Jochen Richter, Margareta Friman & Tommy Gärling

Soft transport policy measures 2

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Abstract

A review of implementations of soft transport policy measures underscores their effectiveness to make participants voluntarily change their travel behaviour (Richter et al., 2008). Yet, more research is needed to answer the question when and why it is useful to implement these measures and when and why they work. The present paper identifies gaps of knowledge concerning the effectiveness of soft transport policy measures. Overarching issues that need to be more researched include synergies between different measures, long-term effects, differences in target groups, the impact of public transport quality, the role of measures’ location, translation to other areas, and cost-benefit analyses. Furthermore, research needs are discussed concerning techniques of soft transport policy measures, including communication, motivational support, goal setting and behavioural plans, customized in contrast to standardised information, the quality of feedforward and feedback information given to the participants, and the results of using incentives.
1. Introduction
Soft transport policy measures refer to measures that are designed to motivate individuals to voluntarily change their travel behaviour to more sustainable transport modes (Cairns et al., 2008; Möser and Bamberg, 2008; Fujii and Taniguchi, 2006; Taylor and Ampt, 2003). In Japan such measures have been implemented as experiments at a small scale and are referred to as travel feedback programs (TFPs) (Fujii et al., in press). Large-scale implementations target large numbers of households and are usually part of broader programs to encourage environmentally friendly behaviour changes. Large-scale implementations are typically commissioned by local governments and implemented by consultant companies, particularly in Australia, UK, and increasingly in other countries. Two examples are the “Individualised Marketing” concept (IndiMark) developed by SocialData (Brög and Schädler, 1999) and the “TravelBlending” concept developed by the Monash University and Steer Davies Gleave (Rose and Ampt, 2003). The latter has been consistently modified and is also labelled “Living Neighbourhoods” or “Living Change” (Cairns et al., 2004).
Taniguchi et al. (2007) raise the question when and why it is useful to implement soft transport policy measures and when and why they work. The aim of a previous companion paper (Richter et al., 2008) was to review the results of implementations of soft transport policy measures. It was shown that in general soft policy measures are effective in changing travel behaviour. But it was also concluded that additional research is needed to answer Taniguchi et al.’s (2007) question. In the current paper gaps of knowledge and needs for research arising from these gaps are identified and discussed.
In the next section we will first address some overarching issues related to the implementation of soft transport policy measures including synergies between hard and soft policy measures, long-term effects, differences in target groups, the moderating impact of public transport quality, the role of location of soft policy measures and their translation to other areas, and finally cost-benefit-analyses. In the third section the focus is exclusively on differences in the techniques constituting the core of soft policy measures. We first review and discuss communication techniques followed by motivational support provided by soft policy measures to change travel behaviour. As a recent development, the promising use of goal setting and behavioural plans in experimental small-scale implementations is discussed. Then, the frequent use of customized in contrast to standardised information as well as the quality of feedforward and feedback information are addressed. Finally, we discuss the results of using incentives. The paper is concluded with a summary of the identified research needs.

2. Overarching issues

2.1 Synergies of hard and soft policy measures
Many transport planners agree with the conclusion that infrastructural improvements alone have failed to deliver the expected modal shift (Cairns et al., 2008; Möser and Bamberg, 2008; Stepheer, 2004; Taniguchi et al., 2006). When this was noted and alternative soft policy measures were proposed, some politicians saw them as some kind of panacea resulting in very high expectations towards their outcome (Taylor and Ampt, 2003). But Gärling and Schuitema (2007) argue that soft policy measures alone
are unlikely to be effective in reducing car use. Empirical evidence suggests that instead a combination of soft and hard policy measures is the most fruitful approach. Cairns et al. (2008) quote studies from Netherlands and USA which report that work travel plans typically reduce car use by 20-25%, if they are accompanied by measures such as parking management and bus subsidy. Plans that do not incorporate such measures result in lower reductions of 5-15%. The authors note further that there is considerable interest in the potential positive “synergies” of different soft policy measures as well as of soft and hard policy measures. The main mechanisms of synergy are assumed to be:

- strengthening awareness, intention, or the range of opportunities available
- reaching thresholds, enabling larger behavioural responses, or reducing offsetting effects which would undermine the impact of the soft policy intervention

The question remains why and when a voluntary travel behaviour change actually occurs. Ampt (2004) gives several reasons:

- arriving at a point where the negative effects of an existing activity reach a certain level of intolerance
- realising for the first time that “it is possible for me, as an individual, to change”
- hearing of someone else who has changed – particularly someone who is trusted, respected, or perceived to have similar values
- experiencing a “change moment” (e.g. a new job, new home, new partner, choosing to change goals of beliefs)
- feeling that a change is appropriate because it is fashionable

Getting to know better who responds more to what reason would be valuable in terms of allowing more customized and efficient programs. A better understanding of the moment when “the Rubicon is crossed”, that is the point in time where the actual decision is made to reduce car use or to increase public-transport use, could also shed some more light upon this issue. With respect to this, interactions between different soft policy measures need to be researched more. The role of hard policy measures has in itself been frequently discussed. Yet, their role in supporting the effect of soft policy measures needs to be addressed in more detail and if possible tested.

2.2 Long-term effects

Studies of effects of hard policy measures have found that the effects may build up over a period of several years, with typical adjustment periods of 5-10 years or even 20 years. Cairns et al. (2008) assume that this build-up process could also apply to the behavioural responses involved in soft policy measures, and that monitoring over only a short period will underestimate the impacts of such measures. However, other factors may be operating in the opposite direction (e.g. income and car ownership). Some initiatives would also seem to need reinforcement or refreshment after a period.

In the majority of cases the objective of a mobility management measure is naturally a long-lasting change towards more sustainable travel behaviour and questions regarding long-term effects are emphasised. Taylor and Ampt (2003) argue that evidence so far is that changed behaviours persist and may intensify over time, at least in the short to medium term. But they also acknowledge that longer-term studies are required to examine the duration of changed behaviours over time.

Taylor (2007) reported diverse results for long-term effects of soft transport policy measures in Australia. For an implementation of IndiMark in Perth, the findings after
twelve months suggest that the initial changes were not only sustained, but there were further increases in walking trips and a corresponding decline in car-driver trips. In South Perth, the impact of pilot projects was monitored for three years (1997-2000), concluding that gains in public transport, walking, and cycling mode share were maintained (Ker, 2003). The increases achieved in a subsequent TravelSmart program in South Perth were also reported to be sustainable. Similar results exist for programs conducted in Adelaide. Brög and Schädler (1999) reported that in German large-scale applications of IndiMark, changes in travel behaviour seem to be stable until at least two years after implementation. Ker (2003) reports long-term effects of soft transport policy measures in Kassel and Nürnberg, Germany. In Kassel, four years after the initial implementation of IndiMark only a small reduction in public transport mode share was observed compared to the more than doubling immediately after implementation. The results from Nürnberg have not been compared to a control group. Yet, they show similar stability up to two years after intervention.

Fujii and Taniguchi (2006) report various long-term effects for Japanese travel feedback programs (TFPs). In a program implemented in the city of Suita, bus use remained equally high even one year after implementation. In a TFP in the city of Sapporo in 2001, participants’ car use was still significantly reduced one year after the TFP ended. Long-term effects were also found in a TFP in the city of Kawanishi in 2003. The apparent persistence of the intervention effect may justify the conclusion that TFPs are useful as a measure to change travel behaviour over the long term. But it is also noteworthy that TFPs did not significantly influence other pro-environmental factors, including moral obligation and awareness of consequences. Gärling et al. (2007) report that in order to have long-term effects, any mobility management measure needs to focus on attitude change, goal setting, and intention formation. Self-regulation theory and the theory of planned behaviour, which are essential in explaining voluntary behaviour changes, both underscore the mediating role of these psychological processes.

However, there are contrary findings. Free test tickets for public transport seem to trigger an increased public-transport use during the test period (i.e. as long as the ticket is valid) but, without further measures, no lasting effect (cf. section 3.5). Taylor (2007) cites mobility management trials in Nottingham, Leeds and Santiago de Chile that apparently did not show sustained changes in participants’ travel behaviour. Unfortunately, comprehensive reports on less successful implementations are difficult to obtain and one can imagine that there is a publication bias. Researchers may tend not to publish or have difficulties in publishing negative results. Moreover, consultant companies may even assume that negative results are bad for their business, and politicians have to face voters who may not be pleased by “wasted” tax money.

Long-term effects and the associated time-scale of behavioural response remain issues that need to be more researched. Naturally, this kind of research takes a long time, yet it is of particular importance. The mixed results may need a more detailed review because there is also a lack of consistency in measures. If found to be comparable, meta-analysis should be applied. As it now is, long-term effects are reported in so many different ways that it is hard to draw sound conclusions.

2.3 Targets
Regarding their travel behaviour, people act differently due to several moderators: work, location, car availability, age, health, family, and others. People also respond differently to soft transport policy measures. It is therefore important to find out about
systematic differences and moderators. Coming to know specific target groups, future programs could be customized and therefore become more effective.

Fujii and Taniguchi (2006) report results from a Japanese TFP in the city of Suita, indicating that soft policy measures may be more effective in promoting public transport to non-frequent users than to frequent users. Yet, it is unclear what “effective” means. A greater change in absolute numbers is certainly easier to achieve with people who do not use public transport regularly, whereas people who already use public transport on a regularly basis may have less room for improvement. Results from the same study also indicated that TFPs were more effective in promoting public-transport use for new residents than for old residents. The former were less likely to have developed travel habits. Similar results were reported by Ampt (2004). Individuals and households who were involved in some significant event or change were found to be more likely to be interested in changing their travel behaviour. Examples of significant changes or events included a new job, the arrival of a new household member, or moving house. This is closely related to how habits are developed and broken, an important issue in mode choice. Taniguchi et al. (2007) even conclude that if a strong habitual car use prevails, soft policy measures do not work. The topic of habitual or script-based choice of travel mode is also highlighted by Fujii and Gärling (2003). They stress the fact that in targeting people’s mode choice one should acknowledge that these choices are often made without much deliberation. Fujii and Gärling showed that frequent car drivers who changed to public transport during an eight-day closure of a freeway (a forced break of habitual car use) continued to use public transport more frequently one year after the closure than did other drivers who did not change to public transport during the road closure. The authors interpreted this enduring effect as reflection of a newly developed habitual travel mode choice.

Outcomes of soft policy measures are often generalised to the population at large. Ampt (2004) mentioned that this should not be done without considering that participants differ systematically from non-participants. There is indeed evidence that participants have different personal characteristics and attitudes than non-participants. Taylor (2007) reports differences in perceptions of environmental issues and perceptions of the consequences of transport use. To take into account such differences is seen as a main requirement for the likely success of a soft policy measure. This also underscores the importance of an accurate and possibly conservative way of generalising results from pilots or trial studies, even more if a program is explicitly based on voluntary participation. Yet, it may seem questionable to discard all people who are not willing to participate voluntarily, although the practice of doing this is supported by some authors (e.g. Brög, 2000; Beirão and Sarsfield Cabral, 2007). There is also a risk of causing a “sucker” effect (Kerr, 1983), that is a decrease in participants’ motivation because they perceive non-participants to free ride on their efforts. To do research illuminating the reasons for not participating and ways to overcome perceived barriers should be valuable.

Bertoia et al. (2005) stated that the identification of barriers preventing people from engaging in sustainable behaviours is a key issue. After successful identification of the barriers, they could be targeted in a next step. Potential barriers to travel behaviour change include safety concerns, enjoyment of driving, comfort, habits, lifestyle, prestige, connectivity, reliability, travel time, convenience, location, flexibility, social support, and lack of information about alternatives. Generally, their study’s objective was to enhance understanding of the reasons why people choose to engage or not engage in reducing car use and investigate the factors differentiating
individuals, thus understanding the perceived barriers to reducing car use better. Participants were classified in two groups (“active” and “inactive” participants) by their statements to the question if they had taken steps to reduce their car use. Results showed that “making small changes to reducing car use” and “convenience” could successfully distinguish between currently active and currently inactive participants, whereas the first issue seemed to be more important for currently active participants and the second for currently inactive participants. According to the authors, the connection between “making small changes to reducing car use” and active participants suggests that individuals who believe in the importance of small changes are more likely to be actually engaged. Conversely, their suggestion for travel behaviour change marketing tools is to place emphasis on people’s concerns about loss of convenience. Perceived advantages of reducing car use (e.g. money savings and exercise) and disadvantages (e.g. time taken and lack of connectivity) also varied between currently active and inactive participants. To further enhance understanding of differences between people engaged and not engaged in car-use reduction, the authors suggest asking participants to identify their perceived benefits and barriers. This would require a shift in travel surveys away from an emphasis on current travel decisions alone to an inclusion of questions on attitudes and perceptions relating to specific behaviours of interest (Taylor, 2007).

Results derived from socio-demographic information of people who had been contacted during an Australian TravelSmart program are reported by Seethaler and Rose (2005). Households with at least one bicycle available were nearly 6 times more likely to participate in the program. Households, whose members already use public transport, were 6.5 times more likely to participate. The authors concluded that further efforts are needed to make travel change programs appealing to households who do not yet use public transport and who are not already in the possession of bicycles. They also point out that language skills were important. An English speaking respondent was 4.8 times more likely to agree to participate in the program than a person of non-English speaking background although translation was offered.

All in all, the assumption that participants and non-participants in soft transport policy measure programs differ is supported by several independent results. More focused research on individual and socio-demographic differences is still needed.

2.4 Quality of public transport
In order to increase public-transport use, the service should be designed in a way that accommodates the levels of service required by customers (Beirão and Sarsfield Cabral, 2007). Reliability, frequency, travel time and fare level (Hensher et al., 2003), comfort and cleanliness (Swanson et al., 1997) as well as safety issues (Smith and Clarke, 2000) are important factors in customers’ evaluation of public transport service quality. Friman and Gärling (2001) underscore the importance of clear and simple information. From the customers’ viewpoint the quality of public transport is not high enough, which prevents public transport from being an attractive alternative to the private car (Grotenhuis et al., 2007). The arguments for preferring the car over public transport include experiences of freedom, convenience, flexibility, time savings, and others (Hagman, 2003), and are consistent with the above-mentioned barriers to travel behaviour change (Bertoia et al., 2005). In the efforts to meet the potential customers’ requirements, the question arises if overall quality of public transport or improvements in quality accompanying soft policy measures have an impact on their effectiveness.
Findings from Taylor (2007) in Auckland, New Zealand show that good quality public transport is seen as a main requirement for the likely success of a soft policy measures’ implementation. Unfortunately, “good quality” is not further explicated. It is also the case in other studies that it is sometimes unclear what is meant by quality or quality improvement. Friman’s (2004) results indicate that quality improvements in general do not generate higher satisfaction. In her study, the respondents judged satisfaction even lower or unchanged after the quality improvement. There are certain artefactual explanations of this effect, but the question remains how to improve public transport quality in a way that attracts more potential users. Whereas Friman (2004) distinguishes between improvements in information systems, vehicle standards, an increased number of departures, and construction of travel centres, different studies use different operationalisations. Even worse, in many reports on soft policy measures the impact of public transport quality is not under examination at all.

Ker (2003) analyzed large-scale applications of IndiMark in six German cities which were accompanied by improvements to public transport provision, ranging from “slight improvements to frequency of service” to “extension of subway to target area”. The impact of these improvements on the absolute change in public transport trips was significant. The mean increase of public-transport use in the six cities was 25 trips per person per year relative to control groups. In three other German cities with no system improvements, the increase was only 17 trips. The combination of public transport improvements and IndiMark resulted in a 47% greater increase in public transport trips compared to cities that undertook IndiMark without public transport system improvements. In cities with low initial public transport mode shares, the increase in mode share after system improvements was of even higher impact. This supports the findings that soft policy measures are more effective in promoting public transport to non-frequent users than to frequent users (Fujii and Taniguchi, 2006). It also suggests that especially in areas with low public transport mode share, specific quality improvements of public transport would be useful. Ker (2003) reports a significant increase in peoples’ satisfaction with public transport for the large-scale applications of IndiMark in Germany. He suggests that simultaneous public transport improvements could enhance this increase even more. The increase in positive perceptions of public transport by those who participate in a soft policy measure has also been identified in the application of IndiMark in Australia. According to Brög et al. (2002), there were no system improvements accompanying a project in South Perth. Yet, the amount of people judging public transport service “better than four years before” increased from 23% to 38% and amount of people judging the public transport service “worse than four years before” decreased from 23% to 8%. The number of people satisfied with public transport increased from 31% to 47% and number of people dissatisfied decreased from 55% to 39%. This supports IndiMark’s general assumption of a gap between common perception of public transport and reality (Taylor, 2007). Fujii and Kitamura (2003) stated that the perception of service level of public transport is influenced by beliefs, attitudes, and habits. A change in mode choice may thus be accomplished by changing these psychological factors, even if the actual level of service remains the same. To change psychological factors can in turn be achieved through actual public transport experience. A simple way to persuade people to give public transport a chance is to administer free test tickets. This approach is further discussed in section 3.5.

Public transport quality has to meet certain standards which vary from person to person. It would be valuable to examine whether people who do not use public transport for different reasons can be persuaded by quality improvements in general
and by which improvements in particular. Furthermore, improvements need to be especially promoted among non-users.

2.5 Location and translation to other areas
Taylor and Ampt (2003) reported as a current and emerging issue to take a closer look at possible translations of research results from one area to another. This is similar to the problem of generalising results gained from voluntary participants to the population as a whole. But emphasis here is placed on content-related and location-dependent issues. Yet, the borders to the problems discussed in section 2.3 are rather fluid.

Fujii and Taniguchi (2006) declare that to date the differences between workplace, residential area, and school targets seem unclear. In the UK, evaluations of soft policy measures revealed significant differences between urban and rural areas (Cairns et al., 2004). Still, location was not a key determinant of the degree of change in behaviour achieved by workplace travel plans. Location could neither be identified as a significant moderator in Australia. The reason may be that all implementations have been made in similar major cities. Yet, Ker (2003) reports for an IndiMark implementation in the Town of Cambridge, Australia that areas with higher incomes, car ownership and car use as well as worse public transport service had a larger reduction in “car as driver” trips but most of this went to “car as passenger” instead of environmentally friendly modes. A link to the quality level of public transport can be established, concluding that IndiMark is not a substitute for the provision of a reasonable level of service. Ker (2003) also points out that IndiMark might not be as effective in increasing public-transport use in high-income and/or high car-owning/using area. This in turn suggests that at least for IndiMark as one type of soft policy measure, implementation area is important.

Although many studies distinguish between different locations and explicitly point towards different outcomes, comparison is often not discussed. Available results are not very consistent and ought also not to be confounded. Location sometimes refers to the type of program (e.g. workplace travel plan vs. school travel plan) and sometimes to the area of implementation. Both are important, but for instance a workplace travel plan may be implemented in an urban or a rural area, so one has to be careful what the term location refers to. In future research it is essential to study the available data about implementation locations more cautiously, separating location from other factors.

2.6 Cost-benefit analyses
Usually it takes some persuasion to convince transport planners that a soft policy measure is effective, as can be seen in Japan (Richter et al., 2008). In this process cost-benefit analysis is always an issue.

Costs for soft policy measures consist of costs for the initial survey, follow-up costs, and any costs incurred by involved households. Personnel and material as well as running costs also have to be considered. The benefits include travel time savings, environmental benefits and network congestion reduction (Taylor and Ampt, 2003).

For the UK the results of cost-benefit analyses have been compiled in terms of expenditure per reduced car kilometre (Cairns et al., 2004, 2008). The calculated figures for workplace travel plans are 0.1-2.0 pence per reduced car km, for school travel plans 1.4-9.9 pence and for personalised travel planning / travel awareness
campaign / public transport marketing 0.2-4.4 pence. The figures at the upper end of the range typically include implementation of supporting hard policy measures. The average calculated overall costs of achieving reduced car use were 1.5 pence per car kilometre removed. Compared with an average benefit of congestion relief of 15 pence per car kilometre removed, the cost-benefit ratio was 1:10 on average, meaning that every £1 spent on well-designed soft policy measures could bring a benefit of about £10 in reduced congestion. The benefits in highly congested urban conditions are assumed to be even higher. The possibility of induced traffic is however also necessary to consider.

Positive outcomes of cost-benefit analyses have also been reported for Australian IndiMark trials in Adelaide and South Perth (Taylor, 2007). Ker and James (1999) reported that for the IndiMark program in South Perth in 1997, benefits would exceed costs by a factor of between 11 and 13 over ten years. Initial costs of A$ 1.3 million would be outweighed by benefits of A$ 16.8 million (e.g. due to decreased air pollution, travel time, greenhouse gas emissions, and road congestion). Brög and Schädler (1999) claim that IndiMark can be financed by the additional revenues for public transport alone. Yet, it has to be noted that their cost-benefit analysis may be too simplistic. Since IndiMark targets people who already use public transport (Brög, 2000), additional trips could also be generated by people with monthly or seasonal tickets, therefore not contributing to the assumed additional revenues. Nevertheless, Ker (2003) states that the level of travel change observed in Australian IndiMark and TravelBlending initiatives (about 15-40 additional public transport trips per person per year) would typically generate sufficient additional fare revenue to cover the full cost of the intervention in two to five years. He further concludes that voluntary travel behaviour change is a highly cost-effective means of achieving progress towards an increase in public-transport use and other environmentally friendly options.

Cost-benefit analyses have limited value when costs and/or benefits cannot be quantified. Ampt (2001) reports non-economic respectively non-transport benefits, for instance changes in land-use, social interaction, economic development, and certain health indicators. Qualitative feedback from participants in the TravelSmart program in South Perth indicated that health was a significant motivator for increasing walking trips. To acknowledge and study these additional benefits is an important future task because if knowledge of them is lacking, essential outcomes from soft policy measures may be overlooked. Perceived benefits of any kind can in turn be used as motivators to support behaviour change. Besides, other government and non-government agencies have begun to form interests in the programs and cross-sector cooperation may lead to further subsidies which in turn would require cost-benefit analyses. Therefore, cost-benefit analysis will remain an essential part of any soft policy measure to justify its existence.

3. Techniques
The term “soft transport policy measure” addresses a wide range of different initiatives that share the common feature of trying to encourage more sustainable travel behaviour. Effectiveness is dependent on the type of technique (Cairns et al., 2004) and in order to further improve soft policy measures, a major task is to understand which techniques are more or less successful.

Although moderating effects have to be taken into consideration and it is sometimes hard to draw conclusions that generalise from the experimental conditions, recent reviews and meta-analytical approaches provide a sound base. The following
subsections about travel behaviour change techniques are loosely based on the parameters used by Fujii and Taniguchi (2006, see Table 1).

Table 1: Parameters to classify travel feedback programs (TFPs)

| Location | TFPs can be implemented in three basic settings: workplaces, schools, and residential areas. Most measures are examples of the latter type and target all daily car use. Workplace and school travel programs typically target commuting |
| Techniques for changing travel behaviour | Techniques differ in three main ways based on the following issues:  
  - Do they motivate travel behaviour change?  
  - Do they request a plan for changing travel behaviour?  
  - Do they provide customized information? |
| Procedure | Simple “single step” TFPs, e.g. just the request to formulate a behavioural plan for how to change travel behaviour; IndiMark involves two or three contacts; TravelBlending involves four contacts |

Communication media  
Face-to-face communication / household visit / group briefing, regular mail, telephone, e-mail, internet web-site

Source: Adapted from Fujii and Taniguchi (2006)

3.1 Communication

How should people be approached in the first place? If mass media campaigns can reach larger populations at relatively low cost, why do soft policy measures typically use an individualised approach?

Mass media campaigns are effective in certain fields, for instance in reducing drunk driving (Elder et al., 2004). Usually, campaigns try to influence problem awareness, attitudes, knowledge, beliefs, and norms and eventually aim for a behaviour change. Intended or unintended, these campaigns often draw on the theory of planned behaviour (Ajzen, 1991) as a theoretical framework. The theory of planned behaviour also deals with the persistent gap between the intention to perform a behaviour and actual behaviour. Concerning pro-environmental behaviour, this gap is of particular importance (e.g. Kollmuss and Agyeman, 2002; Sheeran, 2002; cf. section 3.5). But the problems caused by car use are a frequent topic on the political agenda and the news these days. People do not need to be particularly reminded. Moreover, there is the risk of causing psychological reactance. Tertoolen et al. (1998) reported about negative impacts of travel change programs that occurred due to psychological reactance and cognitive dissonance. In consequence, people should be assisted in forming own intentions to adopt a more sustainable behaviour and actually changing behaviour subsequently. In doing so, it is easier to overcome the gap between intentions and behaviour with an individualised approach.

Regarding communication channel, Fujii and Taniguchi (2006) reported a less effective TFP that only used internet communication. They assume that other modes of communication such as face-to-face interviews and mail have more influence on participants’ travel behaviour. Taniguchi et al. (2006) reported face-to-face communication for ten out of 31 TFPs implemented in Japan but no comparison was made. Experience from European travel surveys show that personal contact at the door-step or over phone increases response rates (Seethaler and Rose, 2005). In a TravelSmart study in the Melbourne suburb of Darebin, establishing personal contact at delivery of the before-survey forms made it 2.4 times more likely for a household to respond. A motivational call on the evening before the survey made a response 2.7 times more likely. For the after-survey forms again the motivational call was the most significant variable, but the personal contact during the delivery of the forms did not
matter. The authors suggest that people who found the forms in their mailbox remembered it or were prompted by the motivational call. In conclusion, the importance of personal contact during recruitment procedures is stressed. Mass media campaigns may only lay the foundation for a personal approach. Future research concerning communication in soft transport policy measures should focus on the latter approach and address the question if and how elements that make face-to-face communication more effective could be transferred, for instance to web-based programs.

An attempt to apply current knowledge about persuasion techniques to soft policy measures has been made by Seethaler and Rose (2005). To achieve more than raising awareness and knowledge and stimulate behavioural changes of lasting effect, they adopted six persuasion techniques from Cialdini (2001): reciprocitation, commitment and consistency, social proof, liking, authority, and scarcity. The techniques are supposed to be especially useful to influence habitual daily travel decisions with low personal involvement. Table 2 shows the application of these principles in a modified phone call for the recruitment of TravelSmart participants. For the theoretical bases of assumed effects, see Seethaler and Rose (2005) or Cialdini (2001).

The six principles were also used in a pre-intervention phase, where a Green Bag and a voucher were used as incentives, as well as in a TravelSmart announcement letter which was written using the persuasion principles. Although the sample sizes were too small to detect statistically significant differences, the use of the new recruitment call using the six techniques made it 2.3 times more likely for a household to participate in TravelSmart than when the old recruitment call script was used. A subsequent large-scale test with some 800 households which received a gift and voucher in a pre-intervention phase as well as a modified announcement letter showed that the uptake rate for the TravelSmart program in this group was 58%. In the control group where no pre-intervention phase took place and the regular announcement letter without persuasion principles was used, the uptake rate was significantly lower (51%). Given the encouraging results from the small-scale test with the modified phone call and the results from the large-scale test with the gift in the pre-intervention-phase and

<table>
<thead>
<tr>
<th>Persuasion principle</th>
<th>Implementation form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authority</td>
<td>The caller identifies him/herself as being part of the TravelSmart staff authorised by the local council and the local traders association.</td>
</tr>
<tr>
<td>Commitment &amp; consistency, social proof</td>
<td>The caller draws the attention to the fact that the promoters of a durable bag that was handed out earlier to the participants now follow up with their promotion of TravelSmart: The promoters themselves are consistent and committed to further action.</td>
</tr>
<tr>
<td>Reciprocation, Liking</td>
<td>The caller offers the respondents the opportunity to “have their say” on personal transport related issues that are found to be important/urgent. A caller showing concern for one’s problem is generally appreciated.</td>
</tr>
<tr>
<td>Liking</td>
<td>The conversation on personal transport issues is then used to offer those TravelSmart services that are best able to alleviate a transport problem reported by a particular respondent.</td>
</tr>
<tr>
<td>Social proof</td>
<td>Social proof is engaged by pointing out that the TravelSmart services have found to be useful by participants in other program areas.</td>
</tr>
<tr>
<td>Scarcity</td>
<td>The scarcity principle is engaged by pointing out that the recruitment phone call is a unique opportunity to receive different TravelSmart services that are normally not free of charge.</td>
</tr>
</tbody>
</table>

Source: Adapted from Seethaler and Rose (2005)
the modified letter, there is evidence that the use of the persuasion techniques could positively influence the take-up rate. As mentioned above, when trying to persuade people to change their behaviour there is always a risk of causing psychological reactance. Since to date most soft policy measures focus on voluntary participation it might not be a major concern. Yet, as has been discussed, soft policy measures need to be adapted to become more appealing to people who refuse participation in the first place.

3.2 Motivation

Taniguchi et al. (2006) report that 26 of 31 Japanese TFPs provided motivational information. Most of them (24) use environmental damages as arguments, but also health (15) and the availability of specific public transport resources (9) are used as arguments. An example for giving motivational support related to health is feedback on the number of burnt calories through walking or cycling. Among 14 more elaborated residential and workplace cases, all provided information on motivating behaviour change, that is motivational support. Feedback on CO\textsubscript{2} emissions was provided in 20 of the 31 TFPs. This might also be counted as a motivational factor, either to learn what has already been achieved or to learn what still can be achieved.

Motivation is a crucial part of soft policy measures. But although many implementations provide motivational support, it is often unclear of which kind and how it works. Some people may for instance be interested in losing weight and see feedback on calories as essential. They might consider any reductions in car use simply as a by-product. Others only take part because they cannot any longer afford using their car as often as they did. They would probably primarily be motivated by information on how much money they save.

Research needs to look further into what motivates people to take part in a program and also what motivates them to maintain any changes towards more sustainable travel behaviour. By identifying and focusing on individual reasons, more effective programs could be designed.

3.3 Behaviour change goals and behavioural plans

Goal setting has become a common technique to improve performance and has successfully been applied to work tasks, sports, and rehabilitation (Locke and Latham, 2006). Setting a behaviour goal is equivalent to having formed strong goal or behavioural intentions (Gollwitzer and Sheeran, 2006). It is still only the first step of a process to achieve the goal. In the next step, a specific behavioural plan should be formed. Gollwitzer (1993) uses the term “implementation intention”. In contrast to goal intention, implementation intention defines in detail if, when, where, and how the target behaviour to reach the goal should be implemented. Forming an implementation intention increases the rate of goal achievement significantly.

Fujii and Taniguchi (2006) note in a review of Japanese TFPs that requesting a behavioural plan has a strong effect on actual behaviour change. TFPs with behavioural plans yielded the greatest reduction in CO\textsubscript{2} (35%), the greatest reduction in car use (25%) and the greatest increase in public-transport use (100%). The authors further refer to comparative analyses between programs with and without behavioural plans. The results indicated that a TFP with a behavioural plan caused a greater increase in public-transport use than the same TFP without a behavioural plan. The authors concluded that the technique of requesting a behavioural plan had an
additional effect on changing travel behaviour. Direct comparison showed that a TFP with a behavioural plan but without customized advice had a significantly greater effect in terms of reduced CO\textsubscript{2} emissions than a TFP without a behavioural plan but with customized information (Fujii and Taniguchi, 2005).

The importance of behavioural plans as well as setting goals to increase the extent of behavioural change is also emphasized in the meta-analysis of Taniguchi et al. (2007). A closer look on 14 residential and workplace TFPs revealed that eleven requested participants to form a behavioural plan for how to change their travel behaviour. The authors state that achieved car-use reductions were mainly induced by those TFPs using behavioural plans together with motivational support and customized information. In seven of the 14 studies, participants were asked to set a behaviour-change goal before forming a behavioural plan by stating the percentage by which they would reduce their car use respectively increase their public-transport use (in two studies). The average car-use reduction for the goal setting TFPs was 20% compared to 10% for seven TFPs without goal setting. Yet, it is somewhat unclear at this point because at least four of the latter seven studies had requested a behavioural plan. It seems that studies with behavioural goals and behavioural plans are confused. However, with the results that public-transport use increased by 76% for TFPs requesting a behavioural goal, and 25% if there was no goal setting, the authors conclude that the technique of asking participants to set behaviour-change goals is promising.

How should behaviour goals look like? Research on goal setting theory has shown that specific and difficult goals lead to higher performance when compared with no goals or vague “do your best” goals (Locke and Latham, 1990). It is an issue for future research to see if goal setting theory can be applied to goals of car-use reduction. Also, results of research on implementation intention (i.e. behavioural plans) may if possible be incorporated in research on the role of behavioural plans for the effectiveness of soft policy measures.

3.4 Customized information

Customized feedforward and feedback information is an essential part of soft transport policy measures. A closer look on measures implemented in Japan (Taniguchi et al., 2006) reveals that among 31 TFPs at least 20 provided customized information, for instance timetables and maps for public transport near an individual’s home. Among 14 more elaborated residential and workplace TFPs, eleven described techniques for providing customized information. Only one out of ten TFPs provided non-customized information (Fujii and Taniguchi, 2006).

Although common, providing customized information is not invariably used. Taniguchi and Fujii (2007) reported a TFP that provided non-customized information on how to use bus service in general. Additionally, participants were asked to form a behavioural plan for how to use bus service. This program resulted in a strong increase in the frequency of bus use. Yet, one has to acknowledge that the program aimed especially to encourage bus use. Customized feedforward information, for instance an individually designed map for public transport might have had an even stronger impact. Because customized information minimizes the cognitive costs of processing the information, it should be more effective in facilitating a behavioural change. But it may not be necessary in case participants are requested to create a behavioural plan (Fujii and Taniguchi, 2006). A program using the latter technique might be successful because it forces people to think about travel alternatives and
acquire the needed information themselves. Thus, while forming their implementation intention, participants have to “pay” the cognitive costs they would not invest if they were not requested to form an implementation intention. In a field experiment by Fujii and Taniguchi (2005) the effectiveness of a TFP that urged participants to make behavioural plans (“planning group”) was compared to a TFP that provided customized information (“advice group”). Frequency of trips longer than 45 minutes was significantly reduced in the planning group and estimated total trip duration in the planning group decreased compared to the advice group. Households in the planning group reduced the number of days that their cars were used compared to households in the advice group. Although the absence of a control group limits the validity of causal inferences, the results challenge the dominant position of customized information.

Brög and Schädler (1999) claimed that people often do not know about public transport alternatives. During an application of IndiMark in Leipzig-Grünau, Germany, measurements were made of the extent to which people had been informed about public transport alternatives before and after the implementation. There was an increase from 53% to 64% of people in the experimental group being informed to some extent about public transport alternatives but no changes in the control group. Having information about travel alternatives readily available is a necessary precondition for the use of public transport. To a more general extent it might be possible to inform people about public transport alternatives through non-customized information, if it raises enough interest, for instance against the background of increasing gas prizes. The importance of people receiving necessary information without making own efforts is also stressed by Brög (2000). He draws parallels to customer-oriented marketing and holds the view that instead of being flooded by useless information, people should receive only the information they really need. Brög and Schädler (1999) reported a study where an Austrian public transport operator was sending out standardised information packages. Simultaneously, there was a group which took part in the IndiMark program that used customized information packages. Additionally, a control group was established which received no information at all. Evaluation of this study revealed that public transport share in the control group and the group with standardised information was the same, whereas the IndiMark group was able to increase public transport use by 17% compared to both other groups.

In case a soft transport policy measure delivers customized feedback to its participants, the quality of the information provided is an important factor in determining the effectiveness of the whole program (Fujii and Taniguchi, 2006). It was found that reduced CO2 emissions and car-use reduction resulting from a TFP with customized information differed based on the length of a preceding travel diary survey. If customized feedback information was based on a 7-day travel diary, it was more effective than if it was based only on a 1-day travel diary. Information seems to be more effective with respect to travel behaviour modification if it is based on more travel data. Nevertheless, it is notable that a 1-day travel diary was also sufficient to achieve reductions. One may criticize the study since there could be pre-existing differences in commitments between those who are willing to complete a whole 7-day diary and those who are willing to complete a 1-day diary. Whether a 7-day-diary is able to provide more detailed feedback and thus also be able to achieve greater effects remains for further research to show. Another question that arises is whether technologies like GPS could be implemented in soft policy measures to gain more accurate travel diaries with less effort for participants.
It appears that the intuitively clear advantages of customized information in soft transport policy measures have been accepted without question in the first place. Some programs rely heavily on customized information and there are good arguments for this (e.g. Brög, 2000). Yet, it has to be admitted that there are gaps of knowledge regarding the effectiveness of each separate technique. Comparisons between customized information and non-customized information, behavioural plans and other techniques should be an important future research task aimed at disentangling which technique is not only the most fruitful but also the most cost-effective. For instance, Fujii and Taniguchi (2005) mention that the behavioural plan technique may be more cost effective than providing customized information. Although customized information is already a major part of most soft transport policy measures, new findings could lead to further improvement and refinement. If for instance the strong effects of behavioural plans can be further confirmed, customized information may be transformed into customized support in realising the behavioural plan.

3.5 Use of incentives
The mere experience of public transport may lead not only to a greater satisfaction and a more positive evaluation but also to an actually persistent increase in use (Brown et al., 2003; Fujii and Gärling, 2003). Incentives such as free test tickets for public transport seem to be an adequate approach to make people experience public transport and correct their misperceptions of public transport (Pedersen et al., 2008).

Fujii and Kitamura (2003) conducted a study in Kyoto, where an experimental group of habitual car drivers received a one-month free bus ticket whereas a control group did not. The difference in the frequency of bus use between the control and experimental groups was not significant before the intervention period. During the intervention period, the experimental group used the bus significantly more than the control group. Bus use dropped again when the free travel card expired. The difference between the two groups was marginally statistically significant one month after. Thøgersen and Møller (2008) conducted a similar study in Copenhagen, where a free one-month travel card was handed out. After the promotion period, the use of public transport did not continue to be higher than baseline.

A possible explanation for these sobering results can be found in Brög and Schädler (1999). They compared issuing of free test tickets within the IndiMark program and the distribution of free test tickets in a German city, where no further action (e.g. information or motivation) was taken. Before and after comparisons revealed no differences in modal shift. No data is available for mode choice during the test period, but one may assume that a similar pattern exists than in the abovementioned studies. Against this, the test tickets that are handed out in the IndiMark program are accompanied by personal contact, customized information, and motivation. These circumstances are perhaps essential. Participants in the IndiMark program also reported positive experiences, changed attitudes, and willingness to use public transport in the future. Yet, one has to exert caution in drawing conclusions. Although an important predictor of behaviour is the intention to perform it, there may be a low correspondence between intention and actual behaviour (cf. section 3.1). Further use of public transport after the expiration of test tickets should therefore be explicitly surveyed or confirmed with data from public transport companies.

It has also been argued that people tend to underestimate costs of car use because they only take fuel costs into account (Gardner and Abraham, 2007; Wardman et al., 2001). In contrast, they may have an accurate idea of public transport costs, because
these are explicit and typically encountered on a daily or per-journey basis. Comparisons with driving are often biased in favour of car use. Brög (2000) even claims that costs of public-transport use are substantially overestimated.

It might be fruitful to implement simplified cost-benefit analyses in soft policy measures, so people can see what the real costs of car use are. Targeted participants might as well be pointed towards benefits of alternative choices they had not yet taken into consideration, for instance the possibility to effectively use in-vehicle journey time. The different outcomes of the use of incentives need to be further researched and it would be valuable to determine why some people do and some do not continue to use public transport after having tried.

4. Summary and conclusions
The combination of soft policy measures with hard policy measures seems essential since soft policy measures are unlikely to alone achieve the necessary modal shift. Therefore, potential synergies of soft and hard policy measures need to be further addressed in research. For instance, it is important to learn in what way hard policy measures would encourage people to take part in a simultaneous soft policy measure, that is how hard policy measures influence the actual decision to adopt more sustainable travel behaviour.

It is evident that soft transport policy measures have different impacts on different target groups. The promotion of public transport appears to be especially successful among people who have experienced major changes in their life. Their susceptibility to soft policy measures is probably related to not yet developed travel habits. People with strong habitual car use seem to be less likely to participate in soft policy measures, underscoring the importance of personal characteristics and attitudes of participants and non-participants. The benefits people receive from car use and the barriers they experience to change travel behaviour need to be further researched and ways to overcome these barriers have to be developed. Further research on the role of socio-demographic factors could also lead to new insights. Although some results indicate that soft policy measures are more effective in promoting public transport to non-frequent public-transport users than to frequent public-transport users (Fuji and Taniguchi, 2006), the latter are more likely to participate in the first place (Seethaler and Rose, 2005). Soft policy measures therefore need to become more appealing to non-frequent public-transport users.

People also perceive public transport quality differently, indicating an influence from psychological factors. To change these psychological factors may in turn lead to higher satisfaction with public transport quality, even if the actual service level remains the same. There is evidence for an increased success of soft policy measures if they have been accompanied by improvements to public transport. Future research needs to address how different kinds of quality improvements of public transport encourage travel behaviour changes and why people judge public transport worse than it actually is.

Translation of research results on soft policy measures from one location to another is only possible if the conditions are clearly defined. Current reviews therefore fail to disentangle the effects. Sometimes location-dependent differences between urban and rural areas are discussed. Sometimes more content-related issues are discussed like differences in work travel plans and school travel plans. Socio-demographic factors can also be drawn on to explain regional effects. Available data on these differences
should be thoroughly reviewed in order to draw valid conclusions and provide suggestions, for instance, of how an effective workplace travel plan should be designed in a rural area with bad public transport connections.

Cost-benefit analyses for soft transport policy measures have yielded positive results. The problem is that government divisions which have to pay the implementation costs of a soft policy measure usually are not those who obtain the revenues. Coordination among different government agencies as well as either investing or benefiting companies is crucial. According to Taylor and Ampt (2003), it is a key challenge that the clients for programs of travel behaviour change have been transport organisations for which the only relevant outcome is travel change. Yet, there are other important outcomes that have to be acknowledged. Additional measurement methods could make evaluations more multidimensional. What participants experience as benefit can also act as motivator to maintain or increase modal shift. Research should focus on identifying additional benefits to see how they can be used as motivators. Other government agencies and companies that receive benefits from soft policy measures should systematically contribute their knowledge to improve them, but also take their share of the costs.

The core of a soft transport policy measure is its technique or combination of different techniques. Regarding communication there are three stages of a soft transport policy measure. First, to make as many people participate as possible during recruitment. Second, to help with problems, respond to questions, and keep up participants’ motivation as long as the program is running. Third, to support people in maintaining travel behaviour changes after program termination. During all stages it seems to be more fruitful to establish personal contacts than to contact people over the internet. Yet, web-based programs offer a huge potential for the future, even more in combination with techniques like GPS. Research should address the question of how programs without personal contact can be made more effective. Then again, the currently predominant individualised approach during all stages should be further refined. The adoption of persuasion principles from social psychology (Bamberg et al., 2008; Seethaler and Rose, 2005) is a good example of how this can look like.

As a vital part of soft transport policy measures, motivational support takes place in many shapes. Individual differences among participants are then important to take into account because people participate in and stay with a program for different reasons. Some want to contribute to the environment, some do it for health reasons, some to save money, and some for other reasons. It remains for research to disentangle these reasons, because the best way to provide motivational support is to directly appeal to people’s individual reasons for participation in a soft policy measure.

Goal setting and plans for travel behaviour change have been successfully implemented in experimental small-scale applications of soft transport policy measures by researchers in Japan (Fujii and Taniguchi, 2006). This is one of the most useful developments to improve soft policy measures and should therefore be further developed. Questions to be answered include: Is it possible to translate the results gathered in research on goal setting theory and implementation intention to soft policy measures? How should behaviour change goals look like and what is a good way of supporting participants in their personal plans for travel behaviour change?

Closely related to questions of communication is the use of customized feedforward and feedback information in soft policy measures. In contrast to flooding people with standardised information that may serve no purpose, the use of customized information makes sense intuitively. Indeed, it has achieved greater
success in comparison to standardised information (Brög and Schädler, 1999). Yet, to gather customized information is time-consuming, expensive, and sometimes difficult. The introduction of behavioural plans to soft policy measures has shown that people can be persuaded to gather the necessary information about travel alternatives themselves. In fact, this has appeared to be even more successful. In future research this should be regarded as an important aspect to examine, because it could lead to a transformation from customized information to customized support. It is also essential to investigate the quality of customized information delivered to the participants, because quality seems to be related to the soft policy measure’s success.

Some topics have not been addressed in this paper. For instance, any measure which reduces congestion has the potential to cause induced traffic, thus eroding its benefits (Cairns et al., 2008). Individuals choosing to reduce their car use may simply be replaced by other individuals who are attracted by the freer road conditions. Identifying people’s willingness and intention to use less populated roads is therefore essential to take counter-measures in time. Furthermore, it is important to know what means participants have employed to achieve car-use reduction. Did they use the bicycle instead of the car for a few short trips to the grocery store or did they use the train instead of the car for one longer journey? A closer look is necessary in order to reward participants’ accomplished travel behaviour changes on the one hand and to see where a program does not fulfil the expectations on the other hand. Technical advances such as GPS-based surveys offer many potential improvements (Taylor, 2007). For instance, travel behaviour could be automatically observed with appropriate IT measures and participants could attend the programs with minimal effort as well as be provided with feedback of higher quality.

Another task for the future not discussed in this paper is the integration of existing theoretical knowledge with the aim of providing a comprehensive theoretical and conceptual framework for the implementation of soft transport policy measures. A start of this is reported in Bamberg et al. (2008).

To conclude this paper we want to endorse the suggestion of Taniguchi et al. (2006) to develop an international platform to exchange practical and political information with respect to mobility management all over the world. Bamberg and Möser (2007) note that results of soft policy measures are often not reported in publicly available sources, because local authorities commission commercial consultant companies with the development, implementation, and evaluation. For their meta-analysis, they attempted to receive more detailed information from these companies, but with little success. If a strong platform for exchange on mobility management evolves, it could create some kind of competition and impose more pressure on reluctant consultant companies to publish about their implementations in more detail.

Aside from research to fill in gaps of knowledge, we also encourage further reviews and meta-analyses of the large number of empirical studies available on soft transport policy measures, since to date no comprehensive such work is available.
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References


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A review of implementations of soft transport policy measure underscores their effectiveness to make participants voluntarily change their travel behaviour (Richter et al., 2008). Yet, more research is needed to answer the question when and why it is useful to implement these measures and when and why they work. The present paper identifies gaps of knowledge concerning the effectiveness of soft transport policy measures. Overarching issues that need to be more researched include synergies between different measures, long-term effects, differences in target groups, the impact of public transport quality, the role of a measures’ location, translation to other areas, and cost-benefit-analyses. Furthermore, research needs are discussed concerning techniques of soft transport policy measures, including communication, motivational support, goal setting and behavioural plans, customized in contrast to standardised information, the quality of feedforward and feedback information given to the participants, and the results of using incentives.