

ISSUES IN TRAVEL DEMAND MANAGEMENT

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INTRODUCTION

Urban travel is becoming more difficult across the world, and the costs involved for both individuals and societies are growing unacceptably. The pressures of travel demand are also taking their toll on leisure time, and in discretionary travel as tourist travel is becoming a major issue outside the weekday periods and even provides the highest flows of the week on an increasing number of routes.

In both cases the classical treatment for the last 30 years has been to reduce congestion by improving the existing capacity of the available network, or by building more. These policies have been remarkably effective for a considerable time, and it is only recently that the sustained efforts to raise traffic capacity by management and selective construction have failed to continue stem the deterioration in the levels of service.

There are now major changes going on, as the growth in travel continues:

- 1) Quality of the travel is declining
- 2) Externalities imposed by traffic movement are less tolerated
- 3) Overall issues of gas production from motor vehicles have become a real issue
- 4) The public in most countries have begun to express a firm view that quality of urban life requires changes in priorities for the transport system and the road network - *and* the terms of its usage.
- 5) The overall levels of traffic now pose pressing environmental and amenity problems.
- 6) Demand for travel continues to grow in the face of rising congestion.

AUSTRALIAN STRATEGY DEVELOPMENT

The Australian issues relevant to travel demand and its management have recently been assessed by a cyclic consultation and analysis process. The context and background to a number of these issues is specified by Wigan (1990). The findings of a series of consultative development meetings aimed at refining a research strategy can be summarised to provide an up to date picture of current concerns.

In the second round of the consultation process the three top priority issues where research and understanding were needed were selected from the issues debated, and Fig. 1 shows the broad balance of these selections. Financial issues (including toll roads and price impacts on different groups) were most strongly selected, while the deficiencies in the planning processes, models and information sources and systems were almost as strongly pressed for. The uncertainties in behavioural and environmental areas were generally rated as having a greater concern for longer term investigation, and thus were less strongly supported as top priority issues for current action.

Fig. 2 covers the balance of state interests in these top priority issues for each state individually. It is a little deceptive, as it reflects only the balance of immediate concerns in terms of issues: there is a much closer confluence of views across the country when the longer and shorter term issues in each state are considered together.

Fig. 3 shows the overall results on a more detailed issue-by-issue basis. The shortened form of the titles of each issue identified are expanded upon in the Appendix, which gives the full wording of each agreed issue specification.

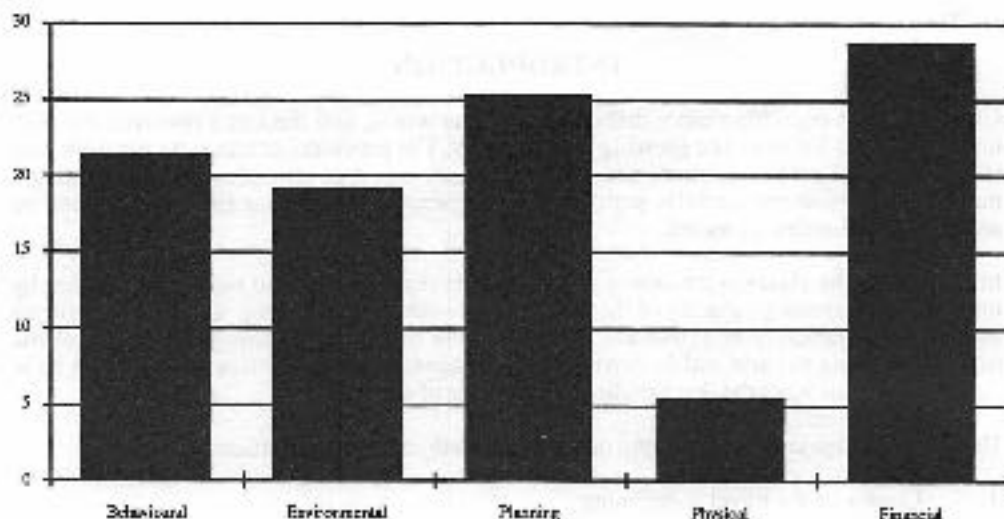


Fig 1. — Percentages of top priority TDM issue allocations equally weighted for each state

The nature of the issues range from a real concern over the poor understanding of the way people will behave to detailed fiscal mechanisms and technical devices to enable new forms of travel management to be introduced and operated. The low ratings of the 'physical' technical devices as issues reflects the objectives of the travel demand management debate: the instruments will be needed - but the real problem is how best to employ them. The technical innovations will merely open the door to new management and information policies: the questions raising more concern are those related as to how to employ them for specific goals, and the distributional and other impacts of such policies being exercised.

MANAGING THE DEMAND

The conclusion is that capacity provision has not proved to be a long term solution to the problems created by travel demand. One might also conclude that there are no longer major gains to be made to managing demand simply by adjusting capacity supply by physical means.

This raises a fundamental question: could these issues and expectations be dealt with by simply managing the capacity in some other way?

The evidence appears to be that we can no longer do so simply through traffic management. The 30 year stay of execution achieved in London adoption of such progressively more sophisticated capacity management and usage measures has at last led to traffic speeds below those that forced the initiation of the London Traffic Management Unit in 1957. However, there is now massively more traffic flowing through what is still largely the same basic network as in 1957.

The reallocation of travel between modes has become more difficult, and the basic problem is that in many cases the increases in traffic demand is due to longer journeys - imposed by the land and housing markets, and the inadequate response of the employment system.

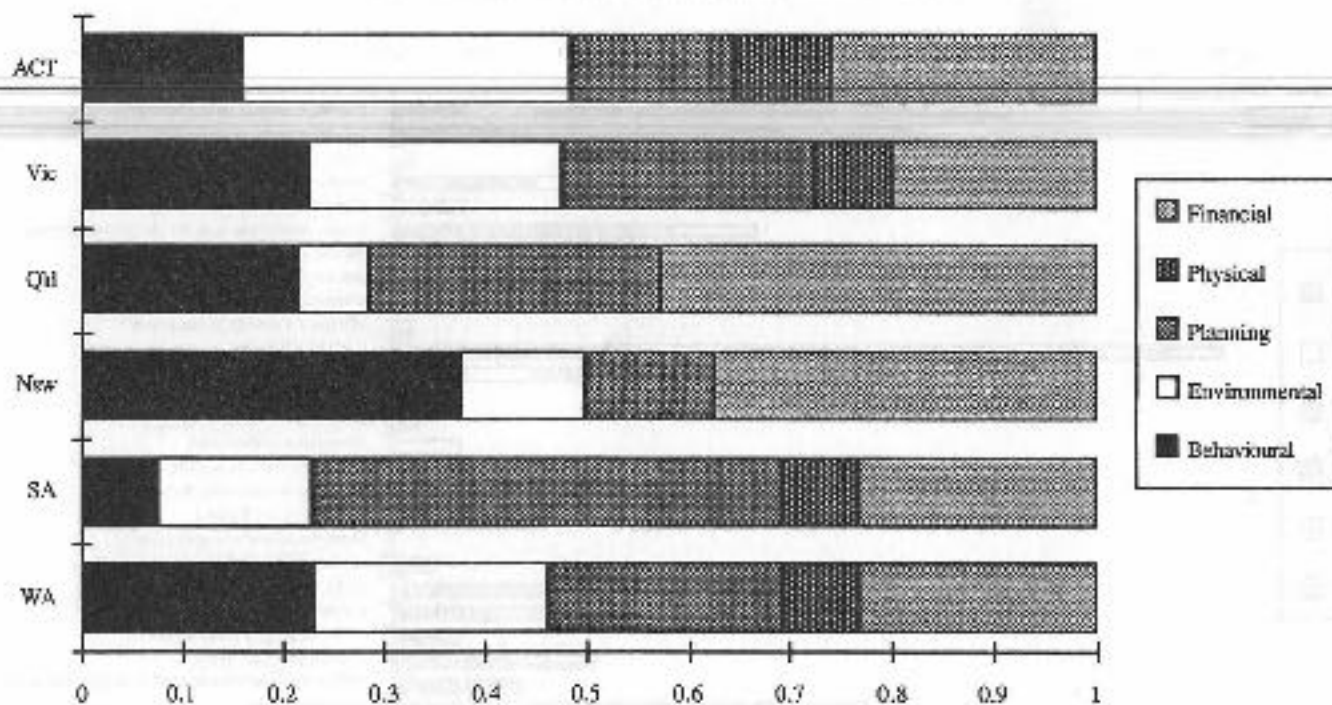


Fig. 2 — Top priority TDM issue allocations equally weighted for each state

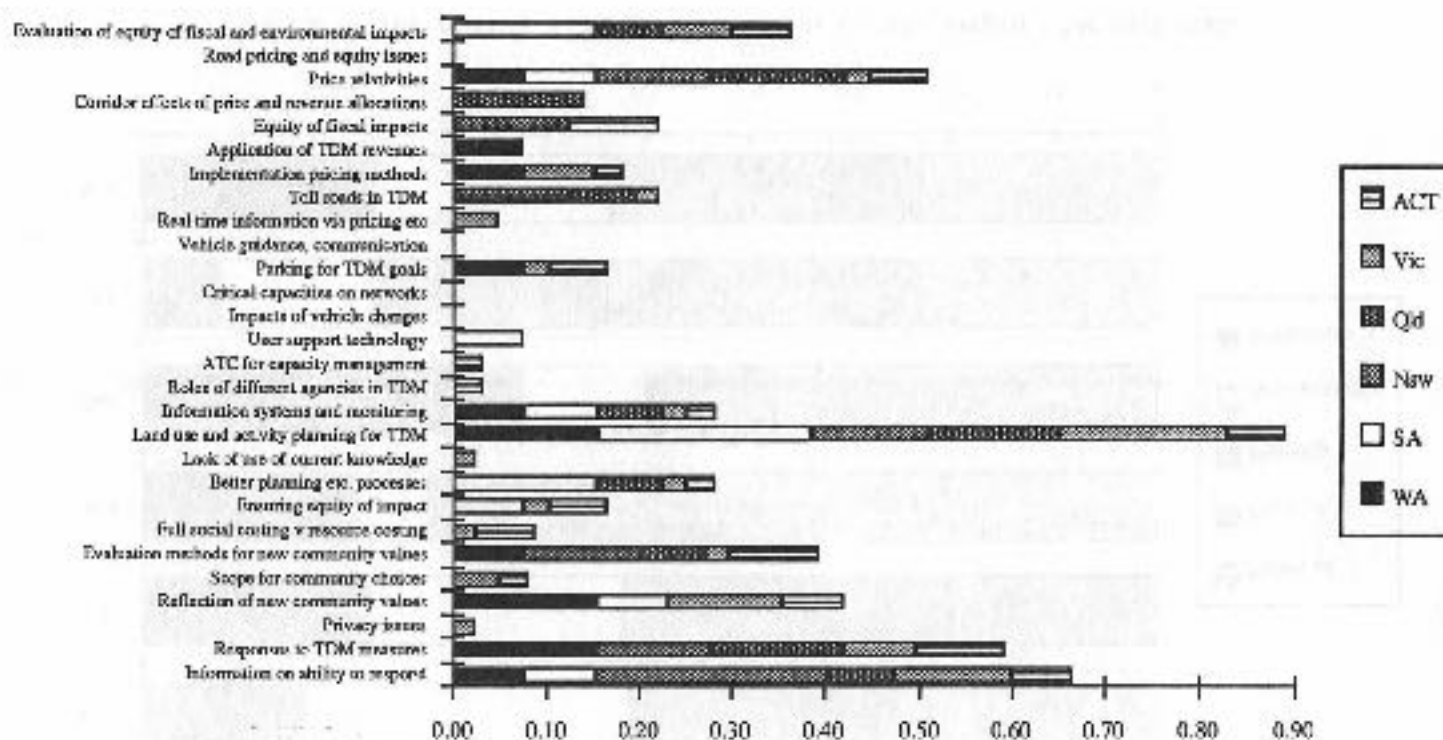


Fig 3. — TDM issue allocations for each state

The peak hour capacity of many public transport systems is not capable of economically accepting more passengers in many areas. Capital requirements of roads, capital requirements for public transport, and the operating subsidies for public transport are now visibly all competing for the same dollars.

At the same time other prices are being exacted from the road system in particular: the emergent requirement to reduce the absolute levels of many forms of vehicular motor gas emissions has a disproportionate effect on private transport - especially in Australia, where a 20% reduction in greenhouse gas emissions applied across the board will require substantial changes to both the nature of vehicles and their manner, modes and levels of their usage.

Recent research has shown (Small 1989, Webster et al. 1988) that there are now close links between road investment, design, pricing of usage, user response, land use and land rent. It is difficult to see how the problems of travel demand could now be managed without taking these close links into account. Simple policies of systematic new road construction in all cases have not been effective, nor indeed have policies of total road closure.

The behavioural responses of the travellers must be influenced, both at source and on individual journeys as far as possible. So too must fiscal judgements on road provision and usage. The net effect is that the issues can be treated as a set of short and long term influences and mechanisms. Short term being the prices, access, environmental controls and the longer term including land use, design and information systems.

THE PROCESS

Management of demand for travel has much in common with any other form of issue management. Instruments are needed to initiate and managing change; information is required to determine the effects of using these instruments; environmental criteria are required to assess the situation, and objectives are needed from the outset to ensure that there is movement towards a specific goal.

Currently trip lengths are growing; vehicle fuel consumption efficiencies are improving, and the diffused areas where people are moving to live are increasingly difficult for public transport to serve.

The results are not being perceived clearly by the community. The public is demanding a greater level of participation in the decision making, but it is quite clear that distorted cost and capability messages are being received by the community. There is only a poor match between the perception of the costs of various demand management or servicing measures and the actual costs, and between the perception of the capacities that the public sector has available to supply travel capacity and the reality.

As direct management, control and redirection of the demand from travel must now be actively considered, this misperception must be addressed as a matter of urgency. Consultative procedures and techniques are not yet performing very well in the eyes of anyone but those operating consultation processes, and often even not then.

There are also a number of professional problems which continue to constrain the process. The information resources required to address travel demand and its management are not well structured to meet the current needs, and reliance on large scale broadly-based data from a decade or more ago is increasingly uncomfortable, indefensible and inappropriate. Analytical manpower skills have become scarce, and the combination of these two issues has made it difficult to marshal the necessary clear basis for continuing assessment, monitoring and planning. The management of travel demand requires a very wide range of professions to work together, and the communication between these professions - and between them and the community - are both poor.

MAJOR OPPORTUNITIES

Australia is not alone in these problems. The density and complexity of many European cities has ensured that there is a substantial amount of experience to be drawn upon. This can come from many sources, not least the work of the toll road constructors and operators, and the technical and social initiatives which Europe has begun in the general areas of road informatics and travel demand management.

The technical activities in Europe are swiftly shaping the emerging Standards for road-vehicle communication, and for the subsequent methods of applying the information gained. This enables careful monitoring and parallel activities in Australia to keep in step, and ensure that Australia does not suffer any delay in picking up Standards that emerge. Some States are already installing road information infrastructures - but it is the emergent *vehicle*-based standards (such as the ALI-SCOUT communication system) that will determine most of the issues on a technical front.

Monitoring activity levels and demand patterns more effectively and frequently is an issue that can and should be acted upon locally. Although new technology methods could materially ease this necessary task, the potential social implications of a course of action taking full advantage of record and identification matching are likely to attract severe negative publicity (Daniel et al. 1990).

Transport organisations are once again tending to merge, and the close links between planning, design and transport operations are likely to handle this more effectively than for some years.

Real opportunities lie in the combination of pricing mechanisms, and the links to funding transport as a whole.

ACTIONS REQUIRED

Public sector organisations need to set up improved links between strategic land use, activity and transport infrastructure planning, underpinned by information and monitoring systems responsive enough to cater for demand management in the short and longer term.

The new round of technological innovations that link vehicles and the road system offers the immediate potential for guidance, control, parking, tracking and pricing all in one package. The technical capacity will have to be used with sensitivity and care, but offers real gains in capacity, as well as capacity management and travel demand management. A close watch should be kept on some of the DRIVE and PROMETHEUS initiatives to ensure that Australia is able to adopt the appropriate standards.

Local experimental efforts should be set up and assessed to ensure that Australia can make the best use of this category of infrastructure and apply the lessons learned locally and elsewhere in a timely manner. The potential to operate some of these new forms of charging, communication, tracking and control is inherent in the new technology, but care should be taken to apply these potentials with the understanding and cooperation of the community.

Better consultation procedures with the community, and greater use of the technical resources in the community outside the specialist public sector organisations will both be required.

REFERENCES

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APPENDIX

ISSUES EMERGENT FROM THE SECOND ROUND OF CONSULTATION

1. Behavioural and social issues raised and considered

- 1.1 The ability of many households - individuals of different ages and sex - to change their travel behaviour is limited. Have we an adequate knowledge or monitoring information to know what we could achieve through various measures?
- 1.2 The responses of individuals and companies to pricing, regulatory and other TDM instruments - *these include elasticities of demand, as well as the response in consultation process*
- 1.3 Privacy issues, and measures to ensure that new technical measures (which could accumulate timed, identified vehicle successive location records) are acceptable?

2. Social and environmental issues raised and considered

- 2.1 To reflect resource and community values adequately, the following issues need to be considered - *Public opinion on environmental issues, the amount the public will pay in money, access and movement limitations to achieve gains*
- 2.2 The degree to which the community has real options in determining and choosing between major issues in this process
- 2.3 The extent to which our present evaluation methods currently reflect both resource & community values
- 2.4 The balance between choices for demand management made under a full social cost framework, or for optimal efficiency of resource usage under present criteria.
- 2.5 The growth in non-traditional, disadvantaged and low income households places special demands on access provision, how can this be equitably handled with the various instruments?

3. Planning issues raised and considered

- 3.1 There is a real need for better planning, consultation and implementation process
- 3.2 Current operational practise does not reflect even currently available knowledge or tools
- 3.3 Land use, activity planning procedures and information systems need to be better integrated into medium and long term travel demand management strategies
- 3.4 Information systems are needed to forecast, monitor and react - *to demands for activities, land uses in specific locations, the resulting travel demand, activity and land use shifts and changes in economic, social and environmental factors*
- 3.5 Which aspects of the above should be picked up by which agencies, and the extent to which the transport and planning sectors should contribute

4. Physical issues raised and considered

- 4.1 Use of area traffic control to amend and balance capacity
- 4.2 Technology for interfacing with users
- 4.3 Impacts of vehicle technology change
- 4.4 Identification of the levels at which single minor events lead to major changes in network capacity
- 4.5 Provision, regulation and pricing of parking to meet TDM objectives
- 4.6 Provision of vehicle guidance and communication infrastructures
- 4.7 Use of vehicle identification/tracking and other methods to provide real time information - *includes guidance, monitoring and pricing technologies and applications*

5. Financial issues raised and considered

- 5.1 Toll roads in a systematic travel capacity provision, revenue & pricing system
- 5.2 Investigate appropriate and implementable pricing mechanisms
- 5.3 Use of revenues from traffic restraint measures : E.g. parking, tolls & road pricing
- 5.4 Balance the unequal impacts on groups of capacity restrictions & fiscal measures
- 5.5 The impacts of altering modal fund & revenues allocations in a specific corridor
- 5.6 Price relativities: between and within modes, and transport and other sectors.
- 5.7 Should road pricing be considered: How to ensure equity of implementation impact?
- 5.8 Measurement, tools and evaluation of equity of both accessibility & fiscal impacts