

NatCen

Social Research that works for society

National Travel Survey GPS Pilot 2011

New technologies to measure non-health topics in longitudinal studies

CLOSER workshop

4th May 2017



Acknowledgements

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University of Eindhoven (TU/e: Prof Harry Timmermans, Anastasia Moiseeva, Tao Feng and Joran Jessurun).

Contents

- Background to the National Travel Survey
- GPS Pilot approach
- Comparison with existing method
- Conclusions



The National Travel Survey



1.

The National Travel Survey

Designed to measure long-term trends in personal travel

Commissioned by the Department for Transport (DfT)

Primary measure of personal travel in England...

- How?
- Why?
- When?
- Where?

The National Travel Survey

Cross-sectional survey

Produces national statistics

Random probability sample of households in England

12,852 addresses selected from the PAF each year

Continuous fieldwork throughout the year

c.7,500 households interviewed

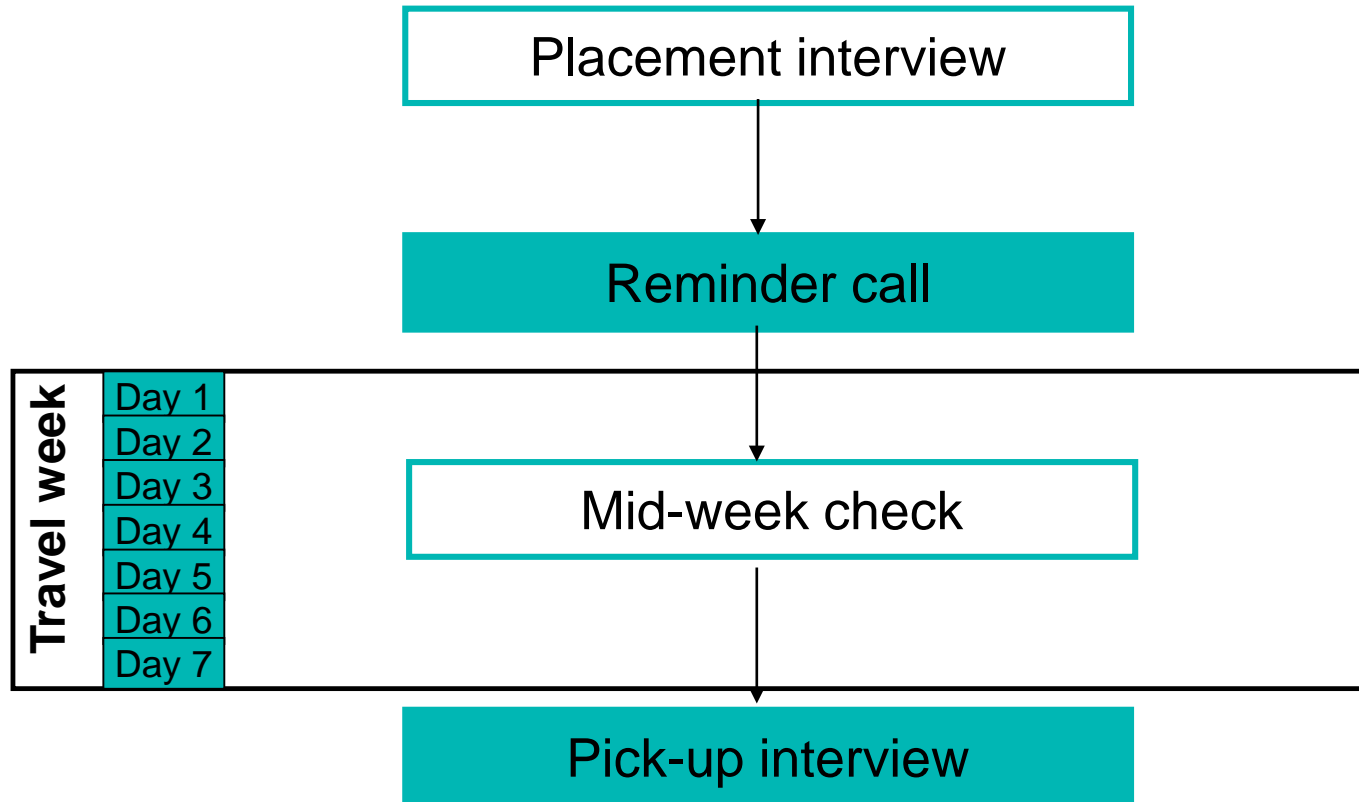
All household members take part

CAPI interview

Paper 7-day travel diary

Incentive strategy designed to maximise full household participation (all completing diaries)

Fieldwork sequence



Travel record – key points



The key part of the survey

Lasts for 7 days



All members of household need to complete

The travel diary

Covers a random 7-day period

Collected for all household members including infants

All journeys except walks less than a mile (days 1 – 6)

Short walks under a mile on day 7

Checked by interviewer

Extensive in office editing

DAY 1

Mon Tues Wed Thur Fri Sat Sun

Date

For help with filling in please unfold side flap for notes

JOURNEYS Please record each journey on a new row. Include very short ones and return journeys. Include walks if 1 mile or more

STAGES These columns are



A What was the purpose of your journey? <i>See Note A</i>	B What time did you leave? <i>See Note B</i>	C What time did you arrive? <i>See Note C</i>	D Where did you start your journey? (Tick Home or give the name of the village, town or area) <i>See Note D</i>	E Where did you go to? (Tick Home or give the name of the village, town or area) <i>See Note E</i>		F What method of travel did you use for each stage of your journey? <i>See Note F</i>	G How far did you travel? (Miles) <i>See Note G</i>
1 	Time : <input type="checkbox"/> am <input type="checkbox"/> pm	Time : <input type="checkbox"/> am <input type="checkbox"/> pm	<input type="checkbox"/> Home	<input type="checkbox"/> Home	1		
					2		
					3		
2 	Time : <input type="checkbox"/> am <input type="checkbox"/> pm	Time : <input type="checkbox"/> am <input type="checkbox"/> pm	<input type="checkbox"/> Home	<input type="checkbox"/> Home	1		
					2		
					3		

Data collected in the travel diary

- **Purpose**
- Time left
- Time arrived
- Origin
- Destination
- **Mode of travel**
- Distance
- Time spent travelling
- Number in party
- Vehicle used
- Whether driver or passenger
- Parking costs
- Ticket type
- Ticket cost
- Number of boardings

The GPS Pilot



2.

Potential benefits

Reduced respondent burden

Reduced costs

Improved data quality

Modernised approach

GPS pilot – summary of methodology

Sub-sample of February and March 2011 NTS sample

c. 900 individuals aged 12+

Household members given GPS monitors instead of diaries

GPS Monitors

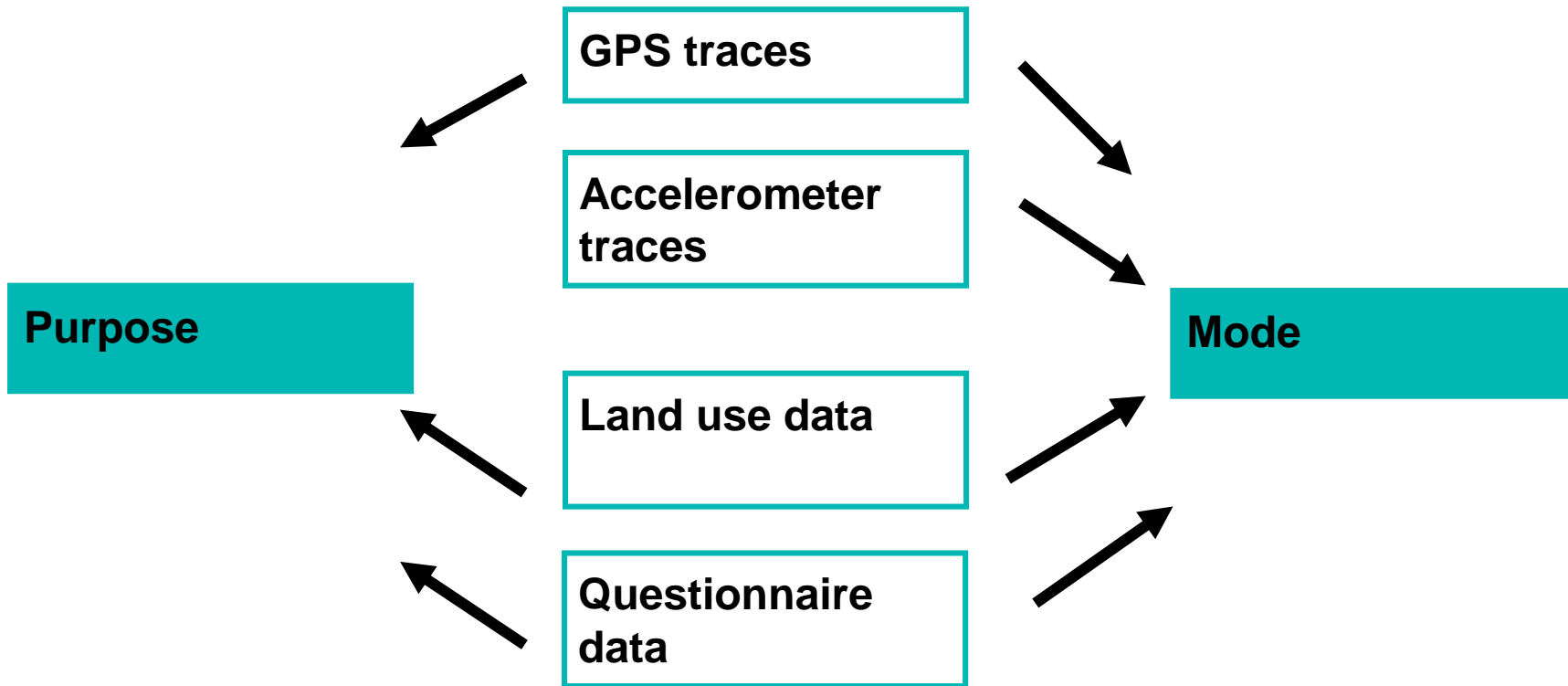
- MGEData MobiTest GSL:
 - Accelerometer-enabled GPS Monitor
 - Extra location data recorded in interview
 - Mapping to GIS data
- Data not recorded by GPS
 - Cost
 - Tickets
 - Number in party
- Practical issues
 - Software not compatible with laptops
 - Devices not set to record correct information
 - Returning devices, downloading data and recycling back into field

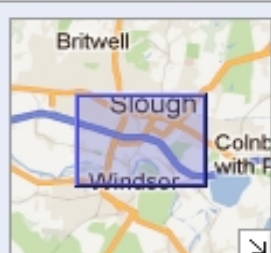
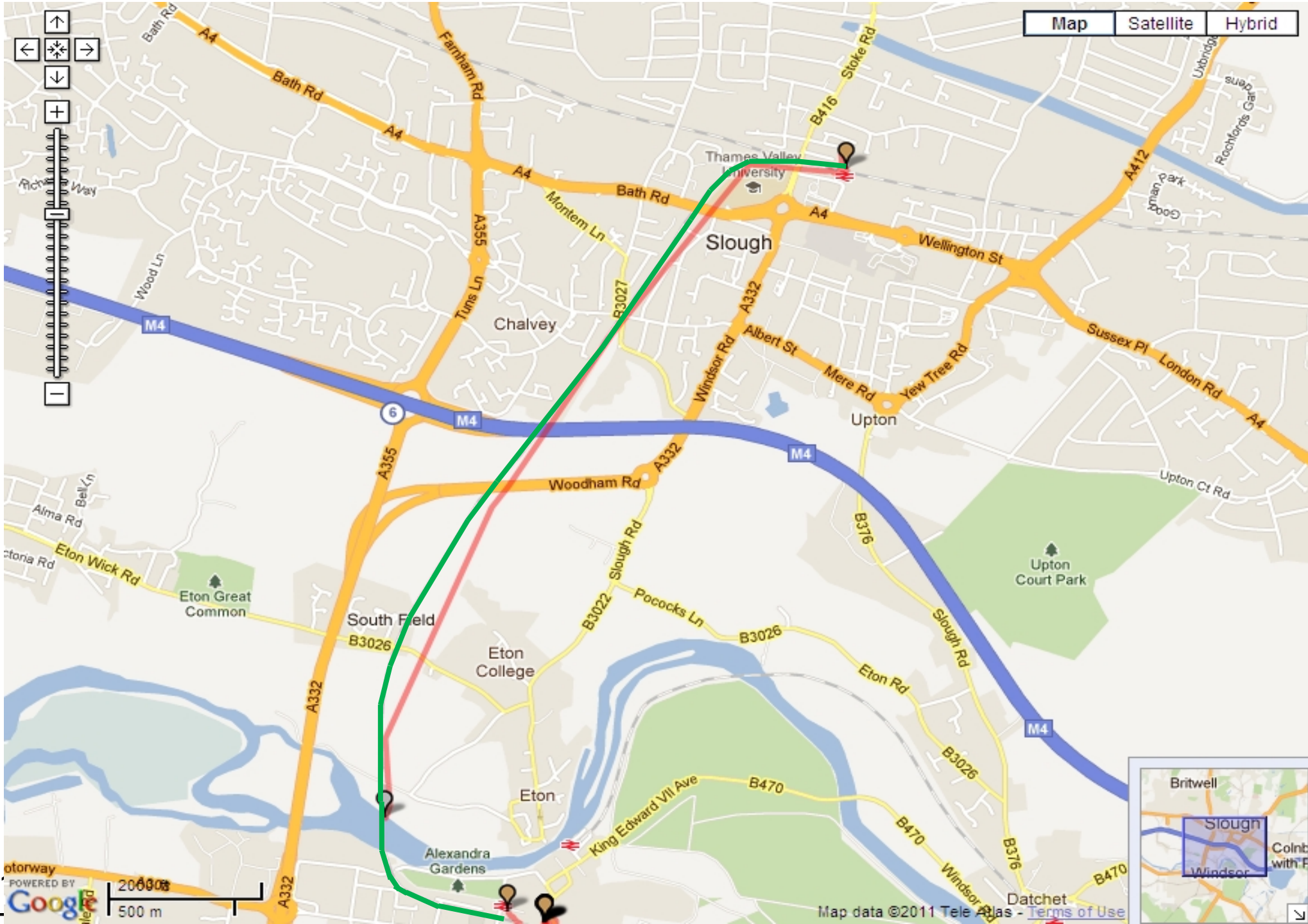


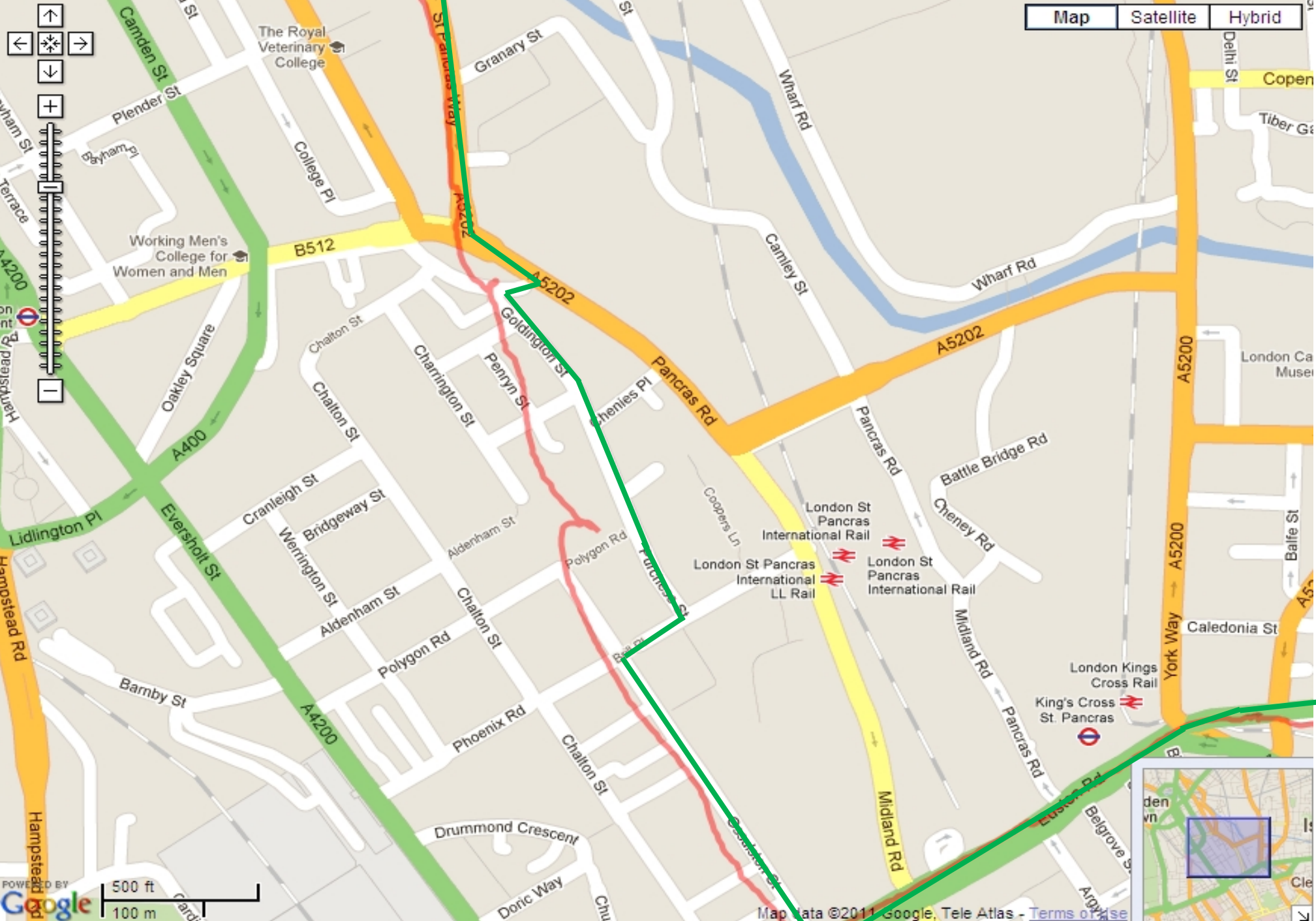
Data processing

Used an enhanced version of the *Trace Annotator* Bayesian Belief Network model with accelerometer data

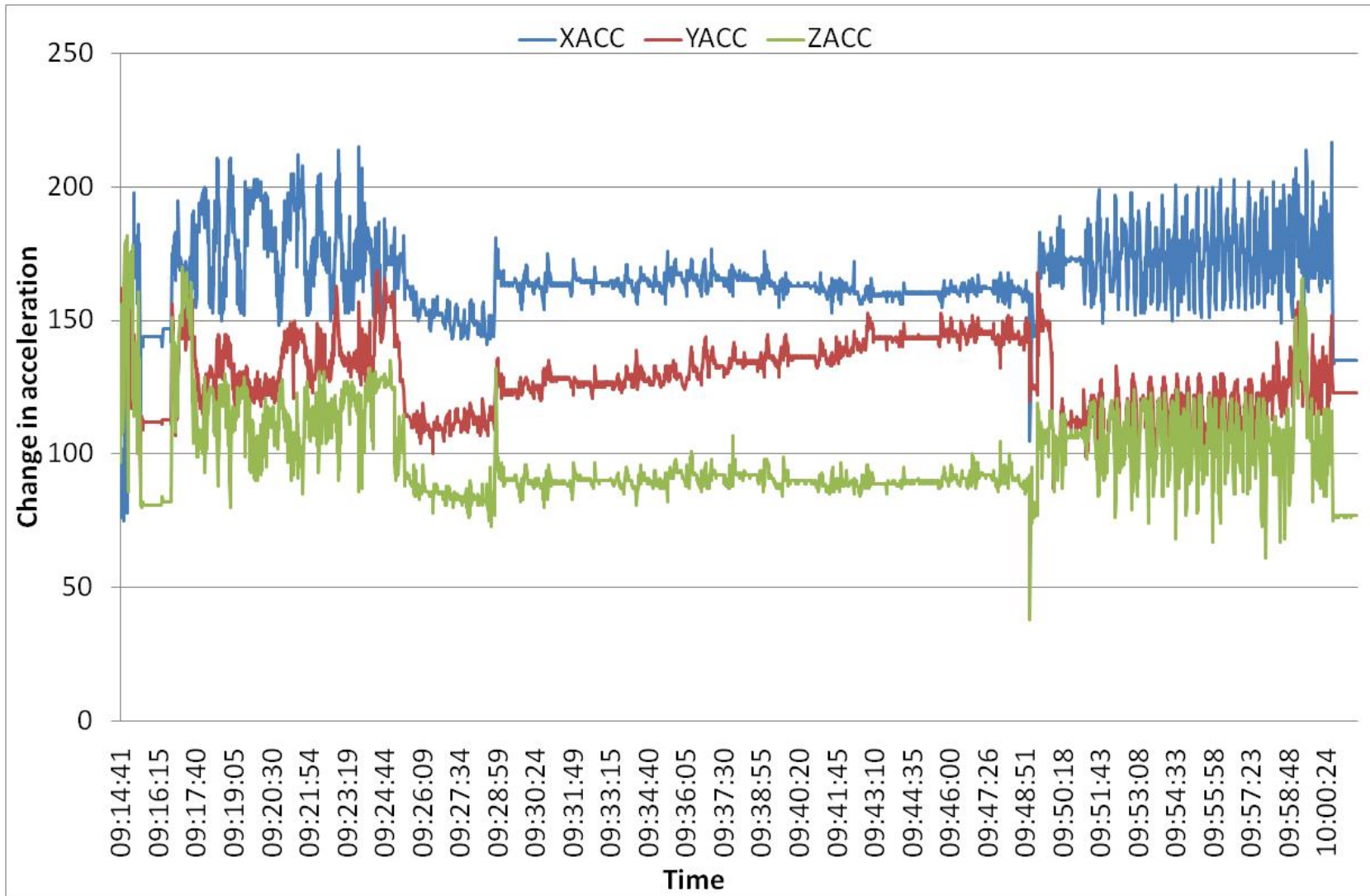
Data processing







Example of accelerometer trace: walk – bus - walk



Comparison with diary data

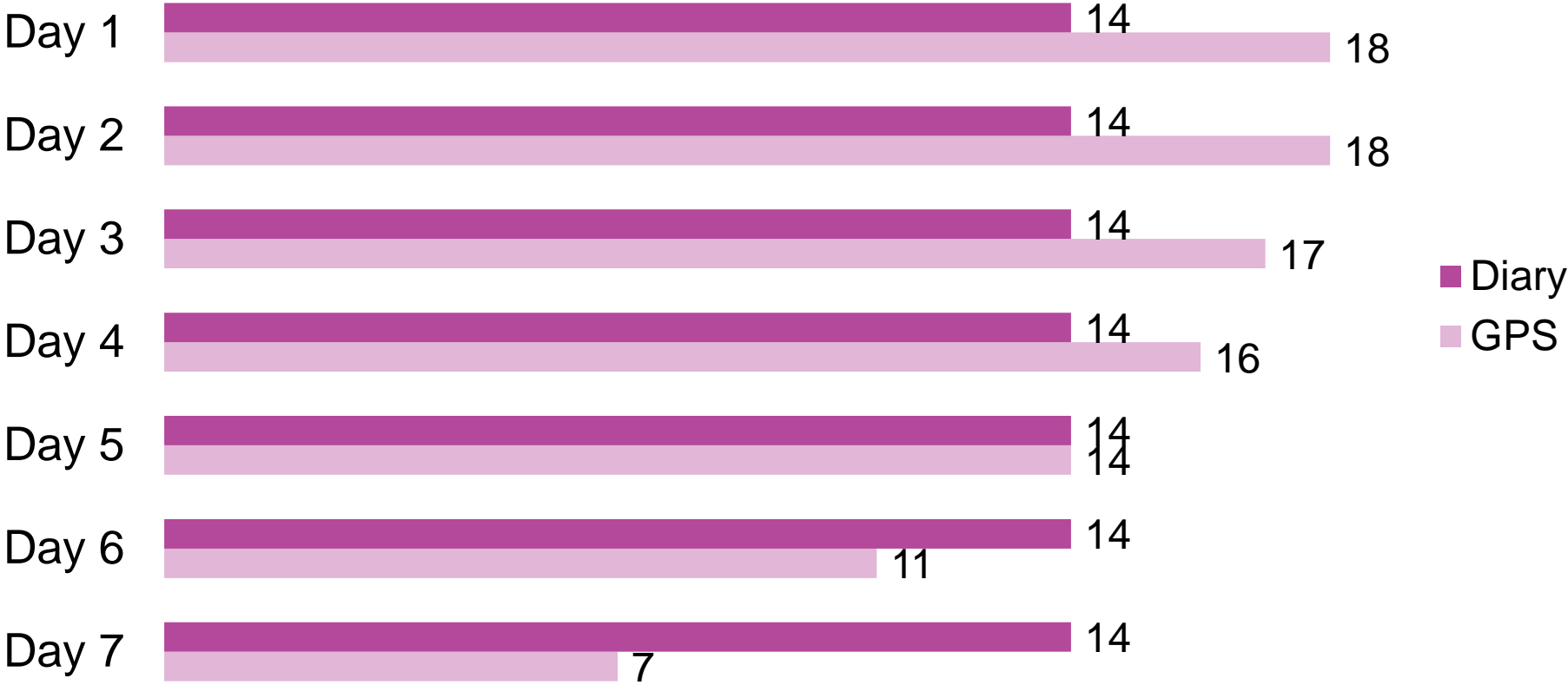


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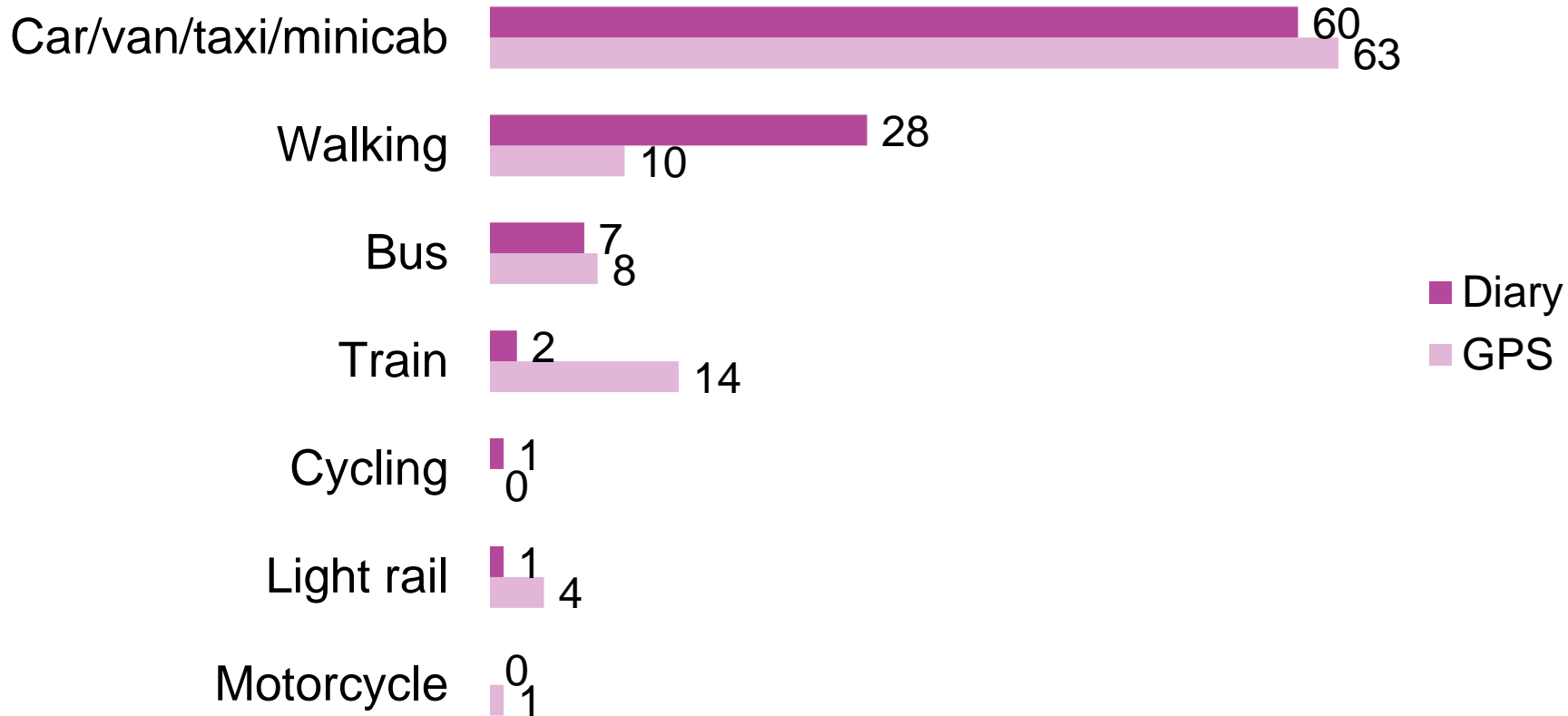
GPS compared with diary

	GPS	Diary
Response rate	52%	59%
Average journeys per person per year	645	934
Average journey distance	24	6
Average journey time	51	21

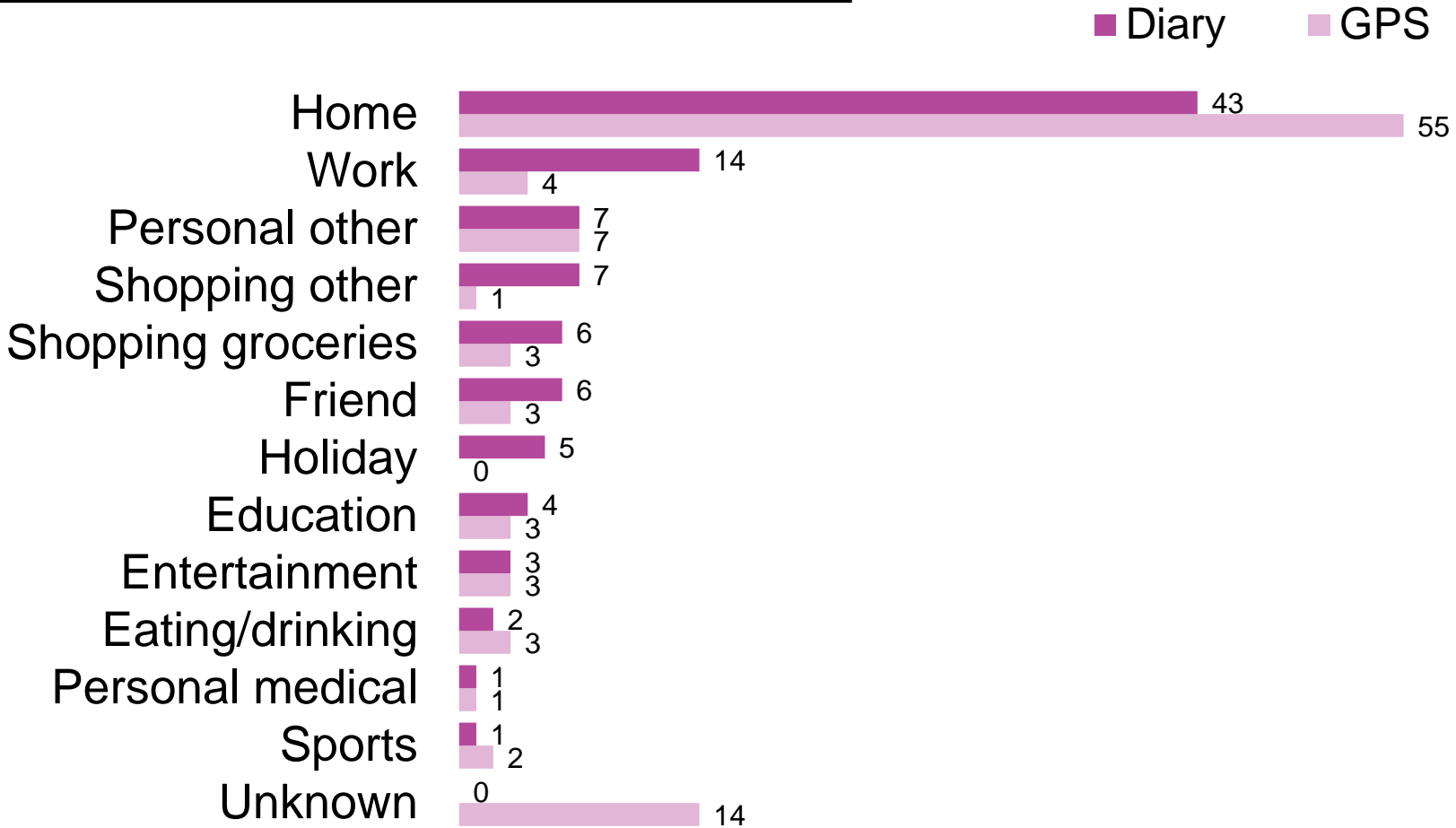
Journeys by days of the week



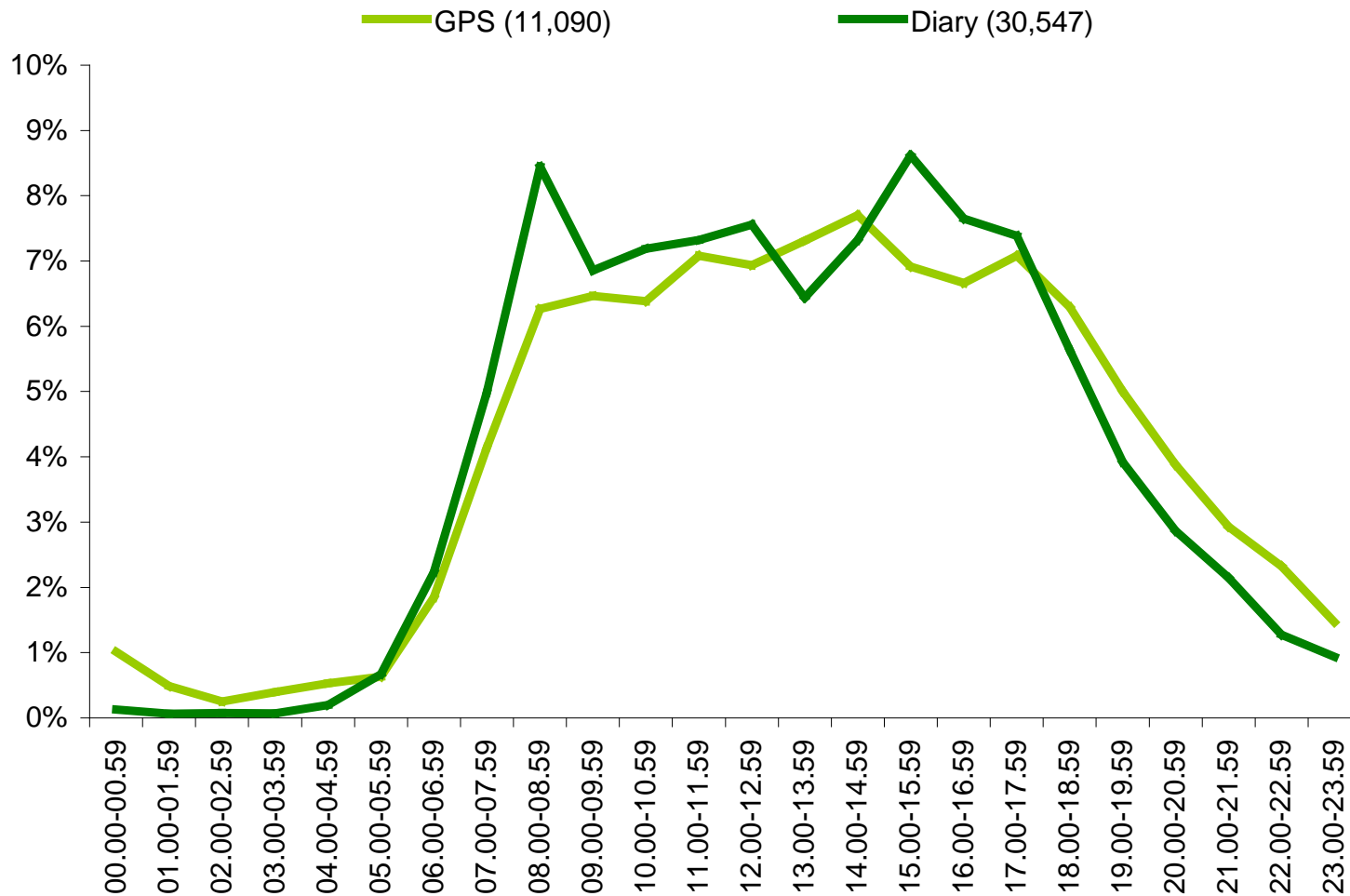
Trip stages by mode



Journey purpose



Journeys by start time



Conclusions

GPS produced different results to traditional diary data collection

Data processing of GPS and accelerometer data were not sufficiently advanced for NTS requirements

Further information

National Travel Survey 2011 GPS pilot: summary analysis, by Abby Sneade at DfT

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/230564/NTS_2011_GPS_pilot_a_summary_analysis.pdf

Processing of National Travel Survey GPS Pilot Data, a technical report prepared on behalf of the Department for Transport by Tao Feng, Anastasia Moiseeva and Professor Harry Timmermans at TU/e.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/230562/Processing_of_NTS_GPS_Pilot_Data_a_technical_report.pdf

National Travel Survey 2011 GPS Pilot, a technical report on the pilot survey management and data collection, by Josi Rofique, Alun Humphrey and Caroline Killpack of NatCen,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/230561/NTS_2011_GPS_Pilot_Field_Report.pdf

Thank you

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