

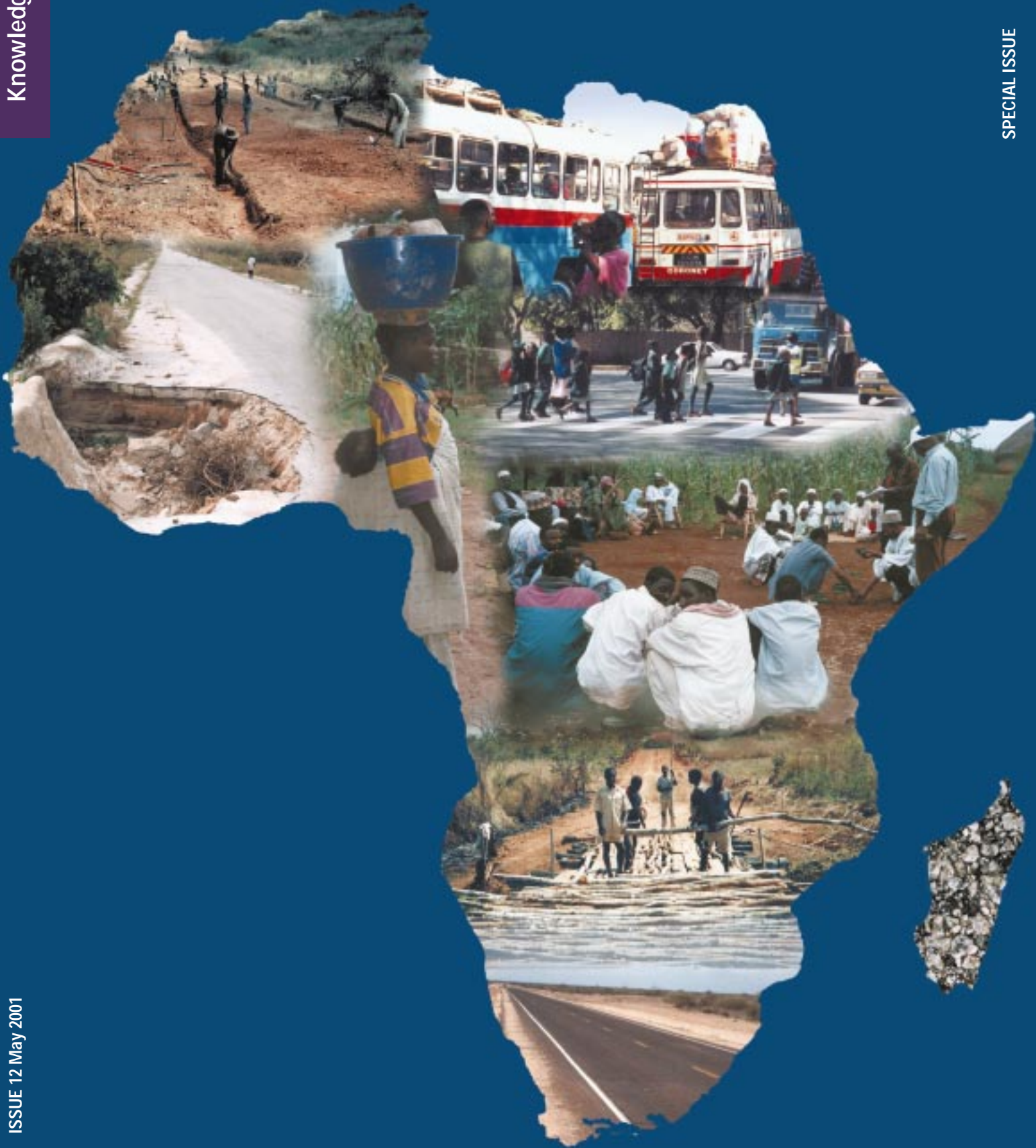
**DFID**

Department For  
International  
Development

# Transport

Knowledge & Research

SPECIAL ISSUE



ISSUE 12 May 2001

## FOCUS ON AFRICA

12 page special issue with Foreword by the President of the World Road Association (PIARC)  
News on research, implementation, dissemination, publications and events

## Foreword by the President of the World Road Association (PIARC), Olivier Michaud

I welcome the opportunity to provide an introduction to this special issue of the DFID Transport Newsletter which corresponds with Tanzania hosting the First Road Transportation Technology Transfer Conference for Africa. PIARC aims to be recognised as a World leader in the dissemination of international best practice in the road transport sector and gives special attention to the information needs of developing and emerging countries, rightly so as these nations form over 60% of the organisations membership.

The host organisation for this conference, the Tanzania Transportation Technology Transfer (T<sup>2</sup>) Centre, has been accepted by the PIARC Executive Committee as one of PIARC's first national Technology Transfer Centres. The T<sup>2</sup> Centre will become a major point of contact in Tanzania for knowledge exchange on international best practice in the transport sector. In due course we trust that many other countries in Africa will choose to work with PIARC in this way.

Those of us working in the road transport sector are well aware of the vital role that transport plays in the economic and social development of our countries. We also have a responsibility to ensure that our national decision makers share that understanding. Transport interests are shared by a wide range of stakeholders including; engineers, planners, vehicle operators, the private sector and social services who depend on an adequate network to provide access to services and markets.

Sustainable transport within a framework of overall sustainable development is a clear target for all of us. This includes environmental considerations and economic and social sustainability. For instance the promotion of costly, non-polluting vehicles may not be appropriate if this means denial of access to essential markets or services for the poorest.

At present there are not enough African member countries of PIARC and new member countries are very welcome. One of the key benefits of membership is the opportunity for national membership of up to 20 PIARC Technical Committees. Each Technical Committee provides an invaluable network of contacts in its specific topic area. Active involvement of the widest possible range of countries will accelerate the increased understanding by Technical Committees of the different problems faced by transport professionals all over the world. PIARC also recognises the expense associated with active involvement in PIARC and has a number of schemes to assist with the costs involved.

In addition to supporting developing country involvement in Committees and encouraging the development of Technology Transfer Centres PIARC also requires its Technical Committees of the International Seminar programme to hold meetings and seminars in developing countries. Our World Interchange Network (WIN)

provides computer networks for use by people needing to be put in touch with technical specialists. Our HDM-4 package, sponsored by bilateral and multilateral donors, provides a unique tool to improve road network management and guide investment decisions in the road transport sector. PIARC are actively involved in encouraging the use of HDM-4, co-ordinating training and dissemination activities and assessing the system to ensure it addresses the needs of the users.

This DFID newsletter is primarily concerned with the dissemination of knowledge about research relevant to the transport sector in developing countries. DFID is widely respected for its long term funding of such research which is essential to maintain progress and development. The PIARC seminar programme requires that the organisers of seminars help to identify the gaps in knowledge which could be addressed by research. PIARC's network of contacts and committees provides an ideal platform for the effective identification of international research needs and the co-ordination of its implementation.

We must recognise that one of the greatest challenges to the effective exchange of information between countries is language. For PIARC there are two official languages, English and French. Our Terminology Committee actively works to minimise misunderstandings in translations of transport sector material. A range of glossaries and dictionaries of road transport terms are available on our web-site. It is also worth noting that our International Road Maintenance Handbook is available in English, French, Spanish, Portuguese, Brazilian Portuguese and Khmer with versions under consideration in Bangla, Chinese and Hindi. Hopefully the Tanzanian conference will provide further discussion on the ways in which the language challenge can be overcome in our dissemination work of best practice in the road transport sector.

PIARC would greatly appreciate any suggestions on how to improve the exchange of information and maximise the impact of technology transfer centres. Please send comments and suggestions to:

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### Note from the editor

The 1st Road Transportation Technology Transfer Conference in Africa in Tanzania (23 - 25, May 2001) has prompted DFID to produce this issue as a 12 page special with a focus on Africa. Future newsletters may focus on other events and continents. I hope you enjoy this issue and look forward to receiving your comments.

## Improving access to knowledge and research

A move towards greater use of electronic means for obtaining information is one outcome of DFID's recent Transport Research Dissemination Review (see Transport: Issue 10, May 2000).

Electronic media has a number of attributes which encourages the exchange of ideas and information:

- permanent, accessible and current mechanism for raising the 'visibility' of research;
- real-time platform for the monitoring of research progress;
- mechanism for instant response to enquiry;
- means to facilitate distance thematic networking;
- means to store information sources which are then easily and quickly accessible;
- means to support distance education and training.

The pace of these technological developments should not outstrip the hardware and other capabilities of users in developing countries. Neither should the use of electronic media alienate or marginalise access to information by poorer groups and individuals.

The impact and effectiveness of its dissemination methods on disadvantaged groups and users should be continually monitored. In the short term hard copy may be the only effective means to disseminate information to some users outside larger institutions and governments. The proliferation of Internet clubs and cafes over recent years within many of the urban and peri-urban areas of Africa has been very noticeable and such establishments are expected to spread with time into the rural centres.

DFID have responded to these trends in using electronic media in a number of initiatives described here.

### A new network hub: [www.transport-links.org](http://www.transport-links.org)

In support of its strategy to encourage greater use of its research findings, DFID has developed a new web-site ([www.transport-links.org](http://www.transport-links.org)) which provides an important hub for the dissemination of transport research in developing countries. This site is being managed for DFID by TRL

The site contains information on DFID's transport programme generally and is intended to encourage participation in the development and running of research programmes. Users will be informed of new projects, and be able to follow their progress and comment upon the work through an email discussion facility. The site will connect users to DFID and the organisations operating within DFID's engineering Knowledge and Research (KaR) programmes. It will also enable users to link with technology transfer centres and international organisations such as the World Bank Transport site, the PIARC and WIN sites, ILO and many others, as well as linking to other companion sites which capture development issues (e.g. Livelihoods-Connect at [www.livelihoods.org](http://www.livelihoods.org)).

An important feature of the web site is interaction with users. Visitors can send questions, make comments or start a dialogue with research colleagues and can also send more general comments on any subject concerning transport in development. Under each KaR project there is both a public correspondence area encouraging users to actively participate in the work and an 'official' correspondence area for research partners and registered correspondents to communicate in greater depth.

The web site is designed to be updated by many users, under the control of the web master, keeping it fresh with new developments, news and information.

## Transport publications on CD

TRL's set of *Overseas Road Notes*, and the manuals and guides that it distributes are now available on a CD-ROM. This contains over thirty documents including PIARC's *International Road Maintenance Handbooks*, the safety design manual *Towards Safer Roads*, an educational road safety booklet *Safe Ways*, the *HGV driver's handbook for Africa* and the *Road Lighting Manual*.

Users can search on a particular subject or an individual word or phrase and can print segments of text or a whole report.

If this medium of disseminating transport research proves popular, other CDs will be produced containing a wider range of publications or groups of publications covering specific subjects and themes.

This will undoubtedly provide an invaluable resource to individuals and organisations wishing to have access to transport knowledge and information.

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### Your chance to comment on the Transport-Links site

DFID recognises the need to involve the end-users of research information in the development of this resource. In support of this aim, the web site is undergoing a trial period, during which the active participation of readers is invited.

- Locate the site using web address [www.transport-links.org](http://www.transport-links.org)
- Use password **connect** in the password access box on the home page (first screen)
- Use the correspondence area on the home page to let us know what you think of, and what you want from the site.

## T<sup>2</sup> centres in Africa

A Technology Transfer (T<sup>2</sup>) centre is a focal point for interchange of information and for encouraging best practice. In Africa, PIARC and the U.S. Federal Highway Administration are actively working to establish T<sup>2</sup> centres in the road transportation sector. To date these have been set up in Tanzania, South Africa, Zimbabwe and Malawi, with more centres planned in other countries.

The aim is to improve the quality of road transportation by providing road agencies and other stakeholders with improved access to technological developments and advances. A T<sup>2</sup> centre also aims to promote local ownership of knowledge with each centre developing programmes that address the needs of local and regional road transportation officials and professionals.

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## Policy as a tool for change on Africa's roads

*Policy provides a framework within which decisions can be taken about all aspects of road network management. Government policy provides a 'statement of intent' about how it intends the sector to be managed, operated and developed.*

At its simplest, policy may be considered as the *what* and *why*. This contrast with 'plans', which are the *how*, *who*, *when* and *where*. Plans provide the *strategy* by which policy is implemented.

A well-structured policy is particularly helpful when budgets are constrained, because ownership and responsibility are clarified, and objectives can be set that are transparent, equitable, and which reflect road user requirements more accurately. Clear policy also provides a firm basis for planning, for considering options and priorities, for determining physical achievement, and obtaining value for money.

Policy can be a powerful vehicle to facilitate change. But policy is complex, because of the need to co-ordinate between many sectors, organisations and bodies if sustainable implementation is to be obtained. In many organisations and bodies, policy is a very nebulous entity: it is poorly defined and ethereal.

A structured approach to policy formulation is therefore necessary to overcome this. There are several key factors, which are equally relevant outside Africa:

- Policy, when developed in a formalised and structured way, can provide a framework within which effective and sustainable reform can develop
- A policy-driven consultative approach to reform can generate ownership and commitment among stakeholders
- Agreement of policy principles is easier than getting embroiled in discussing the details of legislation
- Forming policy, and implementing change, take time – even to reach the *Green Paper* stage in Zimbabwe took over two-and-a-half years
- The process requires commitment from the highest levels of government and needs a champion
- Financial resources and full-time staff are needed to manage the process
- Consultancy assistance can provide specialist support and facilitation

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### The road to policy formulation

Development of the road sector *Green Paper* in Zimbabwe provides a good example of the policy formulation process. This started in August 1996, when the heads of state of most countries in Southern Africa signed the *Protocol on Transport, Communications and Meteorology in the SADC Region*. This committed governments to making reforms in a number of areas, including road administration and finance. This was followed up in Zimbabwe with a workshop two months later, which involved stakeholders both from government and the road user community. The workshop agreed the outlines of a policy for reform. It set up a Steering Committee to guide the reform process, and sought donor funds for its implementation, including a Secretariat and consultancy contracts.

In March 1998, the Steering Committee held a workshop to draft a national policy statement. The outcome provided the basis of a Cabinet memorandum, putting forward the principles for a *Road Fund Bill* to Parliament. The main activities now centred on creating an awareness of the proposed reforms amongst stakeholders and the public. The Secretariat made visits to bodies throughout the country. Workshops were held in all regions. These were facilitated by the Secretariat, introduced by the Deputy Minister of Transport, and attended by a well-briefed media.



The process culminated in October 1998, when a further national workshop was held to finalise the policy statement. This was opened by the Minister, and again attended by stakeholders from both public and private sectors. The conclusions were incorporated into a *Road Sub-Sector Green Paper*, issued in March 1999. This consultative document was widely publicised to seek feed-back on the policy proposals. The aim was to finalise this as a Government *White Paper*. Legislation to enact the reforms would then be submitted to Parliament.

## Tanzania's reform programme

Tanzania has made considerable advances in reforming the road sector since the pressing need for this was identified in the 1990's. The process of change was established under the Executive Agencies Act of 1997 which enabled the Tanzania National Roads Agency (TANROADS) to be created on 1st July 2000. TANROADS is a semi autonomous agency responsible for the day-to-day management of the trunk and regional roads network. It is a legal entity; it can sue and can be sued in a court of law. It comprises 4 divisions, namely maintenance, development, technical services and finance & administration, has its headquarters in Dar es Salaam and is establishing 4 zonal offices and 20 regional offices.

Funding for the Agency comes mainly from a dedicated Road Fund which was set up in 1991. This considerably improved the supply of funds for road works. However, it was not until 1998, that an amendment of the Road Toll Act strengthened the administration of the fund by establishing a Road Fund Board

and ring-fencing the bulk of the fund for road maintenance purposes. Revenue is drawn from vehicle licence fees, fuel levy, transit vehicle charges and overloading fines.

The process of change is dynamic and under the proposed second generation of reforms, TANROADS will be transformed into a fully autonomous roads agency consistent with the SADC model of a Roads Authority. Towards this end the process of reviewing the Highway ordinance in order to enact a new Roads Act is underway.

Experience of TANROADS so far has been encouraging. The road users are already expressing appreciation of improved performance in the maintenance field. Reliable and predictable funding supply has considerably reduced incidence of delayed payments to contractors and suppliers of services. TANROADS is looking forward to the challenges it faces.

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## DFID's development partnership with Botswana

Botswana is characterised by a number of features that combine to pose a major challenge to economic road construction. The size of the country (582,000 sq. km) and its small population (1.5 million) result in large distances between small and scattered population centres. There is a scarcity of conventional road building materials, which often do not satisfy traditional specifications and a near absence of non-saline surface water for road construction purposes. Added to this is a harsh, semi-arid environment in which climatic extremes prevail with adverse consequences on non-durable materials.

In response to the above challenges, the Department for International Development (DFID) has been providing various types of support to the Botswana Roads Department since 1978. This support has included technology research and development (R & D) and has led to a number of benefits, including:

- enhanced methods for locating and mapping road construction materials in the vast, featureless Kalahari Desert;
- development of new specifications and standards for the use of local materials in road construction;
- development of a methodology for combating salt attack of bituminous surfacings using saline water in road construction;
- improved methods of maintaining calcrete gravel roads through adoption of appropriate strategies;
- enhancement of the skills base through courses, workshops and on-the-job training.

The benefits arising from the research and development work undertaken with TRL and other research organisations, over more than two decades, have been substantial and are conservatively estimated at over US \$20 million.

Technology transfer and training has also resulted in the gradual localisation of all the senior posts in the Department. A number of local champions have also emerged who can now defend and promote the new technologies with deep rooted conviction borne out of close involvement in the R & D process.

The collaboration between DFID and the Roads Department has paved the way for the sustainable development of Botswana's road network into the new millennium. A leaflet describing the achievements of the 21 years Development Partnership has been produced and is available from the DFID Southern Africa office.

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Constructing roads with calcrete, Botswana

## The western Uganda road maintenance capacity building project



Representatives of a Road Committee at a site visit briefing, western Uganda

*The core output of this project, co-funded by DFID and the Ugandan Government, is the rehabilitation of 1,600 kilometres of gravel road.*

The rehabilitation is one major element of a multi-donor programme to re-equip Uganda with a modern highway infrastructure which can be maintained on a sustainable basis. Construction commenced in 1996 and is scheduled to finish this year.

It is intended that the new roads should as far as possible be a locally owned resource, rather than one provided centrally by the Ministry of Works, Housing and Communications. To achieve this the project established Road Committees, allowing local people with little or no technical knowledge to be involved in each stage of the project cycle - planning, design, construction, maintenance. This approach has resulted in roads that not only meet the needs of the target population but are capable of being properly maintained after construction.

The project was 'highly commended' by the British Consultants Bureau last year as it was seen to be instrumental in:

- supplying a focus for promoting mutual respect between the communities and the Ministry in sensitising them on the benefits to be gained from such co-operation
- providing a mechanism for involvement through the project's rehabilitation contracts which created a sense of ownership of the community's roads and hence their commitment to maintaining them.

One factor essential to the success of the project was the Uganda Government's own commitment to increase public confidence by involving it in governance issues. The extent to which the approach taken in Uganda can be utilised in other developing countries is under consideration.

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## Promoting sustainable solutions for rural roads in the SADC region

*Unpaved roads carrying low volumes of traffic comprise approximately 70% of the total road network of the Southern African Development Community (SADC) region. These roads, generally connecting the productive agricultural areas to the primary road network, play a vital social and economic role in the development of rural areas where the majority of the population live.*



Surfacing a low volume road in Southern Africa using an Otta seal

Unpaved roads demand constant maintenance to arrest damage by both traffic and the environment. With re-gravelling needed after only one or two years service, an unsustainable demand is put on scarce financial, manpower and natural resources. Provision of thin bituminous seals could mitigate the problem, but it is often difficult to justify this type of upgrading solely on economic criteria, principally because of the relatively low volumes of traffic and the associated negligible user benefits generated. However, it also reflects the inappropriately high design and construction standards often applied to these types of road. These standards originated from developed countries where the social, economic and environmental conditions are very different to those in developing countries.

TRL has been actively involved for some years in a number of research programmes concerning low volume sealed roads in the region, including the SADC Highway Engineering Research Programme, reported in earlier newsletters. The purpose of this programme was to establish the guiding principles for the provision of low volume sealed roads in rural areas. Together with other research programmes of the Norwegian Public Roads Administration and the CSIR, South Africa, it has been conclusively demonstrated that unpaved roads can be economically sealed when more appropriate design standards and innovative construction approaches are adopted.

Large cost savings and increases in efficiency can be achieved by:

- revising traditional approaches to economic appraisal;
- applying appropriate geometric and pavement design standards;
- using local materials for construction and maintenance;
- adopting innovative construction methods (including labour-based approaches);
- making greater use of local and private sector participation in maintenance.

The challenge now is to increase awareness of the research achievements in the region and to increase opportunities for their uptake and implementation. In recognition of this need the British, Norwegian and Swedish Aid organisations

(DFID, NORAD and Sida) and the Southern African Transport and Communications Commission (SATCC) have commissioned a *Guideline for Low Volume Sealed Roads in the SADC Region*. This guideline will provide a compendium of recent approaches to the aforementioned issues.

Local stakeholder participation in all aspects of the provision of infrastructure and transport services can increase awareness of the benefits, ensure the application of appropriate technical solutions, reduce perceived risks and is essential for sustainability. Local engineers from the fourteen SADC member countries are playing a full part in the development of the guideline. Methods of increasing the participation of indigenous professionals from the public and private sectors are included in both the project itself and in the published guidelines. A key aspect of the project design is that most of the tasks associated with its preparation will be carried out by teams of professionals from the region, drawing on local experiences as well as the outputs of the international research effort.

The guideline is being produced by working groups, comprising experts from local government and consultancies, supported by researchers from the region. Each working group reviews available information and approaches at specifically themed workshops and then assists in the formulation of that part of the guideline, under the direction of a lead author. The final draft chapters will be presented for endorsement at regional workshops and seminars before launch of the document, which is scheduled for early 2002. This approach ensures that the guideline captures local knowledge and that the final product reflects the needs of the region. If the recommendations in the guideline are applied, cost savings on expected investments in low-volume sealed roads are estimated to be at least £15 million per annum. Additional benefits from the reduction of environmental impacts and improved social benefits will further increase this figure.

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## Bituminous surfacings

*The development of asphalt road technology has progressed apace in the developed world and recent innovations are well known. DFID and the other aid donors have funded and continue to support research into asphalt road design appropriate for emerging countries in tropical environments.*

*Roads carrying high volumes of traffic can justify the use of bituminous surfacings throughout, based on savings in road user costs. At the other end of the traffic spectrum, when access to a rural area is a priority, the choice of bituminous surfacing is now based on the desire to provide all-weather access rather than merely the need to reduce the running costs of vehicles. Thus for roads carrying low levels of traffic, there is an increased focus on solutions based on spot improvement strategies.*

*In the Foreword, the President of PIARC reminded us that a soundly constructed and maintained road system is essential for the economic and social growth of all countries. Although this may seem a truism, it is far from being attained in many countries, primarily as a result of funding problems but also because 'best practice' methods are either not known or not applied.*

*Several DFID-funded research projects being carried out by TRL are designed to enhance present knowledge on the design and construction of bituminous materials including hot mix asphalt (HMA) and surface dressings. Information on these and earlier research can now be accessed through the 'Transport Links' web site (see page 3). A recent publication is the revised TRL Guide for Surface Dressing (Overseas Road Note 3), further details of which are on page 10.*

## Durability and design of bituminous surfacings



Top-down cracking

In tropical environments, bituminous surfacings must withstand high temperatures, strong sunlight and, frequently, high axle loads. HMA laid on heavily trafficked roads must therefore be designed both to resist premature deformation and 'top down' cracking which results from hardening of the bitumen at the surface of the layer. This makes mix design particularly difficult because the mix properties preventing one form of deterioration are exactly those promoting the other.

A variety of modified bitumens (bitumens containing additives designed to improve their properties) have been incorporated into HMA briquettes and surface dressings so that the effects of natural ageing can be examined and compared. Results show that, in general, the ageing of the modified bitumens, although much more rapid in tropical climates than temperate climates, is nevertheless slower than for the unmodified bitumens. In addition, in surface

dressings, the modified bitumens have better early adhesion with the chippings and higher bitumen application rates can be used, hence improving durability.

Because of the increasing numbers of bitumen modifiers being introduced to the market, a test to assess the durability of binders using the Pressure Ageing Vessel (PAV) is being developed. It is intended that this test will be used in the laboratory to test new products, thus avoiding the need for onerous field-testing.

The results from this research will be disseminated in a new Overseas Road Note to be published later this year.

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DFID Project Reference

R6473 Longer-life surfacings using bitumen modifiers

R6897 Dense bituminous surfacings for

developing countries: A guide

Theme Objective T2



## Labour-based sealing technology

At the same time as providing durable access roads it is also desirable, if possible, to provide beneficial employment for poor rural communities. Whenever spot improvement works are required, an equipment-based approach becomes prohibitively expensive and cumbersome for short sections of road, thus a labour-based technology is the obvious choice.

A range of labour-based bitumen surfacing techniques are available for low volume roads which

## Guidelines for improving road access – your help requested

A DFID-funded project to compile guidelines on sustainable alternatives to gravel road access for poor communities has commenced. The emphasis will be on techniques that are labour friendly and use simple equipment. We are collaborating with established research bodies but appeal to other interested parties who have experience of low cost, labour-based road surfacings, inviting you to inform us of any information that may help in the compilation of the guidelines. Specifications, method descriptions, sketches, photographs, equipment details, productivities, costs etc. may all be useful.

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E-mail: [rob@intech-consult.demon.co.uk](mailto:rob@intech-consult.demon.co.uk)

DFID Project Reference: R7782 "Low cost, labour-based paved roads for poor communities"

Theme Objective T2



use cold bitumen emulsions as the binder, thus avoiding the handling of "hot" bitumens. Adopting the approach enhances the skills of local contractors and provides employment. Some of the surface treatment options that are available include graded or Otta seals, sand seals and penetration macadams.

As part of a DFID-funded project on appropriate surfacings, a series of surfacing techniques will be tested in Mozambique this year. A manual will be produced early in 2002 that sets out the technical specifications for the construction of labour-based bituminous seals.



Otta seal on road in Botswana

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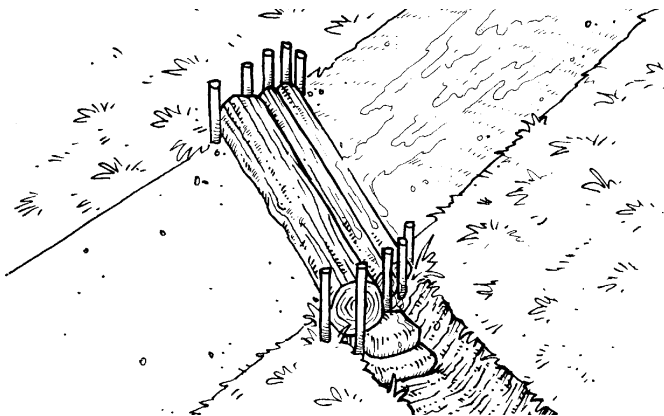
Email: [international\\_enquiries@trl.co.uk](mailto:international_enquiries@trl.co.uk)

DFID Project Reference: R7470 'To develop and implement labour-based technology for surfacing low volume roads, Stage 2'

Theme Objective: T2



## A field manual for footpaths and tracks



Log water bar

**M**any villages of rural Africa do not have road access and the major mode of rural transport is on foot. It is probably unrealistic to assume that roads will be built to all these villages in the foreseeable future. Most of these villages are therefore dependent on the existing extensive network of paths and tracks for access to their fields, sources of water and firewood, and to the outside world.

Rural paths and tracks have usually evolved over a period of time through the passage of people, bicycles, carts and animals. Problems with natural paths and tracks often arise, usually over short sections of difficult terrain such as; river or stream crossings, steep ground or marshy areas.

A manual has been prepared for those responsible for improving and maintaining footpaths or providing advice to communities on the improvement of footpaths and tracks. The manual provides the technical background, through the use of simple diagrams and text, to enable a technician to provide the necessary support to the community group. It is currently being field tested by technicians to prepare detailed proposals for footpath improvements and ensure that it is as useful and usable as possible. A final draft should be presented at a workshop in collaboration with ILO-ASIST in mid 2001.

The upgrading of footpaths may also include facilitating the introduction and use of improved means of non-motorised transport. The manual includes guidelines on organisational issues, the appropriate standards for paths and tracks for different uses, as well as specific technical solutions to problems commonly encountered.

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DFID Project Reference: R7461 'Field manual: construction & improvement of paths & tracks'

Theme Objective T3



Footpath being improved by the community

## Prioritisation techniques for rural roads

Many countries face the problem of budget shortfall, especially for the rural road network. Historically, prioritisation of road improvements has been based on motorised traffic volumes, thus ignoring the social importance of the road and the volume of non-motorised traffic.



Community consultation

In Ghana, a DFID-supported programme has been implemented to develop a procedure enabling the Department of Feeder Roads (DFR) to make investment decisions in a more equitable and justifiable manner.

The procedure includes the following components:

- public participation in the initial selection of candidate roads
- development of a prioritisation index based on:
  - change in engineering condition
  - economic benefits
  - social benefits
- further public consultation involving a district ranking exercise and a public hearing.

The candidate roads are assessed for the social and economic benefits accruing from improvements in road condition and changes in transport costs. These benefits include weightings for social access, district poverty, access to health centres and markets and the use of non-motorised vehicles. The cost of carrying out the improvement works is also estimated.

The assessment takes account of changes in both passability (whether vehicles can pass or not) and traffickability (whether road conditions discourage a significant proportion from making a journey). Assessments are made for both localised ('spot') improvements and full rehabilitation in order to assess the level of improvement appropriate for each road.

The 'Prioritisation Index' enables the roads to be ranked and proposed for improvement according to the ranking until the available funds are exhausted. The ranking is then presented to a community meeting in the district for discussion and amendment as necessary.

The procedure is being trialled in nine districts of the Northern, Brong Ahafo and Volta Regions of Ghana. Subsequently, it will be extended to other regions in Ghana, whilst plans are under consideration to introduce the procedure to other countries.

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## Road safety in Africa: opportunities for improvement

*Road safety in the African region is a major social and economic concern - the region has 11% of the world's reported fatalities but only 4% of the world's motor vehicles.*

Most road accidents occur in the more motorised countries like South Africa or in cities where the risk of being involved in a crash is much higher. However, because of the low motorisation level, a large number of these road deaths comprise the vulnerable road users such as pedestrians, cyclists and motorcyclists (see diagram). Furthermore, these road users are more likely to come from the poorer families and thus the loss of capacity or resources due to a road accident can exacerbate financial hardship for the family.

The cost of road accidents in Africa can be crudely estimated at US\$3.7 billion (1997 figures). Whilst many African countries do not presently have high motorisation and therefore a serious road safety problem, there is still a need to solve existing problems and to develop a framework which can accommodate future traffic expansion in a safe environment.

Within Africa, donor assistance continues to support road safety and help countries minimise the cost of motorisation. DFID and the World Bank have provided considerable support to governments in developing road safety action plans which integrate the roles of engineering, education and enforcement programmes in improving road user behaviour and increasing awareness and understanding of road safety issues. In Ghana and Uganda, this included the development of road safety education and publicity material for school children.

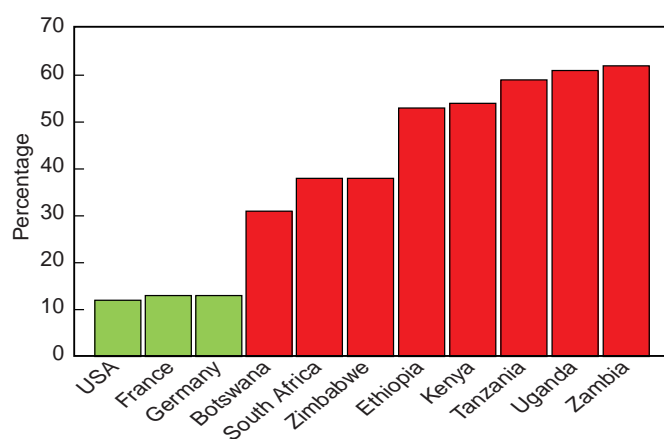
Other agencies, such as the US Department of Transportation and the European Union are also supportive of road safety intervention. The medical community in several countries have begun mobilising and advocating for improved safety standards, with the World Health Organisation's African Road Injury Prevention Initiative, coordinated by the Injury Centre in Kampala, underway in east and southern Africa.

Sustainability of road safety programmes is also essential to achieving permanent improvements in the road safety situation. National road fund bodies are increasingly beginning to invest in road safety and are a particularly effective means of funding low-cost engineering improvements for rehabilitated roads to ensure they are safe and not just fast. In South Africa, third party motor insurance is collected through the fuel levy which pays not only for medical expenses of road casualties but has also contributed to the successful nationwide 'Arrive Alive' road safety campaign. The Global Road Safety Partnership aims to improve road safety by the increased participation and coordination of civil society and the business sector with donor and public sector road safety efforts and currently has projects underway in Ghana and South Africa.

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Vulnerable road users as a proportion of total road fatalities

## Introducing road safety into the curriculum in Uganda

Some 20% of pedestrians killed in road accidents in African countries are aged 16 years or less. Children receive little, or no, training in how to be safe road users and suitable road safety education (RSE) during their formal schooling may be one way of reducing this number.

In addition to raising the awareness and profile of child road safety amongst key administrators, assistance is required with introducing suitable materials into the school curriculum and with class room resources and training for the teachers.



In Uganda, TRL, sponsored by the British Council's In-Country Training Programme, supported a local working group in producing a road safety curriculum and accompanying teachers guide for children aged from 6 – 11. This project formed part of a wider series of resource materials developed in different countries in Africa and Asia for all ages of children.

A 'flip-chart' resource was developed and attainment targets and assessment methods identified for each year of primary education. An observational survey of child behaviour and interviews with the children provided information on their knowledge and attitudes towards road safety. The feedback was very positive and showed that the children (and the teachers) found the materials used stimulating, effective - and fun.

This programme coincided with a review of the National Primary Curriculum and agreement was reached to include road safety as a series of small topics within other subjects, such as science, english and mathematics. The programme might take up to 3 years but everyone attending primary school will be taught road safety using effective materials delivered by teachers trained to use it.

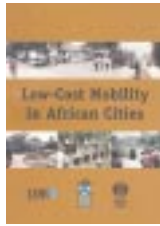
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## Low-cost mobility in African cities



*Proceedings are now available of the Expert Group Meeting.*

Organised by IHE Delft, on behalf of the World Bank and the Vélomondial 2000 World Cycling Conference, the meeting brought together some 80 African politicians, administrators and professionals, donor representatives and other international experts.

This was a logical follow-up to the Urban Mobility and Non-Motorised Transport Pilot Project, which was executed by IHE Delft in four African cities under the World Bank/UNECA SSATP \* programme. The main finding of the pilot project is that the mobility of the majority of the urban populations (i.e. those that walk and cycle), as well as their traffic safety, can be enhanced substantially by the large-scale application of a menu of simple engineering interventions that yield high benefit/cost ratio.

Based on these results, the meeting had the following objectives:

- verification of the findings;
- identifying the success factors necessary for a process of change leading to more efficient, affordable and equitable transport systems in African cities;
- drafting a plan of action, and
- establishing a network of experts dedicated to helping bring about change.

The results of the meeting are set out in the proceedings, which also includes the 'Delft Statement on Low-Cost Mobility'. The statement calls upon African national, provincial and local governments, civil society and the donor community to implement and support actions for change

\* *United Nations Economic Commission for Africa Sub Saharan Africa Transport project.*

Copies are available from IHE Delft - Mrs. T. van der Klis  
Tel: +31.15.2151896,  
Fax +31.15.2122921  
E.mail [klit@ihe.nl](mailto:klit@ihe.nl)



## Book Review



*Roads and Realities*  
By Paul Larcher and  
Derek Miles.  
Published by WEDC,  
Loughborough University,  
UK, 2000. (216 pages)

An output of the DFID funded Management of Appropriate Road Technology initiative, this book seeks to promote the use of appropriate technology small scale road contractors. Much of the focus is on experience in Sub Saharan Africa but many of the issues are wider: readers with experience even in the 'developed' world might echo some of the sentiments.

The structure is not immediately easy to follow and ideas, views and conclusions are often intertwined. Hence the book is educational and general in nature, rather than being specific or instructional.

The opening chapter sets the scene: why labour based? why the private sector? why small scale? and what follows if we say 'yes' to those questions? The road sub-sector is then analysed in more detail, looking at the potential markets for small scale contractors, and describing how market disciplines can be encouraged, drawing on ideas promoted by Ian Heggie in various World Bank publications.

The key issues which affect sustainability are then described - problems with which many practitioners will be sadly familiar. Approaches for institution building and change management are given and perhaps here the style of the book, offering brief paragraphs on the wide variety of issues, is most applicable. For experience seems to suggest that sustainable institutional change can only come about through a deep motivation in the organisation itself, rather than being driven by any outside agencies or 'off the shelf' solutions.

The latter chapters investigate case studies in more depth looking at how change can be implemented. But perhaps one gap is the reporting of the microempresa (small business) experience in the Americas, with their innovative forms of management and payment.

A broad international view indicates the trend in road contracting (particularly maintenance) is towards larger longer term contracts. Readers of this book might reflect how such a trend is compatible with sustaining small scale appropriate technology contracting industries in the developing world.

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## New edition of ORN3: Guide to surface dressing



Surface dressing is a simple, highly effective and inexpensive road surface treatment if adequate care is taken in the planning and execution of the work. The process is used world-wide for surfacing both medium and lightly trafficked roads. It is also a very effective maintenance technique that is capable of greatly extending the life of a structurally sound road pavement if undertaken at the optimum time.

Overseas Road Note 3 is a general guide to the design and construction of surface dressings in tropical and sub-tropical environments and has been widely used since 1982. It also contains brief descriptions of certain other types of surface treatment.

This second edition includes descriptions of a wider

range of surface dressing types, current materials specifications and more detail on the use of bitumen emulsions. A simplified presentation of spray rate adjustment factors, related to different site conditions, has also been provided. For low volume roads, modifications to improve the durability of surface dressings and the use of Otta seals are discussed.

ORN3 provides a framework on which the engineer can base design decisions to suit local conditions, thereby producing cost effective results. Advice contained in the Road Note together with local experience of relevant materials and surface dressing performance should be of value to those drawing up specifications.

For further information or a copy of ORN3 (2nd Edition), contact Sue Stoneman, TRL

Tel: +44 (0)1344 770187, Email: [international\\_enquiries@trl.co.uk](mailto:international_enquiries@trl.co.uk)

## Current DFID funded Knowledge and Research (KaR) projects

### THEME T1

*(Improve transport safety and reduce the impact of accidents particularly for poor people in rural and urban areas.)*

- **Development of an urban road safety management approach. (R7476)**  
TRL Limited: Mr A J Downing  
To introduce effective urban safety management approaches targeted at vulnerable countries in Asia and S.E. Asia.
- **Case studies to assess methodology for accident costing. (R7780)**  
Ross Silcock: Mr D Silcock  
To improve the basis for costing road accidents in order to focus investment, to understand the impact of road accidents on different groups in society and to provide better inputs to project evaluation.
- **Promoting road safety through community education programmes (TBA)**  
TRL Limited: Mr A Quimby  
To develop and use community participation programmes as a sustainable pathway for disseminating road safety education to the urban and rural poor in 4 African and Asian countries.
- **Motor insurance: compensating and preventing road victims (TBA)**  
TRL Limited: Ms A Aeron-Thomas  
To improve traffic safety standards and crash victim's compensation, particularly for the poor, by increased participation of the motor insurance industry.

### THEME T2

*(Reduce the costs of construction, rehabilitating and maintaining road infrastructure to help reduce vehicle operation costs.)*

- **Promoting the use of volcanic ash: a natural pozzolan (R6841)**  
TRL Limited: Ms S J Kirk  
To promote the effective use of natural pozzolan materials specific to developing countries for the construction of roads and other civil engineering purposes.
- **Dense bituminous surfacing for developing countries: A guide (R6897)**  
TRL Limited: Mr C R Jones  
Produce a guide describing the design and construction of dense bituminous surfacings in tropical climates. It will be targeted at engineers in the developing world and enable them to supervise the construction of improved surfacings.
- **Improved vehicle maintenance cost relationships (R7456)**  
TRL Limited: Mr J L Hine  
Improved user cost models for calculating road expenditure and more efficient vehicle maintenance and operating policies adopted on a widespread basis.
- **Appropriate surfacings for low volume roads (R7470)**  
TRL Limited: Mr W G Ford  
To develop and implement labour based technology for surfacing low volume roads.

- **Environmentally optimised designs - Stage 2 (Implementation) (R7783)**  
TRL Limited: Dr C S Gourley  
To develop a new framework for low-volume sealed rural road design that recognises the influence of all environmental control parameters.
- **A new edition of Overseas Road Note 1 to suit current needs (R7781)**  
TRL Limited: Mr S Done  
An improvement in the effectiveness, efficiency and impact of road management at the local district level through the adoption of recent advances in road management and an emphasis on poverty reduction.
- **Low cost, labour-based paved roads for poor communities (R 7782)**  
Intech Associates: Mr R Petts  
To refine, document and disseminate low-cost, labour-based alternative road surfacings suitable for local small-scale/community contracting enterprises and employment generation for the poor.

### THEME T3

*(Improve the mobility of rural and urban poor for meeting their livelihood needs.)*

- **Availability of rural transport services (R6884)**  
TRL Limited: Dr S D Ellis  
To produce guidelines for increasing the supply of rural transport services and to review these with targeted government officials.
- **Policy toolkit for increased rural mobility (R 7457)**  
TRL Limited: Mr J L Hine  
Working framework and procedures for identification of measures and policies to increase rural mobility implemented on a widespread basis.
- **Field manual: construction and improvement of paths and tracks (R7461)**  
I T Transport Ltd: Mr G Taylor  
To produce a manual which will be used in the field by NGOs, technical assistance personnel, local communities and local government staff in constructing, improving and maintaining paths and tracks.
- **Sustainable livelihoods, mobility and access needs (R7784)**  
TRL Limited: Dr D Maunder  
Investigate the utility of the sustainable livelihoods approach in identifying the mobility and access needs of the poor with specific reference to rural-urban linkages.
- **Partnership to improve access and quality of public transport (R7786)**  
WEDC: Dr M Sohail  
To improve sustainable livelihoods of the poor through the improved access and quality of urban public transport by developing a guidelines for use by policy makers and operators in urban transport.
- **Rapid demand appraisal for IMT and transport services (R7787)**  
IT Transport Ltd: Mr R A Dennis  
To improve the effectiveness of rural transport development in Sub-Saharan Africa by developing a rapid appraisal method to evaluate demand for IMT and local transport services, and the inputs needed to promote demand.

- **Impact of road condition on operating costs of bicycles (R7788)**  
IT Transport Ltd: Mr G Taylor  
Tools for including bicycle transport in rural transport appraisal are developed or improved and bicycle operating costs are reduced.
- **Activity patterns, transport and policies for the urban poor (R7789)**  
TRL Limited: Mr P R Fouracre  
To address the impacts of multi-sectoral policies on the travel of the urban poor to ensure that such policy developments contribute to their sustainable livelihoods.'
- **Minimising the cost of sustaining basic rural roads - Stage 2 (R7790)**  
TRL Limited: Dr C S Gourley  
To reduce the costs of basic rural road access provision (very low volume, unsealed roads) by introducing appropriate engineering tools, procedures and practice manuals for district engineers.
- **Comparative assessment of the operational characteristics of rural water transport (TBA)**  
International Forum for Rural Transport and Development: Ms Priyanthi Fernando  
Provide policy makers, planners and organisations working with RWT operators with an assessment of the operational characteristics and affordability of rural water transport (RWT) under different physical and social conditions in Africa & Asia.
- **Appropriate rural transport services in Orissa (TBA)**  
International Forum for Rural Transport and Development: Ms Priyanthi Fernando  
Enhancing accessibility of the rural poor and vulnerable through appropriate mode of transport for poverty alleviation and sustainable livelihood.
- **Enhanced accessibility for disabled people in urban areas (TBA)**  
TRL Limited: Dr D A C Maunder  
Develop a compendium of guidelines and standards for improving the access of disabled people to transport and other services in urban and peri-urban areas.

### THEME T4

*(Increase the efficiency of national and regional transport systems whilst safeguarding the interest of poor and vulnerable users.)*

- **Improved vehicle operations in Sub-Saharan Africa (R7791)**  
TRL Limited: Mr P R Fouracre  
To develop an agreed strategy to improve the efficiency of both road passenger and freight transport through reducing costs, fares, tariffs, and emissions and increasing service frequency.
- **The value of time study in least developed countries (R7785)**  
IT Transport Ltd: Dr G Edmonds  
To develop a methodology for deriving value of time in developing countries for the appraisal of transport and accessibility investment or policy development.

•• New Projects, • Current Projects

## Recent publications

### BOOKS

LARCHER,P and D MILES (2000)  
Roads and Realities  
WEDC. ISBN 1 900930 03 X  
Cost: £24.95 + p&p Available from WEDC

### REPORTS

Proceedings of the 'Expert Group Meeting on Low-Cost Mobility in African Cities'. available from IHE Delft  
Tel: +31.15.2151896  
Email: [kli@ihe.nl](mailto:kli@ihe.nl)

ORN3  
A Guide to surface dressing In tropical and sub-tropical countries (Second edition published 2000. First published 1982, revised 1985). (TRL)

### PAPERS

PA3641/00 KATALA, J and T TOOLE  
Road management systems - The development of the road mentor system in Tanzania. *Annual Roads Convention, Dar es Salaam, Tanzania, 28 - 30 November 2000.* (TRL)

PA3639/00 HINE, J L and H P SINAGA  
ARFCOM, Speed profiles and fuel consumption: results from a congested road in Java. *20th ARRB Conference, Managing Your Countries Assets, Melbourne, Australia, 19 - 21 March 2001.* (TRL)

### WHITE PAPER

Eliminating World Poverty: Making Globalisation Work for the Poor  
White Paper on International Development. (2000)  
Published by DFID

Building on the 1997 White Paper which committed the British Government to international development targets, the new White Paper analyses the nature of globalisation and sets out an agenda for managing the process in a way that could ensure that the new wealth, technology and knowledge being generated brings sustainable benefits to the poor.

The Paper addresses a range of issues including trade and investment, health and education, the environment, governance, information technology and the role of development assistance. It recognises the role of poor infrastructure as a barrier to people trying to take up opportunities for improving their livelihoods. It also discusses the impact of the new technologies which have the potential to help poor people leapfrog some of the traditional barriers to development, by improving access to knowledge.

A short version of the White Paper is available in a number of languages, including Chinese, Arabic, Urdu, Hindi and Welsh. Both this and the full version can be viewed and downloaded from the DFID website:

[www.dfid.gov.uk](http://www.dfid.gov.uk) or [www.globalisation.gov.uk](http://www.globalisation.gov.uk)

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Web Site:  
[www.hrwallingford.co.uk/projects/dfid-kar-water.html](http://www.hrwallingford.co.uk/projects/dfid-kar-water.html)

## Diary of Events

### May 2001

#### Priority issues in Road Management,

Tallinn, Estonia. 17 - 18 May 2001  
Organiser: PIARC Committee C6 and the Estonian  
Road Administration.  
Contact : Tiit Kaal  
Email: [tiit.kaal@tehnokeskus.ee](mailto:tiit.kaal@tehnokeskus.ee)

#### First Road Transportation Technology Transfer Conference

Arusha, Tanzania. 23 - 25 May 2001  
Organiser: Tanzania Technology Transfer Center  
Fax: + 255 22 2116379  
Email: [tcs@twiga.com](mailto:tcs@twiga.com) [tzcenter@udsm.ac.tz](mailto:tzcenter@udsm.ac.tz)

### July 2001

#### 20th Annual South African Transport Conference: meeting the transport challenges

Pretoria, South Africa, 16 July 2001  
Organiser: CSIR  
Tel: +44 161 275 6489, Fax: +91 11 3710341  
Email: [hirobhjwane@yahoo.com](mailto:hirobhjwane@yahoo.com)

#### 9th WCTR in Seoul, 2001,

Seoul, Korea, 22 July 2001  
Organiser: WCTR  
Fax: + 82 344 910 3200 Tel: + 82 344 910 3100  
Email: [wctr@cis.koti.re.kr](mailto:wctr@cis.koti.re.kr)

### October 2001

#### Road Risk Management

Chile, 23 - 26 October 2001  
Organiser: PIARC Committee C18 and National Road  
Directorate of Chile  
Contact : Marcelo Medina  
Email: [mmedina@mop.cl](mailto:mmedina@mop.cl)

#### Fourth Conference of the Eastern Asian Society for Transportation Studies (EASTS)

Hanoi, Vietnam, October 24-26, 2001, ,  
Fax: 81 3 3221-5489  
Email: [easts@sa2.so-net.ne.jp](mailto:easts@sa2.so-net.ne.jp)  
<http://www.rs.civil.tohoku.ac.jp/~isc-easts/>

### November 2001

#### Sustainable Development in Road Transport

India, 8 - 10 November 2001  
Organiser: PIARC Committee C14 and Indian Roads  
Congress  
Contact : Hari Baral  
E.mail: [haribaral@minitel.net](mailto:haribaral@minitel.net)

#### PABIC Pan African Bicycle Conference

Jinja, Uganda, 21-25 November 2001  
Contact: FABIO, First African Bicycle Information  
Office, PO Box 1537 Jinja, Uganda.  
Email: [fabio@source.co.ug](mailto:fabio@source.co.ug)

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