



To switch or not to switch – why and which mode?

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Abstract:

The aim of travel demand management is to entice car drivers out of their cars to use other transport modes. Research to date has tended to find out that the reasons given for not using the environmentally friendly modes are barriers (eg. buses are not frequent enough). When the removal of these barriers occurs it does not necessarily mean that car drivers will switch to these alternative modes. An opportunity to examine the motivations of single occupant car drivers in relation to why they would or would not choose alternative modes was available through the 1996 Perth Travel Survey. This paper presents the results of an analysis of that survey.

Some interesting results are reported including that half the sample has actually contemplated using an alternative mode and that a key distinguishing factor of contemplators is experience of the alternative mode. Other factors are also reported. The majority of contemplators choose public transport and their primary motivation is easier or quicker access. There is a high awareness about the importance of health and the environment yet these factors are not reflected strongly in their travel decision making, except for potential cyclists. The paper gives some pointers for appropriate transport policy actions to create travel behaviour change.

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Introduction

In Western Australia the need to influence travel demand is now a major policy concern. The State Government's Metropolitan Transport Strategy (1995) has set mode share targets for the year 2029. The targets are in a direction away from current trends and seek to reduce single car driver only trips by replacing these trips with alternative modes including car pooling, public transport, cycling, walking and alternatives to transport such as telecommuting. This means there is a need to change people's current travel behaviour in order to achieve these targets.

With this policy in mind the Department of Transport has funded a series of primary research projects aimed at gaining a clearer insight into the travel behaviour and attitudes of Perth residents and exploring the range of approaches to influencing travel demand. This paper reports on the initial findings of one of these research projects.

Research objectives and related research

The research objectives were first, to gain an understanding of both people's reasoning for choosing and not choosing an alternative travel mode to the car. Second to establish what would be involved in getting them the change to a mode acceptable to them. The survey therefore focused on people who have the alternative mode available to them but are not currently using it. This research aimed then to identify potential target groups for mode change together with a list of both positive and negative reasons for particular mode choice. The purpose of gaining this understanding is to inform future marketing campaigns which seek to influence mode choice.

Much of the recent research carried out in this field inevitably discovers that a proportion of the population suggest that they would change from car use to another mode if that mode were more readily available. See for example: Coleman C and Curtis C (1997); Curtis C and Headicar P (1997); Hallett S (1990); Transport Studies Group, University of Westminster (1996). This is particularly the case in relation to the availability of public transport. A second aim of this research, therefore, was to get beyond the usual conclusions about transport infrastructure barriers. Whilst these are valid reasons for people continuing to use their car, experience from other research techniques, such as stated preference, shows that even when these particular barriers are overcome, people still do not switch their mode of travel. In our research we wanted to target those groups who do have reasonable transport infrastructure or services available and explore why despite the apparent removal of this barrier these individuals continue to use the car. In this way we hoped to 'short circuit' the predicted policy solution (ie improve the bus service etc.) and enable a much more detailed analysis of the reasons for mode choice which might present other policy solutions. Clearly for some the car is the most logical choice particularly where the journey to work involves a linked trip such as shopping or a take/fetch journey.

The research therefore focuses on those who have reasonable alternative transport options available and so strives to explore peoples' attitudes and motivators (together

with the strength of attitude) in order to seek an understanding of the underlying reasons for continued car use.

There is now a growing understanding of some of the key factors that differentiate 'car dependent' and non-car dependent people (RAC (1995); Stokes (1995); Steg and Vlek (1996); Curtis and Headicar (1997)). Socio-economic factors such as age and socio-economic group have some bearing on the group individuals fall into. It is however the travel related characteristics that provide a clearer indication. Those travelling shorter distances, those with some familiarity of alternative modes, those with limited access to free parking and those who do not use company cars are more likely to fall into the non-car dependent group. We use this understanding to aid our own inquiries.

Research to date, however, has done little to explore the effects of self-image on car dependency. Yet even a lay person can see that in marketing the car self-image is a powerful message. Advertisements for cars in magazines and on television dwell repeatedly on matters of self-image (buying this car will guarantee your status, sex life peace of mind etc). Other researchers write about our 'love affair with the car' and point to the role of self-image in car ownership (Stokes, Kenny and Cullinane, 1991; Stokes and Hallett, 1992).

"The car is seen by many as a status symbol both in its common parlance (of a single dimension of status), but also in its ability to place people on a number of scales of social positioning. While the cost of a car is one measure of status, other car types form sub-cultures... most clearly seen with company cars where cars offered to employees are clearly related to the status of a job within a company"(Stokes, Kenny and Cullinane, 1991:2)

In identifying appropriate messages for future marketing campaigns it is therefore important to gain an understanding of the place of self-image and this is included in our questionnaire design

Research methodology

The research findings referred to in this paper are based on an interactive household survey of a sample of 600 households conducted in spring 1997. The sample was derived from the 1996 Perth Travel Survey. This is a comprehensive survey of travel and transport patterns throughout the Perth Metropolitan Region. Deriving the sample from the larger Travel Survey provided a number of opportunities. It was possible to select a sample based on certain known travel behaviour patterns. A wider source of household information and travel behaviour was available by using data from two surveys. The face to face survey technique of the interactive survey allowed a more sophisticated methodology to collect more detailed information.

To meet the objective of focusing on attitudes and motivators while neutralising the real effects (not perceived) of inconvenient alternative transport infrastructure/services, the sample was selected from using the following criteria:

"Has anyone in your household, in the last three months, made a trip into the Perth Central Area between the hours of 7.00 am and 9.00 am using their privately owned car in which they were the only occupant?"

The following rationale were applied to the sample criteria:

1. The provision of public transport services to the Perth Central Area between 7.00 am and 9.00 am are the best in the Perth region. Therefore while the critics would suggest that it is mistaken to focus on journeys into the central area, which are more likely to be work journeys we would justify this approach for two reasons. First it enables the research to go on beyond the transport supply barriers identified above. Second whilst journeys to work now form only 20% of all journeys this remains a large proportion and a journey associated with peak demands on road resources. The 1991 census journey to work is dominated by the Perth CBD as a destination. Because of the nature of the journey it lends itself well to use of alternative modes, the critical mass can be served by public transport and enables car-sharing arrangements to be established.
2. Drivers of company cars are the people who are least likely to change, as they do not bear the cost of using their motor car.
3. If they have another occupant in the car, they are already car-pooling.
4. Respondents were not asked the purpose of their journey.

The use of the face to face survey allowed for more sophisticated techniques to be used. To help draw from the respondents' reasons for making decisions, a cue card system was applied. This approach was favoured for the two reasons. First it assists in drawing from respondents' attitudes and motivations rather than just "neutral" inconvenience responses. This was very much the case with self-image motivators. Second it allowed the survey designers to categorise potential reasons.

The survey questionnaire design also set out to determine if respondents were pre-contemplators or contemplators. This was done to ascertain the number of each group and assess differences and similarities between each group. This approach draws on work by Prochaska, DiClemente and Norcross (1992) who in their work on the 'Quit Smoking Campaign' identified 5 stages of behaviour:

- 1 Pre-contemplators (non-contemplators)
- 2 Contemplators
- 3 Preparing to act
- 4 Actors - current users of alternative modes
- 5 Long term maintenance

Individuals move from one stage to another, in both directions. Our research concentrates on the first two categories and identifies contemplators from pre-contemplators by asking if they have ever considered taking trips during the morning peak to the CBD by any other mode.

The survey was also designed to explore both people's reasoning for their choice of alternative mode, and the reasoning for not choosing our suggested alternative mode.

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The mode we suggested depended on the distance the respondent lived from the Central Area. Trip distance affects mode choice for walking, cycling and car-pooling, and therefore also impacts as a potential barrier to using a particular mode. In the case of car pooling it loses its appeal if the driver has to deviate too far or too long to pick up or drop off the passenger. Longer travel distances tend to reduce this as well as make the benefit of sharing car travel costs more appealing. To take the affect of trip distance into account, the offered alternative modes were divided into the categories shown in Table 1.

Table 1: Trip distance and suggested alternative mode.

<u>Distance:</u>	<u>Alternative Modes:</u>
0 to 3 km	walk cycle or bus
3 to 5 km	walk cycle or bus
5 to 10 km	cycle bus or train
10 to 25 km	bus train or car-pool
25 km plus	train or car-pool

Findings

Sample characteristics

Of the 600 individuals in the sample two thirds are male, there is therefore a gender bias. The average age of the sample is 41 years. The majority are in managerial or professional occupations. Representation from manual and non-manual occupations is low, as one would expect in a sample focusing on journeys to the Perth Central area. The sample comprises households on above average incomes (80% had a household income of \$37,000 or more, the average for the population as a whole being about \$30,000).

Unfortunately whilst there is an over representation of those living within easy walking and cycling distance from the CBD (3-5km) (in relation to the total population) the actual sample size is too small a group for meaningful analysis. Almost half the sample lives between 10 and 25 kms. In relation to other travel characteristics just over a third of the sample (39%) could park in the CBD with no cost or time constraint. The majority had a cost constraint to parking (52%). Of significance is the fact that the majority (90%) had had some prior experience of their selected mode of transport, three quarters of these had done so in the last year.

Sample Attitudes

Respondents were asked their attitudes to issues relating to health, economic and environmental factors, self-image and safety. Positive environmental attitudes featured

strongly with almost all (95%) agreeing that it is everyone's responsibility to help control air pollution. There was not however the same clarity about the contribution of the car to environmental problems in cities. In this case whilst two thirds (63%) agreed with the statement there were a large proportion who were not sure (13%). A large proportion of the sample agreed on the need to maintain a healthy lifestyle, with 82% agreeing that they liked to exercise regularly to keep fit and 79% who tried to avoid foods that were unhealthy.

Attitudes to statements on lifestyle and image are also revealing. 88% of the sample agreed that a car makes you feel independent and free, while 79% disagreed with the statement that the type of car you drive needs to reflect your social position. A large proportion (79%) agreed that driving a car is important to them. The nature of this statement means that it is not possible to be clear about the reasoning behind this attitude. Of those who agreed that 'driving a car is important to me', they also agreed that their life was more hectic than 5 years ago (69%), and that 'having a car makes you feel independent and free' (91%). But few agreed that the type of car you drive needs to reflect your social position' (17%).

The potential to switch mode

There is significant potential for modal change. Half the sample had contemplated changing mode. Compared with surveys in the UK this is a significantly high proportion of contemplators. A survey of car commuters into Liverpool, UK found only one third of contemplators (called 'the persuadables') (Stokes, 1996). This was also the result in another survey of car commuters in the Oxford region, UK with only 37% contemplating mode change (Curtis and Headicar, 1997). This high proportion of contemplators found in the Perth survey may well be the result of the focus on those who had other mode choices available to them. Of further note in the Perth survey is that of those who had not contemplated change, half could actually use an alternative mode if they had no choice but to make the journey into Perth without the car.

It is possible to distinguish between the two groups – contemplators and pre-contemplators. In relation to socio-economic factors a higher proportion of females (56%) are contemplators than males (46%). Those in younger age groups are more likely to be contemplators. A large proportion of professionals and para-professionals are contemplators compared to those in manual occupations. This may also be linked to educational attainment with a higher proportion of university educated people being contemplators (56% as compared to 43% for those without a university education). Household income may have some bearing on whether someone is a contemplator; it would appear that as income levels rise the likelihood of contemplating change declines. Parking restrictions play some role in relation to contemplators with larger proportions of those with cost constraints to parking being contemplators (of those with cost constraints 57% were contemplators).

A discriminant analysis using the socio-economic, travel and psychographic characteristics indicates those factors that have the most marked effect on whether someone is likely to

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fall into to contemplator or pre-contemplator group. This output is provided at Appendix 1. The analysis gives a high degree of confidence to the following factors. Experience of alternative mode selected – the more recent the mode was used the more likely the individual to contemplate change. Age – the younger the person the more likely to contemplate change. Gender – females are more likely to contemplate change. Parking – those with constraints are more likely to contemplate change as are those living closest to the city. All of these factors are confirmed by findings in other related research (see above). Two psychographic factors also stand out, those who are less likely to agree that 'driving a car is important to me', and those who are more likely to agree that live is more hectic than 5 years ago.

Contemplators and their preferred mode

The majority of contemplators would use bus as the alternative mode to the car for the morning peak CBD trip (55%). Just over a third (35%) would travel by train interestingly car pooling hardly features with only 3% of contemplators selecting this mode; this has implications for the preferred approach put forward in the Metropolitan Transport Strategy. Walking and cycling are selected by very few (1% and 4% respectively) but this must also be measured against the fact that the sample is skewed away from those living close to the CBD.

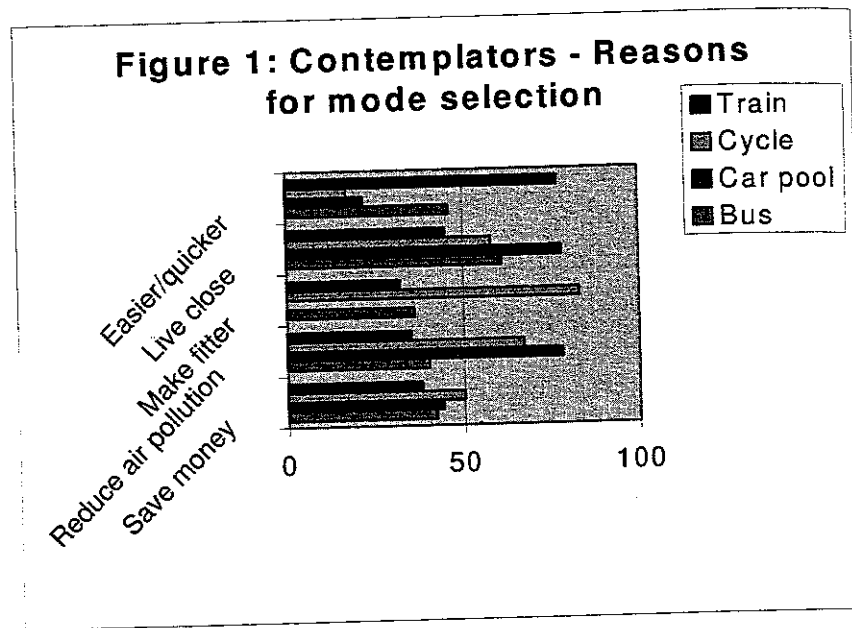
There is a significant relationship between mode selected and distance the respondent lives from the CBD. Those living in close proximity to the CBD select walking or cycling. Bus use dominates the selection for those in the middle distance bands, while car pooling and train feature most strongly in the longer distance journeys.

Contemplators and the reasons for their selected alternative mode of travel

Respondents were asked to identify the reasons (from a pre-coded list) why they chose to travel by their selected mode (figure 1). They were then asked to rank these reasons. Convenience reasons were selected by the majority of respondents in each mode group, with the exception of cycling. For example 61% of those who selected bus as the alternative mode said they lived close to the bus stop, 77% of those who selected train said it was easier or quicker than car.

Health reasons were selected by the next largest proportion of respondents in the bus (54%), train (54%) and ferry (57%) modes - in these cases referring to the possibility of saving time on the journey. Only cyclists appear to be strongly motivated by the health benefits, with 83% stating that they would select this mode for fitness reasons. A large proportion of car-poolers (75%) and cyclists (67%) selected reducing pollution.

Economic reasons (the need to save money) rank lowest, for example the proportion in each selected mode group stating that that mode would save them money was: bus (38%), car pool (44%). This is interesting when considered in relation to the importance of parking costs as a constraint and perhaps demonstrates the issue of up

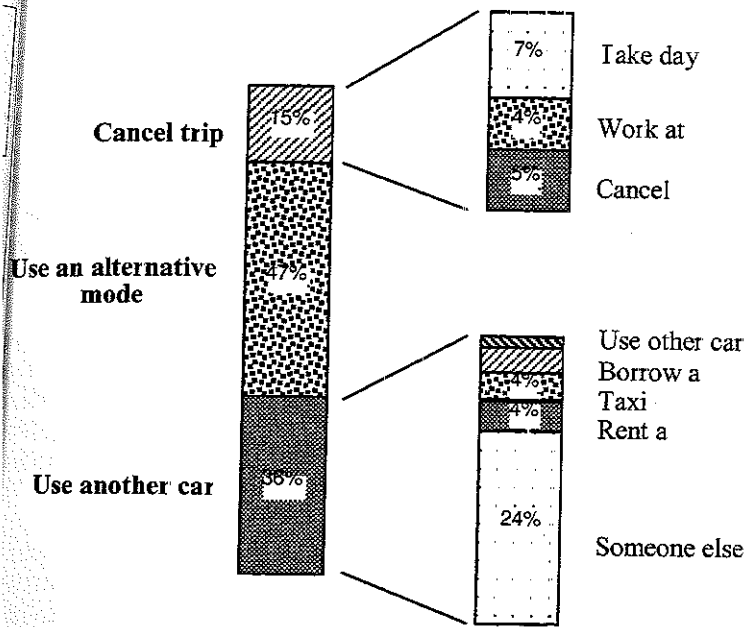


front' and hidden costs to motoring. James and Brög (1998) shows that car drivers under estimate travel costs by 60%.

Pre-Contemplators

This half of the sample had never considered using another mode of travel for the morning peak CBD trip (figure 2). They were questioned to see if it would be possible for them to travel in by another mode. Almost half indicated that they could use another mode rather than car (47%). One group were committed car users, just over a third (36%) indicated that they would use another car to make the trip either by having someone else driving them, borrowing another household or non-household car, renting a car, or taking a taxi. 15% indicated that they would not take the trip at all, a quarter of these would work at home instead.

Figure 2 Travel Alternatives Chosen by Pre-contemplators



Of those pre-contemplators who would continue to make the trip to the CBD rather than cancel the trip (ie. the 47% who would use an alternative mode in figure 2 above) the majority select bus (50%) as their 'preferred mode', followed by train (25%). The majority of potential bus and train users select convenience reasons, they live close to the stop/station and the journey is quick and easy. Health reasons (ie. relaxation) are the next largest group of reasons selected by bus and train users and then environmental reasons. This pattern differs slightly for car poolers for whom economic reasons follow convenience reasons rather than health.

Characteristics of people in each selected mode group

Analysis of the characteristics of people by their mode choice reveals some significant findings. Respondents were classified according to the preferred alternative mode of travel: self-powered, public transport or car pool. Using discriminant it was found that the ability to predict group membership was very good with 68% chance of predicting those in the self powered group and 61% for the public transport group and 67% for the car pool group.

Whether or not the individual is a contemplator or pre-contemplator is highly significant, as is distance from the CBD. Those in the self powered mode groups are more likely to have contemplated mode change, live a short distance from the CBD and have a high level of education. Those in the public transport group are more likely to

live further from the CBD, have had recent experience of using public transport and be in an older age group.

'Removing the barrier' – why the sample do not use the available alternative mode

The next stage in the research was to explore the reasons why people in a given distance band from the CBD did not use an available alternative mode. Where the respondent had already selected this mode in the first stage of the research, an appropriate alternative was offered to the respondent (see Table 1). Respondents were asked to select the reasons why they had not considered travelling by that mode and again to rank these reasons in order of importance.

For all modes the largest proportion of respondents selected inconvenience items. These included the statement that individuals were too busy, or that they lived too far from the stop or that waiting times were too long. Few people raise economic reasons; they do not think they will save much money or saving money is not that important to them. Environmental factors are rarely selected as reasons not to take the alternative mode.

Potential cyclists show a different pattern. Inconvenience reasons are still important (too busy), but the inability to relax was selected by a large group as well as concerns about not being healthy enough. Concerns that the atmosphere is too polluted were also raised. Interestingly concerns about self-image feature more strongly with this group than for other modes.

Towards action – the next steps

The findings of this research give clear guidance to those seeking to influence individuals to switch from single car driver to alternative modes. First there is encouraging evidence that modal change is possible to achieve. By focussing on journeys to a particular location (the CBD), during a particular time frame, and by focussing on those locations which do not have problems with transport infrastructure and service provision we find a significant proportion of the sample had contemplated change. Furthermore, even in the group who had not contemplated change the majority could in fact change mode if necessary. Second it is possible to identify both particular groups of people who are likely to switch mode and the reasons why and why they do not switch. All of these sources of information can be used to inform education and marketing campaigns.

Media messages

Given that the purpose of this research was to gain an understanding in order to inform future marketing campaigns that seek to influence mode choice it is useful to identify the main message areas. The reasons for alternative mode choice are important. The majority state that the choice is a convenient one and this should be capitalised on. The

fact that people find the journey easier or quicker offers a solution to those who conversely suggest they are 'too busy'. Messages that include information on journey times should be included where appropriate.

The fact that economic and environmental reasons do not feature strongly in reasons for alternative mode choice suggests the need for messages that seek to raise awareness on these issues. This could include real costs of car travel, information on the impact of pollution on people, including children. The health benefits should be capitalised upon. Messages should draw attention to the relationship between ill health and inactivity and focus on the synergies between mode switching and healthy lifestyles in our hectic lives.

Different actions for pre-contemplators and contemplators?

There remains a question as to whether any education or marketing message should be focussed on particular audiences. Given the clear distinctions between contemplator and pre-contemplator groups it would be possible to adopt different strategies for each group. There are however synergies which can be achieved for both groups.

There is a need for raising awareness in the pre-contemplator group. Educational campaigns that focus on the economic and environmental benefits of switching mode are important, as are messages that seek to correct the miss-perceptions. Such campaigns would aim to shift pre-contemplators into the next stage to become contemplators. The campaign would also serve as a reminder/memory jogger to contemplators.

Any action via an educational message should be seen as part of a package of measures to encourage pre-contemplators to shift into the contemplator group. The research evidence both from this project and others identifies the importance of both 'push' and 'pull' actions. A change in the parking strategy in the Perth Central area to impose more effective cost constraints would clearly be an effective 'push' action given the evidence above. Giving pre-contemplators experience of public transport or cycling through the use of free trial tickets, a 'buddy' scheme (chaperones) and good information would clearly be an effective 'pull' action. Although if this latter approach is to be effective it needs first to be undertaken in areas where the public transport and cycle networks are of good quality. Second it needs to be linked with constraints to the car such as car free days since it is the highly paid, university-educated groups who lack public transport experience.

The actions most appropriate for contemplators require careful consideration. These are people who have actually thought about using an alternative mode. They have recent experience of using that mode. The majority select the alternative mode because it is convenient (close to their home with a frequent service), yet they still continue to drive their car as a single occupant into to Perth Central area. Work undertaken on another of the Department of Transport projects (John, 1998) suggests that it is important to change people's beliefs as a step towards changing behaviour. That is to get a message

across that changing their behaviour can make a difference. An education campaign, which develops this theme, would therefore be of value.

What is also needed is some way to more directly focus any campaign on the particular group in order not to waste the effort by spreading limited resources too thinly. The research findings show that it is possible to identify particular target groups and in this way any education campaign can be more directly targeted. Work by James and Brög (1998) using an individualised marketing approach and by Ampt (1997) using her method known as 'Travel Blending' concentrates on direct contact with each household and seeks to customise travel change suggestions to the individual household. Whilst these approaches are effective they are costly. This is because they need to contact every household in order to find contemplating households (for example in James and Brög's work every household is contacted and asked to participate, those not interested are then discarded). The goal must be to benefit from the strategies applied by James, Brög and Ampt in direct work with households, but to find a way of identifying the contemplators in a more cost-effective way.

Targeting contemplator groups.

The research findings suggest a possible method. First it is clear that for contemplators the alternative mode selected depends upon their distance from the central area. There is a clear relationship with walk journeys dominating the 0-3km-distance band, cycle journeys the 3-10km band, and bus journeys in the 10-25km band and only at this point does car pooling journeys feature. Train dominates the further distance (25km plus). We have also established the importance of focusing on areas which have good quality transport infrastructure. This suggests the possibility of setting up focussed experiments in particular locations. For example an experiment to encourage a switch to cycling in an area between 3 and 10km from the central area which is already well served by cycle routes and signs. Or to encourage a switch to bus use select a location 10-25kms from the central area with a quality bus route (with spare capacity)

Having identified the location it would be possible to use tried and tested strategies such as for buses – improving information and legibility ('re-badging' buses, new easy to understand timetables at stops and for households, personal information tailored to individual needs), free bus tickets for a trial period and so on.

The outstanding issue is then to identify actual households or specific areas where people are likely to fall into the contemplator group. The findings above suggest some socio-economic variables (age and gender for example) which can be used to identify likely contemplators. Our task is twofold, first to refine details of the socio-economic characteristics by further analysis of the household characteristics from the main Perth Travel Survey. Second, to seek guidance from the marketing industry on lifestyle groupings and geodemographic mapping.

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The self-image issue

One aspect our research set out to explore was the importance of self-image as a barrier to switching mode. If the findings are to be believed self-image does not feature as a strong deterrent. For example in response to the statement 'the type of car you drive needs to reflect your social position' only 15% of the sample agreed. For each of the cue cards used for reasons why or why not an alternative mode was used, two cue cards contained self-image statements. Only in the case of potential cyclists did these feature as a barrier, in relation to 'I would look ridiculous/unprofessional riding a bike'. Given the millions spent on advertising the car it is hard to believe self-image is not an important barrier to switching mode. This area certainly warrants further research, but is likely to involve more costly methods than we were able to pursue.

Summary

The key factor in identifying a contemplator is recent experience of the alternative mode. Half the sample are contemplators. Marketing should focus on convenience messages for contemplators where alternative modes are actually convenient alternatives. Education and individual testing of the system will move pre-contemplators to contemplators and alternative mode users. There will be more likelihood of success if this is done in conjunction with push-pull strategies. The next challenge is to encourage contemplators to become actors.

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Appendix 1
Discriminant Function Coefficients: Contemplators vs. Precontemplators

The analysis gives a chi square score of 104 898 with 14 degrees of freedom and a significance as close to 100% as the statistical program SPSS can report

Factor	Function (highest values first)
Experience of alternative mode selected	-.78390
'Driving a car is important to me'	.39816
Age category	-.26029
Gender	.18693
'TV adverts OK, but sometimes devious	.17361
Parking constraints	.15648
'Live life to fullest, no matter the cost'	.14357
Distance from CBD	.12876
'To help control pollution is everyone's responsibility'	-.12462
'Like to exercise regularly to keep fit'	.12255
'Try to avoid foods that are unhealthy'	-.11726
Household income	-.09970
'Having a car makes you feel independent and free'	-.06947