme has initiated a two year project to assess the operational characteristics and affordability of rural water transport (RWT) under different physical and social conditions.

There are locations where rural water transport is effective (notably Bangladesh and Vietnam) and others where, though the operating environment appears to offer similar opportunities, RWT is little used or is very costly. The reason for these disparities are unclear. There is no comparative data, so investigating the potential for improvement or demonstrating the comparative economic advantages of efficient systems is almost impossible.

In addition, a hostile policy and institutional environment limits the potential of RWT even where it is effective at the local level. ESCAP (Economic and Social Commission for Asia and the Pacific) data suggests that even though almost 50% of the freight in Vietnam is moved on water, the sector only receives 1% of the national budget devoted to transport infrastructure. This neglect has a significant impact, particularly on isolated communities with fewer assets and limited access to goods, services and opportunities.

The project will compare different operational conditions and identify the critical success factors associated with low cost RWT. The results will provide information for integrating this transport mode into rural access planning and generating information that can be used to improve the viability of RWT operations and reduce the isolation of poor rural communities.

For further information contact: Priyanthi Fernando, IFRTD (International Forum for Rural Transport & Development)
Tel: +44 (0)20 7713 6699
Email: ifrtd@gn.apc.org

DFID Project Reference: R8014: 'Comparative Assessment of the Operational Characteristics of Rural Water Transport
Theme T3

IFRTD

District and village roads programme in rural Tanzania

An innovative district level programme is being carried out in Tanzania through interventions to support the improvement of the district road system including village roads, tracks and paths. The emphasis is on improving access through building sustainable capacity in District Councils to provide a service to rural people.

Rufiji District lies approximately three hours drive south of Dar-es-Salaam. The District Council is responsible for 880km of district and feeder roads. Village Councils are responsible for an unknown length of village roads and tracks. Since the 1970s there has been a steady decline in the quality of this road system, which has constrained economic and social growth.

To address this, a Danida-funded programme of support was designed in 1997 in a participative process with the District Council and other district-level stakeholders. Following consultation there was consensus that support be given to:

- District and Village Councils to improve prioritised district and feeder roads
- local artisans to establish themselves as small-scale maintenance contractors for district roads
- villagers to identify and conduct works on their roads and footpaths.

The District Council allocates Road Fund money to the maintenance of the district and village road networks, and additional contributions are made by villagers. Outside support is provided in the form of technical advice and the provision of materials such as concrete pipes, which cannot be sourced from within the village. Fundamental to the approach is that the responsibility for future maintenance of the improved infrastructure remains with the District and Village Councils.

Since starting in 1998, 135 km of the district roads have received spot improvement at an average of US$3,000 per km and maintenance using local contractors has commenced. In addition, 16 villages have improved their access to essential services by improving 175 km of roads and footpaths as well as constructing numerous footbridges. This approach has engendered a belief both within the councils and village governments that improvements to access can be brought about by using their own local resources.

For further information contact: Gary Taylor, IT Transport.
Tel: +44 (0)1235 833753/821366
Email: gary.taylor@ittransport.co.uk

Recent publications

PAPERS

PA3745/01, DAVIS, A S C
Transport versus service provision: A sustainable livelihoods profile of Cameroon. ***74th EAAE Seminar on Livelihoods and Rural Poverty, Wye, UK, 12 - 15 September 2001.***

PA3741/01, GOURLEY, C S and P R FOURACRE
Improving opportunities to promote transport research. ***First Road Transportation Technology Transfer Conference in Africa (Africa T^2 2001) Arusha, Tanzania. 23 - 25 May 2001.***

PA3740/01, GREENING, P A K
A guideline for low-volume sealed roads in the SADC region. ***First Road Transportation Technology Transfer Conference in Africa (Africa T^2 2001) Arusha, Tanzania. 23 - 25 May 2001.***

PA3739/01, QUIMBY, A
Teaching children in developing countries to be safe road users. ***First Road Transportation Technology Transfer Conference in Africa (Africa T^2 2001) Arusha, Tanzania. 23 - 25 May 2001.***

PA3738/01, ROLT, J
Top-down cracking: myth or reality? ***The World Bank Regional Seminar on Innovative Road Rehabilitation and Recycling Technologies, Amman, Jordan, 24 - 26 October 2000.***

PA3737/01, SMITH, H R
Bituminous surfacings for heavily trafficked roads in tropical climates. ***The World Bank Regional Seminar on Innovative Road Rehabilitation and Recycling Technologies, Amman, Jordan, 24 - 26 October 2000.***

PA3736/01, ROLT, J
Long-life pavements. ***The World Bank Regional Seminar on Innovative Road Rehabilitation and Recycling Technologies, Amman, Jordan, 24 - 26 October 2000.***

PA3723/01,MAUNDER, D A C, A S C DAVIS, D BRYCESON, J D G F HOWE, T C MBARA and T ONWENG
Sustainable livelihoods mobility and access needs in urban and peri urban areas. ***20th Annual South African Transport Conference, Pretoria, 16 - 20 July 2001.***

PA3700/01,
PARKMAN, C C, K B MADELIN, R ROBINSON and T TOOLE
Developing appropriate management and procurement approaches for road maintenance. ***First Road Transportation Technology Transfer Conference in Africa (Africa T^2 2001) Arusha, Tanzania. 23 - 25 May 2001.***

For copies of the above papers contact TRL International Division

Contact addresses

CRRI, P.O. CRRI, New Delhi - 110 020, India
Tel: + 91 11 6848914 Fax: + 91 11 6845943

DFID, 94 Victoria Street, London SW1E 5JL, UK
Fax: + 44 (0) 207 917 0072 www.dfid.gov.uk

DFID, India, British High Commission, B-28, Tara Crescent Qutab Institutional Area, New Delhi - 10 016, India
Tel: + 91 11 652 9123 Fax: + 91 11 652 9296

IFRTD Secretariat, 2 Spitfire Studios, 63 - 71 Collier Street, London N1 9BE, UK, Fax: + 44 (0) 207 7138290
www.gn.apc.org/ifrtd

Institute of Road Traffic Education (IRTE)
S-63, Okhla Industrial Area Phase II,
New Delhi - 110 020, India, Fax: + 91-11-6817965
www.irte.com

IT Transport Ltd., The Old Power Station, Ardington, Nr. Wantage, Oxfordshire OX12 8QJ, UK, Fax: + 44 (0) 1235 832186
www.dial.webs.co.uk/ittransport/contacts.html

Orissa Regional Forum for Rural Transport and Development, C/o OSVSWA, 49 Dharma Vihar, Bhubaneswar 751030, Orissa, India
Tel/Fax: + 91 674 472785

Ross Silcock Babtie Group Ltd., 16 Sussex Street, London SW1V 4RW, UK
Fax: + 44 (0) 207 630 1137
www.babtie.com

TRL Limited, Old Wokingham Road, Crowthorne, Berkshire RG45 6AU, UK.
Fax: + 44 (0)1344 770356
www.trl.co.uk

The University of Birmingham, School of Civil Engineering, Edgbaston, Birmingham B15 2 TT, UK
Fax: + 44 (0) 121 414 3575/5160
www.bham.ac.uk

World Road Association (AIPCR/PIARC), La Grande Arche, Paroi Nord (Level 8), 92955 La Defense Cedex, France
Fax: + 33 1 49 00 02 02
www.piarc.org

Transport-links. org web site update

DFID's transport-related web site has been running in its trial phase for five months. During this time over 800 people have visited the site, most of them returning for repeated sessions.

New features include:

- a registration system. Registered users can bookmark favourite pages, gain quick access to parts of the site they are interested in, and directly contribute publications and news items. Registration also enables DFID to follow the growth and location of visitors to the site.
- a site-wide Search facility, to help users find news items, research, events and publications relating to that subject.
- improved guidance notes for using the site

Visit the site today at www.transport-links.org using password connect.

For further information contact :
international_enquiries@trl.co.uk

Newsletter Editors

Transport
Linda Parsley, International Division
TRL Limited, Old Wokingham Road, Crowthorne,
Berks RG45 6AU, UK
Tel: +44 (0) 1344 770551 Fax: +44 (0) 1344 770356
Email: international_enquiries@trl.co.uk
Web:
www.transport-links.org/transport_links/newsletter/newsletter.asp

Earthworks
David Greenbaum, British Geological Survey, Keyworth
Nottingham NG12 5GG, UK
Tel:+44 (0)115 936 3224 Fax:+44 (0) 115 936 3474
Email:dgree@bgs.ac.uk
Web: www.bgs.ac.uk/dfid-kar-geoscience/

Energy
Gill Wilkins, ETSU, 154 Harwell, Didcot
Oxon OX11 0QJ, UK
Tel: +44 (0)1235 433128, Fax: +44 (0)1235 432331
E-mail: gill.wilkins@aeat.co.uk
Web: www.etsu.com/dfid-kar-energy/

Urbanisation
Julie Woodfield, Urban Services Unit, Water, Engineering and Development Centre, Loughborough University
Leicestershire, LE11 3TU, UK
Tel: +44 (0)1509 222393 Fax: +44 (0)1509 211079
E-mail: urbanisation@lboro.ac.uk
Web: www.lboro.ac.uk/wedc

Water
Geoff Pearce, HR Wallingford
Howbery Park, Wallingford, Oxon OX10 8BA, UK
Tel:+44 (0)1491 822439 Fax:+44 (0)1491 826352
Email:g.pearce@hrwallingford.co.uk
Web:
www.hrwallingford.co.uk/projects/dfid-kar-water.html

Diary of Events

November 2001

International Seminar on Sustainable Development on Road Transport,
New Delhi, INDIA, 8 - 10 November 2001
Organiser: PIARC Committee C14 and Indian Roads Congress
Contact: Hari Baral
Email: haribaral@minitel.net

2002

International Seminar on Road Surface Characteristics
Habana, CUBA, April 2002.
Organiser: PIARC Committee C1
Contact: Fidel Delgado
Email: eutiguio@civil.espjae.edu.cu
Seminar in English, French and Spanish.

Intertraffic 2002
Bangkok, THAILAND. 12 - 14 June 2002
International Seminar on Management of Bridges, International Seminar on Road Safety
Organiser: PIARC Technical Committees C11 and C1, The Ministry of Transport and Communications of Thailand, Roads Association of Thailand, RAI Exhibitions Co Ltd (Thailand)
Contact: Nisarat Adsawapornwasin
Email: intertrafficasia@bkkrai.com
Tel: +662 960 0141-3 Fax: +662 960 0140

2003

22nd PIARC World Road Congress,
Durban, SOUTH AFRICA, 19 - 25 October 2003
www.wrc2003.com

This newsletter is available free of charge, aimed at those who are interested in Transport related issues in the developing world. To be included on the mailing list for future editions, please send your name and address to the editor or use the application form now available on the TRL World Wide Web Page:
www.trl.co.uk/1024/newsform.asp
To optimise the dissemination process, it is important that this newsletter is reaching the right people. Please inform the editor of changes in address details or if you no longer want to remain on the mailing list.
Published by the International Division TRL, on behalf of the Department for International Development. Printed on recycled paper.