

An Evaluation of TravelSmart Tools for Travel Behaviour Change

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ABSTRACT

Between 2005 and 2006, a TravelSmart project was introduced in targeted suburbs within metropolitan Adelaide, South Australia. A component of the project was to provide participants with tools to assist them to change their travel behaviour. The tools included information on ways to cut down car driving in general, and information relating to alternative, more environmentally friendly travel modes.

An extensive perception study was conducted to measure if some tools were more effective in bringing about travel behaviour change. More than 1,000 TravelSmart participants were involved. The survey was conducted by telephone and a stratified sampling method was implemented to evaluate four tools: Journey Plan, Walking and Cycling Map, Affirmation Letter, and Local Activity Guide. The Cycling and Walking Map appeared to be the most effective tool, and encouraged people to walk more. The other three tools, Journey Plan, Affirmation Letter and Local Activity Guide, together appeared less effective in changing travel behaviour. In addition, the most useful feature participants cited in the survey was providing them with information about driving alternatives and locations of nearby facilities.

INTRODUCTION

The voluntary travel behaviour change approach, as one of the new approaches in Travel Demand Management (IEAust, 1996), is defined as one where the objective of the approach is to allow people to choose to change travel behaviour rather than to expect or force reactions in response to external stimuli or pressures (Taylor and Ampt, 2003). Research suggests that the benefits of travel behaviour change programmes that can be seen at the community level are substantial and compared with the costs of infrastructure improvements, they incur at relatively low cost (James and John, 1997; Marinelli and Roth, 2002; Taylor and Ampt, 2003). Although approaches to VTBC have differed across Australia, VTBC programmes have consistently been branded under the TravelSmart® banner (Ampt, 2003; Red3, 2005)

The research this paper presents is from the TravelSmart Households in the West (THITW) project, which was implemented in Western Adelaide, South Australia by the South Australian Department of Transport, Energy and Infrastructure (SA DTEI) through a contract with the firm of Steer Davies Gleave (SDG). The project targeted a geographically large and diverse area, comprising 4.5% of the total Adelaide metropolitan area and 13% of its population and engaged 22,101 households to reduce their car use (SA.Government, 2009). The primary aim of this project was to reduce transport-related greenhouse gas emissions through travel behaviour change and a

shift in societal values towards sustainable travel patterns (TravelSmart, 2006)¹. The TravelSmart project achieved significant results in reducing car use. Some of the successful outcomes include: savings of over 86 million vehicle kilometres travelled (or 28,000 tonnes of CO₂) across the population of over 22,000 households during the project; increases in public transport patronage of more than 6 per cent in the target area since the implementation of the project, while non-targeted regions showed annual growth rates of less than 2 per cent over the same period (SA Government, 2009). Furthermore, aggregate measurements of these households showed that, from before TravelSmart to about a year after TravelSmart, the engaged households decreased their driving by about 18 percent. On the other hand, households that were not engaged increased their car use by about 6 percent (Stopher et al., 2007; Stopher et al., 2009)².

The approach adopted to engage the community in TravelSmart in this project was to have an individualized conversation-based approach, where a TravelSmart officer had a guided conversation with at least one person within each household to identify motivations or frustrations about transport, exploring issues specific to the individual (SA Government, 2009). A tool, or a number of tools, such as the Journey Planner and the Access Guide, was then offered to the households to assist with those issues raised in the conversation and to change their travel behaviour. Detailed information about these tools can be found in the final report (Zhang and Stopher, 2008; SA Government, 2009). However, this paper does not aim to evaluate the effectiveness of TravelSmart but the effectiveness of those various tools. The Institute of Transport and Logistics Studies (ITLS), which was contracted by SA DTEI, as an independent evaluator for this programme, conducted an in-depth survey to determine to what extent different tools offered by the TravelSmart project changed travel behaviour with the premise to streamline future TravelSmart Households projects by focusing on the tools which have the most effect on changing behaviour, in particular to determine:

1. If there is evidence to suggest that some tools are more effective in bringing about travel behaviour change than others; and
2. If so, to identify which tools appear to be more effective and which ones appear to be less effective.

Alternatively, the survey may indicate that there is little to choose between the tools, perhaps because it is the conversation itself that is the primary motivator of change.

TOOL DESCRIPTIONS

As mentioned earlier, each household was offered either a single tool or a combination of up to five different tools according to their specific needs. To compare the differences between the tools, interest was in those households who were assigned

¹ More detailed information about this project can be found in the final report (SA Government, 2009) and <http://www.transport.sa.gov.au/environment/travelSMARTsa/about.asp>

² For more details about the results of the TravelSmart evaluation, please see Stopher et al. (2007) or access the online final project report at http://www.transport.sa.gov.au/pdfs/environment/travelSMART_sa/Households_in_the_West_Final_Report.pdf

one tool only. According to the tool distribution, four tools were selected. These tools were the most requested and had reasonably good sample sizes for the comparison. These four tools are: the Walking and Cycling Map, the Affirmation Letter, the Local Activity Guide, and the Journey Plan. Table 1 shows detailed descriptions of these four tools and ways that the tools could have reduced vehicle travelled kilometres.

Table 1: Tools and Their Applications

	Description	Use	Way/s that the tool could have reduced vehicle kms
Walking and Cycling Map	Map specifically prepared by DTEI to show walking and cycling opportunities in the western suburbs of Adelaide.	For people who wanted to walk/cycle more or walk/cycle a specific route	Increased walking or cycling. By getting to know the area better, could have encouraged trip linking by car
Affirmation Letter	A letter to praise people for past reduction of kms and to remind them of the benefits they articulated.	To reinforce the benefits of this behaviour	Could have reinforced any way that car use had already been reduced
Local Activities Guides	Guides that gave local information on activities including shops, services, clubs etc.	To assist people who expressed frustration at having to drive a long way to obtain certain goods and services.	Designed to let people know of local activities so that they could walk, cycle, or trip chain by car to reduce kms.
Journey Plans	Individually tailored journey plans for public transport, cycling or walking trip that substitutes for a current car journey.	For people who wanted to know more about sustainable ways of travelling	To encourage people to take sustainable ways of travelling

In addition, for households that received two tools, a sufficient sample size was found where one of the tools was the Affirmation Letter and the other was either the Walking and Cycling Map or the Local Access Guide. Those two combinations were also included in the study to determine if the Affirmation Letter reinforced participants' travel behaviour changes.

METHODOLOGY

Sampling Method and Recruitment Process

Stratified sampling was used to explore the behaviour differences, if any, between six conditions of tool usage. As mentioned previously, due to the nature of the data provided by SA DTEI, six scenarios were selected which included four types of tools with respect to one-tool households and two combinations of tools with respect to two-tool households. The six strata are:

- Stratum 1: Journey Plan;
- Stratum 2: Walking and Cycling Map;
- Stratum 3: Local Access Guide;
- Stratum 4: Affirmation Letter;
- Stratum 5: Combination of Walking and Cycling Map and Affirmation Letter;
- Stratum 6: Combination of Local Access Guide and Affirmation Letter.

The recruitment process was quite simple: first, pre-notification letters signed by an SA DTEI official were sent to the selected participants with the suggestion to contact SA DTEI if they did not want to participate in this study; second, interviewers

conducted phone interviews if participants did not express the wish to withdraw from the study within two or three days of receiving the letters.

Survey Instrument

The survey instrument consisted of four main sections. The first section comprised some introductory questions asking about the respondent's familiarity with the TravelSmart program and whether they recall having been approached by TravelSmart. For respondents that did not recall, the interview was terminated and they were marked as ineligible. Those who did recall, proceeded to Section 2 where they were asked to estimate how much they believe their use of travel modes had changed since the TravelSmart intervention. The travel modes were car as driver, walk, bicycle, public transport, and travel as a car passenger. Section 3 of the survey consisted of four open-ended questions asking respondents to indicate the influences of the information provided by TravelSmart, the useful features of TravelSmart, the impact of TravelSmart on their everyday life, and how they implemented the information provided by TravelSmart. The last section contained questions about household demographics. An example of the survey instrument can be accessed from Zhang and Stopher (2008).

RESULTS

Response Rates and Attrition

Initially, a sample of 2,286 was drawn. Of these, 1,010 participants successfully completed the survey. Table 2 shows that the response rates varied from around 58 percent in strata 3, 4, and 6 to around 70 percent in stratum 5. In addition, the refusal rates were between 7 percent and 13 percent.

Table 2: Sample Dispositions of Six Strata in the Perception Survey

	<i>Stratum 1</i>	<i>Stratum 2</i>	<i>Stratum 3</i>	<i>Stratum 4</i>	<i>Stratum 5</i>	<i>Stratum 6</i>	Total
	Journey Plan	Walk/Bike Map	Local Access Guide	Affirmation Letter	Walk/Bike Map & Affirmation Letter	Local Access Guide & Affirmation Letter.	
Initial Sample	165	377	438	492	365	449	2286
Eligible	91	217	241	239	224	241	1253
Known Ineligible*	18	29	76	113	31	79	346
Eligibility Unknown ^	56	131	121	140	110	129	687
Refusals (percent)	13(7.9%)	31(8.2%)	63(14.4%)	52(10.6%)	25(6.8%)	59(13.1%)	243
Completes	78	186	178	187	199	182	1010
Response Rate	62.2%	62.8%	59%	58.3%	71.6%	58.7%	62%

* Households who were not familiar with TravelSmart program.

^ Households whose numbers were no longer working, households who did not live there anymore, households that were unavailable during the period of study and households who had language barriers.

Demographic Information

Table 3 summarises the principal demographic characteristics for the six strata. A number of observations can be made about the data in Table 3. First, the proportion of households by household size is very similar among the strata. For example, the

proportion of one-person households is around 20-30 percent, the proportion of two or three persons households are around 30-40 percent, and the proportion of four person households is between 10 and 15 percent. Second, Journey Plan and Access Guide and Affirmation Letter are similar in relation to most of the demographic variables, such as household size, car ownership and number of licensed drivers. Third, the only variable which shows a distinct difference among the strata is the bicycle ownership. In strata 1, 3, 4 and 6, there are on average 50 percent of the households who do not own a bicycle or bicycles; however, less than 30 percent of the households in strata 2 and 5 do not have a bicycle. This can be explained by the nature of the tools offered in the strata. In both strata 2 and 5, where the Cycling and Walking Map tool was offered, it would be expected that households in those two strata would have a relatively higher probability of owning bicycles than households in other strata, as this tool was targeted particularly at those who wanted to walk/cycle more or walk/cycle a specific route around local areas.

Table 3: Summary of the Demographic Information received from the Six Strata

Demographic (per household)	Value	Stratum1	Stratum2	Stratum3	Stratum4	Stratum5	Stratum6
		Journey Plan	Walk/Bike Map	Local Access Guide	Affirmation Letter	Walk/Bike Map and Affirmation Letter	Local Access Guide and Affirmation Letter
Number of Persons	1	33.3%	17.7%	26.6%	25.7%	25.0%	31.9%
	2	35.9%	33.3%	41.8%	41.7%	40.5%	40.7%
	3	12.8%	17.2%	11.9%	10.2%	17.5%	13.2%
	4	16.7%	21.0%	13.0%	17.1%	11.5%	12.1%
	5+	1.3%	10.8%	6.8%	5.3%	5.50%	2.2%
	Average	2.18	2.84	2.38	2.40	2.38	2.14
Number of Vehicles	0	12.8%	4.3%	9.6%	7.0%	4.0%	13.2%
	1	35.9%	24.7%	39.5%	34.8%	40.0%	41.8%
	2	38.5%	47.8%	33.3%	38.5%	35.5%	31.9%
	3+	12.8%	23.1%	17.5%	19.8%	20.5%	13.2%
	Average	1.51	1.90	1.59	1.71	1.73	1.45
Number of Bicycles	0	56.4%	22.6%	55.9%	43.9%	28.5%	67.0%
	1	10.3%	17.7%	16.4%	23.0%	22.5%	13.7%
	2	16.7%	26.3%	16.4%	20.9%	28.0%	13.7%
	3+	16.7%	33.3%	11.3%	12.3%	21.0%	5.5%
	Average	0.94	1.7	0.83	1.02	1.42	0.58
Number of Adults	1	38.5%	19.4%	28.2%	27.3%	28.0%	33.5%
	2	42.3%	57.0%	52.0%	52.4%	52.5%	44.5%
	3	10.3%	15.1%	14.1%	8.6%	12.5%	14.3%
	4+	9.0%	8.6%	5.6%	11.8%	7.0%	7.7%
	Average	1.94	2.15	2.01	2.05	1.98	1.97
Number of Children	0	83.3%	66.7%	79.7%	82.4%	78.0%	88.5%
	1	7.7%	11.3%	10.7%	8.0%	12.5%	6.6%
	2	9.0%	17.2%	5.1%	7.0%	6.0%	4.9%
	3+	0	4.8%	4.5%	2.7%	3.5%	0
	Average	0.26	0.61	0.35	0.32	0.37	0.16
Number of Licensed Drivers	0	12.8%	3.8%	6.8%	5.9%	2.0%	10.4%
	1	34.6%	21.5%	27.7%	27.3%	30.0%	33.0%
	2	35.9%	52.7%	50.8%	46.5%	49.5%	39.0%
	3	16.7%	22.0%	14.7%	20.3%	18.5%	17.6%
	Average	1.56	1.93	1.73	1.81	1.85	1.64
Age (Year)	18-26	5.1%	3.2%	0.6%	3.7%	2.0%	0.5%
	27-50	33.3%	42.5%	29.9%	26.2%	30.0%	20.9%
	51-70	42.3%	47.3%	40.1%	49.7%	58.0%	48.4%
	71+	19.2%	6.5%	28.8%	20.3%	10.0%	30.2%
Gender	Male	34.6%	48.4%	38.4%	36.9%	39.5%	38.5%
	Female	65.4%	51.6%	61.6%	63.1%	60.5%	61.5%
Physical Limitation	Yes	15.4%	7.0%	18.1%	9.1%	13.0%	23.6%
	No	84.6%	93.0%	81.9%	90.9%	87.0%	76.4%

Table 4 shows the results of the comparisons of the demographic characteristics in the perception survey with 2006 census data for the regions from which the sample was drawn. Table 4 highlights the proportions of one-person households in strata 1 and 6 are relatively close to the census but that the census values are larger than those in strata 2, 3, 4 and 5. A similar pattern can be observed in relation to car ownership. A plausible explanation is that non-car-owning households are more likely to be one-person households. The average number and proportion of children per household in stratum 2 is slightly larger than the census where the rest of the strata are slightly smaller than the census. It is possible that participants with children are more likely to use the tool provided in stratum 2 (Cycling and Walking Map) than the tools in other strata. In other words, this indicates that households with children are more attracted to acquire information about cycling and walking routes than households without children.

Table 4: Comparison of the Demographics of the Survey with 2006 Census Data*

<i>Demographic (per household)</i>	<i>Value</i>	<i>2006 Census – All Households</i>	<i>Stratum 1</i>	<i>Stratum 2</i>	<i>Stratum 3</i>	<i>Stratum 4</i>	<i>Stratum 5</i>	<i>Stratum 6</i>
Number of Persons	1	32.8%	33.3%	17.7%	26.6%	25.7%	25.0%	31.9%
	2	34.5%	35.9%	33.3%	41.8%	41.7%	40.5%	40.7%
	3	14.1%	12.8%	17.2%	11.9%	10.2%	17.5%	13.2%
	4	12.5%	16.7%	21.0%	13.0%	17.1%	11.5%	12.1%
	5+	6.2%	1.3%	10.8%	6.8%	5.3%	5.50%	2.2%
Number of Vehicles	0	14.4%	12.8%	4.3%	9.6%	7.0%	4.0%	13.2%
	1	42.5%	35.9%	24.7%	39.5%	34.8%	40.0%	41.8%
	2	32.1%	38.5%	47.8%	33.3%	38.5%	35.5%	31.9%
	3+	11.1%	12.8%	23.1%	17.5%	19.8%	20.5%	13.2%
Average Number of Adults		1.97	1.94	2.15	2.01	2.05	1.98	1.97
Proportion of Adults in the Population		80.5%	88.3%	78.0%	85.2%	86.7%	85.0%	92.3%
Average Number of Children		0.48	0.26	0.61	0.35	0.32	0.37	0.16
Proportion of Children in the Population		19.6%	11.7%	22.0%	14.8%	13.3%	15.0%	7.7%

* The census statistics are obtained by aggregating Port Adelaide Enfield (LGA45890) with Charles Sturt (LGA41060) and Holdfast Bay (LGA42600) to approximate the evaluation zone.

Travel Behaviour Changes

In this section, the analysis of the results of the travel behaviour changes is explored. Table 5 summarises the frequency and proportion of five scales in the Likert-type statements towards estimated changes of five types of travel modes, where values 1, 2, 3, 4, and 5 represent much decreased, slightly decreased, remain the same, slightly increased and much increased, respectively.

Table 5: Estimated Changes of Five Travel modes

Demographic (per household)	Value	Stratum1	Stratum2	Stratum3	Stratum4	Stratum5	Stratum6
		Journey Plan	Walk/Bike Map	Local Access Guide	Affirmation Letter	Walk/Bike Map and Affirmation Letter	Local Access Guide and Affirmation Letter
Change of Car Driving	1	15.4%	11.3%	14.7%	16.6%	14.5%	17.6%
	2	32.1%	30.6%	25.4%	27.8%	32.0%	23.1%
	3	41.0%	42.5%	45.2%	41.7%	29.0%	43.4%
	4	10.3%	8.6%	7.3%	8.6%	12.0%	6.6%
	5	1.3%	7.0%	7.3%	5.3%	12.5%	9.3%
	Average	2.50	2.69	2.67	2.58	2.76	2.67
Change of Walking	1	9.0%	2.7%	10.2%	8.0%	3.0%	14.8%
	2	6.4%	10.2%	15.3%	12.8%	17.0%	14.3%
	3	50.0%	41.9%	44.6%	40.1%	46.0%	44.5%
	4	20.5%	32.3%	16.9%	23.5%	21.0%	17.6%
	5	14.1%	12.9%	13.0%	15.5%	13.0%	8.8%
	Average	3.24	3.42	3.07	3.26	3.24	2.91
Bicycle Ownership	Yes	23.1%	38.7%	13.0%	22.5%	38.5%	7.1%
	No	76.9%	61.3%	87.0%	77.5%	61.5%	92.9%
Change of Cycling	1	10.5%	6.8%	13.0%	0.0%	7.8%	7.7%
	2	10.5%	17.8%	17.4%	11.9%	22.1%	7.7%
	3	36.8%	37.0%	17.4%	42.9%	29.9%	30.8%
	4	31.6%	20.5%	26.1%	26.2%	19.5%	23.1%
	5	10.5%	17.8%	26.1%	19.0%	20.8%	30.8%
	Average	3.21	3.25	3.35	3.52	3.23	3.62
Change of Using Public Transport	1	5.1%	3.8%	9.0%	7.5%	8.0%	7.7%
	2	10.3%	7.0%	5.6%	5.9%	5.0%	7.1%
	3	44.9%	60.8%	65.5%	61.5%	61.5%	59.9%
	4	28.2%	20.4%	15.8%	15.5%	15.0%	17.6%
	5	11.5%	8.1%	4.0%	9.6%	10.5%	7.7%
	Average	3.31	3.22	3.00	3.14	3.15	3.10
Change of Travel As Passengers	1	7.7%	1.6%	3.4%	3.7%	3.5%	4.9%
	2	6.4%	6.5%	4.5%	6.4%	8.5%	4.9%
	3	61.5%	76.9%	73.4%	76.5%	73.5%	70.3%
	4	14.1%	10.8%	15.3%	9.6%	10.0%	13.2%
	5	10.3%	4.3%	3.4%	3.7%	4.5%	6.6%
	Average	3.13	3.10	3.11	3.03	3.04	3.12

From Table 5, first, there is great similarity in terms of changes relating to using public transport and travel as passengers, which means it cannot be known which tool is more effective for promoting public transport or car pools. Second, in terms of car driving, there is little difference between strata: in each stratum, there are around 40 percent of respondents who claim to have decreased the amount of car driving since two years ago, although stratum 1 has the greatest change (47.5%), and strata 3 and 6 have the smallest change (41%). Third, a reasonably distinct difference is observed in relation to walking, which is that 45.2 percent of respondents in stratum 2 have reported that they increased their amount of walking, the highest amongst the six strata, with the lowest being in stratum 6, with only 26.4 percent. This finding indicates the Walking and Cycling Map provided a much more positive effect in increasing the amount of walking than the other tools. Fourth, while respondents in strata 2 and 5 have much higher percentages of bicycle ownership than the rest of the strata, there appears to be no correlation with a much higher proportion of people increasing the amount of cycling in strata 2 and 5 than the rest of the strata. This may indicate that the Cycling and Walking Map is not as effective in encouraging people to do more cycling as it is for walking. The results from Table 5 show that, although the strata shared a great deal of similarity in most of the travelling modes, some differences were observed. However, it is not known if those differences are

statistically significant. Therefore, a one-way ANOVA statistical test (F test) was employed to determine whether the differences between strata were significant. The mean of each stratum is compared to the mean of each of the other strata with respect to five different travel modes: car driving, walking, bicycling, public transport and travelling as a car passenger. The p-value column gives the probability (p) value of the F test and in this test, we assume statistical significance if differences are detected for $p < 0.05$. From the one way ANOVA results, no significant differences were found with respect to the changes of car driving, bicycling, public transport, and travelling as a car passenger. All significant differences are related to the change of walking (see Table 6). Those are:

- Significant difference A: stratum 2 is significantly higher than stratum 3;
- Significant difference B: stratum 2 is significantly higher than stratum 6;
- Significant difference C: stratum 4 is significantly higher than stratum 6; and
- Significant difference D: stratum 5 is significantly higher than stratum 6.

Some of the mean differences have asterisks in the Mean Dif. column, to indicate those that are significant at the 0.05 level or better. For instance, the first such difference is 0.351 between stratum 2 and stratum 3 in relation to the walking mode, which indicates that the change in walking is significantly different between stratum 2 and stratum 3.

Table 6: Mean Comparison of the Changes of Walking

	Stratum 1 Journey Plan	Stratum 2 Walk/Bike Map	Stratum 3 Local Access Guide	Stratum 4 Affirmation Letter	Stratum 5 Walk/Bike Map and Affirmation Letter	Stratum 6 Local Access Guide and Affirmation Letter
Stratum 1 Journey Plan	-	-0.181	0.17	-0.013	0.004	0.332
Stratum 2 Walk/Bike Map	0.181	-	0.351*	0.168	0.185	0.513*
Stratum 3 Local Access Guide	-0.17	-0.351*	-	-0.183	-0.167	0.161
Stratum 4 Affirmation Letter	0.013	-0.168	0.183	-	0.017	0.345*
Stratum 5 Walk/Bike Map and Affirmation Letter	-0.004	-0.185	0.167	-0.017	-	0.328*
Stratum 6 Local Access Guide and Affirmation Letter	-0.332	-0.513*	-0.161	-0.345*	-0.328*	-

*The mean difference is significant at the .05 level

As is well known, the higher the mean, the higher is the change for travelling respondents on a particular travel mode. From Significant difference A, it is predicted that the Cycling and Walking Map provides a more positive effect for changing people's walking behaviour than the Local Access Guide. More interestingly, the Affirmation Letter is more effective than the combination of the Affirmation Letter and the Local Access Guide according to Significant Difference C, which means that the Local Access Guide may perform rather poorly. The last line, Significant Difference D, reconfirms that the Walking and Cycling Map is more effective than the

Local Access Guide. In summary, the one way ANOVA test shows that, the Cycling and Walking Map is more effective than the Local Access Guide and the Affirmation Letter in terms of encouraging people to walk more, but no such effects were detected in other types of behaviour change.

Reliability of Travel Behaviour Change in the Perception Survey

As indicated earlier, TravelSmart engaged 22,101 households to reduce their car use. To quantify the behaviour change results an independent evaluation was undertaken. Some respondents from this survey previously participated in the TravelSmart independent evaluation (Stopher et al., 2009). The reason for including the data gathered from those who participated in TravelSmart independent evaluation was to validate the reliability of the changes in car use measured in this perception survey. If the reliability of people’s estimated change towards car use is known, this may assist to predict the reliability of the estimated changes of other types of travel, such as public transport, walking, etc.

There is one data set in the TravelSmart independent evaluation project which are valuable for this project: one from the odometer panel, which contains the Vehicle Kilometres Travelled (VKT) per household and VKT per vehicle over the period for which the household remained in the panel. After cross matching the list of participants in the TravelSmart independent evaluation and the list of participants in the TravelSmart tool acquisition, 455 participants in the Odometer Panel were eligible³ to undertake the perception survey. Among those 455 participants, 162 successfully completed the Tools Evaluation Survey. A correlation test was conducted to determine whether a relationship exists between the VKT changes and perceived change (see Table 7).

Table 7: Correlation Between Changes of VKT per Households and Perceived Changes

		Change in VKT per Household per Day		
		2005-06	2006-07	2005-07
Perceived Change (2006-08)	r	0.109	0.100	0.177
	p-value	0.341	0.304	0.146
	N	78	107	69

Due to the fact that the odometer readings from the households were collected every four months from 2005 to 2007, this was consolidated to annual figures. In addition, as the perceived changes measured in the survey are between 2006 and 2008, we chose 2005-06, 2006-07 and 2005-07 from the odometer panel as the most comparable periods of time. Table 7 shows no p-values are observed as less than 0.05, indicating that there is no significant correlation between the perceived changes measured in this tool evaluation project and the changes of VKT measured in the TravelSmart independent evaluation.

³ The eligibility criteria were that the number of the TravelSmart tools received by the households cannot be more than two and that the type(s) of tools must be one of the four tools (Journey Plans, Cycling and Walking Map, Local Access Guide, Affirmation Letter) or two of the combinations (Cycling and Walking Map and Affirmation Letter, Local Access Guide and Affirmation Letter).

Open-ended Questions

This section presents the results of three open-ended questions in relation to the most useful feature of TravelSmart, the impact it had on everyday travel, and how the TravelSmart information has been applied in everyday travel.

Table 8 represents the participants' answers to the first question: "What is the most useful feature of TravelSmart for you?" In Table 8, *Not Useful* means participants expressed that the tool package was not useful for them, *Not Applicable* means participants did not answer the question properly, *Not Remember* means participants did not remember any useful features from their tools or how they applied the tools in their everyday travel, *Things They Already Knew* means participants already knew the information provided in the tool package before participating in the TravelSmart program. The percentages in Table 8 are calculated for all respondents in each stratum, so that the distribution can be compared between the strata. From Table 8, the highest proportion of eligible answers is stratum 2 in relation to the most useful feature question, and then stratum 1, and the least percentages are strata 3 and 4.

Table 8: Most Useful Feature of TravelSmart

	<i>Stratum size</i>	<i>Not Useful</i>		<i>Not Applicable</i>		<i>Not Remember</i>		<i>Things They already knew</i>		<i>Eligible answers</i>	
Stratum 1	78	12	15.4%	4	5.1%	11	14.1%	0	0.0%	51	65.4%
Stratum 2	186	22	11.8%	7	3.8%	17	9.1%	2	1.1%	138	74.2%
Stratum 3	177	44	24.9%	11	6.2%	41	23.1%	17	9.6%	64	36.2%
Stratum 4	187	47	25.1%	18	9.6%	36	19.3%	18	9.6%	68	36.4%
Stratum 5	200	44	22.0%	11	5.5%	18	9.0%	20	10%	107	53.5%
Stratum 6	182	35	19.2%	12	6.6%	38	20.9%	12	6.6%	85	46.7%
Average	n/a	19.73%		6.13%		15.92%		6.15%		50.08%	

Table 9 shows the top four most cited useful features of TravelSmart with the proportion under each ranking.

Table 9: Most Useful Features of TravelSmart

<i>Stratum</i>	<i>Public Transport Information</i>	<i>Awareness /availability of using alternative to driving</i>	<i>Environmental benefits</i>	<i>Awareness of TravelSmart project</i>	<i>Cycling or walking route</i>	<i>Promotion of car pool</i>	<i>Promotion of walking or cycling</i>	<i>Local information</i>
1 (N=51)	1 (58.8%)	2 (37.3%)	3 (7.8%)	4 (5.9%)				
2 (N=138)		2 (18.8%)			1 (26.8%)		3 (7.2%)	4 (5.8%)
3 (N=64)	3 (17.2%)	2 (37.5%)		4 (9.4%)				1 (60.9%)
4 (N=68)		1 (79.4%)				2 (20.6%)	3 (17.6%)	4 (11.8%)
5 (N=107)	1 (27.1%)	2 (23.4%)				4 (8.4%)	3 (10.3%)	
6 (N=85)	3 (16.5%)	2 (30.6%)		4 (3.5%)				1 (43.5%)

Tables 10 and 11 show the results of the second open-ended question: "Do you think the information provided by TravelSmart has had an impact on your everyday travel or the everyday travel of your household? If yes, what is the impact?". Table 10 shows how many participants in each stratum agreed that TravelSmart has impacted their everyday travel. For those who felt the program had impacted them or their

households, Table 11 shows the result of the top four most cited impacts with the frequency and proportion under each ranking.

In reviewing Table 10, the percentages of no impact are between 70 and 80 percent per stratum, which is quite high. However, among this 70-80 percent of participants, a large proportion contains those who have expressed that they cannot remember any useful TravelSmart features or whether they had applied the TravelSmart information or if they had already known the information included in the tool packages (the details of those figures can be found in Tables 8 and 9). According to the most cited impacts of TravelSmart (Table 11), Awareness of public transport and Awareness of car pool or trip chains appear in each stratum, and Using more public transport appears in most of the strata except stratum 3.

Table 10: Result Disposition of the Second Open-ended Question: Whether TravelSmart has Impacted Respondents' Everyday Travel

	<i>Stratum size</i>	<i>Have impact</i>		<i>No impact</i>	
Stratum 1	78	21	26.9%	57	73.1%
Stratum 2	186	36	19.4%	150	80.6%
Stratum 3	177	36	20.3%	141	79.7%
Stratum 4	187	53	28.3%	134	71.7%
Stratum 5	200	48	24.0%	152	76.0%
Stratum 6	182	43	23.6%	139	76.4%

It can be seen that the most useful feature, identified in Table 9, is quite different for each stratum: public transport information for strata 1 and 5, cycling and walking route for stratum 2, local information for strata 3 and 6, and awareness of using alternatives for stratum 4. In particular, more than half of the respondents in strata 1, 3, and 4 cited those dominant features. However, in stratum 2, where the Cycling and Walking Map was offered, only 26.8 percent of respondents considered it as the most useful feature, much less than the other strata if we compare the percentage of the dominant features. Furthermore, it was also found that the feature awareness/availability of using alternatives to driving appeared in all six strata, and local information appeared in four strata (strata 2, 3, 4, and 6). These findings indicate the two most useful features participants considered TravelSmart to have is in increasing their awareness or informing them of the availability of alternatives to driving and providing useful local information, showing residents locations of nearby facilities. However, as previously found, the Walking and Cycling Map was the most effective in changing the amount of walking. From here an interesting point is inferred: the most useful features considered by participants do not necessarily correspond to the most effective feature according to the measured travel behaviour changes, supporting the notion that perceptions of behaviour do not necessarily correlate with actual behaviour change.

Table 11: Impact of TravelSmart

Stratum	Awareness of public transport	Using more public transport	More car pool or trip chains	More walking or cycling	Awareness of what to do locally	Awareness of car pool/trip chains
1 (N=21)	1 (52.4%)	2 (33.3%)	3 (19.0%)	4 (14.3%)		
2 (N=36)	2 (33.3%)	2 (33.3%)	4 (16.7%)	1 (36.1%)		
3 (N=36)	3 (19.4%)		4 (16.7%)	2 (22.2%)	1 (25.0%)	
4 (N=53)	1 (32.1%)	4 (20.8%)	2 (24.5%)			2 (24.5%)
5 (N=48)	1 (27.1%)	2 (25.0%)	4 (14.6%)	2 (25.0%)		
6 (N=43)	2 (18.6%)	1 (23.3%)			4 (16.3%)	2 (18.6%)

Table 12 shows how participants answered the third open-ended question: “Can you tell me how you have applied the information provided by TravelSmart into your everyday life?”. Similar to Table 8, in Table 12, *Have not applied* means participants did not apply the information provided by TravelSmart in their everyday travel, *Not Applicable* means participants did not answer the question properly, *Not Remember* means participants did not remember how they applied the tools in their everyday travel, *Things They Already Knew* means participants already knew the information provided in the tool package before participating in TravelSmart. Furthermore, the percentages in Table 12 are calculated for all respondents in each stratum, so that the distribution can be compared from one stratum to another. In Table 12, around 50 percent of respondents provided eligible answers in strata 1 and 2, where the rest of the strata are around 30-40 percent. Probably, it is worthwhile to point out that around 10 percent of the participants already knew the information provided in the tool packages in strata 3, 4, and 5.

Table 12: Result Disposition of the Third Open-ended Question: How the Information Have Applied into Everyday Life

Stratum	Stratum size	Have not applied		Not Applicable		Not Remember		Things They already knew		Eligible answers	
		Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Stratum 1	78	29	37.2%	1	1.3%	8	10.3%	0	0.0%	40	51.3%
Stratum 2	186	78	41.9%	5	2.7%	15	8.1%	2	1.1%	86	46.2%
Stratum 3	177	56	31.6%	9	5.1%	45	25.4%	12	6.8%	55	31.1%
Stratum 4	187	57	30.5%	4	2.1%	36	19.3%	15	8.0%	75	40.1%
Stratum 5	200	69	34.5%	11	5.5%	14	7.0%	20	10%	86	43.0%
Stratum 6	182	82	45.1%	3	1.6%	30	16.5%	12	6.6%	55	30.2%

In terms of how participants have applied TravelSmart tools, Table 13, which displays the top four cited ways of applying TravelSmart tools, shows that *Using public transport* is the most common way used in every stratum and *Awareness of the alternatives* is applied in most of the strata except strata 3 and 5.

Table 13: Ways of Applying TravelSmart Tools

Stratum	Using public transport	Walking or cycling	Trip chain or trip planning	Awareness of alternatives	Sharing information with others	Car pool	Using local information	Using walking or cycling map
1 (N=40)	1 (62.5%)	2 (20.0%)	3 (17.5%)	4 (7.5%)				
2 (N=86)	1 (32.6%)		3 (11.6%)	2 (12.8%)	4 (5.8%)			
3 (N=55)	1 (29.1%)		4 (18.2%)			2 (25.5%)	3 (21.8%)	
4 (N=75)	2 (38.7%)		3 (29.3%)	4 (13.3%)		1 (45.3%)		
5 (N=86)	2 (25.6%)		3 (16.3%)				4 (11.6%)	1 (60.5%)
6 (N=55)	1 (34.6%)		3 (21.8%)	2 (25.5%)			4 (18.2%)	

CONCLUSIONS

This paper presents an extensive perception study which measures if some tools were more effective in bringing about travel behaviour change with the premise to streamline future TravelSmart Households projects by focusing on the tools which have the most effect on changing behaviour. Four tools were selected for evaluation: the Journey Plan, the Walking and Cycling Map, the Affirmation Letter, and the Local Activity Guide. The statistical tests show that no significant differences were detected in most of the travel modes except that the Cycling and Walking Map is more effective than the Local Access Guide and the Affirmation Letter in terms of encouraging people to walk more. Moreover, the analysis of open-ended questions shows that participants considered the most useful features from the TravelSmart program to be providing the awareness or availability of using alternatives rather than driving, and providing useful local information. However, this does not mean that the other tools, other than Cycling and Walking Map are not effective. As was stated in the beginning of this paper, strong evidence was found that TravelSmart has a positive effect in changing behaviour into more environment friendly travel modes, such as public transport, walking or cycling. Therefore, these results suggest that the TravelSmart tools studied here were relatively similar in their effectiveness in bringing about travel behaviour changes, while the Cycling and Walking Map tool is more effective than the others for those interested in walking and cycling, although there are interesting inconsistencies in how this information is received and perceived. It is also noteworthy that self-reporting of changes in travel behaviour appears to be highly suspect. Further in-depth analysis is still required on other aspects of the TravelSmart engagement process as it appears from this inconclusive evidence that the common element is that all participants had a guided conversation focusing on the personal motivators.

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