INSMART
Integrative Smart City Planning

Internal Report 2

Task 1.2 – Surveys for City Data

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March 2014

Grant agreement no.:

314164 (ENER/FP7/314164)

Project acronym:

InSMART

Project full title:

Integrative Smart City Planning

Coordination and support action (Coordinating Action)

FP7-ENERGY-SMARTICITIES-2012

Start date of project: 2013-12-01

Duration: 3 years

Internal Report

on the Current Status Analysis Report
for each city and the Data surveys

Project co-funded by the European Commission within the Seventh Framework Programme			
Dissemination Level			
PU	Public		PU
PP	Restricted to other programme participants (including the Commission Services)		
RE	Restricted to a group specified by the consortium (including the Commission Services)		
CO	Confidential, only for members of the consortium (including the Commission Services)		

Version	**Submitted by**	**Review Level***	**Date Submitted**	**Reviewed**
V01		WPL		

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Executive Summary:	
Synthesis of the results in the available data report for each city and building energy and transport survey questionaires.	
Keywords	Survey, data analysis, energy systems, transport & mobility, water &waste, cities, building energy survey, transport survey

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1. Introduction:

According to description of work and role of the partners of InSMART, the WP1 will set the basis of the methodological approach for a strategic urban planning as it will create the GIS platform that will be used to supply the rest of the models and to visualize and analyse the results.

Based on the available data as identified in Task 1.1 a comprehensive survey will be designed and conducted in Task 1.2.. The survey will merely focus at the recording and characterization of the city building stock and the energy consumption patterns especially using the residential sector. In addition, data regarding transportation and mobility in major city zones, water consumption and waste disposal as well as municipal urban spaces street lighting and DH networks will be also collected.

This work will be undertaken by the cities, either through their technical departments or through subcontractors, in close cooperation with the scientific partners that will provide all the necessary expertise and guidance.

1. Gaps Identification:

2.1 Cesena

After the first analysis of the available data, this section will describe the main gaps identified and presents some proposals to address the problems encountered that might be useful in the definition of the survey in Task 1.2.

A general problem found during this phase is due to the fact that, the municipality of Cesena, has contracted the services of waste, water management, public lighting and public transport to external managers (Multi-utilities/Private companies) who are the owners of the data and responsible for the monitoring. The Municipality has direct access to only a portion of these data and often there is no formal agreement for data exchange of updated data

over the long term. In addition, the monitoring system within some municipal services is badly organized.

To try to address these data gaps (especially on consumption) formal requests to the different multi-utilities will be necessary by creating special survey during the Task 1.2.

At this purpose the municipality of Cesena with the support of e4smaS.r.l. will present the project InSMART to the various operators trying to actively involve them in the data collection. The project InSMART will be useful for organizing and formalizing the exchange and updating of data between the Municipality and private stakeholders.

Below are presented the main missing data by individual issues and, where possible, some proposal to address these gaps:

Building Stock

- Currently no data on energy consumption by building are available.

To address gaps identified on energy consumption profiles in the building stocks, a possible approach may be via the identification of a number of relevant building types, which characterize the individual districts of the territory. Using therefore the geo-referenced database of 2010 electricity consumption will be possible to estimate consumption profiles for these building archetypes, which can be used as average consumption patterns for the city buildings. It is worth noting that these analyses can be provided only for few building samples and only for portions of territory.

Transport and mobility

- The Integrated Mobility Plan (PRIM) does not contain updated data and there are no data on CO_2 emission related to the transport in the territory.
- There are no data on traffic flows, telemetry and scheduled routes per vehicle.

Public Lighting

- There are no data available at district level

Waste chain

- There are no data on electrical consumption in the waste chain (urban waste) except for 2 active users
- There are no data on energy consumption and waste production in the tertiary and industrial sector. The Municipality manages only the data of urban waste and assimilated. The flow of waste produced by private companies (e.g., industries) is controlled by other public agencies: Local public health unit (USL), Regional Agency for Environment Protection (ARPA), Chamber of Commerce, Province etc.

Other data

- There are no data on electrical consumption of individual companies.

Decentralised Energy Supply and Facilities

- There are no data on solar thermal plants and cogeneration units
- There are no data on PV plants on private properties
- There are no data on hourly profiles

2.2 Nothingham

Nottingham possesses a wide and varied range of data, much of it in the public domain through the Nottingham Insight mapping platform. However, there are some areas with significant gaps in the data which will need to be resolved or mitigated against as a part of the InSMART programme.

A common gap identified across all data categories is not related to the existence of data but relates to access to that data. Due to the fragmentary

nature of the data related to an entire city and the multitude of stakeholders involved in the collection and management of such a dataset it is inevitable that ownership of data and access to data can be a significant challenge. In addition, a large proportion of useful data for the city of Nottingham is held by private enterprises on behalf of their customers and both data protection and commercial confidentiality concerns greatly restrict, and in some instances prohibit, access to such data. In particular energy and water consumption data held by private providers of such services is not likely to be available except in a highly aggregated (both spatially and temporally) form.

Details of the data gaps for each of the categories of data used in the report are provided under the following sub-headings.

Spatial Data

There are no significant gaps or omissions relating the spatial data in the city of Nottingham. OS mapping is available to a high level of resolution 1:500 through Nottingham Insight and building level spatial data is sufficiently accurate for the needs of the project. Road and transport based mapping is also available to a high level of resolution and accuracy.

Building Stock

There are many gaps in the availability of property level information on buildings particularly in respect of private owner occupier and private rented properties. These can be somewhat mitigated through the use of aggregated datasets available and by the application of building typologies based on national surveys like the EHS. The 2006 private sector housing condition survey carried out in the city of Nottingham is of particular use in terms of residential properties though it obviously will not reflect any recent changes to the housing stock.

As described in section 3.1, energy consumption and demand data at the level of individual properties is highly restricted in the UK. This is a significant gap in developing an energy model for the city of Nottingham. It is highly unlikely that energy providers will be willing to provide details of individual energy use and demand. A series of energy related typologies based on building type and household demographics could be developed to simulate energy use for individual properties but will be prone to inaccuracy.

In terms of urban demographics, there is a broad and extensive set of data available from sources such as NeSS, Mosaic and NCC. It should be noted that this data is subject to frequent change and the age of data (e.g. based on decadal census or infrequent sampling) could be an issue. However, since the results of 2011 census are just becoming available and a Mosaic study was carried out in 2012; there is currently a low risk of demographic data being outdated.

It is likely that additional survey work on the privately owned housing stock and commercial properties will be necessary to build an accurate and robust model of the condition and energy efficiency of Nottingham's housing stock.

Transport and Mobility

In terms of transport there is currently a lack of detailed data on individual journeys not using public transport options (e.g. car, bicycle and walking). There are also a number of areas outside the city centre with limited live data on congestion and traffic flows and routing. However, The Greater Nottingham Transport Model, described in section 3.2, is thought to provide a more than sufficient dataset for the aims and context of the InSMART programme.

The only potential gaps in this area might concern data for the modelling of future transport scenarios not already covered or planned for the Nottingham

Model. Currently, no such scenarios are envisaged but the possibility should be considered in the early phases of work package 3.

Urban Spaces and Public Lighting

No significant gaps identified but need to confirm access to public lighting details from city's private lighting contractor.

Water & Sewage

Data relating to the provision of water and sewage services to the city is not readily available for this work. This area represents a significant data gap in terms of modelling Nottingham's overall energy profile. Research to date has failed to identify a reliable and accurate method to acquire data that could be used to fill this gap.

Data describing average water consumption per person or household for drinking, cleaning and waste could be used to calculate a rough estimate of household energy use associated with water and sewage use but would be obviously prone to serious inaccuracy.

Waste

There appears to be a lack of data at low spatial and temporal scales for waste collection and recycling for the city. However, it is thought that there is enough detailed quarterly data at the city level to model waste flows in a limited but sufficient manner to fulfil the needs of the project.

NCC waste management team will also be able to provide data on waste at lower levels of aggregation if necessary.

Other Data

No significant gaps identified in terms of data on industrial facilities beyond those previously identified for tertiary building stock in section 4.2.

2.3 Évora

Supported on the policies and plans review and on the first data collection assessment (GIS maps and energy data) a few gaps were identified that need to be overcame in the next tasks of the project, specially through the conduction of the Task 1.2. Survey. The main gaps identified are linked to: buildings stock characterization and households' structure and consumption profiles.

Some information is available on the building stock at the parish level in the Census 2011, but a coherent dataset of information compiling all the needed characteristics for InSMART development within the same sample is preferable. The extensive database on the buildings stock inside the city wall is outdated and should also be improved.

There is no available information on specific energy consumption inside households like type of heating and cooling equipment's, ownership of electrical equipment and energy consumption by end use (lighting, cooling, refrigeration, etc.). No statistical information is available regarding households biomass consumption.

The survey that will be done on Task 1.2 should cover all this and also households' characteristics (e.g., area, number of persons, age, sex, education, income) to increase the knowledge on their energy consumption profiles.

All this information will be valuable not only for the GIS map municipal building stock characterization (Task 1.3 of WP1) but also for the selection of buildings typologies to be assessed in WP2 on the integrated assessment through the TIMES model (WP5).

Transport sector detailed consumption and characterization.

A specific transport survey (e.g. traffic counting and traffic movement characteristics) should be conducted in order to obtain knowledge on intra municipal traffic flows, city fleet stock characteristics and associated fuel consumption. Furthermore there are not available any plans for changes in land use in the future (e.g. major new developments). Details on the location, quantity and type of any future planned developments are needed to identify changes in land use between the 2014 base year and 2028 forecast year. Details on planned changes to the relevant transport infrastructure will be required, along with likelihood of going ahead.

industries sub sectors energy consumption and characterization.

decentralize energy supply. No municipal solar map is available. This would help to identify solar technologies use potential. Furthermore, no statistical information is available on the solar thermal technologies installed capacity and production and on the photovoltaic electricity production.

Other relevant information regarding energy consumption and electricity production at wastes, wastewater and water facilities exist but its collection is underway.

2.4 Trikala

Supported on the policies and plans review and on the first data collection assessment (GIS maps and energy data) a number of gaps were identified. These gaps will be addressed in Task 1.2. through the conduction of a survey. The main gaps identified for the city of Trikala are described below.

More details are needed on the buildings' stock characterization and households' structure and consumption profiles. Some information on the building stock is available through the Census of 2011. However, in order to compile the full set of data that will be required for the modeling in WP2, more detailed data are required for the building typologies concerning construction

typology and installed equipment for heating/cooling. This will be included in the survey of Task 1.2.

There is no available information on energy consumption by end use (heating, lighting, cooling, refrigeration, etc.) in the residential and the tertiary sector. Statistical data for the split of the consumption of oil products between the residential and tertiary sector are needed. Statistical data for the consumption of biomass for heating purposes should be collected, since these are not available. The use of biomass has increased considerably over the last two years but reliable statistics are still missing.

Public transport data are readily available however more detailed data regarding individual mobility will be collected during the dedicated task of data collection for WP3.

Data from local industries regarding their consumption and the possibility of energy production from the industrial wastes.

Regarding Municipal Waste, the data presented should be checked and updated to current dates. Moreover, more detailed energy consumption data will be sought for the operation of the landfill and waste quantities data from food industries (milk and cheese) located nearby the municipality as well as livestock and olive oil production units will be gathered for potential energy exploitation. On Water and Sewage, major gaps have been identified as only aggregated data existed and general information about the water network operation was available. Water consumption data per sector (residential, primary, tertiary), water grid depiction, profile data of all pumps' operating in drilling, pumping stations, sewage facilities and operational schedule of those, electricity consumption of pumping stations, pumping facilities, sewage facilities, quantities of sewage treated and energy potential of the sewage treatment facility will be determined on a detailed survey at the responding departments of the Municipality of Trikala.

3 - Survey Templates

The following common survey templates have been developed and are used in the city specific surveys.

3.1 Building Energy Survey Template

1. General Data		
Building form	Terraced house	☐
	Detached	☐
	Semi-detached	☐
	Multi-family / apartment building	☐
Building Use	Residential ☐ Mixed ☐ If mixed use, please provide information of specific uses by floor ………………………………………………………………………………………… ………………………………………………………………………………………… ………………………………………………………………………………………… …………………………………………………………………………………………	
Address		
Total area (sq.m)		
Building height		
Number of Floors		
Area per floor (sq.m)	Basement ………………………… Ground Floor ………………………… 1st ………………………… 2nd ………………………… 3rd ………………………… ………………………………………………… …………………………………………………	
Construction Year		
No of apartments		
Apartment number which is surveyed		
Floor at which apartment is located		
Apartment total area (sq.m)		
Refurbishment Year		
Type of Refurbishment	Replacement of windows:	☐
	Year:	………………………………
	Roof Insulation:	☐
	Year:	………………………………
	Wall insulation:	☐
	Year:	………………………………
	Boiler replacement:	☐
	Year:	………………………………
	Other: ……………………………………………… ………………………………………………	
No of residents:	Apartment ………………………	Whole building …………………

2. Occupant / Contact person data		
	Owner-occupier ☐ Tenant (public rented) ☐	Tenant (private rented) ☐ Leasehold ☐

	Shared ownership ☐	Building manager ☐
Family name / First name		
Age of primary resident		
Vocation / Working status	Professional ☐ Retired ☐ Student ☐	
	Other ……………………………………………………………	
Number of household members		
Age of each household member		
Relation of household members	Family ☐ other Couple ☐ room mates ☐	
	Other …………………………………………………….	
Income	High ☐ Medium ☐ Low ☐	
Tel/ Fax		
e-mail		

3. Building Use data (for NON-residential building/NON-residential part of building)	
Operation hours:	Monday – Friday: from ………………- to………………
	Saturday – Sunday: from ……………- to……………
Average number of occupants during:	
Working days (Mon – Fri)	
Saturday	
Sunday and Public holidays	

4. Building envelope data	
Load bearing structure	Concrete ☐ Wood ☐ Timber ☐ Steel frame ☐
	Other ……………………………………………………
External walls material	Brick wall ☐ Single layer ☐ Double layer ☐
	Masonry (brick and blockwork) cavity wall ☐
	Solid stone wall ☐ Concrete panels ☐
	Other ………………………………………………
	………………………………………………
External wall thickness (cm)	
Type of insulation	Expanded Polystyrene ☐ Extruded Polystyrene ☐
	Polyurethane ☐ Glass wool ☐ Stone wool ☐
	Other ………………………………………………………………
	……………………………………………………………………
Insulation layer thickness (cm)	
Position of Insulation	Internal ☐ External ☐ Core ☐
Roof:	
Horizontal concrete roof	☐ thickness: ……………… (cm)
Sloped concrete roof	☐
Sloped Concrete roof with tiles	☐
Horizontal concrete roof on which a wooden sloped with tiles is constructed	☐
Sloped wooden roof with tiles	☐
If sloped roof, please provide angle of slope (^{0}):	……………………………
Roof space under the sloped roof occupied and heated?	Yes ☐ No ☐
Roof insulation layer thickness (cm)	………………………………………..
Type of insulation	Expanded Polystyrene ☐ Extruded Polystyrene ☐
	Polyurethane ☐ Glass wool ☐ Stone wool ☐
	Other ………………………………………………………………
	……………………………………………………………………

Type of windows: Framing material	Wood ☐ Aluminum ☐ Plastic ☐
Glazing type	Single ☐ Double ☐ Triple ☐ Special ☐
Ratio of window / wall area by orientation (%):	South……………………. East…………………… West…………………… North ……………………
Type of shading system:	Balcony / Overhang ☐ (1) Shutters ☐ (2) External Blinds ☐ (3) Awning ☐ (4) Side fins ☐ (5) Other …………… (6)
Shading type by orientation: South façade	☐(1) ☐(2) ☐(3) ☐(4) ☐(5) ☐(6)	Please write depth & width (m), if overhang or fin
East façade	☐(1) ☐(2) ☐(3) ☐(4) ☐(5) ☐(6)	d ……………………… w ………………………
West façade	☐(1) ☐(2) ☐(3) ☐(4) ☐(5) ☐(6)	
Flooring:	Ceramic tiles ☐ wood ☐ mosaic ☐ Concrete ☐ Other ………………………………………………… If flooring material varies, please provide information by floor:
Basement Gr. Floor 1st 2nd 3rd ……	…………………………………………………… …………………………………………………… …………………………………………………… …………………………………………………… …………………………………………………… ……………………………………………………
Basement occupied and heated?	Yes ☐ No ☐
Floor insulation layer thickness (cm) Type of insulation	……………………………… Expanded Polystyrene ☐ Extruded Polystyrene ☐ Polyurethane ☐ Glass wool ☐ Stone wool ☐ Other ………………………………………………………… ………………………………………………………………

4a. Conservatory	
Is there a conservatory attached?	Yes ☐ No ☐
If Yes, please complete separately (especially for the conservatory), boxes (4), (6), (8), (9)	

5. Building layout

Please, provide a draft layout of the building, with spatial dimensions, orientation, street width height of adjacent and opposite buildings.

Please, provide photos of each façade and of the surrounding area.

6. Heating system

Type of heating system	Diesel boiler ☐ Gas boiler ☐ Heat pump ☐ Micro - CHP ☐ Electric based ☐ Solid Fuel burners ☐ Other ………………………………………………………………………
If multiple systems, estimate % of heating needs covered by each system	
Capacity (kW)	
Efficiency	
Type/Model	
Number of systems (if there are multiple systems of the same type e.g. two or more heat pumps)	a.
Installation year	
Operating hours per day	Winter Period: from ………………- to………………
Operating hours per day	Spring/Autumn Period: from ………………- to……………… to get operation profile
Type of heating control	Thermostat ☐ timer ☐ thermostatic valve ☐ other……………………………

7. Domestic Hot Water system

Winter season please describe:	Type: electric resistance ☐ solar ☐ gas ☐ diesel ☐ biomass ☐ heat pump ☐ Other …………………………………………… Capacity kW): ……………………. Operating hours/day: ………………….
Summer season please describe:	Type: electric resistance ☐ solar ☐ gas ☐ diesel ☐ biomass ☐ heat pump ☐ Other ……………………………………… Capacity kW): ……………………. Operating hours/day: …………………. For solar systems: Surface of solar panels … m2
Is there a hot water storage vessel?	YES ☐ NO ☐
If yes, what is the volume (lt)	

8. Space Cooling system

Type	Central ☐ split units ☐ fan coil ☐ Other ………………………………………………………
Installation year	
Number of units	
Electric capacity per unit (kW)	
Cooling capacity per unit (kW)	
Operating hours per day	
Is it used for space heating as well? If yes, please give %	YES ☐ NO ☐ …………………………%
Roof fans Number	……………………………
Power per fan	……………………………

9. Lighting system of individual apartments/households

Type of light bulbs:	Number	Power (W)	Operating hours per day
Incandescent			
Fluorescent			
Fluorescent compact (CFL)			
Halogen			
Other			

10. Lighting system in common use areas of the building

Type of light bulbs:	Number	Power (kW)	Operating hours per day
Incandescent			
Fluorescent			
Fluorescent compact (CFL)			
Halogen			
Other			
Is there an automation system? What type?	b. Time scheduling control □ Occupancy sensors □ i. Other …………………………………………………		

10.a Lighting system of non-residential part of building

Type of light bulbs:	Number	Power (W)	Operating hours per day
Incandescent			
Fluorescent			
Fluorescent compact (CFL)			
Halogen			
Other			
Type of luminaires	ceiling mounted direct □ ceiling mounted with diffuser □ recessed downlighter □ pendant direct □ pendant indirect □ chandelier □ free standing □ wall-washer □		
Is there an automation system; What type;	Time scheduling control □ Occupancy sensors □ Other …………………………………………………		

11. Other Electric equipment

	Number	Power (kW)	Operating hours per day
Computers - Desktop			
Laptops			
Copiers/Printers			
Refrigerator			
Electric cooker			
Microwave			
Washing machine			
Tumble dryers			
TV			
Other			

12. Energy consumption data of the last three years

Year	Electricity (kWh)	Diesel (lt)	Natural Gas (Nm^3)	Other fuel
2011				
2012				
2013				

13. Energy cost data of the last three years

Year	Electricity (€) incl. tax	Diesel (€) incl. tax	Natural Gas (€) incl. tax	Other fuel (€) incl. tax
2011				
2012				
2013				

14. Onsite energy generation

Is there a PV system on the building? If Yes please provide:	Installed Capacity …..KWp
Is there another micro-generation system? If yes please describe:	Type of system ….. Fuel Used….. Installed Capacity ….. kW

SURVEY FORMS

i.   This section consists of:
- The introduction for recruitment
- Screening questionnaire
- Main Questionnaire/Travel Diary

Introduction for recruitment

[Read out] Good [morning/afternoon/evening]. My name is [interviewer's name] and I am undertaking some research on behalf of the European Commission.

[Read out] They have commissioned us, to undertake short household surveys with residents in [city] to better understand travel behaviour in the city. The purpose of the survey Is to help gauge the levels of energy use and emissions greenhouse gases created by travel in [*Insert the name of the relevant city here*].

[Read out] This survey takes up to 15 minutes of your time to complete in full and all eligible people who complete the survey will be entered into a free prize draw with a prize of €200. The first part of the survey identifies whether you are eligible to be considered for the survey and only takes a few minutes.

I1. **[If uncertain whether the resident is aged 18+, ask:] Are you aged 18 or over?**

    Yes   [GOTO I3]
    No   [Continue]

I2. **Is there someone else at home, aged 18 or over who I could speak with?**

    Yes   [Once contact is established with someone aged 18+, re-read the intro and then continue]
    No   [Thank person for their time and end the interview]

I3. **Do you live at this address?**

    Yes   [GOTO I5]
    No   [Continue]

I4. **Is there someone else at home, aged 18 or over who lives at this address and who I could speak with?**

    Yes   [Once contact is established with someone aged 18+ who lives at the address, re-read the intro and then continue]
    No   [Thank person for their time and end the interview]

I5. **Please can you spare a couple of minutes to answer a few quick questions?**

    Yes   [GOTO Screening Questionnaire]
    No   [Continue]

I6. **Is there anyone else aged 18 or over who lives at this address who might be able to speak with me?**

    Yes   [Once contact is established with someone aged 18+ who lives at the address, and who is willing to take part, re-read the intro and then continue on to the Screening Questionnaire]
    No   [Thank person for their time and end the interview]

Screening Questionnaire

Serial no:

S1. Interviewer's name: _____

S2. Sector: _____

S3. Day of week:_____ Date:_____ Month:_____ Year:_____

S4. Time (24hr clock):_____

S5. Gender [please circle]: Male Female

[Read out] Thank you very much. I need to ensure we speak to a range of different people so that our survey represents the views and behaviour of all different groups in society. Therefore I would like to start by asking you a few questions about yourself.

S6. **Please can you tell me which of the following age categories you are in?**

18-34
35-49
50-64
65+

S7. **Which of the following best describes your working status?**

Working full time (35+ hours per week)
Working part time (<35 hours per week)
Student
Retired
Not working
Full-time Home Duties/Caring for Others
Other (Please specify) ……………………………………………………………………

[Interviewer: Check quotas – is this type of person still required]

Yes [Continue]
No [Ask if there is anyone else in the household of the age/working status required. If there is, establish contact, re-read the intro and the screening questions. If there isn't, thank & close]

S8. **Thank you. We still need people of your age and working status to take part in the survey. Would you be willing to answer a few more questions about your travel patterns, to help us understand about the type of journeys which you make? It will take about 5-10 minutes to complete, depending on your answers.**

Yes [Skip to Main Questionnaire]
No [Thank person for their time and end the interview]

Main Questionnaire

I'd like to start by asking you about the journeys you made yesterday, including those which you made for yourself and those in which you were accompanying others. This will help us understand the type of journeys which you make. For each journey I'll ask where it started and ended, what time you set off and how long the journey lasted, what the main reason for the journey was, how you travelled, and who, if anyone, you were travelling with.

One journey is defined by a single trip for a single purpose, for example if you travelled to work, but stopped off at the shops on your way, then the first journey will be your trip to the shops, your second journey will be from the shop to work, etc. Note that a trip from home to work and back again should be classified as two separate journeys.

Please think back to what you were doing yesterday. What was the first journey you made?

[Prompt if necessary:] Did you get up and go to [work/college/ the shops]?

[Interviewer: Please ask the respondent to complete a travel diary description for all journeys made on the preceding day, prompting, 'and then what was the next thing you did that day?'. Note that it does not matter whether the previous day's travel was 'typical' or not]

ONE DAY TRAVEL DIARY FOR THE PREVIOUS DAY   **Serial no:**

Date diary refers to *(i.e. yesterday's date)*: _____ Day of week diary refers to *(i.e. what day was it yesterday?)*: Mon / Tues / Weds / Thurs / Fri / Sat / Sun

Journey number	In which sector did your journey start?	In which sector did your journey end?	What time did your journey begin?	Journey purpose (to or from….)	How long did your journey take? *(in minutes)*	Main mode of transport	If main mode is car, how many adults were in the car?	If main mode is car, how many children were in the car?
	Enter sector number from map. If outside sectors on map, enter name of nearest town/city	Enter sector number from map. If outside sectors on map, enter name of nearest town/city	Estimate, using 24 hour clock, e.g. 20:15	Enter number 1-11 1: Normal place of work 2: Education (including escorting others) 3: Other work trip 4: Shopping 5: Personal business (e.g. doctor/bank etc.) 6: Visiting friends/ family 7: Leisure 8: Other (please specify)	Estimate, in minutes, the length of time the journey took e.g. 20 minutes	If more than one mode, enter mode which is used for the greatest distance <u>Enter number 1-9</u> 1: Car/van (driver) 2: Car/van (passenger) 3: Bus 4: Train 5:Motorbike/scooter 6: Bicycle 7 Walk 8 other (specify)	Enter the number of people in the car aged 18+, including yourself e.g. if it was you plus one other adult, enter '2'	Enter the number of people in the car aged 0-17
1								
2								
3								
4								
5								

6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

[Read out] Finally, I just need to take a few more details about you and your household. Please can you tell me…?

    a.

b.   **Q1.**   **Which of the following best describes the type of property you live in?**

Detached property
Semi-detached property
Terrace property
Flat/ maisonette
Other (specify)

Q2.   **How many bedrooms are there in your property?**

1 bedroom
2 bedrooms
3 bedrooms
4+ bedrooms

Q3   **How many people, including yourself and any children, live in your household?**

1
2
3
4
5
6
More than 6 (Please specify _____)

Q4.   **For each person living in your household, please can you tell me which age category they are in and whether they are male of female?** [Interviewer: please tick correct age and gender for each person living in the household]

C. PE RSON		D. -4	E. -10	F. 1-17	G. 8-34	H. 5-49	I. 0-64	J. 5+	K. M ALE	L. FE MALE
m.	1	n.	o.	p.	q.	r.	s.	t.	u.	v.
w.	2	x.	y.	z.	aa.	bb.	cc.	dd.	ee.	ff.
gg.	3	hh.	ii.	jj.	kk.	ll.	mm.	nn.	oo.	pp.
qq.	4	rr.	ss.	tt.	uu.	vv.	ww.	xx.	yy.	zz.
aaa.	5	bbb.	ccc.	ddd.	eee.	fff.	ggg.	hhh.	iii.	jjj.
kkk.	6	lll.	mmm.	nnn.	ooo.	ppp.	qqq.	rrr.	sss.	ttt.
uuu.	7	vvv.	www.	xxx.	yyy.	zzz.	aaaa.	bbbb.	cccc.	dddd.

C. PERSON	D. -4	E. -10	F. 1-17	G. 18-34	H. 35-49	I. 50-64	J. 65+	K. MALE	L. FEMALE
eeee. 8	ffff.	gggg.	hhhh.	iiii.	jjjj.	kkkk.	llll.	mmmm.	nnnn.
oooo. 9	pppp.	qqqq.	rrrr.	ssss.	tttt.	uuuu.	vvvv.	wwww.	xxxx.
yyyy. 10	zzzz.	aaaaa.	bbbbb.	ccccc.	ddddd.	eeeee.	fffff.	ggggg.	hhhhh.

Q5. **How many cars/vans are available for use by members of your household?**

0
1
2
3
More than 3 *(please specify _____)*
IF Answer to Q5 = 0, GOTO Q7

Q6. **For each car in your household, please can you tell me it's approximate age and the fuel it uses?**
[Interviewer: please tick correct age and fuel type for each car]

iiiii.

JJJJJ. CAR	KKKKK. LESS THAN 2 YEARS OLD	LLLLL. T LEAST 2 YEARS OLD AND LESS THAN 5	MMMMM. T LEAST 5 YEARS OLD AND LESS THAN 10	NNNNN. 0 YEARS OR OLDER	OOOOO. PETROL	PPPPP. DIESEL	QQQQQ. NG	RRRRR. HYBRID	SSSSS. ELECTRIC
ttttt. 1	uuuuu.	vvvvv.	wwwww.	xxxxx.	yyyyy.	zzzzz.	aaaaaa.	bbbbbb.	cccccc.
dddddd.	eeeeee.	ffffff.	gggggg.	hhhhhh	iiiiii.	jjjjjj.	kkkkkk.	llllll.	mmmmmm
nnnnnn.	oooooo.	pppppp	qqqqqq.	rrrrrr.	ssssss.	tttttt.	uuuuuu.	vvvvvv.	wwwwww.
xxxxxx. 4	yyyyyy.	zzzzzz.	aaaaaaa.	bbbbbb	ccccccc.	ddddddd.	eeeeeee	fffffff.	ggggggg.
hhhhhhh.	iiiiiii.	jjjjjjj.	kkkkkkk.	lllllll.	mmmmmm	nnnnnnn.	ooooooo	ppppppp.	qqqqqqq.
rrrrrrr. 6	sssssss.	ttttttt.	uuuuuuu.	vvvvvvv	wwwwww	xxxxxxx.	yyyyyyy.	zzzzzzz.	aaaaaaaa.
bbbbbbbb.	ccccccc.	ddddddd	eeeeeeee.	ffffffff.	gggggggg.	hhhhhhhh	iiiiiiii.	jjjjjjjj.	kkkkkkkk.
llllllll. 8	mmmmm	nnnnnn	oooooooo.	pppppp	qqqqqqqq	rrrrrrrr.	ssssssss.	tttttttt.	uuuuuuuu.
vvvvvvvv.	wwwww	xxxxxxx	yyyyyyyy.	zzzzzzzz	aaaaaaaaa	bbbbbbbb	ccccccccc	ddddddddd	eeeeeeeee

Q7.   **How many motorbikes/scooters are available for use by members of your household?**

0
1
2
3
More than 3 *(please specify _____)*

Q8.   [If S7='working full time' or 'working part time', ask:] **Earlier you said that you [work full time/ work part time]. Do you** <u>**usually**</u>**…?**

Work from home   [GOTO END]
Travel to a single workplace   [Continue]
Travel to different locations   [GOTO END]

Q9. [If Q8=b 'Travel to a single workplace, ask:] **How many times per week do you <u>usually</u> travel to that location?**

1
2
3
4
5
More than 5 *(please specify _____)*

Q10. **Which mode do you normally use to travel to your normal place of work** (please tick one only, choosing the mode which covers the longest part of the journey)

1 Car/van (driver)
2: Car/van (passenger)
3: Bus
4: Train
5:Motorbike/scooter
7: Bicycle
8: Walk Other (Please specify _____)

Q11. [If Q8=b 'Travel to a single workplace', ask:] **Which sector number from the map is your work place located. If outside sectors on map, enter name of nearest town/city**

Sector Number _____

Q12. [If Q8=b 'Travel to a single workplace ', ask:] **Approximately how long does it take you to travel to that location?** (Please enter in minutes)

_____ minutes

END

[Read out] **Many thanks for your time, that is everything I need to ask.**