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24 March 2001 Ref 9/89/1

Tony Brennand
Wellington Regional Council
PO Box 11646
WELLINGTON

Dear Tony

REPORT FOR REGIONAL LAND TRANSPORT COMMITTEE

I enclose copies of recent Transfund newsletters which contain items which will be of interest to Committee members.

Particular activities that have a bearing on the functions of this Committee include:

ROADING PROJECTS

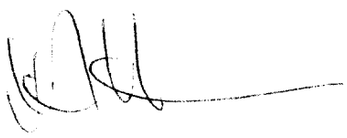
A study has been commissioned by Transfund into the benefit values that are used in the evaluation of roading projects. Some of the current values used are "imported" from overseas and some others are quite old. The study will seek to derive new values based more on peoples "willingness to pay", and to explore whether all the costs and benefits of roading projects are being considered in analysis. It is hoped that this study will be completed early in 2002.

PASSENGER TRANSPORT

Transfund staff have continued to work with the staff of Wellington Regional Council to gain approval for ATR and Patronage Funding/Kick-Start projects. While progress has not been as fast as we all would have hoped for, significant new service improvements have been approved, and others are still being discussed.
Wellington Region is well ahead of the rest of the regions in both the value and proportion of requests approved so far for Patronage Funding. Some submitted projects are proving difficult to reach agreement on, but progress continues to be made. There is also a need to agree on the baseline patronage and funding values for these services before the cost of any new services can be claimed.
The ATR analysis for funding of the Wellington Passenger Transport Terminal has been a protracted process which is hopefully nearing an end.

I will be happy to expand on any matters of interest to the Committee at the meeting.

Yours sincerely



Ian Hunter
Regional Manager

Transfund NEW ZEALAND ARATAKI AOTEAROA

Transfund News

A monthly newsletter published by Transfund New Zealand | February 2001 Issue 28

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Passenger transport funding grows

As more regional councils sign up to join the patronage funding scheme for passenger transport services, Transfund is also receiving new applications for the special kick-start funding now available to encourage new or improved services.

Since December three more regional councils have joined the scheme — Environment Waikato, Environment BOP, and Environment Canterbury, which had earlier operated the country s first patronage funding scheme on a trial basis. This brings to seven the number of major councils to adopt the new method of funding their passenger transport services.

Boosting services

A growing number of applications have been received for one-off kick-start funding. In Auckland start-up funding has been approved for new bus services at North Shore and Manukau, as well as new early morning services on some peak routes. Applications are also expected for funding assistance with information and publicity packages, including development of a Rideline web site.

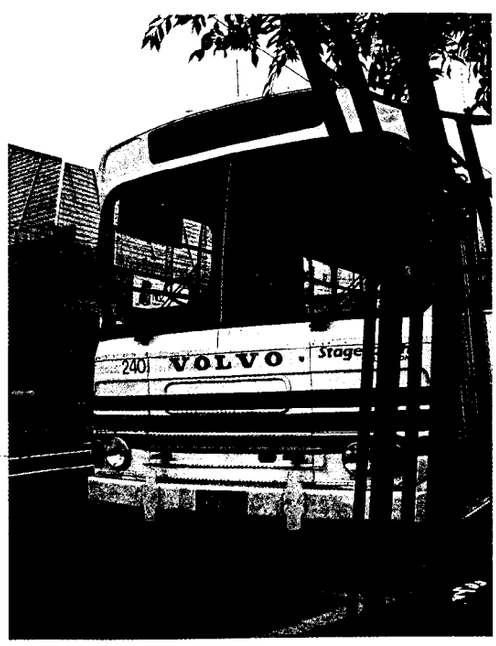
In Waikato enhanced passenger services are expected to include new services in Hamilton and a service between Huntly and Hamilton. In Tauranga, Environment BOP proposes to undertake commercial trials to improve existing services and increase patronage, as well as investigating the establishment of new services.

Horizons Manawatu is planning a new free bus service to Massey University for next financial year, as well as improvements to weekend and other services in both Wanganui and Palmerston North. Applications have been received for improvements to the central bus terminal in Palmerston North and for the construction of more shelters at stops throughout the city.

Wellington Regional Council has several new initiatives in the pipeline. The council has already applied for funding to start new bus services in the Johnsonville, Newlands and Churton Park areas, while improved services in Wellington, Hutt Valley, Porirua and Kapiti are also being considered. Improved rail services in the region are also on the Council s programme.

Environment Canterbury has already introduced some new services, such as its Orbiter bus service in Christchurch. It is now looking at increasing frequencies on some existing services, introducing new express services, extending some routes and introducing such facilities as integrated ticketing, smart-cards, new ticketing machines and software.

Otago Regional Council has received funding approval for introducing new Sunday services on the Port Chalmers, Peninsula and Southern routes.



Bus services in a number of regions will be enhanced as a result of kick-start funding.

Major Projects Review implementation gathers momentum

"Working together to get the right results, at the right time, at the right cost" is the common thread running through a number of new initiatives Transfund is currently working through with road controlling authorities (RCAs) and regional councils.

Resulting from the recommendations contained in last year s report of the Major Projects Review, these initiatives include:

- improving the way Transfund and RCAs develop longer term investment plans with a **portfolio management** approach aimed at ensuring alignment between regional/district roading programmes and the transport outcomes identified in Regional Land Transport Strategies (RLTS) and the National State Highway Strategy
- segmenting projects for funding, and funding lower risk projects through a **block allocation** of funds *(output funding)*
- developing **case management** of some higher-risk projects with selected RCAs
- developing and testing an **auditing, benchmarking and feedback** process to underpin the above methodologies.

Transfund has approached a number of authorities in the Northland, Waikato, Bay of Plenty, Otago and Southland areas to work with them in trialling these initiatives. Transfund regional staff will be discussing with potential participating authorities how the initiatives will work and the implications and benefits of trialling them, prior to reaching agreement on undertaking the trials.

Transfund is also working with a Business Practices Working Group, comprising representatives of RCAs and Transfund, to help ensure the policies and procedures arising from these initiatives are practicable and supported by all relevant parties.

Portfolio management

The two key objectives of portfolio management are (1) to match the funds required for a basket of outputs with the expected funding availability, and (2) to develop the right projects (outputs) at the right place and the right time.

Thus an ideal portfolio will include projects at different stages of development, with the timing of investment in each project being matched to achieve a long-term sustainable flow of road construction projects meeting the country s needs.

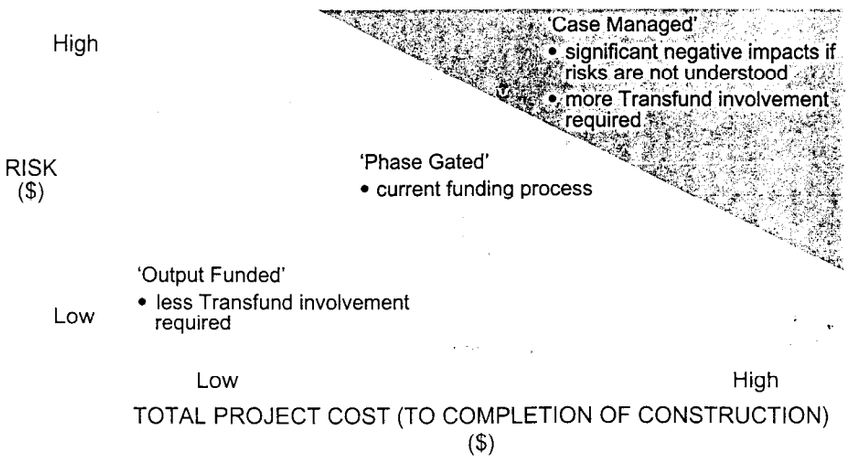
Meeting these objectives requires Transfund to predict 3-5 year revenue and expenditure flows based on various BCR thresholds, and to ensure that the portfolio of projects matches the various strategic goals.

Funding segmentation

In order to manage the risk of making poor or misplaced investments, the Major Projects Review recommended that Transfund should target its evaluation resources at areas with the highest value by segmenting projects into three categories:

- case managed
- project gated, and
- output funded.

Funding may be on an individual project basis (as at present) or output-funded (i.e. on a block allocation basis). The levels of risk involved determine the appropriate segment. The accompanying diagram graphically illustrates the level of risk and attendant Transfund involvement in each project type. Following consultation with those authorities agreeing to participate in trialling the various initiatives, Transfund hopes to commence the trials by mid-March and looks forward to working with the roading sector to deliver on these initiatives — initiatives which will benefit RCAs, Transfund and, ultimately, road users.



To help manage the risk of making misplaced investments, Transfund plans to segment projects into three categories for funding evaluation purposes.

Financial assistance rates – policy review likely

The Transfund Board is planning to consider reviewing the policy for determining territorial authorities financial assistance rates (FAR) for road construction and maintenance work. The current FAR policy has been unchanged for some time, and some authorities believe it is time to re-examine the formula used.

The annual review of financial assistance base rates was completed in December, as per the current policy, with adjustments being made to the FAR percentages of some authorities for the 2001/02 financial year.

The present means of determining financial assistance rates is based on a formula which takes account of the net equalised land value (NELV) of each authority and the value of its annual road maintenance programme. Assistance rates range from 43 percent to around 75%.

Authorities receiving higher rates of assistance tend to be rural districts with a low NELV relative to their maintenance programme. Conversely, urban areas tend to receive a lower rate of assistance.

The timing and scope of any review of the FAR policy will be influenced by the Government s review of Land Transport Policy, the outcomes of which should be known shortly.

Contributing to the "information highway"

In addition to its primary role of funding New Zealand's transport infrastructure, Transfund also contributes to international roading know-how through membership of the World Road Association (still usually referred to by its original name of PIARC – the Permanent International Association of Road Congresses).

While most countries are individually represented on PIARC, Australia and New Zealand are jointly represented as members of Austroads, which appoints representatives with particular expertise to the various technical committees.

Transfund has two such appointed members. Ian Melsom is the New Zealand representative of Austroads on the C9: Economics & Finance committee, and Ian Appleton is the representative on the C13: Road Safety committee.

Their key areas of involvement are:

- Ian Melsom recently attended a meeting of the C9 committee in Cape Town and is currently team leader of the committee s subgroup dealing with Economics of Road Assets. The group is addressing four main topic areas as follows:
  - economic evaluation methods in member countries
  - economic benefits of information technology
  - valuing the road asset
  - economic evaluation of maintenance.
- Ian Appleton leads a C13 subgroup on Road Safety Audit, which among other things is currently planning to hold regional forums in South East Asia and Europe followed by a second International Road Safety Audit Forum. In October 1999 Ian presented a paper on road safety audit to the World Road Congress in Kuala Lumpur, and last year he attended C13 committee meetings in Paris, Brussels and Budapest.

In addition to the benefits of disseminating information on best business practice internationally, one of PIARC s strategic goals is to assist developing countries to improve their transport infrastructures. Transfund is pleased to be an integral part of this objective by sharing its expertise through membership of these technical committees.

Stakeholder surveys to be streamlined

Transfund is revising the way its annual stakeholder survey is conducted. This will reduce the time needed to answer the questionnaire – or, in some cases, to respond to telephone interviews.

The annual survey has to be done to satisfy the performance measures in Transfund s accountability documents, as well as identifying areas where Transfund could improve the way it operates. Since 1997 the form of survey has been comprehensive, covering most areas of Transfund s performance.

In response to feedback on the last two surveys Transfund has decided to change its approach. In future, for two successive years (commencing this year) Transfund will commission an abbreviated form of survey focussing only on its reporting requirements. These reporting requirements cover areas including satisfaction with Transfund s performance, quality of its advice and the effectiveness of its training and research programmes.

Every third year (i.e. from 2003) an expanded survey will be carried out to assess the wider aspects of Transfund s performance and satisfaction issues. This in-depth survey will coincide with the Independent Performance Review which is commissioned by the Minister of Transport.

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As well as saving up to 50% of time for respondents, the abbreviated surveys will result in worthwhile cost savings for Transfund. These savings could be even greater if asset managers were surveyed by email, a method rated positively in response to a question in the 2000 survey.

Stakeholder sample

The recent Minister s Performance Review also recommended that Transfund expand the stakeholder sample to include a wider cross-section of transport industry interest groups. This will be addressed by including a small number of key industry participants, in addition to the industry associations, in order to take account of the sometimes differing views of individual members.

In line with another suggestion from the reviewer, Transfund will in future report the results for road controlling authorities and regional councils separately from those for industry sector groups and government agencies. This will overcome the possibility that one set of results, particularly those from local authorities, could blur the results from the other. Transfund has different relationships with each of these stakeholder groups.

Talking Points

Transfund places a strong emphasis on consultations with industry stakeholders in all matters affecting its funding policies. Some of the policy initiatives on which we re currently consulting are:

Issue	Parties involved	Status/Timing	Transfund contact
Business practice improvements (arising from the Major Projects Review)	Transit, MoT, Business Practices Working Group, RCAs	Currently developing performance measures, best practice guidelines etc.	Pieter Burghout 04 495-3284
Trials of portfolio management, output funding/block allocations, case management.	Specific RCAs, RCs	Aiming to confirm trials mid-March for start in 2001/1002 year.	Pieter Burghout 04-495 3284
Patronage funding of passenger transport services	Regional councils	Working with councils to implement the scheme.	Bob Alkema 04 495-3260
Other passenger transport issues	Passenger Transport Advisory Group (PTAG)	Next bi-annual meeting early in 2001.	Glenn McGregor 04 495-3262
Review of benefit parameters used in Transfund s project evaluation procedures	RCAs, RC s, AA, Road Transport Forum, MoT	Bulletin on project released. E-mail service working. Information available on Transfund web site. Consultation committee has met twice.	Ian Melsom 04 495-3266
Cost sharing agreements for local road / State highway connection	Territorial authorities and Transit	Final policy due March 2001.	Murray Riley 04 495 3263
NRP maintenance allocations for 2001/2002	Territorial authorities and Transit	Regional managers currently negotiating with RCAs	Dave Macdonald 09 529-9936 Ian Hunter 04 495-7600 Neil Bennett 03 341-6012
Revised NRP Agreements (to be circulated shortly for comment)	RCAs, RCs, unitary authorities	Consultation with representative group. Final to all in April 2001	Gary Milne 04 495-3265

For Further Information

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Central PO Box 3228, Wellington; Ph 04 495 7600; Fax 04 495 7609

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transfund NEW ZEALAND ARATAKI AOTEAROA

TranSearch

A newsletter published by Transfund New Zealand

February 2001 Issue 42

Analysing New Zealanders' travel habits

Before construction, every potential roading project in New Zealand must undergo a cost-benefit analysis. For complex road network solutions it is often necessary to develop a transportation model to assist with the analysis. Data for such models are generally collected from sample Household Interview Surveys (HIS) which, because of the costs involved, are generally carried out every 10 to 20 years and only in the main centres.

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Photo: Christine Prebble

Editorial

Once again Transfund is calling for applications for research projects for our annual research programme. The deadline for proposals is 30 March. This year we are planning a number of changes, in order to simplify the administration of research for all those involved. Changes to the information required in proposals, and to reporting and invoicing, should go a long way towards streamlining procedures and reducing frustration for all parties. See page 3.

Obtaining copies of Transfund is also easier, via Standards New Zealand's website. See page 5.

In our last issue of TranSearch, we published what we intend to become a comprehensive directory of transport research organisations and individuals. The result of a survey undertaken by Transfund staff, the directory is intended to put researchers in touch with potential clients and other researchers for the good of the whole transportation industry. Since publication we have received details of further research organisations, which we publish on pages 6 - 8. If there are further researchers and organisations who wish to be included in the directory, please contact Ineke Brockie at Deloitte Touche Tohmatsu.

We intend to publish the complete list at least once a year.

Cost-benefit analysis for complex roading and passenger transport projects often requires the use of transportation models to forecast traffic patterns. In turn, these models often incorporate data collected from Household Interview Surveys (HIS). A project summarising all the HIS data collected over the last 30 years comes complete with a supporting CD ROM. See story this page.

Research aimed at improving the accuracy and consistency of recommended pavement design procedures for New Zealand pavements will lead ultimately to the revision of some design procedures for New Zealand pavements. Research carried out by Bartley Consultants for Transit New Zealand is summarised on page 4.

We are always interested in learning of successful applications of research that we have funded. A letter to the Editor comments on Wellington Regional Council's use of a methodology developed by Booz Allen and Hamilton for establishing reliable passenger transport trip matrices at reasonable cost.

Happy reading

Martin Gummer
Chief Executive
Transfund New Zealand

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YOUR VIEWS

TRANSEARCH welcomes letters from readers. Letters should be addressed to:

The Editor,
TRANSEARCH,
Transfund New Zealand,
PO Box 2331,Wellington.
www.transfund.govt.nz

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TranSearch

Transfund contact: **Gary Milne**

Editor: **Diana Moir**

TranSearch is published quarterly by Transfund New Zealand. Its purpose is to report the results of research funded through the Transfund New Zealand Research Programme, and to act as a forum for passing on national and international information to aid collaboration between all those involved – to stimulate enquiry, discussion and solutions concerning road, traffic, safety and land transport problems in New Zealand.

Contributed articles are welcome, and should be typed in double spacing and not exceed 1000 words. Illustrations may be either black and white or colour, and must be of high quality. *TranSearch* reserves the right to edit, abridge or decline any article.

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Transfund New Zealand, PO Box 2331,

Wellington, www.transfund.govt.nz

Phone: (04) 473 0220, fax: (04) 499 0733

How accurate a decision can be made for strategic roading projects involving millions of dollars from this data? Can information be extrapolated for areas outside the main centres? How much money should be spent on public transport? Is too little or too much money being spent?

Multi-modal traffic models are only now being developed in New Zealand to help answer these questions and the accuracy of the data used to calibrate these models is vitally important.

With such questions in mind, the Christchurch firm of Transportation and Transport Systems Ltd carried out a project between 1995 and 1997 to analyse HIS data over the last 30 years in order to build up a picture of the personal travel characteristics of New Zealanders.

"In collecting the data, we found that some of the HIS information had already been lost," the researchers say.

Of all the studies carried out, the 1978 National Urban Transport survey (NUTS) was the only one that specifically surveyed six cities at the one time. The others were carried out for transportation studies within a particular city.

Most of the studies recorded average weekday travel logs, but generally only for motorised vehicles. And while the NUTS 1978 survey recorded walk and cycle trips, it only did so if they were direct trips to and from work or school.

The Ministry of Transport carried out a broader survey in 1989/90, surveying a sample of households over the whole of New Zealand. It recorded two days of travel logs, where those days could be any day of the week and at any time of the year. It therefore included travel data on weekends and during public holidays.

"Once we had brought together all the existing household interview survey data, both in electronic form and as documents, that are still available in New Zealand, we loaded the data onto a database for analysis," the researchers say.

"We researched the number of trips per person and per household, and what mode of transport was used. We also looked at vehicle ownership rates and the number, purpose and duration of vehicle driver trips. And we compared trip rates both between cities and within cities over time."

Photo: Christine Preoble

A supporting CD-ROM was produced, containing all the collected survey data and original study documentation, which is available with the report on the project.

The researchers found that the present frequency of HIS data is not sufficient to ensure rigorous dissection of the information. At most only three years of data for a particular city was available.

"Our findings are more indicative than conclusive."

That said, the report suggests:

- Person trip rates vary only slightly between cities.
- Person trip rates vary only slightly over time.
- Vehicle driver trip rates vary slightly between cities and increase over time, as vehicle ownership increases.
- If public transport trip rates are low, vehicle driver trip rates are high.
- Vehicle passenger trip rates do not vary.

"For more accurate analysis in the future, we believe that home interview surveys need to be carried out more frequently, perhaps coinciding with census years at five-year intervals. Costs could also be minimised if the HIS surveys were incorporated into the census.

"We also suggest that guidelines should be produced to ensure a standardised format for data collection. However, that format would need to be flexible to allow the survey to evolve over time, reflecting changes in the country's transportation system and society."

Contact for more information: Mike Blyleven, phone 03-366-9871, Email: mike@gabites.co.nz

Transfund's 2001/2002 research programme

Applications are being sought for proposals to Transfund's 2001/2002 research programme. This annual programme funds proposals that contribute to making New Zealand's roading system safer and more efficient for road users.

The 2001/2002 programme begins on 19 February with the planned release of the 2001/2002 Request for Proposal (RFP). The closing date for applications is 30 March.

As with last year's programme, Transfund is particularly interested in receiving practical research proposals that have **written** end user support. Written support will be given greater weight than verbal support in the evaluation process, which takes place from 2 April until 22 June.

The RFP and our five-year research strategy will be available either from the Transfund website (www.transfund.govt.nz) or from our programme administrator, Ineke Brockie at Deloitte Touche Tohmatsu, PO Box 1900,Wellington, fax (04) 472 8023, email: ibrockie@dcloitte.co.nz.

Decisions on successful proposals for the 2001/2002 Research Programme will be released in June.

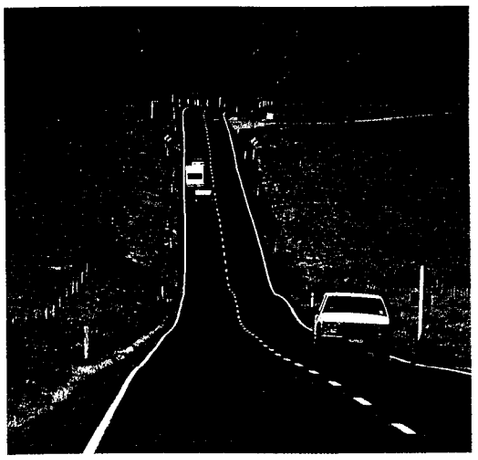

Photo: Christine Prebble

Streamlining the research process

Transfund plans a number of changes to the way its research programme is administered, in order to simplify processes and reduce administration time and costs both for researchers and programme administrators.

Reporting and invoicing

The first change to administration is the simplifying of reporting and invoicing. Currently researchers submit invoices monthly or on reaching a project milestone, with a retention of 20% being deducted from every invoice. Retentions are then invoiced on completion of the project.

In future — for those contracts awarded for 2001/02 onwards — researchers will be asked to invoice on the basis of completed milestones but no more frequently than monthly. The final invoice, on completion of the project, should be for no less than 10% of the total project value. This invoice will be paid when the project final report has been edited and sent for publishing, or within a withholding period of no more than three months from submission of the final report.

Reporting by researchers to Deloitte will be quarterly, instead of the present monthly frequency. However, any deviations from the project programme should be reported to Deloitte on a monthly basis.

Report editing delays, which have sometimes held up both the final payment to researchers and the publication of the edited report, are currently being tackled by Deloitte who plan to draw on a larger pool of editors.

Research proposals

For the 2002/03 Research Programme, Transfund is considering changing the way proposals for research are submitted and evaluated.

Transfund currently uses a single-stage request for proposal (RFP) process. This requires a full evaluation of a large number of proposals, each a substantial document typically up to 50 pages long, and including details of the proposed methodology for the research. Such proposals cost researchers a considerable amount to prepare.

There is also a risk of loss of intellectual property from unsuccessful proposals.

The change under consideration would mean that commencing with the 2002/03 Transfund Research Programme, a new two-stage RFP process would come into effect. In September 2001 Transfund will call for outline proposals, about three pages long, which describe the nature of the proposed research but do not include a detailed methodology. An estimated price would be included, so that the reviewers can select a number of outlines that in total approximate Transfund's new research budget for the coming year.

Three reviewers will be used for this process, as at present, and at the February 2002 meeting of the Research Strategy Group (RSG), around 30 to 40 outlines will be selected for invitation to progress to full proposals. The full proposals will be considered at the May RSG meeting, with about 25 of these likely to be selected as projects to commence in July 2002.

The cost of preparing the outlines and full proposals will be included in the final lump sum project price. The unsuccessful proposals will receive no contribution towards preparation costs.

Consultation with some researchers has indicated support for the proposed change, but to be sure of widespread support, we will be contacting researchers to obtain their views during March 2001.

All these measures should streamline processes, reduce administration costs for all parties, and reduce the frustration for researchers of preparing comprehensive proposals that may prove unsuccessful.

Pavement design - establishing procedures for New Zealand conditions

Pavement design has to take into account a number of factors such as materials, climate and traffic loading. Currently New Zealand follows AUSTROADS mechanistic pavement design procedures as presented in the publication, Pavement Design: A Guide to the Structural Design of Road Pavements (AUSTROADS 1992). The influences of uniquely New Zealand factors are described in a separate document entitled New Zealand Supplement to Pavement Design: A Guide to the Structural Design of Road Pavements (Transit New Zealand 1999).

A recent research project managed by Transit New Zealand has utilised traffic surveys and data analysis to improve the accuracy and consistency of the design traffic parameter of recommended pavement design procedures. The ultimate output of the project will be the revision of the Traffic Loading section of the New Zealand Supplement document.

Data analysis and reporting for this project was carried out by Bartley Consultants Ltd, and traffic surveys were undertaken by Traffic Design Group Ltd. Tasks included videotaping four of Transit New Zealand's Weigh-in Motion (WIM) sites around New Zealand and then relating the video images to the axle load records of heavy vehicles so that the damaging effect of trucks carrying various commodities could be determined.

" Vehicles passing four WIM sites - at Te Puke, Tokoroa, Waipara and Drury – were videotaped for periods of eight hours each," Ross Peploe of Bartley Consultants says.

"A timer on the video allowed the image of each heavy vehicle passing the WIM site to be matched against the axle loads and other data including the corresponding WIM record.

"We then calculated Load Factors and Traffic Distribution Factors to allow for the relationship between the damaging effect of axles and the performance of subgrade, asphalt and cement materials."

An Electronic Massing Unit (EMU) traffic survey carried out by the New Zealand Police provided supplementary data to the main WIM data. This involved stopping all heavy vehicles in order to weigh their axles and determine what they were carrying. The data obtained from this was significantly lower than that obtained from the WIM records, possibly influenced by the survey location, timing, or by heavily laden trucks avoiding the survey locale.

The next step was to transform eight-hour traffic surveys to equivalent 24-hour data and then to equivalent annual data. Screened, full year (1998) WIM data were available for the Te Puke and Tokoroa sites and these were used to establish daily and annual factors.

"The Te Puke data showed a relatively uniform daily factor, while the Tokoroa data were slightly more variable. Further investigations using WIM data from other sites would better establish the daily and yearly factors," Ross Peploe says.

Finally, eight procedures of incremental complexity were developed for establishing the design traffic parameter.

"At this stage, they are given as guidelines only."

The research has identified a number of issues that are worthy of further investigation, including:

- The 'No Load Description' category tends to dominate the commodity classifications because of the large number of heavy vehicles with covered sides and non-descriptive livery. Better identification of loads is required.
- The daily and annual factors calculated in the project are based on the only screened full-year WIM data available at the time. When further data is available, more analysis could be carried out to examine any local or yearly variation.
- The WIM equipment cannot identify super single tyres. Further studies to determine the distribution of heavy vehicles using super single tyres and their damaging effect would be beneficial.
- WIM equipment is located on state highways. A study to determine if the state highway traffic distribution is comparable to that for local roads would give more confidence in the general application of the WIM data.

Contact for more information:

Ross Peploe at Bartley Consultants Ltd, Auckland
ph: 09 486 4620, Email: bartcon@ihug.co.nz

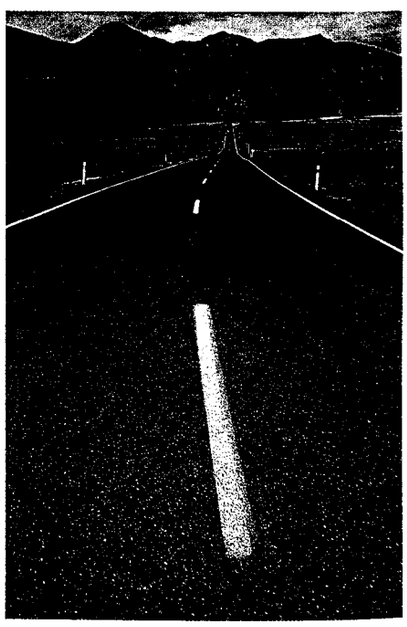

Photo: Christine Prebble

Letter to Editor

Estimating passenger transport trip matrices

I refer to your article, 'Effects of Improving Public Transport' (TranSearch issue 41 October 2000) concerning the innovative research carried out by Booz Allen and Hamilton Limited into the application of matrix estimation techniques for enhancing passenger transport trip matrices.

Good quality public transport trip matrices are invaluable for designing and evaluating passenger transport schemes. Unfortunately they are very costly to develop from survey techniques.

Strategic transportation models can estimate a passenger transport trip matrix. However strategic models are not well suited for these purposes. Strategic models are typically coarse and the passenger transport component of the mode-split model is usually based on a small part of the home interview data set.

The use of matrix estimation techniques provides an economical means of estimating passenger transport trip matrices. This technique has a well established history when applied to car trip matrices but little or no experience exists of this technique being applied to passenger transport trip matrices.

Booz Allen and Hamilton have successfully applied matrix estimation techniques to an old seed matrix, which they were able to update using available cordon data in Wellington. The results were very encouraging and found to be very consistent with independent data. This research has proved to be a very useful in establishing a methodology for providing reliable passenger transport trip matrices at reasonable cost.

Tony Brennand
Manager, Transport Policy
Wellington Regional Council

Photo: Christine Prebble

Calling research users

We are keen to publish news of successful uses of Transfund research projects. We are seeking feedback from consultants, end users such as road controlling authorities, or from researchers themselves.

If any reader is aware of the successful application of a particular Transfund funded research project, please contact:

Diana Moir,	Email: dd@clear.net.nz
TranSearch Editor	Phone: 04 473 7728
c/o PO Box 12181	Fax: 04 473 7729
Wellington	Mobile: 021 126 5738

Subject to agreement by the parties involved, articles concerning good applications of research could be published in future issues of TranSearch.

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Transfund directory of researchers
- additional entries

Since publishing our directory of research organisations and individuals in the last issue of TranSearch, we have been made aware of additional organisations and researchers who wish to be included. As we stated in the last issue, only those researchers who have submitted proposals to Transfund were sent notification of the directory's compilation. We are aware, however, that there are many more individuals and organisations not on Transfund's database who may have specialist research capabilities that should be listed in the directory. Relevant topics may range from transportation and roading issues to related areas such as environmental or social impacts.

We are keen to make our directory as complete as possible and to publish it at least once a year in TranSearch. For those who did not receive our questionnaire, or if you have not yet returned it, please contact Ineke Brockie at Deloitte Touche Tohmatsu on 04 470 3632 or email ibrockie@deloitte.co.nz.

We are pleased to add the following additional organisations to the list.

Business and Economic Research Ltd (BERL)

PO Box 10 277
Wellington

Phone: 04 470 5550
Fax: 04 473 3276

Contact: Grant Andrews,
Executive Director
Email: innovate@berl.co.nz

BERL is an economics consultancy which undertakes applied regional analysis, including regional economic projections (e.g. for transport demand forecasting), regional development strategies, project assessment, and analysis of regional transport policy.

Constantine Planners Ltd

43 Princes Street
Dunedin

PO Box 555
Dunedin

Phone: 03 477 4202
Fax: 03 474 0547

Contact: Peter Constantine
Email:
constantine.planners@clear.net.nz

Peter Constantine

Peter is a planner with expertise in the assessment of environmental effects surrounding the operation of transportation systems. He is particularly interested in integrated strategic planning in urban areas.

Denise Anderson

Denise is a traffic and planning engineer providing research and consulting work including traffic effects and resource management assessments, traffic safety and auditing, integrated management of roads and the environment.

Energy Efficiency and Conservation Authority

22 The Terrace
Wellington

PO Box 388
Wellington

Phone: 04 470 2200
Fax: 04 499 5330

Contact: Dr Harbans S Aulakh
Email:
Harbans.Aulakh@eeca.govt.nz

The Energy Efficiency and Conservation Authority (EECA), a Crown Entity, researches and reports on transport sector energy efficiency issues, including how energy is used, how that use is changing and what factors are driving the change.

To date, EECA has researched the following areas of New Zealand's transport sector:

- Energy using characteristics of the transport sector.
- Energy use and energy intensity patterns and trends.
- Passenger and freight transport growth and their energy use trends.
- Key factors influencing passenger and freight transport energy intensities.
- Energy efficiency opportunities and measures.

Industrial Research Ltd

Gracefield Road
Lower Hutt

PO Box 31 310
Lower Hutt

Phone: 04 569 0671
Fax: 04 569 0142

Contact: Dr Neil Milestone
Email: n.milestone@irl.cri.nz

Dr Neil Milestone

The Applied Inorganic Team undertakes a range of activities associated with cement and concrete technology. These include water, soil, concrete and aggregate interactions. Current research is studying road stabilisation.

Ross Fletcher

The Team has many years' experience in determining materials properties. A wide range of characterisation techniques is available to ensure the right materials are being used.

LB Dowling & Associates Pty Ltd

28 Wrightson Avenue
Newcastle
NSW 2300
AUSTRALIA

Phone: 0061 2 4926 5194
Fax: 0061 2 4929 7651

Contact: Laurie B Dowling
Email: lbdowli@attglobal.net

Laurie Dowling's focus covers research, practice and training in road network asset management, valuation, route strategies, public consultation, road user costs, transport and land use planning, contracts, and traffic safety.

Linclab Ltd

Linclab Technology Services
Building
Springs Road
Lincoln
Canterbury

Private Bag 4749
Christchurch

Phone: 03 325 3027
Fax: 03 325 3028

Contact: Dr Bob Wynn-Williams
Email: info@linclab.co.nz

Linclab draws on the skills and experience of 150 engineers and scientists. Skills and experience relevant to Transfund include: image analysis, use of photogrammetry to measure wear and surface roughness, geotextile modeling, modeling and manufacture of windbreaks, recovery and reuse of materials, site remediation, filtering hydrocarbons from aqueous mixes, luminescence, near infrared reflectance applications, waste management, alternative fuels.

McDermott Miller Limited

Level 3
64 Dixon Street
Wellington

PO Box 629
Wellington

Phone: 04 384 6280
Fax: 04 385 0535

Contact: Richard Miller
Email:
strategies@mcdermottmiller.co.nz

McDermott Miller is an independent, Wellington based strategic planning consultancy with extensive experience in transport research. Its research capabilities are:

- Market survey design, analysis and modelling, specialising in Stated Preference surveys to build models which simulate and value user demand for transport options. Other techniques include perceptual mapping to measure consumer attitudes to competing transport services.
- Surveying. Market, business-to-business and social surveys using our own trained interviewers and CATI/CAPI systems.
- Economic and Financial Evaluation of transport projects and strategies.

Examples include: Stated Preference surveys of regional residents' willingness to pay for early construction of the Transmission Gully Road; perceived social benefits of transport in the Wellington region; and, motorists perceptions of the benefits of sealing unsealed roads in New Zealand.

Clients include: Regional and District Councils, Transit NZ, TranzRail and Transfund NZ.

Meritec Limited *(The new name for Worley Consultants Ltd)*

47 George Street
Newmarket
Auckland

PO Box 4241
Auckland

Phone: 09 379 1200
Fax: 09 379 1471

Contact: Andrzej (Andre) Tomecki
Email: andre.tomecki@meritec.org

Andrzej (Andre) Tomecki

André has over 15 years' experience in traffic and transportation research, including 11 years managing transportation research programme for the NITRR in South Africa. He is currently a Specialist Consultant at Meritec.

Don Munro

Don Munro is a transportation engineer with over 20 years' transportation experience, including the practical application of research in traffic engineering. Currently he is a Specialist Consultant at Meritec.

Notices

2001 ITE Spring Conference: Improving Transportation Performance and Productivity

Monterey, California

USA

25 - 28 March 2001

Organized by Institute of Transportation Engineers (ITE)

Commuter Rail Conference

Seattle, Washington

USA

1 - 4 April 2001

Organized by American Public Transportation Association (APTA)

Contact: Fran Hooper

American Public Transportation Association

1201 New York Avenue, N.W. Washington, DC 20005, USA.

Phone: +1-202-898-4076

Email: info@apta.com

Website: www.apta.com/meetings

2001 IES-CTR International Symposium on Advanced Mass Transit Systems

SINGAPORE

26 - 27 April 2001

Organized by Institute of Engineers, Singapore

Contact: Interfama Brooks Exhibitions

Singapore Office, 1 Maritime Square, #09-07, World Trade Centre, Singapore 099253.

Phone: +65-276-6933

Fax: +65-276-6811

Email: info@interfama.com.sg

Itesafety Quad Conference

Vancouver, B.C.

CANADA

3 – 5 May 2001

Joint conference organised by the BC, Washington and Oregon Sections of ITE.

See Conference web page at www.islandnet.com/ITE_BC/Conf2001

Home page www.islandnet.com/ITE_BC

Papers sought for conference

Bus and Paratransit Conference

Calgary

CANADA

5 - 10 May 2001

Organized by American Public Transportation Association (APTA)

Contact: Jerry Trotter

American Public Transportation Association

1201 New York Avenue, N.W. Washington, DC 20005, USA

Phone: +1-202-898-4087

Email: info@apta.com

Website: www.apta.com/meetings

Eighth International Road Conference: Roads and Bridges in Europe

Budapest

HUNGARY

21 - 23 May 2001

Contact: Secretary of the Conference

CONGRESS Rendezvenyszervezo Kft.

H-1026 Budapest, Szilagyi Erzsebet fasor 79, Hungary

Phone: +36-1-212-0056

Email: congress@congress.hu

First World Conference on Urban Road Tunnels

Paris

FRANCE

14 - 15 June 2001

Organized by International Road Federation (IRF)

Contact: Colloquium/WCUR, 12, rue de La Croix-Faubin, 75557 Paris cedex 11, France

Phone: +33-1-44-64-15-15

Fax: +33-1-44-64-15-16

Email: p.fournier@colloquium.fr

Website: www.irfparis2001.com

Moving through the Millennium: 8th International Conference on Automated People Movers

San Francisco, California

USA

7 - 11 July 2001

Organized by American Society of Civil Engineers (ASCE)

Contact: ASCE - World Headquarters

1801 Alexander Bell Drive, Reston, Virginia 20191-4400, USA

Phone: +1-703-295-6300

Fax: +1-703-295-6144

Website: www.asce.org/conference/apm8

International Symposium on Transportation Technology Transfer

St Petersburg, Florida

USA

29 July - 2 August 2001

Organized by United States Federal Highway Administration (FHWA)

Contact: 2001 International Symposium

Office of International Programs, Federal Highway Administration

400 Seventh Street, SW, Suite 3325, Washington DC 20590 USA

Phone: +1-202-366-9636

Fax: +1-202-366-9626

Email: 2001symposim@fhwa.dot.gov

Website: www.international.fhwa.dot.gov

Fifth International Conference on Managing Pavements

Seattle, Washington

USA

11 August - 14 August 2001

Organized by Washington Department of Transportation

Contact: Conference Secretariat, Engineering Professional Programs, University of Washington

13030 Meridian Avenue North #301, Seattle, WA 98133-9482, USA.

Phone: +1-206-543-5539

Fax: +1-206-543-2352

Email: pavements@engr.washington.edu

Website: www.engr.washington.edu/epp/pavements

IATR Quebec 2001 Conference: International Conference on the Regulation of Transport Services

Quebec City

CANADA

9 - 12 September 2001

Organized by International Association of Transportation Regulators (IATR)

Contact: IATR Quebec 2001 Transports Quebec

700, boulevard Rene-Levesque Est, 24ieme etage, Quebec (Quebec), Canada, G1R SH1

Phone: +1-514-864-1637

Fax: +1-514-873-0435

Email: iatr@mtq-gouv.qc.ca

Website: www.mtq-gouv.qc.ca/iatr2001

3rd International Conference on Arch Bridges

Paris

FRANCE

19 - 21 September 2001

Contact: Conference Secretariat: Mrs. Francoise Bourgain, Service des Colloques, ENPC

28 Rue des Saints-Peres, F - 75343 Paris Cedex 07, France

Phone: +33-1-44-58-28-22

Fax: +33-1-44-58-28-30

Email: bourgain@mail.enpc.fr

IPC-11: 11th International Pacific Conference on Automotive Engineering: Motor Vehicles for the 21st Century

Shanghai

CHINA

6 - 9 November 2001

Organized by Society of Automotive Engineers of China (SAE China

Contact: Secretariat, IPC-11, Society of Automotive Engineers of China

46 Fucheng Road, Beijing 100036, P.R. China

Phone: +86-10-88127156

Fax: +86-10-88127156

Email: office@sae-china.org

FISITA 2002: 29th World Automotive Congress

Helsinki

FINLAND

2 - 7 June 2002

Organized by FISITA

Contact: FISITA 2002 c/o CongCreator CC Ltd

PO Box 762, FIN-00101 Helsinki, Finland

Phone: +358-9-4542-190

Fax: +358-9-4542-1930

Email: fisita2002@congcreator.com

Website: www.fisita2002.com

Abstracts due 31 May 2001

International Congress: Challenges of Concrete Construction

Dundee

SCOTLAND

5 - 11 September 2002

Organized by University of Dundee, Concrete Technology Unit

Contact: Professor R.K. Dhir, Director, Concrete Technology Unit

University of Dundee, Dundee DD1 4HN, Scotland, United Kingdom

Phone: +44-1382-344-347

Fax: +44-1382-345-524

Email: r.k.dhir@dundee.ac.uk.

Website: www.dundee.ac.uk/civileng/ctucongress/welcome.htm

New Transfund research publications

Prices include postage, handling and GST

The following reports (166 – 174) summarise research carried out in 1998-1999, as part of Stage 2 of the Short Term Health Monitoring and 'Fitness for Purpose' Assessment of 10 bridges on New Zealand highways, in order to develop and evaluate bridge health monitoring methodology.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Bealey (Waimakariri) Bridge, Canterbury

Transfund New Zealand Research Report No 166

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $25.00

The report evaluates the Bealey Bridge on State Highway 73, selected because it is an ageing single-lane reinforced concrete bridge with a concrete deck, and has a low conventional strength rating (65%).

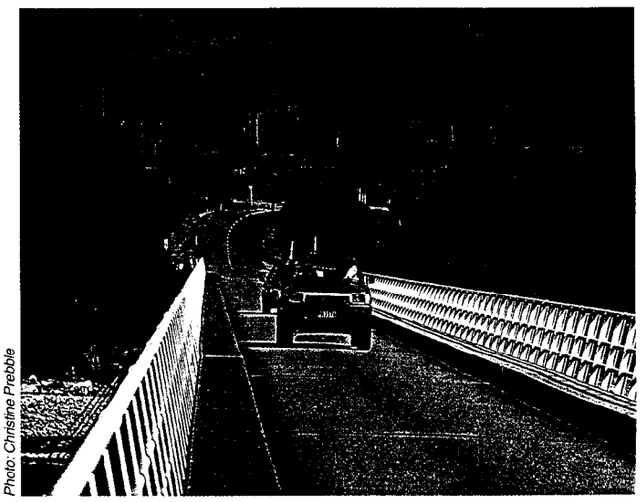

Photo: Christine Prebble

Health Monitoring of Superstructures of New Zealand Road Bridges:

Rakaia Bridge, Canterbury

Transfund New Zealand Research Report No 167

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $30.00

The Rakaia Bridge, on State Highway 1 S, is typical of a significant proportion of New Zealand's bridge infrastructure. It is a major asset to New Zealand's transport system because of its length (1757 metres) and the fact that it is the main crossing of this wide braided river.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Waipara Bridge, Canterbury

Transfund New Zealand Research Report No 168

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $30.00

This bridge is typical of a large population of prestressed concrete bridges in New Zealand.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Otauru Bridge, Manawatu

Transfund New Zealand Research Report No 169

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $30.00

This bridge was selected for evaluation because it has a large crack at midspan, and the structure is visibly deflecting under traffic. The Fitness for Purpose Evaluation indicates that intervention is required.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Waipawa Bridge, Hawke's Bay

Transfund New Zealand Research Report No 170

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $35.00

Although this bridge has a steel girder structure with spans that are longer than usual for this type of bridge and relatively wide girder spacing, the Fitness for Purpose Evaluation derived from ambient heavy vehicle traffic suggests that the bridge is performing better than the theoretical evaluation suggests. Reasons for this are discussed in the report.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Waitangi Washout Bridge, Hawke's Bay

Transfund New Zealand Research Report No 171

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Infratech Systems & Services Pty Ltd, Brisbane

Cost: $25.00

This bridge is an old (built in 1935) two-lane, three-girder reinforced concrete structure with a low conventional strength rating. Health Monitoring results show that bridge performs substantially better, with more capacity than required, than the theoretical evaluations predict.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Wanganui Bridge, Wanganui

Transfund New Zealand Research Report No 172

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Cost: $25.00

This bridge on State Highway 4 crosses the Wanganui Bridge near Taumarunui. Although it has low conventional strength evaluation, and the spans are relatively long, it is a significant transport infrastructure asset and is representative of a large population of prestressed concrete bridges in New Zealand.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Atiamuri Bridge, Waikato

Transfund New Zealand Research Report No 173

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Cost: $35.00

This bridge was selected for evaluation because it has a relatively unique form of construction, with a steel-concrete composite deck system, and a history of load-induced problems.

Health Monitoring of Superstructures of New Zealand Road Bridges:

Tuakopai Bridge, Bay of Plenty

Transfund New Zealand Research Report No 174

R.P. Andersen, W.S. Roberts, R.J. Heywood, T.J. Heldt

Cost: $30.00

This bridge is typical of many New Zealand bridges built between the early 1930s and late 1940s. The removal of the original reinforced concrete guardrails has decreased the stiffness of the structure.

Riprap Protection of Bridge Abutments

Transfund New Zealand Research Report No 181

Auckland Uniservices Ltd, University of Auckland

Cost: $30.00

Describes experiments conducted with a spill-through abutment under both clear-water and live bed conditions in a laboratory flume, varying the riprap size and apron size. The data are compiled graphically with dimensionless variables representing riprap size and apron extent on the axes. A useful relationship was found, with a clear zone of partial failure. See article in Transearch Issue 41.

Endurazyme Trials on Unsealed Roads in Tararua District, New Zealand

Transfund New Zealand Research Report No.182

M Darnell, W Stewart
Opus International Consultants, Palmerston North

K Hudson
Duffill Watts & Tse Ltd, Wellington

T Bennett
Tararua Consultancy, Dannevirke

Cost: $25.00

An investigation of the use by Tararua District Council of the proprietary bioenzyme stabiliser, Endurazyme #388 to allow greater use of marginal in-situ pavement materials as a way to reduce the cost of maintaining unsealed roads. Field trials began in December 1995 and were terminated in December 1996 for safety reasons, two and a half years earlier than planned. It was not possible to conclude whether the addition of Endurazyme #338 had any significant effect on reducing potholes, corrugations or reducing pavement wear, although it did reduce dust for a short period.

Personal Travel Characteristics of New Zealanders

Transfund New Zealand Research Report No. 183

Transportation & Traffic Systems Ltd, Christchurch

Cost: $25.00

See article this issue

Obtaining research publications

Research publications of Transfund New Zealand, Transit New Zealand and the former National Roads Board can be obtained from:

Standards New Zealand
Private Bag 2439
Wellington
Phone: 0064 4 498 5991
Fax: 0064 4 498 5994
Email: snz@standards.co.nz

Order direct from www.standards.co.nz

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Transfund New Zealand
PO Box 2331, Wellington

Deadline for next issue

Copy for the next issue of TRANSEARCH must be in the Editor's hands by 31 March 2001.

Valuation of Public Transport Attributes

Transfund New Zealand Research Report No. 184

Booz. Allen & Hamilton (New Zealand) Ltd

Cost: $25.00

This report reviews international evidence on user valuations of individual components of public transport journeys, for use in evaluating user benefits of public transport improvement projects. See article in Transearch Issue 41.

Methods to Establish Design Traffic Loading

Transfund New Zealand Research Report No. 185

Bartley Consultants Ltd, Auckland

Cost: $45.00

See article this issue

Performance of Deck Expansion Joints in New Zealand Road Bridges

Transfund New Zealand Research Report No. 186

S.M. Bruce & D.K. Kirkcaldie

Opus International Consultants, Wellington

Cost: $25.00

Deterioration of deck joints has been identified as the most common maintenance problem for New Zealand bridges. This report assesses the suitability of use and application of deck joints in New Zealand in comparison to current international best practice and makes a number of recommendations.

Thin Bituminous Surfacings for Stabilised Pavements

Transfund New Zealand Research Report No. 188

G Foley

ARRB Transport Research Ltd

Cost: $20.00

Presents a review of the use of thin surfacings over bound pavement layers and develops a test protocol for future research, based on field evaluations of in-service trial pavements.

Probabilistic Techniques for Optimising Cut Slope Earthworks

Transfund New Zealand Research Report No. 189

Riddolls & Grocott Ltd, Christchurch

Cost: $45.00

Describes a methodology developed to identify cost-optimal earthworks cut slope design and the establishment of appropriate earthworks contingency factors using probabilistic techniques.

Photo: Christine Prebble

For Futher Information

Transfund New Zealand
PO Box 2331
Wellington
www.transfund.govt.nz
ISSN 1170-7321

TranSafe

A safety newsletter published by Transfund New Zealand

December 2000 Issue 4

CONTENTS

Curve warning signage needs attention

From recent Transfund safety audits it is obvious that a lot of confusion exists as to which situations warrant the erection of curve warning signs, advisory speeds, chevron boards and single chevron curve indicators.

These problems may also be arising because road controlling authorities or their consultants are just dealing with particular issues, rather than reviewing the need for curve warning signage on a "whole of route" basis. Common problems include:

- poor application or lack of curve warning signage
- incorrect location of curve warning signage
- inconsistent sign standards.

Transit New Zealand's Manual of Traffic Signs and Markings (MOTSAM) provides guidelines for the correct installation and location of curve warning signage. The requirements for curve warning signage are as follows:

- Curve warning signs should be erected in advance of curves that are deceptive, not obvious to approaching drivers and constitute a hazard.
- Advisory speed signs are supplementary to curve warning signs.

An unusual and potentially confusing array of signs approaching a moderate curve.

This curve warning sign is too close to the curve to provide effective advanced warning.

Curve warning and advisory speed sign requirements are determined using Table A3.1 in MOTSAM Part I.

Chevron boards should be erected on curves:

- where advisory speed signage is erected on the approaches and speeds through the curve are consistently greater than the posted advisory speed
- where a significant accident problem exists
- where a lack of backdrop means it is difficult for the motorist to distinguish that the road does not continue straight ahead
- having a curve advisory speed of 15 km/h or where oversize (1200 x 1200mm) signs are warranted.

Chevron boards should only be used where curve warning signage is also erected. They should always be erected in the driver's line of sight, and if preceded by advisory speed signs

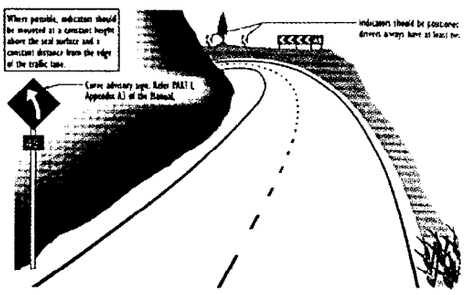
continued on following page

While the findings of Transfund's own audits provide much valuable material for topics in TranSafe, we are also indebted to experts in various fields for agreeing to contribute articles that we believe are worthy of wide dissemination. In this issue we publish two such items – one on the safety aspects of street lighting, and another on issues of intersection design that can adversely affect the safety of cyclists. The article on curve warning signs results directly from Transfund's own audit observations.

continued from previous page

should have an advisory speed value board attached.

Single chevron curve indicators are used to supplement chevron boards. They should be erected on curves with high deflection angles where additional delineation is required throughout the curve. The curve indicators should be erected on the outside of the curve and at spacings such that drivers will always have two indicators in view (see diagram).



Curve warning signage and delineation should be investigated and planned on a "whole of route" basis in order to ensure that road users get consistent guidance.

Road safety benefits of road lighting

This article was specially prepared for TranSafe by Mike Jackett, New Zealand's representative on the LG2 Standards Committee (Road Lighting)

Do those lights on poles above our roads really make life safer for those of us below? Both international and New Zealand research suggest they do.

Accident reduction

In the 1980s the international body on road lighting, the Commission Internationale de L'Eclairage (CIE), commissioned a study to review international research on the safety benefits of good road lighting.

In all, they reviewed some 62 "before and after" studies from 15 countries. Most studies showed night accident reductions ranging from just a few percent up to 75% after lighting was installed. The authors suggested that a 30% reduction in night accidents was a realistic expectation for well designed lighting installations.

So internationally it has been shown there are accident savings – but what about New Zealand? New Zealand road lighting standards are not as demanding as many European standards. Does New Zealand road lighting also reduce accidents by 30%?

Fortunately the Land Transport Safety Authority maintained a New Zealand wide database of remedial works carried out in Accident Investigation Studies. In the late 1990s the database included 230 sites where road lighting was installed or upgraded. In addition there were over 1,000 sites in the database where no road lighting had been installed. These sites can be used as a control to account for reductions in night accidents that were due to other factors, such as reduced drink driving.

The results of the New Zealand study[1] show an overall 34% reduction in night injury accidents where road lighting was installed, compared to sites without road lighting. Further breakdowns show an average 30% reduction where a full route was lit and a 41% reduction where improvements were made to intersection lighting.

Of some interest was the similarity in accident reduction between improvements to existing lighting (33%) and new lighting installations (38%). This begs the question, "how effective is some of our existing, ageing road lighting?"

Maintenance essential

Not surprisingly, the output from road lighting degrades over time. The lamps emit less light and the optics and reflectors become coated with dust. Unless this is addressed with a maintenance regime, the once-effective road lighting installation may become little more than a decorative feature, useful for seagulls and pedestrians but contributing little to road safety.

The road lighting designer will take lighting degradation into account by applying a maintenance factor (normally 70%). This allows for normal lumen depreciation over say a three or four year period, at which point lamps may need changing and fittings need cleaning. If no maintenance is carried out, then the lamps may continue to burn but with ever decreasing light output. (The author has measured sites where light output had dropped to just 30% of the standard.)

Clearly therefore, upgrading some of these poorly performing installations should give similar accident reductions to installing new ones.

Standards

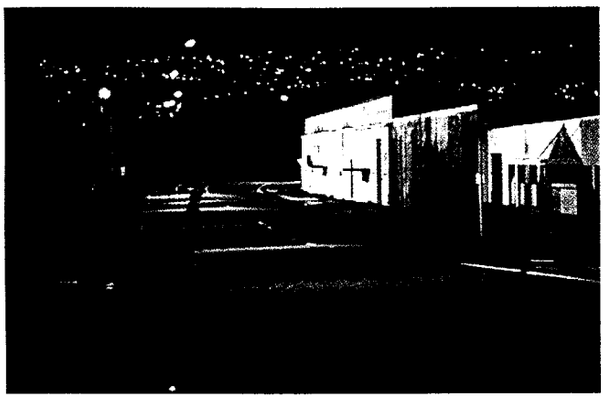
The new joint New Zealand / Australia Road Lighting Standard (AS/NZS 1158) recognises the different visual needs of pedestrians and motorists and provides a category of lighting for each – P for Pedestrian, V for Vehicular traffic. Category V lighting is a much higher standard than category P lighting, recognising that motorists travel at around ten times the speed of pedestrians and need to process visual information more quickly.

The standards for Category V lighting specify minimum criteria on eight light technical parameters. If the lighting

installation fails on any one of these it may not be delivering the level of safety intended.

What is a well lit road? ***(Light technical parameters)***

1. A well lit road will have a bright road surface *(average luminance).*



Non-compliant lighting, where a lack of uniformity in surface brightness confuses the silhouette of the pedestrian.

2 & 3. The surface brightness will also be uniform both down the lane that you are driving *(longitudinal uniformity)* and across the whole width of the carriageway *(overall uniformity).*

4. Well designed lighting controls glare so that the overall visual result remains positive. The down side of any road lighting is that light from the luminaires ahead may cause disability glare *(threshold increment).*

5. While the primary objective of category V lighting is to light the road surface, the road surrounds also need some illumination *(surround illuminance)*. This ensures that drivers are not faced with a canyon-like road with no visibility beyond the immediate carriageway.

6. Light pollution is controlled by ensuring that no more than 6% of light from the luminaire is emitted above the horizontal *(upward waste light ratio).*

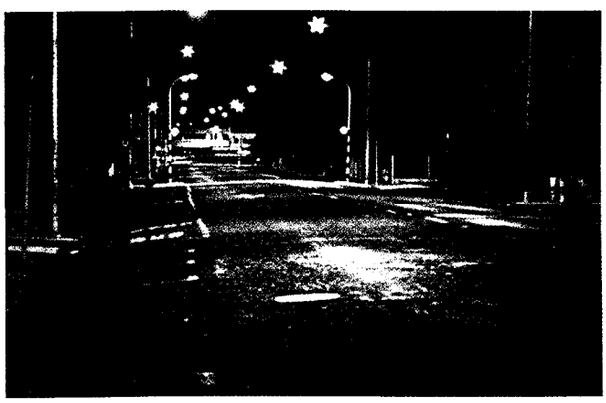
7 & 8. To complete the criteria for a well lit road, the illumination at intersections should be both adequate *(minimum illuminance)* and uniform *(illuminance uniformity).*

RCAs take note

Next time you drive at night check out the quantity and quality of road lighting on your route. When both are present and the above parameters are met, then driving conditions really are safer for road users.

Transfund New Zealand recommends the use of New Zealand / Australia Road Lighting Standard AS/NZS 1158 by roading authorities, and also urges them to ensure that a regular maintenance schedule is in place.

(1) "Accident Savings from Road Lighting in New Zealand", M.J.Jackett (Proceedings, Roads 96 Conference, Part 5).



Standards-compliant lighting, both in quantity and quality.

Don't forget the cyclist

The following article was contributed by Kerry Wood, an engineer specialising in sustainable resources

A recent study of cycle crashes[1] in New Zealand audited nine junctions improved by the local authority on safety grounds, and found that six of them had been made worse for cyclists. Three were much worse. The study also drew on overseas evidence and estimated that cyclists' fatal injury risk in the Netherlands – a very cycle-conscious country – is only about 15% of the New Zealand risk, despite our use of helmets.

The local study compared the junctions' old and new layouts, looking at all possible paths for cyclists, and giving a score to each: 1 = definitely worse, 2 = probably worse and so on, through to 5 = definitely better. The basis used for assessment was design information from Australian, Dutch and UK (Sustrans) codes, and data on some 800 fatal and serious injury New Zealand crashes. Average scores ranged from 1.3 (average definitely worse), to 3.9 (average probably better). Problems found in the audit included:

- A free left turn, leaving nowhere for a cyclist who was not turning to go. (A short length of cycle lane would have been enough.)
- Approach lanes too narrow for a motor vehicle to safely overtake a cyclist, but not narrow enough to stop drivers trying. (A recommended minimum width for a kerbside lane used by cyclists is 4.2 m.)
- Bollards placed where a cyclist could be crushed between them and a turning vehicle.

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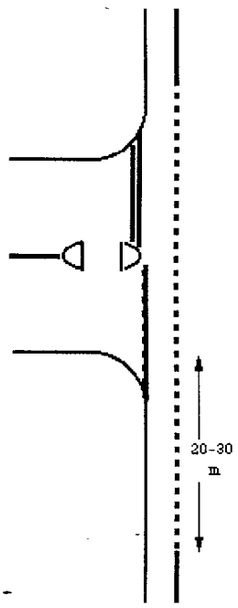
The worst problems were at two junctions where mini-roundabouts replaced Give Way control. In New Zealand, cyclists account for only about 1% of vehicle kilometres, but at roundabouts they suffer 11% of fatalities and 22% of serious injuries. Their risk is actually worse than this, because of cyclists avoiding roundabouts where possible, and under-reporting. Serious injury risks may be 50 – 100 times as great as for other road users. Helpful measures for the safety of cyclists include:

- Avoid installing roundabouts where possible; traffic signals or a four-way stop are good alternatives[2].
- Use small, single lane roundabouts with splitter islands and plenty of deflection, to keep traffic speeds down. The Dutch manual recommends a road width of no more than 5 m on the roundabout, with a maximum core diameter of 25 m. If necessary large trucks can be allowed to go over a collar forming the outer part of the core, but it must be arranged so that the collar is clearly visible and too high to be crossed at speed.
- Provide a separate route for cyclists. Underpasses need to be socially safe, with generous width, good lighting and alignment so that a rider can see right through before entering.
- Provide a cycle track or a shared cycle/pedestrian path around the outside of multi-lane roundabouts. This approach is undesirable because of delays to cyclists.

At junctions, standard New Zealand practice is to end a cycle lane, removing the protection of the lane where it is most needed: 72% of serious injury crashes are at junctions, including 16% at driveways.

Cycle lanes should continue through a junction whenever a cyclist can go through with right of way, including signalised intersections. The sketch shows a cycle lane crossing of a minor road, with continuous markings – which need to be distinct from lane or edge lines – and a highlighted surface (green or red)[3] for the crossing and the last 30 m of approach.

Cycle lane crossing minor road intersection.



[1] Wood, K (1999): Bicycle Crashes in NZ. Wellington: ISBN 0 473 05791 3

[2] Editor's note: In many instances, of course, roundabouts greatly increase road safety, though as the author suggests, not always for cyclists.

[3] The industry has recently chosen green for cycle lanes.

Transfund joins NRSC

Transfund chief executive Martin Gummer has accepted a recent invitation to join the National Road Safety Committee (NRSC). The committee is the principal inter-agency forum for agreeing top level strategy between member agencies on matters relating to road safety.

Other members of the NRSC are the Secretary for Transport, the Commissioner of Police, the Director of the Land Transport Safety Authority, and the chief executives of Transit New Zealand, the Accident Compensation Corporation and Local Government New Zealand.

Transfund provides substantial funding for road safety improvement through all its main funding activities, and has an interest in ensuring that proposed strategies are an efficient and effective use of road user funds.

Safety Audit Workshops

Transfund is keen to collect industry feedback on the use of audit procedures and methods at roadwork sites, including the use of its own Interim Procedures (RA 98/689S), published in February 1999. It is seeking expressions of interest from industry members wishing to attend one of the half-day workshops on Procedures for Safety Audit of Traffic Control at Roadwork Sites, being conducted on its behalf by the New Zealand Institute of Highway Technology.

Five workshops are planned during March 2001 in Auckland, Hamilton, Wellington, Christchurch and Dunedin. Those attending will be asked for their experiences in using the Transfund Interim Safety Audit Procedures, or any alternative forms or procedures. To register your interest, contact either Lynette Walsh or Tony Tough at the NZIHT, ph 06 759-7065, email admin@nziht.co.nz

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