



## Editorial

**WELCOME** to the fifth edition of *Transport* produced by the Transport Research Laboratory (TRL) on behalf of the Department for International Development (DFID). DFID replaced the Overseas Development Administration (ODA) at the last UK Government elections in May 1997.

*Transport* covers the various DFID themes within the transport sector and this editorial highlights Theme T4: *Increase the efficiency of national and regional transport systems*. In this theme, emphasis is placed on improving the operations of the institutions responsible for administering the transport sector. Roads organisations need the ability to plan and finance road projects, allocate funds efficiently and to manage and implement routine maintenance and other road works. There are substantial differences in transport operating costs and tariffs across the world, even between countries whose average road conditions are similar. In many countries, high transport costs are having an adverse effect on economic growth and development.

Several of the current research projects under this theme, on transport efficiency and freight operations, road network management and road investment models were reported on in earlier issues. This edition contains articles on projects ranging across different themes, including urban transport, road safety and community participation in road maintenance. Also included are lists of recent publications, book reviews and a diary of events. It is also with regret that we report the death of Dr Ray Millard who was well known and respected world-wide by many in the Highway Engineering profession.

The purpose of the DFID Newsletter is to provide information on the Transport sub-sector and disseminate research findings to relevant organisations and individuals both in the developed and developing world. DFID are interested to hear of take-up of their research results and the project managers or the editor would be pleased to hear from you if you have examples of where the results of DFID research have been shown to be beneficial.

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 Home Page: <http://www.trl.co.uk/orcmail>

## Diary of Forthcoming Events

December 1997

### Training Programme on Managing and Financing Rural Transport

(Supported by DFID and the World Bank)  
1-11 December 1997, Washington DC, USA  
Contact: Linda Parsley, Overseas Centre, TRL,  
Fax: +44 (0)1344 770719

### Computers in Urban Planning and Urban Management (CUPUM 97), 5th International Conference

16-19 December 1997, Indian Institute of Technology (IIT), Bombay, India  
Contact: Dr PK Sikdar, IIT.  
Tel: +91 22 578 2545/6530, Fax: +91 22 578 3480  
Email: cupum97@gemini.civil.iitb.ernet.in

January 1998

### 77th Transportation Research Board (TRB) Annual Meeting

11-15 January 1998, Washington DC, USA  
Contact: Angelia Summons.  
Tel: +1 202 334 2934/2952, Fax: +1 202 334 2003

April 1998

### Road and Airfield Pavement Technology; 3rd International Conference & Exhibition,

28 April 1998, China  
Contact: Conference Secretariat, China.  
Tel: +86 1 064 914 809, Fax: +86 1 064 914 808

May 1998

### 9th REAAA Conference (Road Engineering Association of Asia and Australasia) An International Focus on Roads: Strategies for the Future.

3-8 May 1998, Wellington, New Zealand  
Contact: Fiona Knight, Transit NZ.  
Tel: +64 4 499 6600, Fax: +64 4 496 6666.

### 4th International Conference on Managing Pavements

17-21 May 1998, Durban, South Africa  
Contact: Conference Planners,  
Tel: +27 12 631 681, Fax: +27 12 631 680  
Email: confplan@iafrica.com,  
website: <http://www.icc.co>.

May 1998

### Rural Development Technology Africa '98

27-30 May 1998, Nasrec, Johannesburg, South Africa  
Contact: Tendai Dumbutshena,  
Tel: +27 11 835 1565, Fax: +27 11 496 1161/2045

June 1998

### Road Management for Senior Engineers

15-26 June 1998, Worthing, Sussex, UK  
Contact: Training Manager, Crown Agents.  
Fax: +44 (0)181 7707448

### Appropriate Technology Roadworks for Developing Countries

22-26 June 1998, Berkshire, UK  
Organised by Intech Associates and TRL  
Contact: Linda Parsley, TRL,  
Fax: +44 (0)1344 770719

### Roads and Transport in Developing Countries

29 June-10 July 1998, Wokingham, Berkshire, UK  
Organised by the Overseas Centre, TRL  
Contact: Linda Parsley, TRL,  
Fax: +44 (0)1344 770719

July 1998

### 8th World Conference on Transport Research

12-17 July 1998, Antwerp, Belgium  
Contact: Viviane De Wacker, University of Antwerp.  
Tel: +32 3 220 4174, Fax: +32 3 220 4026

### International Conference on Traffic and Transportation Studies

27-29 July 1998, Beijing, China  
Contact: Dr Baohua Mao, School of Traffic and Transportation, Northern Jiaotong University, Beijing 100044, People's Republic of China.

September 1998

### CODATU VIII

21-25 September 1998, Cape Town, South Africa  
Contact: Christian Jamet, President CODATU Scientific Committee,  
Tel: +33 472 047 701, Fax: +33 472 047 702

## NEW TRL EMAIL ADDRESS

A new Email address is now available for general enquiries to TRL Overseas Centre:

Email: [Overseas\\_Enquiries@o.trl.co.uk](mailto:Overseas_Enquiries@o.trl.co.uk)

Individuals can still be contacted directly.

## INTERNET

The text of all the DFID newsletters will be available on the Internet on the DFID World Wide Web Home Page:

<http://www.oneworld.org/dfid>

DFID Transport newsletters can also be found on the TRL Overseas WWW Home Page:

<http://www.trl.co.uk/oseas>

# PTRC to twin with the Egyptian National Institute of Transport

**PTRC**

A major 3 year contract from DFID to assist in the institutional strengthening of the Egyptian National Institute of Transport (ENIT) has been won by PTRC Education and Research Services.

ENIT was formed in 1983 by the Egyptian Ministry of Transport as an educational, training and research centre serving the Egyptian transport sector. Sharing many of the same objectives as PTRC, its mission is "to be an influential source of the knowledge, education, training and research for improved efficiency in the transport industry". It's programme of activities includes a one-year Diploma course for young transport professionals, a programme of short-courses for middle managers, and high level seminars for senior staff.

The package of support funded by DFID is intended to help the Institute in its next phase of development and to ensure that it is fully

self sufficient and self financing by 1998. PTRC's role is to:-

- Set up a staff development programme
- Develop training management systems
- Advise on the marketing of the Institute's activities in Egypt and the Middle East
- Restructure the Diploma course and organise its accreditation by a UK University
- Recommend and design a programme of short courses to meet the needs of Egyptian transport operators
- Procure software, equipment and books for the ENIT library
- Establish links and cooperation between the Institute and international transport professionals.

Through this contract the University of

Westminster has accredited the ENIT Diploma Course and also a Masters degree option. It is now possible to receive a transport degree from a British University but taught in Arabic.

The project will be managed by PTRC, supported by specialist advisors and the extensive training resources and expertise of the PTRC network of Member organisations.

For further information contact: Dr Andy Costain, PTRC, Tel: +44 (0)181 741 1516, Email: PTRC@cityscape.co.uk



ENIT office in Cairo

## The use of MAAP in Sub-Saharan Africa

Globally the cost of road accidents average 1% of a country's Gross Domestic Produce (GDP). Sub-Saharan Africa has the highest road accident death rates (in terms of fatalities per registered vehicle) of any region in the world. Furthermore, road accidents are an increasing problem - recent findings from Botswana show an increase of 18% per year over a decade.

Bringing this situation under control requires the careful targeting of scarce resources within the three E's: Engineering, Education and Enforcement. However, success can only be achieved if full information on road accidents is available through an efficient accident data collection and analysis system. To assist with this, TRL, with the support of DFID, have developed the Micro-computer Accident

Analysis Package (MAAP) which allows accident data to be recorded and analysed on a single personal computer. An important feature of MAAP is its graphics capability, which includes the ability to plot accident locations.

Throughout the 1980's and 1990's the package has been installed in a number of Sub-Saharan African countries including Botswana, Zimbabwe, Tanzania, Swaziland and Ghana. Support for each of these installations, has been provided through visits and remote support from TRL. This has contributed to the smooth running of the installations and enabled local road safety professionals to develop their accident investigation skills.

The first installation of MAAP in Africa was in

Botswana and for the past ten years the Accident Analysis and Statistics section of the Department of National Transport and Communications has used it to produce annual Road Traffic Accident Reports. MAAP has also been used to identify accident blackspots in the capital Gaborone and a number of hazardous locations have been successfully improved by engineering countermeasures.

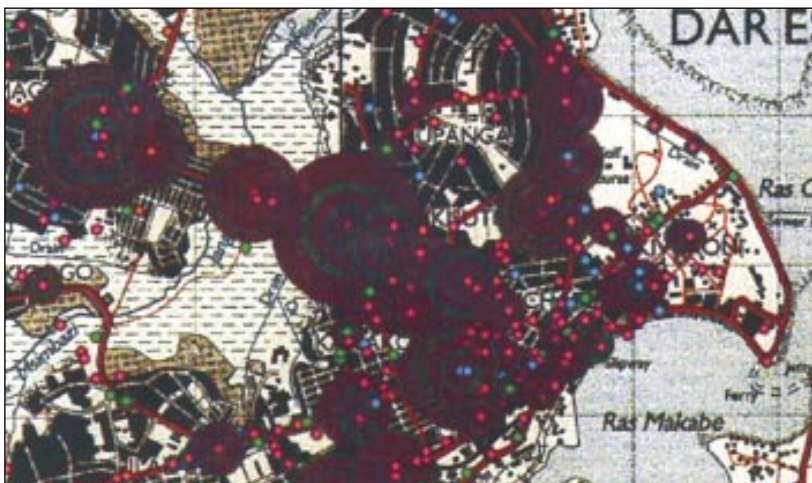


MAAP training in Tanzania

MAAP has provided local road safety specialists with the major tool they require to monitor safety on their road networks and to carry out in-depth analyses of road accidents. With technical support from TRL and continued funding from DFID, this important work will promote wider use of the database and techniques of analysis and design such that road safety is significantly improved.

For further information contact Ryszard Gorell, TRL. Tel:+44 (0)1344 770636, email: rgorell@trl.co.uk

DFID Project Reference R6028 "Accident data collection and analysis: the use of MAAP in the Sub-Saharan region of Africa"  
Theme Objective T1



Plot of accident locations in Dar es Salaam

# CODATU

**CODATU (Cooperation for the continuing development of urban and suburban transportation) is an international association with the goal of furthering scientific, technical, economic and social activities and exchanges for the development and improvement of urban and suburban transportation based on shared experiences between developing and already industrialised countries.**

**The association is a meeting point for professionals in the urban transport sectors including:**

- training, consulting, research and financing institutions
- local organisations and transport authorities
- operators and engineering companies, industries and manufacturers.

**CODATU's activities to date include the organisation of international conferences on Urban Transport Planning issues in Dakar (1980), Caracas (1982), Cairo (1986), Jakarta (1988), Sao Paulo (1990), Tunis (1992) and New Delhi (1996).**

**Recently, CODATU has created 5 technical committees, each of which will provide decision makers with advice and information. These are:**

- transportation systems and organisation of space
- financing and control
- intermodal transportation
- relations with the environment
- use of new technologies.

**A newsletter and training programmes for its members are also being planned.**

**The next conference is CODATU VIII which will be held in CapeTown, South Africa in September 1998 when 200 papers will be presented on the topic of 'Urban Transportation Policy: a sustainable development tool'.**

*For further information, contact: Claude Berenguer (Executive director), CODATU, Espace Ville, Rue Maurice Audin, 69518 VAULX-EN-VELIN Cedex, France.*

*Tel: +33 (0) 4 7204 7701,  
Fax: +33 (0) 4 7204 7702.*



## Review of National Road Design Manual

In May this year, representatives of the engineering community in East and Southern Africa gathered in Nakuru to review the Kenya Road Design Manual. The seminar was held by the Ministry of Public Works and Housing (MoPW&H) and jointly sponsored by the Government of Kenya and the British Development Division East Africa (BDDEA). Central and local government as well as consultants, contractors and academic institutions were represented.

The Manual contains the information required by engineers to design structurally sound road pavements using materials of specified qualities. To take account of engineering experience and developments in technology, the Manual is periodically reviewed. TRL has been engaged in collaborative research projects with the Materials and Research Department of the MoPW&H for many years and were invited to participate in the review and present the findings from two DFID funded projects.

A study of the performance of bituminous road surfacing materials (DFID Project R5612) showed the need for new mix design methods. In tropical environments, bituminous road surfacing materials frequently fail through 'surface down' cracking because of bitumen hardening. The study also showed that there has to be a balance between countering cracking and inducing deformation under very heavy wheel loads. The knowledge gained benefitted subsequent projects, the results of which were an integral part of the presentation.

TRL also outlined the findings of a DFID funded project (R5604) which aimed to resolve the problems of designing and constructing roads in arid areas where the cost of importing water can be prohibitive. The project investigated the compaction of soils and road pavement materials at the prevailing low moisture contents. This is contrary to conventional design, but the research shows that durable roads can still be assured for many materials offering substantial savings in construction costs.

Other topics addressed at the seminar included the potential for pavement design and construction of lightly trafficked roads using lower cost marginal materials, the need for good drainage design and the promotion of environmental issues. This process of review and assessment will enhance a manual already well respected in the region.

*For further information contact Mick O'Connell, TRL.*

*Tel: +44 (0)1344 770993,*

*email: moconnell@trl.co.uk*



*Participants at the recent Kenya Road Design Manual seminar*

## SSATP: Urban Transport Component

The Sub-Saharan Africa Transport Policy (SSATP) program was launched in 1987 as a joint initiative of the World Bank and the United Nations Economic Commission for Africa (UNECA) to improve the response to key policy issues and the development of related capacities in Sub-Saharan Africa. The program benefits from the participation of bilateral and multilateral development agencies and is managed by the World Bank.

The programme is implemented through a number of components which progress at their own speed, depending on priority, availability of partners, donor's involvement and linkages with the World Bank operational programs. The active components are: Urban Transport, Road Maintenance Initiative, Rural Travel and Transport, Trade and Transport and Railways Restructuring.

The objectives of the Urban Transport Component (UTC), as approved at the latest Steering Committee Meeting in Dakar in May 1996 are to,

- Consolidate and strengthen the policy reforms through the reinforcement of sector dialogue, user participation and institutional coordination

- assist in the provision of safe and affordable urban mobility with a specific focus on the urban poor
- develop partnerships with African institutions to enhance local expertise in the areas of urban transport planning, operation and research
- disseminate best practices in the region.

Actions that have been promoted and financed so far include support of institutional reform in the urban transport policy, non-motorised transport pilot tests in Kenya and Tanzania, a road safety actions plan, studies on the mobility of the urban poor, and analyses on external effects of urban transport systems.

As of September 1997, the following countries are active members of the SSATP-UTC: Benin, Bukina Faso, Cameroon, Cap Vert, Congo, Cote d'Ivoire, Ghana, Guinea, Kenya, Mali, Mozambique, Nigeria, Senegal, Tanzania, Togo and Zimbabwe.

*For further information contact: Patrick Bultynck, Urban Transport Economist, SSATP-UTC Coordinator, The World Bank. Tel: +1 202 473 4549, Email: pbultynck@worldbank.org*



# Community participation in road maintenance

*Why are some community road maintenance schemes effective?*

*In many countries of Africa steps are being taken to develop sustainable approaches to the maintenance of national road networks. Strategies adopted have highlighted the need for the local community to participate in road maintenance initiatives by taking some responsibility for the secondary and feeder roads that link them to the national road network.*

A DFID funded research project currently being undertaken by I.T. Transport aims to explore the subject by addressing questions such as, why do villagers maintain certain roads and footpaths and not others? What role does government play? What are the gender roles in road maintenance? What resources do villagers have and use?. The research is focused on Kenya, Tanzania and Uganda and is being carried out in three stages.

The first stage, completed earlier this year, involved a literature review of current experience of community participation in the maintenance of roads and other rural infrastructure. The review indicated that attitudes towards maintenance often differ between governments and donors; there is a lack of end-user



*Local authority built bridge, suffering from lack of maintenance*

participation in the planning process; villagers feel no 'sense of ownership' or responsibility towards public infrastructure and government financing of maintenance is scarce especially at the feeder road level and below.

These points have shaped and guided the second stage which will examine existing project experience. This will be achieved through case studies from projects in the region which have incorporated community participation in their design and implementation. One case study will focus on the Government of Tanzania's pilot Village Travel and Transport Programme, which aims to increase the capacity of local communities to develop and maintain their transport infrastructure. The attitudes of stakeholders towards the participatory approach are being studied, together with the possible effects on future road maintenance.

The experience gained from the literature review and case studies will be presented as "Guidelines for planning and implementation of community participation in maintenance" to be presented and discussed in regional seminars and appropriate publications. The guidelines will benefit transport planners and engineers when planning and implementing future transport infrastructure maintenance.

*For further information or comments please contact:  
Dr. Tony Airey or Marcus Wattam, I.T. Transport Ltd,  
Tel: +44 (0)1235 833 753, E-mail: ittran@mplc.co.uk*



*DFID Project Reference R6476  
"Community Participation in Road Maintenance"  
Theme Objective T3.*



*Well maintained footbridge built and maintained by the local community*

## RS MILLARD, CMG, PhD, FICE, FIHT

*5 June 1920 - 1 June 1997*

It is with regret that we report the death in June of Dr. Ray Millard, one of the highway engineering professions most influential and vigorous members.

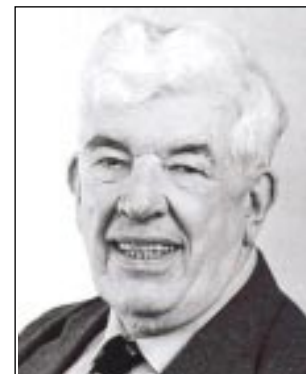
Dr Ray Millard was an engineer with a strong and energetic commitment to solving highway engineering problems in the developing world. His reputation grew in the 1960s when, as Head of the Tropical Section of the Transport and Road Research Laboratory (now TRRL), he initiated a broad range of research work in developing countries which formed the foundation of TRRL's reputation overseas. He was Deputy Director of TRRL from 1965 until his

departure from the Civil Service in 1974. During this time he served on the Council of the Institution of Civil Engineers and in 1971 was awarded the CMG for his dedicated service to the developing world.

After a few years in the private sector he joined the World Bank in 1976 as a highway engineering adviser and from 1982 he continued as a freelance consultant.

Over his lifetime he produced numerous publications, including a TRL State of the Art Review: *Road Building in the Tropics* (1993) which incorporated a lifetime's knowledge.

The loss will be deeply felt by all who knew him and we send our condolences to his wife and family.



## Pedestrian vulnerability and accidents

The developing world faces the serious and growing problem of pedestrian road accident casualties, particularly in the urban environment.

Contributing factors include poor or inadequate pedestrian facilities, the growth of the population and the rapid transition of developing countries to motorised transport. In general, the poorer sections of the urban community are more exposed to pedestrian accident risk than the more affluent.

An ongoing programme of research, funded by DFID and managed by WS Atkins with inputs from TRL, aims to examine the high incidence of pedestrian casualties, determine contributory factors and provide guidance for highway engineers in appropriate analysis and design principles of remedial measures.

The project is being carried out in Accra (Ghana), Bangalore (India), Port Moresby (Papua New Guinea), Colombo (Sri Lanka) and Harare (Zimbabwe). Extensive accident, highway and socio-economic data have been collected and are undergoing analysis in the search for significant risk factors. The aim is to provide engineers and road safety specialists with engineering criteria and guidance enabling them to provide safety measures for pedestrians using roads and footpaths.



Pedestrians typically using the road in Harare



Children attempting to cross the road in Port Moresby

The main source of data has been police reports, which form the basis of the locally maintained MAAP databases. The highway survey information includes traffic and pedestrian volumetric counts and details of highway condition, standard and geometry. Socio-economic data have been collected through structured interview questionnaire methods.

The research has involved the collaboration of local agencies who undertook the surveys and provided an insight into the problems inherent in the local environment and culture for pedestrians. These agencies include the Police, Ministries of Works and Engineering, road safety committees/institutions and emergency services.

In 1998, the study team will report on the different experiences of setting up major field research in the various developing countries. It will present its findings on the behavioural pattern of pedestrians and their socio-economic background, the highway related data and the relationships between different risk predictors.

For further information contact: Dr Farshid Kamali or Gregg Holland, WS Atkins International Ltd.  
Tel: +44 (0)1372 726140.

DFID Project Reference R6236 "Pedestrian Accidents/Vulnerability in Developing Countries"  
Theme Objective T1



## Why spend a billion dollars?

*One of the biggest investments a city can ever make is a mass transit system. The three main options; underground rail (metro), Light Rail Transit (LRT) and high-capacity segregated Bus-ways have been investigated by TRL in a DFID funded research project, with the research focusing on the performance and potential of each mode under actual developing city operating conditions.*

A typical 'metro' underground railway can cost around one billion US dollars. This does not guarantee success, however, and many metros fail to meet their expectations. New metros in Colombia and Taiwan have cost 3 and 6 billion US dollars respectively, and yet both have had contractual problems and have yet to carry the passenger numbers forecasted. Cost and construction time overruns are common and this coupled with unrealistic passenger forecasts led TRL to suggest that "because of the extremely high cost, a city should exhaust all alternatives before opting for a metro".

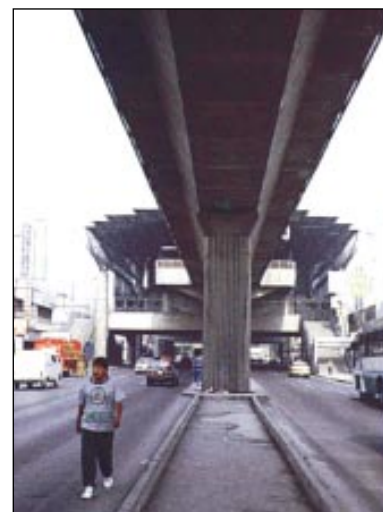
Research on the busway alternative, shows that these can rival the carrying capacity of many metros for a fraction of the cost. Hourly directional passenger flows of 18-20 thousand at 18-20 km/hr are possible. The modern version of the traditional tramway is the LRT which has also been studied.

This has an appealing modern image but appears to have a lower passenger carrying capacity than a busway. This somewhat surprising result is thought to be due to the superior ability of buses to overtake the obstacles that are typical in developing cities, and which can delay LRT.

It therefore seems surprising that cities consider spending a billion dollars on a rail system when a busway costing just fifty million dollars could, in many cases, offer the same passenger capacity. The choice is evidently not based upon technical criteria alone.

For further information contact Geoff Gardner, Overseas Centre, TRL.  
Tel: +44 (0)1344 770644. Email: ggardner@trl.co.uk

DFID Project Reference R5596:  
"Urban Mass Transit"  
Theme Objective U2



An elevated rail transport system or an expensive symbol of civic pride?

# New TRL Overseas Road Note



## ORN 17 - Road Safety Education in developing countries: Guidelines for good practice in primary schools.

Road accidents are one of the most prominent causes of injury and death in developing countries. The problem is particularly marked among child pedestrians who typically represent 20 - 30 per cent of developing country pedestrian road accident casualties.

TRL, funded by DFID, began researching Road Safety Education materials and teaching methods for use in developing country primary schools in 1996 and based on results from research in Ghana, has produced Overseas Road Note 17. The Guidelines are aimed at policy makers and advisors in Ministries of Education, Transport, Health and Public Works, as well as teachers, headteachers and the Police.

The Road Note provides practical information, illustrates the importance of Road Safety Education, and shows how developing countries might establish an adequate Road Safety Education course for primary school children. Also described is how Road Safety Education, as part of a school's curriculum, can be

linked with subjects such as *life skills, the environment, mathematics, English and science*, or can be a subject in its own right. Examples of road safety teaching methods from other developing countries are included. Full details of the research project and samples of teaching materials and methods are given in TRL Report 265.

For further information contact: Ivan Sayer,  
Overseas Centre, TRL. Tel: +44(0) 1344 770407 Email: [isayer@trl.co.uk](mailto:isayer@trl.co.uk)  
DFID Project Reference R6890 "Road safety education in developing country schools and communities",  
Theme Objective T1



Children walking to school in Ghana

## Book Reviews



*Road Maintenance and Regravelling (ROMAR) using labour-based methods (Handbook and Workbook)* by C Andersson, A Beusch and D Miles.  
Published by IT publications, 1996.



These books are written for managers of small construction businesses starting in the routine maintenance and regravelling sector. They were originally developed as part of a contractor

development programme in Lesotho and now form part of the 'Improve Your Construction Business' series of publications.

The Handbook has two main sections; the first, entitled 'Principles', introduces the reader to the terminology, standards and techniques used in road maintenance. It also details basic soil mechanics and field testing, the choice and design of equipment/handtools and the organisation of labour based roadworks. The second section, called 'Practice', covers pricing and bidding, how to plan and carry out effective maintenance and regravelling, and also discusses staff management techniques. Particularly useful are the detailed cost examples which are based on typical work rates.

The smaller workbook complements the handbook, by covering the same topics but asking questions and giving exercises with worked solutions. These are extremely useful for testing the readers understanding of the subject.

The ROMAR books provide a good introduction to the subject, giving clear worked examples and extensive

technical, financial and management advice.

A few small errors were noted that could confuse a reader new to the subject, but hopefully these will be corrected in future editions and this should not dissuade anyone interested in the subject.

The books are well written and contain concise and useful information that will help both new and established contractors to improve their operations.

Reviewed by Nigel Hewitt, TRL



*Transport in the Urban Environment.*  
Published by The Institution of Highways and Transportation, 1997

This new publication by the U.K. Institution of Highways and

Transportation is a comprehensively revised version of the highly successful *Roads and Traffic in Urban Areas* known as 'the Brown Book' which has proved a good source of information for practitioners in highways, traffic engineering, transportation and urban planning.

Although *Transport in the Urban Environment* is not specifically aimed at the developing world, there is no doubt that this edition will be as extensively used by transport practitioners as 'the Brown Book' throughout urban centres of the developing world.

The book is divided into six parts.

**Part I** (Issues, Responsibilities and Principles) provides an overview of the key issues, including the intrinsic importance of travel and transport. Sustainable development issues are discussed as well as the importance of developing sustainable urban transport policies. Past travel patterns and future trends are described as is the recent growth in the negative impacts of traffic growth. Transport policy is covered

focusing on objectives-led planning and the role of targets and the roles, responsibilities and powers of both central and local government are described.

**Part II** (The Transportation Planning Process) describes the context for urban transport plans. The components of transport policy are described, in detail, as are the different methods of data collection. For measures to be introduced successfully, public approval and acceptance are required, so a chapter concentrates upon methods of involving the public.

**Part III** environmental management. This covers general issues such as managing the use of the road system, town centres, procedures for implementing traffic management measures and enforcement, transport users, road safety, environmental management, technology for network management, car parking, traffic calming, management of speed and demand management.

**Part IV** deals with highway and traffic developmental issues. Chapters cover various transport aspects of new developments.

In **Part V** the development and design of highways and other infrastructure schemes is considered in detail. Chapters cover design concepts, alternative concepts of capacity, as well as the procedures for the planning and approval of transport infrastructure schemes.

**Part VI** reports on variations applying to Northern Ireland, Scotland and Wales; and provides a general index to the whole volume.

The new book has been produced in hardback and in an electronic format (CD-ROM).

Reviewed By Mahmoud Al-Katib, TRL

## Recent publications

## BOOKS

**IHT (1997).** Transport In The Urban Environment. Published by the Institution of Highways and Transportation (IHT), London. ISBN 0902 933 213. (£56 includes worldwide p&p)(IHT)

**IFRTD (1997).** An Annotated Bibliography on Rural Transport. Edited by N. Sieber. Available from IT Publications Ltd, London. ISBN 1 85339 4181. (£9.95 + p&p)(IT Publications)

**Larcher, P (1997).** Labour-based Road Construction: A State of the Art Review. Available from IT Publications Ltd, London. ISBN 1 853 39 4165. (£11.95 + p&p)(IT Publications)

## REPORTS

**ORN 17**  
**TRL (1997).** Road Safety Education in Developing Countries - Guidelines for Good Practice in Primary Schools. TRL Overseas Road Note 17. (£10\*)(TRL)

**TRL 265**  
**SAYER, IA, CJ PALMER, G MURRAY and J GUY (1997).** Improving Road Safety Education in Developing Countries; Ghana. TRL Report 265. (£10\*)(TRL)

**TRL 267**  
**HINE, JL, JH EBDEN and P SWAN (1997).** A Comparison of Freight Transport in Tanzania and Indonesia. TRL Report 267. (£10\*)(TRL)

## PAPERS

**DOWNING, A (1997).** Accident Costs in Indonesia: A Review. *ICORS'97, India, 24-27 July 1997.* (TRL)

**DOWNING A and H ISKANDAR (1997).** Engineering Approach to Accident Prevention and Reduction. *KRTJ-5, Yogyakarta, 22-24 September 1997.* (TRL)

**GOURLEY, C S and PAK GREENING (1997).** Use of 'sub-standard' lateritic gravels as roadbase materials in southern Africa. *International symposium on thin pavements, surface treatments and unbound roads, University of New Brunswick, Canada, 24-25 June 1997.* (PA3281/97)(TRL)

**GOURLEY, C S (1997).** Lightly trafficked sealed roads in southern Africa: flexibility in design and construction. *1st International symposium on paving of low volume roads, Rio de Janeiro, Brazil, 5-10 October 1997.* (PA3283/97)(TRL)

**GREENING, PAK and J ROLT (1997).** The use of marginal materials for road bases in the Kalahari region of southern Africa. *International symposium on thin pavements,*

*surface treatments and unbound roads, University of New Brunswick, Canada, 24-25 June 1997.* (PA3282/97)(TRL)

**LARCHER, P and D MILES.(1997) Developing Small Scale Contractors in Road Maintenance. Tanzania Roads Association: Annual Roads Convention on Road Transport: The key to Development, Dar es Salaam, September 24-26, 1997.** (Loughborough University)

**MBARA, T C and D A C MAUNDER (1997).** Travel Characteristics of Urban Households in Harare, Zimbabwe. *8th IFAC Symposium on Transportation Systems 1997, Chania, Crete 16-18 June 1997.* (PA3228/97)(TRL).

**MILES, D, J deVEEN and J CLIFTON (1997).** The Development of Labour-based contracting for Roadworks: Lessons from Ghana, Mozambique and Lesotho. *International Workshop on Rural Infrastructure, May 1997.* (Loughborough University)

**MILES, D and R PETTS (1997).** Management of Appropriate Road Technology (MART). *Routes/Roads - PIARC World Roads Association, July 1997.* (Loughborough University)

**SMITH, H, AC EDWARDS and J MREMA (1997).** Condition of the TANZAM Highway at Kitonga Gorge. *Tanzania Roads Association: Annual Roads Convention on Road Transport: The key to Development, Dar es Salaam, September 24-26, 1997.* (PA3286/97) (TRL)

**STERLING A and K A ZAMHARI (1997).** Designing Asphalt Mixes That Last. *3rd Annual Bitumen Conference, Singapore, 25-27 June 1997.* (TRL)

**TATANG DACHLAN, A, K A ZAMHARI, A STERLING & T TOOLE (1997).** Improved Design Procedure for Hot Mix Asphalt. *EASTS '97, Seoul, 29-31 October 1997.* (TRL)

**WAWAN WITARNAWAN & A F DALY (1997).** Strengthening of bridges using external post-tensioning. *EASTS '97, Seoul, 29-31 October 1997.* (TRL)

**WOODBIDGE, M E (1997).** The Development and Value of a Construction Material Information System. *Tanzania Roads Association: Annual Roads Convention on Road Transport: The key to Development, Dar es Salaam, September 24-26, 1997.* (PA3285/97) (TRL)

*For copies of the above publications, please contact the relevant organisation - indicated in brackets  
\* Limited numbers of TRL publications are free of charge to nationals from developing countries.*

## Newsletter Editors

## Transport

Linda Parsley, Overseas Centre, Transport Research Laboratory, Old Wokingham Road, Crowthorne, Berks RG45 6AU, UK.  
Tel: +44 (0)1344 770551 Fax: +44 (0)1344 770719  
Email: lparsley@o.trl.co.uk

## Earthworks

Dr John Bennett, British Geological Survey, Keyworth, Nottingham NG12 5GG, UK.  
Tel: +44 (0)115 936 3465 Fax: +44 (0)115 936 3474  
Email: j.d.bennett@bgs.ac.uk

## Energy Efficiency

Dr Andrew Gilchrist, ETSU, Harwell, Oxon OX11 0RA, UK.  
Tel: +44 (0)1235 433589 Fax: +44 (0)1235 433727  
Email: andy.gilchrist@aeat.co.uk

## Urbanisation

Dr Andrew Cotton, Water, Engineering and Development Centre, Loughborough University, Leicestershire LE11 3TU, UK. Tel: +44 (0)1509 222885 Fax: +44 (0)1509 211079  
Email: wdec@lboro.ac.uk

## Water

Geoff Pearce, Overseas Development Unit, HR Wallingford, Howbery Park, Wallingford, Oxon OX10 8BA, UK.  
Tel: +44 (0)1491 835381 Fax: +44 (0)1491 826352  
Email: odunit@hrwallingford.co.uk

## Contact addresses

*CODATU, Espace Ville, Rue Maurice Audin, 69518 VAULX-EN-VELIN Cedex, France. Tel: +33 (0)472 047 701, Fax: +33 (0)472 047 702.*

*Crown Agents, St Nicholas House, St Nicholas Road, Sutton, Surrey SM1 1EL, UK. Fax: +44 (0)181 770 7448.*

*DFID, 94 Victoria Street, London W1E 5JL, UK. Fax: +44 (0)171 917 0072*

*Institution of Highways & Transportation (IHT), 6 Endsleigh Street, London WC1H 0DZ, UK. Tel: +44 (0)171 387 2525, Fax: +44 (0)171 387 2808.*

*IT Publications Ltd, 103-105 Southampton Row, London WC1B 4HH, UK. Fax: +44 (0)171 436 2013*

*IT Transport Ltd, The Old Power Station, Arlington, Nr. Wantage, Oxon OX12 8QJ, UK. Fax: +44 (0)1235 832186*

*Loughborough University (Institute of Development Engineering) Leicestershire LE11 3TU, UK. Fax: +44 (0)1509 211079*

*PTRC, Glenthorne House, Hammersmith Grove, London W6 0LG, UK. Tel: +44 (0)181 741 1516, Fax: +44 (0)181 741 5993*

*Transport Research Laboratory, Old Wokingham Road, Crowthorne, Berkshire RG45 6AU, UK. Fax: +44 (0)1344 770719*

*The World Bank, 1818 H Street N.W., Washington DC 20433, USA. Fax: +1 202 522 1500*

*WS Atkins International Ltd, Woodcote Grove, Ashley Road, Epsom, Surrey KT18 5BW, UK. Tel: +44 (0)1372 726140, Fax: +44 (0)1372 740055*

THIS NEWSLETTER is sent free of charge, aimed at those who are interested in Transport related issues in the developing world - engineers and planners, researchers and practitioners in Governments, Aid Agencies, Training Institutions, etc world-wide. Please show this newsletter to your colleagues. For you or your colleagues to be included on the mailing list for future editions, please send your name and address to the editor.