

TECHNICAL NOTE

TRANSPORTATION RESEARCH BOARD (TRB)
ANNUAL MEETING 2009 & 2010 – CONFERENCE HIGHLIGHTS

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ABSTRACT

The TRB Annual Meeting is a large conference held each January in Washington DC. The programme covers all transportation modes and attracts policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academia. The Meeting draws attendees from throughout the United States and from 65 countries, and is probably the single largest annual gathering of transportation practitioners and researchers in the world with over 10,000 attendees. Each year there are over 3,000 presentations (including poster displays), almost 600 technical sessions and workshops and 200 committee and task force meetings.

The authors are all TRB Committee members and regular recent attendees at this conference. This "conference highlights" technical note will include an outline of the Meeting, what topics are covered and why it is important that more New Zealand transport professionals should go to this conference (even though it is in the middle of the harsh USA winter!) or at least pay attention to the conference outcomes. It will include updates on recent developments in the Highway Capacity Manual for the 2010 edition, an outline of the first edition of the Highway Safety Manual soon to be released as well as updates on other programmes and initiatives, and guidance on how to "survive" a TRB Annual Meeting.

INTRODUCTION

The TRB Annual Meeting is a large conference held each January in Washington DC. The programme covers all transportation modes and attracts policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academia. The Meeting draws attendees from throughout the United States and from 65 countries, and is probably the single largest annual gathering of transportation practitioners and researchers in the world with over 10,000 attendees. Each year there are over 3,000 presentations (including poster displays), almost 600 technical sessions and workshops and 200 Committee and Task Force meetings.

Bruce Robinson has been a regular attendee at this annual meeting and other mid-year TRB conferences and seminars for over 15 years. He is a member of the "Highway Capacity and Quality of Service" Committee, as well as the Roundabouts Committee and the "Highway Safety Manual" Task Force. Glen Koorey and Shane Turner first attended in 2007 and returned in 2009. This year Bruce and Glen attended the 2010 Meeting. Glen is now a member of the Bicycle Transportation Committee and Shane a member of the "Safety Data, Analysis and Evaluation" Committee.

As well as the three authors, a handful of other "Kiwis" have also attended in recent times, including other Auckland and Canterbury University researchers, Peter McCombs (TDG) and Martin Leak (Resolve Group). It is our contention however that more New Zealand practitioners should take the opportunity to attend and participate in future TRB meetings, including NZTA staff. This will serve to raise awareness of international best practice and development in the state of the science, as the conference has become a showcase for the work of many countries. Within the TRB Committee process, there is also the opportunity to influence one of the most significant transport research programmes in the world.

This technical note will outline briefly what topics are covered at the Meeting and why it is important that more New Zealand transport professionals should go to this conference (even though it is in the middle of the harsh USA winter!) or at least pay attention to the conference outcomes (e.g. obtain a copy of the Proceedings). It will also include updates on recent developments on some important documents, programmes and initiatives initiated by TRB, and some guidance on how to "survive" a TRB Annual Meeting.

ABOUT THE TRB

Although the TRB interacts significantly with the US Federal Highway Administration (FHWA), other federal agencies and state Departments of Transportation (DoTs), it isn't a government organisation. TRB is one of six major divisions of the National Research Council (NRC), which serves as an *independent* adviser to the federal government and others on scientific and technical questions of national importance. The NRC is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board is *"to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal"*.

Each year, TRB's varied activities engage more than 7,000 engineers, scientists, and other transportation researchers and practitioners from the public and private sectors and academia, all of whom contribute their expertise in the public interest by participating on TRB Committees, Panels, and Task Forces (without monetary compensation). Others get involved and support TRB activities by becoming a TRB Affiliate; participating in TRB-sponsored conferences and workshops (including the Annual Meeting); authoring technical papers and contract research reports; and more.

In 1920 the (then) Highway Research Board established three technical committees to promote research and disseminate highway research findings. Today TRB maintains more than 200 Standing Committees and Task Forces that address all aspects and modes of transportation, including roads, public transport, freight, pedestrians & bicycles, rail, aviation and maritime transport. Committee members identify research needs; provide information to the transportation community on research priorities and procedures; review papers for presentation at the TRB Annual Meeting and for publication; encourage the incorporation of appropriate research findings into practice; and develop special programmes, conferences, and workshops.

HIGHWAY CAPACITY MANUAL UPDATE

The US *Highway Capacity Manual* (HCM) was first published in 1950 as a less-than-200-page document, mostly concerned with highway capacity in terms of vehicle throughput. It has evolved through the 1965, 1985, 2000 and imminent 2010 editions into the preeminent guide on capacity and quality of service techniques, including the other modes, and now exceeds 1,000 pages (a CD-ROM version is available). It contains methods for planning, functional design, and operations for a wide variety of facility types. Guidance is now provided on pedestrians, bicycles, buses as well as the use of alternative tools such as micro-simulation. Capacity estimates for various facility types are supplemented by computations of delay (speed or travel time), queue and in some cases stops.

Although many New Zealand transportation engineers may not have used the HCM itself, it is likely that they have used Austroads publications and software such as SIDRA which is broadly based on the HCM. Another reason to consult it occasionally is that it contains a wealth of information on field measurements, traffic engineering concepts and parameter values that may not always be locally available.

The 2010 edition is scheduled to be available in December, following a decade of extensive research since the previous edition. It contains updated material based on about US\$6 million of new research. Some of the changes include:

- Basic Freeway Segments have modified speed-flow curves;
- Freeway Weaving is a new method based on the intensity of lane changes;
- Freeway Facilities now include the ability to analyse oversaturated conditions with bottlenecks and queue shockwaves along a freeway corridor (the subject of another technical note at this conference);
- Urban Street corridor analysis includes methods to evaluate the Level of Service for Pedestrians, Bicycles and Buses and a variety of combinations of intersection controls such as signals, roundabouts, two-way stop controlled intersections.
- Guidance on alternative analysis tools for each facility type;
- An applications guide which goes beyond sample problems to show a series of real world project applications using more than one facility type and the decision processes used in their analysis.
- Computational engines, usually in the form of spreadsheet applications driven by macros or Visual Basic for Applications code, will be provided for many of the facility types. For more productive application, it should be noted that the HCM is usually translated by others into commercial software soon after each publication. Examples include SIDRA, HCS (Highway Capacity Software), Traffix, TEAPAC.

The HCM has spawned two other manuals, the *Transit Capacity and Quality of Service Manual*, now being updated for the 3rd edition (which includes rail modes and stairway and terminal capacities), and the first edition of a *Highway Safety Manual* described below.

DEVELOPMENT OF HIGHWAY SAFETY MANUAL

The *Highway Safety Manual* (HSM) is intended to counter-balance the focus on capacity and operations in the HCM. Prior to its development, transportation professionals did not have a single national resource for quantitative information about crash analysis and evaluation. Although such a document has been mooted in some circles for nearly 40 years, its development has only occurred during the past decade. The first edition of the HSM is due to be published by AASHTO in March 2010.

Using the HCM as a model, the road safety community formed a TRB Task Force in May 2000 to address the lack of a comprehensive guide to applying crash prediction models to various facility types. The state of practice then was to consider “naïve” measures such as linear crash rates and to report simple before-and-after experiences at sites where crashes were over-represented and atypical. A more rigorous set of statistically sound models was needed to screen networks for safety projects and apply appropriate counter-measures.

Recognising that not all facility type models could be funded for the first edition, full Safety Performance Functions (SPFs) and associated Crash Modification Factors (CMFs) were developed for two-lane rurals highways, multilane rural highways, and urban arterials (including 3-leg and 4-leg intersections). A calibration method is described to adapt the published SPFs to local before-and-after conditions, using statistical procedures known as Empirical Bayes Analysis (EBA). However, the HSM goes well beyond these rigorous models for a few facility types and provides vetted and “acceptable” CMFs for a full range of counter-measures. As this is the first edition and is intended to raise awareness and a safety culture within the transportation planning and design profession, a lot of background material is provided on fundamental concepts, such as human factors, effects of speed, and surrogate measures of safety other than crash experience. Research also continues to develop the next HSM edition, e.g. more/better SPFs/CMFs and a chapter on Interchanges & Freeways.

Rather like New Zealand's *Economic Evaluation Manual*, a looming challenge is now how to educate transportation practitioners and state DoTs on how to properly use the HSM. Major training initiatives are planned to introduce the content of the Manual and to ensure that people are familiar with how to use the various procedures and (equally importantly) to know the limitations of what they should expect from it.

A variety of software is also being developed to help implement the various stages of road safety monitoring, diagnosis and evaluation. These include the *Interactive Highway Safety Design Model* (IHSDM, described at this conference in a separate paper) and the *Safety Analyst* suite of diagnostic and evaluation tools.

OTHER CONFERENCE HIGHLIGHTS AND GUIDANCE

For those used to typical Australasian transport conferences, attending a TRB Meeting is quite an eye opener. For a start there are literally hundreds of different sessions, workshops and meetings to choose from over the course of 5-6 days (over 700 overall in 2010). Some of these run from 7am or finish well past 9pm and at any given time of the day you could have the opportunity to attend about 30-50 different sessions.

A key feature of TRB are the numerous poster sessions; without them, far fewer presentations could be accommodated during the 4-5 days. Large halls allow for hundreds of posters to be displayed during 2-3 hour sessions (with their authors present); typically there are multiple topics being displayed at any given time in a room. This results in an incredibly efficient way to see a lot of interesting research quickly and have a good chat with the authors, whilst bypassing the posters you're not interested in. If you're trying to fill in time

before your next scheduled session, they also provide a welcome diversion that sometimes unearths a few gems.

The other key aspect of TRB are the many and varied committee meetings. TRB Committees are a great way to get involved in driving transport research in areas that you are interested in. A large proportion of the US transport research funding (federal, state, etc) is based on proposals developed by the various TRB Committees. They are also a good starting point for getting to know other people with expertise and interests in your area. There are over 250 Committees and shorter-term Task Forces set up by TRB to cover virtually every transport topic you can think of. It is worth sitting in on one or two Committee meetings to see what activities they get up to (you can also join the list of "friends" of Committees). If you're really keen, you can try to get nominated as a Committee member (a third of which are rotated every three years); it is useful to know that most Committees have separate quotas for both international and "younger" members.

Many of you will have read papers from the very useful "*Transportation Research Record*" (TRR) series of journals. The source of these papers is from those presented at the TRB Annual Meeting. Of the 1500-odd peer-reviewed papers accepted for the Meeting (from over 3000), about one quarter are then accepted for publication in the TRR Journal. Each year the TRB Committees play a role in reviewing the submitted papers and ultimately determining those accepted for presentation and publication. For example, in 2009 Glen Koorey helped to review six papers across three different Committees for the 2010 Meeting.

Until recently, TRB used to be a strictly non-commercial affair, save for a few "sponsors' functions" held in hotel suites. Since 2008 there has been an extensive exhibitors area, allowing both commercial and government agencies to tout their wares, including many useful free publications and CDs. It's also a great place to pick up a few freebies for the kids!

Needless to say, planning your TRB Meeting visit requires some work. Not only do you have to identify which sessions you wish to see (difficult if you don't specialise in one area), you also have to organise your own meals - no specific catering is provided for the conference. Fortunately there is a huge selection of restaurants and cafes nearby and, with a bit of smart planning, you can arrange to catch up with various colleagues to fill your lunch and dinner diary. For the thrifty-minded, you could also try to skimp on dinner by attending some of the various hosted functions run during the conference, often by commercial and research organisations. Having sessions at three different hotels (one of them a short walk or shuttle bus away from the other two) also requires a few logistical decisions. With potentially long days of sessions and socialising, New Zealand visitors also have to watch that jet lag doesn't affect you adversely.

For those who are new to the event, TRB also holds welcome sessions for New/Young attendees and International attendees. These are a useful way to find out a bit more about the various TRB Committees and make some new contacts in a friendly setting.

REFERENCES

- TRB 2010 Meeting Conference website:
<http://www.trb.org/AnnualMeeting2010/Public/AnnualMeeting2010.aspx>.
- TRB Standing Committees and Task Forces:
<http://www.trb.org/GetInvolvedwithTRB/Public/GetInvolvedCommittees.aspx>
- *Highway Capacity Manual*, 2000, TRB:
<http://144.171.11.107/Main/Public/Blurbs/152169.aspx>
- Task Force on the Development of the Highway Safety Manual:
<http://www.highwaysafetymanual.org/>