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TITLE: Reducing Car Travel Through an 'Individual Action' Programme

ABSTRACT: This paper outlines a new approach to reducing car use in order to address environmental concerns. The individual action programme, known as travel blending, aims to encourage individuals to choose a mixture, or blend, of travel choices **over time** to satisfy their travel needs rather than being a captive of the private car. Participating households are sent a series of four kits, containing information booklets and travel diaries, over a nine week period. The travel diaries and vehicle log books are analysed and a summary of the household's travel patterns, and the emissions produced by their vehicles, is sent back in a subsequent kit along with suggestions explaining how they could introduce travel blending into their travel patterns. Households complete another set of diaries and vehicle log books after four weeks and these are analysed so that a comparative summary can be returned to the household with the final kit. The paper describes results from a pilot study, involving about 50 individuals, undertaken in Sydney, Australia. The encouraging results from the pilot have resulted in preparations being made for a larger trial involving about 300 individuals.

KEY WORDS: surveys, travel awareness, demand management, feedback

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1. Introduction

Throughout the world there is increasing attention being focused on the link between motor vehicle use and air pollution. In the UK, the Royal Commission on Environmental Pollution (1994) suggested that transport "has become possibly the greatest environmental threat facing the UK and one of the greatest obstacles to achieving sustainable development". In the United States, Clean Air legislation and the Intermodal Surface Transport Efficiency Act (ISTEA) have combined to focus attention on the link between motor vehicle use and air quality. Worldwide there have also been other reasons pressing for a reduction of car travel including problems associated with congestion, noise pollution, time loss etc.

A variety of solution approaches have been formulated and are being implemented to varying degrees to address these issues. These include:

- technological improvements in the motor car to reduce emissions,
- construction of new infrastructure to reduce congestion or provide public transport or other alternatives to the private car, and
- other measures, excluding provision of major infrastructure, which aim to modify travel decisions. (These are sometimes referred to as 'demand management' or 'travel demand management' measures)

The last of these approaches includes a variety of measures which can be grouped into strategy areas focused on improving asset utilisation, physical restraint, pricing, and urban and social changes (Wayte, 1991). This paper concerns the last of these strategy areas (urban and social changes). In particular, it describes a method aimed at changing social attitudes, and subsequently travel behaviour, through individual measurement and personalised information.

Reducing the use of the car through urban and social change (as opposed to legislative and pricing measures common in the USA) has primarily taken the form of "travel awareness" campaigns which have largely been pioneered in the UK. The programmes have aimed to encourage people to reduce car use by "campaigns" in which brochures, leaflets and other materials have been provided to people to "tell" them about the problem (too much congestion, too much pollution etc.) and "suggest" solutions (eg. car sharing, work at home etc.).

The link between attitudes and travel behaviour has been recognised in the literature for some time (Golob *et al.*, 1979). Knowledge or information can influence attitudes and hence ultimately behaviour but many of the programmes to date have made little attempt to step beyond the "raising awareness" phase.

The differences along what might be considered as a continuum from awareness to attitude change to behavioural change are highlighted in the following example. In a random telephone survey of 1000 households in the greater Sydney region (Sydney, Newcastle and Wollongong in Australia), 89 % of respondents expressed concern or at least some concern for air pollution in the greater Sydney region (Gollner, 1995). The majority of those surveyed perceived motor vehicles as being the major cause of urban air pollution ahead of industrial sources. Respondents were also asked how frequently they take some action because it's better for the environment. While 89 % of respondents said they take some general action once a week or more frequently because it would be better for the

environment, only 59 % said they take some action about car use because of the environment. The general environmental action would include recycling, composting and purchase of environmentally 'sensitive' products.

This highlights the challenge of getting people to move from awareness of a problem towards change in behaviour. Furthermore, the best climate for change is likely to be where there is a common perceived goal. In Sydney, it is reduction of air pollution, though in other cases it might be congestion or improving the quality of life.

This paper considers a new approach which takes all these aspects into consideration. The approach, called 'Travel Blending', represents an innovation not only in terms of travel awareness programs but also in travel behaviour research. This paper explains the approach and compares it to international initiatives. Insights into the effectiveness of the approach are provided by a pilot study, which involved about 50 individuals. While the results from this small sample cannot be generalised, they were nevertheless encouraging and have led to the development of plans for a larger trial which will be conducted in 1998.

The structure of this paper is as follows. It begins with a review of the UK based public awareness campaigns and identifies issues which led to the development of quite a different approach for a major travel awareness campaign in Sydney (Section 2). The context of the 'travel blending' programme, as it is known, is described in Section 3 along with an outline of the concept of travel blending and the components of the programme. Experience from a pilot study is reported in Section 4 while conclusions and research direction are identified in Section 5.

2. Foundation of the Individual Approach to Reducing Car Travel

In the UK, several initiatives, broadly termed "travel awareness", have been instigated to encourage people to reduce car use. Their prime objective has been to make people aware of:

- the need for the reduction in car use, and
- ways in which this could be achieved.

The first stage, and generally the key component of these initiatives, has been an advertising campaign assisted by a set of brochures, posters, bumper stickers and logos to show people the problems of congestion and pollution and to point out the alternatives (eg. car sharing or pooling, use of public transport, trip chaining, and so on). Later stages have often included more targeted efforts such as 'walk to school' weeks or 'ride to work' campaigns and facilitated discussions with community groups to get them to understand the issues more thoroughly than can be done with an advertising campaign.

The two initial examples of these were initiated by local authorities and are TravelWise, begun in Hertfordshire (Hertfordshire County Council, 1993) and HeadStart (Hampshire County Council, 1993). More than 20 authorities have now subscribed to the TravelWise approach and have introduced it, often customised for local conditions, in their regions.

Once launched, the major thrust of TravelWise tends to be publicity (Steer Davies Gleave, 1996). The most popular forms of publicity have tended to be advertising on the outside of

buses, leafleting and radio advertising. However, TravelWise is not merely a publicity campaign (Steer Davies Gleave, 1996) because it has been promoted through the logo appearing on official council documents like transport strategy documents and public transport timetables. In addition to the publicity campaign and branding of documents particular events have been organised under the banner of TravelWise. These include 'walk to school weeks', 'bike to work days' etc.

HeadStart was launched by the Hampshire County Council shortly after Hertfordshire introduced TravelWise. However, Hampshire describes its approach as being a 'bottom up' approach in contrast to the TravelWise 'top down' approach. The distinction is that TravelWise is aimed at everyone; tying to influence them to a greater or lesser extent by recognition of a name, logo and concept via a mass media campaign. In contrast, HeadStart focuses on taking the message to community groups and trying to significantly affect the ways these groups think about transport (Steer Davies Gleave, 1996). The main thrust of the Headstart campaign is the conduct of workshops with community groups. Target groups include parish councils, parent and toddler groups, fitness groups etc. In addition business conferences have been held with the aim of getting commitments to the development of commuter plans and on another front a 'Safer Routes to Schools' campaign is being developed (Steer Davies Gleave, 1996).

Each of these programmes has its own merits, as noted earlier. Certainly raising awareness of the issues is a critical first step in changing behaviour. The travel blending approach described in the following section has been designed to incorporate two important components that most of these initiatives lack:

- an objective and a method to ensure that there are *behaviour changes* as well as awareness and attitude changes (ie. people actually use the car less); and
- an in-built monitoring system, to measure whether and what type of changes are actually occurring.

3. The Travel Blending Programme

In this section we begin by describing the context within which the programme was developed before outlining the concept in detail and then identifying and describing each of the components of the programme.

3.1 Setting the Context: Clean Air 2000

The NRMA is the largest motoring membership organisation in Australia. It initiated a major public initiative called Clean Air 2000 which aims to reduce pollution caused by car travel in Sydney prior to the year 2000 Olympics. Clean Air 2000 is a twofold initiative (Gollner, 1996) focusing on:

- encouraging behavioural change in the way people use their cars, and
- the solutions to vehicle induced air pollution and increasing traffic congestion.

While part of the Clean Air 2000 initiative involves working with government and transport service providers to address the second of these points, this paper primarily focuses on the first.

3.2 The Concept and Potential Impact

When embarking on a strategy to encourage behavioural change in the way individuals use their cars, it was recognised very quickly that the focus needed to be on achievable change. Achievable meant that it should not rely on an 'overnight' change in lifestyle but rather should be based on sustainable reductions in vehicle use.

Travel blending is the terminology used to describe a way for individuals to reduce the use of the car which involves:

- *thinking about activities and travel in advance* (ie. in what order can activities be done, who should do them, where should they be done etc.) and then
- *blending modes* (ie. sometimes car, sometimes walk, sometimes public transport etc.), or
- *blending activities* (ie. doing as many things as possible in the same place, or on the same journey), or
- blending *over time* (ie. making small sustainable changes **over time** on a weekly or fortnightly basis).

The focus of the concept is on simplicity for any individual and, while it could be applied on a daily basis, it is more likely that people will be able to commit small changes over time. Thus, for example a commitment to use public transport to work one day per week would have the potential for that individual to reduce their weekday peak period vehicle use by 20 percent. In this way, rather than saying people should always use public transport the message is to blend travel choices in a manageable but sustainable way to reduce motor vehicle use. Importantly, the blending approach is based on allowing people to participate in the same activities which they currently undertake.

The generic notion of "travel choice blending" has received only limited attention in the literature. Anas and Moses (1984) examined mode choice blending using data on people's travel choices over a period of six working days. They concluded that the traditional analysis approaches which ignore the possibility that choices can be deliberately blended overestimate the responsiveness of demand to changes in the attributes of modes such as travel cost. So for example, traditional analysis approaches which implicitly deal with a single day's travel decisions would predict that an increase in parking prices would mean a certain percentage of people would stop driving each day. However it may be that people blend their travel choices and drive less frequently. The analysis undertaken by Anas and Moses indicates that the traditional approach which ignores the blending option would overestimate the impact of the parking price impact. This suggests that travel choice blending could reduce the effectiveness of some of the road pricing policy initiatives which are being analysed with traditional analysis approaches. Insight into the extent to which individuals may be prepared to blend their travel choices to reduce environmental 'costs' will be provided by the research programme described in this paper.

It is appropriate to assess the potential impact of broad adoption of the travel blending principle. Luk (1993, 1994) examined the transportation impact of telecommuting which is one of the 'choices' which could be included under the umbrella of travel choice blending. Considering Sydney commuting, he concluded that an average rate of one teleworking day per week for all workers (20 per cent adoption rate) would reduce travel time costs by 19 percent. Even at moderate levels of adoption he concluded it could have a large impact on congestion. Table 1 summarises the social cost reductions in Sydney estimated by Luk for various adoption rates of teleworking. With a 10 per cent adoption rate, social costs would be reduced by more than $1B.

Table 1: Social Cost Reduction in Sydney due to Teleworking
(Source: Luk, 1993. While not clear in the paper the figures are assumed to be annual estimates)

Externality	Savings at 5% Adoption Rate ($M)	Savings at 10 % Adoption Rate ($M)
Delay cost	476	832
Vehicle operating cost	86	164
Accident Costs	111	22
Noise pollution cost	0.98	1.95
Air pollution cost	1.38	2.76
TOTAL	$575M	$1023M

A one day per fortnight adoption of travel choice blending by all workers would be equivalent to the 10 per cent acceptance level in Luk's analysis. Clearly not all workers will be able to adopt travel choice blending. However, even if 10 per cent of the workforce could adopt travel choice blending one day per fortnight, Luk's analysis indicates the social cost savings would be in the order of $100M.

These are likely to be at best upper bound estimate of benefits. The benefits that accrue from any travel demand management measure will be reduced if other car trips are induced onto the system during the period when demand is suppressed. For example, someone who would not normally have undertaken a recreational trip during the peak period is now inclined to do so because the congestion is reduced. This situation, which simply results from the interaction of demand and supply (Manheim, 1979), is referred to as latent or suppressed demand and highlights that congestion itself acts to manage travel demand. In the absence of real time road pricing there is always a risk that travel demand management initiatives will unleash suppressed demand.

While the prospect of suppressed demand could reduce the system wide effects of initiating an individual travel demand initiative like travel blending, the approach is still potentially valuable in two contexts:

- as a mechanism for reducing the rate of growth of road traffic, and

- as a complementary measure introduced with more severe travel demand management initiatives, such as road pricing.

In the first case, initiatives aimed at reducing the rate of growth of road traffic may be far more realistic than aiming to reduce traffic levels in an absolute sense. In many urban areas the growth in road traffic is placing an increasing strain on the transport system and moderating that growth would reduce future environmental impacts and reduce pressure for infrastructure expansion. In the second case, travel blending could be used to complement the introduction of a road pricing scheme. In this context, the travel blending programme would amount to a form of individually focused education campaign to help residents identify and use alternatives to the private car.

It is also important to highlight that while the examples from the literature cited above give some estimates of likely benefits, they, unlike travel blending, focus on peak hour, work-based travel. It is now realised that work journeys represent only about a quarter of all travel in most cities and that other journeys (eg. recreational travel and trips by people other than workers) are growing much faster then work travel (Ampt and Richardson, 1994). Importantly, the diversity of the travel blending approach means that everyone has an opportunity to change. Travel blending may mean sharing a car to a restaurant, getting someone to pick something up for you, a child walking to sport or simply turning multiple car trips into chains. Travel blending, unlike other approaches, focuses on the individual, but in the context of the household. This is critical since, from a behavioural perspective, much decision-making, particularly that related to travel behaviour, is made at the household level (Jones, 1979).

3.3 The Travel Blending Programme

In the long term it is envisioned that the travel blending programme could be made available to all persons or households in Sydney. In the context of Clean Air 2000, therefore, there was a need to develop an approach for communicating the concept of travel blending to individuals/households participating in the program.

Exploratory interviews were conducted with a small sample of individuals in Sydney to explore some of the initial concepts relating to the travel blending programme. The outcome of these interviews confirmed the philosophy of a need for an approach which was not prescriptive but rather was based on an *individual action* plan - in essence a *How To* rather than a *Should Do* emphasis was preferred. The key elements of the action plan were to be:

- to give people a knowledge of their existing patterns of travel,
- to present this knowledge in the context of the household or family,
- to give them 'customised' feedback related to their actual travel for one week,
- to allow them to experiment with reducing car travel by "blending",
- to let them check or measure their reductions in vehicle use, and
- to give them a simple way of ongoing maintenance, once travel changes had occurred.

Based on this philosophy a concept was developed which was based on:

- the provision of easy-to-understand information on the need for change;
- the provision of a set of ‘kits’ in which each of the steps in the travel blending process were described and the relevant tools to carry out these steps were provided.

Following a period of intense development work in late 1995 the travel blending concept for Sydney has developed into a package of four 'kits'. Even at the initial stages, these kits were designed as much as possible with the final stage of the concept in mind - to be sent to all households which expressed an interest in the program.

Tangible Change Based on Measurement

A fundamental premise underlying the development of the travel blending programme is that people's travel must be made tangible if they are to comprehend the need for change. Unlike recycling or adopting a 'green' approach to consumer purchases, individuals have no tangible evidence at the end of a week that their actions to modify their travel behaviour have produced results. Therefore a fundamental component of the travel blending programme is a series of diaries which are completed by members of the household. These diaries provide:

- a means of making travel activity 'tangible' for the participants in the program, and
- a basis for giving quantitative ‘feedback’ to participants about their travel activity and changes in their travel activity.

Importantly the diaries have a major role to play in measuring the effectiveness of the travel blending package. Therefore they not only play a fundamental role in the process itself but also provide the basis for evaluation of the programme as a whole.

Diaries to Measure Vehicle Use

Since the motor vehicle is a major contributor to air pollution in Sydney it was essential that individuals focus on their use of motor vehicles. The first type of diary was therefore a vehicle log book, in which respondents record their use of the car in terms of the number of kilometres travelled for each trip. Since the pilot these have been incorporated into the activity diaries.

Diaries to Measure Travel Activity

It is essential that people's use of the car be viewed within the context of their total travel activity. Changes in vehicle use may have implications for other household members and even out-of-home activities which do not presently rely on the car. Therefore the travel blending programme also includes travel diaries which are used to record all travel outside the home. Importantly, these diaries are completed by all individuals within the household. In this way the household can begin to consider the interactions between household members which produce their household travel activity.

The diaries and vehicle log books were designed to obtain sufficient information to prepare the tailored feedback while serving as adequate memory joggers for participants. They were therefore less detailed survey instruments than is traditional in one day self-completion travel surveys (Richardson, Ampt and Meyburg, 1995). The travel diary recorded information for each trip including the start and end times, the mode used and the destination/purpose. The vehicle log book likewise recorded details for each trip including the start and end times, odometer readings and the destination/purpose.

While the concept of travel diaries and vehicle log books is not new there are two features of this project which are innovative in the travel behaviour field. First the diaries and log books are completed over a one week (seven day) period. This is in contrast to the majority of travel surveys which collect data for only a single survey day. Covering the whole week is considered to be critical in this case because travel blending relies on modifying travel activity over time, for example, going by public transport one day per week rather than driving. In addition, weekend travel is very different from weekday travel and people may find their capacity to practice travel blending is different at the weekend than through the week. The use of seven day diaries, while widely acclaimed as being extremely effective in measuring travel behaviour, (particularly day-to-day variability) is acknowledged in the literature (eg. Golob and Meurs, 1986; Hanson and Huff, 1981) as being subject to various pitfalls such as underreporting and attrition. However, the emphasis of this approach is not on collection of accurate travel data. Rather 'sufficiently' accurate data are required to enable participants to develop an appreciation for the nature of their current travel patterns and motivate them to change their behaviour. As Tukey (1960) noted, perfect information is not needed for decision making. Likewise, in this situation perfect information is not needed in order for people to change their travel behaviour to reduce motor vehicle use and the associated environmental impacts.

The second unique feature of this project is that households receive feedback when they return the diaries. Traditionally people complete surveys and never receive any feedback. Indeed researchers may even be concerned that the very process of completing the survey may affect people's behaviour. An example here would be a panel study of motor vehicle purchase decisions where the act of surveying the participants each year may result in changes in the factors which they consider in their decisions. These changes could result from the increased awareness which comes from participating in the survey. In this case the results of the survey would not be representative of the population which had not participated in the survey. In contrast, in this study, the travel surveys are used as a tool to encourage people to modify their travel behaviour.

Response Aids

All travel surveys suffer from non-response, that is people who are sent the diaries do not complete them. Non-response rates depend on many factors. In rigorously designed one day travel surveys conducted recently in Australia, non-response has varied between 25 and 35 per cent (Richardson, Ampt and Meyburg, 1995). It was therefore perceived as particularly critical to ensure a high 'internal' or 'item' response rate to discourage underreporting in the seven day diary.

To help increase this response rate in the travel blending project the kit's have been designed with an inbuilt reminder system. The travel diaries are designed to be kept in a purpose designed 'diary holder' (cardboard box) which can be kept on the refrigerator (using attached magnets) or stood on a desk/table/counter top. The diaries are designed to display each person's name and the day of the diary they are completing. When placed in the 'diary holder' the names of everyone in the household, and the day of the diary that they are completing, is visible. Thus, for example, a glance at the box would show that Tom and Julia have completed their Wednesday diary but Greg has not completed his diary for

Tuesday. This would serve as an inbuilt reminder system where peer pressure within the household would encourage everyone to complete their diaries.

In all, the Travel Blending Programme involves four 'kits' which are sent to households which indicate a desire to participate in the program. The focus of the kits and their contents are outlined below.

Kit 1: Getting Started

This kit is sent to the household in a presentation box which can be used to store material from subsequent kits. Included in the first kit is a letter of introduction from a prominent Sydney personality who is also Chairman of the Clean Air 2000 advisory committee. Also included are two information booklets "Why clean the air?" and "How can we do this?". The 'Why' booklet explains the link between air pollution and vehicle use and describes why pollution will continue to worsen unless action is taken. The 'How' booklet outlines the range of potential solution approaches and places the need for individual action into perspective against other initiatives which form part of the Clean Air 2000 initiative. This booklet introduces the concept of travel blending and indicates that the first step for an individual in changing their travel patterns is to understand what travel they currently undertake. In this way the rationale for completing a one week travel diary and vehicle log book is explained.

Kit 1 includes a one week travel diary for each member of the household together with a vehicle log book for each vehicle. Also included is a diary holder box for the fridge which serves as a depository for the diaries and an inbuilt reminder system. A set of 'Count your Kilometres' stickers is included. These stickers are designed to be placed on the steering wheel of the vehicles to serve as a reminder for the driver to complete the vehicle log book. Participating households complete the travel diaries and vehicle log books over a seven day period and return them in a pre-paid envelope for processing.

Once the travel diaries and vehicle log books are received at the study office, the data is coded into a database and summarised to facilitate interpretation and preparation of the tailored feedback sheets. In the pilot this process took about a week, and then the household was sent the second kit. In the roll-out to Sydney this is planned to be quicker.

Kit 2: Help Make a Difference

This kit contains customised feedback from the travel diaries and vehicle log books. This feedback was presented on a sheet headed "Did you know these things about your household?'. In the pilot the feedback sheet for each household was produced on a laserwriter printer using a word processor and printed onto special letterhead stationery so that it had a similar appearance of the other printed material in the kit.

The feedback sheet summarises travel patterns for each individual (by name) and the household as a whole. This includes details of the total number of trips, trips by mode and total time spent travelling. For each vehicle, the total kilometres travelled is summarised along with the number of engine cold starts and an indication of the emissions produced (in

terms of kilograms of carbon monoxide, hydrocarbons and oxides of nitrogen). In the pilot the emissions estimates were based on a relatively simple model which predicted vehicle emissions as a function of the age of the vehicle and the number of kilometres travelled.

The feedback sheet also includes a number of ideas for how the household members could try to reduce their vehicle use. In many cases these tend to be fairly general but in other cases detailed suggestions are able to be made including details of specific public transport services, with relevant timetables enclosed, for some trips. In all cases the suggestions are tailored to the travel patterns reported by members of the household. The following examples illustrate the type of feedback suggestions made to participants:

- **Craig**, would it be possible for you to travel by public transport one day a week or one day a fortnight? You could catch the train from Blaxland Station and change to the 301 bus at Central Station. We have enclosed copies of the relevant timetables.

- **Tony**, would it be possible to reduce the number of cold starts for your vehicle by perhaps riding a bike or catching the bus to the station once a week or once a fortnight?

- **Graham**, would it be possible for you to reduce the number of cold starts for your vehicle by perhaps getting a lift from someone else at work on a once per week or once per fortnight basis? Perhaps you could set up a regular carpool for Tuesdays (for example), where you drive one week, and pick up someone else from work, and they drive the next week. Of course whether carpooling at your workplace will reduce vehicle emissions will depend on where people live in relation to your home and work.

- **Everyone:** Remember its not just the driver who can reduce vehicle use and associated pollution - often the car is used as a 'taxi' for one or more of the passengers. Think about those trips you made when someone else drove you. Could you have got to your destination another way, perhaps by walking, riding a bike or taking public transport?

- Many trips in the Kingswood are relatively short - roughly a fifth of the trips are on the order of one to two kilometres. Could you have got to your destination another way, perhaps by walking or riding a bike? There is also a health benefit from going for a walk or a ride and if you did walk for these short trips it would probably only take you about half an hour at the most.

Consistent with the travel blending theme, the suggestions were framed in terms of reducing vehicle use on a once a week or once a fortnight basis. The feedback was produced manually from the summarised data from the travel diaries, however, in future stages it is intended to produce the feedback using artificial intelligence computer software. This will enable even more detailed feedback to be provided.

Also included in Kit 2 is a booklet titled "Thinking about your travel". This brochure is designed to encourage households to think about their travel using the details provided on the travel feedback sheets. It also included 'tips' to help people practice travel blending to

help reduce motor vehicle emissions. At the bottom of the tailored feedback sheets participants were encouraged to read the "Thinking about your travel" booklet to learn about other suggestions they could follow to reduce motor vehicle emissions.

Finally a goal card is provided. This allows either the household as a whole, or individuals, to record their travel blending goals. This goal card had a magnetic strip on the back so that it can be placed on the front of the refrigerator.

Participating households are given about four weeks to practice travel blending and then they are sent the next kit.

Kit 3: Are you on Track?

The purpose of this kit is to measure the impact of travel blending on the household's travel activity. This kit includes another set of travel diaries and vehicle log books. The household completes these over a seven day period and returns them for analysis. To encourage a higher response rate, a booklet titled, "Track your travel 2" explains the importance of completing this second set of diaries and vehicle log. After analysis, the household is then sent the final kit.

Kit 4: Keeping the Air Clean

This final kit includes the summary of travel activity from the second set of diaries/vehicle log books and an analysis of the changes in travel between the first and second sets of travel diaries/vehicle log books. This comparative summary identifies changes in the total time spent travelling and number of trips by mode for the household as a whole and also for each individual within the household. Changes in motor vehicle use are reported in terms of the changes in total kilometres travelled and changes in the number of cold starts as well as the changes in emissions (kilograms of carbon monoxide, hydrocarbons and oxides of nitrogen).

This final kit also includes a simple vehicle log book so that the household can continue to monitor their total weekly vehicle use over time as they continue to practice travel blending.

4. Experience from the Pilot

In the first half of 1996 the travel blending programme was pilot tested. At least one family member in each of the participating households worked for the NRMA. As noted earlier the travel blending programme is not focused solely on travel to work but it can be initiated within an organisation. The early stages of roll-out will most likely see the programme offered to NRMA employees so that the organisation can lead by example in later public stages of the roll-out. It was therefore appropriate for the pilot to focus on households containing NRMA employees. It should be emphasised however, that not all households involved in the pilot were sympathetic to the programme and so it was certainly not a case of preaching to the converted. The pilot involved 46 individuals and 27 vehicles from 13 households.

The participating households received the four kits, completed two sets of travel diaries and vehicle log books. At the conclusion of the pilot, detailed interviews were conducted with entire households. The results of the pilot proved to be very encouraging not only in terms of changes in attitude/awareness but also because respondents reported changes in

behaviour which they attributed to the program. Major issues raised in the detailed household interviews were as follows:

Changes in Opinions and Attitudes

- There was unanimous agreement that the travel blending package resulted in increased awareness of the use the motor vehicle and its associated environmental consequences for people of all ages. The tailored feedback was given as the major reason for this. The tailored feedback sheets also served to stimulate discussion within participating households.
- At one extreme, for one individual who did not reduce her car travel, she said that *"I started valuing my trips in the car"*. This respondent came to appreciate the role the car played *"as an important tool to communicate"* and for the access it provided for speciality shopping and leisure activities.
- One respondent said *"I used to consider convenience and cost when making travel decisions, now I consider three things: convenience, cost **and** environment"*.

Behavioural Changes

Respondents provided concrete examples of behavioural change which they attributed to having been involved in the travel blending programme. Examples were:

- One respondent used to drive to the station every day. In response to a specific suggestions made in the feedback sheet, he now catches the bus one day per week. This results in a 12 km reduction in distance travelled and the elimination of 2 cold starts per week. He needs to get up slightly earlier on that morning, and he chooses a day when he does not go to University after work. Importantly, this respondent indicated that this was a sustainable long term change in behaviour.
- Another respondent who indicated that she had set no specific goals, and who, indeed, exhibited no change between diaries, had gone to some trouble to organise a group of friends who were travelling from Sydney to a country destination in two rather than three cars as had originally been proposed. This saved approximately 600 km of vehicular travel. This respondent attributed this experience solely to the increased awareness about vehicle in use that resulted from her participating in the travel blending programme. Importantly, the study team would have regarded this person as being resistant to change on the basis of initial discussions so this made the reported change in behaviour even more encouraging.
- One respondent increased walking and car pooling trips although this was swamped by a "non-normal" long car journey. (The issue of non-normal trips will be explored shortly).
- In two other households, fairly dramatic reductions in car travel were probably largely determined by the fact that one of the household's vehicles was off the road for repairs. One respondent commented that this *"made it interesting because we had to trial other modes"*.
- A few other respondents have specific longer term plans for change - which were not possible to implement in the short time covered by the pilot. They include:

- occasionally riding a bicycle to a friends home instead of requiring the mother to drop her off and pick her up;
- organising a car pool system for children's Saturday morning sport;
- travelling to work by bus one day a week; and
- considering access to public transport in an upcoming residential location decision to enable the household to 'survive' with one rather than two cars.

Issues for Travel Awareness Campaigns

The interviews which followed the pilot study also highlighted a host of other issues relevant to travel awareness campaigns. A number of the major ones are highlighted below.

- People do not read brochures

Although a great deal of professional design effort had been spent on the brochures, in most of the participating households individuals reported that at best they had skimmed them. It was commonly emphasised that there is a lot of printed material coming into the house, either from schools or in the form of printed advertising material and there is not the time to read and absorb all of this material. Clearly this has implications for travel awareness campaigns which rely on a lot of printed material to communicate their message to participants.

There was one exception in terms of the attention given to printed components of the kits: the tailored feedback sheet. All people in all households indicated that this sheet was read and provoked discussion within the household. The reason for the interest in this sheet was that it was tailored to the members of the household and they took a greater interest in it because it had their names printed on it and they knew that the details it contained related to their travel.

- Is there a normal travel week?

The diary system was originally designed around a seven day period hoping to capture the variability in day-to-day travel behaviour. However a number of households felt that the diary weeks were 'not normal' weeks for them. This may have been because of a trip to the country or a weekend beach holiday. One family had infact delayed completing the second diary because they were waiting for a 'normal' week. This prompted one person to suggest that perhaps households have 50 'non-normal' weeks a year.

The nature of this non-normal travel is important because a long car trip over the weekend can swamp any changes people may have made to reduce vehicle use during the week. Indeed some household expressed a sense of 'failure' when they received the second feedback in Kit 4 because their vehicle use, and associated emissions, had gone up as a result of one of these non-normal trips.

- People did complete two weeks of diaries and kilometre counters.

  Although it is only a small sample, it is significant that all the participants did complete two sets of a one week travel diary and vehicle log book. While the desirability of multi-day diaries has been discussed in the literature (Golob and Meurs, 1986) the concern over response rates has always dampened professional enthusiasm for this approach.

It is fair to say that there is evidence of underreporting in the responses to the survey instruments. However, the pilot provides evidence that perfect information is not needed in order to provide feedback to participants which is sufficiently accurate and detailed to stimulate behavioural change.

5. Conclusions and Research Directions

This paper has outlined the development of a unique travel awareness campaign built around a series of diaries and vehicle log books which are completed by members of the household. These survey instruments provide:

- a means of making travel 'tangible' for participants in the program, and
- a basis for giving quantitative 'tailored' feedback to participants about their travel activity along with suggestions of changes they could make to reduce vehicle use.

These survey instruments and associated feedback sheets are delivered via a series of 'kits' which are sent to participating households over a nine week period.

The response to the travel blending programme in the pilot was overwhelmingly positive with evidence that the programme not only resulted in increased awareness of motor vehicle use and associated environmental impacts but also changes in travel behaviour which resulted in reduced motor vehicle use.

As noted in this paper the pilot involved testing the kits on a sample of about a dozen households. Because of the encouraging results obtained from the pilot, preparations are now being made for a larger Sydney trial involving about 300 households. The trial will be guided by an explicit experimental design which will enable estimates to be made of the effectiveness of the travel blending programme in terms of changes in attitudes/awareness and travel behaviour. The trial will also enable an estimate to be made of the broad community acceptance and impact of the programme.

To facilitate the move to larger sample sizes, automated systems have been developed to handle the enrolment of respondents, entry of data from the diaries/vehicle log books, analysis and interpretation of the data and preparation of tailored feedback for individual household members. These automated systems have been used in a test, involving about 100 households, of the Travel Blending program in Adelaide, South Australia, and will be used in the larger sample size trial project being prepared in Sydney.

The results of the Sydney pilot have already provided valuable insight into the effectiveness of the approach in influencing attitudes/awareness and behaviour; however, the small sample size makes it inappropriate to generalising the results. Initial indications from the Adelaide test are encouraging with about a one fifth reduction in car kilometres attributed to the Travel Blending program (Ampt, 1997). Greater confidence in the generalisability of the results and the magnitude of the impact of the Travel Blending programme will come from the large sample size studies underway in Adelaide and Sydney. Subsequent research will also be needed to examine the long term impacts of these programs on travel behaviour.

There is no doubt that the travel blending programme is an ambitious concept. The research currently being undertaken will provide further contributions to understanding the role which individual travel awareness campaigns can play in reducing motor vehicle use to address environmental concerns.

References

Ampt, E.S. and Richardson, A.J. (1994) "The validity of self-completion surveys for collecting travel behaviour data", PTRC European Transport Furum, Warwick, UK.

Ampt. E.S. (1997) "Reducing Car Travel Through Travel Blending", presented at the 25th European Transport Forum Annual Meeting, Brunel University, UK.

Anas, A. and Moses, L.N. (1984) "Qualitative Choice and the Blending of Discrete Alternatives", *Journal of Economics and Statistics*, 9(4), pp. 547-555.

Gollner, A. (1995) "Monitor of Public Attitudes: Air Quality and the Car", NRMA Limited, Sydney.

Gollner, A. (1996) "Talking Reform - Shaping Sydney's Transport for Clean Air", Proc. *ITE Regional Conference*, Melbourne, Australia.

Golob, T.F., Horowitz, A.D. and Wachs, M. (1979) "Attitude-Behaviour Relationships in Travel-Demand Modelling", in D.A.Hensher and P.R.Stopher (eds.) *Behavioural Travel Modelling*, Croom Helm, London, pp. 739-757.

Golob, T. and Meurs, H (1986) "Biases in Response over Time in a Seven-Day Travel Diary", *Transportation*, 13**,** 163-181.

Hampshire County Council (1993) *HeadStart*, UK.

Hanson S. and Huff, J. (1981) "Assessing Day-to-Day Variability in Complex Travel Patterns", *Transportation Research Record 891*, 18-23.

Hertfordshire County Council (1993) *TravelWise Campaign*, UK.

Jones, P. (1979) "'HATS': A Technique for investigating household decisions", *Environment and Planning A*, 11, 1, 59-70.

Luk, J. (1993) "Transportation Impact", Third National Telecommuting Conference, Sydney, New South Wales.

Luk, J. (1994) “Teleworking and Travel Demand Management”, *Road and Transport Research*, 3(1), pp. 26-33.

Manheim, M. (1979) *Fundamentals of Transportation Systems Analysis, Volume 1: Basic Concepts*, MIT Press, Cambridge, MA.

Richardson, A.J., Ampt, E.S. and Meyburg, A.H. (1995) *Survey Methods in Transport Planning*, Eucalyptus *Press*, Melbourne, Australia.

Royal Commission on Environmental Pollution (1994) *Eighteenth Report: Transport and the Environment*, HMSO, London.

Steer Davies Gleave (1996) *A Strategy for TravelWise in Leeds*, unpublished report for Leeds City Council and Metro, London.

Tukey, J.W. (1960). 'Conclusions vs Decisions', *Technometrics*, Vol. 2, No. 4, pp. 423-433.

Wayte, A. (1991) Road Demand management, Paper presented at *Travel Demand Management Seminar*, Perth, Western Australia, (Adelaide, PPK Consultants Pty. Ltd.).