



## TravelSmart in Exeter

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Final Report on the Individualised Travel Marketing Project in Exeter (2008-2009)

**Report for Devon County Council and Exeter City Council**

September 2010



## EXECUTIVE SUMMARY

The TravelSmart® Individualised Travel Marketing (ITM) project in Exeter and Exminster<sup>1</sup> was successful in increasing the use of sustainable and active travel modes, leading to significant reductions in car use. The project was conducted in 2008 and 2009 with a target population of 25,000 households.

The project achieved substantial increases in walking, cycling and use of public transport, leading to a relative reduction in car-as-driver trips of 12% and in car distance travelled for day-to-day trips of 15% (a net saving of 29.6 million car km per year against baseline levels). This level of behaviour change is in line with that observed in other UK TravelSmart projects.

The shift from car travel to walking, cycling and public transport also resulted in a 19% relative increase in average daily exposure to physically active forms of travel.

Changes in travel behaviour were measured by detailed surveys conducted before and after the ITM project across the target population, with a separate control group in an untargeted area of north Exeter.

The Exeter TravelSmart project was managed by a working group consisting of Sustrans, Socialdata, Devon County Council (DCC, including Cycle Exeter) and Exeter City Council (ECC). The ITM project and evaluation activities were designed and implemented by Sustrans and Socialdata, with funding from the Big Lottery Fund's Wellbeing Programme and both Councils. In addition, in-kind contributions were provided by both Councils towards the development and supply of marketing materials and in staff time to support the project. Public transport test tickets were provided by Stagecoach and First Great Western. The total cash cost of the project, including evaluation, was £709,712.

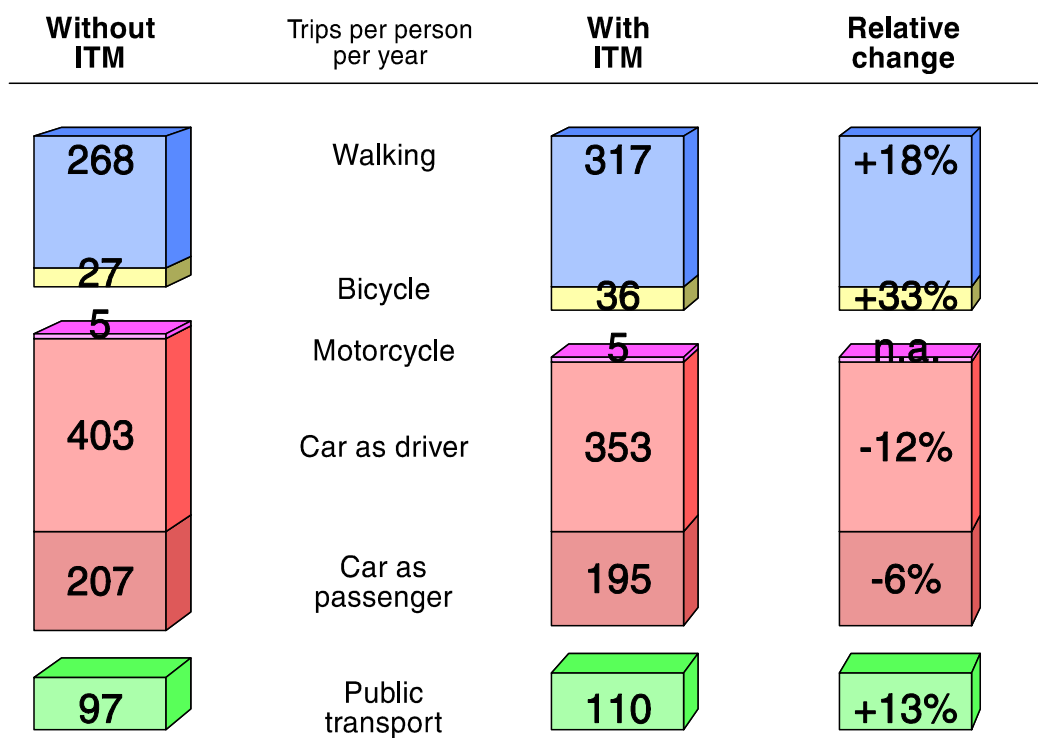
The changes in travel behaviour, measured in trips per person per year, are summarised in the figure below. This modal shift was achieved with minimal impact on daily mobility among the target population, and with no increase in average daily travel time. The surveys also showed that the greatest increases in use of sustainable modes occurred between 9am and 3pm and

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<sup>1</sup> For brevity, the target area is referred to simply as Exeter in the remainder of this report.

the greatest reductions in car-as-driver trips were observed after 7pm, although smaller changes were also observed at peak travel times.

**Changes in trips by main mode (trips per person per year)**



The first phase of the ITM project involved making contact with the target population of 25,000 households in Exeter. Eighty-one percent of these households responded to doorstep or telephone contact and were segmented into groups according to their current travel patterns and willingness to participate in the TravelSmart project. Of these contacted households, 64% were interested in receiving personalised information and advice on sustainable and active travel modes.

In total, TravelSmart information packs containing 108,690 items of information, rewards and incentives were delivered to a total of 11,530 households in the target area. The most popular individual items were the

new local travel maps (specifically developed for the TravelSmart project), followed by Exeter Green Circle, Exeter Walking Map and the Discount Card.

Households were also able to request TravelSmart further services in the form of home advice sessions and incentives to encourage greater use of sustainable and active travel modes (including a free Megarider ticket to try out local Stagecoach services and a free train ticket provided by First Great Western). A total of 80 home visits were conducted by trained advisors on walking, cycling or public transport (the latter by staff from Stagecoach).

**TRAVELSMART IN EXETER**  
**Final Report on the Individualised Travel Marketing Project in 2008-2009**

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## **1 INTRODUCTION**

### **1.1 This report**

This report reviews the implementation and outcomes of the TravelSmart Individualised Travel Marketing (ITM) project conducted in Exeter in 2008 and 2009. The project aimed to reduce levels of car use and encourage more environmentally-friendly forms of travel by promoting walking, cycling and use of public transport.

The report is intended primarily for Devon County Council (DCC) and Exeter City Council (ECC). However rights to the use of this report and data contained herein will be shared by the client group, Sustrans and Socialdata for the purposes of further developing TravelSmart in the UK.

### **1.2 Report structure**

Although the report should be taken as a whole, each main section is designed to provide readers with a stand-alone account of the project background, methodology or outcomes, as follows:

- Section 2 provides general background to TravelSmart, sets out the key elements of the ITM methodology and reviews the local context for the Exeter TravelSmart project including its specific objectives, timetable and project management;
- Section 3 covers the work done by all project partners to prepare for the ITM project;
- Section 4 reviews the implementation of the project and provides a detailed account of responses at each stage;
- Section 5 reviews the methodology of the evaluation surveys and reports the behavioural changes achieved by the TravelSmart project;
- Section 6 presents key conclusions based on the project outcomes and compares the results of this project with those of other TravelSmart projects which have taken place in the UK.

## **2 PROJECT DESCRIPTION**

### **2.1 Background**

The Exeter TravelSmart project was funded by the Big Lottery Fund's Well-being Programme, DCC and ECC, and managed by Sustrans and Socialdata. TravelSmart in Exeter was developed in close co-operation with DCC and ECC to ensure that it complemented other initiatives in the area.

The project was part of a portfolio of 50 projects being delivered by a consortium of walking, cycling and health organisations, led by Sustrans. This 'Travel Actively' consortium aims to provide people with the practical support they need to walk and cycle as part of their everyday lives, improving their mental and physical wellbeing. Three new TravelSmart ITM projects were commissioned through this consortium, each targeting 25,000 households (in Exeter, Watford and Lowestoft).

In Exeter, Sustrans and partners Socialdata were commissioned to conduct a TravelSmart ITM project targeting 25,000 residential households. The project involved close working with local authorities and other local partners.

In order to measure the outcomes of the TravelSmart project, part of the funding was used by Socialdata and Sustrans to conduct a programme of travel behaviour research.

### **2.2 Aims and objectives**

The aim of the Exeter TravelSmart project was:

- To reduce levels of car use among the target population by promoting walking, cycling and use of public transport.

The specific objectives were:

- To develop a package of information, incentives and other services to promote walking, cycling and public transport;
- To offer this package of information, incentives and other services to a target population of 25,000 households in Exeter and to fulfil all requests using the TravelSmart ITM technique (see below); and

- To evaluate the effects of this intervention against a range of performance indicators relating mainly to personal travel behaviour.

### **2.3 The TravelSmart Individualised Travel Marketing process**

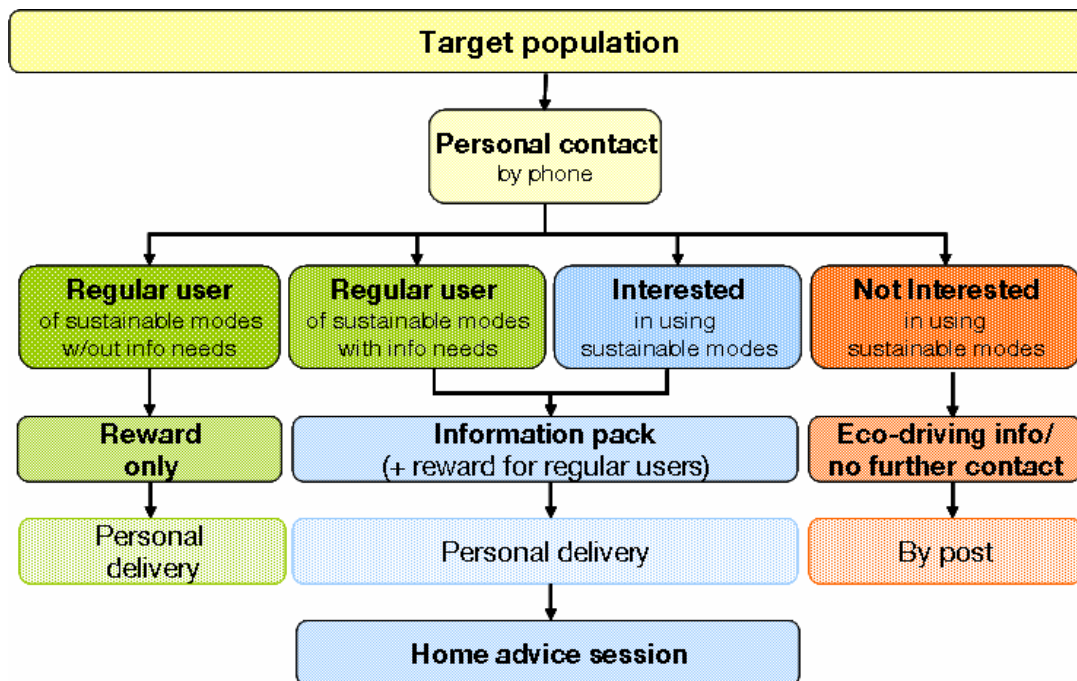
The TravelSmart ITM process has been developed and proven over many years as a highly successful tool for changing travel behaviour. Pioneered by Socialdata during the late 1980s, the technique has since been applied in more than 250 projects targeting a total of more than three million people worldwide. In the UK, the TravelSmart programme run by Sustrans and Socialdata has worked with more than 250,000 households to offer personalised travel information and support.

The ITM process was developed as a result of detailed research by Socialdata showing that poor information and lack of motivation were important barriers preventing greater use of walking, cycling and public transport as alternatives to car travel. It is now widely recognised that while good infrastructure is needed to provide better alternatives to the car, the full potential for modal shift towards more sustainable travel cannot be realised unless people are well-informed about the options and motivated to use them.

The TravelSmart ITM process, as illustrated in Figure 2.1, involves three key stages each based on personal contact with the households in the target area. The process involves dialogue which motivates people to consider and review their travel behaviour in the context of their lifestyles. People who are interested in changing are supported and encouraged, but the choice is always left to the individual. This process enables people to make voluntary individual changes which add up to make a substantial difference to community-wide travel patterns.

The same Individualised Marketing technique has been successfully applied by Socialdata in Australia to promote domestic water efficiency. Other TravelSmart programmes have included the use of health-related marketing materials and promoted other forms of physical activity alongside sustainable travel.

**Figure 2.1 Individualised Travel Marketing process**



## 2.4 Target area and population

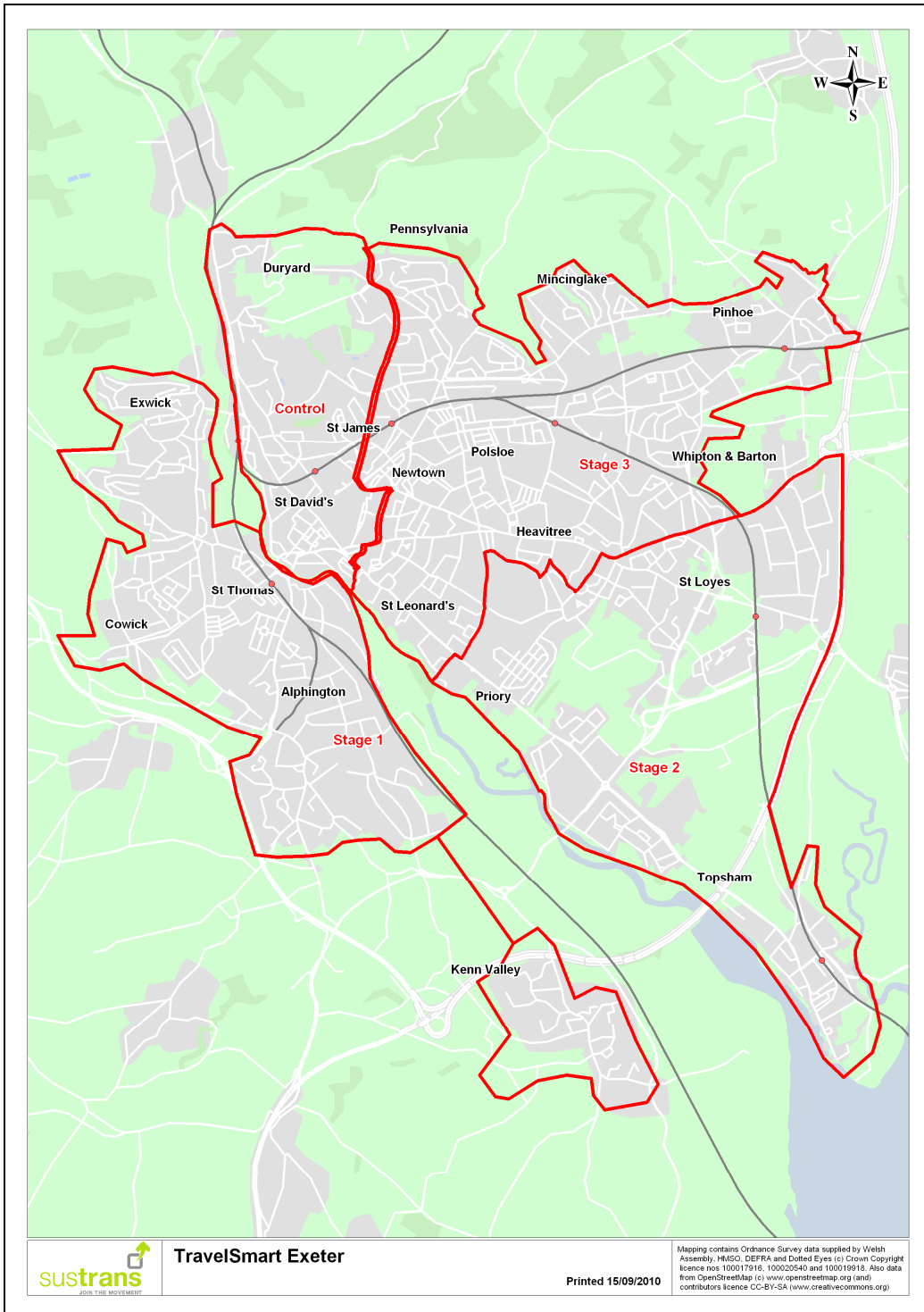
The target area for this TravelSmart project covered most of Exeter. The boundaries of the target area are shown in Figure 2.2. The control area for evaluation surveys is also shown.

This area was selected for a number of reasons:

- Good existing bus links linking the city centre and residential areas;
- An established network of walking and cycling routes;
- Proximity to the city centre and therefore access to its bus and rail stations; and
- Local facilities and amenities reducing the need to travel into the city.

The target population was drawn from this area at random using a commercially available address database. This process provided the total target population of 25,000 households.

**Figure 2.2 Map of the target area**



## 2.5 Project management

The project was co-ordinated by a working group which consisted of Sustrans, Socialdata, DCC and ECC. Meeting around four times per year over the course of the project, this group was responsible for finalising the overall project design, developing the marketing package and reviewing progress with the fieldwork.

Sustrans, with support from Socialdata, was responsible for day-to-day project management and reporting, as well as development of the marketing package. Sustrans also managed the local ITM fieldwork, including delivery of information packs and co-ordination of home visits. Implementation of the travel surveys, preparation of databases, ITM telephone contact and mailing operations were managed by Socialdata.

DCC and ECC supplied local travel information materials on public transport, walking and cycling. Local bus operator, Stagecoach, supplied a number of bus service timetables. The project also received valuable support from a number of other partners including: Cycle Exeter (as part of DCC), National Express, First Great Western and The Ramblers.

## 2.6 Costs and funding

The total original budget for delivery of the Exeter TravelSmart ITM project was £715,599 (including £76,720 for evaluation). To date £709,712 has been spent, with the remaining amount to be used for final reporting and dissemination activities. In addition, in-kind contributions to a value of £65,960 have so far been provided by DCC and ECC towards the development and supply of marketing materials and in staff time to support the project. Bus test-tickets were provided by Stagecoach. Train test-tickets were provided by First Great Western.

## 2.7 Timetable

The project was delivered according to the following timetable:

|                            |                                  |
|----------------------------|----------------------------------|
| July – September 2007      | Project inception                |
| January – March 2008       | Travel behaviour survey (before) |
| November 2007 – March 2008 | Preparation of ITM project       |
| April 2008 – August 2009   | Implementation of ITM project    |
| January – March 2010       | Travel behaviour survey (after)  |
| September 2010             | Final reporting                  |

### **3 PREPARATIONS FOR THE TRAVELSMART PROJECT**

#### **3.1 Introduction**

The TravelSmart project offered households a wide range of high-quality information, advice and support on local options for using sustainable travel modes (walking, cycling and public transport).

With support from DCC, ECC and other local partners, Sustrans co-ordinated the assembly of a marketing package consisting of printed information materials, incentives and rewards, and personal advice sessions (home visits).

#### **3.2 Information materials**

A range of information materials was assembled on local options for walking, cycling and public transport. The principal sources of these materials were DCC, ECC, Sustrans and the local public transport operators.

A checklist of available materials was developed and refined according to the following broad criteria:

- Relevance to local travel needs of households in the target area;
- Consistency with the overall aims of the TravelSmart project; and
- Availability in the quantities required and within project timescale.

A complete list of all information materials offered during the TravelSmart project is given in Table 3.1.

All of the materials selected for use in the ITM project were listed on a TravelSmart order form (see Annex A). The form included the offer of a small incentive (see following section) to encourage households to respond quickly.

**Table 3.1 Information materials assembled for the ITM project**

| Category / item  | Publisher/provider  |
|--|---|
| <p><b>Local Travel Map (one per stage of the project)</b></p> <p>West Exeter and Exminster on foot, by bike, by bus</p> <p>East Exeter and Topsham on foot, by bike, by bus and by train</p> <p>Central and North East Exeter on foot, by bike, by bus and by train</p>  | <p>Sustrans</p> <p>Sustrans</p> <p>Sustrans</p>   |
| <p><b>Public Transport</b></p> <p>Bus stop timetables (Stage 1 only)</p> <p>Stagecoach: Exeter bus map and frequency guide</p> <p>Local bus timetables (relevant to the specific target area for each of the three stages)</p> <p>Area bus timetables (Stages 2 and 3 only):<br/>East Devon<br/>Teignbridge<br/>Mid Devon</p> <p>Park and Ride (Stage 3 only)</p> <p>Stagecoach – Tickets to go</p> <p>A guide to catching the bus or train</p> <p>Traveline – TXT 4 Times</p> <p>National Express (Stage 1 only)</p> <p>Local train timetables (relevant to the specific target area for each of the three stages)</p> <p>Regional &amp; National train timetables</p> <p>PLUSBUS</p> | <p>DCC</p> <p>DCC</p> <p>DCC/ Stagecoach</p> <p>DCC</p> <p>Stagecoach</p> <p>DCC/Stagecoach</p> <p>DCC</p> <p>DCC</p> <p>National Express</p> <p>First/DCC</p> <p>DCC/First/Cross Country Trains</p> <p>First/DCC</p> |

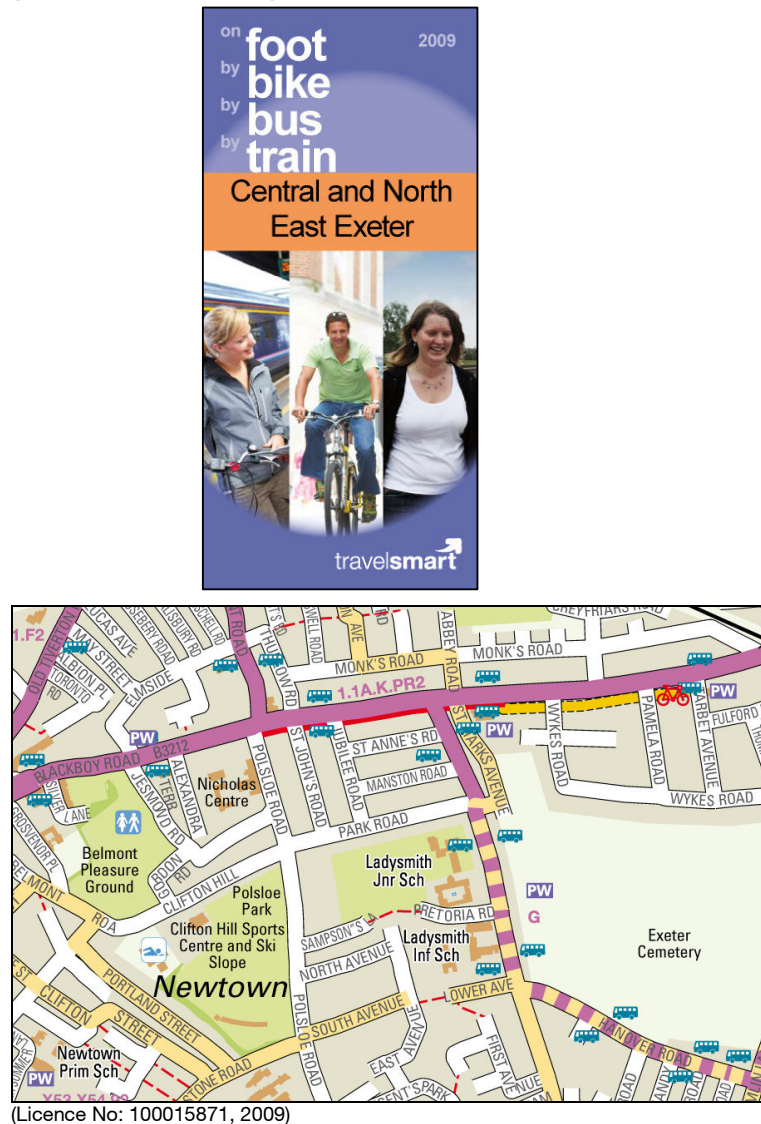
|   |   |
|---|---|
| <p>Railcards:<br/>         - Senior Citizens<br/>         - Young Persons<br/>         - Families<br/>         - Within Devon and Cornwall (Stages 1 and 2 only)<br/>         - Network Railcard, for South West trains between Exeter and the South East<br/>         - Network Railcard, when using South West trains services between Exeter and the South East</p>  | <p>National Rail/DCC</p>  |
| <p><b>Walking</b><br/>         Exeter Walking Map<br/>         The Exeter Green Circle<br/>         Exeter Ship Canal – Towpath and Waterway routes (Stages 1 and 2 only)<br/>         Westbank Walking Your Way to Health (Stage 1 only)<br/>         Exeter Leisure Walks (Stages 2 and 3 only)<br/>         Devon Walking Guide (Stage 3 only)<br/>         Walk More – Feel the Difference (Stages 1 and 2 only)<br/>         Walk in to Work Out (Stages 1 and 2 only)<br/>         Stepping out (Stages 2 and 3 only)<br/>         Why Walk? (Stage 3 only)<br/>         Get Walking, Keep Walking (Stage 3 only)</p> | <p>Sustrans/ECC<br/>         Sustrans/ECC<br/>         ECC<br/>         DCC<br/>         ECC<br/>         DCC<br/>         Sustrans<br/>         Sustrans<br/>         Sustrans<br/>         Sustrans<br/>         Ramblers</p> |
| <p><b>Cycling</b><br/>         Cycle guide and map<br/>         Exminster &amp; Exwick to Exeter City Centre Cycle Route (Stages 1 and 2 only)<br/>         Discover Devon – Cycling (Stage 1 only)<br/>         Cycling trails in Devon (Stages 2 and 3 only) *same as above?<br/>         Haldon Forest Park (Stages 2 and 3 only)<br/>         Why cycle?<br/>         Get cycling<br/>         Cycling with children<br/>         Cycle Exeter – Making Exeter a cycle friendly city (Stage 1 only)<br/>         Cycle training for children and adults<br/>         Cycle scheme ‘wage slip’</p>                       | <p>DCC<br/>         DCC<br/>         DCC<br/>         DCC<br/>         Haldon<br/>         Sustrans<br/>         Sustrans<br/>         Sustrans<br/>         DCC<br/>         DCC<br/>         DCC</p>                          |

|  |                |
|--|----------------|
| The Road Code  | DCC            |
| Give cyclists space  | DCC            |
| Cycling by train (Stage 3 only)  | National Rail  |
| <b>Discount Card</b>   |                |
| TravelSmart Discount Card  | Sustrans       |
| <b>Related Information</b>   |                |
| Stagecoach – Making your journey easier                                  | Stagecoach/DCC |
| Rail travel made easy – Disabled Person’s Railcard (Stages 1 and 2 only) | DCC            |
| ECTA: Exeter Community Transport Association                             | DCC/Sustrans   |
| Freedom Wheels   | DCC            |
| Safe Routes to Schools   | Sustrans       |
| Eco-driving Pack   | DCC            |
| Exe Explorer   | DCC/ECC        |
| Mini Guide 2008 Exeter (Stages 1 and 2 only)                             |                |
| Mini Guide 2009 (Stage 3 only)   | ECC            |
| Topsham (creating memories) (Stage 2 only)                               | ECC            |
| <b>Incentives</b>  |                |
| Key ring (with five years membership of a lost key recovery service)     | Sustrans       |

### 3.2.1 Local travel map

In partnership with DCC and ECC, Sustrans produced a local travel map for each stage area showing integrated information on cycling, walking and public transport in and around the target area (see Figure 3.1).

**Figure 3.1 Central and North East Exeter (Stage 3) Local travel map (cover and extract)**



### ***3.2.2 Personal journey plan***

The offer of a personal journey plan, downloaded from the Traveline journey planner, was included on the order form.

The back page of the order form was designed to capture the same information about the user's requirements as the Traveline internet journey planner.

### ***3.2.3 Discount Card***

When a household pledged to use environmentally-friendly travel options more often, they qualified for a TravelSmart Discount Card. The Discount Card enabled households to take advantage of discounts at cycle shops in Exeter. These discounts were arranged by Sustrans with local retailers and included savings on servicing, accessories, new bikes and clothing.

The Discount Card also included a 20% discount on all orders placed by phone with the Sustrans shop.

## **3.3 Incentives and gifts**

Sustrans sourced a range of incentives and gifts to support the ITM project:

- TravelSmart-branded calico shopping bags and folders in which to package materials and facilitate deliveries;
- TravelSmart-branded key rings to encourage a quick response to the order form; and
- TravelSmart-branded pens, notepads and fluorescent armbands, and an unbranded puncture repair kit, to reward regular walkers, cyclists and public transport users to reinforce their sustainable travel behaviour.

Incentives offered as part of further services are discussed separately in the following section.

## **3.4 Further Services**

A package of 'further services' was developed and offered on the TravelSmart order form as a means of providing further support and encouragement to households with a particular interest in making greater use

of sustainable travel modes. These services were provided in the form of a home advice session and were geared towards people currently making little or no use of the travel modes concerned. Households could receive a home visit from a local advisor on cycling, walking and/or public transport.

The TravelSmart order form<sup>2</sup> carried the following text to allow households to sign up for these further services:

“Your household may be eligible for a personal advice session with one of our local experts on public transport, cycling and/or walking in your area. Select one (or more) of the options below and we’ll be in touch to arrange a home visit to suit your needs. You’ll be surprised at the opportunities available!

- Choose public transport – get the most out of public transport with the help of one of our specialist advisors, including tips on all the best ticket deals and a chance to try out local services.
- Choose cycling – get going on two wheels with the help of one of our cycling consultants, including advice on the best local routes, a bike ‘health check’ and the limited offer of a free cycle trip computer.
- Choose walking – put your best foot forward with the help of one of our walking experts, including advice on the best local routes, health information and the limited offer of a free pedometer.”

For *Choose public transport*, local bus operator Stagecoach agreed to offer, a free Megarider ticket to try out local Stagecoach services and First Great Western offered a free train ticket for local services.

For *Choose cycling*, a local Sustrans cycling advisor was able to provide households with personal advice, a bike health check and the offer (and set-up) of a free cycle trip computer.

For *Choose walking*, households could receive personal advice and route planning from a local Sustrans walking advisor, as well as the offer (and set-up) of a free pedometer to help measure progress.

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<sup>2</sup> Only households that were not regular bus users were sent this version of the order form.

### 3.5 Local field offices

Sustrans managed the door-to-door canvassing and packing and delivery of personalised information packs from temporary field offices set up for each stage of the ITM project. A team of local field office staff was recruited and trained for each stage of the project and led by a field office manager. The team included walking and cycling home visit advisors using the field office as a base. The following premises were used in each stage:

|                |  |
|----------------|--|
| <b>Stage 1</b> | Buddle Lane Youth Centre, Merrivale Road   |
| <b>Stage 2</b> | Wonford Community Centre, Burnthouse Lane  |
| <b>Stage 3</b> | Exeter Harriers, The Pavilion, Summer Lane |

### 3.6 Call centre

Socialdata managed the telephone contact process, together with the mailing of all announcement letters, order forms and gift lists, from its office in Bristol. A team of dedicated staff carried out telephone contact and motivation throughout the project. Other specialist staff were called upon to book home visit sessions and carry out a thorough process of quality control.

## **4 IMPLEMENTATION OF THE TRAVELSMART PROJECT**

### **4.1 Introduction**

This section describes the implementation of the Exeter TravelSmart project in its three main phases: ‘Contact and Segmentation’; ‘Service (Confirmation, Motivation and Information)’; and ‘Convincing’.

### **4.2 Contact and Segmentation Phase**

The aim of the Contact and Segmentation Phase was to make direct contact with as many private residential households as possible in the target population, and to segment them into groups for the later phases of the ITM process.

All households were sent an official announcement letter<sup>3</sup> explaining the purpose of the project. A total of 20,310 households (81% of the initial 25,000 households) were successfully contacted. Based on their current use of sustainable travel modes and level of interest in receiving information on walking, cycling and/or public transport, they were segmented into Interested, Regular User and Not Interested (‘I’, ‘R’ and ‘N’) Groups (see Table 4.1).

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<sup>3</sup> Signed by Debbie Fox, Business Manager, Environment, Economy and Culture, DCC and David Betteley, Directorate Projects Officer, ECC (Stages 1 and 2); and Dave Hubbard, Engineering and Construction Manager, ECC (Stage 3).

**Table 4.1 Contact and Segmentation Phase**

|  | Households    |
|--|---------------|
| Total Households                         | <b>25,000</b> |
| Contacted / segmented Households (total) | <b>20,310</b> |
| Contacted / segmented Households (%)     | <b>81%</b>    |

Comprising:

|  |       |     |
|--|-------|-----|
| <b>Group ‘I’</b> households interested in receiving information (not including regular public transport users, but including regular walkers and cyclists)   | 8,997 | 44% |
| <b>Group ‘R with’</b> households with at least one person in the household using environmentally-friendly modes (including public transport) regularly and with an information wish                              | 4,006 | 20% |
| <b>Group ‘R without’</b> households with at least one person in the household who regularly uses environmentally-friendly modes, (public transport, walking or cycling), but did not require further information | 2,162 | 11% |
| <b>Group ‘N’</b> households who did not wish to participate, had no interest or were unable to use environmentally-friendly modes  | 5,145 | 25% |

#### **4.3 Service Phase: Confirmation, Motivation and Information**

The aim of this phase was to offer information and support to households contacted during the ITM process according to their specific needs.

An order form of information on walking, cycling and public transport was sent to households in Groups ‘I’ and ‘R with’. An offer of a small incentive (a key ring) was included on the order form to encourage households to return their requests promptly.

In the Confirmation Phase, all households in Group ‘R’ (with or without information needs) and those in Group ‘I’ that regularly walked or cycled were offered a TravelSmart-branded gift as a way of reinforcing (or

‘confirming’) their behaviour. This offer was made on a separate mail-back order form.

The outcomes of this Confirmation Phase are detailed in Tables 4.2 and 4.3. These show that a total of 8,144 rewards were delivered: 3,747 to households in Group ‘I’<sup>4</sup>; 3,100 to Group ‘R with’; and 1,297 to Group ‘R without’. Of the total rewards delivered, 1,343 were puncture repair kits, 3,675 were pens and notepads and 3,126 were fluorescent armbands.

**Table 4.2 Confirmation Phase (Groups ‘I’ and ‘R with’)**

|   | I            | R with       | Total         |
|---|--------------|--------------|---------------|
| <b>Total Households</b>                   | <b>8,997</b> | <b>4,006</b> | <b>13,003</b> |
| <b>Households with wish for reward</b>    | <b>3,747</b> | <b>3,100</b> | <b>6,847</b>  |
| Puncture Repair Kit                       | 870          | 272          | 1,142         |
| Recycled Notepad and Pen                  | 1,511        | 1,580        | 3,091         |
| Fluorescent Arm Band                      | 1,366        | 1,248        | 2,614         |
| <b>Households with no wish for reward</b> | <b>4,601</b> | <b>652</b>   | <b>5,253</b>  |
| <b>Total Response</b>                     | <b>8,348</b> | <b>3,752</b> | <b>12,100</b> |
| <b>Response Rate</b>                      | <b>93%</b>   | <b>94%</b>   | <b>93%</b>    |

<sup>4</sup> Group ‘I’ includes households with regular use of walking and/or cycling which are therefore eligible for a reward.

**Table 4.3 Confirmation Phase (Group ‘R without’)**

|   | <b>R<br/>without</b> |
|---|----------------------|
| <b>Total Households</b>                   | <b>2,162</b>         |
| <b>Households with wish for reward</b>    | <b>1,297</b>         |
| Puncture Repair Kit                       | 201                  |
| Recycled Notepad and Pen                  | 584                  |
| Fluorescent Arm Band                      | 512                  |
| <b>Households with no wish for reward</b> | <b>420</b>           |
| <b>Total Response</b>                     | <b>1,717</b>         |
| <b>Response Rate</b>                      | <b>79%</b>           |

During the Motivation and Information Phase, households segmented into Groups ‘I’ and ‘R with’ received order forms by post. Motivation phone calls were made to households not returning their forms within a specific time period. As shown in Table 4.4, a total of 13,003 households were included in the Motivation and Information Phase. Of these 93% (12,085 households) responded by completing the order form and a total of 10,233 requested information.

**Table 4.4 Motivation and Information Phase**

|   | I            | R with       | Total         |
|---|--------------|--------------|---------------|
| <b>Total Households</b>                 | <b>8,997</b> | <b>4,006</b> | <b>13,003</b> |
| Households with information wish        | 7,011        | 3,222        | 10,233        |
| Households with no wish for information | 1,322        | 530          | 1,852         |
| <b>Total Respondents</b>                | <b>8,333</b> | <b>3,752</b> | <b>12,085</b> |
| <b>Response Rate</b>                    | <b>93%</b>   | <b>94%</b>   | <b>93%</b>    |

Table 4.5 reviews the quantities of information materials and incentives delivered during the TravelSmart ITM project. All items were included in personalised packs on the basis of requests made via the order form. These packs, together with the rewards for regular users, were delivered almost entirely by bike and on foot, with a small proportion by post.

The local travel maps were the most popular items of information requested across all stages. The Discount Card, Exeter Walking Map and Exeter Green Circle leaflets were also amongst the most popular items requested across all stages.

In addition to the main Service phase, a pack of information materials on responsible driving was sent to 1,366 households in Group 'N'. This pack consisted of the stage-specific local travel map; *TransportEnergy* top tips card; *Speed: Know your limits* leaflet; *Transport Direct* card; *Car Share Devon* leaflet; *Exe co-cars* leaflet; in Stage 2 *Park and Ride 2, 4 and 5* leaflets; and in Stage 3 *Park and Ride 2 and 5* leaflets. The remaining households in Group 'N' were not sent this information because their responses to the Contact phase suggested this service would be inappropriate (e.g. households with strong data confidentiality concerns; very aged and/or infirm occupants; or long-term absence).

**Table 4.5 Information materials and incentives delivered**

|  | <b>I</b>      | <b>R with</b> | <b>Total</b>   |
|--|---------------|---------------|----------------|
| <b>Total items</b>                                   | <b>69,194</b> | <b>31,352</b> | <b>100,546</b> |
| <b>Items per participating household<sup>5</sup></b> | <b>7.7</b>    | <b>7.8</b>    | <b>7.7</b>     |
| <b>Items per pack<sup>6</sup></b>                    | <b>9.9</b>    | <b>9.7</b>    | <b>9.8</b>     |
| General Materials: Local Travel Maps                 | 4,968         | 2,213         | 7,181          |
| Public Transport Information (Total)                 | 17,884        | 11,009        | 28,893         |
| Cycling Information (Total)                          | 17,198        | 5,393         | 22,591         |
| Walking Information (Total)                          | 15,327        | 6,518         | 21,845         |
| TravelSmart Discount Card                            | 3,854         | 1,571         | 5,425          |
| Other Information (Total)                            | 6,825         | 3,136         | 9,961          |
| Incentives (Key Club Membership Key Ring)            | 3,138         | 1,512         | 4,650          |

## **4.4 Convincing Phase**

### **4.4.1 Overview**

The Convincing Phase aimed to further encourage people to make sustainable travel choices by offering additional personal advice and support. This support was included on the order form under the heading of *TravelSmart Plus*.

A total of 366 households expressed an interest in *TravelSmart Plus* (see Table 4.6). These households were telephoned to explain the offer of a home visit conducted by an advisor on walking, cycling and/or public transport<sup>7</sup>. As a result, 66 households booked a total of 91 home visits. Of these, 80 were successfully conducted.

<sup>5</sup> Based on all households in Groups 'I' and 'R with' included in the motivation and information phase.

<sup>6</sup> Based on all households in Groups 'I' and 'R with' receiving a pack.

<sup>7</sup> Households already using public transport regularly were not offered public transport further services.

**Table 4.6 Further service requests and home visits**

|  | <b>I</b>     | <b>R with</b> | <b>Total</b>  |
|--|--------------|---------------|---------------|
| <b>Total Households</b>                    | <b>8,997</b> | <b>4,006</b>  | <b>13,003</b> |
| Households interested in further services  | 226          | 140           | 366           |
| Number of potential home visits by type:   |              |               |               |
| <i>Public Transport</i>                    | 192          | -             | 192           |
| <i>Cycling</i>                             | 151          | 136           | 287           |
| <i>Walking</i>                             | 84           | 129           | 213           |
| Households booking one or more home visits | 45           | 21            | 66            |
| Number of booked home visits:              |              |               |               |
| <i>Public Transport</i>                    | 10           | -             | 10            |
| <i>Cycling</i>                             | 33           | 19            | 52            |
| <i>Walking</i>                             | 18           | 11            | 29            |
| Number of conducted home visits:           |              |               |               |
| <i>Public Transport</i>                    | 7            | -             | 7             |
| <i>Cycling</i>                             | 30           | 17            | 47            |
| <i>Walking</i>                             | 16           | 10            | 26            |

#### ***4.4.2 Public transport further services***

Households which wanted to use public transport more often and which were not already using the bus regularly were offered a home visit conducted by a trained member of Stagecoach staff, together with a free Megarider ticket to try out local Stagecoach services and a free ticket for local train services from First Great Western.

Households that expressed an interest were contacted by phone to schedule an appointment for a home visit. In total, 10 households booked an appointment, of which seven took place.<sup>8</sup>

Following the home visits a record form was completed by the advisor. All the visits were rated as either successful or very successful.

#### ***4.4.3 Cycling further services***

Households interested in further support on cycling were offered a home visit including personal advice, a bike health check and the offer of a free cycle trip computer.

Following phone contact, 52 cycling home visits were booked, and 47 were subsequently completed.<sup>8</sup>

Advisors found that the most frequently stated motives for wanting to cycle more were exercise, environmental, economic and family/social reasons. Barriers to cycling included lack of confidence, personal safety concerns and poor or lack of equipment, e.g. bike or child seat.

Among the home visits conducted, 22 included a cycle health check to identify any maintenance issues in need of attention, and 37 households also took advantage of the free cycle trip computer. Visits typically lasted 30 to 60 minutes. The majority of visits were rated as either successful or very successful.

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<sup>8</sup> A small minority of visits were either cancelled before the visit, cancelled at the door, or the household was not in.

#### **4.4.4 Walking further services**

Households interested in further support on walking were offered a home visit including personal advice and route planning, as well as the offer (and set-up) of a free pedometer to help measure their progress.

Following phone contact, 29 walking home visits were booked, and 26 were subsequently completed.<sup>9</sup>

During the home visits, the most frequently stated motives for wanting to walk more were for physical exercise, environmental and economic reasons. Among the barriers to walking discussed were lack of knowledge about the local area, personal health, time constraints and high levels of traffic.

Visits typically lasted 30 to 60 minutes. The majority of visits were rated as either successful or very successful by the advisors.

#### **4.5 Summary**

In summary, during the TravelSmart project in Exeter, deliveries containing 108,690 items of travel information, incentives and rewards were made to a total of 11,530 households. Each delivery was packed in a project-branded folder and calico bag before being hand-delivered on foot or by bicycle. A total of 80 home visits were conducted.

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<sup>9</sup> A small minority of visits were either cancelled before the visit, cancelled at the door or the household was not in.

## 5 EVALUATION

### 5.1 Introduction

The Exeter TravelSmart project was evaluated against a range of performance indicators focusing mainly on changes in personal travel behaviour.

In common with most other TravelSmart projects, the key components of monitoring and evaluation were detailed travel behaviour surveys, conducted by Socialdata before and after the ITM project.

As well as results from these surveys, a number of additional outputs have been provided to DCC and ECC as further feedback. These include:

- Detailed Field Reports summarising the implementation of each stage of the ITM project and responses from the target population (amalgamated in Section 4 of this report).
- ‘Quote of the Day’ booklets, containing comments collected from households during the ITM project.
- Quality control checks, where a sample of households receiving information from the ITM project were telephoned to check safe receipt of their information pack, whether all items had been included and whether they were satisfied with the contents.

The remainder of section 5 focuses on the objectives, methodology and analysis of the travel behaviour surveys.

### 5.2 Travel behaviour surveys

#### 5.2.1 Objectives

The key objective of these surveys was to provide a robust measure of the changes in travel behaviour associated with the TravelSmart project in Exeter. In particular, the surveys were designed to evaluate the effects of the ITM project on mode choice, car use and average daily participation in walking and cycling as modes of travel.

### **5.2.2 Method and implementation**

The New KONTIV<sup>®</sup> survey method has been developed over many years by Socialdata and applied successfully in travel behaviour research and the evaluation of ITM projects in more than 15 countries, including most previous UK TravelSmart projects.

For each household, the survey consists of a household questionnaire and an individual travel diary for each member, for a nominated day of the week. The survey sample includes households completing travel diaries for all seven days of the week. To ensure a high response rate, a pre-paid return envelope is provided with the survey and in cases where surveys are not returned Socialdata provides further motivation by post and telephone.

The survey aims to collect information on all trips<sup>10</sup> to all out-of-home destinations on a nominated travel day for each respondent. The customer focus of the questionnaire design and individualised approach in the introductory mailing and subsequent motivation ensures high response rates and reliable results.

Surveys were conducted before and after the ITM project to evaluate changes in key mobility indicators over the project period. The key elements of the survey design were as follows:

- Separate samples were drawn from the ITM target population and an untargeted area in north Exeter (as a control group). This allowed the analysis to take into account any external influences on travel behaviour across the city (e.g. changes in the weather including seasonal effects; major events affecting the highway network).
- All samples were drawn at random from residential households. To further ensure that results were representative of the whole ITM target population, the target group sample for the after survey included a proportional share of households which chose not to participate in the ITM project.

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<sup>10</sup> The subsequent analysis of day-to-day mobility excludes trips of more than 100km (a very small percentage of personal trips) to avoid skewing any distance-related indicators.

- Minimum sample sizes for both target and control groups (i.e. the number of complete survey responses) were designed to allow assessment of the statistical significance of changes in car use.<sup>11</sup> For the before survey, the required sample size was set at 1,200 persons net for the target group and 600 persons net for the control group. For the after survey, the required sizes were 1,000 persons net for the target group and 500 persons net for the control group.

The before survey was implemented by Socialdata with support from Sustrans during January to March 2008, and the after survey during January to March 2010. The procedure for each of the surveys was as follows:

- i) Mailing of an official announcement letter to all households in the gross sample;
- ii) Mailing of survey forms and official covering letter to all households in the gross sample;
- iii) Mailing of an official reminder letter to all households from which a response had not been received after one week;
- iv) Mailing of a second reminder letter (on Socialdata headed paper and signed by the Socialdata project manager) to non-responding households a further week later; and
- v) Reminder telephone calls to non-responding households each week to offer support in completing the forms and to motivate returns.

The sample sizes and response rates achieved in the before surveys are summarised in Tables 5.1 and 5.2, below.

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<sup>11</sup> The statistical tests used in analysing the survey data are explained in Annex B.

**Table 5.1 Survey sample sizes (persons) and response rates (%) – Before survey, target area (Exeter and Exminster)**

Contract requirements: **1,200 persons net**

Period of implementation: January 21<sup>st</sup> to March 2<sup>nd</sup> 2008

|                           | <b>TOTAL</b> | <b>With Telephone</b> | <b>Without Telephone</b> |
|---------------------------|--------------|-----------------------|--------------------------|
| Mail-out Gross            | 2,600        | 1,100                 | 1,500                    |
| Sample loss <sup>a</sup>  | 428          | 161                   | 267                      |
| Adjusted gross sample     | 2,172        | 939                   | 1,233                    |
| <b>Returns persons</b>    | <b>1,317</b> | <b>702</b>            | <b>615</b>               |
| <b>Response rate in %</b> | <b>61%</b>   | <b>75%</b>            | <b>50%</b>               |
| (Contract persons)        | 1,200        |                       |                          |

<sup>a</sup> Sample loss: Moved away; deceased etc.

**Table 5.2 Survey sample sizes (persons) and response rates (%) – Before survey, control area (untargeted area in north Exeter)**

Contract requirements: **600 persons net**

Period of implementation: January 21<sup>st</sup> to March 2<sup>nd</sup> 2008

|                           | <b>TOTAL</b> | <b>With Telephone</b> | <b>Without Telephone</b> |
|---------------------------|--------------|-----------------------|--------------------------|
| Mail-out Gross            | 1,400        | 600                   | 800                      |
| Sample loss <sup>a</sup>  | 305          | 109                   | 196                      |
| Adjusted gross sample     | 1,095        | 491                   | 604                      |
| <b>Returns persons</b>    | <b>638</b>   | <b>364</b>            | <b>274</b>               |
| <b>Response rate in %</b> | <b>58%</b>   | <b>74%</b>            | <b>45%</b>               |
| (Contract persons)        | 600          |                       |                          |

<sup>a</sup> Sample loss: Moved away; deceased etc.

The sample sizes and response rates achieved in the after surveys are summarised in Tables 5.3 and 5.4.

**Table 5.3 Survey sample sizes (persons) and response rates (%) – After survey, target area (Exeter and Exminster)**

Contract requirements: **1,000 persons net**

Period of implementation: January 25<sup>th</sup> to March 7<sup>th</sup> 2010

|                           | <b>TOTAL</b> | <b>With Telephone</b> | <b>Without Telephone</b> |
|---------------------------|--------------|-----------------------|--------------------------|
| Mail-out Gross            | 2,500        | 1,000                 | 1,500                    |
| Sample loss <sup>a</sup>  | 255          | 78                    | 177                      |
| Adjusted gross sample     | 2,245        | 922                   | 1,323                    |
| <b>Returns persons</b>    | <b>1,296</b> | <b>666</b>            | <b>630</b>               |
| <b>Response rate in %</b> | <b>58%</b>   | <b>72%</b>            | <b>48%</b>               |
| (Contract persons)        | 1,000        |                       |                          |

<sup>a</sup> Sample loss: Moved away; deceased etc.

**Table 5.4 Survey sample sizes (persons) and response rates (%) – After survey, control area (untargeted area in north Exeter)**

Contract requirements: **500 persons net**

Period of implementation: January 25<sup>th</sup> to March 7<sup>th</sup> 2010

|                           | <b>TOTAL</b> | <b>With Telephone</b> | <b>Without Telephone</b> |
|---------------------------|--------------|-----------------------|--------------------------|
| Mail-out Gross            | 1,050        | 500                   | 550                      |
| Sample loss <sup>a</sup>  | 199          | 91                    | 108                      |
| Adjusted gross sample     | 851          | 409                   | 442                      |
| <b>Returns persons</b>    | <b>516</b>   | <b>315</b>            | <b>201</b>               |
| <b>Response rate in %</b> | <b>61%</b>   | <b>77%</b>            | <b>45%</b>               |
| (Contract persons)        | 500          |                       |                          |

<sup>a</sup> Sample loss: Moved away; deceased etc.

With 1,317 respondents in the before survey and 1,296 respondents in the after survey for the target area, and 638 respondents in the before survey and 516 respondents in the after survey for the control area, a larger sample was provided by Socialdata than in the initial design at no additional cost.

### **5.2.3 Analysis**

The analysis of the before and after surveys was designed to show changes in key mobility indicators associated with the TravelSmart project. This involved a comparison of behavioural data from the target and control groups in the before and after surveys. A summary of this methodology, including the statistical procedures used to account for changes in the data due to sampling factors or external influences, is shown in Annex B.

The basic measure used for this analysis was the average number of trips per person per year. This gives the best overall picture of personal travel behaviour, as opposed, for example, to average distances per person per year, the results for which would be skewed by the very small number of long trips.

The main indicators selected for the evaluation were as follows:

- Trips per person per year by main mode;<sup>12</sup>
- Personal daily mobility (including trip rates, distances travelled and trip purposes);
- Time spent travelling per person per day by main mode, and total daily exposure to walking and cycling; and
- Car use measured by actual usage, number of trips, travel time, distance travelled and average occupancy per private car per day.

A series of other indicators is also used to show changes in mode choice by trip purpose, time of day, gender and age group.

For the purposes of this evaluation, a trip is defined as a one-way course of travel having a single main activity as its purpose. The number of trips per person per year was calculated on the standard formula that on average, a person will spend 341 days of the year at home. This takes into account the days that a person travels away, for example on holiday or business.

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<sup>12</sup> The main mode of a trip is determined according to the following hierarchy: public transport; motorised private modes (car or motorbike); non-motorised modes (bicycle, walking).

The charts below use ‘Without ITM’ and ‘With ITM’ to represent the changes in the ITM target group before and after the implementation of the TravelSmart project, taking into account the effects of external influences measured in the control group.

It is important to note that the following results show the changes in travel behaviour that were achieved across the whole target population including those in the ‘N’ (‘Not Interested’) group, and non-respondent households.

#### ***5.2.4 Changes in travel behaviour***

Figure 5.1, overleaf, shows the percentage of trips by main mode (i.e. the ‘mode share’ for each mode) with and without TravelSmart, as measured by a comparison of the after survey (‘With ITM’) and the before survey (‘Without ITM’). This comparison takes into account changes measured in the control group that did not receive TravelSmart. The share of car-as-driver trips was reduced from 40% to 35%, with corresponding increases in walking, cycling and public transport use.

**Figure 5.1 Changes in percentage of trips by main mode**

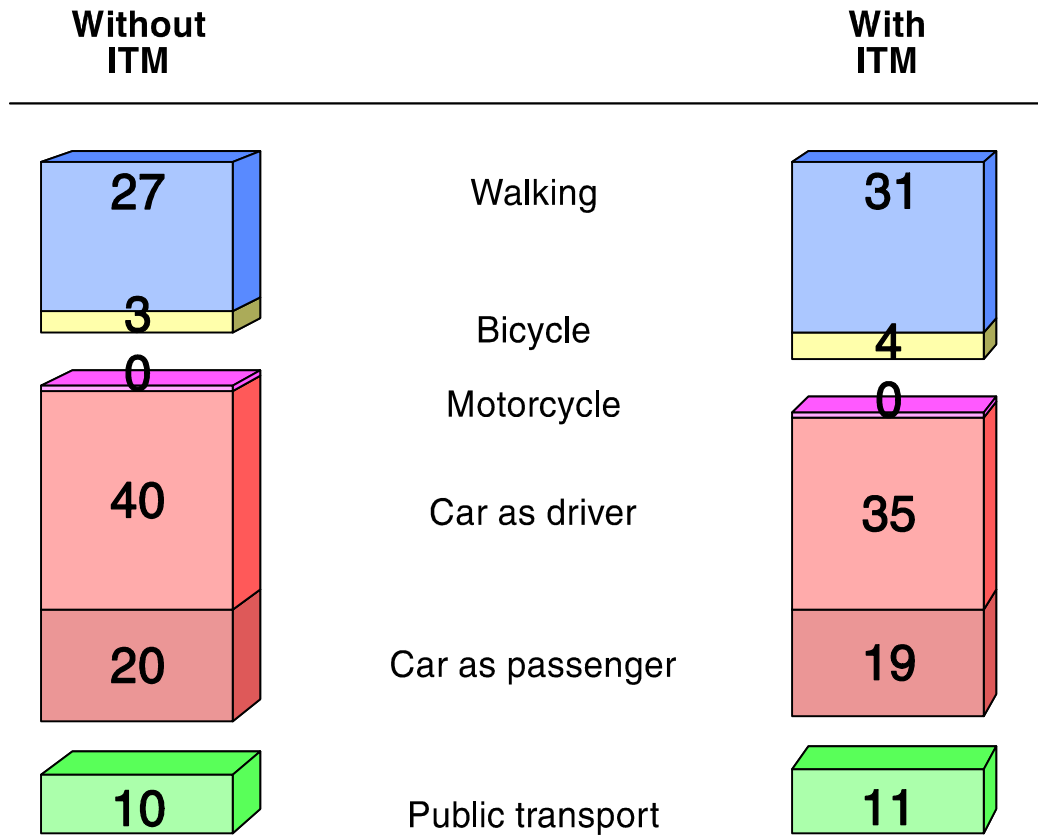
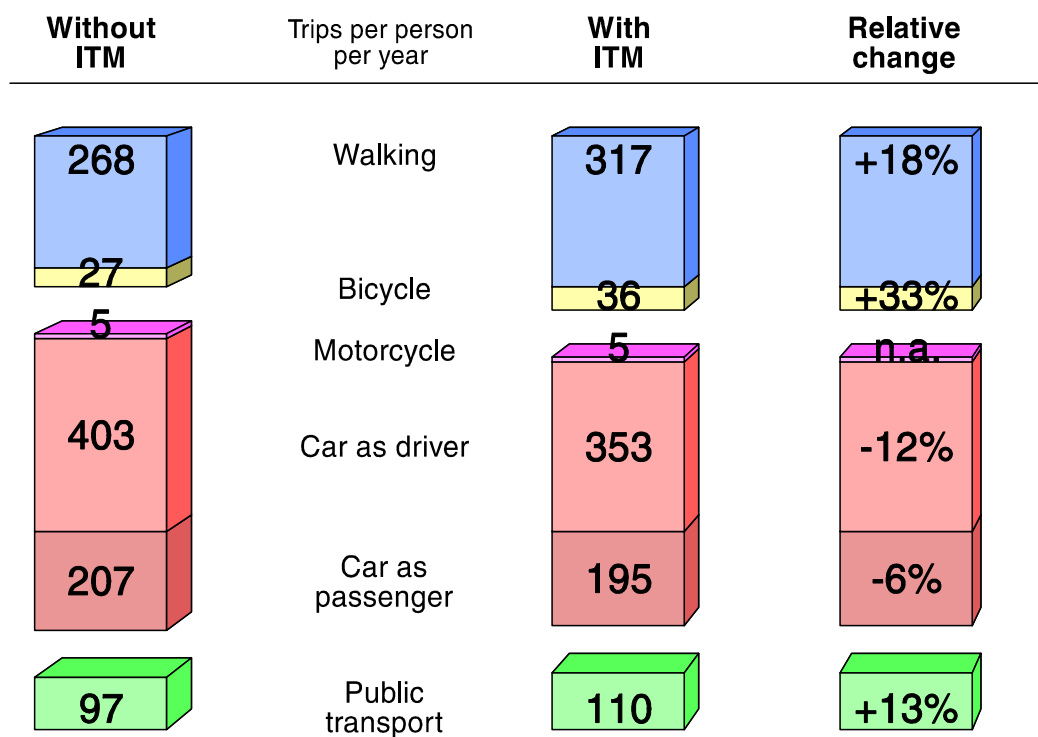


Figure 5.2 expresses the changes in mode choice in terms of trips per person per year and shows the relative changes associated with the TravelSmart project. It shows that the 12% relative reduction in car-as-driver trips was achieved by cutting 50 trips per person per year (i.e. an average across the target population of less than one trip per person per week).

Among the sustainable travel modes, walking saw the biggest gains in absolute terms with an average additional 49 trips per person per year being made on foot, a relative increase of 18%. Public transport also gained an additional 13 trips per person per year (a relative increase of 13%), while cycling saw a 33% relative growth, albeit from a lower baseline than the other sustainable modes.

**Figure 5.2 Changes in trips by main mode (trips per person/year)**



As shown in Figure 5.3, there was little change in personal daily mobility between the two surveys. This suggests that while TravelSmart influenced how people travel, it did not impact on the number of activities they undertook on a daily basis, the time spent travelling, or number of trips, and had very little impact on travel daily travel demand (measured by distances travelled).

**Figure 5.3 Changes in personal mobility (per person/day)**

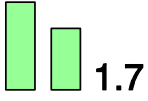
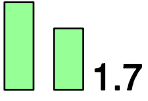


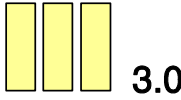
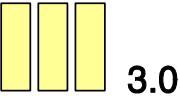


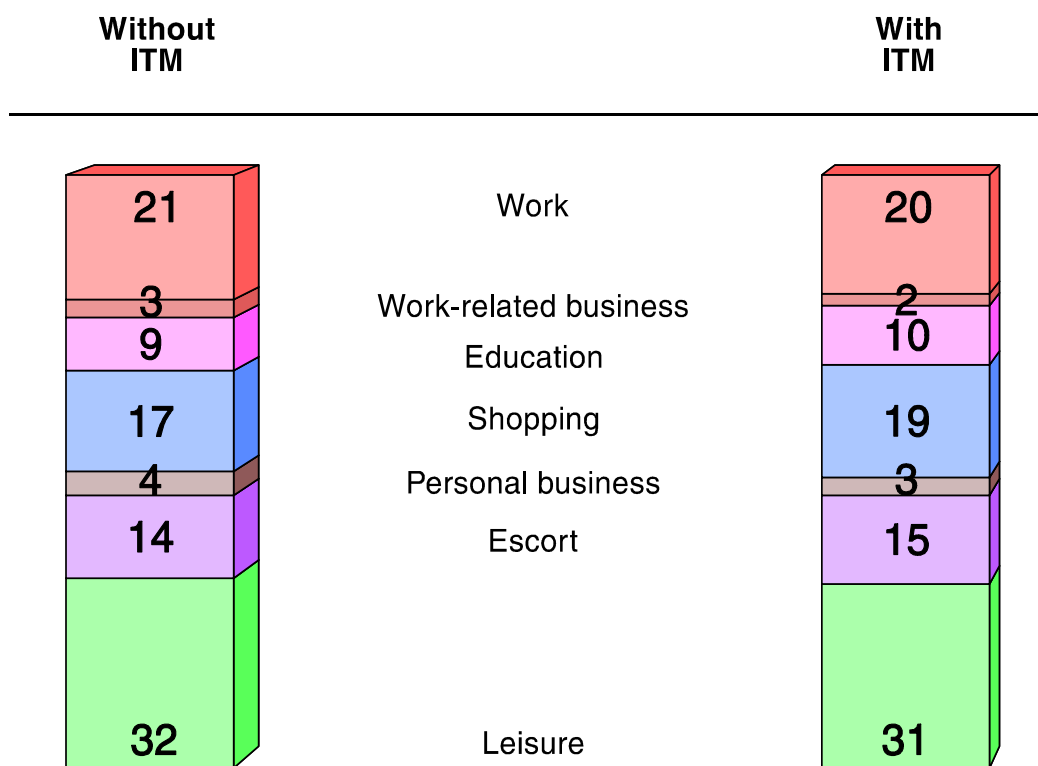
| Without ITM   | Per person/day    | With ITM  |
|---|-------------------|---|
|    | ACTIVITIES        |    |
|  | TRAVEL TIME (min) |  |
|  | TRIPS             |  |
|  | DISTANCE (km)     |  |

Figure 5.4 provides an analysis of trips by purpose. This shows that on the whole there was little change in the types of trips being undertaken by residents in the Exeter target population between the two surveys. Leisure remained the largest single trip generator, accounting for just under a third of all trips.

**Figure 5.4 Changes in trip purpose (%)**



The changes in car use for day-to-day trips shown in Figure 5.5 reflect the reduction in car-as-driver trips reported above. There were reductions in the share of cars used each day (from 72% to 66%), average trips per car per day (from 2.1 to 1.8), average duration of use per car per day (from 36 to 30 minutes), and average distance travelled per car per day (from 19.4 to 16.5 km). Average car occupancy remained the same between the two surveys.

**Figure 5.5 Changes in car usage (per car/day)**

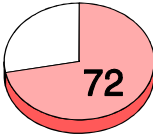
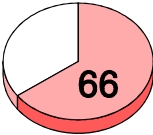
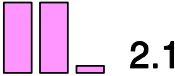
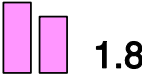




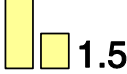
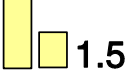
| Without ITM   | Per (private) car/day | With ITM  |
|---|-----------------------|---|
|   | USAGE (%)             |   |
|  | TRIPS                 |  |
|  | DURATION (min)        |  |
|  | DISTANCE (km)         |  |
|  | OCCUPANCY (per trip)  |  |

Figure 5.6 shows changes in car distances travelled at the population level. Although the number of cars owned by households across Exeter remained the same between the two surveys, the distance travelled per car per day for day-to-day trips<sup>13</sup> fell from 19.4km to 16.5km, resulting in a net saving of 29.6 million car km per year, a relative reduction of 15%.

**Figure 5.6 Changes in car distances travelled**

| Without ITM   |  | With ITM       |
|---------------|--|----------------|
| <b>30,000</b> | (Private) Cars in total                        | <b>30,000</b>  |
| <b>19.4</b>   | Kilometres per car per day (everyday mobility) | <b>16.5</b>    |
| <b>198.4</b>  | Total kilometres per year (341 days)           | <b>168.8</b>   |
|               | Reduction (kilometres per year)                | <b>-29.6 m</b> |
|               | Relative reduction                             | <b>-15%</b>    |

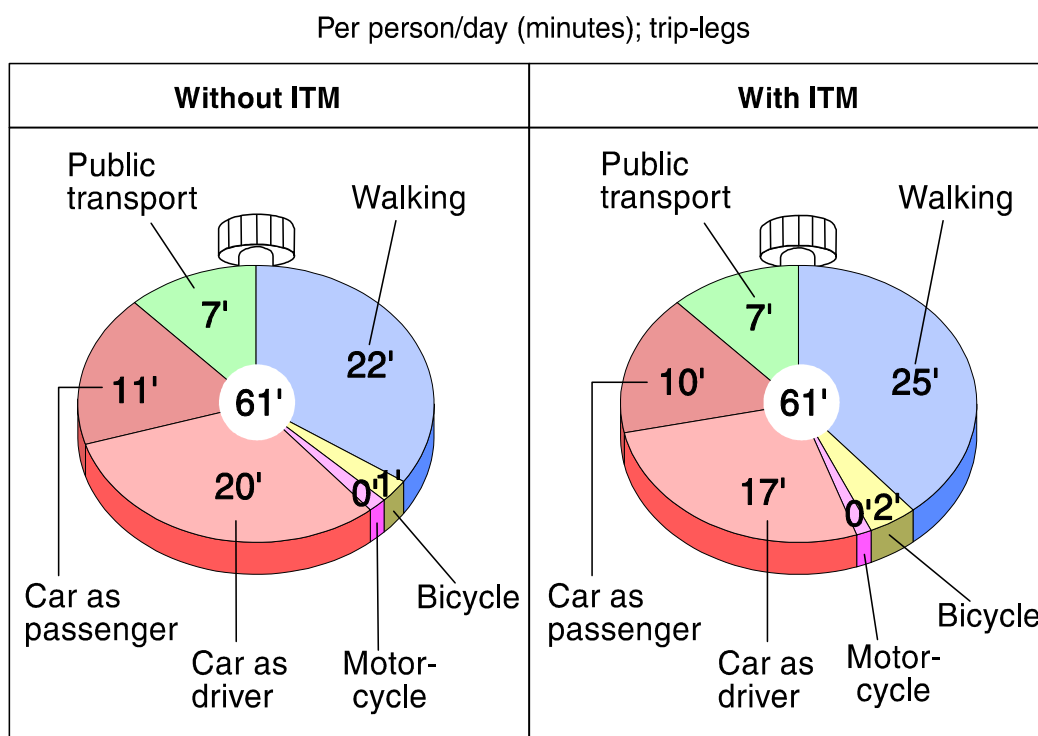
Using Defra’s fleet average CO<sub>2</sub> emissions factor<sup>14</sup>, this equates to annual emissions reductions of 6,002,880 kg (or 6,003 tonnes) CO<sub>2</sub> compared to pre-project levels. (This assumes that the average car is used on 341 days per year, taking account of holidays, etc).

<sup>13</sup> As stated earlier, this analysis excludes the small proportion of trips over 100km.

<sup>14</sup> Based on a fleet average emissions factor of 202.8g CO<sub>2</sub> per vehicle km, from Defra’s (2009) *Guidelines to GHG Conversion Factors for Company Reporting*.

Figure 5.7 shows the total time spent travelling per person per day by mode, with and without ITM. This analysis includes all trip stages (e.g. walking to a bus stop, or from a car park to the final destination). It shows an increase in the average time per person per day spent walking from 22 to 25 minutes. Time spent cycling increased by an average of one minute per person per day.

**Figure 5.7 Changes in travel time by mode**



Over the course of a year, the effect of ITM would be to increase the total exposure to active travel from 128 to 152 hours per person (Figure 5.8). This 19% relative increase could make a substantial contribution to increasing overall levels of physical activity amongst the target population, especially for those whose activity baseline levels were very low.

**Figure 5.8 Changes in total active travel time (per person/year in hours)**

|                       | Without ITM | With ITM   | Change     | Relative change |
|-----------------------|-------------|------------|------------|-----------------|
| Hours per person/year | <b>128</b>  | <b>152</b> | <b>+24</b> | <b>+19%</b>     |

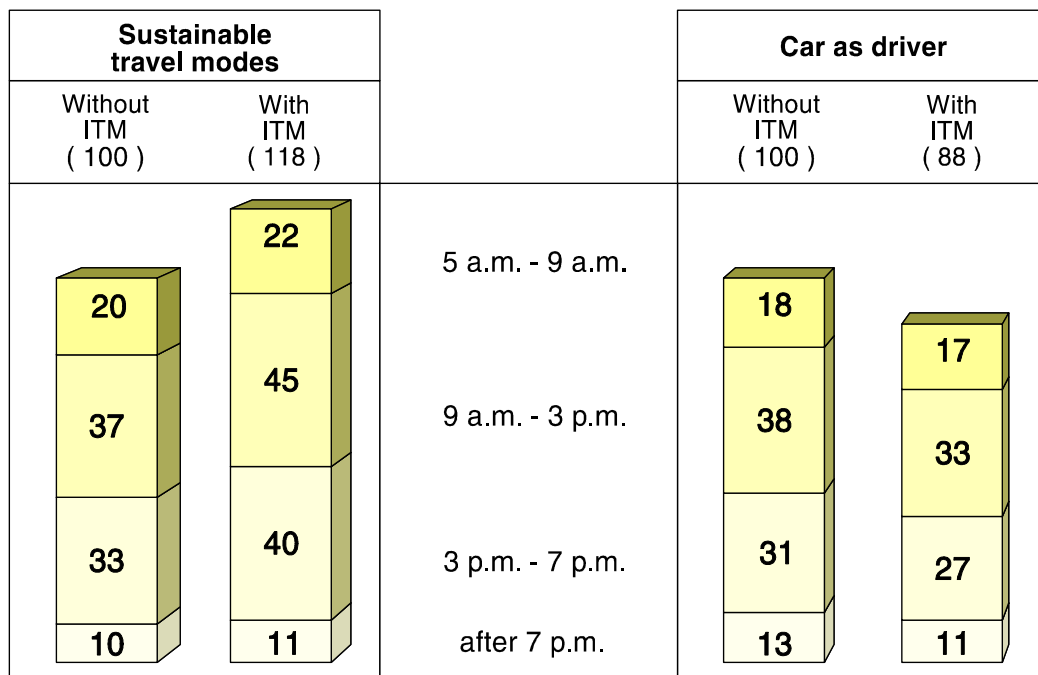
Walking, cycling and access / egress to public transport or car (parked)

The next three figures show how the increases in use of sustainable travel modes and the reductions in car-as-driver trips associated with TravelSmart were distributed by time of day, age and gender, and by trip purpose. For the purposes of this analysis, trips by sustainable travel modes (walking, cycling and public transport) are aggregated and compared with car-as-driver trips. There was an overall 18% relative increase in use of sustainable travel modes for all trip purposes (increasing from a baseline index of 100 to 118). The relative reduction in car-as-driver trips of 12% is shown by the change from a baseline index of 100 to an index of 88.

Figure 5.9 shows that the use of sustainable travel modes increased at all times of day, with the greatest relative increase occurring between 9am and 3pm.

The greatest relative reduction in car-as-driver trips occurred after 7pm. Overall this analysis suggests that TravelSmart contributed to increasing active travel and reducing car trips the most at off peak periods of the day, however there were also increases in active travel and reductions in car-as-driver trips during peak periods.

**Figure 5.9 Changes in mode choice by time of day (%)**



The distribution of travel behaviour change by age and gender is shown in Figure 5.10. Increases in walking, cycling and use of public transport were measured across the different age and gender groups. The greatest relative increase was observed among males aged 20-59, while the greatest absolute increase was seen among males and females aged 20-59. The greatest absolute and relative reductions in car-as-driver trips were seen among females aged 20-59. Car-as-driver trips actually increased slightly among people aged 60 and over.

**Figure 5.10 Changes in mode choice by age and gender (%)**

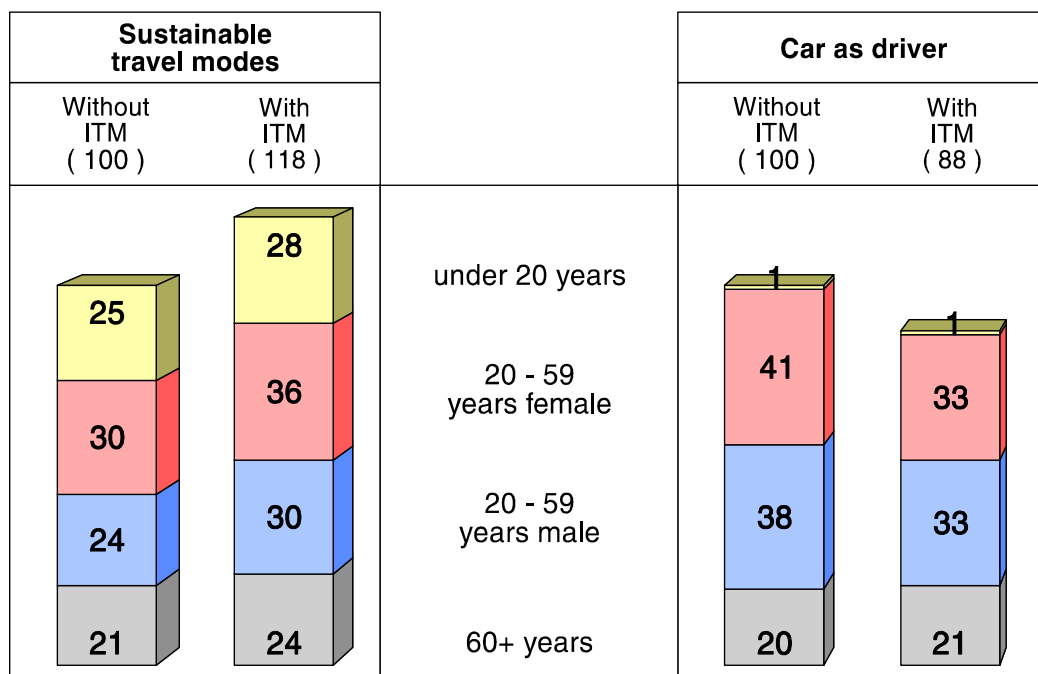
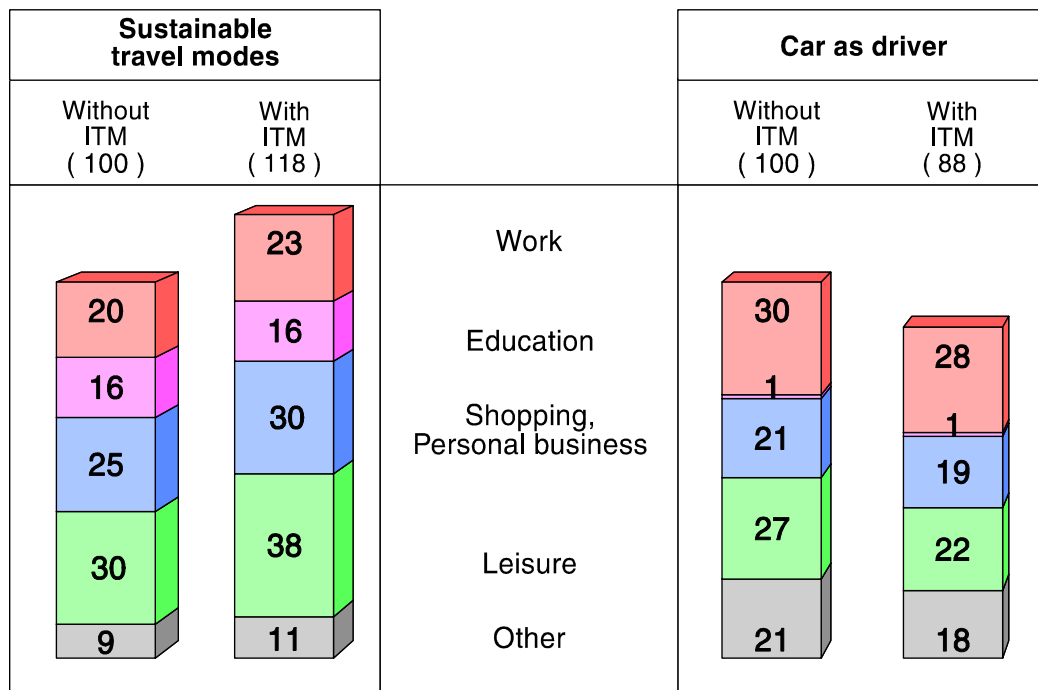


Figure 5.11 shows changes in mode choice for different types of trips. Increases in use of sustainable travel modes were apparent for all trip purposes except education. The greatest relative and absolute increase was for leisure trips. The greatest relative and absolute reduction in car-as-driver trips was also for leisure trips.

**Figure 5.11 Changes in mode choice by trip purpose (%)**



## 6 CONCLUSIONS

### 6.1 Introduction

The aim of the TravelSmart project in Exeter was to promote greater use of sustainable and active travel modes (walking, cycling and public transport) as alternatives to car travel among a target population of 25,000 households.

In order to achieve this aim, the following components were put in place:

- The design of a coherent and attractive marketing offer consisting of local sustainable transport information;
- The identification of key individuals and project partners to ensure relevance, supply and shelf-life of marketing materials;
- The recruitment of local staff to implement the fieldwork, providing an effective knowledge base and adding value as a community initiative; and
- The application of the proven TravelSmart ITM technique, with supporting project management systems, adapted where appropriate to local conditions.

The success of the project in achieving its aim is measured ultimately by the responses of the target population, in particular the willingness of households to participate in the TravelSmart project; the volume of information and other services requested; and, critically, the changes in travel behaviour.

The following sub-sections review the key outcomes of the Exeter TravelSmart project under these broad headings.

### 6.2 Key outcomes

#### *6.2.1 Travel behaviour change*

The travel behaviour surveys conducted before and after the TravelSmart project show substantial increases in levels of walking, cycling and use of public transport as modes of day-to-day travel, leading to notable reductions in car use. The key indicators, measured across the whole target population (i.e. not only those who actively participated in TravelSmart), are:

- Growth in trips by sustainable and active travel modes, with relative increases in walking (18%), cycling (33%)<sup>15</sup> and public transport (13%);
- A relative increase of 19% in daily exposure to active forms of travel (i.e. time spent per person per day participating in walking and cycling as modes of transport);
- A relative reduction in car-as-driver trips of 12%, generating a 15% reduction in car distances travelled, a net saving of 29.6 million car km per year on pre-project levels, and an estimated annual CO<sub>2</sub> saving of 6,003 tonnes.

The evaluation suggests that the greatest modal shift occurred from car-as-driver trips (which declined by 50 trips per person per year) to walking (which gained 49 trips). Public transport also gained 13 trips per person per year (a relative increase of 13%), while cycling saw a 33% relative growth, albeit from a lower baseline level than other modes.

These changes are broadly in line with those measured in other recent TravelSmart projects (as shown in Table 6.1 below).

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<sup>15</sup> Exeter's status as a Cycling Town and the initiatives delivered as part of this programme may have influenced levels of cycling across the city, but the 33% increase reported here can be attributed to TravelSmart with reasonable confidence as it takes account of control group effects.

**Table 6.1 Summary of recent TravelSmart project outcomes**

| Location                       | Project dates | Target population (households) | Relative change in mode share |         |               |                  |                  |
|--------------------------------|---------------|--------------------------------|-------------------------------|---------|---------------|------------------|------------------|
|                                |               |                                | Walking                       | Bicycle | Car-as-driver | Car-as-passenger | Public transport |
| Peterborough                   | 2005-07       | 30,006                         | +9%                           | +36%    | -11%          | -5%              | +33%             |
| Worcester                      | 2005-07       | 23,504                         | +15%                          | +19%    | -10%          | -5%              | +30%             |
| Preston                        | 2006-07       | 25,231                         | +11%                          | +35%    | -10%          | +3%              | +9%              |
| Lancaster & Morecambe          | 2006-07       | 25,001                         | +18%                          | +69%    | -14%          | +10%             | +7%              |
| Inverness                      | 2007          | 1,500                          | +22%                          | +27%    | -13%          | +1%              | +11%             |
| Weston-super-Mare              | 2008          | 2,078                          | +15%                          | +36%    | -12%          | +5%              | +10%             |
| Brislington & Knowle (Bristol) | 2009          | 1,900                          | +14%                          | +26%    | -11%          | not measured     | +13%             |

Further analysis of the travel survey data for TravelSmart in Exeter shows that:

- The changes in mode choice were achieved with little effect on daily mobility (i.e. activities, number of trips, distances travelled) among the target population;
- Although there was markedly increased use of sustainable travel modes, there was no change in daily time spent travelling among the target population;
- The greatest increases in use of sustainable modes occurred between 9am and 3pm and the greatest reductions in car-as-driver trips were observed after 7pm, although smaller changes were also observed at peak travel times.
- Leisure remained the largest trip generator after TravelSmart, accounting for just under a third of all trips; and
- Growth in the use of sustainable and active travel modes was seen across all age and gender groups, with the largest growth in trips by sustainable modes occurring among males aged 20-59.

### **6.2.2 Participation in the ITM project**

The ITM process resulted in high participation rates among the target population of 25,000 households. This demonstrates a positive response to the personalised TravelSmart approach, and suggests a previously unmet demand for information on local transport options.

- Eighty-one percent of households in the target population responded to the initial contact phase;
- Of these, 64% were interested in receiving information through the TravelSmart project and a further 11% were already regular users of sustainable travel modes and so did not request additional information;
- Ninety-three percent of those initially interested in receiving information then responded to the offer of information and advice by completing a TravelSmart order form, either in their own time at home, over the phone or on the doorstep; and
- A total of 11,530 personalised TravelSmart packages were hand-delivered to participating households (including 1,297 containing only rewards for regular users): just under half of the initial target population.

### **6.2.3 Demand for information and advice**

The profile of requests received during the TravelSmart project indicates a high demand for information and advice on local transport.

- 108,690 items of information, incentives and rewards were requested during the TravelSmart project, an average of 7.7 information materials per participating household.
- Of the information materials on offer, the new local travel maps (developed specifically for the TravelSmart project) were the most popular items, followed by the Exeter Green Circle, Exeter Walking Map and Discount Card.
- A total of 366 households requested further personal advice on walking, cycling and/or public transport. Sixty-six households went on to book one or more advice sessions, and 80 sessions were successfully completed.

These advice sessions were conducted at people's homes and included the offer of a sustainable travel incentive.

***ANNEX A:  
TRAVELSMART ORDER FORM***



Central and North East Exeter

Please fill in and return this form to order your **free** personal information pack

Help us to **help you!**

Help us to ensure prompt delivery of your materials – please fill in your contact details below

Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Tel. No. \_\_\_\_\_  
 Day: \_\_\_\_\_  
 Evening: \_\_\_\_\_



Your order form for a personal journey plan

Please tell us about the journey you wish to make by public transport.

In order for us to provide you with the most useful information, please complete **ALL** sections of this form. Please note that we may not be able to process your journey plan without **exact locations with correct postcodes.**

Journey plans are available for travel starting in Exeter going to any location in the UK.

**From:** (please give exact location with postcode)

House number/name: \_\_\_\_\_

Street: \_\_\_\_\_

Town/City: \_\_\_\_\_

Postcode: \_\_\_\_\_

**To:** (please give exact location with postcode)

House number/name: \_\_\_\_\_

Street: \_\_\_\_\_

Town/City: \_\_\_\_\_

Postcode: \_\_\_\_\_

**Outward journey:**  
 I need to depart / arrive (delete as appropriate) on (day of the week) \_\_\_\_\_ at (time) \_\_\_\_\_ am / pm

**Return journey:**  
 I need to depart / arrive (delete as appropriate) on (day of the week) \_\_\_\_\_ at (time) \_\_\_\_\_ am / pm

**Means of travel:**  
 I am prepared to travel part/all of the way by: Bus  Coach  Rail  Any mode

Sustrans registered charity No. 326550

**travelsmart**

Project enquiries: **Socialdata**  
 PO Box 536 Bristol BS20 2UX  
 Telephone 0800 58 78 028

Thank you for taking part in *TravelSmart!*

travelsmart Would you like to use environmentally friendly travel options more often? YES  NO   
 How can we help you? Please tick the boxes below to order your personal travel information pack

### New local travel map

**Central and North East Exeter on foot, by bike, by bus and by train:** a brand-new TravelSmart map for your local area showing walking and cycling routes, information about bus and train services and local facilities.

### Bus travel

• **Bus stop timetables:** showing the frequency and destination of all main services using the bus stops nearest to your home.

• **Bus timetables:** information on times and routes for bus services in and around Exeter.

- **A:** Aplington - City Centre - Thorpark Rise
- **B:** Digby Retail Park - City Centre - Marsh Barton
- **D:** University - High Street - St Lukes - Digby
- **E:** Lanxead Road - City Centre - Exwick
- **F1/F2:** Exwick - City Centre - Summerhay
- **G:** Harrin Gardens - City Centre - The Quay
- **H1/H2:** Cowley Bridge - City Centre - Exter Business Park Pynes Hill
- **K & T:** Prince - City Centre - Topsham
- **P:** Pennsylvania - City Centre - Coesmead
- **R & S:** City Centre - Heavitree - Rifford Road - Topsham Road - City Centre (circular)
- **X1/X2:** Early morning specials, Topsham - St David's Station - Pinhoe - Marsh Barton - Alington - Exwick - City Centre
- **1/1A/1B Culm Valley Connect:** Tiverton via Cullampton
- **Park & Ride:** between city centre and Honiton Road, Sowton and Maford Park & Ride sites
- **Stagecoach - Exeter bus map and frequency guide:** routes and destinations throughout the area
- **East Devon:** including Ermouth-Honiton and Ottery St Mary
- **Teignbridge:** including Newton-Abbot, Teignmouth and Moretonhampstead
- **Mid Devon:** including Tiverton, Crediton and Bampton

### Train travel

• **Devon train timetables:** local trains towards Plymouth, Barnstaple, Exmouth, Honiton and Axminster.

• **Regional & national train timetables:** trains towards Cornwall, London, the Midlands and beyond.

### Walking

- **Exeter walking map:** local walking routes for commuting and leisure.
- **The Exeter Green Circle:** five walks around Exeter, through historic villages and into the countryside.
- **Devon Walking Guide:** walking routes in Devon, including coastal paths and riverside trails.
- **Why walk?:** how to step your way to a happy, healthy lifestyle.
- **Get Walking, Keep Walking:** tips to help you get started and a 12-week plan to track your progress.
- **Exeter Leisure Walks:** the Exeter Woolfen Trail and Exeter's Historic Quayside.
- **Stepping Out:** a programme of free walks in Exeter.

### Other public transport information

- **Stagecoach - Tickets to go:** information about fares and ticket options.
- **Stagecoach - Making your journey easier:** information for visually or mobility impaired customers, easy access services and using wheelchairs on buses.
- **TXT 4 Times:** how to get bus information sent straight to your mobile phone by text message.
- **A guide to catching the bus or train:** how to get fare and timetable information and other useful tips on using public transport.
- **PLUSBUS:** information on adding bus travel to your train ticket.
- **Railcards:** details on discounted train travel: Devon and Cornwall  16-25  Family and Friends  Senior
- **Network Railcard:** for South West Trains between Exeter and the South East.

### Cycling

- **Cycle guide and map:** your comprehensive map for getting around Exeter by bike.
- **Cycling Trails in Devon:** cycling routes taking in some of Devon's most beautiful scenery.
- **Haddon Forest Park:** forest walking and cycling trails.
- **Why cycle?:** find out what's making more and more people take to two wheels.
- **Get cycling:** an indispensable guide to buying, riding and maintaining your bike.
- **Cycling with children:** advice on buying the right bike for your child and handy tips for family trips.
- **Cycle training for children and adults:** training courses for all ages and abilities.
- **Cycle scheme 'wage slip':** information on the government's Cycle to Work scheme, a tax-free way to buy your bike.
- **The Road Code:** advice for cyclists and motorists on respecting other users and the Highway Code.
- **Give Cyclists Space:** car sticker.
- **Cycling by Train:** find out how easy it is to take your bike on a train.

### Related information

- **Exeter Community Transport Association:** services for those with limited mobility.
- **Freedom Wheels:** information on Exeter Disability Transport Service.
- **Exe Explorer:** leaflet about the Exe estuary, including a map for walkers and cyclists, ferry information and details about its environmental and recreational features.
- **Mini guide 2009 Exeter:** a comprehensive guide to what to do, where to go and what to see in Exeter.
- **Safe Routes to Schools:** providing a safe and healthy journey to school for your children.
- **Eco-driving pack:** car sharing in Devon, the Exeter car club and lowering your costs.

### Discount card

By ticking 'Yes' to the question at the top of this form, you qualify for a unique discount scheme. The TravelSmart Discount Card offers savings on outdoor clothing, new bikes, servicing and accessories at local cycle and outdoor shops.

### TravelSmart PLUS

Your household may be eligible for a personal advice session with one of our local experts. Select one (or more) of the options below and we'll be in touch to arrange a home visit to suit your needs. You'll be surprised at the opportunities available!

- Choose public transport - get the most out of public transport, including tips on all the best ticket deals and a chance to try out local services
- Choose cycling - get going on two wheels with advice on the best local routes, a bike 'health check' and the limited offer of a free cycle trip computer
- Choose walking - put your best foot forward with advice on the best local routes, health information and the limited offer of a free pedometer

### Free gift!

On quick return of this order form, you can receive this **FREE keyring** with 5 years membership of a lost key recovery service (value up to £25). Limited numbers available. Please tick the box  to accept this offer.



See back page for your personal journey plan order form

***ANNEX B:  
CONCEPT OF EVALUATION***

## **ANNEX B: CONCEPT OF EVALUATION**

### **1 Travel behaviour surveys**

To demonstrate the effects of the TravelSmart ITM programme in Exeter and Exminster, behavioural travel surveys were conducted to measure the change achieved in travel behaviour. The surveys used the New KONTIV®-design, a self-administered mail-back survey technique with follow-up by post and telephone.

The survey concept was planned as ‘before’ and ‘after’ surveys, each approaching the ITM target group and a control group not approached in the marketing intervention. The ‘before’ survey treated most of Exeter and Exminster as target area, and the rest of Exeter as control area. The ‘after’ survey was a cross-sectional survey based on independent randomly drawn samples of households from these same areas.

Table A1 shows the dates, response rates and net sample sizes for each of the surveys.

**Table A1: Survey Data**

|                        | Survey date    | Response rate | Net sample |
|------------------------|----------------|---------------|------------|
|                        |                |               | Persons    |
| <b>BASELINE SURVEY</b> |                |               |            |
| Target area            | Jan - Mar 2008 | 61%           | 1,317      |
| Control area           |                | 58%           | 638        |
| <b>AFTER SURVEY</b>    |                |               |            |
| Target area            | Jan - Mar 2010 | 58%           | 1,296      |
| Control area           |                | 61%           | 516        |

The survey samples ensure an acceptable level of statistical significance in the key outcomes presented (see Section 3 of this Annex). However the evaluation also includes a weighting procedure to ensure the response behaviour of the target group sample is representative of that found in the ITM target population as a whole. To provide the correct basis for comparison the distribution of the ITM groups ('I', 'R' and 'N' and non-respondents) in the survey sample is adjusted to that found during the contact phase of the ITM project. Furthermore a weighting (based on gender / age and with / without telephone) was applied for both surveys.

## **2 Control group effects**

Changes in mode choice are the central indicators for the success of an ITM project. To separate the effect of ITM from other influences, a survey design with a control group was applied. Both the target group and the control group were surveyed before and after the project.

Table A2 shows the before (= baseline survey) and after results for the Target Group. Before the ITM project, 25% of all trips were made (exclusively) on foot, 4% by bicycle, 1% with a motorcycle, 39% with car-as-driver, 22 % with a car-as-passenger and 9% with public transport. After the project the share of walking had risen to 31%, whereas the share of car-as-driver decreased to 35%. Bicycle remained the same and public transport increased from 9 to 11 %.

**Table A2: Mode Choice (%) – Target Group**

|                  | TARGET GROUP |                 |
|------------------|--------------|-----------------|
|                  | Before %     | After %         |
| Walking          | 25           | 31              |
| Bicycle          | 4            | 4               |
| Motorcycle       | 1            | 0 <sup>*)</sup> |
| Car-as-driver    | 39           | 35              |
| Car-as-passenger | 22           | 19              |
| Public transport | 9            | 11              |
| <b>TOTAL</b>     | <b>100</b>   | <b>100</b>      |

<sup>\*)</sup> less than 0.5%

Mode choice can also be shown in trips per person per year. An average person in the target group undertook 1030 trips per year at the time of the before survey (on 341 days at place of residence). 257 out of these trips were made on foot, 41 with a bicycle, etc. (see Table A3).

**Table A3: Mode Choice (trips per person per year) – Target Group**

|                  | TARGET GROUP              |             |
|------------------|---------------------------|-------------|
|                  | Before                    | After       |
|                  | Trips per person per year |             |
| Walking          | 257                       | 317         |
| Bicycle          | 41                        | 36          |
| Motorcycle       | 7                         | 5           |
| Car-as-driver    | 405                       | 353         |
| Car-as-passenger | 225                       | 195         |
| Public transport | 95                        | 110         |
| <b>TOTAL</b>     | <b>1030</b>               | <b>1016</b> |

However the changes between the ‘before’ and ‘after’ are not necessarily the effects of the ITM project. To determine other influencing factors (seasonal and external influences), a control group which was not exposed to the ITM project was used.

Before the ITM project in the control group (Table A4) 36 % of all trips were made (exclusively) on foot, 33 % by car-as-driver and 17 % by car-as-passenger. Public transport accounted for 9 % and cycling for 4 %. After ITM there were only slight changes. An increase in walking (+2 %-points) and decreases in cycling and car-as-passenger.

**Table A4: Mode Choice (trips per person per year) – Control Group**

|                  | CONTROL GROUP |         |
|------------------|---------------|---------|
|                  | Before %      | After % |
| Walking          | 36            | 38      |
| Bicycle          | 4             | 2       |
| Motorcycle       | 1             | 1       |
| Car-as-driver    | 33            | 33      |
| Car-as-passenger | 17            | 16      |
| Public transport | 9             | 10      |
| TOTAL            | 100           | 100     |

<sup>1)</sup> less than 0.5 %

These changes in the control group have to be taken in account when the reference for the situation ‘with ITM’ (in the main body of this report) is established. The observed changes for the control group between the ‘before’ and ‘after’ would also be expected in the target group. Comparing ‘before’ and ‘after’ on the basis of trips per person per year for the control group, a ‘transfer factor’ is derived (Table A5), and with this transfer factor the before figures for the target group are adapted (Table A6). On this basis, the ‘before’ situation in the target group *corrected by control group effects* forms the baseline against which change is measured.

**Table A5: Mode Choice (trips per person per year) – Control Group**

|                  | CONTROL GROUP |              | Transfer Factor |
|------------------|---------------|--------------|-----------------|
|                  | Before        | After        |                 |
| Walking          | 369           | 385          | 1.043           |
| Bicycle          | 35            | 23           | 0.650           |
| Motorcycle       | 8             | 5            | 0.630           |
| Car-as-driver    | 335           | 335          | 0.995           |
| Car-as-passenger | 174           | 161          | 0.920           |
| Public transport | 95            | 97           | 1.020           |
| <b>TOTAL</b>     | <b>1,016</b>  | <b>1,006</b> |                 |

**Table A6: Mode Choice (trips per person per year) – Target Group**

|                  | TARGET GROUP |                 |              |
|------------------|--------------|-----------------|--------------|
|                  | Before       | Transfer factor | Without ITM  |
| Walking          | 257          | 1.043           | 268          |
| Bicycle          | 41           | 0.650           | 27           |
| Motorcycle       | 7            | 0.630           | 5            |
| Car-as-driver    | 405          | 0.995           | 403          |
| Car-as-passenger | 225          | 0.920           | 207          |
| Public transport | 95           | 1.020           | 97           |
| <b>TOTAL</b>     | <b>1,030</b> |                 | <b>1,007</b> |

This shows that following the after survey there would have been 268 walking trips per person per year ‘without ITM’, 27 bicycle trips, 403 trips by car-as-

driver, 207 trips by car-as-passenger, and 97 public transport trips. The changes associated with ITM can be measured on this basis.

Table A7 shows the findings of the after survey ('with ITM') for the target group. In the target group 31 % of all trips were now made (exclusively) on foot, 4 % by bicycle, less than 0.5 % by motorcycle, 35 % by car-as-driver, 19 % by car-as-passenger and 11 % by public transport.

Compared to 'without ITM', the share of walking trips had risen from 27 to 31%, the share of public transport trips from 10 to 11% whereas the share of car-as-driver decreased from 40 to 35%.

**Table A7: Mode Choice – Target group**

|                  | Without ITM<br>% | With ITM<br>%   |
|------------------|------------------|-----------------|
| Walking          | 27               | 31              |
| Bicycle          | 3                | 4               |
| Motorcycle       | 0 <sup>*)</sup>  | 0 <sup>*)</sup> |
| Car-as-driver    | 40               | 35              |
| Car-as-passenger | 20               | 19              |
| Public transport | 10               | 11              |
| <b>TOTAL</b>     | <b>100</b>       | <b>100</b>      |

<sup>\*)</sup> less than 0.5 %

Again, mode choice can also be shown in trips per person per year. At that time of the after survey an average person undertook 1007 trips per year 'without ITM' and 1016 trips 'with ITM'.

Walking was the means of transport for 268 trips 'without ITM' compared to 317 trips 'with ITM'. Cycling increased from 27 to 36 trips per person per year, public transport from 97 to 110 trips. Car-as-driver trips decreased from 403 to 353, while car-as-passenger trips rose slightly from 207 to 195 per person per year (see Table A8).

**Table A8: Mode Choice (trips per person per year) – Target Group**

| Trips per person per year | Without ITM  | With ITM     |
|---------------------------|--------------|--------------|
| Walking                   | 268          | 317          |
| Bicycle                   | 27           | 36           |
| Motorcycle                | 5            | 5            |
| Car-as-driver             | 403          | 353          |
| Car-as-passenger          | 207          | 195          |
| Public transport          | 97           | 110          |
| <b>TOTAL</b>              | <b>1,007</b> | <b>1,016</b> |

This can also be expressed as relative change, as shown in Table A9.

**Table A9: Mode Choice – Relative Change**

| Change in trips per person per year |                  | Relative change % |
|-------------------------------------|------------------|-------------------|
| +49                                 | Walking          | +18               |
| +9                                  | Bicycle          | +33               |
| 0                                   | Motorcycle       | n. a.             |
| -50                                 | Car-as-driver    | -12               |
| -12                                 | Car-as-passenger | -6                |
| +13                                 | Public transport | +13               |

Walking trips per person per year increased by 49 (relatively by +18 %). This is the greatest increase in number of trips. Cycling increased by 9 trips per person per year (+33%) and public transport by +13 (+13%).

There was a decrease of 50 car-as-driver trips per person per year (-12%).

This evidence indicates that the ITM project reduced car use by 12% and increased the share of sustainable travel modes: walking (+18%); cycling (+33%); and public transport (+13%).

### 3 Statistical Significance of the Changes in Mode Choice

Concerning the statistical significance of the changes in mode choice, expert opinions differ whether this test should be based on persons or trips. For that reason the following test was implemented for both persons and trips. The statistical significance of change in mode choice is located between the results of these two tests. Bases for the test are persons in independent samples 'before' and 'after'.

#### Share of car-as-driver

##### Persons

The following test can be performed. The zero-hypothesis and the alternative-hypothesis are:

$$H_0: P_1 \leq P_2$$

$$H_1: P_1 > P_2$$

$P_1$  = share of car-as-driver 'without ITM'

$P_2$  = share of car-as-driver 'with ITM'

The zero-hypothesis states that the share of car-as-driver trips 'with ITM' is not lower than 'without ITM'. If this zero-hypothesis can be rejected, there is an impact from the ITM on the reduction in car use.

The calculation is done as t-test for independent samples. The share of car-as-driver ‘without ITM’ (40%) and ‘with ITM’ (35%) and the number of observed persons are the inputs (before:  $n_1 = 1,317$ ; after:  $n_2 = 1,296$ ).

For the test value the following formula exists:

$$T = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1-P_1)}{n_1} + \frac{P_2(1-P_2)}{n_2}}} =$$

$$= \frac{0.053}{\sqrt{0.0004}} = 2.8002$$

Test-decision:

$$\varphi(y, y) = \begin{cases} 1 & \text{if } T < z_a \\ 0 & \text{other} \end{cases}$$

$z_{0.05} = 2.326$  (critical value for a level of significance of 99 %).

It follows that based on this test the zero-hypothesis (no decrease of the share of car-as-driver ‘with ITM’) can be rejected with a probability of over 99%.

### Trips

For testing on the basis of trips, the same test can be performed.

The zero-hypothesis and the alternative-hypothesis are:

$$H_0: P_1 \leq P_2$$

$$H_1: P_1 > P_2$$

$P_1$  = share of car-as-driver ‘without ITM’

$P_2$  = share of car-as-driver ‘with ITM’

The zero-hypothesis states that the share of car-as-driver trips ‘with ITM’ is not lower than ‘without ITM’. If this zero-hypothesis can be rejected, there is an impact from the ITM on the reduction in car use.

The calculation is done as t-test for independent samples. The share of car-as-driver ‘without ITM’ (40%) and ‘with ITM’ (35%) and the number of observed trips are the inputs (before:  $n_1 = 4,043$ ; after:  $n_2 = 3,870$ ).

For the test value the following formula exists:

$$T = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1-P_1)}{n_1} + \frac{P_2(1-P_2)}{n_2}}} =$$

$$= \frac{0.053}{\sqrt{0.00012}} = 4.8720$$

Test-decision:

$$\varphi(y, y) = \begin{cases} 1 & \text{if } T < z_\alpha \\ 0 & \text{other} \end{cases}$$

$z_{0.01} = 2.326$  (critical value for a level of significance of 99 %).

It follows that the zero-hypothesis (no decrease of the share of car-as-driver ‘with ITM’) can be rejected with a probability of more than 99%. The reduction in car-as-driver trips achieved by the ITM project in the target area is therefore statistically highly significant.

The significance tests performed produced a significance level of more than 99% both based on persons and on trips.

**Table A10: Overview of significance tests for car reduction**

| Level of significance | Persons | Trips |
|-----------------------|---------|-------|
|                       | > 99%   | > 99% |

These values enable us to say with great confidence that the observed changes in mode choice did not occur by chance.

### Share of environmentally-friendly modes

The statistical significance of the changes in mode choice was also tested for the achieved increase of the share of environmentally-friendly modes (EFM = walking, cycling, public transport).

### Persons

The following test can be performed. The zero-hypothesis and the alternative-hypothesis are:

$$H_0: P_1 \geq P_2$$

$$H_1: P_1 > P_2$$

$P_1$  = share of EFM ‘without ITM’

$P_2$  = share of EFM ‘with ITM’

The zero-hypothesis states that the EFM share ‘without ITM’ is larger than or equal to the EFM share ‘with ITM’. If this zero-hypothesis can be rejected, there is an impact from the ITM on the increase in EFM use.

The calculation is done as a t-test for independent samples. The share of EFM ‘without ITM’ (39%) and ‘with ITM’ (46%) and the number of observed persons are the inputs (before:  $n_1 = 1,317$ ; after:  $n_2 = 1,296$ ).

$$T = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1-P_1)}{n_1} + \frac{P_2(1-P_2)}{n_2}}} =$$

$$= \frac{-0.067}{\sqrt{0.0004}} = -3.4667$$

For the test value the following formula exists:

Test-decision:

$$\varphi(y, y) = \begin{cases} 1 & \text{if } T > z_a \\ 0 & \text{other} \end{cases}$$

$z_{0,1} = -2.326$  (critical value for a level of significance of 99 %).

It follows that based on this test the zero-hypothesis (no increase of the share of EFM ‘with ITM’) can be rejected with a probability of over 99%. The increase in EFM usage achieved by the ITM project is statistically highly significant.

### **Trips**

For testing on the basis of trips, the same test can be performed. The zero-hypothesis and the alternative-hypothesis are:

$$H_0: P_1 \geq P_2$$

$$H_1: P_1 > P_2$$

$P_1$  = share of EFM ‘without’ ITM

$P_2$  = share of EFM ‘with’ ITM

The zero-hypothesis states that the EFM share ‘without ITM’ is larger than or equal to the EFM share ‘with ITM’. If this zero-hypothesis can be rejected, there is an impact from the ITM on the increase in EFM share.

The calculation is done as t-test for independent samples. The share of EFM ‘without ITM’ (39%) and ‘with ITM’ (46%) and the number of observed trips are the inputs (before:  $n_1 = 4,043$ ; after:  $n_2 = 3,870$ ).

For the test value the following formula exists:

$$T = \frac{P_1 - P_2}{\sqrt{\frac{P_1(1-P_1)}{n_1} + \frac{P_2(1-P_2)}{n_2}}} = \frac{-0.067}{\sqrt{0.00012}} = -6.0315$$

Test-decision:

$$\varphi(y, y) = \begin{cases} 1 & \text{if } T > z_a \\ 0 & \text{other} \end{cases}$$

$z_{0.01} = -2.326$  (critical value for a level of significance of 99 %).

It follows that the zero-hypothesis (no increase in the share of EFM ‘with ITM’) can be rejected with a probability of at least 99%. The increase of EFM usage in the ITM target area is highly statistically significant.

The significance tests performed produced a significance level of over 99% both based on persons and on trips.

**Table 11: Overview of significance tests for EFM increase**

|                       | Persons | Trips |
|-----------------------|---------|-------|
| Level of significance | > 99%   | > 99% |

These values enable us to say with great confidence that the observed changes in mode choice did not occur by chance.

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