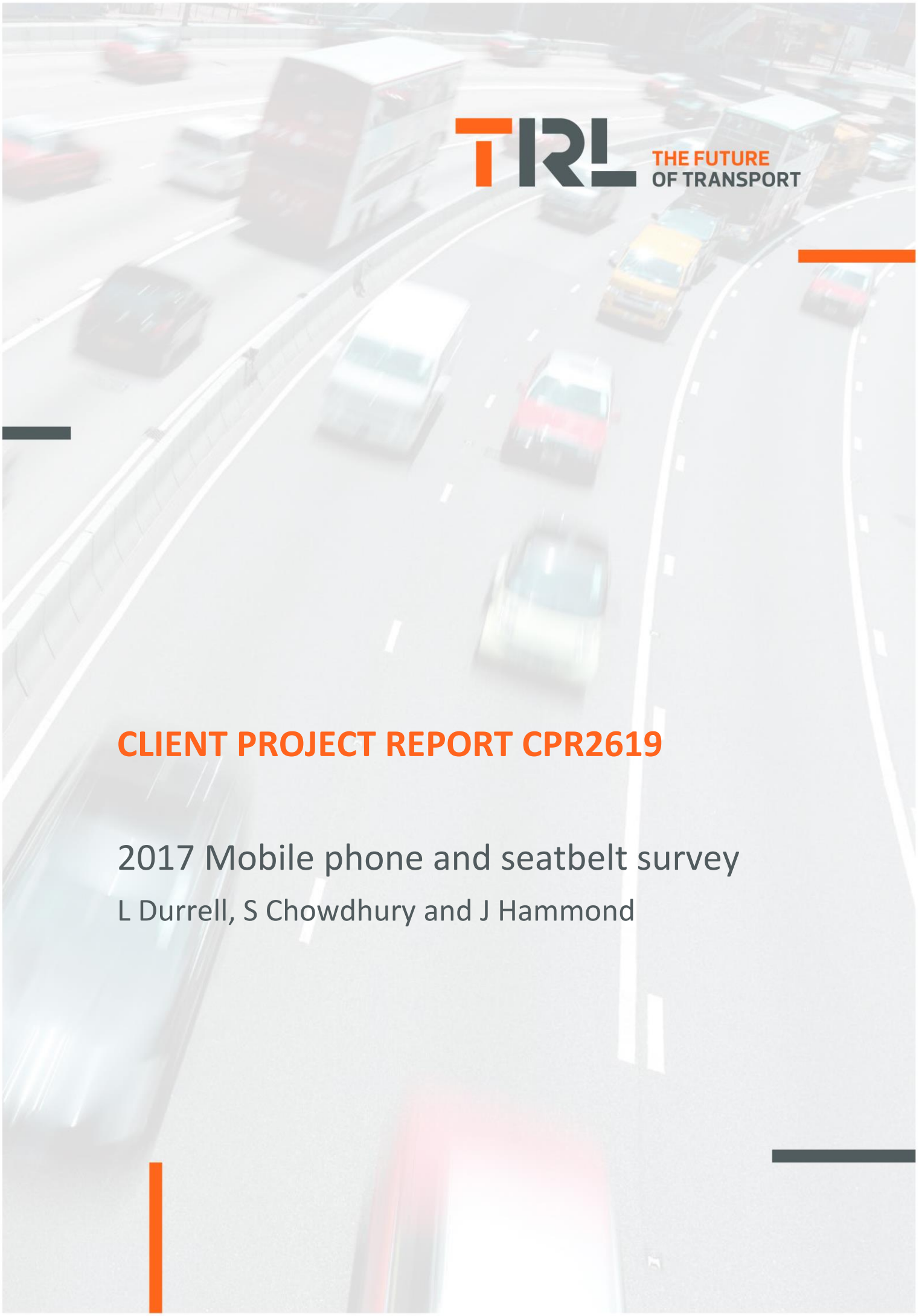

THE FUTURE OF TRANSPORT

CLIENT PROJECT REPORT CPR2619

2017 Mobile phone and seatbelt survey

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Report details

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1	04/01/2018	Draft report	LD, SC	CW
2	27/02/2018	Second draft	LD, SC, JH	CW
3	02/08/2018	Third draft	LD	CW

Contents

1 Executive summary

Since 1988 the Department for Transport has commissioned TRL to survey seatbelt usage by vehicle occupants on the national road network. Since 2002, similar surveys for driver mobile phone use have also been undertaken. In addition to mobile phone and seatbelt use, the 2017 survey collected data on driver and rider distractions such as eating or re-configuring a satnav system. The 2017 survey was also extended to collect data on the mobile phone use of pedal cyclists and motorcyclists.

This report presents the research methodology for collecting the data in the 2017 survey. This methodology is consistent with the previous surveys to allow long term trends to be analysed. The survey used road-side observations to collect data on free flowing traffic and stationary traffic held at traffic light junctions. One hundred thirty-five surveys were conducted at 90 different survey locations across England, Wales and Scotland between 7th October 2017 and 19th June 2018 inclusive. This report also describes the data validation processes and the calculations used for weighting the survey data to be representative of local and national traffic flows.

2 Introduction

Between 2002 and 2009, the Department for Transport commissioned TRL to estimate the rate of driver hand-held mobile phone use across England and Scotland though annual surveys. These roadside surveys were conducted on moving traffic and collected data on observed mobile phone use by drivers of different vehicle types. Seatbelt surveys, which were carried out on stationary traffic, were also conducted around the same time.

In 2014, these two surveys were combined such that the mobile phone observations and seatbelt observations were made at the same survey sites of stationary traffic (surveys of moving traffic continued to observe mobile phone data only).

The results of these mobile phone and seatbelt surveys have been used to identify trends and offender characteristics, supporting appropriate changes to legislation and allowing particular offending groups to be targeted. In 2003, legislation was introduced making it illegal to use a hand-held mobile phone whilst driving (or riding a motorbike) on the road. In 2007, penalties were established: a £60 fine and three driving licence penalty points, with the potential to be disqualified from driving if the case were to go to court. These fines increased to £100 in 2013 and then again to £200 and 6 penalty points in 2017, with a maximum fine of £1,000 (£2,500 if you're driving a lorry or bus) if the case goes to court.

In order to support the ongoing monitoring of driver compliance, the mobile phone and seatbelt surveys were repeated in 2017. The surveys were extended to include a number of survey sites in Wales, in addition to survey sites in England and Scotland. Additional driver or rider distractions were also recorded as part of this survey. Although it is legal to use hands-free mobile phones, satellite navigation systems and 2-way radios whilst driving or riding, if police have reason to think the driver or rider was distracted and no longer in control of their vehicle though doing so, they can still be stopped and penalised.

The 2017 survey was conducted between 7th October 2017 and 11th November 2017 at 90 sites on both weekdays and at the weekend. Survey updates for five sites in Scotland took place in June 2018. This document details the methodology for these surveys, which aim to obtain a representative estimate of driver and rider hand-held mobile phone use and seatbelt use in England, Scotland and Wales.

Figure 1 and Figure 2 below show the location of the 90 survey sites and Table 1 gives a summary of the variables that were collected during the survey. Location and site information for all the survey sites are included in Appendix B.

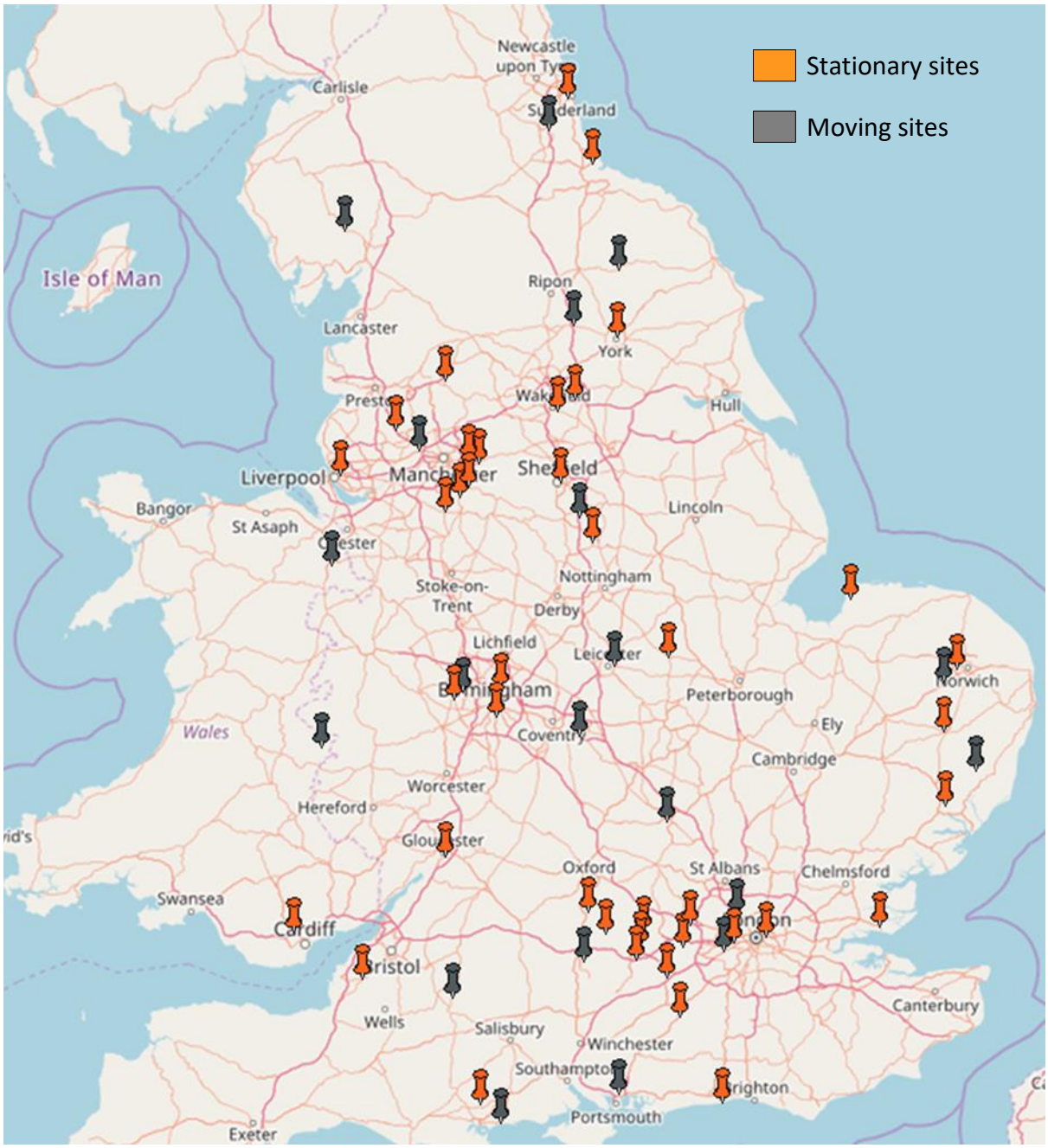


Figure 1: Map of survey site locations in England and Wales[1]

[1] www.openstreetmap.org © 2011 OpenStreetMap contributors, CC-BY-SA

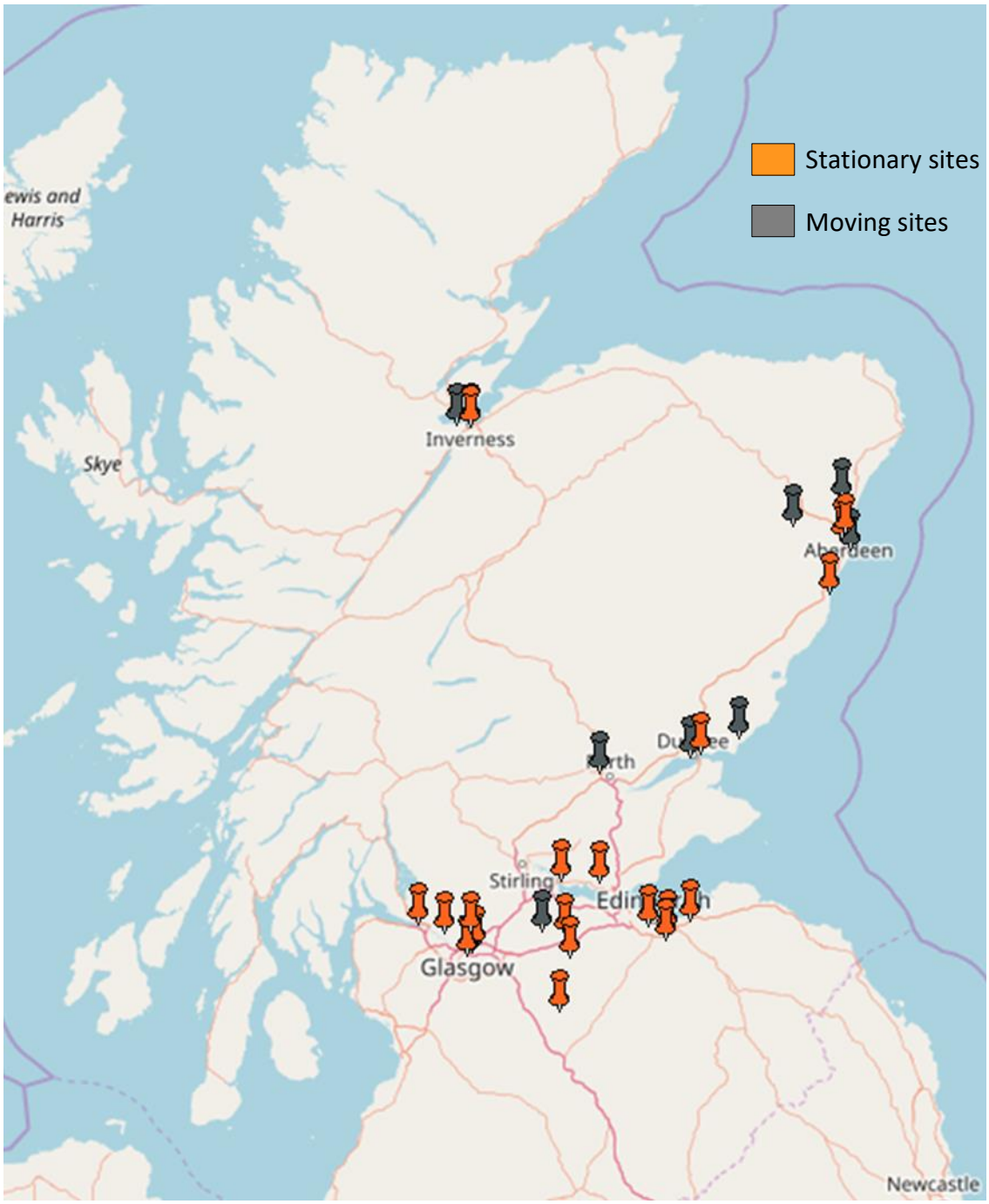


Figure 2: Map of survey site locations in Scotland[1]

Table 1: Variables to be collected during each survey

		Mobile phone moving	Mobile phone stationary	Seatbelt stationary
Site characteristics	Speed limit	✔	✔	✔
	Moving/stationary	✔	✔	✔
	Time of day	✔	✔	✔
	Weekday/weekend	✔	✔	✔
	Road type	✔	✔	✔
	Observation conditions	✔	✔	✔
Vehicle characteristics	Type: car, van, taxi, private hire, lorry, bus (or minibus or coach), motorcycle, pedal cycle	✔	✔	✔
	Passengers present	X	✔	X
Driver/rider characteristics	Gender	✔	✔	✔
	Age group (drivers only)	X	✔	✔
	Hand-held mobile phone use	✔	✔	X
	Purpose of hand-held mobile phone use	✔	✔	X
	Driver restraint use (drivers only)	X	X	✔
	Additional distractions	✔	✔	X
Passenger characteristics	Seating position	X	X	✔
	Gender	X	X	✔
	Age group	X	X	✔
	Restraint use	X	X	✔

This report provides:

- An overview of the changes introduced in the 2017 survey: Section 3
- A description of the survey methodology: Section 4
- Commentary on the fieldwork phase: Section 5
- Commentary on the data validation process: Section 6
- A description of the weighting process applied to the data: Section 7
- The lessons learnt from this survey: Section 8
- A summary of the project outputs: Section 9

3 Changes introduced for the 2017 survey

The method used in 2017 was based on the 2014 method with some additions:

- The method extended the range of vehicles surveyed to included motorcycles and pedal cycles (for the mobile phone survey only). These vehicle types have not previously been included.
- For motorcyclists and pedal cyclists, an additional phone use category was introduced: headphones. The use of headphones whilst riding was included in the survey for these road user groups as it was felt that headphone use could be considered more dangerous for riders (due to their inability to hear other vehicles around them) compared with drivers.
- Additional observations of driver distraction were introduced to capture data on distractions other than mobile phone use. The types of distraction recorded included activities use such as tuning the radio or eating.
- Observers were also asked to record where tinted windows impacted on their ability to make a clear observation. Tinted windows can severely impede the observers' ability to make observations of rear-seat passengers and it was felt that the number of cars with tinted windows has increased and will continue to do so. This data may be useful when looking at the practicalities of using the current survey method for future work.

4 Methodology

This section describes process of selecting and auditing the survey sites providing an overview of the requirements of the survey site locations. This section also describes the variables collected during the survey and the method used to collect the survey data.

4.1 Site selection

Ninety survey sites were selected for this survey. These were chosen to be broadly representative of all types of road and included urban, rural, major and minor[2] roads. No motorway sites were used as previous work[3] has shown that it is not possible to record reliable results with high speed traffic.

Sites were selected to provide a national spread and were not clustered around distinct locations, as in previous surveys. A list of suggested sites was provided by DfT based on locations used for the annual traffic surveys. These were assessed against the specific survey site criteria (outlined in Section 4.1.1). Where these sites were not suitable, alternative sites were selected from the pool of sites previously used for these surveys, or by querying Open Street Map[1] and exploring google maps street view to identify sites of a similar nature to those rejected. Additional sites were selected to ensure that there was a balance of different road types and locations as far as possible.

To further check the suitability of each site, site audits were conducted. These primarily assessed whether the data currently held about the site was accurate (e.g. the position and timing of traffic signals), and to assess the safety of the location and the traffic flow. An example of a completed audit form is included in

Each site required a safe place for the survey team to stand whilst still having the ability to observe drivers clearly. Care was taken that the presence of the survey did not affect the safety of drivers or pedestrians at the site. Sites were located far enough apart so that survey staff were unlikely to observe the same set of vehicle occupants. Sites located close to each other (where it might be feasible that the survey captured the same vehicle multiple times) were surveyed at different times of day.

As in previous surveys, a combination of stationary sites and moving sites were used. Moving sites were located at pavements or laybys and made observations of moving traffic[4]. Stationary sites were located at traffic light junctions and observed driver behaviour whilst the vehicles were stationary (being held by the red light).

Use of both types of sites enables:

- Results to be compared to previous surveys

[2] For the purpose of this survey, major roads are classified as A roads; B, C and unclassified roads are defined as minor roads.

[3] Buttress. S., Lloyd. L., Durrell, L., Scoons, J. (2014*). Mobile phone survey 2014 – methodology*. CPR1959.

[4] Although care was taken to select sites that are unaffected by junctions, periods of congestion were included in the surveys unless caused by extreme circumstances such as a traffic collision.

- A representative sample of driver behaviour to be achieved
- More detailed observations to be made (for example passenger age and seatbelt use can feasibly only be recorded stationary sites)
- A greater number of observations to be achieved

The sites selected comprised of twice as many stationary sites as moving sites, as the number of vehicle observations possible at a moving site is, on average, considerably higher than at a stationary site.

4.1.1 Site requirements

The selection of survey sites (both moving and stationary sites) took into consideration the following key requirements:

- Safe pedestrian access
- Safe standing at the observation location
- Clear visibility
- Adequate traffic flow

The survey teams were required to be able to safely access each site, and stand in a safe and suitable location when carrying out the observations. This means that they were able to stand at least 1 metre away from the moving traffic on a level surface such as a pavement or well-maintained layby. Consideration was also given to the exposure of the sites to high pollution levels and weather conditions such as high winds.

4.1.1.1 Moving sites

Moving sites require a clear view of the oncoming traffic (the direction of traffic being surveyed) that allows enough time to make observations of the drivers. This is dependent on factors such as the speed limit, road curvature, and nearby vegetation and buildings.

The sites also need an adequate traffic flow to ensure that the necessary volume of data is collected. The level of traffic at moving sites was checked by taking a count of the number of passing vehicles in one minute (in the direction to be surveyed) during the site audit. For rural and minor roads a lower traffic flow was deemed suitable than for major and urban roads.

4.1.1.2 Stationary sites

Each stationary site requires a traffic light at a road junction; pedestrian operated traffic lights are not suitable due to their inconsistent use. During the site audit the length of the red phase was measured to ensure it was long enough to create a suitably sized queue. Enquiries were also made to the local authorities to check that the timing of the light phases were not dependent on other traffic lights along the carriageway (as this could reduce the number of vehicles stopped).

Stationary sites were also checked to ensure that the length of the pavement or walkway would allow the survey team to walk alongside a normal length traffic queue (allowing observations to be made for the majority of each queue).

The traffic flow was assessed by counting the number of vehicles passing the site in one minute and counting the number of vehicles stopped in one red light phase.

4.1.2 Auditing process

Each site was visited pre-survey to ensure that the location was appropriate both from a methodological and safety point of view (considering the safety of survey staff and road users while the survey was taking place). Typically the site assessor would mimic carrying out the survey at each site to check for hazards underfoot and for the appropriateness of the site. The audits were conducted and documented on site by the company carrying out the surveys. Completed audit sheets were subsequently checked by TRL.

At each audit, the date and time were recorded, traffic flow measures were taken, the survey standing locations were described, pictures of the location and view of survey traffic were taken. In addition, notes taken about the location of amenities, any potential hazards (such as high pollution or high winds), and any other useful information for the survey teams. An example of a completed site audit sheet is provided Appendix A.

As a result of the site visits, some sites were rejected and replaced. A final approved list of sites is provided in Appendix B. Local Authorities with responsibility for the specified junction or location were contacted; both as a matter of courtesy to inform them of the survey and to confirm that there were no planned road works during the planned survey days. The relevant police forces were contacted close to the survey date and any sensitive nearby businesses or establishments such as schools and health clinics were notified of the survey as a matter of courtesy.

4.1.3 Site characteristics

In total, 90 sites were surveyed across England, Wales and Scotland (Table 2).

Table 2: Number of sites by country

	England and Wales	Scotland
Stationary	39	20
Moving	21	10
Total	**60**	**30**

The survey sites were categorised by their location (urban or rural) and the road type (major or minor). Urban and rural classifications were based on the population of the area[5]. A-roads were classified as major roads; B, C and unclassified roads were defined as minor roads. Table 3 shows the breakdown of sites by these characteristics.

[5] These classifications were provided by DfT and were based on data from the 2011 census. An urban area is defined to be a settlement with a population of more than 10,000. The dwelling population density is measured over a 100mx100m square.

Table 3: Number of sites broken down by country and road characteristics

		Major		Minor		
Country	**Site type**	**Rural**	**Urban**	**Rural**	**Urban**	**Total**
England and Wales	Moving	5	6	3	7	21
	Stationary	6	14	6	13	39
Scotland	Moving	4	2	2	2	10
	Stationary	5	6	2	7	20
Total		20	28	13	29	90

Site WAS3, which was intended to be a stationary site but was coded as a moving site. Therefore, there were 59 stationary sites and 31 moving sites in the final data.

4.2 Data collection method

The survey comprised of:

- A count of vehicles at each survey site
- Observations of the number of drivers and riders using hand-held mobile phones
- Observations of the number of unrestrained vehicle occupants.

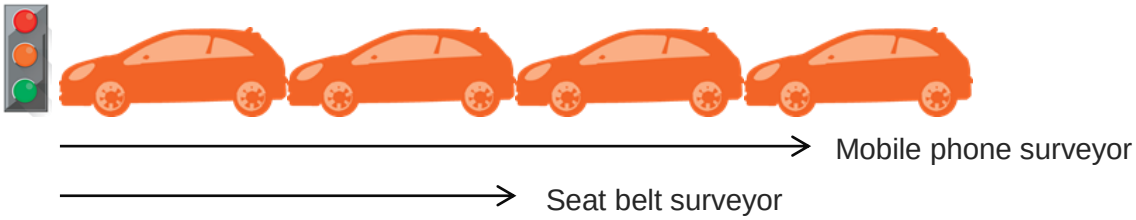
Different survey methods were used to collect data at stationary sites and moving sites. These methods are outlined below.

4.2.1 Stationary sites

At stationary sites, the survey team consisted of three individuals; the mobile phone observer, seatbelt observer and enumerator. The two observers were instructed to wait until the traffic light turned red and a queue of traffic started to form. They then walked down the line of traffic (starting at the traffic light) recording detailed observations of the vehicle, driver, and passengers for each vehicle until either they reach the end of the queue or the traffic started to move through the junction. At stationary sites, the teams were instructed to only make observations of the lane of traffic nearest to them (lane 1). At one survey, lane 2 was observed instead as, due to limited traffic in the lane 1; there was clear visibility of lane 2.

The mobile phone observer had fewer variables to collect per vehicle and hence typically surveyed more vehicles than the seatbelt observer. A linking statement (the vehicle colour and type) was made in order to match mobile phone and seatbelt data for the same vehicles.

So as not to obstruct to the mobile phone observer (who as mentioned above tends to move quicker down the queue of traffic), the seatbelt observer was instructed to wait until the mobile observer had surveyed the first vehicle before starting their observations. This also helped to reduce any potential crowding around the vehicles being surveyed, which could cause distress to vehicle occupants.



In cases where there was congestion at the site preventing all queueing vehicles from going through the junction one a single light phase, the survey team started to make observations at the last observed vehicle in the queue for the subsequent red light phase. This ensured that the number of vehicle observed in these traffic conditions was maximised.

All observations were made verbally into a digital voice recorder (DVR). At the start of each survey the observers recorded the survey information (site and date), and at the start of each session recorded the session number, start time and observation conditions. The observers also recorded when they started a new queue of traffic on the DVR. Each recording was downloaded at the end of each survey onto the supervisors' laptop and uploaded to a secure server.

The enumerators stood at the traffic lights counting the vehicles that passed through the junction on each green light phase (for all lanes of traffic going in the direction being surveyed).

4.2.2 Moving sites

Only mobile phone observations and vehicle count data were collected at moving sites. Both the enumerator and the mobile phone observer started collecting data at the start of each half hour session and continued till the end of the half hour session using the same data recording techniques described above.

The mobile phone observers made observations of as many vehicles driving past the survey location as possible. The priority was to survey vehicles in the nearside lane, however, if other vehicles in outer lanes could also be included in the survey then they were. The enumerator counted all traffic passing the survey location in the direction being surveyed.

4.3 Data collected

Observations were made of occupants of cars, vans, taxis, private hire vehicles, lorries and buses/coaches/minibuses in the specified direction of travel as per the method described in Section 4.2. Mobile phone use data only was also collected for motorcyclists and pedal cyclists. Emergency vehicles were not included in the survey.

Mobile phone use was classified as:

- Ear: device that was being held to the ear at the time of observation. This was likely to represent a driver receiving or making a call.
- Hand: device that was being held away from the ear. The driver/rider may have been receiving or making a call, texting or reading a text, or using it for some other interactive function.

- Headphones (motorcycles and pedal cycles only): visible headphone being used for any reason including making or receiving calls or listening to music.
- No phone: driver/rider was not using a hand-held mobile phone, or cannot be seen to be using one.

The survey methodology also included recording the use of tablets, mp3 players or satellite navigation systems, along with any other distracting activity (e.g. eating or drinking) at the end of each vehicle observation as a short "free text" description. It is possible that a few uses of these devices are included in the standard observation data where the observer could not clearly tell whether a driver was using a mobile phone or some other device; however, this effect may also be present in the other direction i.e. observers not recording mobile phone use as they thought it was a different type of device.

4.3.1 Observation data

4.3.1.1 Mobile phone observations

At *stationary sites* the following information was recorded:

- The start of each queue
- Vehicle type: car, van, taxi, private hire, lorry, bus (includes coaches and minibuses), pedal cycle, motorcycle
- Vehicle colour (short description to link mobile phone and seatbelt observations)
- Hand-held mobile phone use (see Table 4)
- Driver gender (see Table 4)
- Driver age group (see Table 4)
- Passengers (see Table 4)
- Additional observations (other in-vehicle distractions or activities)
- The end of each queue

Table 4: Data collected for each driver of a vehicle in the mobile phone survey

Occupant Data	Options
Hand-held mobile phone use	Ear Hand No phone Headphones (motorcyclists and pedal cyclists only)
Driver gender	Male Female Not known
Driver age group	Younger (17-29) Middle (30-59) Older (60+)
Passengers	Present Not present

Example observer scripts can be found in Appendix C.1.

To record the motorcycle and pedal cycle mobile phone data, a paper tally was used (shown in Table 5). For motorcyclists and pedal cyclists that moved to the front of the traffic queue during the red light phase, these observations were completed by the enumerator.

Table 5: Cyclist counting sheet

Date :	Site number:	Staff initials:

SESSION	START TIME	CONDITIONS	VEHICLE TYPE		MOBILE PHONE			
			Motor cycle	Pedal cycle	No phone	Hand	Ear	Head phones

Observations of motorcyclists and pedal cyclists that did not filter to the front to the traffic queue were captured by the mobile phone observer in the same way as they would for any other vehicle type.

At *moving sites* the following information was recorded:

- Vehicle type: car, taxi, private hire, van, lorry, bus (includes coaches and minibuses), pedal cycle, motorcycle
- Hand-held mobile phone use (see Table 4)
- Driver gender (see Table 4)

Example observer scripts can be found in Appendix C.2.

4.3.1.2 Seatbelt observations

At *stationary sites* the following information was recorded:

- The start of each queue
- Vehicle type: car, taxi, private hire, van, lorry, bus (including coach and minibus)
- Vehicle colour (short description to link mobile phone and seatbelt observations)
- Seating position (see Table 7 for passengers)
- Occupant age (see Table 6 for driver and Table 7 for passengers)
- Occupant gender
- Restraint use (see Table 6 for driver and Table 7 for passengers)
- Additional notes about observation quality (e.g. observation impeded by tinted windows)
- The end of each queue

Example observer scripts can be found in Appendix C.3.

Table 6: Data collected for each driver of a vehicle in the seatbelt survey

Occupant Data	Options
Gender	Male Female Not known
Age (estimated)	Younger (17-29) Middle (30-59) Older (60+) Not known
Restraint used	Seatbelt Unrestrained[6] Unable to see

[6] Including improperly used seatbelts e.g. seatbelt held across body, but not clipped in place.

Table 7: Data collected for each occupant of a vehicle in the seatbelt survey

Occupant Data	Options
Seating Position	Front seat passenger Front seat passenger, middle - vans Rear seat passenger (behind passenger, middle, behind driver) Rear seat passenger, 3rd row (behind passenger, behind driver)
On lap	On lap Not on lap
Gender	Male Female Not known
Age (estimated)	0-1(Baby) 1-4 (Toddler) 5-9 (Young child) 10-13 (Older child) 14-29 (Younger) 30-59 (Middle) 60+ (Older) Not known
Restraint used	Seatbelt Unrestrained[7] Rear facing baby seat Child seat Booster seat Booster cushion Not known / Unable to see

4.3.2 Traffic count data

For both moving and stationary surveys, a count of each vehicle that passed the survey point in the direction of traffic being surveyed was recorded for every survey session.

The enumerators, who were responsible for these vehicle counts, used a combination of mechanical tally counters and pen and paper tallies. For the most frequent vehicle types (car, van, bus (including minibus and coach), lorry, taxi, and private hire), mechanical tallies where

[7] Including improper use of any type of child seat e.g. child seat used but seatbelt not properly in place.

used. At the end of each session, the enumerator would complete Table 8 documenting the total number of each vehicle recorded.

Table 8: Traffic count record sheet

Date: **Site Number:** **Location:**	**Car**	**Taxi**	**Private hire vehicle**	**Van**	**Lorry**	**Bus**	**Motorcycle**	**Pedal cycle**
Session 1								
Session 2								
Session 3								
Session 4								
Session 5								
Session 6								
Session 7								
Session 8								

5 Fieldwork phase

5.1 Observer training

Four training sessions were held; one in each of London, Birmingham, Leeds, and Glasgow. The survey teams coving the Wales and the South East surveys attended the London session. These sessions were designed to introduce the survey teams to the survey method and provide structured practice time at a nearby location.

The training sessions took place in two parts. The first part was a "classroom" style discussion session to outline the research project, discuss the survey method, materials, and scheduling and have a question and answer session. Appropriate ways to manage public enquiries, or queries from the police or local authorities, were covered in this part of the training.

The second part took place at a nearby traffic light junction and the trainees were given the opportunity to practice the mobile phone and seatbelt method for stationary sites. This allowed them to practice the more involved data collection technique and use the DVRs whilst under supervision of the trainers. As part of these practice session, the trainers completed at least one full walk through with each trainee to listen and watch them record data for a queue of traffic. This was repeated for both the mobile phone and seatbelt observations. They also listened to the recording the trainees were making of their practice observations to pick up on any errors.

Following the training session, and in line with feedback received from the attendees, the designs of the survey scripts were revised to be more user-friendly. The full training materials provided to each attendee are shown in Appendix C.

5.2 Scheduling surveys

A schedule for each survey was developed and agreed with DfT. The schedule was required to cover a range of weekdays and Saturdays. All surveys were required to be completed by the end of British Summer Time (October 29th) as the change in daylight conditions reduces the visibility of vehicles, especially in the late afternoon sessions.

Sites to be resurveyed at the weekend consisted of a subsample of sites selected to provide a similar breakdown of urban and rural sites and major and minor roads as the full sample.

During the data collection, the survey teams provided daily updates on survey progress and data transfers. They also commented on any issues encountered during each survey. These included visibility issues caused by poor weather or cancelation due to staff illness. These regular updates ensured that quick decisions regarding survey rescheduling could be made.

Table 9 shows the surveys that were rescheduled by site number and date. In total, 12 sites had the survey rescheduled, several of which were rescheduled twice. The table shows the original survey date and the final survey completion date. The majority of these were rescheduled due to staff shortfall. LS1 was resurveyed as the initial survey was conducted on the wrong arm of the junction, and LS17 was rescheduled due to traffic delays meaning the survey team was unable to reach the survey location within a suitable timeframe to start the survey.

Table 9: Rescheduled surveys

Site number	Original survey date	Survey time slot	Survey date	Reason for rescheduling
LS1	09/10/17	AM	18/10/17	Incorrect traffic surveyed
LS17	27/10/17	PM	07/11/17	Travel delays
MS10	19/10/17	AM	24/10/17	Staff shortages
SM3	30/09/17	PM	21/10/17	Staff shortages
SM8	30/09/17	AM	21/10/17	Staff shortages
SS15	04/10/17	PM	09/10/17	Staff shortages
SS6	04/10/17	AM	09/10/17	Staff shortages
SS9	23/10/17	PM	27/10/17	Staff shortages
WM9	21/10/17	PM	28/10/17	Staff shortages
WS1	17/10/17	AM	26/10/17	Staff shortages
WS15	14/10/17	PM	28/10/17	Staff shortages
WS8	21/10/17	AM	28/10/17	Staff shortages

5.3 Site changes

After the survey site list had been established and the surveys had started, several alterations needed to be made:

- Site LS5 (Minor, Rural, Latitude: 52.605924, Longitude: 1.328298) had very low flow with only 29 vehicles passing the survey location. This issue was not present at the site visit. This site was replaced with LS17.
- Site MS12 (Minor, Urban, Latitude: 53.479796, Longitude: -2.145458) was scheduled over a period of roadworks and was replaced with MS10.

5.4 Sites with low observation counts

Some sites were reported to have low observation counts of both mobile phone and seatbelt data. The reasons for this were investigated. As mentioned above in Section 5.3, site LS5 had very low traffic flow on the day of the survey. This survey was rescheduled and moved to a different location (site LS17).

The sites in Table 10 were found post-survey to have less than 150 mobile phone observations. Some of the sites had been surveyed on other days with higher observations, or were rural, minor roads and the small number of observations in these cases was mostly due to the traffic flow at these sites.

Table 10: Site details for surveys with low observation counts

Site	Site type	Day	Date	Time	Road type	Area type	Mobile phone obs.	Seatbelt obs.	Total vehicle flow
WS2	Stationary	Tue	26/09/17	AM	Major	Urban	95	94	2,201
LS9	Stationary	Fri	29/09/17	AM	Minor	Urban	134	135	436
SM5	Moving	Fri	29/09/17	AM	Minor	Rural	44	-	46
SS12	Stationary	Fri	29/09/17	PM	Major	Urban	106	110	213
SS18	Stationary	Fri	29/09/17	AM	Minor	Urban	114	106	331
WAS4	Stationary	Sat	14/10/17	PM	Minor	Rural	149	136	927
LS17	Stationary	Sat	28/10/17	AM	Minor	Urban	130	131	1,077
WS8	Stationary	Sat	28/10/17	AM	Minor	Urban	137	162	214

Site SM5 (a moving site in Scotland) experienced very low traffic flow on the day of the survey. This issue was not foreseeable from the site audit data. This is an issue that should have been raised during the first observation session. However, as valid observations were made at this site it has been included in the final sample.

The site supervisors confirmed that the methodology was carried out as requested for all of the sites in Table 10. If this had not been the case, the site would have been re-surveyed. Further investigation into the data (low flows, comparisons with 2014 survey results etc.) suggests that this was simply a function of the site on the days that were selected.

Overall, looking at the whole set of sites, the arithmetic mean (average), and maximum and minimum number of observations and the proportion of flow observed were close to the overall numbers from 2014. This is despite the fact that many of these sites were new this year and so are not directly comparable. As there were a large number of sites surveyed, these lower count sites will not adversely affect the results.

6 Data validation

This section details the ways that the data collection method was monitored and the data post collection was checked to ensure validity.

6.1 Spot checks

Data were validated while surveys were being completed. Unannounced spot checks were made to ensure survey staff were at the correct location and following the survey methodology accurately. In addition, survey supervisors observed data collection for a sample of the traffic recorded by each of the survey staff. The supervisors then advised staff of any errors they were making in their observations, in order to ensure errors did not persist.

Details of these visits were recorded on forms which detailed whether the survey team were on site at the expected time and at the expected location, whether there were any issues with the site, and whether there were any urgent items that required rectification. These urgent issues were reported directly back to the TRL Survey Manager so that appropriate resolutions could be implemented.

Spot checks were conducted at 12 sites. At ten of the sites the survey team were found to be on site at the location and time expected, and the methodology was being followed correctly. The list of sites visited and issues / resolutions are shown in Table 11.

Table 11: Spot check summaries

Site	Type	Date	Notes
WS7	Stationary	03/10/17	Survey team required to wear additional PPE by the council.
WS8	Stationary	03/10/17	Survey team required to wear additional PPE by the council. The traffic enumerator was not ready for the first session. This task was covered by the supervisor in their absence.
WS4	Stationary	03/10/17	Long red phase and short green phase occasionally took the survey team of guard and meant they didn't always get back to the start of the queue in time. This has not had any apparent impact on the data and sample size.
SS6	Stationary	04/10/17	Survey team not on site. It was later established that the survey had been re-scheduled on the day due to a staff member not turning up and the team being unable to fulfil its requirements. This survey was re-scheduled by the survey team and TRL was informed of the changes within the agreed timeframe. However, notification of this was provided after the time when the spot check had been completed.
BS3	Stationary	05/10/17	No issues or notes.
LS3	Stationary	05/10/17	Narrow empty lane left turn lane at traffic lights. The team surveyed the next lane (traffic traveling straight on). Visibility was good for this lane of traffic.

Site	Type	Date	Notes
SM6	Moving	06/10/17	The survey supervisor was doing data verification check during this session. The van was parked in such a way that it may have looked like a police camera van from a distance (e.g. highway maintenance hi-vis livery on rear). Drivers could be seen to slow down on approach. This effect could have affected mobile phone counts. Suggested parking the van around the corner in future visits.
SM4	Moving	06/10/17	No issues or notes.
LM5	Moving	10/10/17	No issues or notes.
LS12	Stationary	10/10/17	Short red light phase and light traffic flow. Seatbelt observer made some observations in the wrong order but captured all necessary data.
LS11	Stationary	12/10/17	Observers were initially recording 'Earphones' (where seen) instead of 'No Phone'. This was corrected once spotted. This has been corrected for in the data transcription to move data on earphones to the additional note column.
WS1	Stationary	17/10/17	As SS6.

6.2 Supervisor checks

Supervisors typically recorded one session at each survey (in addition to the observations made by the standard team member) to check for consistency. The two observers recorded observations from the same vehicles using the same methodology as they proceeded along the line of vehicles. These data were then compared post-survey.

The two sets of data received from the observation validation exercise were inspected by a TRL analyst. Nine randomly selected supervisor transcripts were compared with the original transcript; three moving sites and six stationary sites were selected. There were some differences noted between the independently observed sets.

In eight of the nine sites that were compared, the observation conditions recorded by the supervisor did not match the original transcript e.g. one recording the observation conditions as "Very Good", while someone else may record the same observation conditions as "Good". These differences do not impact the core data and are due to personal perceptions.

In most cased both parties had a similar number of vehicles recorded. For cases where this wasn't the case this was most likely due to supervisors not duplicating whole session in order to assist in other areas of the survey such as dealing with public enquiries. Occasionally there is a case of one of the transcripts recording an 'Unknown' for the mobile phone/restraint use, but this is not very common.

Occupant age also had some inconsistencies. Occupant age is known as a variable that is open to interpretation, and this variation has been consistent over all of the previous surveys so the data should be comparable between the surveys.

These inconsistencies were not considered to impact the validity of the dataset as a whole.

6.3 Post-survey validation

Data checks were also made after the data had been transcribed. A proportion of observations were selected for additional validation. An independent researcher transcribed half hour sessions from selected sites and then compared the transcription with the originals.

Sites chosen for this validation were selected from the list of sites where no other form of validation or site check had taken place. The sites chosen represented a 10% sample of all the sites, chosen to be representative over the different locations and methodologies used.

One randomly chosen session from each of the selected sites was selected to be re-transcribed. The transcripts were compared to identify any inconsistencies. The level of consistency was high (between 91% and 100%), with the majority of inconsistencies coming from the vehicle colour field. Some initial data checks also included editing the vehicle colour field to provide a better match between the mobile phone and seatbelt data.

A high level comparison was also made between the 2017 and 2014 data to look at the proportion of observations where the key variables were recorded as unknown (vehicle type, driver mobile phone use, and driver seatbelt use, and driver gender). In general these results were similar with no notable increase or decreases.

6.4 Final logic checks

A series of logic checks were applied to identify any inconsistencies or variations in the data. The following checks and changes were made:

- Checking that the data matched the schedule
- Checking sample sizes were adequate
- Checking the format of date and time data was consistent throughout
- Checking each cell had an entry or was recorded as unknown
- Checking emergency vehicles had been removed from the observation data
- Instances of values or text which are not within the values specified had been checked and changed where needed
- Correcting spelling mistakes such as ‘HAD’ instead of ‘HAND’
- Checking session numbers relate to the times of each session
- Checking that any comments lined up with the data values recorded
- Checking that the number of seatbelt observations is not greater than the number of mobile phone observations in most cases
- Checking that the number of mobile phone or seatbelt observations is not greater than the total number of vehicles recorded by the enumerator
- Checking the number of pedal cycle and motorcycle observations was not greater than the number of vehicle of this type counted
- Checking the non-compliance rate for each site and investigating any outliers
- Checking all surveys (and survey sessions) are unique

In all cases, changes were made to the data where the correct value was obvious, and where errors clearly existed but the correct value was not obvious, the original voice files were re-transcribed to correct the data.

The following changes were made to the data once the logic checks has been conducted:

- All blanks for vehicle type, vehicle colour, gender and age were changed to unknown (coded as 99).
- Any values that were not within the coding scheme were changed to unknown (coded as 99).
- In some cases within the seatbelt data, values outside of the coding scheme were used e.g. 'cheated' driver restraint. All these cases were changed to 'unrestrained'.
- Site WAS3 was incorrectly surveyed as a moving site and has been included as part of the moving site data.
- Site LS5 had very low flow and was replaced by site LS17. Therefore, any data from site LS5 were excluded from the analysis.
- There were a few cases within the stationary seatbelt data were the age of the rear seat passenger was over 14 years but the restraint type was either 'child seat' or 'boost seat'. The survey team confirmed that in these cases, ‘young children’ (between 5 to 9 years of age) had been incorrectly coded as ‘younger’ (between 14-29 years). Therefore, these were recoded as young child with a 'child seat' or 'boost seat' restraint type.
- There were four moving sites (BM1, SM3, SM9 and WM7) where the total number of vehicles observed was greater than the total number of vehicles counted. A session level comparison between observed and counts for these sites suggested there was no consistent pattern for the differences (for example, the observer was recording both directions of traffic but the enumerator was counting only one or vice versa). As it is difficult to understand the exact reason for these differences, it was assumed that all the vehicles that were counted were also observed in these sites.
- There were several instances where the number of motorcycles and pedal cycles counted was fewer than the number observed. This was followed up with the survey teams and it became apparent that there may have been duplication of observations between the enumerator (using the observation recording sheet in Table 5) and the mobile phone observer. The use of the observation sheet (Table 5) was the most consistent practice and had been used to collect the majority of the motorcycle and pedal cycle data. The data for these vehicle types collected by the mobile phone observes has been removed from the dataset to remove any possibility of duplication.

As a result of the non-compliance rate checks, several outliers were identified. Seven surveys (at five sites) with moving traffic, all in Scotland, had mobile phone usage rates substantially higher (ranging between 12% and 17%) than the other sites (which were below 6% and averaged around 1%). In June 2018, a re-survey at these locations was carried out. This used the same survey method and materials as outlined in Section 4. The aim was to verify the

abnormally high levels of non-compliance, or to obtain revised values that were more credible. For the full details on the 2018 surveys see Appendix D.

The data collected in these revised surveys were in line with the expected rate of mobile phone use at other sites, and as a result, were used to replace the previously anomalous data (after being thoroughly checked and cleaned).

7 Weighting

The data were weighted to be representative of GB traffic[8] using two methods:

- Sampling weights were used to account for the fact that some sites have higher flow than others resulting in a different proportion of the flow being surveyed at each site.
- Traffic weights were also applied to make the sample of sites representative of the traffic for the different site types (major/minor, rural/urban) across the country.

Weights have been split into Great Britain as a whole and separately for Scotland, and England and Wales. If analysis by region within England is required, a new set of weights will need to be used.

The weights were calculated separately (using the same method) for mobile phone and seatbelt observations. For the mobile phone observations, the weighting calculations were based on observations where the vehicle type and driver mobile phone use was known. For the seatbelt observations, the weighting calculations were based on observations where the vehicle type and driver restraint use was known.

The weighting process is described in more detail in the following section.

7.1 Sampling weights

The sampling weights are based on traffic counts at each site (excluding pedal cycles and motorcycles) to ensure that the proportion of vehicles for which detailed data were collected is correctly represented across all sites.

The weight for a particular site is the ratio of the total proportion of vehicles observed across all sites (and for which vehicle type and mobile phone usage or driver restraint was known) compared to the proportion of those observed at that particular site.

Weights were calculated separately for the stationary and moving sites. Due to the differing number of vehicles observed, weights were also calculated separately for the mobile phone and seatbelt elements of the stationary site surveys.

Table 12 shows the proportion of vehicles that were surveyed at each combination of country, site type and day; for example, ‘England, Moving, Weekday’ or ‘Scotland, Stationary, Weekend’.

[8] All data (collected in either 2017 or 2018) were weighted to traffic data from 2017 as the equivalent traffic data for 2018 had not been published at the time of the report.

Table 12: Proportion of vehicles surveyed by country, site type and day[9]

Country	Site type	Day	MP	SB
England and Wales	Moving	Weekday	80%	-
		Weekend	98%	-
	Stationary	Weekday	26%	22%
		Weekend	29%	26%
Scotland	Moving	Weekday	88%	-
		Weekend	97%	-
	Stationary	Weekday	41%	36%
		Weekend	49%	44%

To calculate the sampling weighting for each site, the proportion of vehicles surveyed for that combination of characteristics, was divided by the proportion of vehicles surveyed at that particular site.

For example, site BS1 was a stationary site in England that was surveyed on a weekday. To calculate the sampling weight for the seatbelt observations for this site the proportion of vehicles observed at stationary sites in England on a weekday is compared to the proportion of vehicles observed at this site. In total for weekday, stationary sites within England, the seatbelt survey team observed the drivers of 12,162 vehicles and counted 46,121 vehicles, i.e. 26% of vehicles were observed (row 4 of Table 12). At site BS1, occupants of 303 vehicles were observed and 567 were counted (53%). The sampling weight at this site was calculated as a ratio of these figures:

$$Sampling\ weight = \frac{12{,}162/46{,}121}{303/567} = 0.49$$

7.2 Traffic weights

The weighting procedure also accounts for differing traffic flows on roads in England/Wales and Scotland using national traffic data. Weights are computed to make the data representative across road types. These weights were based on traffic flows split by road type and rural/urban classification.

The distribution of traffic across the network by major/minor and rural/urban was computed from tables TRA0103[10]: Traffic volume - miles (TRA01) and across weekday/weekends using

[9] It should be noted that the stationary surveys have a lower proportion of vehicles observed than moving sites; this is because the methodology only allows vehicles stopped by the traffic lights to be observed, and there will be some vehicles which pass through fully during the green phase without stopping. It is also easier for the observers to make observations of a higher proportion of vehicles when there is less traffic; this is likely to explain why the proportion is typically higher on weekends compared to weekdays.

[10] DfT (2013). *Traffic volume – miles*. https://www.gov.uk/government/statistical-data-sets/tra01-traffic-by-road-class-and-region-miles

TRA0306[11]: Average annual daily flow and temporal traffic distributions (TRA03) (DfT, 2013). The distribution of vehicles counted across different road types was then weighted to match the national distribution.

Table 13 shows the traffic volumes recorded in TRA0103.

Table 13: Extract from TRA0103 (traffic, billion vehicle miles)

Country	Major		Minor	
	Rural	Urban	Rural	Urban
England and Wales	83.1	46.6	41.0	61.3
Scotland	10.7	2.8	4.6	5.1
Great Britain	93.8	46.4	45.5	66.4

TRA306 shows that around 76% of traffic is during the week and 23% of traffic is at weekends. Hence, the traffic figures from TRA0103, for major and minor roads split by rural and urban were multiplied by a factor of 0.76 for the weekday sites and 0.23 for the weekend sites.

The resultant traffic volumes (shown in Table 14) were used to find the proportion of traffic on each road type on weekday and weekends, and this proportion was divided by the proportion of vehicles counted at the sites with each road type (major/minor and rural/urban).

Table 14: Estimated traffic volumes

Country	Day	Major		Minor		Total
		Rural	Urban	Rural	Urban	
England and Wales	Weekday	63.3	35.6	31.2	46.8	**176.9**
	Weekend	19.8	11.0	9.8	14.5	**55.1**
Scotland	Weekday	8.2	2.1	3.5	3.9	**17.7**
	Weekend	2.5	0.7	1.1	1.2	**5.5**
Great Britain	Weekday	71.5	35.4	34.7	50.7	**192.3**
	Weekend	22.3	11.0	10.8	15.7	**59.8**

For example, site BS1 was on an urban major road in England and the survey was carried out on a weekday. The above table shows that the traffic volume needed to calculate the traffic weight for this site is 35.6. This is then divided by the total traffic volume across England and Wales on weekdays (176.9). The next step in the weighting procedure uses the survey data: of the 46,121 vehicles counted at stationary sites in England and Wales on a weekday, 21,544 were at urban major sites. Therefore the road weight for BS1 was calculated as:

$$Road\ weight = \frac{35.6/176.9}{21{,}544/46{,}121} = 0.43.$$

[11] DfT (2013). Average annual daily flow and temporal traffic distributions. https://www.gov.uk/government/statistical-data-sets/tra03-motor-vehicle-flow

7.3 Overall weights

The overall weight for each site is a combination of both the sampling and traffic weights.

Looking again at site BS1, the combination of these two weights results in the overall weight for site BS1 being:

$$Overall\ weight = 0.49 \times 0.43 = 0.21$$

Therefore, each weekday observation recorded at site BS1 should count as 0.23 observations in the analysis.

8 Lessons learned

This section of the report outlines the lessons learned from the 2017 survey and how these can be used to further develop and improve both the survey method and management. Specifically, the majority of the lessons learned relate to the survey method training (Section 8.1) and the management and validation of the data (Section 8.2).

8.1 Training

- Training should include the use of the DVRs. This was informally included in the first training session and then added to the training agenda for subsequent sessions. Although many of the survey teams were accustomed to traffic surveys, some had never used a DVR.
- The training sites for the practical session should be thoroughly checked before the training commences to ensure there is adequate traffic for the team to practice the survey method. Several of the training sites had low levels of traffic, or traffic light phases that meant the traffic queues were short and infrequent. This made it more difficult to train and assess a large survey team. Alternative sites, which are further afield if necessary, should be considered for the next survey.
- A simpler survey script was provided following the first training sessions. Trainees felt that the original was difficult to follow and could lead to confusion and slower observations. The new script could be used as a prompt whilst on site, but should also be included in any future training.
- A small number of surveys collected substantially less data than the others. At the training sessions it was emphasized that there is not a quota and that data quality is the priority over quantity. However, the training session also covered what to do in the circumstances when is the traffic is 'too low' to conduct a meaningful survey. Future surveys should consider implementing a minimum quota to reduce the ambiguity in the instructions. These quotas should take into consideration the site characteristics.
- Some surveys were rescheduled on multiple occasions as a result of staff availability issues. Future surveys should consider training additional staff as contingency for instances of staff illness.

8.2 Data

- Due to the tight timeframes of the project and some of the initial survey locations provided by DfT not being suitable, a number of the 2014 survey sites were used. This may have created some clustering around certain locations such as London. Although the data was weighted to national traffic flows, this may have impacted the representativeness of the survey data.
- It may have been difficult for the observers to correctly identify the type of device being used by a driver. Many electronic devices have very similar shapes and screen sizes. This could have impacted on the quality of the data as some drivers recorded as

using a hand-held phone may have been something else such as a sat-nav or mp3 player.

- Some inconsistencies with how motorcycle and pedal cycle data was recorded between surveys were noted. This was a new addition to the survey for 2017. Additional spot checks may have picked this up and address the issue earlier.
- Some staff were not able to transcribe their own audio file due to several factors:
    - The pressure the increased distance between sites put on the scheduling
    - Not all field staff had suitable technology available
    - Some field staff had limited computer literacy

  This may have introduced additional errors into the data as it is more difficult to transcribe someone else's voice than your own. In addition, the survey teams are more familiar with observation errors made at the roadside, and may have been able to correct for these at the transcription phase e.g. saying "younger, child seat" instead of "young child, child seat". Furthermore, due to the number of variables collected and the number of observations made, it was not feasible for field staff with limited computer accessibility to complete paper versions of the datasheets to be inputted by an alternative member of staff. This resulted in a large amount of survey data being transcribed from the audio files and input into the datasheets by members of staff who had not made the original observations. It is recommended for future surveys that distinct time is factored into the schedule to allow people to transcribe their own audio recordings and provide separate training on how to use the transcription template spreadsheet.
- For the reasons outlined above, the data processing took longer than initially expected and hence issues were not identified as early as intended. For the next survey, more time should be built into the process for data checking. A realistic timetable could be for the work to be commissioned such that the project contract is signed by June; this would enable trial preparations to take place in July and August, enabling the surveys to be completed in September and October; reporting could then take place in November and December, and clarifications could be made in January and February, ahead of a March publication. An additional month at the beginning of the process (i.e. with the contract signed in May), would enable some contingency in this programme.
- Data validation techniques were used on the transition spreadsheet to reduce the number of coding inaccuracies caused by human error. However, this validation did not include logic checks such as an adult being coded as being in a baby seat. These errors had to be retrospectively re-coded. Future data inputting validation should look to include logic checks as well as data validity.
- A number of surveys had more seatbelt or mobile phone observations than vehicles counted. In a number of cases the difference was very small suggesting human error. Anecdotal evidence from the survey teams suggests that some of these cases may have been caused by the enumerator having to stop conducting the traffic count for a short period of time to deal with public enquiries. In addition, it was reported that for one site the mobile phone observer was making observations of both directions of

traffic whilst the enumerator only counted one direction of traffic. For future surveys, it is suggested that the training and summary instructions document includes a section on communication between the team members.

- The data needs to be transferred to the analysis team within a week of the surveys completion and a basic check of the non-complicate rate should be conducted on receipt of each survey's data. This would have helped to avoid the re-surveys that took place in 2018, as the surveys with unusually high levels of non-compliance could have been repeated within the original time period (or the following week).

9 Summary

This survey of the driver mobile phone use and driver and passenger seatbelt use obtained observations from sites in England, Wales, and Scotland. Observations were made under two conditions:

- Sites where traffic was free-flowing
- Sites where traffic was halted by light-controlled junctions

The sites were chosen to give a representation of geographic areas; sites were split by type of road (major or minor) and by location (urban or rural).

Surveys were predominantly held on weekdays and a sample of these sites were re-surveyed at weekends. There were 135 valid surveys held in total.

During the data collection phase, some issues arose which necessitated changes to sites or the survey schedule. Some of these issues were due to external factors, such as poor weather conditions; other issues could have been controlled if they had been known about prior to the survey or had the data transfer process between the fieldwork teams and TRL been more systematic.

The data have been collected in a scientific survey design with strict quality validation applied and analysed thoroughly; the resulting dataset is therefore considered to be robust.

Appendix A Example site audit

Overall Site Risk Assessment Sheet

Moving

Date 09/09/17	**Time** 11:44	**Type of road** - Minor Rural
Site No – LM1	**Road No** B1172	**Speed limit** 40
Place - Norwich**,** NR18 0XJ		**O/S Ref** 52.573800, 1.124532

Description of Site:

Harts Farm Road south of Holly Blue Road

Traffic count in 1 min – 13 vehicles

Traffic lights ☐

Moving site ✔

Where to stand for observations:

On footpath observing traffic travelling Southbound

	Yes	No
Is the pavement / path level?	✔	☐
Is there enough room for cyclists / pedestrians to pass?	✔	☐
Is it possible to stand at least four feet from moving traffic?	✔	☐

Where to stand/sit for car counts:

On footpath observing traffic travelling Southbound.

Car Parking for Observer's cars (Most suitable place to park your car in the vicinity of the site):

Please note: Observer's cars should not cause an obstruction, nor be parked on the main carriageway.

Parking is available in Holly Blue Road

Any other useful information for location of site?

Shops and pubs in the town centre

Refreshment / comfort breaks can be taken at: Wymondham town centre

Journey time to break location: 5 mins drive

Please note any hazards not already mentioned that should be taken into account:

(eg site exposed to high wind, high traffic pollution, etc)

None


Norwich Rd
B1172
Vimy Dr
Harts Farm Rd
Holly Blue Rd
Spindle Cl
Speedwell Rd
Tortoishell Way
The Loke
Fritillary Dr
Gatekeeper Cl
Wymondham Tree Services
Vimy Ridge
Driving lessons Norwich &...
Vetch Cl

Appendix B Site list and schedule[12]

Site ID	Moving or Stationary	Road	Local Authority	Country	Major or Minor	Urban or Rural	Latitude	Longitude	Speed Limit	Weekday survey date	AM/PM	Weekend survey date	AM/PM
BM1	M	A4071	Rugby	England	Major	Rural	52.3467	-1.33194	50	21/09/2017	AM	07/10/2017	PM
BM2	M	A459	Dudley	England	Major	Urban	52.52998	-2.11803	30	19/09/2017	PM		
BS1	S	A4101	Dudley	England	Major	Urban	52.4962	-2.17446	30	21/09/2017	PM		
BS2	S	A452	Birmingham	England	Major	Urban	52.54645	-1.85602	30	14/09/2017	AM	28/10/2017	PM
BS3	S	Howard Road	Birmingham	England	Minor	Urban	52.42803	-1.89234	30	05/10/2017	AM	14/10/2017	PM
LM1	M	B1172	South Norfolk	England	Minor	Urban	52.5738	1.124532	40	25/09/2017	AM	28/10/2017	PM
LM2	M	B1116	Suffolk Coastal	England	Minor	Rural	52.20409	1.348568	50	27/09/2017	PM		
LM3	M	B2177	Portsmouth	England	Minor	Urban	50.8507	-1.06786	30	02/10/2017	AM	07/10/2017	PM
LM4	M	A5109	Barnet	England	Major	Urban	51.60858	-0.26945	30	23/10/2017	AM	21/10/2017	PM
LM5	M	C	Richmond upon Thames	England	Minor	Urban	51.45305	-0.35913	30	10/10/2017	PM	07/10/2017	AM
LM6	M	C	West Berkshire	England	Minor	Urban	51.40612	-1.29552	30	04/10/2017	AM		
LS1	S	A4130	South Oxfordshire	England	Major	Urban	51.53755	-0.90068	30	18/10/2017	AM	14/10/2017	AM
LS2	S	A283 (old A3)	Waverley	England	Major	Rural	51.1732	-0.6503	30	11/10/2017	AM		
LS3	S	A4130	Vale of White Horse	England	Major	Rural	51.61706	-1.26754	40	05/10/2017	AM	14/10/2017	PM
LS4	S	A1066	South Norfolk	England	Major	Urban	52.36849	1.127958	30	27/09/2017	AM	28/10/2017	PM
LS6	S	B4009	West Berkshire	England	Minor	Rural	51.52261	-1.14842	30	05/10/2017	PM		
LS7	S	B478	Wokingham	England	Minor	Urban	51.47554	-0.9136	20	09/10/2017	PM		
LS8	S	B416 Windsor Road	South Bucks	England	Minor	Rural	51.56088	-0.58393	40	22/09/2017	PM		

[12] 2018 re-survey dates are indicted with a '*'.

Site ID	Moving or Stationary	Road	Local Authority	Country	Major or Minor	Urban or Rural	Latitude	Longitude	Speed Limit	Weekday survey date	AM/PM	Weekend survey date	AM/PM
LS9	S	Cutbush Lane	Wokingham	England	Minor	Urban	51.41249	-0.94949	30	29/09/2017	AM		
LS10	S	A259	Worthing	England	Major	Urban	50.81189	-0.36702	30	20/10/2017	AM	21/10/2017	PM
LS11	S	A1202	Tower Hamlets	England	Major	Urban	51.51068	-0.06847	30	12/10/2017	AM		
LS12	S	A127	Southend-on-Sea	England	Major	Urban	51.55872	0.695473	40	18/10/2017	PM		
LS13	S	A205	Hounslow	England	Major	Urban	51.48904	-0.28737	30	10/10/2017	AM	07/10/2017	PM
LS14	S	C	Ipswich	England	Minor	Urban	52.05766	1.133041	30	28/09/2017	AM		
LS15	S	Knoll Road, Camberley	Surrey Heath	England	Minor	Urban	51.3401	-0.74431	30	29/09/2017	PM	21/10/2017	AM
LS16	S	B3022	Windsor and Maidenhead	England	Minor	Urban	51.47081	-0.63003	30	22/09/2017	AM	21/10/2017	PM
LS17	S	B1108 Watton Rd	South Norfolk	England	Minor	Urban	52.62525	1.220775	30	11/07/2017	AM	28/10/2017	AM
MS3	S	A34/ A537	Cheshire East	England	Major	Rural	53.26387	-2.23288	40	19/10/2017	AM	07/10/2017	AM
MS10	S	B6174	Tameside	England	Minor	Urban	53.45751	-2.01183		24/10/2017	PM	28/10/2017	AM
MS13	S	B6170	Tameside	England	Minor	Urban	53.47647	-2.08042	30	19/10/2017	PM		
SM1	M	A85	Perth & Kinross	Scotland	Major	Rural	56.40815	-3.50194	40	25/09/2017	AM		
SM2	M	A930	Angus	Scotland	Major	Rural	56.5194	-2.71212	60	25/09/2017	PM		
SM3	M	A862	Highland	Scotland	Major	Rural	57.47919	-4.30791	40	27/09/2017	AM	21/10/2017	PM
SM4	M	A944	Aberdeenshire	Scotland	Major	Rural	57.17198	-2.4111	30	06/10/2017 *06/06/2018**	PM	07/10/2017 *09/06/2018**	AM
SM5	M	B825	Falkirk	Scotland	Minor	Rural	55.91362	-3.82244	30	29/09/2017 *18/06/2018**	AM		
SM6	M	B999	Aberdeenshire	Scotland	Minor	Rural	57.2551	-2.13013	50	06/10/2017 *06/06/2018**	AM	07/10/2017 *09/06/2018**	PM
SM7	M	A728	Glasgow City	Scotland	Major	Urban	55.84474	-4.21389	40	29/09/2017 *18/06/2018**	PM		
SM8	M	A82 Longman Rd	Highland	Scotland	Major	Urban	57.48273	-4.2244	30	27/09/2017 *08/06/2018**	PM	21/10/2017	AM
SM9	M	Cove Road	Aberdeen City	Scotland	Minor	Urban	57.09719	-2.08887	30	27/09/2017	AM		
SM10	M	PERTH RD	Dundee City	Scotland	Minor	Urban	56.45594	-2.9916	30	25/09/2017	PM	07/10/2017	AM

Site ID	Moving or Stationary	Road	Local Authority	Country	Major or Minor	Urban or Rural	Latitude	Longitude	Speed Limit	Weekday survey date	AM/PM	Weekend survey date	AM/PM
SS1	S	A89	West Lothian	Scotland	Major	Urban	55.8987	-3.69974	30	04/10/2017	AM	14/10/2017	PM
SS2	S	A73	South Lanarkshire	Scotland	Major	Rural	55.65423	-3.72529	40	04/10/2017	AM		
SS3	S	A957	Aberdeenshire	Scotland	Major	Urban	56.96382	-2.20826	30	06/10/2017	PM	07/10/2017	AM
SS4	S	A71	West Lothian	Scotland	Major	Rural	55.82668	-3.66893	60	04/10/2017	PM		
SS5	S	A199	East Lothian	Scotland	Major	Rural	55.94465	-2.98735	40	02/10/2017	PM		
SS6	S	A814	West Dunbartonshire	Scotland	Major	Rural	55.93517	-4.52728	40	04/10/2017	AM	30/09/2017	PM
SS7	S	A977	Fife	Scotland	Major	Rural	56.06923	-3.71735	30	29/09/2017	AM		
SS8	S	Lasswade Road	Midlothian	Scotland	Minor	Urban	55.88311	-3.12483	30	02/10/2017	AM		
SS9	S	Waggon Road	Fife	Scotland	Minor	Rural	56.06361	-3.49765	30	27/10/2017	PM	14/10/2017	AM
SS10	S	The Wisp	Midlothian	Scotland	Minor	Rural	55.91334	-3.11764	30	02/10/2017	PM		
SS11	S	B8084	West Lothian	Scotland	Minor	Urban	55.8987	-3.69974	30	04/10/2017	PM	14/10/2017	AM
SS12	S	A8	Glasgow City	Scotland	Major	Urban	55.86227	-4.19911	40	29/09/2017	PM	30/09/2017	AM
SS13	S	A930	Dundee City	Scotland	Major	Urban	56.46854	-2.93123	40	25/09/2017	AM	07/10/2017	PM
SS14	S	A90(T)	Aberdeen City	Scotland	Major	Urban	57.13303	-2.13317	40	27/09/2017	PM		
SS15	S	A82 (T)	Glasgow City	Scotland	Major	Urban	55.90326	-4.37883	40	04/10/2017	PM	30/09/2017	AM
SS16	S	Colinton Rd	Edinburgh, City of	Scotland	Minor	Urban	55.9299	-3.22397	30	02/10/2017	AM	14/10/2017	AM
SS17	S	B763	Glasgow City	Scotland	Minor	Urban	55.83577	-4.249	30	29/09/2017	PM		
SS18	S	C / unclass	East Dunbartonshire	Scotland	Minor	Urban	55.90457	-4.22468	30	29/09/2017	AM	30/09/2017	PM
SS19	S	B9119	Aberdeen City	Scotland	Minor	Urban	57.14642	-2.11295	30	06/10/2017	AM		
SS20	S	B861	Highland	Scotland	Minor	Urban	57.47701	-4.22668	20	27/09/2017	AM		
WAM1	M	B4355	Powys	Wales	Minor	Rural	52.29961	-3.07029	30	29/09/2017	AM		
WAM2	M	A350	Wiltshire	England	Major	Urban	51.25471	-2.18703	30	11/09/2017	AM		
WAM3	M	B3064	Bournemouth	England	Minor	Urban	50.7223	-1.86163	30	18/09/2017	AM	07/10/2017	AM

Site ID	Moving or Stationary	Road	Local Authority	Country	Major or Minor	Urban or Rural	Latitude	Longitude	Speed Limit	Weekday survey date	AM/PM	Weekend survey date	AM/PM
WAS1	S	A38	North Somerset	England	Major	Rural	51.33451	-2.79377	40	11/09/2017	PM	14/10/2017	AM
WAS2	S	B3082	East Dorset	England	Minor	Rural	50.80567	-1.99927	30	18/09/2017	PM		
WAS3	M	A38	Gloucester	England	Major	Urban	51.84633	-2.23097	40	13/09/2017	AM		
WAS4	S	B4262	Cardiff	Wales	Minor	Rural	51.52894	-3.25945	30	15/09/2017	AM	14/10/2017	PM
WM1	M	A181	County Durham	England	Major	Rural	54.77458	-1.53445	60	05/10/2017	AM		
WM2	M	A591	South Lakeland	England	Major	Rural	54.38295	-2.91048	30	17/10/2017	AM		
WM3	M	A59	Harrogate	England	Major	Rural	54.00953	-1.36575	60	26/09/2017	AM	14/10/2017	PM
WM4	M	A6192	Chesterfield	England	Major	Rural	53.24339	-1.32896	40	28/09/2017	PM		
WM5	M	B1257	Ryedale	England	Minor	Rural	54.22686	-1.06014	60	26/09/2017	PM	14/10/2017	AM
WM6	M	A541	Wrexham	Wales	Major	Urban	53.04894	-2.99964	30	10/10/2017	AM		
WM7	M	A6030	Leicester	England	Major	Urban	52.63791	-1.09065	30	28/09/2017	AM	21/10/2017	PM
WM8	M	B4034	Milton Keynes	England	Minor	Urban	51.99294	-0.73972	30	16/10/2017	AM		
WM9	M	B5232	Salford	England	Minor	Urban	53.51043	-2.41323	30	12/10/2017	AM	28/10/2017	PM
WS1	S	A617	Ashfield	England	Major	Urban	53.13944	-1.2438	40	26/10/2017	AM		
WS2	S	A638	Wakefield	England	Major	Urban	53.66889	-1.47283	30	26/09/2017	AM		
WS3	S	A149, Heacham Road	King's Lynn and West Norfolk	England	Major	Rural	52.9076	0.503192	40	26/09/2017	AM		
WS4	S	A6	Bolton	England	Major	Rural	53.59425	-2.56927	50	03/10/2017	PM		
WS6	S	High Street	Hartlepool	England	Minor	Rural	54.64762	-1.23963	30	05/10/2017	AM		
WS7	S	Mill Lane	Cheshire East	England	Minor	Rural	53.3209	-2.1354	60	03/10/2017	AM	07/10/2017	AM
WS8	S	Windlehurst road	Stockport	England	Minor	Urban	53.3661	-2.0781	30	03/10/2017	PM	28/10/2017	AM
WS9	S	A57	Liverpool	England	Major	Urban	53.41202	-2.94327	30	12/10/2017	AM		
WS10	S	A671	Burnley	England	Major	Urban	53.78895	-2.23484	30	03/10/2017	AM		
WS11	S	A1036	York	England	Major	Urban	53.96301	-1.07812	30	10/10/2017	AM	07/10/2017	PM
WS12	S	A639	Wakefield	England	Major	Urban	53.71471	-1.36248	30	26/09/2017	PM	07/10/2017	AM

Site ID	Moving or Stationary	Road	Local Authority	Country	Major or Minor	Urban or Rural	Latitude	Longitude	Speed Limit	Weekday survey date	AM/PM	Weekend survey date	AM/PM
WS13	S	C	Sunderland	England	Minor	Urban	54.90079	-1.4097	30	05/10/2017	PM		
WS15	S	B6071	Sheffield	England	Minor	Urban	53.37923	-1.45537	30	28/09/2017	AM	28/10/2017	PM
WS17	S	B640	Rutland	England	Minor	Urban	52.66965	-0.72963	30	28/09/2017	PM	21/10/2017	AM

Appendix C Training document and observer scripts

Key Requirements

The survey team:

- Must arrive at your location **at least 15 minutes before** the shift to do a site assessment and be certain of where they should stand. A completed site assessment form must be returned to Tracsis.
- Must stand at the **correct junction** as specified on the site assessment form. If the survey team is not sure, they should call their Supervisor immediately for clarification.
- Must keep strictly to the **half-hour sessions** as specified.
- Must follow the data collection scripts provided recording the required data for **each shift**, **each session**, and **each vehicle**.
- Must record the data as specified for **nearside carriageway traffic** only.
- At stationary sites, observe traffic in the **nearside lane** only.
- At mobile sites on multi lane carriageways, observe vehicles in all lanes going in correct direction prioritising the nearside lane.
- Must record passenger details **in the order specified** and say where they are not sure or cannot see.
- Must **correct** any comments that they realise are incorrect by saying "**correction**" and then giving the correct observation. **Never** try to rewind or delete a recording.
- Must **transcribe** your data at least by the day following your shift.
- Must keep a **safe and respectable distance** from the vehicles being observed so they are able to see into vehicles but not cause distress to vehicle occupants.
- At stationary sites, they must state '**start of queue**' before recording the observations for a new queue of vehicles.
- At stationary sites, they must state '**new vehicle**' before recording the observations for the next vehicle.
- At stationary sites, you must being making observations at the front of the queue at the start of each red light phase.
- At stationary sites, if the vehicle last observed by the mobile phone observer at the end of a red light phase remains in the traffic queue for the next red light phase, do not make any further observations (mobile phone or seatbelt) until this vehicle has passed the traffic light. Start making new observations at the start of next red light phase.

At stationary sites, counters must count **all** traffic passing the stop line i.e. include all lanes going in correct direction within each half hour session.

At mobile sites, counters must count **all** traffic going in correct direction within each half hour session.

Overview of survey

Research has shown that using a hand-held mobile phone whilst driving is detrimental to the driving task and increases the risk of a collision occurring. The Department for Transport has commissioned this survey in order to understand the current rate of mobile phone use by drivers. The survey will take place in four areas of England and at a selection of sites in Scotland.

Observations of mobile phone use by drivers will be made of both free-flowing and stationary traffic at traffic lights. The methodology has been specified to be consistent with previous DfT surveys and comprises:

- a count of cars, vans, taxis, private hire vehicles, buses (including minibuses and coaches), lorries, motorcycles and pedal cycles on a specific stretch of road;
- a recorded observation of mobile phone use by drivers at moving and stationary sites; and
- a recorded observation of restraint use by all vehicle occupants (drivers only for buses, minibuses, coaches and lorries) at stationary sites.

Survey Plan

The survey will take place on weekdays, and some sites will be revisited at weekends as shown in the following table:

			England and Wales	Scotland	Total
Weekday	Stationary surveys	Mobile phone	40	20	**60**
		Seatbelt			
		Traffic count			
	Moving surveys	Mobile phone	20	10	**30**
		Traffic count			
	Total		**60**	**30**	**90**
Weekend	Stationary surveys	Mobile phone	20	10	**30**
		Seatbelt			
		Traffic count			
	Moving surveys	Mobile phone	10	5	**15**
		Traffic count			
	Total		**30**	**15**	**45**
Total number of surveys					**135**

Survey sessions – time periods

Either a morning or afternoon shift will be conducted at each site. The survey sessions will be as follows:

Morning shift		Afternoon shift	
start	**end**	**start**	**end**
07:30	08:00	13:30	14:00
08:30	09:00	14:30	15:00
09:30	10:00	15:30	16:00
10:30	11:00	16:30	17:00
11:30	**12:00**	**17:30**	**18:00**

It is **essential** that sessions start on the specified half hour.

Observers will be trained in both the mobile phone survey and the seatbelt survey methodology to allow for schedule flexibility. Observers will be allocated to a survey methodology (mobile or seatbelt) for the duration of the survey where possible to reduce confusion and data collection errors:

- Observers allocated to the mobile phone methodology will conduct surveys at both stationary and moving sites;
- Observers allocated to the seatbelt methodology will conduct surveys at stationary sites only.

Survey methodology

- **Mobile phone survey at STATIONARY sites**[13]

This survey will take place at traffic light controlled junctions. The survey team consists of two members; one to collect the observation data on mobile phone use (the 'observer') and the second to make a count of vehicles passing, broken down by vehicle type (the 'enumerator').

The observations will begin when the traffic light turns red and traffic has stopped moving.

The observer will start at the front of the queue stating 'start of queue' and walk along the line of vehicles recording detailed observations of the vehicle type and colour, hand-held mobile phone use, gender, and age of drivers, and whether there are any passengers present in each vehicle. Observations are spoken into a digital voice recorder. Once the green traffic light shows, and the vehicles start moving, the observations will cease and the observer will state 'end of queue' and walk back to the traffic light in preparation for the next cycle (see Appendix C.1 for the detailed survey script and several examples).

Observers at stationary sites should say 'new vehicle' and state the type and colour of the vehicle in order to link the mobile phone and seatbelt observations in the transcription phase.

The mobile phone observer should make observations of motorcycle and pedal cycle mobile phone use if the rider remain in traffic queue (instead of filtering to the front of the queue: If this is the case the riders will be recorded by the enumerator as outlined below). For riders, observations should be recorded of the vehicle type (motorcycle or pedal cycle) and the rider mobile phone use only. The mobile phone observer does not need to record the vehicle colour or the rider's age and gender.

Recordings of the observations are made using a digital voice recorder and files are downloaded from the device onto the supervisor's laptop at the end of each day. These will then be uploaded to Tracsis' secure server. The observers will transcribe the observations the following day from the digital voice recorder. If there is any loss of data on the digital recording device, a duplicate will be on Tracsis' secure server.

The enumerator will collect traffic count data using mechanical tally counters as the vehicles pass the traffic lights on the green phase. They will then record the totals for each vehicle type at the end of each session. All cars, vans, taxis, private hire vehicles, buses (including minibuses and coaches), lorries, motorcycles, and pedal cycles passing the through the junction (including all lanes) during the survey period should be counted. Please see Appendix C.3 for further information regarding the difference between taxis and private hire vehicles.

[13] Mobile phone stationary surveys and seatbelt surveys take place at the same time at the same junction.

During the red light phase, if a cyclist or motorcyclist has made its way to the front of the queue of traffic, the enumerator should record the information about the rider's mobile phone use by putting a tick in the relevant boxes of the sheet shown below.

Table 15: Cyclist counting sheet (for full sheet see Appendix C.7)

Date :	Site number:	Staff initials:

SESSION	START TIME	CONDITIONS	VEHICLE TYPE		MOBILE PHONE			
			Motor cycle	Pedal cycle	No phone	Hand	Ear	Head phones

- **Mobile phone survey at MOVING sites**

At moving vehicle sites, traffic is free-flowing and the observer will begin recording at the beginning of the half hour session. The survey team consists of two members; one to collect the observation data on mobile phone use (the 'observer') and the second to make a count of vehicles passing, broken down by vehicle type (the 'enumerator').

Observations of vehicle type, hand-held mobile phone use and gender will be recorded for every vehicle that passes the observation point in the specified direction. Vehicles in the nearside lane should be prioritised, however, on a road with more than one lane in each direction, if there are no vehicles in the nearside lane and it is possible to record observations of drivers in the next lane reliably then these vehicles should be surveyed. A data collection script is provided in Appendix C.2 along with several examples.

There may be some vehicles that are missed due to the speed of the vehicle passing, and the observer should resume observations with the next vehicle that passes.

Recordings of the observations are made using a digital voice recorder and files are downloaded from the device onto the supervisor's laptop at the end of each day. These will then be uploaded to Tracsis' secure server. The observers will transcribe the observations the following day from the digital voice recorder. If there is any loss of data on the digital recording device, a duplicate will be on Tracsis' secure server.

The enumerator will collect traffic count data using mechanical tally counters and record the totals for each vehicle type at the end of each session. All cars, vans, taxis, private hire vehicles, buses (including minibuses and coaches), lorries, motorcycles, and pedal cycles passing the survey location during the survey period should be counted.

- **Seatbelt survey at STATIONARY sites**

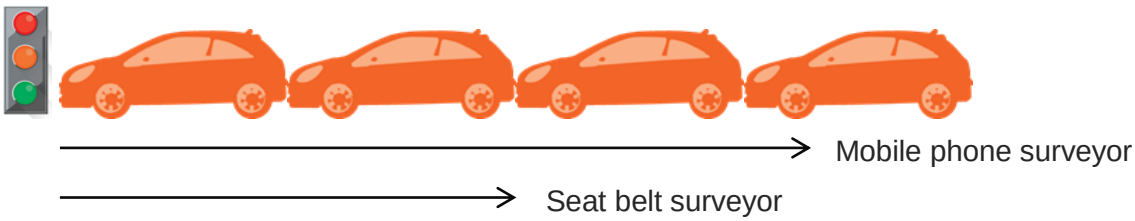
This survey takes place at the same time as the mobile phone survey, and at the same stationary sites. An additional team member is responsible for collecting the seatbelt observation data and will be trained specifically in the seatbelt methodology.

Each time traffic stops for the red signal during the session, the observer waits for the mobile phone observer to make observations of the first vehicle. When the mobile phone observer moves to the second vehicle in the line, the seatbelt observer proceeds along the line of traffic and records detailed observations of the seating position, gender, age and restraint use of the occupants of each vehicle. When the traffic begins to move, the observer returns to the junction to wait for the next red signal. A data script is provided in Appendix C.3 along with several examples; Appendix C.4 outlines the order that seatbelt observation of vehicle passengers should be made in.

The mobile phone observer should be allowed to complete observations of the first vehicle before the seatbelt observer begins observations. It is possible that the seatbelt observer will not observe as many vehicles as the mobile phone observer (see diagram below).

At the start of each queue of traffic, observers at stationary sites should state 'start of queue' into their recording device. For each vehicle they survey they should also state 'new vehicle' and state the vehicle type and colour. At the end of each queue the observers should state 'end of queue' and walk back to the traffic light.

There is no need for the seatbelt observer to record any information about motorcyclists or pedal cyclists. If these vehicles are in the observed queue of traffic, the seatbelt observer should skip them and move on to the next vehicle.



Recordings of the observations are made using a digital voice recorder and files are downloaded from the device onto the supervisor's laptop at the end of each day. These will then be uploaded to Tracsis' secure server. The observers will transcribe the observations the following day from the digital voice recorder. If there is any loss of data on the digital recording device, a duplicate will be on Tracsis' secure server.

- **Child restraints**

Please see Appendix C.5 for an explanation of child seat types.

Please note observers should not cause concern to parents by spending too long looking for evidence of child seats. It is **not necessary** to peer closely into the vehicle to decide on the type of child restraint used.

For children not obviously using a child or booster seat, if the seatbelt can be seen to be positioned properly across the shoulder of the child, then record the child seat as properly used, if the seatbelt cuts across the neck of the child, the restraint system is being used incorrectly and should be recorded as such.

- **What to do if it is not possible to see into a vehicle**

If the observer is unable to record all of the observation variables for any vehicle, then that variable should be recorded as unknown. The remainder of the variables observed are valid.

The observer must **correct** any comments that are incorrect by saying "**correction**" and then giving the correct observation. **Never** try to rewind or delete a recording.

- **Enumerator instructions**

The total number of vehicles that travel through the survey junction (i.e. all lanes) in one pre-selected direction during the survey session are counted and recorded by the enumerator. Vehicles are categorised into car, taxi (including private hire vehicles), van, lorry, bus (including minibus and coach), motorcycle and pedal cycle. The traffic count will continue until the end of the session.

The traffic count data is collected using tally counters and recorded at the end of each session on paper forms, as follows:

Date: **Site Number:** **Location:**	**Car**	**Taxi**	**Private hire vehicle**	**Van**	**Lorry**	**Bus**	**Motorcycle**	**Pedal cycle**
Session 1								
Session 2								
Session 3								
Session 4								
Session 5								
Session 6								
Session 7								
Session 8								

Safety

The survey team must arrive at least 15 minutes before the beginning of their shift to carry out their own site survey to ensure the site is safe for surveying, and to make sure they know where they should be standing. **They must phone their Supervisor if they are not sure of where to stand, in good time to ensure they start their sessions as specified.**

Tracsis is responsible for ensuring the health and safety of their survey staff and that all staff are wearing Hi Vis, have Dictaphones, and all other relevant documentation (Letter of Authority and Survey Info Sheets) required for the survey.

The survey team should assess whether they should introduce themselves to anyone – if, for example, they are standing outside a restaurant or pub it may be a good idea to explain to them what they are doing. They should emphasise that this is an observation study only, and

that no personal information is being recorded. This judgment should be aided by the site audit sheets.

As with all roadside surveys, the primary concern must be for safety – their own and that of other road users and pedestrians. The survey team should make sure that they are always in a safe place, whether they are counting or observing, and when resting in between sessions. In addition, the survey teams should ensure that they are not obstructing any footways / cycle paths.

We suggest all survey team members wear hi-vis jackets. Previous experience has shown that road users are unlikely to change their behaviour when they see people wearing hi-vis clothing.

The police will have been notified that the survey is taking place and the survey team should make sure that they have contact details for local emergency services with them. If you ever feel concerned for your safety, please leave the site and inform your supervisor.

Please remember that the survey teams are there simply to observe and count. They are not concerned with enforcement. Observers should **not** tell drivers that they should not be using a mobile phone or should be wearing a seatbelt. If they do see any infringements – for example, red light running – there is no need to get involved: in such cases they should behave as a private individual. In the unfortunate event that any such infringement should result in anyone being hurt, then they may be approached as a witness.

Information

It is possible that road users will want to interact with or challenge observers. Observers will have a Letter of Authority from the DfT containing information about the survey to show to any member of the public who enquires. This contains a brief outline of the survey, and contact details for further information.

Observers will be provided with TRL information slips with contact details that can be handed to anyone asking for further information.

Data Quality and Validation

Quality checks will be made at each site by survey supervisors during the survey. Checks of both the traffic counts and observational data will be made, with each team being observed (and corrected if necessary) for a 30 minute period each day.

In addition, it is expected that the supervisor will make a duplicate recording of one of the 30 minute sessions at 10% of sites (5 sites in Scotland, and 9 sites in England in a variety of regions), which will enable comparison of collected data for quality control purposes. Transcriptions of these recordings should be made on the day following the observations.

Quality of the observations will be gauged from this data, and poor matches between the two sets of data may mean that a site has to be resurveyed.

Unannounced visits may be made to the survey sites by a representative from TRL to ensure the correct use of the methodology, and the Client has indicated that they may also make visits to selected sites.

Outputs

The following outputs are required from Tracsis:

1. Transcriptions of all recordings (including validation recording) should be sent to TRL within 2 days of the site being surveyed – i.e. the session recorded on Tuesday to be available by Thursday pm.
2. Count data and the observed data (including validation data) tabulated into an Excel spreadsheet (an example and template have been provided).
3. A brief survey report for each site on each survey day, including details of weather and traffic conditions, and any extreme or unusual conditions.
4. Audio files of all sessions.

A new digital disk should be used each survey day to minimise any loss of data.

C.1 STATIONARY Mobile Phone Survey

1. At the start of each survey day:

Day	*then*	Date	*then*	Month	*then*	Year

2. At the start of each survey session:

Site number	*then*	**Session number**	*then*	**Start time**	*then*	**Observation conditions**
State: site number		*State:* session number		*State*: start time		Very good Good Average Poor Very bad

3. For every red phase of traffic lights:

Start of red phase
State: "Start of queue"

4. For every vehicle

New Vehicle	*then*	**Vehicle type**	*then*	**Vehicle colour**
State: "New vehicle"		Car Taxi Private hire Van Lorry Bus (including minibus and coach) Motorcycle *(if stationary in the queueing traffic)* Pedal cycle *(if stationary in the queueing traffic)*		*State colour (for example:* black, white, grey, red, blue, green*)*

5. Occupant details

Driver Mobile phone use	*then*	**Driver Gender**	*then*	**Driver Age (estimated)**	*then*	**Passengers**	**Additional observation**
Ear Hand No phone		Male Female Unknown		Younger (17-29) Middle (30-59) Older (60+)		Passengers No passengers Unknown	*Note any driver distraction*: such as personal

(Riders only) Headphones		Unknown		grooming, eating / drinking

6. When traffic starts moving (at end of red phase of traffic lights):

State: "End of queue"

Stationary Mobile phone Survey: SAMPLE OBSERVATIONS
- TUESDAY 10th OCTOBER 2017
- SITE 1, SESSION 3, Time: 09:30
- CONDITIONS: AVERAGE
START OF QUEUE
NEW VEHICLE
Car
White
Hand
UnKNoWN
Younger
No passengers
NEW VEHICLE
LORRY
GREY
NO PHONE
MALE
OLDER
NO PASSENGERS

NEW VEHICLE
TAXI
RED
EAR
FEMALE
MIDDLE
PASSENGERS

NEW VEHICLE

CAR

RED

NO PHONE

FEMALE

MIDDLE

NO PASSENGERS

PUTTING ON MAKEUP

END OF QUEUE

C.2 MOVING Mobile Phone Survey

1. At the start of each survey day:

Day	*then*	Date	*then*	Month	*then*	Year

2. At the start of each survey session:

Site number	*then*	**Session number**	*then*	**Start time**	*then*	**Observation conditions**
State: site number		*State*: session number		*State*: start time		Very good Good Average Poor Very bad

3. During observation period, for every vehicle that passes:

Vehicle type	*then*	**Mobile phone use**	*then*	**Gender**	*then*	**Additional observation**
Car Taxi Private hire Van Lorry Bus (including minibus and coach) Motorcycle Pedal cycle		Ear Hand No phone		Male Female Unknown		*Note any driver distraction*: such as personal grooming, eating / drinking

MOVING Mobile Phone Survey: SAMPLE OBSERVATIONS
- TUESDAY 10th OCTOBER 2017
- SITE 1, SESSION 3, Time: 09:30
- CONDITIONS: AVERAGE
Car
Hand
Male
DRINKING
Lorry
No phone
Male
Taxi
Ear
Female
Car
No phone
Male

C.3 STATIONARY Seatbelt Survey

1. At the start of each survey day:

Day	*then*	Date	*then*	Month	*then*	Year

2. At the start of each survey session:

Site number	*then*	**Session number**	*then*	**Start time**	*then*	**Observation conditions**
State: site number		*State*: session number		*State*: start time		Very good Good Average Poor Very bad

7. For every red phase of traffic lights:

Start of red phase
State: "Start of queue"

8. For every vehicle

New Vehicle	*then*	**Vehicle type**	*then*	**Vehicle colour**
State: "New vehicle"		Car Taxi Private hire Van Lorry Bus (including minibus and coach)		*State colour:* *(for example:* black, white, grey, red, blue, green)

3. Occupant details

Seating position State details first, then if applicable, "on lap…"	**Driver**
	Front seat passenger (NOT bus/ minibus or coach)
	Middle front passenger: Vans and lorries (NOT bus/ minibus or coach)
	Rear seat passenger (NOT bus/ minibus or coach): 1. behind passenger 2. middle 3. behind driver
	Rear seat passenger, **3rd row** (NOT bus/ minibus or coach): 1. behind passenger 2. behind driver

Sex	***then***	**Age (estimated)**	***then***	**Restraint Use**	**Additional observations:**
Male Female Unknown		Younger (17-29 for driver or 14-29 passenger) Middle (30-59) Older (60+) Unknown Baby (0-1) Toddler (1-4) Young child (5-9) Older child (10-13)		Seatbelt Unrestrained Unknown Rear facing baby seat Child seat Booster seat On Lap	*Note dark tinted windows or anything that impacts on the quality of observation.*

Stationary Seatbelt Survey: SAMPLE OBSERVATIONS

- TUESDAY 10TH OCTOBER 2017
- SITE 1, SESSION 3, TIME: 09:30
- CONDITIONS: AVERAGE

START OF QUEUE

NEW VEHICLE

CAR

GREY

DRIVER: MALE, MIDDLE, SEATBELT;

FRONT SEAT PASSENGER: FEMALE, MIDDLE, SEATBELT

NEW VEHICLE

VAN

RED

DRIVER: MALE, YOUNGER, SEATBELT

NEW VEHICLE

CAR

WHITE

DRIVER: FEMALE, YOUNGER, UNRESTRAINED;

FRONT SEAT PASSENGER: FEMALE, OLDER, SEATBELT;

TODDLER, FEMALE, ON LAP;

BEHIND PASSENGER, MALE, YOUNG CHILD, BOOSTER SEAT

NEW VEHICLE

BUS

GREEN

DRIVER: FEMALE, YOUNGER, SEATBELT;

END OF QUEUE

C.4 Seating Position Order

State vehicle type, then specify the location and details of occupants in an anti-clockwise order as follows:

Car

Direction of travel

1 – driver	5 – behind driver
	4 – middle at back
2 - front seat passenger	3 – behind passenger

Left hand drive car

Direction of travel

2 - front seat passenger	5 – behind driver
	4 – middle at back
1 – driver	3 – behind passenger

Van with 3 front seats

Direction of travel

1 – driver
3 – front middle passenger
2 - front seat passenger

People carrier

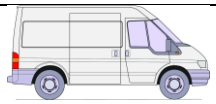
Direction of travel

1 – driver	5 – behind driver	7 – 3rd row- behind driver
	4 – middle at back	
2 - front seat passenger	3 – behind passenger	6 – 3rd row- behind passenger

C.5 Seatbelt Restraint Notes

Seatbelt restraint states	Description
Seatbelt	Shoulder belt worn as tightly as possible over the shoulder and across the chest. Lap belt firm against the body and low across the hips. Buckle fastened.
Unrestrained	Seatbelt left unfastened. Not wearing a seatbelt or any other kind of restraint, including when a seatbelt appears to be worn but is not securely fastened
Rear facing infant carrier 	Held in place by the car's lap and diagonal seatbelt, the rear facing infant carrier contains an integral harness which keeps the occupant restrained.
Child seat 	Held in place by the lap and diagonal seatbelt, the child seat includes an integral harness which keeps the occupant restrained.
Properly restrained with Booster seat 	The booster cushion or booster seat raises the height of the occupant such that the vehicle shoulder belt goes over the occupants shoulder and across their chest. If the child is **improperly restrained** with a Booster seat, the booster seat raises the height of the occupant but the vehicle seatbelt is not fastened.
On Lap	Passenger seated on lap of other passenger.

C.6 Vehicle Types

Vehicle type categories		Description
Cars		Includes: saloon, estate, people carrier, car towing caravan, motorhome
Taxi	See section below	hackney carriages and taxis
Private hire	See section below	Includes minicabs and private hire
Vans		Includes: van, car-derived van, <3.5 tonnes (single rear wheel), pick-up
Lorry	Rigid Lorry  Articulated Lorry 	Includes: >3.5 tonnes (twin rear tyres), 2-axles rigid flatbed 2-axles rigid 3-axles rigid 4 or more axles rigid 3-axles artic 4 or more axles artic Other goods vehicle with trailer
Bus / Coach / Minibus		Includes: Bus Coach Minibus

Please Note the following:

Emergency vehicles

Emergency vehicles are not included in the observation survey or counts

Taxi or private hire/minicab?

Taxis (or 'hackney carriages') are available for immediate hire and can be hailed in the street (known as 'plying for hire'). They will normally have roof signs or other clear labelling on the vehicle, taxi licence plates on the rear and charge metered fares.

Private hire vehicles may only be booked in advance. Private hire vehicles have plates on the rear and no roof sign or (normally) no meter.

C.7 Stationary Site Traffic Counter Cyclist Sheet

Date: ……. **Site Number: ……** **Staff initials: ……**

SESSION	START TIME	CONDITIONS	VEHICLE TYPE		MOBILE PHONE			
			Motor cycle	Pedal cycle	No phone	Hand	Ear	Head phones

Appendix D Re-survey of sites with high levels of non-compliance

The mobile phone usage rates at most of the sites (surveying moving traffic) were below 6%, and averaged around 1%. This result suggests that, on average, around one driver in every hundred is likely to be using a hand-held mobile phone at any given time. These results were in line with previous surveys of this nature in the Great Britain.

However, the mobile phone usage rates observed in seven surveys (at five sites) with moving traffic, all in Scotland, were substantially higher, ranging between 12% and 17%. These results are shown in Figure 3. This would suggest around one driver in seven is likely to be using a hand-held mobile phone at any given time.

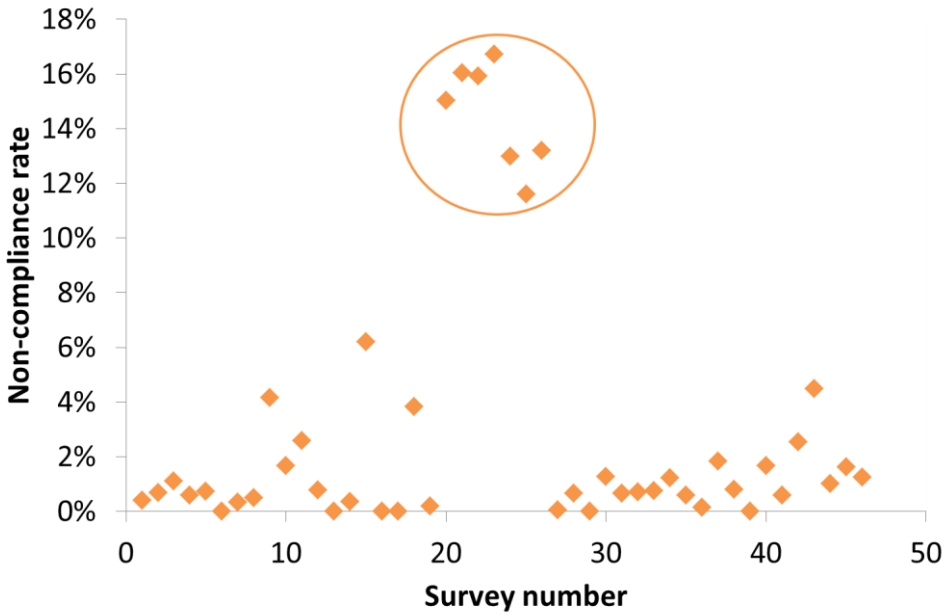


Figure 3: Mobile phone use non-compliance rates from the 2017 surveys

In June 2018, a re-survey at these particular locations using the same survey method and materials was carried out in order to verify the abnormally high levels of non-compliance, or to obtain revised values that are more credible.

This appendix outlines the work the TRL has undertaken re-surveying the mobile phone use in light of anomalous results:

- Section D.1 outlines the additional surveys that took place in June 2018
- Section D.2 summarises the survey spot checks
- Section D.3 details the data checks performed on the new survey data
- Section D.4 contains the result of the 2018 surveys and a comparison to the 2017 results

D.1 Surveys

The mobile phone use rates at the following seven surveys in 2017 were substantially higher than expected (see shaded sites in Table 16):

- SM4 (A944, a major rural road with a 30mph speed limit): weekday PM and weekend AM
- SM5 (B825, a minor rural road with a 30mph speed limit): weekday AM
- SM6 (B999, a minor rural road with a 50mph speed limit): weekday AM and weekend PM
- SM7 (A728, a major urban road with a 40mph speed limit): weekday PM
- SM8 (A82 Longman Road, a major urban road with a 30mph speed limit): weekday PM

Mobile phone usage data was collected again at these sites between 07/06/2018 and 19/06/2018 at the same time of day as the original survey (AM or PM) and day of the week (weekend/weekday).

Given the length of time between the original surveys and the re-surveys, Transport Scotland was concerned that the results of the re-surveys may not be comparable with those from the original surveys. Therefore, an additional six re-surveys were conducted at sites which previously had typical levels of non-compliance (see unshaded sites in Table 16) at the same time as those above. The sites selected were:

- SM1 (A85, a major rural road with a 40mph speed limit): weekday AM
- SM2 (A930, a major rural road with a 60mph speed limit): weekend PM
- SM3 (A862, a major road with a 40mph speed limit):weekday AM
- SM9 (Cove Road, a minor urban road with a 30mph speed limit): weekday AM
- SM10 (Perth Road, a minor urban road with a 30mph speed limit): weekday PM and weekend AM

D.2 Spot checks

A number of unannounced spot checks were conducted to check that the survey was being carried out in the correct way. The following surveys were subject to these checks:

- SM6 06/07/2018
- SM4 06/07/2018
- SM1 07/07/2018
- SM10 16/07/2018

The site visits included a member of the TRL project team overseeing the data collection for at least one session. Details of these visits were recorded on forms which detailed whether the survey team were on site at the expected time and at the expected location, whether there were any issues with the site, and whether there were any urgent items that required rectification. No issues reported and the method was being conducted appropriately.

D.3 Data checks

The following checks were made on the transcribed data:

- The codes used in data entry matched the coding scheme
- All corrections in the notes had been reflected in the data
- The number of observations per survey (by session and vehicle type) was equal to or lower than the traffic flow data
- The observation conditions and session timings matched between the vehicle count and observation data
- The data for all sessions was unique
- The transcribed data matched the audio recordings of the survey observations: 100 observations from five surveys were re-transcribed and compared
    - SM1 session 5
    - SM10 (weekend) session 4
    - SM3 session 1
    - SM4 (weekend) session 3
    - SM8 session 2

As part of the above checks and data cleaning exercises, minor edits were made to the data. The level of unknown data points recorded was acceptable (at 0.1%) and the re-transcription match rate was 90% or above for all fields (similar to the 2017 match rate). The majority of non-matches were due to a small number of missed observations (12). As with the 2017 survey, the original data has been kept, although any re-occurring errors were reported back to Tracsis to resolve. For example, the audio checks highlighted a systematic error where pick-up trucks were recorded as cars instead of vans (as outlined in the training and method documents); Tracsis has subsequently recoded these data and provided a revised dataset.

D.4 Results

Table 16 shows the compliance rate and total number of observations for each survey that was re-surveyed in 2018 compared with the equivalent results from 2017. The surveys with previously high levels of non-compliance have been highlighted. Seven observations where the vehicle type or mobile phone use were recorded as unknown have been excluded.

Table 16: Comparison of 2017 and 2018 non-compliance results

Survey		2017 results		2018 results	
Site	Day/Time	Non-compliance rate	Total observations	Non-compliance rate	Total observations
SM1	Weekday AM	0.4%	1,104	3.0%	1743
SM2	Weekend PM	0.0%	565	2.0%	934
SM3	Weekday AM	3.8%	652	2.1%	992

Site	Survey Day/Time	2017 results Non-compliance rate	2017 results Total observations	2018 results Non-compliance rate	2018 results Total observations
SM4	Weekday PM	15.0%	852	1.5%	1299
	Weekend AM	16.0%	667	0.7%	806
SM5	Weekday AM	15.9%	44	6.8%[14]	103
SM6	Weekday AM	16.7%	909	1.5%	852
	Weekend PM	13.0%	893	1.3%	829
SM7	Weekday PM	11.6%	560	3.4%	644
SM8	Weekday PM	13.2%	1,462	2.4%	2158
SM9	Weekday AM	0.7%	460	2.0%	910
SM10	Weekday PM	6.2%	517	2.2%	918
	Weekend AM	0.0%	744	0.9%	650

For the sites with high non-compliance in 2017, the overall non-compliance rate decreased from 14.3% in 2017 to 1.9% in 2018. The results from the sites with originally low levels of non-compliance did not suggest a strong seasonal effect; overall the non-compliance rate at these sites did increase from 0.9% to 2.2% but the direction of this change was not consistent across sites.

As it was extremely unlikely that exactly the same levels of non-compliance would be observed at each site; an assessment criteria was derived that would consider whether the non-compliance rates for the 2018 survey were within the range of previous values (excluding those with abnormal results) observed in the 2017 survey. Specifically, this assessment criteria required that for each site the non-compliance rate was less than 6%, and that the total non-compliance rate in both sets of re-surveys was less than 4%[15].

SM5 was the only survey which had a non-compliance level above 6%. This is likely to be related to the relatively small number of observations and low traffic flow. Due to the small number of observations at this site (103) this result is not likely to have a notable impact on the final results. Aside from this site, the 2018 results are in-line with the expected levels from the other sites in 2017 and from previous surveys.

[14] The slightly higher non-compliance rate than would be expected based on the other sites may be linked to the small number of observations and low traffic flow at this site.

[15] 6% was the highest non-compliance rate deemed to be 'normal' at sites in 2017 (as shown in Figure 3). 4% was the upper end of the 95% confidence interval for the sites with expected levels of non-compliance..

As a result, the 2018 data for the sites with previously high levels of non-compliance was used to replace the data collected in 2017 to form the final dataset.

2017 Mobile phone and seatbelt survey

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