NEW ZEALAND HOUSEHOLD TRAVEL SURVEY

2015-2017

Methodology Report

Version 1
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Ministry of Transport
TE MANATŪ WAKA

CBG
PUBLIC SECTOR SURVEYING

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Additional information
For more information about the background to the survey see the Ministry of Transport website at www.transport.govt.nz/research/TravelSurvey/

Enquires relating to the household travel survey may be directed to the Ministry of Transport, PO Box 3175, Wellington, or by email on info@transport.govt.nz or travelsurvey@transport.govt.nz .

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Introduction

Overview

The New Zealand Household Travel Survey (NZHTS) collects information about day-to-day travel in New Zealand – such as, how, where and when we travel. The results provide a picture of the travel patterns and choices of all types of people. The survey is used by a range of stakeholders for developing transport policy including road safety, public transport, walking and cycling.

Historically this has been done through a national travel survey, measuring the travel of average New Zealanders by collecting 2 days of travel data for everyone in randomly selected households (1989/90, 1997/98 and continuously between 2003 and 2014).

In 2015, the survey changed methodology from a traditional 2-day personal interviewer-based survey, to a 7-day online survey with the option of using a GPS logger (NZHTS GPS7).

This document describes the methodology used to deliver the 2015/16 and 2016/17 iterations of the survey. This includes the sample selection, the questionnaires that were administered, data collection and data cleaning processes, and the calculation of weights included in the final datasets. A final section provides some notes on differences between the current survey and historical survey and other issues encountered.

Background

The Ministry provides advice to Government on issues across the whole of the transport system, and the regulatory framework that supports it. It is focused on developing a transport system that maximises economic and social benefits for New Zealand and minimises harm. To do this, we must have a good base knowledge of the transport sector. We also need to understand the future drivers for transport and their implications for Government policy and investment decisions.

The purpose of the Travel Survey is to understand who is travelling in New Zealand as well as when, why, where and how they are travelling. This provides an evidence base to inform central government, local government, academia and elsewhere about travel and the impacts of transport policies.

Examples of areas of interest include:

- exposure rates for relative safety risks
- changes in kilometres travelled, by vehicle, amongst different groups of New Zealanders and for different travel purposes
- cycling and walking patterns
- measuring changing travel patterns nationally and across different geographic areas and demographic groups

There have been numerous national travel surveys over the years. Details of the national surveys are shown in Table 1.

Table 1: Historical national travel surveys

Survey	Time period	Sample	
		Households	People
1989/90	July 1989 - June 1990	3,102	7,913
1997/98	July 1997 - June 1998	5,367	14,251
2003/2004	July 2003 - June 2004	1,382	3,365
2004/2005	July 2004 - June 2005	1,405	3,431
2005/2006	July 2005 - June 2006	1,491	3,723
2006/2007	July 2006 - June 2007	1,439	3,539
2007/2008	July 2007 - June 2008	1,378	3,473
2008/2009	July 2008 - June 2009	3,149	7,940
2009/2010	July 2009 - June 2010	3,430	8,840
2010/2011	July 2010 - June 2011	3,457	8,794
2011/2012	July 2011 - June 2012	3,321	8,585
2012/2013	July 2012 - June 2013	3,273	8,300
2013/2014	July 2013 - June 2014	3,194	7,966

All the historical surveys were conducted using face-to-face interviews, based on 2 days of travel. Further information from these surveys is available from http://www.transport.govt.nz/research/travelsurvey/

In 2014, a pilot was conducted, testing GPS devices, online diaries and smartphones as an alternative method of data collection. At that time, the pilot demonstrated some difficulties with collecting information using smartphone apps but there were potential options for improving data collection as technology advances.

A 2014 review identified core household travel data requirements, after which the Ministry invited companies to participate in a competitive dialogue process as a precursor to delivering a new survey.

Ministry requirements for the new survey included:

- using new technology to survey people more efficiently
- the option of a panel survey approach that would allow the Ministry to expand its evidence base through additional surveying
- a new operating model where the supplier undertook most of the data cleaning and analysis work
- an ability to expand the survey through additional samples purchased by local government.

The chosen supplier was also offered the chance to innovate throughout the life of the contract, allowing for the investigation of new technologies and potential cost savings.

From an initially open pool, a select few suppliers participated in a formal competitive dialogue process which included:

- discussing in detail the needs of the Ministry of Transport and refining the requirements,

- sharing the refined requirements with all invited suppliers, and
- identifying and developing potential solutions with each invited supplier.

As a result, CBG Public Sector Surveying (CBG) was awarded the contract.

The resulting NZHTS differs from earlier surveys in some key respects:

- The NZHTS now collects 7 consecutive days of travel from all household members
- GPS devices are issued to respondents if they agree to use them
- Respondents have the option to self-code their travel using a website showing GPS tracks as a prompt
- A fresh sample of meshblocks (MBs) is drawn each year, based on primary sampling units (PSUs) supplied by Statistics NZ[1]

Some questions from previous surveys were removed (e.g. alcohol use) and sections on mobility difficulty and air travel were added.

Survey content

NZHTS collects information about households, the occupants of those houses and about trips made by those people. Respondents have the option of completing an online questionnaire, a telephone interview, or a combination of both.

The broad categories of information collected are:

Household

- Household type
- Number and type of vehicles
- Availability of bicycles in the household

Occupants

- Age / sex / ethnicity / income / household relationship matrix
- Addresses of work / school and other points of interest
- Whether a person travelled on a given day
- Frequency of use over the past year for:
    - cycling
    - public transport
    - domestic air travel
- Characteristics of most recent domestic air travel, including travel to airport
- Distance (0 / 100 / 100+ km) travelled last year via different travel modes
- Recreational use of water transport
- Details of driver's license(s)
- Disabilities
- Employment status
- Occupation
- Education

[1] More information about meshblocks is available from http://archive.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards/meshblock/definition.aspx

Trip data for 7 continuous assigned travel days

- Start and stop location and time of trips, waypoints
- Trip time
- Trip purpose
- Travel mode
- Vehicle details
- Vehicle occupants
- Trip by Uber-like services

Copies of all questionnaires are available at:
http://www.transport.govt.nz/research/travelsurvey/survey-questionaires/

These documents contain the text of questions, possible response options and explanatory notes on questions and routing logic.

Sampling

Target and survey population

A target population is the population the survey aims to represent. A survey population is the population actually covered in the survey.

To be able to build a picture of national travel, the population targeted for this survey was the New Zealand 'usually resident' population of all ages.

The survey population consists of those people in New Zealand households.

A small proportion of the target population is excluded from the survey population, including:

- Most types of non-private dwellings (prisons, hospitals, hospices, dementia care units and hospital-level care in aged-care facilities)
- Households located on islands other than the North Island, South Island and Waiheke Island
- People living in aged-care facilities (rest homes) and those temporarily living away from their household in student accommodation (university hostels and boarding schools).

Sample frame

The NZHTS GPS7 was based on responses from randomly selected households from primary sampling units (PSUs). Statistics NZ chose PSUs to avoid clashes with the NZ Health Survey, the NZ Crime and Victims Survey and the Household Labour Survey.

Stage 1a – PSUs selected by Statistics NZ

The first stage in building the sample was a selection of 300 PSUs drawn probabilistically proportional to size (PPS) by Statistics NZ. In 2015/16 the sample was stratified by Regional Council so that the number of PSUs in each Regional Council area was in proportion to the Regional Council's population. In 2016/17 the sample composition was weighted towards

smaller regions so that the pooled data for the first 3 years of NZHTS GPS7 would represent the same proportion of Regional Councils in the core sample as in previous household travel surveys.

Statistics NZ provided a list of 300 PSUs along with the selection probabilities. PSUs were selected using a coordinated sampling model designed to make a PSU that has been chosen for other surveys less likely to be selected in a given time period.

Stage 1b - Select a meshblock within each PSU

A Statistics NZ PSU usually comprises one to five meshblocks. To keep travel costs within budget, one meshblock was selected within each PSU. This selection was also probabilistic proportional to size, based on the 2013 Census resident count for that meshblock. To be eligible for selection, each meshblock had to have at least 9 houses.

Stage 2

Within each meshblock a systematic sample of 13 houses were drawn. The NZ Post Postal Address File (PAF) was used as the basis for this sample, filtered to residential addresses only.

Houses were listed in house number order and a "skip" was calculated based on the number of houses in the Postal Address File, so that if every n^{th} house was chosen from this list, the sample would contain 13 houses. This systematic sampling provided a representative sample of houses from the meshblock.

Any house that has received a postal delivery is included in the Postal Address Frame, as well as any addresses notified to NZ Post from Councils. Therefore, in most meshblocks, the Postal Address Frame is a reasonably complete enumeration of households. However, if a house has not received a postal delivery, is erroneously classified as a business address, or does not have a household postal address it will not be included in the sample. An additional enumeration check is required to identify missing houses and to select them for the sample with the same probability as the other houses selected in the meshblock. This enumeration can be undertaken, and the selection applied, in-field when the meshblock is being surveyed for the first time. A meshblock with a low number of houses in the Postal Address Frame will be fully enumerated. This typically occurs in isolated rural meshblocks.

Advantages of using the hybrid "PAF/In-field Enumeration" approach are:

(1) In most meshblocks, enumeration starts with a complete list that is likely better than one obtained by de novo in-field enumeration.
(2) The sample can be drawn in advance and letters delivered to specific houses before the first house call by the interviewer. The household can then be provided with the name of the interviewer and their contact details in advance.
(3) Surveying and in-field enumeration can happen at the same time. This reduces travel costs and reduces transcription error rates.

This process yielded approximately 3,900 houses. The Postal Address File includes some addresses that might not have actual dwellings (typically from when Council's supplied addresses for houses not yet built, or from inaccuracies in address-type coding). For example, churches often appear as a residential address. The "Not a Dwelling or Empty Section" (NDE) rate was about 2.5% (based on having surveyed over 100,000 houses using this methodology). All such addresses were audited. Additionally, there were a proportion of addresses in the sample which were not occupied. The sum of the NDE and not occupied

houses was referred to as the “sample loss”. These addresses were considered to be ineligible for the survey and are excluded from the response rate calculation.

Stage 3

All eligible occupants in every recruited house were invited to participate in the survey. The NZHTS GPS7 sample was designed to deliver 2200 fully completed households, in which all occupants completed 7 consecutive/continuous days data collection.

Table 2: Estimated yield per year

Item	Value	Notes
PSU / MB	300	PSU supplied by Statistics NZ, meshblocks selected by CBG
Houses per MB	13	Systematic sample from Postal Address File supplied by NZ Post
Selected houses	3,900	
Sample loss	8%	Based on previous large surveys using same methodology
Occupied dwellings	3,588	
Expected Response Rate	70%	
	2511.6	Goal: 2,200 houses with all occupants completing

Future stratification by proximity to transport corridor

With respect to public transport access for major cities with local rail, a further level of stratification was applied to the sample to maintain time series. This ensured that annual NZHTS GPS7 samples would have approximately the same number of respondents living close to rail transport.

In the first year (2015/16), meshblocks in Auckland and Wellington were selected randomly and then flagged if they were in a railway corridor. This was based on the meshblock centroid distance to the closest railway station. The definition of “rail corridor” (3km or less for Wellington and 2km or less for Auckland) was based on the distribution of historical household travel survey distances travelled prior to a train trip. The proportion of meshblocks in a rail corridor in the 2016/17 meshblock sample was then fixed to the 2015/16 proportion by regarding Auckland and Wellington as having 2 substrata.

Table 3: Regional meshblock distribution.

Region (including transport corridor split)	2015-2016	Required over next 2 years	2016-2017	2017-2018	% of meshblocks
Northland	11	31	16	15	5%
Auckland	87	65	19	19	18%
Auckland in corridor	*41%*		13	14	2%
Waikato	30	65	32	32	10%
Bay of Plenty	18	47	24	23	7%
Gisborne	3	21	10	11	2%
Hawkes Bay	12	22	11	11	4%
Taranaki	9	29	14	15	4%
Manawatu/Wanganui	19	28	14	14	6%
Wellington	33	70	18	17	9%
Wellington in corridor	*48%*		17	17	3%
Nelson/Marlborough/Tasman	9	42	21	21	5%
West Coast	4	28	14	14	3%
Canterbury	40	75	37	37	13%
Otago	17	40	20	20	6%
Southland	8	38	19	19	4%
New Zealand	300	600	300	300	100%

Survey time periods

Due to some initial issues, initial surveying did not exactly align with the intended July through to June survey periods. Survey timing is as follows:

Table 4: Survey time periods

Survey year	Time period covered	Comments
2015/16	Oct 2015 – Oct 2016	Surveying paused 16rd Dec – 8th Jan
2016/17	Nov 2016 – Jun 2017	Surveying paused 23rd Dec – 2nd Jan
2017/18	Jul 2017 – Jun 2018	Surveying paused 17th Dec – 4th Jan

Achieved sample

The response rate for 2015/16 and 2016/17 is described in the following table, in comparison with data from the last three years of the previous survey.

Table 5: Household response rates.

Household response status	2011-2014	2015/16	2016/17	2015-2017
Eligible Households	**14,237**	**3,530**	**3,758**	**7,288**
No contact with household	667	407	414	821
	5%	*12%*	*11%*	*11%*
Refused initial interview	2,651	522	563	1,085
	19%	*15%*	*15%*	*15%*
Language or health issues	309	62	59	121
	2%	*2%*	*2%*	*2%*
Partial recruitment – no-one fully responded	822	377	418	795
	6%	*11%*	*11%*	*11%*
Partial recruitment – 1 or more people fully responded	317	631	952	1,583
	2%	*18%*	*25%*	*22%*
Full recruitment and response by all eligible people	9,471	1,531	1,352	2,883
	67%	*43%*	*36%*	*40%*
Full response by at least one person	9,788	2,162	2,304	4,466
	69%	*61%*	*61%*	*61%*

Comparing historical and new response rates, we found a lower fully completed household rate (where every member of the household fully completed the 7 days of the travel diary) and a correspondingly higher partial completion rate (where at least 1 person in the household fully completed the 7 days of the travel diary).

Historically 67 percent of eligible households fully completed while 2 percent of eligible household only partially completed.

In the new survey 40 percent of households fully completed the survey (43 percent 2015/16, 36 percent 2016/17) while 22 percent only partially completed (18 percent 2015/16, 25 percent 2016/17). This may have been a result of the longer travel survey period and increased respondent burden.

Once a household had been recruited by the interviewer, further sample loss may have occurred due to already recruited household occupants changing their minds or other household members no longer being willing or able to take part

Of those eligible in recruited households, 65 percent completed 7 days of travel (74 percent 2015/16, 57 percent 2016/17); 31 percent changed their minds before the travel days started or did not agree to take part (23 percent 2015/16, 39 percent 2016/17); and the remainder did not complete the full course of the travel days. The greatest attrition rate occurred in the first few days.

Overall, 61 percent of the eligible households had one or more people in the household complete the new survey, compared to 69 percent of eligible households historically.

Data collection

Households were sent an introductory letter before interviewers called in person - to recruit those who were present in the household at the time. The household members who had agreed to participate were asked to recruit other eligible household members (3rd party recruitment). Once a household was recruited, all householder's details were recorded, and the household was assigned 7 consecutive travel days.

Household members aged 12 and over were given the option of using a GPS logger to record their travel, to assist with filling in the online travel diary.

A follow-up phone call was made on the first day of travel to check that respondents understood the survey process and the definition of travel.

For the purposes of the survey, a trip is:

a) any movement on a public street, footpath, railway line, etc. of **more than 100 metres.**
b) any movement on a public street of less than 100 metres **if there is a change of purpose or a street is crossed.**
c) any trips in a public aeroplane, train, ferry, water taxi.
d) any trips on a private aeroplane, balloon, boat, that **do not finish where they started.**
e) any trip not on public roads that does not finish where it started. This includes trips in a vehicle, on a bicycle or on foot.
f) In outdoor malls, any time the shopper must walk along an outdoor footpath, across a street, car park or pedestrianised street (i.e. one that has been closed to traffic), then the above criteria apply.

A new stop is recorded if:

i. the respondent travels more than 100 metres on a public street or footpath, or
ii. they cross a road used by any traffic, or
iii. the purpose changes or
iv. the mode changes.

If a person elected to self-code then they may have needed to add trips to those recorded on the website as the GPS logger was unable to detect road crossings. Trips of less than 100m were not automatically detected.

Data was uploaded from the GPS logger continuously and automatically. Whenever the participant logged on, they were able to see a map of their travel, edit their trips and fill in details for each.

Text message reminders were used for a variety of functions. For example, to remind participants to use and charge their device. Reminders were also sent if no motion was recorded for more than a day (checking to see if the person did not travel that day); or if the battery of the GPS unit was low/flat (battery levels were remotely monitored). Notification/reminder levels were tailored to suit respondent needs, to minimise intrusion.

If no travel coding was detected, the participant was contacted by telephone to remind them to complete their coding. Alternatively, the information was collected over the phone and coded by survey staff. A free-phone assistance line was also available to help anyone having issues, or for anyone who was unable or unwilling to complete the survey online.

Data processing

GPS fixes (time stamped longitude and latitude) were constantly uploaded from the GPS device to a central secure server. A stop detection algorithm partitioned the GPS sequence of points into proposed trips. The GPS points along a trip were supplied to a Google Maps API which returns a trip speed and distance and renders the trip on a map.

Trips were coded on the website either by respondents or with assistance from survey staff (by telephone or in a shared screen session). Simultaneously, real time data checks were applied.

The respondent could delete incorrectly detected stops, for example, being stopped outside a shop in a traffic jam. They could also add a trip, for example, when they forgot to take their GPS logger or the GPS logger battery ran flat. The speed of trips for entered data were also calculated in real time using the Google Maps API.

The trip data entry screen included internal consistency checks and mode-specific travel speed checks. These took the form of a pop-up that asked the respondent to confirm the data that had just been entered, allowing them to correct it.

A respondent could choose to ignore a data check, so they could continue to code trips. Manual editing of data on the website was difficult for some people and rather than create an impasse in the survey, the software recorded that there was an error with this trip, and then allowed coding of subsequent trips.

The most common data errors were speed errors that resulted from the manual entry of address data when a GPS tracker was not being used. If the address was not correctly geocoded, for example, entering the correct street name but in the wrong town, the trip speed would exceed the test threshold. The subsequent trip would also usually have an excessive speed.

At the end of the week, the household was recontacted by telephone and coding was checked and corrected if applicable.

Each quarter, the trips that failed any data checks were checked by an expert coder.

A final series of internal consistency checks and speed checks were also applied to the data each quarter.

Weighting

Weights were applied to establish national-level results.

Household dataset HH

In the new NZHTS GPS7, a random sample of 300 MBs were drawn from across NZ. There was no stratification by rurality. The original sample was stratifed by Regional Council as described earlier.

Meshblocks were selected randomly (PPS) and within each meshblock, a household was selected randomly (with systematic sampling). The household sampling weight (hhsamwgt) was derived from these two components. The sum of household weights equals the number of houses in the sampling frame.

Not all houses provided a response. Within each meshblock an adjustment was made to the household sampling weight so that the sum the weights of all responding houses was the same as the sum of all sampled houses. This is the household non-response weight (hhnrwgt)

The household non-response weights were then scaled to so they summed to the estimated number of houses in New Zealand (hhweight).

The weights were then further stratified so the sum of weights at the regional council level was equal to the estimated number of houses in the regional council (hhweight_poststrat). Nelson, Marlborough and Tasman were considered as a single unit.

Person dataset PE

The person weight (peweight) was constructed by restricting the dataset to all people that fully responded, ie completed 7 days of the travel diary, then post stratifying by Statistics NZ estimated of the number of people in each age / gender cell for each regional council.

The sum of peweight was the estimated number of people in each age / gender cell for each region and nationally. In Gisborne and West Coast some aggregation of age groups 0-15 and 15-40 was required.

As a further means of analysis, an additional person weight was generated for reporting on a national level, based only on the sample of fully responding people in households, where every eligible member of the household completed the survey (peweight_fullhh). This weight was used for the December 2017 data release reports on the 2015-2017 data.[2]

Trip dataset TR

A weight (tripwgt_ann_mill) was then calculated for each trip so that the sum of the weights was the number of million trips per year. Unlike in previous surveys, there was no adjustment for weekends (“day of week”) as all people contributing to this dataset completed 7 days of travel diary. An equivalent weight (tripwgt_ann_mill_fullhh) was calculated based on the person weight of those in fully responding households only.

[2] Preliminary results for the New Zealand Household Travel Survey 2015-2017 [PDF, 390 KB]
NZHTS Main urban area results 2015-2017 [XLSX, 32 KB]
NZHTS Travel by purpose and mode 2015-2017 [XLSX, 29 KB]

Table 6: Weighting summary

Level of sampling		Numerator	Denominator	Level applied	NZHTS 2015-16 variable	Notes
Meshblock (MB)	Sampling	1	Probabilty of selection	meshblock	**MB_weight**	sums to number of meshblocks in NZ in frame
Household (hh)	Sampling	Number of households enumerated in meshblock	Number of households sampled	meshblock	**hhsamwgt**	sum weights for selected houses comes to total houses in NZ
	Non-response	Summed weight of all eligible households	Summed weight of all responding households	hh non-response groups	**hhnrwgt**	use meshblock level response rate to scale sampling weight up for responding houses
	National households	National estimate of household numbers	Summed weight of all responding households	national	**hhweight**	sum hhweight = national estimates of household numbers
	Post-stratification by region	Predicted number of houses in region	Summed weight of all responding households	region	**hhweight_poststrat**	rescales the above so weights sum to number of houses in region and NZ
Person (pe)	Post-stratification by region/age/sex	Total estimated of resident population in cell	Summed weight of all fully responding people	age/sex groups within region	**peweight**	in each region / age / sex group weights sum to Statistics NZ estimates
	Post-stratification by region/age/sex	Total estimated of resident population in cell	Summed weight of all fully responding people in fully responding houses	age/sex groups within region	**peweight_fullhh**	in each region / age / sex group weights sum to Statistics NZ estimates
Trip (tr)	Post-stratification	365/7 * nzpop/people *1/1000000		trip	**trwgt_ann_mill**	simple multiple of peweight to give million trips per annum
	Post-stratification	365/7 * nzpop/people *1/1000000		trip	**trwgt_ann_mill_fullhh**	simple multiple of peweight_fullhh to give million trips per annum

Notes and issues

Note on continuity with historical data

Due to the large respondent burden in the 7-day self-complete diary some modification in methodology will be required to account for non-response bias and differential response to different survey methods, to provide comparability with historical datasets. This means that as of publication date (May 2018), time-series comparison of the 2015-2017 data to the historical data is not possible.

Reception to new survey

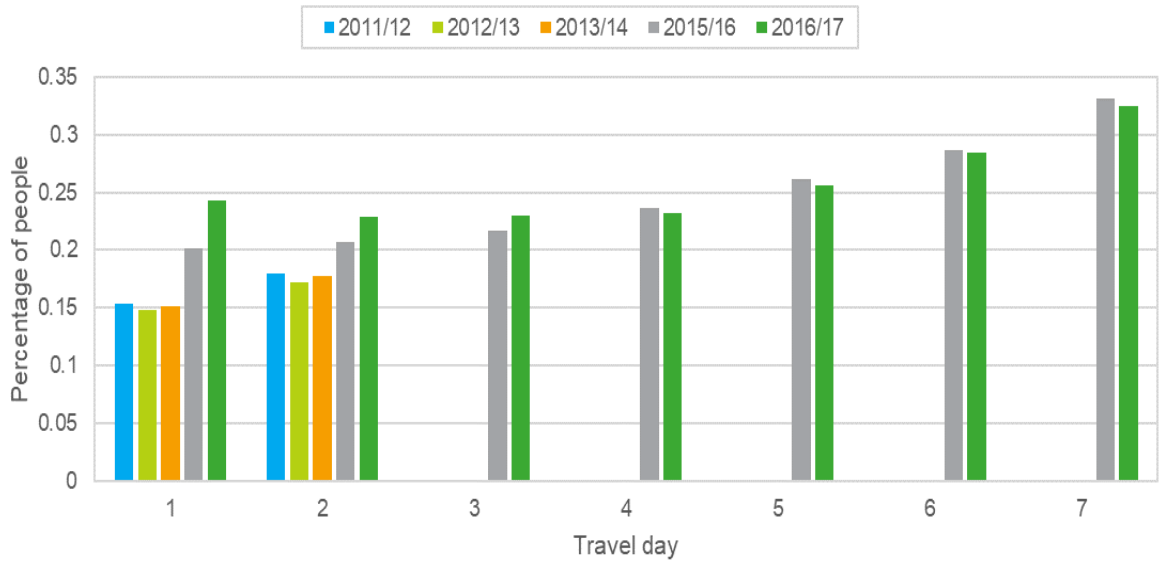
People that completed the new form of the travel survey regarded the survey experience positively, with 80% saying they would do the travel survey again. Over 75% of people agreed to carry a GPS tracker device, and of these people, 96% subsequently used the device on any given day.

The number of households that agreed to take part in NZHTS GPS7 was similar to earlier surveys (around 70%) but the proportion of houses in which all occupants completed 7 days data collection and coding was considerably lower than the proportion of houses that completed 2 days data collection in the earlier survey. The result is that NZHTS GPS7 had a lower rate of “fully completed” houses.

A soft form of non-response occurs when respondents claim they did not travel on a given day, rather than formally withdrawing. A certain amount of non-travel was to have been expected, but as can be seen below, rates of non-travel increase as a function of travel day.

In the earlier survey (years 2011-2014), there was an increase between days 1 and 2, and this was also apparent in the 7-day survey. There was an increase from about 1 in 4 or 5 people not travelling at the start of the travel days, to nearly 1 in 3 people not travelling by the end of the travel days. As the start of the travel days was assigned to different days of the week for each household, this should not be a function of the day of the week travelled.

Figure 1: Percentage of people who did not travel on given survey day, by survey year.



Allowing for reducing trip counts over 7 days

Fewer trips were recorded by respondents towards the end of the 7-day collection period, so it is likely that trip numbers were slightly underestimated. Some controlling for dropout could be undertaken by scaling up estimates of trip numbers by a factor that is a function of day of survey and day of week.

Regional estimates.

Regional estimates rely on Statistics NZ estimates of the numbers of households. More accurate household counts could have been used if they had been available.

Size of regions

Some aggregations have been undertaken: Nelson/Marlborough/Tasman have always been considered as a single group, and to perform age x gender x region post stratification, some age groups were merged in Gisborne and West Coast.

Adjusting for person non-response at household level.

In previous surveys all household members were expected to take part for two days. While there was some within-household non-response in earlier surveys, in the current 7-day survey about 30% of occupants declined in houses where at least one person had agreed to take part. Of those occupants that started the survey, some did not complete all 7 days data collection.

All estimates were post stratified to age and gender distributions but there is an argument for weighting for household occupant non-response, on the assumption that a non-responding occupant is more like a responding occupant from the same house than another person of their age and gender.

Sample composition by age and gender

The following table and graph compare the sample composition in 2011-2014 with 2015-2017 and with the current NZ population. The 2015-2017 sample under-represents younger people and over-represents people 55 and older.

Table 7: Composition of sample

Age (years)	2011-2014 sample		2015-2017 sample		NZ population	
	Female	Male	Female	Male	Female	Male
0-4	4%	4%	2%	2%	3%	3%
5-9	3%	4%	2%	2%	3%	4%
10-14	4%	4%	2%	2%	3%	3%
15-19	3%	3%	2%	2%	3%	4%
20-24	3%	3%	2%	2%	4%	4%
25-29	3%	2%	3%	3%	4%	4%
30-34	3%	3%	3%	2%	3%	3%
35-39	4%	3%	3%	3%	3%	3%
40-44	4%	3%	4%	3%	4%	3%
45-49	4%	4%	4%	4%	4%	3%
50-54	4%	3%	4%	4%	4%	3%
55-59	3%	3%	4%	4%	3%	3%
60-64	3%	3%	4%	4%	3%	3%
65-69	3%	2%	5%	4%	3%	2%
70-74	2%	2%	3%	3%	2%	2%
75-79	1%	1%	3%	2%	1%	1%
80-84	1%	1%	1%	1%	1%	1%
85+	1%	1%	1%	1%	1%	1%
Total	52%	48%	52%	48%	51%	49%

Figure 2: Composition of sample compared to population