

EVALUATING TRAVEL BEHAVIOUR CHANGE PROGRAMMES

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1. BACKGROUND TO THE PROBLEM

Since the 1950s the private car has provided an affordable method of personal transport that has transformed individual mobility. The “predict and provide” approach to transport planning resulted in the transport infrastructure being developed to meet the needs of the private car. This has even extended to wider planning policy with retail and leisure facilities locating to areas with good, often almost exclusively, car access.

In more recent years the problems generated by this approach have become evident. In 2004 alone (DfT 2005) 3,221 people were killed on the U.K.’s roads, with 25% of these being pedestrians or cyclists. A further 31,130 people were seriously injured. Exhaust emissions cause serious local air quality problems with road vehicles accounting for 48% of the U.K.’s Carbon Monoxide emissions, 41% of Nitrogen Oxides and 27% of PM_{10} particulates. On a global level road traffic accounts for 25% of the U.K.’s Carbon Dioxide emissions and 26% of our total energy consumption. Land use from both roads and parking provision is also a serious issue, as is the cost and frustration cost by increasing levels of congestion. All of these problems make the existing level of car use, and the increasing trend shown in Figure 1, unsustainable. This has prompted the Government (DETR 1998, DETR 2000, Scotland Office 1998) to seek measures to reduce car use, without reducing economic growth or personal freedom.

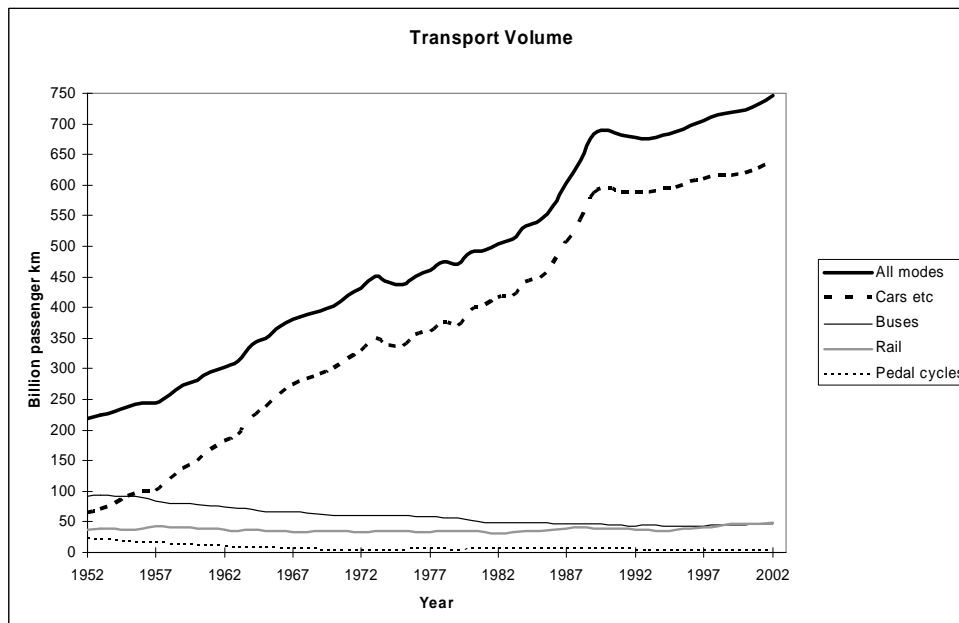


Figure 1. The volume of passenger travel in Britain from 1952 to 2002. Figures taken from (DfT 2005).

To improve the sustainability of our transport system a variety of measures are available. Some involve reducing the number or length of journeys that people undertake while others aim to change the mode of travel used.

- Physical improvements to public transport systems, including new rail or light rail routes or services, more frequent buses, park-and-ride provision for buses or trains.
- Changes to the existing road infrastructure, such as pedestrianization, parking restrictions, bus only lanes, high occupancy vehicle lanes, improvements to walking or cycling routes.
- Financial incentives or penalties, including road user charging, congestion charges, tolls, taxes on fuel, parking charges, subsidized public transport fares. Generally these measures are designed to ensure that the car driver is aware of the full economic and environmental cost of their journey, and makes travel choices accordingly.
- Interventions at the planning level to control the location of major trip generators such as supermarkets, leisure facilities, businesses and new housing developments.
- The use of education, information, or advertising programmes to encourage people to think more carefully about their travel behaviour and adopt more sustainable travel habits.

This final option might be best described as “Travel Behaviour Change Programmes” and will be the main focus of this paper.

2. TRAVEL BEHAVIOUR CHANGE PROGRAMMES

Travel Behaviour Change Programmes (DfT 2001) are an attractive option to governments (UK, Scottish and local) because they are viewed as inexpensive and non-disruptive as well as being less controversial. They aim to change travel behaviour through more psychological, rather than physical, means. They aim to alter the travel decision made by each individual car user. They rely on the decision making process being based on more than physical or financial factors.

For example, the trip maker may be making their decisions based on incomplete or inaccurate knowledge of the available alternatives and their true costs. The trip maker may also not have considered some of the wider implications of their choice, such as environmental impact, health impacts or benefits. Their current choice may even simply be a habit, which is no longer their best option. Travel Behaviour Change Programmes aim to tackle this by providing information, education, and persuasive advertising to encourage the trip maker to look again at their available choices and make a new, better-informed, decision.

The most common types of Travel Behaviour Change Programme are:

- Travel Awareness Campaigns.
- Personalized Travel Planning (PTP).
- Workplace or School Travel Plans.
- Home shopping, teleworking and teleconferencing.
- Car sharing schemes.

2.1 Travel Awareness Campaigns

Travel awareness campaigns usually take the form of large advertising or public-information campaigns via television, radio, newspapers, magazines, posters, or mass-distribution of leaflets. These campaigns aim to improve the general understanding of the problems that can be caused by transport choices. They may also indicate what can be done to solve these problems by changing a person's own travel behaviour. They can also aim to improve knowledge of the alternatives available in the form of walking, cycling and public transport. Therefore, the normal advertising by public transport companies might also be included in this category. Some campaigns might be targeted at school children and may include material that can be included within school lessons. Travel to school has become increasingly dominated by the private car (Gilhooly and Low 2005) and is a particular contribution to peak-hour congestion, as well as having potential long term consequences for the travel behaviour habits that are learned by children. These campaigns may find themselves directly competing with commercial advertising campaigns by car manufacturers using the same media. Recent awareness raising campaigns in the UK have included:

- 'Travelwise', a package of campaigns run by UK local authorities, which include Walk to School Week, Bike Week, and Car Free Day (National Travel Wise Association 2006)
- 'In Town Without My Car', part of European Mobility Week, which encourages towns and cities throughout the European Union to implement specific measures which will have lasting effects in supporting alternatives to the car (DfT 2002)
- 'Choose Another Way, a media advertising campaign run by the Scottish Executive which highlights the disadvantages of car use and encourages car users to consider the benefits of alternatives (Scottish Executive 2005)
- 'Learn to Let Go' was a national travel awareness campaign launched by the Scottish Executive in the summer of 2001, supported by bus and rail operators. (Dudleston and Hewitt 2005)

2.2 Personalised Travel Planning (PTP)

The key feature of this approach is that it provides each individual with information that is specifically targeted at their individual travel pattern. A trained advisor will visit an individual at home and assess their travel needs. By taking into account the needs of the individual, the alternatives offered will all be practical options tailored to the individual's requirements. For example, there is little point in attempting to encourage public transport use where none exists, or in suggesting that someone with a mobility difficulty uses an unsuitable transport mode.

The advice and information that can be provided is often extremely detailed. For a particular journey between 'A' and 'B', perhaps to and from work, the trip-maker will be provided with a range of alternative travel options. The

emphasis will be on modes that provide an alternative to the private car and usually include bus, rail, cycling or walking. The travel advice will be extremely comprehensive including, for example, details of which bus number to use, the location of the bus stop, the walking time to the bus stop, the departure time of the bus etc. This method aims to make it as easy as possible for the individual traveler to switch to a more sustainable mode of transport. This can be extremely important in trying to break habitual choice behaviour.

For each travel option the adviser will provide details of information on the journey time and cost, to help the traveler make an informed choice. In many ways this is similar to the approach taken by “route choice” software used by many motorists. This approach is based on the assumption that many trip makers may not be fully aware of all of the transport options available to them. For example, their perception may be that public transport provision is worse than it really is. They may also not be aware of the true cost of each option, either the true personal financial cost, or the wider environmental cost. This approach attempts to remedy this by providing detailed accurate information to the trip-maker to help them make a better informed decision as to how they should travel.

Personal Travel Planning tends to be most successful in large urban areas where there is a readily available public transport alternative. In particular, they tend to work where there is a ‘perception gap’ between what people think their local public transport is like compared with what it is really like. In fact some personalized travel planning initiatives are linked to the provision of new or improved public transport services, timetables or travel information. At the present time there are two main methods of Personal Travel Planning in use in the UK at present: ‘TravelSmart’ and ‘Living Change’

2.3 Travel Smart

This method (Ampt 2003), formerly known as IndiMark (Socialdata 2002) is used by the German company Socialdata and by Sustrans. It attempts to target individuals who have expressed an interest in changing their travel behaviour. Usually they are asked, by telephone, a small number of questions that enables them to be identified as not already being a regular user of sustainable transport, but being interested in changing. It makes sense to target the individuals most ready to make a change as motivation is always important in encouraging any change in behaviour. These individuals are then offered a range of information, encouragement, and incentives. Examples include:

- maps and timetables for public transport routes that are of direct relevance to individual's needs;
- provision of general maps and timetables, with guidance as to the routes that are of relevance to the individual;
- information on other environmentally friendly modes (walking and cycling) usually in the form of general walk and cycle route maps for the area.

- They are also offered a home visit to discuss their needs in more detail. In return for this they may be offered free public transport travel tickets (usually for up to one month) to encourage people to try out the system.

2.4 Living Change

This approach, formerly known as Travel Blending', is used by the U.K. company Steer Davies Gleave. It targets the whole population within the selected community, rather than attempting to identify those most likely to change their travel behaviour. In addition to encouraging modal shift, the Living Change programme seeks to reduce the overall number of trips by combining or 'blending' activities or destinations, as well as bringing about modal shift. (Cairns et al 2004, Buchanan and Coleman 2004). Questions are asked to identify each household's travel needs and enable an adviser to provide them with personalized advice. A range of tools are then used to try to influence household behaviour. Each household will be offered a choice of options. Some households may accept the simplest options such as brochures providing general information on how to save money, time, stress, or reduce environmental impact, or activity leaflets specifically aimed at children.

More committed individuals will be asked to complete a seven-day Travel Diary. This aims to make them more aware of their present travel patterns and to help the planner decide what to offer them. They will then be given suggestions as to how they might reduce travel, for example, by combining journeys that have more than one purpose. They will also be provided with personalized journey plans which detail practical travel alternatives using more sustainable modes. To encourage this change in behaviour they may also be given a free public transport ticket. Participants are encouraged to complete a second travel diary approximately a month after starting to make the changes so that changes can be measured and further feedback provided. The message of behaviour change is designed to diffuse into the wider population by word of mouth and by example, as individuals follow others who have made the change. So the effectiveness of the campaign is designed to extend well beyond the target audience.

2.5 Workplace or School Travel Plans

These are measures that can be introduced by employers or by schools to encourage more sustainable methods of travel to and from the workplace or school. In addition to general and personal travel planning information this may include measures such as secure cycle storage or shower facilities for cyclists, financial support for bus services, or workplace parking restrictions or parking charges. Parking charges may even be targeted on those who are identified as having a suitable alternative mode of travel, although this can be controversial. Staff and students may also be provided with detailed information on appropriate public transport services. Workplace travel plans may be targeted at customers as well as employees.

To encourage walking and cycling, school travel plans may be backed up by measures to improve road safety. For example, traffic calming measures, safer cycle routes, safe crossings, and drop-off restrictions. Schools may also introduce 'walking buses', 'cycle trains' or traffic calming measures. Promoting sustainable school travel also aims to contribute to health benefits linked to physical activity and hopes to form the travel habits which will be carried into adulthood.

2.6 Home Shopping, Teleworking and Car Sharing Schemes

Journeys for the purpose of shopping account for 12% of all private car km (DfT 2005) approximately half the value accounted for by commuting. Therefore, if more goods are purchased via the internet then a large number of car trips can be avoided. These could be replaced by an efficient home delivery service that avoids multiple individual car trips from similar locations to a large out-of-town supermarket. Teleworking and teleconferencing can also reduce the number of trips that individuals make. Even if an employee works only part of the day at home then that may at least displace their journey to a less congested time.

Car-sharing schemes are motivated by the fact that each car journey transports an average of only 1.6 people, reducing to 1.1 people for commuting and business journeys (DfT 2005). Therefore, car-sharing could dramatically reduce the number of private car kilometres recorded each year. These schemes are often part of workplace schemes where there is a common destination and time of travel.

3. Measuring the Success of Travel Behaviour Change Programmes

It is natural to ask the question "How effective are Travel Behaviour Change Programmes?" Therefore, it is important to measure the success (if any) of any programme. In the context of Travel Behaviour Change Programmes the following terms are used:

- **Monitoring:** The collection and input of data, including the method by which they are collected
- **Evaluation:** The interpretation of the input data into a numerical measurement of change
- **Appraisal/Assessment:** The process of combining monitoring and evaluation into an overall examination of impacts.

These provide a numerical measurement of the improvement that the scheme provides. The most common measures are:

- changes in modal split (although this will not show up any reduction in the distance being traveled by car, only the total number of trips)
- reduction in vehicle kilometers of travel by car drivers (although this will not show up other changes in travel behaviour, such as changing from being a car passenger to cycling or using public transport)

- increases in public transport use (or walking or cycling) (although this would not show whether car use had reduced, or simply been replaced by other car journeys)
- local air quality or greenhouse gas emissions.

A number of organisations and companies have produced guidelines for the evaluation of travel behaviour change programmes, notably (Dirks and Voerknecht 2004, European Commission 2001, Brog 2000, Finke 2003). These guidelines have generally been developed for specific projects or used on an 'ad-hoc' basis, and no common appraisal framework has been adopted on a UK-wide or a worldwide basis.

3.1 How to Measure and Change in Travel Behaviour?

There are three main ways in which any change in travel behaviour can be identified.

- (a) Retrospective Cross-sectional survey. This is only conducted after the Travel Behaviour Change programme has been completed. Using this single survey respondents are asked about their travel behaviour both before and after the Travel Behaviour Change programme. There are obvious difficulties in the accuracy of the remembered "before" data.
- (b) Repeated Cross-sectional Survey. A random sample of the population is surveyed before implementation of the programme, then a new random sample of the population is surveyed after implementation. As a result two different samples are being compared, and this can require a large sample size if it is to give statistically significant results.
- (c) Panel Survey. The same random sample of the population is surveyed both before and after implementation of the Travel Behaviour Change programme. This eliminates the variance between samples, so allowing a smaller sample size to produce statistically significant results. However, there may be an issue of "panel fatigue" as this group of people are being asked to take part in two surveys.

In general the Panel Survey is preferred, but it does have some problems. There is usually a reduced response rate to the "after" survey and there may be bias in the nature of those who dropout. For example, they may tend to be the ones who have not changed their travel behaviour. This attrition may also depend on household characteristics and so this may also bias the results. A detailed description of the biases that might occur in a panel survey of this nature is contained in (Richardson et al 2003). All the survey methods have bias problems. Even for the "before" surveys individuals who are most likely to change their travel behaviour may be more likely to reply. Certain sections of the community may be more likely to reply, perhaps because they have more time.

Larger sample sizes are required to detect a smaller percentage change in behaviour. Therefore, Travel behaviour Change Programmes that target groups who are well-motivated to change, and thus produce a larger change in behaviour, will be easier to monitor.

3.2 Eliminating Background Influences

There is always a problem in deciding to what extent any change is actually due to the Travel Behaviour Change Programme rather than other factors, such as changes in fuel price, transport infrastructure, economic conditions, or weather/seasonality/holidays. To take account of these external environmental factors it is necessary to include a control group. This group of people should be in the same area as the “campaign group” and thus subject to the same background influences, but not the Travel Behaviour Change Programme. By carrying out identical before-and-after surveys on both these groups the effect of the background influences can be isolated and removed from the effect of the Travel Behaviour Change programme.

To minimise the influence of seasonality on the results, pre and post campaign surveys should ideally take place at the same time period in consecutive years. Ideally, other major influences should be the same in each survey, such as school or workplace holidays, and business trading levels should be reasonably consistent between surveys.

3.3 Survey Methods

It is unusual to collect survey data by face-to-face interviews as this is relatively expensive, requiring a large number of staff if everyone is to be interviewed within a short period of time, especially if visits can only take place at times of the day when people are most likely to be home.

An alternative is the telephone survey. However, this requires experienced interviewers to minimize the risk that the interviewer may influence the answers that the respondent gives. Response rates can be high but it is very labour intensive.

The most common method used is the Postal Survey. These are relatively inexpensive, less labour intensive, and tends to give accurate and consistent results. However, response rates tend to be low even if a reply-paid envelope is provided. Response rates can be significantly improved if non-returnees are followed up by a telephone reminder, when a telephone interview can be carried out. Any survey technique or questionnaire will generally be tested initially on a pilot group who are not involved in the campaign, but who have similar characteristics to the target groups. This should allow any problems with the survey to be corrected before implementation begins.

The ‘before’ and ‘after’ surveys will usually take the form of a ‘travel diary’ where the respondent is asked to record their travel behaviour over a seven day period. This will include the trip mode, purpose and time of travel. The form will also request some demographic data from the user such as employment status, number of people in household, number of cars in the household, age, and income level. Stated preference questions may also be included to gauge user attitudes that may have changed, or awareness of transport provision or issues. The ‘Travel Blending’ methodology used by

Steer Davies Gleave employs a joint travel-diary and attitudinal survey technique (Buchanan and Coleman 2004). The revealed 'travel diary' data should be accurate if it is written down straight away, but the process of daily recording is subject to user fatigue.

The survey could be restricted to one day, rather than a week, but because of the larger variability in daily travel a much larger sample size of households would be needed. In addition this might fail to detect cases where the trip maker has been encouraged to combine several journeys that would previously have appeared on separate days.

An alternative is to ask the user to recall their travel activity over a recent time period, typically one week. However, this recalled data is susceptible to the user forgetting trips, or being influenced by what the user thinks they should have done.

3.4 Alternative Monitoring Methods

A way of avoiding any reporting errors that arise from travel diaries or questionnaires would be to directly observe the overall travel patterns in the survey area could be used. For example through car counts, parking counts, passenger counts, or bus queue observation. This might use an observer or video analysis. Direct observation of travel activity is labour-intensive and is difficult to associate with the individual. It is easiest to do if the programme is confined to an area where monitoring can be most easily carried out, for example, within a single retail development or industrial estate.

More modern approaches might involve GPS tracking of the individual's car, or even of the individual themselves, perhaps via their mobile phone. Public transport trips could be monitored via data collected by public transport providers from the users electronic travel card, e.g. Oyster Card. There would be obvious issues of bias in the type of individual who would consent to such intrusive monitoring.

4. RESULTS FROM PREVIOUS INITIATIVES

In this section we present a review of existing monitoring results from a variety of different types of Travel Behaviour Change Programme. The data sources indicated in Table 1 by the numbers 1,2,3,4,5,6 refer in turn to the references (Cairns et al 2004, SISTech 2004, Zhang 2005, Sustrans 2002, Sustrans 2005). In Table 1 the abbreviation "P" in the "Survey Tyo2" column indicates a Postal Stated Behaviour Questionnaire & Travel Diary. The results are ranked according to their effectiveness in changing the car driver component of the modal split.

Location (and survey type)	Data Source	Year	Scheme Type	No of people eligible (hh = households)	No of Participants (hh = households)	Tool Take-up	'After' Survey Response Rate	'After' Survey Sample Size	% car driver (before)	% car driver (after)	% Change in Car Driver mode share	% car driver or passenger (before)	% car driver or passenger (after)	% change in car driver or passenger	% Change in car kilometres
Bracknell	6	2003/04	Workplace						73%	52%	-29%	82%	64%	-22	
Durham	6	2003/04	Workplace						71%	52%	-27%	93%	67%	-28	
Winchester	6	2003/04	Workplace						66%	49%	-26%				
York	6	2003/04	PTP, TravelSmart	5,701	432	8%					na	89%	69%	-22	
Bracknell	6	2003/04	PTP	2,758	25	1%			67%	54%	-19%	70%	60%	-14	
Southwark, London	1	2002/03	PTP	1000hh					41%	34%	-17%	49%	42%	-14	
Cambridge	6	2003/04	Workplace						69%	57%	-17%				
West Sussex	6	2003/04	School						42	35	-17%				
British Telecom	1	2002	Teleworking	108,000	7,500	7%					-16%				
Adelaide, Australia	1	2001	PTP, LivingChange								-15%				
Adelaide, Christie's Beach	1	2001	PTP, LivingChange	1000hh							-15%				
Nurnberg, Germany	1	1993	PTP, TravelSmart						44	38	-14%				
Perth, Australia	1	2000	PTP, TravelSmart	350000	15,300hh				60	52	-14%				
New Jersey, USA	1	2001	PTP, LivingChange	212hh							-14%				
Gotheburg, Sweden	1	2003	PTP, TravelSmart								-13%				
Vierheim, Germany	1	1998	PTP, TravelSmart								-12%				
Bristol	1	2003	Workplace	30,000	8,000	27%					-12%				
Cambridge	1	2003	Workplace	575,000	69,000	12%					-12%				
Sheffield	6	2003	PTP, TravelSmart	3,210	1,461	46%	72%	435	41%	36%	-12%	57%	51%	-11	
Kingston, London	1	2002/03	PTP	1000hh	793hh				42%	37%	-12%	59%	52%	-12	
Cramlington	6	2003	PTP, TravelSmart	2,045	855	42%	81%	323	54%	48%	-11%	70%	65%	-7	
Bristol	6	2003/04	PTP, TravelSmart	5,000	2,251	45%			38%	34%	-11%	52%	48%	-8	
South Perth, Australia	1	1999	PTP, TravelSmart								-10%				
Adelaide, Dulwich, Australia	1	2001	PTP, LivingChange	1000hh							-10%				
Merseyside	1	2002	Workplace	700,000	56,000	8%					-10%				
Brisbane, Australia	1	2003	PTP, TravelSmart								-10%				
Nottingham (travel to work survey)	1	2003	Workplace	188,000	52,000	28%					-10%				
Nottingham	6	2003/04	PTP, TravelSmart	1,900	567	30%			29%	26%	-10%	40%	36%	-10%	
Quedgely, Gloucester	6	2003/04	PTP, TravelSmart	10,700	5,280	49%			49%	44%	-10%	70%	64%	-9%	

5. LONGITUDINAL ANALYSIS

When monitoring Travel Behaviour Change Programmes the 'after' survey is usually carried out shortly after the programme has been completed. This leaves us with the question of whether there could be any response lags. The Travel Behaviour Change Programmes may have produced changes in attitude or knowledge amongst the target group that will only be realized as physical changes in travel behaviour at a later date. Conversely, there may be trip makers who have been recorded as having changed their travel behaviour who will revert to their previous travel patterns. To investigate this important issue we have begun a follow-up study to the Scottish Executive's StepChange programmes. This will enable us to assess the longitudinal effect of these Travel Behaviour Change Programmes.

The Stepchange project is a personal travel behaviour change initiative implemented by the Scottish Executive in 2003 and 2004 (SisTech 2004, Buchanan and Coleman 2004, Zhang 2005). The programme and its evaluation was conducted by transport consultants Steer Davies Gleave, and the Scottish Institute of Sustainable Technology, SISTech, at Heriot-Watt University. The programmes used a Travel Blending/Living Change approach. Participants completed seven-day travel diaries to gain an understanding of personal and household travel patterns. They were then offered a range of products from Advice Leaflets to detailed Personal Journey Plans. The evaluation methodology was based on the European Commission's TAPESTRY project 'Common Assessment Framework' (European Commission 2001). This captures information on behaviours and attitudes to travel choice before intervention and again immediately after intervention. Control groups were included to remove any background influences. The evaluation of the influence of Stepchange took the form of a before-and-after survey, by means of postal questionnaires, in each of the study areas, plus equivalent control areas.

Stepchange I ('after' survey) January 2004 (1,750)	
Campaign Group	Control Group
Inverurie, Aberdeenshire (500)	Ellon, Aberdeenshire (250)
Bishopbriggs, East Dunbartonshire (250)	Milngavie, East Dunbartonshire (250)
Paisley, Renfrewshire (250)	also in Paisley (250)

Stepchange I ('after' survey) November 2004 (2,636)	
City of Aberdeen (1,318)	also in City of Aberdeen (1,318)

Table 2. Figure in brackets is the number of questionnaires distributed (Buchanan and Coleman 2004, SISTech 2004, Zhang 2005, Operational Research Unit 2005).

The questionnaire return rate for Stepchange I was rather low at around 8% resulting in a small sample size. The results revealed a small change in travel behaviour with car use dropping by 5% in comparison with the control group. However, attitudinal questions did reveal a greater awareness of sustainable

travel issues. This might suggest a greater willingness to change their travel behaviour at a convenient time in the future.

Our investigation includes a 2-year follow up to the Stepchange I initiative (Paisley, Bishopbriggs, Inverurie) and a 1-year follow up to the Stepchange II initiative (Peterculter, Cults). Our follow up monitoring to Stepchange I and Stepchange II was by postal survey using a one week recalled travel diary. This was the same method used in the original monitoring. In January 2006 we posted 806 questionnaires to everyone who returned a response to the original 'after' surveys. This includes members of both the Campaign Group and the Control Group and equates to a sample size of around 30% (Stepchange I) and 20% (Stepchange II) of the original population surveyed. Inevitably, some of those respondents have since moved away, but a 46% response rate has been achieved to date. This data is currently being analysed and will appear in a future paper.

6. CONCLUSIONS

It is extremely difficult to make reliable comparisons between the different Travel Behaviour Change Programmes that appear in Table 1 because each tends to use its own customised monitoring method. We believe that there is a need for a consistent monitoring method that would make comparisons much easier. Many of the initiatives in Table 1 calculate the modal split based only on the data from those who actually reply to the 'after' survey. This may well produce a significant bias in the results, tending to overestimate the effectiveness of the programmes. However, from the ranking order that appears in the table we can see that the most effective methods tend to be those that are targeted on specific workplaces. Personalised Travel Planning initiatives show a wide range of reductions in car driving of between 2% and 19%.

It may be that the percentage reduction in vehicle kilometres is a more appropriate measure of the success of an initiative. However, very few schemes have recorded this information. Table 1 shows that there is no clear link between this measure and the more common measure of percentage reduction in the car driving mode share.

There remains the important question of which of the following three factors has the biggest effect on the measured percentage success rates shown in Table 1:

- Is it the Travel Behaviour Change Programme?
- Is it the monitoring method?
- Is it the specific measure of change?

One problem that can arise after any initiative is completed is that any road space that is freed up by targeted individuals changing their travel behaviour may simply be taken up by other trip makers. To avoid this happening, and to lock in any benefits, we would suggest that Travel Behaviour Change Programmes be combined with complementary physical or economic

measures. These measures should also maximize the impact of the Travel Behaviour Change Programme.

The results may only be showing significant improvements because only those who are well-engaged are being measured. The real impact may be much lower. However, changes in attitude may have taken place that will produce more significant physical changes in the future. Trip makers may only change their travel behaviour at a time that is convenient for them and their family. Our longitudinal study that follows up the StepChange initiative may help us to address this issue.

References

Ampt, L (2003) *TRAVELSMART - Understanding voluntary Travel Behaviour Change*, 26th Australasian Transport Research Forum, Wellington, N.Z.

Brog, W (2000) *The New KONTIV Design, A Total Survey Design for Surveys on Mobility Behaviour*, Socialdata, Germany

Buchanan, L Coleman, N (2004) *Easy Targets - Individualised Travel Planning in the Community*, Steer Davies Gleave, Edinburgh

Cairns, S, Goodwin, P et al (2004) *Smarter Choices – Changing the Way We Travel*, DfT, London

Department for Transport (2001) *Personal Journey Planning, A review of the effectiveness of personalised journey planning techniques* DfT, London

Department for Transport (2002) *In Town Without My Car' (2002) An introduction to In Town Without My Car,*

Department for Transport (2005) *Transport Statistics Great Britain TSGB 2005 (31st edition)*, The Stationery Office, London. Also available at www.dft.gov.uk.

Department of the Environment, Transport and Regions (1998) *A New Deal for Transport: Better for Everyone*, The Governments White Paper on the Future of Transport. The Stationery Office, London.

Department of the Environment, Transport and Regions (2000) *Transport 2010 the 10 Year Plan*. The Stationery Office, London

Dirks, J & Voerknecht, H (2004) *OPTIMUM²: Assessment of good practices on Mobility Management valid throughout Europe*, ECOMM

Dudleston, A & Hewitt, E, (2005) *Public Perceptions of Travel Awareness - Phase 3*, Transport Research Planning Group, Scottish Executive

European Commission (2001) *TAPESTRY (2001) Deliverable 3; Common Assessment Framework - 5th Framework European RTD Programme*, Travel

Awareness Publicity and Education supporting a Sustainable Transport Strategy in Europe, European Commission, Netherlands

Finke, T (2003) *MOST-MET Monitoring and Evaluation Toolkit*, Mobility Management Strategies for the next Decades, Institute for Stadtbauwesen and Stadtverkehr, Germany

Gilhooly P. and Low, D. (2005) Primary school travel behaviour in Midlothian, UK, *ice*, **volume 158**, (Issue ME2) 129-136.

National Travel Wise Association (2006), 'Travel Wise', www.travelwise.org.uk

Operational Research Unit (2005) DfT (2005) *Personalised travel planning: evaluation of 14 pilots part funded by DfT*, Operational Research Unit, DfT, London

Richardson, A, Seethaler, R and Harbutt, P (2003); *Design Issues for Before and After Surveys of Travel Behaviour Change*, 26th Australasian Transport Research Forum, Wellington, N.Z.

Scotland Office (1998) *Travel Choices for Scotland, The Scottish Integrated Transport White Paper*. The Stationery Office, London, 1998.

Scottish Executive (2005) 'Choose Another Way', at the website www.chooseanotherway.com/travel_awareness

SISTech (2004) *Stepchange Final Report Year 1*, Scottish Institute of Sustainable Technology, Edinburgh

Socialdata (2002) SUSTRANS (2002) *Evaluation of the 'Travel SMART' programme*, Australia, Socialdata, Germany

Sustrans (2002) *Completed Projects 2001 - 2002*, TravelSmart, Sustrans, Bristol

Sustrans (2005) *TravelSmart 2003-05 Programme*, TravelSmart, Sustrans, Bristol

Scotland Office (1998) *Travel Choices for Scotland, The Scottish Integrated Transport White Paper*. The Stationery Office, London, 1998.

Scottish Executive (2005) 'Choose Another Way', at the website www.chooseanotherway.com/travel_awareness

Zhang, S (2005) The StepChange Campaign (evaluations), SISTech, Edinburgh