Transport Focus Bus Passenger Survey

Methodological overview – Autumn 2017 wave

June 2018

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1 Background

Transport Focus first established the Bus Passenger Survey (BPS) in April 2009 to generate a robust and comprehensive measure of bus passengers' journey experience within our remit area (England outside of London). The survey is an objective measure of bus passengers' experience on individual journeys and it covers: the bus stop environment, punctuality, 'on bus' comfort, and the standards of the bus driver, together with overall journey satisfaction and value for money ratings. The Bus Passenger Survey has a well-established methodology, achieved over many waves of this survey. However, following an independent review in late 2014 and further development work through 2015, the Autumn 2015 survey saw some enhancements; these have been carried forward ever since and are detailed in this document.

Transport Focus allows local transport authorities and/or bus service operators (operators) to 'buy into' the survey to achieve boosted response numbers in their territories of interest.

BDRC Continental was appointed by Transport Focus to provide the market research agency services needed to carry out the Autumn 2017 wave of the survey. BDRC Continental is an independent market research agency and conducts research in accordance with the Market Research Society (MRS) Code of Conduct; it is also accredited with the ISO 20252 Quality Assurance and ISO 27001 IT and Data Security Standards. BDRC Continental is also an MRS Company Partner Scheme member.

This document describes the methodology in general and specifics as they relate to the Autumn 2017 BPS wave. If there are any further questions about the methodology deployed in the survey, please call Robert Pain on 0300 123 0835.

2 Survey Overview

The BPS is designed to provide results that are statistically representative of bus passenger journeys made within a Primary Sampling Unit (PSU); a passenger journey is defined as an individual trip made on a local bus service. PSUs are typically local transport authority areas or the divisions of a bus operator. The survey is a measure of individual journey experience. It is designed to provide results that have utility at the PSU level, and in certain circumstances at remit wide level.

The sampling process generates a list of bus routes representative of journeys made in each PSU selected. Fieldworkers board buses on a representative sample of bus routes; they discuss the survey briefly with individual passengers on these buses and invite them to take part in the survey; those wishing to take part fill in a self-completion questionnaire after their journey (details of the questionnaire and data collection method are given in sections 4 and 5). The survey is restricted to passengers aged 16 and over. Weighting is applied to correct for differential response rates by age, gender and the day and time of day when travelling. Weighting is also applied to proportionate the individual PSU relative to all the others included in the survey.

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2.1 The Primary Sampling Units surveyed in Autumn 2017

PTE authorities	Unitary authorities	Two tier authorities	Operators not aligned to any authority areas	Scottish / Welsh samples	Other special territory areas
West Midlands	Bournemouth	Essex	Blackpool Transport	Nestrans ⇑ Booster (Aberdeen-shire)	Coventry VMA routes within West Midlands
Mersey (+ Halton)	Cornwall	Norfolk	First Potteries	First Buses Aberdeen	QBN routes within Mersey (+ Halton)
South Yorkshire	Durham	Northampton-shire	First South Coast	First Buses Glasgow	Milton Keynes: boost on non-major operators
Greater Manchester	Hull	Nottingham-shire	GA - Anglian Bus and Konectbus^	First Buses Scotland East	Nottinghamshire: boost on non-major operators
Tyne and Wear	Leicester City	Oxfordshire	GA – Bluestar	Stagecoach East Scotland	
West Yorkshire	Milton Keynes	Staffordshire	GA - Brighton & Hove	Stagecoach Highland & Bluebird / North Scotland	
	North East Lincolnshire	Warwickshire	GA - Hedingham & Chambers	Stagecoach West Scotland	
	Northumber-land	Worcester-shire	GA - Metrobus	Xplore Dundee	
	Poole		GA - Oxford P&R	Mid Wales ⇈	
	Swindon		GA - Plymouth Citybus	North Wales	
	Tees Valley Partnership*		GA – Salisbury Reds	South East Wales	
	WECA & N.Somerset**		GA - Southern Vectis	South West Wales	
	York		GA – Thames Travel	Newport Bus boost	
			Reading Buses	TrawsCymru routes^^ boost	
			Stagecoach Cumbria & North Lancashire***		

			Stagecoach East (Cambridge Busway)***		
			Stagecoach in Gloucester-shire***		
			Stagecoach South***		
			Stagecoach South East***		
			Stagecoach South West***		
			Transdev Blazefield - Harrogate & District		

*Comprised of Redcar & Cleveland, Middlesbrough, Stockton on Tees, Hartlepool, Darlington local authority areas

**WECA (West of England Combined Authority) is comprised of: Bath and North East Somerset, Bristol City Council and South Gloucestershire local authority areas. For the BPS, WECA also partners with North Somerset as a co-funder

***Stagecoach samples were comprised of the operator's routes running in the following local authority areas

- Stagecoach Cumbria & North Lancashire: Cumbria and North Lancashire.

  Due to the way timetable data is organised at pre-sampling stage (i.e. by local authority area), for Autumn 2017 this Stagecoach coverage was sampled from within the totality of the Cumbria and Lancashire authority areas, rather than North Lancashire specifically. This meant that some services from different Stagecoach business units – those covering the southern areas of Lancashire – were picked up erroneously within this sample. In future waves, more specific information will be sought about which routes should and should not be included in operator-only samples where the survey is set up to cover that operator's business in a specific area.

- Stagecoach East (Cambridge Busway): Cambridgeshire, specifically Stagecoach in the Fens branded services A, B, D, N and R
- Stagecoach in Gloucestershire: Gloucestershire
- Stagecoach South: Hampshire, West Sussex
- Stagecoach South East: East Sussex and Kent
- Stagecoach South West: Devon and Somerset
- Stagecoach East Scotland: the authority areas covered within the TACTrans area (Angus, Dundee, Perth and Kinross, Stirling) and SESTrans area (Clackmannanshire, East Lothian, Edinburgh, Falkirk, Fife, Midlothian, Scottish Borders, West Lothian)
- Stagecoach Highland & Bluebird / North Scotland: the authority areas covered within the HiTrans area (Highlands, Moray and most of Argyll and Bute) and Nestrans area (Aberdeen and Aberdeenshire)
- Stagecoach West Scotland: the authority areas covered within the SPT area (East Dunbartonshire, East Ayrshire, East Renfrewshire, Glasgow City, Inverclyde, North Ayrshire, North Lanarkshire, Renfrewshire, South Ayrshire, South Lanarkshire, West Dunbartonshire and the Helensburgh and Lomond areas of Argyll and Bute), and SWESTrans area (Dumfries and Galloway)

^Go-Ahead abbreviated to "GA"

† Nestrans is the abbreviation for the North East of Scotland Transport Partnership (for Aberdeen City and Shire)

†† Welsh regions were comprised of local authorities as follows:

- Mid Wales – Ceredigion, Powys
- North Wales – Conwy, Denbighshire, Flintshire, Gwynedd, Isle of Anglesey, Wrexham
- South East Wales – Blaenau Gwent, Bridgend, Caerphilly, Cardiff, Merthyr Tydfil, Monmouthshire, Newport, Rhondda Cynon Taff, Torfaen, Vale of Glamorgan
- South West Wales – Carmarthenshire, Neath Port Talbot, Pembrokeshire, Swansea

^^TrawsCymru routes were boosted in two ways: with a representative sample of TrawsCymru routes across the services' full timetable, and separately with an additional boost sample of TrawsCymru weekend services.

3 Sampling

The sampling process was designed to ensure representative results were achieved for each Primary Sampling Unit surveyed.

Sometimes in some Primary Sampling Units, sample design also accommodated requests to boost specific routes or Operators, so that substantive response numbers could be achieved for these groups; where this occurred, they were suitably weighted back when producing the final Primary Sampling Unit results.

In this wave, the following were sampled as sub-Primary Sampling Units within their respective areas:

- Routes covered by the Voluntary Multilateral Agreement (VMA) within the West Midlands area
- Routes covered by the Quality Bus Network (QBN) within the Mersey (and Halton) area
- Services run by non-major operators within Nottinghamshire
- Services run by non-major operators within Milton Keynes

3.1 Sample design

A sample was designed for each Primary Sampling Unit. The sample universe was sourced from ITO World Ltd (which collects and makes available the bus journey data shown by Traveline, for example). To ensure the research encompassed the totality of routes, the starting point was to use the information from ITO World Ltd to make a list of every bus service and every timetabled occurrence of each service that runs within each Primary Sampling Unit. Bus journeys that started outside 06.00 to 21.59 were excluded, as these were outside the fieldwork hours.

This data source had some additional key fields, including: the local transport authority through which the route runs, whether or not it crossed a local transport authority boundary, the journey length in minutes, the start/finish bus stops. To date no superior sample source has been identified, and experience has not suggested that this sample source omits any noticeable proportion of journeys. A small proportion of journeys sampled in advance of the fieldwork were found to have been withdrawn or changed (i.e. timetable changes) by the time of fieldwork itself. The effect of this was relatively minor and was usually due to local changes made in the short period between sampling and fieldwork, rather than due to inaccuracies in the sample source. For the Autumn 2017 survey, local authorities and some operators were asked to inform the agency about any routes which were likely to change significantly (e.g. be withdrawn or see major timetable changes) between late summer when the sample was drawn and the fieldwork, or during the fieldwork.

The sampling process is described below:

1. The journey duration of every timetabled occurrence of every bus service was calculated using the stated start and end times provided by ITO World Ltd. Journeys reaching beyond the Area boundary used the proportion of the journey within the Area boundary (unless this was less than 30% of its total route time, and the portion of the journey within the area was under 15 minutes; such journeys were removed from this initial list). The PSU list (of every timetabled occurrence of every bus route) was then sorted in descending journey lengths.

2. A "Passenger Value" (PV) was then applied to each individual bus journey (this was based on additional research and modelling work which took place during the preceding Autumn 2016 wave of the survey):

    - The total number of passengers boarding during a single one-way bus journey was counted on a sample of all the bus journeys surveyed during the Autumn 2016 wave

    - This data was used to generate models to predict the number of people travelling on each bus service depending on:

        - area (or type of area[1] if that area was not surveyed in 2016 and did not therefore have its own counts and model)

        - duration

        - time of day and day of week when travelling

        - operator (one of the "big five[2]", another major operator in certain areas, or "other" operators)

    - The passenger values determined in this way correlated well with published journey volume statistics when aggregated at total Local Authority level (but were superior to the published figures because they were applicable at the level of individual bus journeys).

    - The models used for sampling in Autumn 2017 are provided in Appendix 2, along with an example of the passenger value (PV2) applied to bus services in one of the areas covered in this survey. These models will be updated in advance of the Autumn 2018 survey, based on new passenger counts undertaken during the Autumn 2017 fieldwork.

    - This passenger value, known as "PV2" thus gave a good estimation of how busy each individual bus service was relative to all others. This was an enhancement compared to early waves of the BPS (before Autumn 2015),

[1] Types of areas were: PTEs, Unitary Authorities and Two-tier Authorities

[2] The "big five" were: Arriva, First, Go-Ahead, National Express and Stagecoach. Other major operators given their own co-efficient in the modelling work were: Reading Buses and Blackpool Transport in their respective operator samples, and Nottingham City Transport and Trent Barton in Nottinghamshire.

where a PV was assigned to each bus vehicle journey based on some assumptions (e.g. that longer journeys would carry more passengers). The new method based the PV2 on evidence about how passenger volumes vary and accounted for more journey variables, not just the duration of the bus route

- This knowledge was used in the next stage to enable systematic selection of a representative sample of vehicle journeys on which to recruit respondents.

3. Next, the database was sorted by route, day-part[3], journey start time and day of week. In practice, each row of the database (i.e. each journey) showed a cumulative passenger value (PV2). Probability proportional to size was then used to sample the required number of journeys; i.e. probability proportional to PV2. A sampling interval for the PSU was calculated which was the total Passenger Value divided by the number of fieldwork shifts required. For example, a PSU with a total of 30,000 Passenger Value units and 30 shifts required, would have a sampling interval every 1000th fraction of the total value. In practice, to allow for some journeys being infeasible to cover (e.g. non-returning market day services), or if a need was to arise during fieldwork to add supplementary shifts through low return rates, a sample 'overage' was built into calculating the sampling interval. In Autumn 2017, this overage was 75% of the required number of shifts. So in the example for the PSU requiring 30 shifts, in practice 53 journeys would be sampled, and the sampling interval would be 566.

4. The actual sample was struck by choosing a random start point between 0 and the row with the cumulative Passenger Value of the required sampling interval, and then selecting the service corresponding to every sampling interval gap down the list. So, from the example in the previous paragraph, the random start might have been 326 with 53 shifts required and a sampling interval of 566, the selected services would be taken from the rows which contained cumulative passenger values of 892, 1458, 2024, etc.

5. The result of step 4 was a list of bus vehicle journeys, which would form the basis of fieldwork shifts. In early waves of the BPS, fieldworkers had boarded the bus selected during this process and made outward and return journeys from that point onwards, within a three hour period. In the independent consultant's review following the Autumn 2014 BPS, a concern was raised that this approach skewed the overall survey coverage towards later journeys in the day. This is because, for example, passenger journeys happening at 6am could only ever be picked up by fieldwork shifts arranged to start at 6am, whereas journeys starting at 8am could be picked up by shifts starting at 6am, 7am and 8am, and anywhere in between. Therefore from Autumn 2015, a step was added here to correct for this: A programme was written into the sampling database to find the same journey as the one selected, but starting 1.5 hours earlier, for all bus vehicle journeys selected. That is, a journey with the same start and end point, the same

[3] Day-parts are weekday morning peak (06:00 – 08:59), weekday off-peak (before 06:00, 09:00 – 16:29, or after 18:59), weekday evening peak (16:30 – 18:59) and weekends.

operator, the same overall duration, and on the same day of the week. Inevitably, bus timetables do not run with journeys exactly 1.5 hours apart, and so the identical journey which was nearest to 1.5 hours earlier was identified (and in some cases this was actually the same journey, if the original selection was the first of the day or the first for some hours). This newly 'adjusted' journey then became the start point for the fieldworker's shift, meaning that, in practice, the originally selected start time became the mid point of the shift. This meant that the overall profile of fieldwork shifts matched the PV2 profile for each PSU, for different times of the day. As a result this also meant we could expect to see more (and a better representation of) early morning journeys contributing to the survey results, and fewer journeys from the end of the day.

6. Finally, any journey which had a start time at or later than 19.30 was removed and manually replaced by the instance of that journey which started closest to, but before, 19.00. For example if a journey was selected which started at 19.56, and there was another instance of the same journey at 18:56, it was replaced with the 18.56. This was in order to ensure that a three hour shift could be worked, while still finishing at a reasonable time for the fieldworker (no later than 10:30pm). Similarly, any journey which now had a start time before 6am (as a result of the adjustment in step 5) was replaced by the instance of that journey starting at or closest to, but after, 6am.

   NB. in isolated circumstances, respondents were included in the final survey dataset who travelled after 10.30pm. These were usually when a fieldwork shift had been scheduled for late in the evening and there had also been some kind of delay on the buses covered during that shift meaning the fieldworker finished a little later than normal.

3.2 Sample review

Following the systematic selection of the routes, a further process was undertaken which checked the suitability of each route for a three-hour shift. The guideline was that a shift was feasible where two hours or more of a three hour shift could be spent on board a bus (rather than waiting at a stop which is non-productive time). Some Park-and-Ride services and all obvious school-bus routes were excluded during this process and replaced with a randomly selected alternative journey from the sampling 'overage' already provided.

In practice, the timing of bus services meant that some fieldworker shifts were a little shorter or longer than three hours. The general principle used in Autumn 2017 was that a bus journey could be selected and covered by a fieldworker shift if:

a) It would yield a shift of no less than two and a half hours total duration
b) It would yield a shift of no more than four hours total duration (although there were a small number of 4+ hour shifts, where this was necessary to ensure that a reasonable proportion of all routes in a PSU had opportunity to be covered)
c) At least around two hours could be spent on board a bus rather than waiting at a stop
d) At least one full outward and one full return trip could be made on the selected route.

In Autumn 2017, of the 5,835 bus services reviewed for suitability in a fieldworker shift, 4,072 were accepted as possible shifts (including some overage) for the start of fieldwork, and 1,763 were 'rejected'. Bus services were 'rejected' for the following reasons:

a) No return journey available (641)
b) Too small proportion of shift to be spent on board a bus (229)
c) Journey and available returns could not fill a 3-hour (or even a 2.5-hour) shift (126)
d) Shift would finish too late (after 10.30pm), and no suitable alternative journey start time was available, as described in point 6 above (94)
e) Journey would be too long for a 3-hour (or even a 4-hour) shift (656)
f) Other (17) – these were all "ineligible" bus services, including obvious park and rides, school buses and Transport for London services in areas close to London.

At this point then, a pool of possible journeys was available, including some overage, as the basis for fieldworker shifts, and from this pool the final selection was made. This was done by listing the possible journeys in a randomised order, and selecting the top n, where n was the number of shifts required.

The profile of the selected shifts was then compared to the universe profile of all bus passenger journeys (using the number of journeys previously estimated in the PV2 process). Their profile was observed in terms of operator mix, day-part and day of week. Where the profile of the fieldwork shifts was close to that of the journey universe, the selection of bus journeys was deemed final and fieldwork was subsequently booked to take place on these journeys. Where the profile was not close, different journeys (from the overage) were swapped in to achieve a better profile.

In some cases, if the whole pool of "possible" journeys could not yield a set of journeys and therefore fieldwork shifts with a reasonable profile, slight amendments would need to be made to other, previously not "possible" journeys, in order to make them feasible for fieldworker shifts. For instance, there were some cases where, if a fieldworker stayed on a bus to the end of its journey, there would be no suitable return service to catch; but if they disembarked two or three stops early they would be able to catch a return service. In such cases the journey would be included in the survey and the fieldworker would be instructed to disembark a little before the end of the journey. Another example was where a bus journey could be included in the survey if the shift it yielded was allowed to run a little over four hours.

Before Autumn 2016, the process for "accepting" bus journeys as the basis of fieldwork shifts was a little different to this. Up to and including Autumn 2015, the profile of "accepted" journeys was not reviewed, but instead there was a target for at least 80% of journeys reviewed for suitability to be accepted as the basis of shifts. Where fewer than 80% of reviewed journeys were accepted, amendments such as those described above were made in order to make a sufficient proportion of journeys feasible as shifts.

Once the pool of possible journeys for use as the basis of fieldwork shifts had been reviewed and refined into a workable fieldwork plan, the result was a set of 3,590 shifts which were planned at the outset of the project. In addition to these shifts scheduled at the outset, a further 229 were scheduled later on, to 'top up' the fieldwork where response was looking lower than needed to generate the required sample sizes. 'Top up' shifts were selected from within the 'overage' provided at initial sample selection stage.)

4 Fieldwork

Fieldwork took place between 11 September and 18 December 2016. The start date was staggered across the country due to later confirmations in some areas. The latest start dates were in Scotland and Wales where fieldwork commenced from 25 September. Due to the staggered start dates, completion dates also ran into December (where usually fieldwork is completed by the end of November / beginning of December in each Autumn wave).

There was a pause within the fieldwork period to avoid the school half-term holidays and also to allow for a review of progress with the project. In most areas this was between 14 and 29 October, although there were some variations if school half term holidays were at a different time (as in Scotland for example).

4.1 Distribution of questionnaires

Data collection method

Before working their first shift on the project all fieldworkers received a detailed briefing from BDRC via regional supervisors. Fieldworkers joined the bus routes selected from the sampling process on the specified day and start time. They travelled to the final destination of the route and made the first return trip possible on that route, returning to their start point. They repeated this process to make as many trips as possible within their three-hour shift. During this time fieldworkers were required to approach all passengers who boarded the bus and give them the opportunity to participate in the research.

In Autumn 2017, passengers were offered the choice to take a paper questionnaire, along with a post-paid envelope, or to complete the survey online. If they chose the latter, the fieldworker took their email address and a survey invitation was emailed to them as soon after the shift as possible (in most cases this was within two days). All those recruited were asked to complete their questionnaire after they had finished their journey. The online option was first offered in Autumn 2015 after previous pilot work showed it had the potential to improve participation from certain demographic groups (especially younger males) who are typically somewhat under-represented in this type of research, and it has been offered in every wave since.

Fieldworkers were issued with between 50 and 80 questionnaires for each shift, driven in part by the estimated number of passengers expected to be encountered during the whole shift (based on the PV2 calculated earlier), but capped with a minimum of 50 and a maximum of 80 (to ensure there would always be enough and to control the sheer weight of questionnaires for fieldworkers to manage).

In total, 160,112 paper questionnaires were distributed (an average of 42 per shift), and 14,312 email addresses were collected (an average of 3.7 per shift). In total therefore, 174,424 people were recruited to take part in the survey, an average of 46 per shift.

Travelling on buses in practice

Fieldworkers were instructed that if they were at their original start-point and the three-hour shift was not complete, but there was insufficient time to make a complete outward and return journey, they should travel outwards for half the remaining time, and then get off the bus and return so that they were back at their start-point at the completion of the three hours.

If the PSU was a Local Transport Authority, where a route crossed the boundary of that Authority area, the fieldworker treated the route as truncated to the portion within the PSU, i.e. only passengers boarding within the PSU would be approached. To achieve this, fieldworkers themselves would only travel within the boundaries of the Authority area, alighting at the border and boarding the next bus back in the opposite direction from that point. The last stop before the Authority border was identified within the bus timetable information supplied by ITO World.

In advance of each shift, fieldworkers were instructed to double check the journey details they had been given (since, as described above, changes could be made to bus services between the sampling and fieldwork stages). This sometimes resulted in changes to a shift; either:

- if the timetable had been altered, the fieldworker may have needed to start the journey at a different point or at a slightly different time, or
- if a service had been withdrawn it would be replaced with another from the 'overage' in the initial sample.

Further tasks performed during fieldwork

As described in the later section on weighting, fieldworkers also recorded the observed age and gender details of all passengers who were on the bus at a given point in time. For Autumn 2017, this observation was conducted twice within a fieldworker shift: at the mid-point of the first outbound journey, and again at the mid-point of the last inbound journey. These details allowed the creation of a representative passenger demographic profile to be used for weighting purposes.

In addition, during the Autumn 2017 fieldwork (and as in previous waves), a second fieldworker accompanied the first on a sample of 10% of all shifts in each PSU, to count the

total number of passengers boarding during one whole outbound and one whole inbound journey. This data will be used to update the models used to estimate passenger values for all bus journeys, for use in sampling for the Autumn 2018 survey.

4.2 Authorisation to work on buses

Regarding permission to conduct interviewing on the bus, Transport Focus provided a letter which the fieldworkers were able to show drivers to vouch for the bona fides of the survey, and Transport Focus communicated to operators that the survey might take place on their services during the intended period. In Autumn 2017 a relatively small number of shifts were disrupted by bus drivers refusing to allow fieldworkers to work.

4.3 Monitoring fieldwork

Throughout fieldwork, fieldworkers reported the number of questionnaires they had handed out, and how many email addresses they had collected (i.e. how many people they had recruited). This was reported by the next working day after each shift, and these metrics were monitored by the team at BDRC.

As questionnaires were returned to BDRC's head office, their barcodes were scanned to provide immediate extra confirmation that a fieldwork shift had taken place, and a number of data fields from the questionnaire were recorded manually to enable a first stage of validation checks to take place (see section 6.2). The same information from electronic surveys completed online was recorded automatically. The numbers of completed and validated questionnaires were matched with the reported recruitment figures, to allow the project team to monitor the overall productivity of the fieldwork. Several actions had potential to be triggered by this information, including for example:

- If the sample sizes in certain areas appeared likely to fall below the target, additional 'top up' shifts could be scheduled using the sample overage
- If it was found that all of the available questionnaires were routinely given out in certain areas or on certain routes, this was recorded and more questionnaires may be printed where relevant in future waves
- Steps could be taken to address lower productivity in certain fieldworkers if this was found to be the case.

BDRC carried out all fieldwork in accordance with the MRS Code of Conduct, the IQCS (Interviewer Quality Control Scheme) and ISO 20252. Exceeding normal industry standards, at least 10% of all BPS shifts were subject to unannounced spot-checks by BDRC supervisors and other project team staff. The majority of shifts to be spot-checked were

selected at random, but some were chosen specifically, to monitor new or less productive fieldworkers or areas more closely, and indeed to observe more productive fieldworkers in order to study and pass on best practise techniques. Random unannounced spot-checks were also made by Transport Focus staff.

5 Questionnaire

The paper questionnaire was an 8-page self-completion booklet that was handed out along with a reply-paid envelope to all passengers on the bus who were willing to take part. The online questionnaire was exactly the same in terms of question content and had small modifications in order to work appropriately depending on the type of device (desktop, smartphone, etc.) being used by the respondent.

The questionnaire had a core set of questions to provide consistent measurement of the components of journey experience. A copy of the standard version of the questionnaire is shown in Appendix 1. Transport Focus allocated a space on the questionnaire (part 6) where participating local transport authorities or bus operators were able to place a small number of questions of their choosing.

6 Response rates, and validation of returns

6.1 Response rates achieved

The metric of fieldwork outcome was the product of hand out rates achieved and response rates achieved. The tables below show the metrics achieved from fieldwork across the Primary Sampling Units in this wave.

Fieldwork metrics: PTEs

PTEs *(and boosts)*	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average respon-ses per shift (total)
West Midlands	224	11102	2445	22%	1125	139	12%	12227	2584	21%	11.5
Coventry VMA routes within West Midlands	54	2830	653	23%	496	28	6%	3326	681	20%	12.6
Mersey (+ Halton)	132	5248	1634	31%	416	74	18%	5664	1708	30%	12.9
Mersey and Halton – QBN routes	27	1266	404	32%	193	30	16%	1459	434	30%	16.1
South Yorkshire	128	6314	1563	25%	232	36	16%	6546	1599	24%	12.5
Greater Manchester	212	8213	1713	21%	1102	181	16%	9315	1894	20%	8.9
Tyne and Wear	125	6801	1655	24%	570	91	16%	7371	1746	24%	14.0
West Yorkshire	174	8694	1607	18%	38	9	24%	8732	1616	19%	9.3
PTEs total	**1076**	**50468**	**11674**	**23%**	**4172**	**588**	**14%**	**54640**	**12262**	**22%**	**11.4**

Fieldwork metrics: Unitary Authorities

Unitary authorities	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average respon-ses per shift (total)
Bournemouth	38	1758	456	26%	92	14	15%	1850	470	25%	12.4
Cornwall	60	1801	790	44%	526	95	18%	2327	885	38%	14.8
Durham	57	2823	756	27%	91	16	18%	2914	772	26%	13.5
Hull	76	3515	815	23%	82	9	11%	3597	824	23%	10.8
Leicester City	67	3022	715	24%	144	12	8%	3166	727	23%	10.9
Milton Keynes (representative sample)	51	1882	472	25%	147	14	10%	2029	486	24%	9.5
Milton Keynes (non-major operators)	23	601	184	31%	33	12	36%	634	196	31%	8.5
North East Lincolnshire	45	1941	470	24%	64	9	14%	2005	479	24%	10.6
Northumberland	43	1616	476	29%	42	9	21%	1658	485	29%	11.3
Poole	37	1692	512	30%	186	27	15%	1878	539	29%	14.6
Swindon	76	3033	908	30%	228	32	14%	3261	940	29%	12.4
Tees Valley Partnership	153	6769	1952	29%	53	7	13%	6822	1959	29%	12.8
WECA & N.Somerset	90	3459	1235	36%	536	80	15%	3995	1315	33%	14.6
York	32	1641	515	31%	168	26	15%	1809	541	30%	16.9
Unitaries total	**848**	**35553**	**10256**	**29%**	**2392**	**362**	**15%**	**37945**	**10618**	**28%**	**12.5**

Fieldwork metrics: Two tier authorities

Two tier authorities *(and boosts)*	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average responses per shift (total)
Essex	74	2349	712	30%	301	72	24%	2650	784	30%	10.6
Norfolk	78	2804	910	32%	473	105	22%	3277	1015	31%	13.0
Northamptonshire	38	1600	414	26%	115	10	9%	1715	424	25%	11.2
Nottinghamshire (representative sample)	81	3464	988	29%	257	38	15%	3721	1026	28%	12.7
Nottinghamshire (non-major operators)	43	1015	288	28%	22	5	23%	1037	293	28%	6.8
Oxfordshire	98	3688	1053	29%	820	167	20%	4508	1220	27%	12.4
Staffordshire	62	2341	708	30%	286	60	21%	2627	768	29%	12.4
Warwickshire	31	1072	338	32%	96	27	28%	1168	365	31%	11.8
Worcestershire	32	1134	412	36%	187	54	29%	1321	466	35%	14.6
Two tier total	**537**	**19467**	**5823**	**30%**	**2557**	**538**	**21%**	**22024**	**6361**	**29%**	**11.8**

Fieldwork metrics: Operators (1)

Operators	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average responses per shift (total)
Blackpool Transport	38	1798	427	24%	440	113	26%	2238	540	24%	14.2
First Potteries	45	1915	452	24%	186	31	17%	2101	483	23%	10.7
First South Coast	49	2149	606	28%	195	44	23%	2344	650	28%	13.3
GA - Bluestar	31	1376	344	25%	203	23	11%	1579	367	23%	11.8
GA - Brighton & Hove	51	3178	824	26%	137	24	18%	3315	848	26%	16.6
GA - Headingham & Chambers	33	846	297	35%	58	12	21%	904	309	34%	9.4
GA - Metrobus	34	2069	580	28%	251	48	19%	2320	628	27%	18.5
GA - Oxford P&R	21	906	254	28%	100	27	27%	1006	281	28%	13.4
GA - Plymouth CityBus	31	1434	528	37%	334	84	25%	1768	612	35%	19.7
GA - Salisbury Reds	18	894	293	33%	65	9	14%	959	302	31%	16.8
GA - Southern Vectis	19	730	286	39%	45	8	18%	775	294	38%	15.5
GA - Thames Travel	29	961	280	29%	96	26	27%	1057	306	29%	10.6
GA Anglia & GA Konectbus	37	1141	379	33%	228	48	21%	1369	427	31%	11.5

Fieldwork metrics: Operators (2)

Operators	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average responses per shift (total)
Reading Buses	72	2844	705	25%	651	129	20%	3495	834	24%	11.6
Stagecoach Cumbria & North Lancashire	37	1687	461	27%	72	13	18%	1759	474	27%	12.8
Stagecoach East (Cambridge Busway)	22	919	334	36%	247	73	30%	1166	407	35%	18.5
Stagecoach Gloucestershire	39	1372	442	32%	182	18	10%	1554	460	30%	11.8
Stagecoach South	34	1900	558	29%	112	20	18%	2012	578	29%	17.0
Stagecoach South East	35	1315	468	36%	92	12	13%	1407	480	34%	13.7
Stagecoach South West	17	549	262	48%	86	27	31%	635	289	46%	17.0
Transdev Blazefield - Harrogate & District	21	975	355	36%	16	2	13%	991	357	36%	17.0
Operators total	**713**	**30958**	**9135**	**30%**	**3796**	**791**	**21%**	**34754**	**9926**	**29%**	**13.9**

Fieldwork metrics: Scottish samples

Scottish samples	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average responses per shift (total)
First Buses Aberdeen	28	1231	463	38%	17	0	0%	1248	463	37%	16.5
First Buses Glasgow	40	2230	1035	46%	91	16	18%	2321	1051	45%	26.3
First Buses Scotland East	33	912	512	56%	196	25	13%	1108	537	48%	16.3
NESTRANS Booster (Aberdeenshire)	21	615	337	55%	7	0	0%	622	337	54%	16.0
Stagecoach East Scotland (TACTrans and SESTrans)	22	881	479	54%	60	9	15%	941	488	52%	22.2
Stagecoach Highland & Bluebird / North Scotland (HiTrans and NESTrans)	30	1037	532	51%	37	8	22%	1074	540	50%	18.0
Stagecoach West Scotland (SPT and SWESTrans)	26	973	467	48%	18	0	0%	991	467	47%	18.0
Xplore Dundee	13	942	465	49%	4	1	25%	946	466	49%	35.8
Scotland total	**213**	**8821**	**4290**	**49%**	**430**	**59**	**14%**	**9251**	**4349**	**47%**	**20.4**

Fieldwork metrics: Welsh samples

Welsh samples	No. shifts	Recruits: paper	Respon-ses: paper	Response rate: paper	Recruits: online	Respon-ses: online	Response rate: online	Recruits: total	Respon-ses: total*	Response rate: total	Average responses per shift (total)
Wales - Mid	64	1669	706	42%	55	12	22%	1724	718	42%	11.2
Wales - North	83	1796	674	38%	358	83	23%	2154	757	35%	9.1
Wales - South East	158	6765	1679	25%	260	38	15%	7025	1717	24%	10.9
Wales - South West	64	2311	733	32%	162	15	9%	2473	748	30%	11.7
Newport Bus	18	908	362	40%	52	7	13%	960	369	38%	20.5
Wales - TrawsCymru	27	830	319	38%	43	12	28%	873	331	38%	12.3
Wales - TrawsCymru weekend	18	566	283	50%	35	2	6%	601	285	47%	15.8
Wales total	**432**	**14845**	**4756**	**32%**	**965**	**169**	**18%**	**15810**	**4925**	**31%**	**11.4**

6.2 Validation of completed surveys

Completed questionnaires were subject to two stages of checks and validation; once before they were scanned electronically to pick up the tick-box responses (for paper questionnaires), and once afterwards:

1. Pre-scanning of question responses (for paper questionnaires)

The first stage took place immediately after completed questionnaires were received. Firstly, each paper questionnaire was opened to check that the respondent had answered the questions and not simply returned a blank or mostly-blank form. Sometimes, with self-completion questionnaires, respondents miss some questions, either accidentally or because they choose not to or cannot answer. They may however have provided sufficient, valid answers to most of the questionnaire and so it would be wrong to waste their other answers. Questionnaires were therefore accepted according to these guidelines:

- Providing the respondent had reached the "overall journey satisfaction" or beyond (including a small number of cases where the respondent had clearly reached the end of the questionnaire but missed the "overall satisfaction" question itself), the questionnaire was accepted. In other words, if they had left some subsequent questions blank, such as the demographic questions which some people prefer not to answer, they would be accepted on this basis since they would have completed the majority of the questions by this point.

- If the respondent had missed two whole consecutive pages, where this was clearly the result of the pages having been turned over together and the respondent had not realised they were there, the questionnaire would be accepted – providing most of the other questions were completed. If the respondent had missed four whole pages, the questionnaire would be rejected since in this scenario they would have missed at least half of the questions.

- A small number of questionnaires were rejected where the respondent had written nonsense, offensive words or phrases, or expletives (which were unconnected to their feedback on the bus journey), or had defaced part of the questionnaire.

Each questionnaire had a unique ID number; once the above basic checks were completed, for paper questionnaires this was scanned from a barcode on the front page. The answers to certain questions were then manually entered into a database – these were the date (top right on the paper questionnaire and time/date stamped on the electronic questionnaire), the route number of the bus (Q1, see questionnaire example in the Appendix) and the time the respondent boarded the bus (Q2). These were checked against the original details of the fieldwork shift, to check that the passenger filled in the questionnaire about a verified journey (this also served as a check that fieldwork had been carried out as intended). Questionnaires which did not tally with the expected

journey details were investigated and would be rejected if they could not be verified as corresponding to the correct fieldworker shift.

The same basic checks were made at the equivalent stage for online questionnaires:

- Respondents were counted as "complete" providing that they had reached and answered at least the "overall journey satisfaction" question. Of course the questions up to this point would also have all been answered in the online questionnaire since unlike the paper version there was no possibility of a respondent accidentally missing any.

- The online questionnaire reminded respondents of the date and approximate time when they were first approached by the fieldworker, and the route number of the bus they were travelling on. However they were also asked to confirm these details at the beginning of the survey (just in case there had been any unexpected changes on the day, for example due to fieldworker illness or significant disruption to the bus service). These details in the online questionnaire were equivalent to Q1, Q2 and the date information on the paper questionnaire and were checked electronically against sample information for the same reasons as for the paper questionnaire.

It was useful to carry out this stage of the validation immediately (rather than later on alongside other DP checks), because it enabled more accurate monitoring of the real number of 'useable' responses which had been collected in each PSU.

At this stage, for paper questionnaires, the answers to numeric questions were also recorded manually and/or checked. These are all about times (Q15, Q17, Q24 and Q25), and were recorded manually because sometimes respondents' handwriting was difficult to pick up via the electronic scanning data capture system, or passengers incorrectly recorded route numbers or times which used the 24-hour clock. (Checks were built into the manual data entry system to avoid human error, such as a flag to alert the person if they had entered an abnormally long time for waiting for the bus, etc. Also note that the answers to these questions were still scanned electronically, and a sample compared to the manually entered data, as a further check against human error at the data entry stage). Similarly, electronic validation of the equivalent (typed-in) responses in the online questionnaire was built in to the cleaning programme.

2. Post-scanning of question responses

Validated paper questionnaires were then scanned electronically to record which answer boxes on the form had been ticked by respondents. (At this stage, the data capture itself was 100% validated, meaning that a person checked, for example, that the electronic process had picked up genuine ticks, rather than instances where a respondent may have ticked one response and then crossed it out in favour of another, or where a mark may have been made accidentally in a box).

Once all of the responses to the questionnaire were recorded in a database, other data cleaning could take place. This included, for example, checks for multi-coded answers where a single-code was required, and responses to questions which the respondent should have routed around.

6.3 Data preparation and analysis

After the data was validated, coded and edited, an SPSS data file was provided to Transport Focus. Transport Focus also ran some checks on this file before it was ruled off as final, and then also produced a large number of reports and other outputs.

7 Weighting

7.1 Weighting by age, gender and day-part

The survey weighting was designed to offset the effects of both non-response bias and non-participation bias based on age, gender and day-part.[4]

Age and gender weights

No known source of information exists to detail the demographic of journeys by age and gender consistently for each PSU; therefore this information was collected through the fieldwork. During the Autumn 2017 survey, fieldworkers broke from distributing questionnaires temporarily at points through their shift, to record the age (within 3 bands: 16-25, 26-59 and 60+) and gender of every passenger of the bus (from observation). As described earlier, this age and gender report was made at the mid-point of the first outbound journey, and again at the mid-point of the last inbound journey. The passenger age and gender profile was aggregated at the PSU level and compared to the profile given by the declared age and gender on the questionnaires returned for that PSU. Rim weights were then applied for each PSU for age and gender (which were not interlocked), based on the observed profiles made during fieldworkers' shifts. In practice, a small proportion of respondents did not declare their age and / or gender in the questionnaire itself. Therefore the observed profiles were adjusted proportionately to allow for this. (The alternative would be to have excluded these respondents on account of the fact that they could not be given a weight, but this would have meant a reduction in the overall sample size and the loss of passenger feedback which was otherwise entirely valid).

(The above age and gender weighting approach was used in Autumn 2015 and has then been used since. Previously, up to 2014, factor weights were applied for eight interlocking age-gender cells (4 x age and 2 x gender). Following the independent review of the BPS, the day-part weight (below) was added, and the age-gender weights were simplified at the same time.)

Day-part weights

The proportion of all journeys within each PSU had been estimated via Passenger Value models, during the sampling process. These proportions formed a further set of rim weights applied to each PSU.

Note that for the purpose of weighting, where there were overlaps between a PSU for a local authority, and PSU(s) for operators or other boosts, local authorities were treated as "local authority excluding routes relevant to the operator/boost". For example for Staffordshire, where the Autumn 2017 wave surveyed both Staffordshire as a whole and a separate samples for First in the Potteries, weights were applied to all responses for "Staffordshire excluding First Potteried",

[4] Day-parts are weekday morning peak (06:00 – 09:00), weekday off-peak (before 06:00, 09:01 – 16:29, or after 19:00), weekday evening peak (16:30 – 19:00) and weekends.

and separately for the operator. Therefore responses from within the original ‘main’ Staffordshire sample which were for First Potteries, were weighted in the same way as all other responses for that operator.

The following tables show the observed age and gender profile of passengers from the fieldworker observation (adjusted for non-response to age and gender questions in the questionnaire itself), and the estimated day-part profiles generated by the PV2 models. These were therefore the target rim weights applied to each PSU in Autumn 2017.

Target rim weights

Target rim weights applied in PTE Areas

PTE Authorities *(and boosts)*	Male	Female	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
West Midlands (ex. VMA routes)	44.3%	49.3%	6.5%	27.8%	45.0%	21.6%	5.6%	16.7%	53.0%	10.9%	19.3%
Coventry VMA routes within West Midlands	44.7%	49.6%	5.7%	31.3%	41.8%	21.9%	5.0%	16.6%	52.9%	10.9%	19.6%
Mersey and Halton (ex. QBN routes)	43.1%	51.7%	5.2%	20.8%	39.9%	34.0%	5.3%	16.3%	52.9%	10.7%	20.1%
Mersey and Halton – QBN routes	40.4%	53.3%	6.3%	28.9%	37.0%	28.0%	6.1%	15.0%	54.2%	9.9%	20.9%
South Yorkshire	41.0%	56.0%	3.0%	21.8%	50.7%	24.3%	3.2%	16.5%	55.1%	9.0%	19.4%
Greater Manchester	43.9%	51.8%	4.3%	26.4%	51.4%	18.7%	3.5%	16.6%	54.0%	10.0%	19.4%
Tyne and Wear	41.8%	54.4%	3.8%	25.2%	37.4%	33.5%	3.9%	14.7%	51.1%	8.6%	25.6%
West Yorkshire	41.0%	54.3%	4.7%	29.8%	43.0%	22.9%	4.3%	16.0%	54.1%	10.2%	19.7%

Target rim weights applied in Unitary Authority Areas

Unitary authorities	Male	Fe-male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Bournemouth	44.1%	51.4%	4.5%	29.3%	42.5%	24.1%	4.1%	15.3%	55.4%	10.4%	18.8%
Cornwall (ex. Stagcoach SW, Plymouth Citybus)	43.9%	50.8%	5.4%	33.2%	28.5%	32.7%	5.6%	16.1%	54.9%	10.2%	18.8%
Durham	39.5%	55.1%	5.3%	22.6%	35.1%	37.5%	4.8%	14.9%	57.6%	9.9%	17.7%
Hull	39.1%	55.1%	5.9%	21.4%	45.2%	27.8%	5.6%	16.1%	56.1%	9.9%	17.9%
Leicester City	37.8%	55.8%	6.5%	21.1%	41.4%	31.5%	6.1%	17.0%	56.7%	10.0%	16.3%
Milton Keynes (ex. non-major operators)	47.2%	47.1%	5.7%	27.9%	44.7%	21.5%	6.0%	17.6%	53.3%	10.6%	18.5%
Milton Keynes (non-major operators)	37.5%	57.4%	5.1%	22.7%	40.4%	31.1%	5.8%	17.2%	54.5%	11.2%	17.1%
North East Lincolnshire	43.4%	52.2%	4.4%	21.8%	45.5%	28.5%	4.2%	16.5%	56.1%	10.2%	17.2%
Northumberland	41.2%	53.0%	5.8%	18.9%	29.1%	46.0%	6.0%	14.6%	52.9%	10.1%	22.5%
Poole (ex. First South Coast)	38.8%	57.3%	3.9%	26.6%	40.6%	29.5%	3.3%	16.0%	55.9%	10.0%	18.1%
Swindon (ex. Salisbury Reds)	41.5%	53.5%	5.0%	27.3%	37.9%	30.3%	4.5%	17.2%	54.6%	11.1%	17.0%
Tees Valley Partnership	39.9%	55.4%	4.7%	21.3%	37.0%	37.2%	4.5%	15.2%	55.7%	9.7%	19.3%
WECA & N.Somerset	43.0%	51.0%	6.0%	26.4%	40.8%	26.8%	6.0%	16.7%	51.9%	12.1%	19.3%
York	39.3%	56.4%	4.3%	32.0%	43.4%	20.7%	3.9%	15.1%	54.4%	10.0%	20.5%

Target rim weights applied in Two Tier Authority Areas

Two tier authorities *(and boosts)*	Male	Female	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Essex *(ex. Hedingham & Chambers)*	40.1%	54.9%	5.0%	23.3%	35.9%	34.7%	6.1%	19.6%	55.2%	10.0%	15.1%
Norfolk *(ex.Anglian Buses and Konectbus)*	40.8%	56.3%	2.9%	24.7%	33.6%	39.2%	2.5%	15.3%	55.4%	10.4%	18.9%
Northamptonshire	43.2%	50.8%	5.9%	31.3%	40.7%	23.8%	4.3%	17.8%	54.6%	11.0%	16.6%
Nottinghamshire *(ex. non-major operators)*	39.7%	56.0%	4.3%	19.2%	39.8%	36.9%	4.1%	16.3%	55.0%	9.0%	19.7%
Nottinghamshire *(non-major operators)*	45.9%	50.5%	3.5%	19.9%	41.9%	35.2%	3.0%	14.4%	64.4%	7.0%	14.1%
Oxfordshire *(ex. Reading Buses, Thames Travel, Oxford Bus Co. P&R)*	40.6%	56.0%	3.3%	24.3%	48.1%	23.9%	3.7%	16.6%	51.9%	10.8%	20.7%
Staffordshire *(ex. First Potteries)*	40.9%	55.2%	3.9%	26.1%	32.5%	37.9%	3.6%	18.3%	60.9%	7.5%	13.3%
Warwickshire	42.8%	54.3%	2.9%	29.0%	37.3%	31.6%	2.0%	16.6%	57.1%	10.4%	15.9%
Worcestershire	39.0%	56.9%	4.1%	18.4%	30.2%	47.2%	4.1%	18.5%	58.7%	9.2%	13.6%

Target rim weights applied to Operator PSUs

Operators	Male	Female	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Blackpool Transport	43.4%	52.3%	4.3%	29.4%	32.0%	34.0%	4.6%	16.1%	53.0%	9.1%	21.8%
First Potteries	43.8%	52.5%	3.8%	30.9%	36.1%	29.1%	3.9%	17.1%	53.8%	10.1%	19.0%
First South Coast	39.0%	55.7%	5.2%	23.4%	40.7%	31.1%	4.8%	16.4%	54.0%	9.2%	20.4%
GA - Bluestar	37.5%	58.3%	4.2%	27.7%	42.8%	24.5%	5.0%	16.1%	58.5%	6.0%	19.4%
GA - Brighton & Hove	38.7%	54.8%	6.5%	24.3%	42.4%	26.8%	6.6%	14.4%	51.8%	11.6%	22.2%
GA - Headingham & Chambers	38.2%	57.5%	4.3%	24.6%	18.1%	53.0%	4.3%	19.3%	58.1%	10.4%	12.3%
GA - Metrobus	39.5%	52.9%	7.5%	18.7%	44.9%	29.2%	7.2%	16.1%	53.8%	9.3%	20.8%
GA - Oxford P&R	46.1%	48.5%	5.4%	23.9%	51.7%	19.0%	5.4%	13.4%	53.6%	8.0%	25.1%
GA - Plymouth CityBus	41.0%	54.8%	4.1%	24.2%	39.0%	32.9%	4.0%	17.1%	52.5%	10.4%	20.0%
GA - Salisbury Reds	35.0%	62.0%	3.0%	17.7%	38.4%	41.3%	2.7%	18.7%	54.5%	11.5%	15.2%
GA - Southern Vectis	45.0%	51.9%	3.1%	21.1%	20.9%	54.9%	3.1%	13.6%	53.1%	8.0%	25.3%
GA - Thames Travel	43.5%	52.7%	3.7%	24.4%	44.8%	27.1%	3.7%	16.9%	54.8%	12.0%	16.3%
GA Anglia & GA Konectbus	40.0%	57.8%	2.2%	21.0%	38.5%	37.9%	2.5%	16.8%	57.6%	9.6%	16.0%
Reading Buses	40.1%	55.8%	4.1%	23.8%	46.9%	25.1%	4.2%	17.3%	52.5%	10.9%	19.3%
Stagecoach Cumbria &	43.3%	51.5%	5.1%	26.7%	30.4%	38.2%	4.7%	17.2%	55.2%	9.8%	17.8%

North Lancashire											
Stagecoach East (Cambridge Busway)	44.6%	53.9%	1.5%	36.5%	38.0%	23.7%	1.7%	21.2%	49.6%	13.4%	15.8%
Stagecoach Gloucestershire	41.3%	55.6%	3.1%	25.5%	41.5%	30.1%	2.9%	19.2%	54.4%	10.3%	16.1%
Stagecoach South	36.4%	58.9%	4.7%	28.3%	31.8%	35.4%	4.5%	19.2%	53.5%	10.4%	16.9%
Stagecoach South East	39.0%	54.5%	6.5%	19.3%	36.6%	38.1%	6.1%	16.6%	54.0%	10.3%	19.1%
Stagecoach South West	44.0%	52.5%	3.5%	21.6%	28.6%	46.3%	3.5%	18.3%	57.5%	3.7%	20.5%
Transdev Blazefield - Harrogate & District	48.0%	48.4%	3.7%	19.7%	41.1%	35.9%	3.4%	17.2%	54.1%	8.2%	20.5%

Target rim weights applied to Scottish PSUs

Areas in Scotland	Male	Female	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
First Buses Aberdeen	41.6%	49.5%	8.9%	24.8%	39.7%	26.8%	8.7%	19.0%	51.3%	10.5%	19.1%
First Buses Glasgow	39.9%	48.4%	11.7%	20.6%	40.9%	27.0%	11.5%	17.6%	51.6%	10.1%	20.7%
First Buses Scotland East	38.9%	57.0%	4.1%	17.0%	35.7%	43.7%	3.5%	17.9%	52.0%	9.1%	21.0%
*NESTRANS: Aberdeenshire Boost plus Stagecoach Highland & Bluebird/North Scotland**	39.6%	52.6%	7.8%	15.8%	40.4%	36.9%	6.9%	18.2%	71.4%	5.4%	5.0%
Stagecoach East Scotland (TACTrans and SESTrans)	39.0%	47.6%	13.3%	22.8%	28.8%	35.6%	12.7%	16.5%	55.6%	9.1%	18.8%
Stagecoach West Scotland (SPT and SWESTrans)	43.4%	48.0%	8.6%	22.9%	39.7%	29.9%	7.5%	17.7%	54.8%	9.3%	18.2%
Xplore Dundee	29.6%	51.8%	18.6%	20.9%	24.9%	35.9%	18.2%	17.9%	53.1%	9.7%	19.3%

* NB. The Aberdeenshire boost in Nestrans and the Stagecoach Highland & Bluebird / North Scotland PSUs were actually sampled separately. However, because all Stagecoach Highland & Bluebird / North Scotland routes were excluded from the Aberdeenshire area responses for the purpose of weighting, this left only five respondents in the "Aberdeenshire (ex. Stagecoach)" weighting cell – because Stagecoach dominates heavily in Aberdeenshire. This is not sufficient for applying weights, and the two PSUs were therefore merged for weighting.

Target rim weights applied to Welsh PSUs

Areas in Wales	Male	Female	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Wales – Mid *(ex. TrawsCymru routes)*	39.3%	55.6%	5.0%	25.2%	30.5%	38.9%	5.4%	18.8%	57.5%	10.1%	13.6%
Wales – North *(ex. TrawsCymru routes)*	39.4%	54.4%	6.2%	24.2%	36.2%	33.2%	6.4%	17.8%	55.3%	9.9%	17.0%
Wales - South East *(ex. Newport Bus, TrawsCymru routes)*	42.2%	52.4%	5.4%	18.9%	42.3%	34.0%	4.8%	16.3%	56.9%	9.8%	17.0%
Wales - South West *(ex. TrawsCymru routes)*	40.7%	53.1%	6.3%	25.6%	30.4%	38.9%	5.1%	16.4%	58.8%	9.6%	15.2%
Newport Bus	45.1%	46.8%	8.1%	14.1%	47.7%	31.3%	6.9%	17.5%	55.8%	10.3%	16.3%
Wales - TrawsCymru *(ex. weekends)*	42.6%	50.3%	7.0%	20.8%	36.7%	35.7%	6.8%	24.0%	64.3%	11.7%	0.0%
Wales - TrawsCymru *(weekends)*	42.2%	52.1%	5.7%	33.5%	39.8%	19.6%	7.1%	0.0%	0.0%	0.0%	100.0%

The average weights applied to respondents in each PSU, within each of the weight cells, are given in the tables below. Before settling on these final weights as shown (i.e. the degree to which the final weighted profile matched the target profiles in the tables above), average weights for each of these cells were observed. For a small number of day-parts within PSU cells, the average weight for all respondents in that cell was 4 or higher. In these cases, the cell was merged with the most similar other cell (e.g. a weekend cell would be merged with the weekday off-peak cell, a morning peak cell would be merged with an evening peak cell), and the weight for the combined cells applied. The aim was that no individual cell would have respondents with an average weight of above 4, to control the overall level of manipulation on the data.

Actual weights applied

Actual (average) rim weights applied in PTE Areas

PTE Authorities *(and boosts)*	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
West Midlands (ex. VMA routes)	0.67	1.55	0.91	1.37	1.28	0.45	1.04	1.27	0.86	1.32	1.00
Coventry VMA routes within West Midlands	0.81	1.37	1.05	1.49	1.32	0.46	1.18	2.02	0.77	0.88	1.71
Mersey and Halton (ex. QBN routes)	0.70	1.37	1.03	1.92	1.30	0.49	1.08	2.34	0.65	0.93	1.94
Mersey and Halton – QBN routes	1.12	1.30	1.03	1.21	1.16	1.16	1.10	1.47	1.00	1.00	2.53
South Yorkshire	0.74	1.66	1.10	2.48	1.40	0.42	1.18	1.18	0.83	1.18	1.74
Greater Manchester	0.73	1.49	0.98	1.34	1.39	0.45	1.02	1.19	0.81	0.85	1.62
Tyne and Wear	0.74	1.40	1.33	2.65	1.15	0.54	1.01	1.61	0.74	1.22	1.29
West Yorkshire	0.83	1.34	1.10	2.89	1.32	0.43	1.12	2.48	0.73	0.92	1.68

Actual (average) rim weights applied in Unitary Authorities

Unitary authorities	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Bournemouth	0.59	1.60	0.95	1.86	1.29	0.38	1.00	1.42	0.81	1.14	0.90
Cornwall (ex. Stagcoach SW, Plymouth Citybus)	0.99	1.26	1.18	1.59	1.15	0.89	1.02	2.43	1.04	1.20	0.77
Durham	1.11	1.29	1.06	1.76	1.23	1.00	1.14	1.77	1.05	1.62	1.22
Hull	0.66	1.61	1.05	2.55	1.41	0.37	1.10	2.05	0.72	1.81	1.01
Leicester City	1.08	1.21	0.84	1.27	1.21	0.99	1.00	1.93	0.99	1.00	1.14
Milton Keynes (ex. non-major operators)	0.64	1.19	1.50	1.86	1.09	0.36	1.50	1.02	0.78	1.90	0.78
Milton Keynes (non-major operators)	0.72	1.09	1.14	2.39	1.61	0.21	1.60	3.00	0.51	2.06	1.69
North East Lincolnshire	0.74	1.88	1.07	1.57	1.61	0.43	1.20	2.79	0.78	1.96	1.45
Northumberland	1.14	1.28	1.18	1.91	1.52	1.02	1.17	2.85	1.00	1.83	1.28
Poole (ex. First South Coast)	0.64	1.60	1.58	3.02	1.52	0.41	1.12	2.72	0.69	1.17	1.42
Swindon (ex. Salisbury Reds)	1.14	1.37	0.84	2.53	1.08	0.99	1.00	1.46	1.13	1.54	1.16
Tees Valley Partnership	1.00	1.33	1.00	1.43	1.17	1.00	1.01	1.25	1.05	1.32	1.14
WECA & N.Somerset	1.04	1.21	0.91	1.43	1.14	0.96	1.00	1.06	1.06	0.86	1.55
York	0.71	1.16	0.83	3.11	1.35	0.09	1.05	1.27	0.59	0.76	2.44

Actual (average) rim weights applied in Two Tier Authorities

Two tier authorities *(and boosts)*	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Essex *(ex. Hedingham & Chambers)*	0.69	1.41	1.57	2.66	1.52	0.43	1.57	2.31	0.62	2.03	1.81
Norfolk *(ex.Anglian Buses and Konectbus)*	0.63	1.33	0.87	3.05	1.21	0.43	1.10	2.86	0.59	0.87	1.29
Northamptonshire	0.63	1.68	1.44	3.45	1.25	0.27	1.00	1.38	0.88	0.92	0.88
Nottinghamshire *(ex. non-major operators)*	0.67	1.53	0.99	2.52	1.71	0.47	1.05	2.65	0.65	1.76	1.50
Nottinghamshire *(non-major operators)*	0.90	1.31	1.35	2.61	1.58	0.58	0.73	2.08	1.51	3.63	0.23
Oxfordshire *(ex. Reading Buses, Thames Travel, Oxford Bus Co. P&R)*	0.80	1.24	1.04	2.16	1.15	0.42	1.09	1.05	0.75	1.01	1.82
Staffordshire *(ex. First Potteries)*	0.72	1.29	0.98	2.34	1.36	0.50	1.03	2.48	0.67	1.63	1.25
Warwickshire	0.69	1.38	1.20	1.81	1.28	0.43	1.08	2.22	0.65	1.42	1.82
Worcestershire	1.12	1.24	1.16	2.11	1.25	1.01	1.11	2.16	1.02	1.50	1.00

Actual (average) rim weights applied for Operators

Operators	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Blackpool Transport	0.75	1.29	1.00	2.86	1.04	0.54	1.00	1.50	0.71	1.49	1.30
First Potteries	0.72	1.40	1.18	1.70	1.17	0.54	1.16	1.38	0.74	2.57	1.32
First South Coast	0.68	1.52	1.98	2.31	1.29	0.45	1.06	1.31	0.74	1.40	1.25
GA – Bluestar	0.65	1.49	1.00	1.83	1.28	0.36	1.06	1.12	0.79	1.20	1.15
GA - Brighton & Hove	0.88	1.41	1.01	2.49	1.19	0.55	1.05	2.40	0.84	1.15	1.29
GA - Headingham & Chambers	0.50	1.62	0.50	2.92	1.39	0.41	0.57	2.13	0.46	2.95	2.20
GA – Metrobus	0.98	1.47	0.99	1.34	1.33	0.97	1.00	1.24	1.09	1.17	1.17
GA - Oxford P&R	0.67	1.54	0.93	3.65	0.88	0.43	1.00	0.60	1.08	0.43	1.32
GA - Plymouth CityBus	1.06	1.26	1.00	1.29	1.24	1.00	1.00	1.35	1.00	1.23	1.42
GA - Salisbury Reds	1.14	1.31	0.67	2.29	1.33	0.96	1.13	3.05	1.11	0.73	1.09
GA - Southern Vectis	1.10	1.31	1.00	1.90	1.79	1.00	1.00	2.13	1.05	1.20	1.40
GA - Thames Travel	1.04	1.42	1.00	1.88	1.22	0.95	1.00	1.12	1.24	0.91	1.23
GA Anglia & GA Konectbus	1.03	1.46	1.00	3.48	1.27	0.84	0.50	2.32	1.19	1.53	0.64
Reading Buses	0.61	1.34	1.47	2.24	1.16	0.34	1.50	1.12	0.77	0.83	1.06
Stagecoach Cumbria &	0.72	1.44	1.04	2.73	1.26	0.54	1.09	2.62	0.70	1.36	1.26

North Lancashire											
Stagecoach East (Cambridge Busway)	0.78	1.36	1.00	2.77	1.08	0.48	1.00	1.44	0.76	1.57	1.31
Stagecoach Gloucestershire	0.62	1.50	1.00	2.35	1.63	0.39	1.00	2.00	0.65	1.05	1.79
Stagecoach South	0.64	1.52	0.98	2.19	1.39	0.39	1.00	1.35	0.67	1.02	1.52
Stagecoach South East	0.68	1.61	0.47	1.49	1.81	0.47	1.07	2.60	0.59	1.92	1.48
Stagecoach South West	1.13	1.42	1.56	2.68	1.16	1.06	1.56	2.32	1.09	0.04	3.00
Transdev Blazefield - Harrogate & District	0.47	1.54	0.75	2.92	1.60	0.38	1.08	1.40	0.62	3.00	1.18

Actual (average) rim weights applied to areas in Scotland

Areas in Scotland	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
First Buses Aberdeen	0.95	1.35	0.83	1.32	1.13	0.92	1.00	0.91	1.17	1.02	1.07
First Buses Glasgow	1.10	1.14	1.04	1.28	1.10	1.05	1.08	2.25	1.00	1.00	1.11
First Buses Scotland East	1.07	1.09	1.00	1.25	1.05	1.04	1.00	1.18	1.00	2.09	1.00
*NESTRANS: Aberdeenshire Boost plus Stagecoach Highland & Bluebird/North Scotland**	1.08	1.24	1.28	1.10	1.26	1.06	1.25	1.69	1.00	1.00	1.58
Stagecoach East Scotland (TACTrans and SESTrans)	1.09	1.30	1.01	1.51	1.10	1.07	1.02	2.10	1.05	1.10	1.07
Stagecoach West Scotland (SPT and SWESTrans)	1.00	1.10	1.03	1.13	1.01	1.01	1.06	1.14	1.00	1.26	1.00
Xplore Dundee	1.14	1.31	1.05	1.14	0.85	1.83	1.11	1.60	1.29	1.08	0.77

Actual (average) rim weights applied to areas in Wales

Areas in Wales	Female	Male	No res-ponse	16-25	26-59	60+	No res-ponse	AM peak	Off-peak	PM peak	Week-end
Wales – Mid *(ex. TrawsCymru routes)*	1.05	1.13	1.15	2.03	1.26	0.80	1.13	3.59	1.10	1.34	0.33
Wales – North *(ex. TrawsCymru routes)*	0.67	1.39	1.38	2.03	1.38	0.46	1.59	2.13	0.61	1.38	2.56
Wales - South East *(ex. Newport Bus, TrawsCymru routes)*	0.70	1.28	1.35	2.21	1.23	0.54	1.00	1.42	0.70	1.38	1.39
Wales - South West *(ex. TrawsCymru routes)*	1.04	1.45	1.50	1.55	1.40	1.00	1.00	1.65	1.09	1.23	1.10
Newport Bus	0.95	1.26	1.00	0.89	1.23	0.98	1.00	0.86	1.09	1.26	1.10
Wales - TrawsCymru *(ex. weekends)*	1.08	1.32	1.00	1.42	1.25	1.05	1.24	1.94	1.00	1.90	-
Wales - TrawsCymru *(weekends)*	0.60	1.55	0.95	1.30	1.38	0.36	1.00	-	-	-	0.95

The weighting efficiency after rim weights had been applied (and before the second stage of weighting described below) ranged from 35% for the Milton Keynes non-major operators boost, to 93% for Stagecoach West Scotland.

7.2 Weighting to proportion Primary Sampling Units within total survey dataset

Weighting was also used to proportion each PSU to the number of passenger journeys it represented within the total set of areas surveyed. Journey numbers for each local authority were sourced from DfT Bus Statistics, and the unweighted sample size for each PSU was 'grossed up' to this number. This meant that, with any analysis where results were aggregated, e.g. for a type of PSU (such as 'all PTEs'), the component PSUs within that aggregate made the appropriate contribution relative to each other.

While journey numbers for local authority areas were available from the DfT, journey numbers for Operator PSUs were derived, and in some cases provided by operators themselves. For operator journey volumes that were derived: from the sample universe supplied by ITO World, it was possible to determine the proportion of all journeys served by an individual operator within the local authorities where it operated, and therefore to estimate the journey volumes for an operator, as a proportion of the journey volumes published at local authority level by the DfT.

For some Operator PSUs in the Autumn 2017 survey, that PSU was the only (or main) coverage of bus services in its area (e.g. the survey of Blackpool Transport was the only coverage in the whole survey of the areas this operator serves). However, some Operator PSUs were effectively sample boosts on local authority PSUs which were also being surveyed already – such as GA Hedingham and Chambers as a boost on the Essex survey. In these cases, the same process was used to estimate the annual journey volume weights for the operator, but the same volume was also *deducted* from the journey volume weights for the respective local authority. This was necessary to ensure that the total journey volume weight for these local authorities was still proportionate to other PSUs, e.g. that the total journey volume weight for Essex (which was actually made up of the Essex survey plus the Hedingham and Chambers boost), matched the published figures for the number of journeys in Essex. The same principles applied to other types of booster samples, for example the boost of QBN routes in the Mersey (+ Halton) area and the boost of VMA routes in Coventry as part of the West Midlands area.

The following tables show the journey volume weightings applied to the PSUs selected within this wave's survey. Journey volumes are shown in thousands. The tables show only the weights which were informed by the DfT's published statistics, and / or derived using the methods outlined above. Where the weights were informed by operators themselves, this information has been redacted in the tables below since it is potentially commercially sensitive. More information can be provided on request following discussion with Transport Focus about how it will be used.

PTEs (and boosts)	Journeys ('000)*	Sample size (valid responses used in reported results)	Journey volume weight
West Midlands (ex. VMA routes)	234,497	2,324	100.9
Coventry VMA routes within West Midlands	30,240	874	34.6
Mersey and Halton (ex. QBN routes)	91,069	1,278	71.3
Mersey and Halton – QBN routes	20,368	857	23.8
South Yorkshire	100,667	1,585	63.5
Greater Manchester	201,346	1,881	107.0
Tyne and Wear	114,519	1,733	66.1
West Yorkshire	151,531	1,591	95.2

Unitary Authority	Journeys ('000)*	Sample size (valid responses used in reported results)	Journey volume weight
Bournemouth	17,513	465	37.7
Cornwall (ex. Stagcoach SW, Plymouth Citybus)	9,626	765	12.6
Durham	21,871	768	28.5
Hull	21,633	749	28.9
Leicester City	27,498	724	38.0
Milton Keynes (ex. non-major operators)	6,895	368	18.7
Milton Keynes (non-major operators)	2,735	277	9.9
North East Lincolnshire	7,005	479	14.6
Northumberland	8,587	483	17.8
Poole (ex. First South Coast)	10,309	512	20.1
Swindon (ex. Salisbury Reds)	11,514	936	12.3
Tees Valley Partnership	30,884	1,951	15.8
WECA & N.Somerset	70,006	1,313	53.3
York	16,736	535	31.3

Two tier authorities (and boosts)	Journeys ('000)*	Sample size (valid responses used in reported results)	Journey volume weight
Essex (ex. Hedingham & Chambers)	41,387	735	56.3
Norfolk (ex.Anglian Buses and Konectbus)	22,204	803	27.7
Northamptonshire	19,034	423	45.0
Nottinghamshire (ex. non-major operators)	26,220	936	28.0
Nottinghamshire (non-major operators)	3,576	368	9.7
Oxfordshire (ex. Reading Buses, Thames Travel, Oxford Bus Co. P&R)	34,230	1,112	30.8
Staffordshire (ex. First Potteries)	15,567	612	25.4
Warwickshire	15,363	342	44.9
Worcestershire	11,362	463	24.5

Operators not assigned to any authority areas	Journeys ('000)**	Sample size (valid responses used in reported results)	Journey volume weight
Blackpool Transport	7,674	539	14.2
First Potteries		637	
First South Coast		648	
GA – Bluestar	15,815	361	43.8
GA - Brighton & Hove	41,492	845	49.1
GA - Headingham & Chambers	2,805	327	8.6
GA – Metrobus	13,953	624	22.4
GA - Oxford P&R	2,902	276	10.5
GA - Plymouth CityBus	15,138	725	20.9
GA - Salisbury Reds	5,005	301	16.6
GA - Southern Vectis	8,007	290	27.6
GA - Thames Travel	4,386	402	10.9
GA Anglia & GA Konectbus	6,037	633	9.5
Reading Buses		825	
Stagecoach Cumbria & North Lancashire		470	
Stagecoach East (Cambridge Busway)		407	
Stagecoach Gloucestershire		445	
Stagecoach South		573	
Stagecoach South East		460	
Stagecoach South West		285	
Transdev Blazefield - Harrogate & District	2,436	356	6.8

** Source: Table BUS0109a - Passenger journeys on local bus services by local authority1,2: England, from 2016/17*

*** Source: information provided directly by operators*

Scotland	Journeys ('000)***	Sample size (valid responses used in reported results)	Journey volume weight
First Buses Aberdeen		459	
First Buses Glasgow		1,049	
First Buses Scotland East		537	
NESTRANS: Aberdeenshire Boost plus Stagecoach Highland & Bluebird/North Scotland	18,311	872	21.0
Stagecoach East Scotland (TACTrans and SESTrans)		487	
Stagecoach West Scotland (SPT and SWESTrans)		466	
Xplore Dundee		456	

Wales	Journeys ('000)***	Sample size (valid responses used in reported results)	Journey volume weight
Wales – Mid (ex. TrawsCymru routes)	4,430	556	8.0
Wales – North (ex. TrawsCymru routes)	20,943	677	30.9
Wales - South East (ex. Newport Bus, TrawsCymru routes)	51,188	1,527	33.5
Wales - South West (ex. TrawsCymru routes)	16,556	703	23.6
Newport Bus		554	
Wales - TrawsCymru (ex. weekends)	1,973	497	4.0
Wales - TrawsCymru (weekends)	578	351	1.6

****Source: DfT Bus Statistics data 2016/17 and operator information*

7.3 Weighting total

The final weight was the multiplication of the two component weights as shown below:

Final weight = demographic x journey millions.

7.4 Survey accuracy

This research was designed to ensure robust sample sizes for analysis, at PSU level and in some cases among specific passenger groups within PSUs (e.g. commuters versus leisure travellers). As the survey was conducted with a sample of bus users in each PSU (as opposed to all of them), there could be some differences in results compared to a census of the whole population.

We can be 95% certain that the actual figure (in the universe of all bus journeys) falls within a certain range of the survey figure. The percentages within the tables below represent the typical error variance, for a result of around 80% (results nearer to 0% or 100% are statistically more accurate than results nearer to 50%). This level of accuracy is for analysis run on the Autumn 2017 wave only; where possible, combining waves together for analysis will increase robustness and therefore accuracy.

PTEs *(and boosts)*	**Typical error variance on a result of around 80%**
Coventry VMA routes within West Midlands	3.1
Greater Manchester	2.1
Mersey and Halton	2.0
Mersey and Halton – QBN routes	3.1
South Yorkshire	2.5
Tyne & Wear	2.2
West Midlands	1.6
West Yorkshire	2.6

Unitary Authorities	**Typical error variance on a result of around 80%**
Bournemouth	4.4
Cornwall	3.1
Durham	3.2
Hull	3.5
Leicester City	3.2
Milton Keynes (rep sample)	4.3
Milton Keynes (non-major operators)	7.9
North East Lincolnshire	4.6
Northumberland	4.7
Poole	4.9
Swindon	3.0
Tees Valley Partnership	1.9
WECA & N.Somerset	2.4
York	5.2

Two tier authorities *(and boosts)*	**Typical error variance on a result of around 80%**
Essex	3.7
Norfolk	3.2
Northamptonshire	5.1
Nottinghamshire (non-major operators)	6.3
Nottinghamshire (rep sample)	2.9
Oxfordshire	2.6
Staffordshire	3.5
Warwickshire	5.1
Worcestershire	5.7

Operators	**Typical error variance on a result of around 80%**
Blackpool Transport	4.2
First Potteries	3.8
First South Coast	3.7
GA - Bluestar	4.9
GA - Brighton & Hove	3.3
GA - Headingham & Chambers	6.7
GA - Metrobus	3.4
GA - Oxford P&R	6.5
GA - Plymouth CityBus	3.2
GA - Salisbury Reds	5.6
GA - Southern Vectis	6.7
GA - Thames Travel	4.4
GA Anglia & GA Konectbus	4.0
Reading Buses	3.2

Stagecoach Cumbria & North Lancashire	4.7
Stagecoach East (Cambridge Busway)	5.1
Stagecoach Gloucestershire	4.8
Stagecoach South	3.8
Stagecoach South East	4.6
Stagecoach South West	6.1
Transdev Blazefield - Harrogate & District	5.5

Scotland	**Typical error variance on a result of around 80%**
First Buses Aberdeen	3.9
First Buses Glasgow	2.6
First Buses Scotland East	3.6
Stagecoach East Scotland (TACTrans and SESTrans)	3.9
Stagecoach Highland & Bluebird / North Scotland (HiTrans and NESTrans)	2.8
Stagecoach West Scotland (SPT and SWESTrans)	3.8
Xplore Dundee	4.0

Wales	**Typical error variance on a result of around 80%**
Wales - Mid	3.8
Wales - North	3.7
Wales - South East	2.1
Wales - South West	3.4
Wales - TrawsCymru	3.1

8 Online methodology: Impact of changes to the survey method

8.1 Impact of changes to survey method on respondent profile

Prior to the Autumn 2015 wave of the BPS, only paper questionnaires were offered to passengers. It was known that younger people (especially males) were under-represented in this method. Linked to this imbalance in respondent profile, commuters and fare-paying passengers were also typically under-represented in favour of more leisure, off-peak travellers. Pilot and other work had indicated that moving to the dual paper / online method could improve the response from these under-represented groups, thus improving the overall quality of the survey sample. From Autumn 2015 a dual online and paper method was used.

The tables below show the proportions of respondents in Autumn 2015, 2016 and 2017, who were recruited to the survey and who completed the survey on paper and online. In summary, a little under one in ten received a questionnaire using an online method and there was a slight decrease to this in 2017 compared to 2016 and 2015. This is also accompanied by a slightly lower online response overall in 2017. These are partly real decreases, and partly driven by variances in the PSUs covered: in particular, Wales and Scotland generally had lower online take-up than many English PSUs. .

Method of questionnaire distribution	***2015***	***2016***	***2017***
Paper questionnaires handed out	90%	89%	92%
Email addresses collected	11%	11%	8%

Method of survey completion	***2015***	***2016***	***2017***
Respondents completing survey on paper	92%	93%	95%
Respondents completing survey online	8%	7%	5%

The tables below demonstrate the profile of respondents completing a questionnaire using each method. In summary this shows a slightly greater proportion of younger people (16-25 year olds), males, fare-payers and peak passengers completing online. That is, the online option appears to be encouraging response from under-represented and harder to reach groups. While this is true through 2015, 2016 and 2017, in the latest survey there appears to be a slight flattening out of the age profile of online respondents, which is to be expected as the wider use of smartphones and tablets in particular continues to increase among all ages.

Profile of respondents by method	2015		2016		2017	
	Paper	**Online**	**Paper**	**Online**	**Paper**	**Online**
16-25	14%	34%	13%	36%	12%	31%
26-59	34%	49%	34%	46%	31%	46%
60+	48%	16%	48%	16%	51%	22%
Not stated	5%	2%	5%	1%	5%	1%
Male	32%	37%	32%	38%	32%	37%
Female	62%	61%	63%	60%	62%	61%
Not stated	6%	2%	5%	1%	6%	2%
Free pass holder	51%	17%	50%	19%	54%	22%
Fare payer	47%	83%	47%	81%	44%	77%
Not stated	2%	0%	3%	0%	2%	1%
Peak time journeys	21%	32%	20%	26%	19%	29%
Off-peak time journeys	79%	68%	80%	74%	81%	71%
Commuter	33%	57%	32%	57%	31%	54%
Non-commuter	62%	43%	63%	43%	69%	46%

Following the introduction of online completion as an option in the 2015 study, additional steps were taken to encourage response via the online questionnaire, in 2016 and 2017. These are detailed in the next section.

8.2 Increasing the contribution of online surveys

Following the introduction of the online questionnaire distribution method in Autumn 2015, a number of steps were taken aimed at improving online take up and response rate:

- Small changes to the questionnaire to reduce 'drop-out' once respondents began the survey
- Efforts made to reduce the time between recruitment (when a passenger was approached on board a bus and provided their email address) and survey access (when that passenger actually received an email invitation with a link to the survey), to increase likelihood of response.

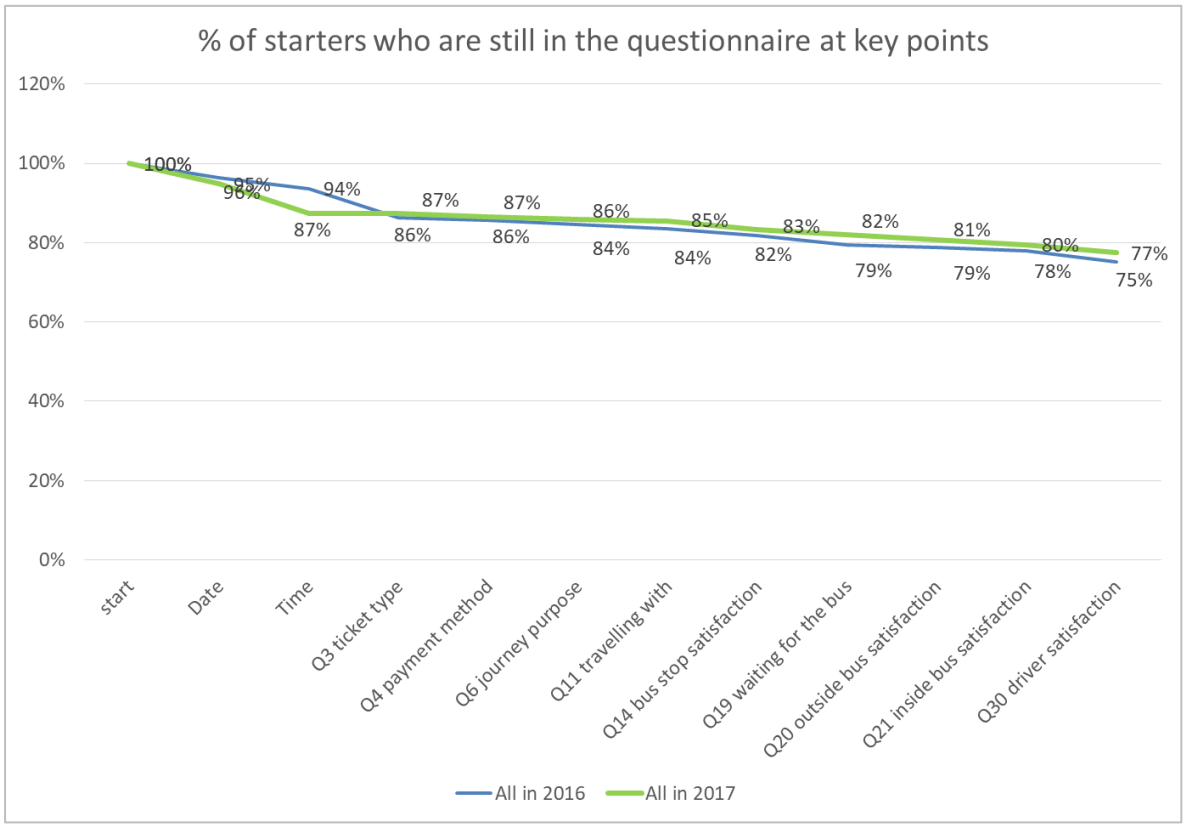
Reducing drop out

The graph over the page shows those who completed key questions as a proportion of those who began the online survey, effectively showing where drop-out was most prevalent. This compares 2016 and 2017 data. A previous comparison of 2016 to 2015 showed that efforts to improve drop outs at key drop out questions in 2015 had been successful to some extent, with the drop-out rate more gradual over the whole survey[5]. Small additional changes in 2017 had a very small impact overall, probably indicating that the survey is becoming as effective as possible in this respect (some level of drop out is to be expected in all online questionnaires).

See the questionnaire in Appendix 1 to view full question wording.

[5] *The questionnaire shown in the Appendix is an example of the paper version. This does not include a question on the date of the passenger's journey, because this information can be confirmed by the fieldworker at the point of recruitment (they write the date in the top right hand corner of the questionnaire). The question about the date of the journey is included on the online questionnaire only. The survey programme gives the date the respondent is expected to have been recruited (from sample information), but the respondent is asked to verify and amend this, in case of last-minute changes to fieldwork which, in isolated cases, may not have been accounted for in the survey programme by the time of completion.*

% of online starters who are still in the survey at key points in the questionnaire:



(The main changes made to the questionnaire to reduce drop out in 2016 (where largest drop out was around entering the time and the ticket type) were:

- An overall upgrade of the look and feel of the questionnaire (different software was used in 2016 which allowed some further enhancements to be made)
- Shortening of introductory text, specifically with smart phone completion in mind which avoids an overly busy screen or extensive scrolling
- Provision of further explanation on how to complete the questionnaire using a 24 hour clock system and providing an example
- The ticket type question had four 'over codes' and detailed ticket types within each. By splitting the online version of this question into two parts (overcodes first, then relevant detailed codes) this was hoped to provide an easier to understand question and reduce drop-out.

The latter improvement appears to have worked well. Further small improvements to the time question were made for 2017 and the graph above does show that this had a small positive impact. However as an earlier question, it is likely that drop-off was not because of the question format but simply because it was an early question (where we typically see drop out in online surveys more generally).

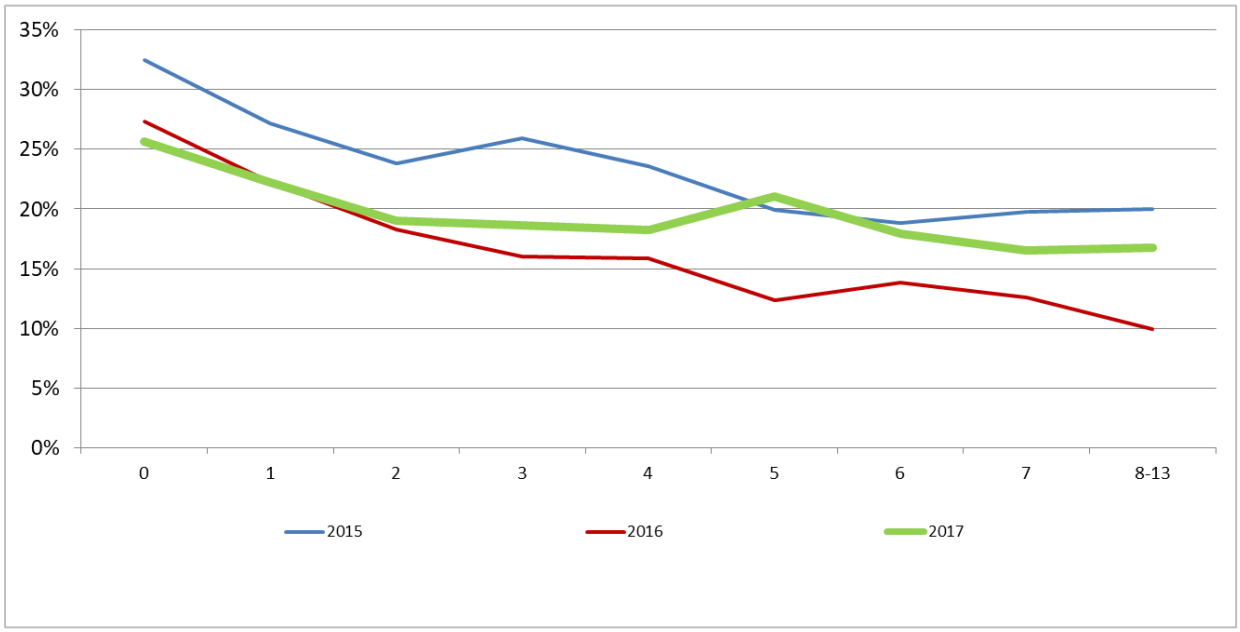
Increasing response rate

Survey invitations were sent to respondents as soon as possible after recruitment; in most cases this could be done within one or two days, and this was made possible by collecting almost all email addresses electronically in 2017, where a large proportion had been collected using paper forms in previous waves. (The small number of recruits which were recorded on paper forms in 2017 were in cases where there was a problem with the fieldworker's device, or where they did not feel secure using a smartphone or tablet for this purpose, in certain areas and typically late in the evening).

The aim was for invitations to be sent on the same day or the next day following recruitment (if recruitment fell late on a Friday or on a weekend, the survey invitations would follow on Monday). If a respondent had not completed the survey two days after the invitations, a reminder email was sent.

The following graph shows the proportion of all recruits who went on to fully complete the survey, by the length of time between recruitment and receiving the email invitation. It shows that, of respondents who received the actual survey invitation on the same day as they were first approached by the fieldworker, 26% went on to complete the survey. Of respondents who received their survey invite the day after they were first approached, 22% completed it, and so on. Clearly, the sooner a respondent receives the survey invitation, the more likely they are to complete it (although this does appear to flatten after some time).

Response rate time between email invite and recruitment (days):



Because receiving the survey invitation promptly is so important, efforts were made in the Autumn 2016 survey to reduce the time taken for this, compared to the Autumn 2015 wave.

In all, the average gap between recruitment and receiving the survey invitation was 4.9 days in 2015 (with 60% of recruits being contacted within three days). In 2016 the gap was 4.1 days on average (with 67% being contacted within three days), and in 2017 was 4.0 (with 64% being contacted within 3 days). The main incremental improvement in 2017, compared to 2016, was the full roll-out of electronic data capture for recruits' email addresses.

9 Other analysis: key drivers of satisfaction

The purpose of Key Driver Analysis

The headline measure on the Bus Passenger Survey is the level of passenger satisfaction with the overall journey, which provides a simple summary for the journey as a whole. Transport authorities and operators are, of course, also interested to understand how they might improve overall satisfaction, and where they should focus attention and resources to achieve this. Key Driver Analysis assists with this, by identifying elements of the journey experience which have the greatest impact upon the overall journey satisfaction rating that passengers give, using the other question ratings from the survey.

Questions included in the Key Driver Analysis

The headline measure is passenger satisfaction with the overall journey, taken from the core survey question:

Q31. Overall, taking everything into account from the start to the end of the bus journey, how satisfied were you with your bus journey?

The questions that were then tested for the impact they have on this overall satisfaction were taken from the core survey questions (see more detail in the questionnaire provided in Appendix 1):

- Q13 and Q14 (bus stop ratings)
- Q19 (waiting time and punctuality)
- Q20 (boarding the bus)
- Q21 and Q26 (on the bus)
- Q30 (the driver and quality of driving)
- Q33 (value for money).

How the Key Driver Analysis was conducted

A series of statistical techniques were used, with three stages:

Stage 1: Selecting fare paying passengers (filtering the data)

Transport Focus believes that value for money is important to passengers and so it was important to test it as one of the potential influencers of overall journey satisfaction. This meant that the analysis could only be conducted using the survey responses from fare-

paying passengers. Responses for non-fare paying passengers were therefore removed from the data before carrying out the Key Driver Analysis.

Stage 2: Categorising the main survey questions into themes (factor analysis)

This stage was first introduced for the Autumn 2016 survey and has been repeated in 2017. The aim of this stage was to use a statistical technique (factor analysis) to group together individual questions from the survey into themes, based upon the way in which passengers respond to the questions. In previous waves (and in Transport Focus' other Passenger Surveys) there had usually been some degree of overlap between the responses that passengers give to the different satisfaction questions in the survey. For example, the survey asked about waiting time and punctuality in two separate questions, and while these questions have a slightly different meaning, there have often been similarities between the responses that passengers give to each. In such an example, we might regard this as being responded to by passengers as one theme, even though we have asked them two questions.

This is a common phenomenon when it comes to market research data, partly because of genuine overlap in topics covered and partly due to questionnaire effects, where responders to a survey might respond in a similar way across multiple questions or topics.

All the responses from fare payers in the Autumn 2017 Bus Passenger Survey were taken together, and used to identify the different themes, using the factor analysis technique. From this analysis we identified ten themes, which are shown in the table below; we then used these themes, rather than the individual questions, in the next stage of the analysis.

Theme (factor)	**Questions**
Bus driver	Nearness to kerb
	Appearance
	Greeting/welcome
	Helpfulness/attitude
	Time given to get to seat
	Smoothness/freedom from jolting
	Safety of driving
On bus environment and comfort	Availability of seating or space to stand
	Comfort of the seats
	Amount of personal space

	Provision of grab rails to stand/move within the bus
	Temperature inside the bus
	Personal security
Bus stop safety and information	General condition/standard of maintenance
	Freedom from graffiti/vandalism
	Freedom from litter
Boarding the bus	Route/destination information on outside of bus
	Ease of getting onto/off bus
	Time taken to board
Timeliness	Waiting time
	Punctuality
Bus cleanliness and information on-board	Exterior cleanliness/condition
	Interior cleanliness/condition
	Information provided inside bus
Access to the bus stop	Distance from journey start
	Convenience/accessibility
Bus stop safety and information	Information provided at stop
	Personal safety at stop
Journey time	On-bus journey time
Value for money	Value for money (asked of fare payers only)

Stage 3: Identifying how much of an impact each of these themes had on the overall journey satisfaction question (regression analysis)

We used a second statistical technique (Multiple Linear Regression) to identify how much of an impact each of the themes had on the overall journey satisfaction question. While the generation of the themes was based upon all the responses from fare-payers in the Autumn 2017 surveys, the impact scores for each of the themes was calculated from the responses of passengers in each PSU only.

The analysis was performed in two stages:

- First, the drivers of satisfaction were identified. 'Satisfied' passengers were defined as those who were either very or fairly satisfied with their journey. Dissatisfied customers were classified as those saying either very or fairly dissatisfied, or those saying neither/nor (thus this latter group are perhaps more accurately described as 'not

satisfied'). The regression took into account all five points of the satisfaction scale, and was run using scalar driver variables (sometimes called independent variables) – this meant that moving any one point up the five point scale was assumed to have the same impact.

- Once the drivers of satisfaction had been determined, the 'non-satisfied' (very dissatisfied, fairly dissatisfied and neither/nor respondents) were removed, and a new regression analysis was run to determine which factors drove people to be very satisfied (rather than either fairly or very satisfied), again using scalar driver variables.

The two parts of the analysis therefore indicated, firstly, which service aspects should be improved in order to provide an adequate overall journey experience (i.e. one which is at least satisfactory) and secondly, which service aspects should be improved in order to provide a genuinely good experience.

For Autumn 2017, the key driver analysis typically explained around a third of the variance in overall journey satisfaction, with a small amount of variation for individual PSUs. (The R^2 value was, on average, 0.34 for the drivers of satisfaction, and 0.35 for the drivers of very satisfied).

Why did we change the way we conduct the Key Driver Analysis from Autumn 2016?

Each year we review all elements of the survey and see what lessons we can learn from the previous year. Our latest review identified this opportunity to improve the way in which we conduct the Key Driver Analysis; partly, as being a better approach in its own right (with such a large number of questions being included in the analysis, reducing this into a smaller number of themes is more robust), and partly to respond to queries from stakeholders as to why a question could be identified as having a large impact upon overall journey satisfaction in one year, but not in the next (and the effect of this upon investment decisions).

The theming process (using factor analysis) removed the degree of overlap that could exist between individual questions, as each theme was independent of the others, i.e. they were responded to in different ways. The outputs from this new approach to the Key Driver Analysis were therefore likely to be more stable year on year, making it easier to identify where to focus attention or the resources required to improve, or maintain, overall journey satisfaction. Furthermore, in reality, it may well be simpler to address a theme rather than an individual measure, for example, fixing/cleaning bus stops could cover a range of the individual aspects related to the 'bus stop condition' theme.

Appendix 1: Questionnaire used in BPS Autumn 2017

Core version as used in PTE (metropolitan) areas shown as example

491026 001

transportfocus

1 7
DATE (DD/MM/YY)
Sep-Nov 2017

Bus Passenger Survey

Transport Focus is the official, independent consumer watchdog that represents rail, bus, and tram passengers.

To help us represent the views of passengers in your area we would appreciate a little of your time to complete this survey. **It asks about the bus journey you made when given this questionnaire.** Towards the end, there are also questions to record your general experiences too.

Bus companies, local authorities and governments pay close attention to the survey's results. These results provide Transport Focus with the evidence to seek improvements on behalf of passengers.

Completing the questionnaire

Please fill in the questionnaire after completing your journey.

Please tick only one box per question, unless directed otherwise.

Return it to us in the reply paid envelope provided.

WHEN ANSWERING:
CONSIDER ONLY THE JOURNEY YOU MADE WHEN GIVEN THIS QUESTIONNAIRE

1 About your journey

Q1 Please enter the route number or letter of the bus you boarded

Q2 Please fill in the time that you boarded the bus:
Please use the 24 hour clock e.g. 5.25pm is 17:25.
Enter your time of boarding into the boxes as shown

1 7 : 2 5

Q3 What type of ticket did you use for that journey?

A free pass or free journey
- Elderly person's pass ☐
- Disabled person's pass ☐
- Complimentary/free ticket ☐

Single/return/multi tickets
- Standard single ticket ☐
- Standard return ticket ☐
- From a multi-ticket/carnet ☐
- Discounted single/return ticket ☐

A day pass - valid for
- That bus company only ☐
- Across bus companies ☐
- Buses and other modes of transport ☐

A pass/season ticket for a longer period (e.g. weekly, monthly) - valid for
- That bus company only ☐
- Across bus companies ☐
- Buses and other modes of transport ☐

Other ☐

For office use only:
#10 NO007638

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Your opinion counts!
transportfocus

Q4 On boarding the bus, did you?

Use cash to buy a ticket or pass ☐
Use a contactless payment method (e.g. credit or debit card, Apple Pay or Android Pay) to buy a ticket or pass ☐
Show the driver a paper ticket or pass ☐
Place your smartcard onto the fare machine ☐
Show the driver or scan a ticket displayed on your smart phone ☐

Q5 If you bought your ticket or pass before getting on the bus, how did you do this?

From a bus driver before that day ☐
Direct from the bus company using their app ☐
Direct from the bus company via website, phone call, or some other way ☐
From another website or app ☐
From a travel centre/bus station/booking office ☐
From a local shop or post office ☐
Arrangement through work/college ☐
Other ☐
Did not buy your ticket before boarding the bus ☐

Q6 What was the main purpose of your bus journey?

Travelling to/from work ☐
Travelling to/from education (e.g. college, school) ☐
Shopping trip ☐
Visiting friends or relatives ☐
Leisure trip (e.g. day out) ☐
Other ☐

Q7 What was the main reason you chose to take the bus for that journey?

Cheaper than the car ☐
More convenient than car (e.g. parking) ☐
Cheaper than other transport ☐
More convenient than other transport ☐
Preferred bus to walking/cycling ☐
Other reason ☐
Didn't have the option of travelling by another means ☐

Q8 Did you use any other form of transport as part of your journey?
(Please do not count walking as a form of transport)

Yes ☐
No ☐

Q9 What was the weather like when you made your journey, was it?

Dry ☐
Light rain ☐
Heavy rain ☐
Snow ☐

Q10 Please tell us whether your bus journey was …

On a single-decker bus ☐
Downstairs on a double-decker bus ☐
Upstairs on a double-decker bus ☐

Q11 Were you travelling with …
(Please tick all that apply)

Heavy/bulky luggage ☐
Shopping bags ☐
A shopping trolley ☐
A pushchair, buggy or pram ☐
A folding bicycle ☐
A dog ☐
A helper ☐
A mobility scooter ☐
A wheelchair ☐
None of the above ☐

2 About the bus stop where you boarded the bus

Q12 Which of the following were provided at the stop where you caught the bus?
(Please tick all that apply)

A shelter ☐	Information on types of tickets available ☐
Seating ☐	A route map ☐
Electronic display showing bus arrival times ☐	Lighting ☐
A timetable ☐	A mobile text code for bus arrival times ☐
Information on fares ☐	

Q13 Thinking about the bus stop itself, how satisfied were you with the following?

	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
Its distance from your journey start e.g. home/shops	☐	☐	☐	☐	☐	☐
The convenience/accessibility of its location within that road/street	☐	☐	☐	☐	☐	☐
Its general condition/standard of maintenance	☐	☐	☐	☐	☐	☐
Its freedom from graffiti/vandalism	☐	☐	☐	☐	☐	☐
Its freedom from litter	☐	☐	☐	☐	☐	☐
The information provided at the bus stop	☐	☐	☐	☐	☐	☐
Your personal safety whilst at the bus stop	☐	☐	☐	☐	☐	☐

Q14 Overall, how satisfied were you with the bus stop?

Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
☐	☐	☐	☐	☐	☐

3 Waiting for the bus

Q15 How long did you wait for your bus?
(Please write the time in minutes)

Q16 Did you check any of the following to find out when the bus was meant to arrive?
(Please tick all that apply)

	Before you left for the bus stop	At the bus stop
Paper timetable	☐	☐
Online timetable	☐	☐
Live bus locator/timings (e.g. via mobile app/web)	☐	☐
Disruption updates (e.g. on Twitter/Facebook)	☐	☐
Electronic display at the bus stop		☐
Other	☐	☐

If you did not check before leaving, or at the bus stop, why was this?

Knew service was frequent ☐	Didn't have time ☐
Already knew arrival times ☐	Other ☐
Could not find the information ☐	

Q17 How long did you expect to wait for your bus?
(Please write the time in minutes)

☐☐

Q18 Thinking about the time you waited for the bus, was it …?

Much longer than you expected	A little longer than you expected	About the length of time you expected	A little less than you expected	Much less than you expected
☐	☐	☐	☐	☐

Q19 How satisfied were you with each of the following?

	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
The length of time you had to wait for the bus	☐	☐	☐	☐	☐	☐
The punctuality of the bus (arriving on time)	☐	☐	☐	☐	☐	☐

4 On the bus

Q20 Thinking about when the bus arrived, please indicate how satisfied you were with the following?

	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
Route/destination information on the outside of the bus	☐	☐	☐	☐	☐	☐
The cleanliness & condition of the outside of the bus	☐	☐	☐	☐	☐	☐
The ease of getting onto and off of the bus	☐	☐	☐	☐	☐	☐
The length of time it took to board the bus	☐	☐	☐	☐	☐	☐

Q21 Thinking about whilst you were on the bus, please indicate how satisfied you were with the following?

	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
The cleanliness and condition of the inside of the bus	☐	☐	☐	☐	☐	☐
The information provided inside the bus	☐	☐	☐	☐	☐	☐
The availability of seating or space to stand	☐	☐	☐	☐	☐	☐
The comfort of the seats	☐	☐	☐	☐	☐	☐
The amount of personal space you had around you	☐	☐	☐	☐	☐	☐
Provision of grab rails to stand/move within the bus	☐	☐	☐	☐	☐	☐
The temperature inside the bus	☐	☐	☐	☐	☐	☐
Your personal security whilst on the bus	☐	☐	☐	☐	☐	☐

Q22 Did you get a seat on the bus?

Yes - for all of the journey ☐
Yes - for part of the journey ☐
No - but you were happy to stand ☐
No - but you would have liked a seat ☐

Q23 Did other passengers' behaviour give you cause to worry or make you feel uncomfortable during your journey?

Yes ☐ No ☐

If yes: **Which of the following were the reason(s) for this?** *(Please tick all that apply)*

Passengers drinking/under influence of alcohol ☐
Passengers taking/under influence of drugs ☐
Abusive or threatening behaviour ☐
Rowdy behaviour ☐
Feet on seats ☐
Music being played loudly ☐
Smoking ☐
Graffiti or vandalism ☐
Other ☐

Q24 How long was your journey on the bus?
(Please write the time in minutes)

Q25 How long did you expect your journey on the bus to take?
(Please write the time in minutes)

Q26 How satisfied were you with the length of time your journey on the bus took?

Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
☐	☐	☐	☐	☐	☐

Q27 Was the length of time your journey took affected by any of the following?
(Please tick all that apply)

- Congestion/traffic jams ☐
- Road works ☐
- Bus driver driving too slowly ☐
- Poor weather conditions ☐
- The bus waiting too long at stops ☐
- Time it took passengers to board/pay for tickets ☐

Q28 Were any of these items of information present on the bus?

	Yes	No	Don't know
A map of the bus route/journey times	☐	☐	☐
Audio announcements e.g. saying the next bus stop	☐	☐	☐
An electronic display e.g. showing the next bus stop	☐	☐	☐
Information about tickets/fares	☐	☐	☐
A timetable	☐	☐	☐
Details of how to contact the bus company, for example, to make a complaint or find out information	☐	☐	☐

Q29 Thinking about the driver, please indicate how satisfied you were with the following?

	Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
How near to the kerb/stop the bus stopped	☐	☐	☐	☐	☐	☐
The driver's appearance	☐	☐	☐	☐	☐	☐
The greeting/welcome you got from the driver	☐	☐	☐	☐	☐	☐
The helpfulness and attitude of the driver	☐	☐	☐	☐	☐	☐
The time the driver gave you to get to your seat	☐	☐	☐	☐	☐	☐
Smoothness/freedom from jolting during the journey	☐	☐	☐	☐	☐	☐
The safety of the driving (i.e. appropriateness of speed, driver concentrating)	☐	☐	☐	☐	☐	☐

5 Your overall opinion of the journey you made when given this questionnaire

Q30 Overall, taking everything into account from start to end of the bus journey, how satisfied were you with your bus journey?

Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
☐	☐	☐	☐	☐	☐

Q31 If something could have been improved on your journey, what would it have been?

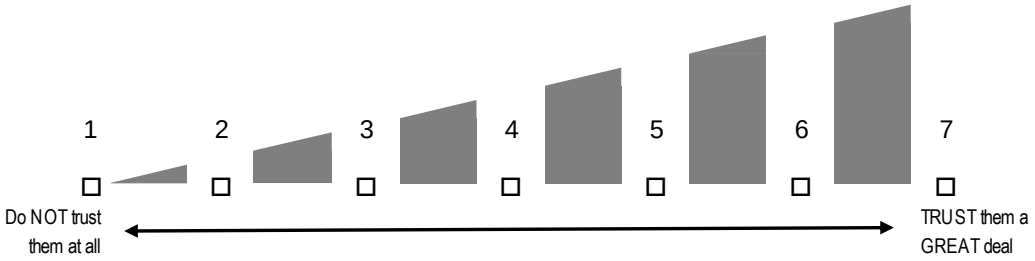
Q32 How satisfied were you with the value for money of your journey?

Very satisfied	Fairly satisfied	Neither satisfied nor dissatisfied	Fairly dissatisfied	Very dissatisfied	Don't know/no opinion
☐	☐	☐	☐	☐	☐

Q33 What had the biggest influence on the 'value for money' rating you gave in the previous question?

- The cost for the distance travelled ☐
- The cost of the bus versus other modes of transport ☐
- The fare in comparison to the cost of everyday items ☐
- Comfort/journey quality for the fare paid ☐
- A reason not mentioned above ☐

Q34 All things considered, how much do you trust the bus company that operated the bus you used for this journey? *(Please tick one box only)*



6 Your opinion of bus travel in your local area

WHEN ANSWERING THIS SECTION PLEASE CONSIDER BUS SERVICES GENERALLY (NOT JUST THE JOURNEY YOU MADE WHEN GIVEN THIS QUESTIONNAIRE)

Q35 How would you rate your local bus services for the following?

	Very good	Fairly good	Neither good nor poor	Fairly poor	Very poor
Ease of getting to local amenities (e.g. shops, hospitals)	☐	☐	☐	☐	☐
Connections with other forms of public transport (e.g. trains)	☐	☐	☐	☐	☐
The frequency of services in your area	☐	☐	☐	☐	☐
The reliability of services in your area	☐	☐	☐	☐	☐

Q36 How often do you typically travel by bus?
(Please tick the closest to your frequency of bus use)

- 5 or more days a week ☐
- 3 or 4 days a week ☐
- Once or twice a week ☐
- Once a fortnight ☐
- Once a month ☐
- Less frequently ☐

7 About you

QA Are you?

Male ☐
Female ☐
Prefer another term ☐

QB In which age group are you?

16 to 18 ☐	35 to 44 ☐	65 to 69 ☐
19 to 21 ☐	45 to 54 ☐	70 to 79 ☐
22 to 25 ☐	55 to 59 ☐	80+ ☐
26 to 34 ☐	60 to 64 ☐	

QC Which of the following best describes your ethnic background?

White ☐
Mixed/multiple ethnic groups ☐
Asian or Asian British ☐
Black, African/Caribbean or Black British ☐
Chinese ☐
Arab ☐
Other ethnic group ☐

QD In terms of having a car to drive, which of the following applies?

You have a car available and don't mind driving ☐
You have a car available but prefer not to drive ☐
You don't have a car available ☐

QE How often are you able to ask someone else to drive you for local journeys?

All or most of the time ☐	You don't have anybody you can ask ☐
Some of the time ☐	Not applicable ☐

QF Are you affected by any physical or mental health conditions or illnesses lasting or expected to last 12 months or more? *(Please tick all that apply)*

No: None ☐

Yes: Vision (e.g. blindness or partial sight) ☐
Yes: Hearing (e.g. deafness or partial hearing) ☐
Yes: Mobility (e.g. only able to walk short distances or difficulty climbing stairs) ☐
Yes: Dexterity (e.g. difficulty lifting and carrying objects or using a keyboard) ☐
Yes: Learning or understanding or concentrating ☐
Yes: Memory ☐
Yes: Mental health ☐
Yes: Stamina or breathing or fatigue ☐
Yes: Socially or behaviourally (for example associated with autism, attention deficit disorder or Asperger's syndrome) ☐
A reason not mentioned above ☐

Does your condition/illness have an adverse affect on your ability to make journeys by bus?

Yes, a lot ☐	Yes, a little ☐	Not at all ☐

QG And finally, to help us get a better picture of bus services at a local level, it would be helpful if you could provide us with your home postcode.

If you provide it, this will be used to help understand bus usage and make improvements locally. Your postcode will not be used to identify you personally and will only be used for research purposes.

Please write in your home postcode here: | | | | | | | |

This survey is being undertaken for Transport Focus by BDRC Continental, an independent market research agency which adheres to the Market Research Society's code of conduct. You were handed this questionnaire by an interviewer working for Perspective Research Services, a part of BDRC Continental.

The information that you have provided on this questionnaire is subject to the Data Protection Act 1998 and will not be used to identify you personally. The data will only be used for research purposes. Any organisations receiving the data will also be subject to the same restrictions and obligations under the Data Protection Act 1998.

If you have any queries about this survey or how your data will be used please contact Jacqui Banerjee at BDRC Continental on 020 7490 9133.

If you would like to check that this survey is genuine, you can contact the Market Research Society on 0800 975 9596 or www.mrs.org.uk who will verify BDRC Continental's status as a legitimate market research organisation.

To find out more about the Bus Passenger Survey or Transport Focus' work visit our website or follow us on Twitter.
Web: www.transportfocus.org.uk
Twitter: @transportfocus

If you would be happy to participate in future research projects about the transport industry for Transport Focus please complete the contact details below:

Name:

Email address:

Thank you for completing this questionnaire.
You have made your opinion count

Please return it in the envelope provided or use the following Freepost address:

bdrc continental

Bus Passenger Survey
Perspective Research Services Ltd
FREEPOST (RTLU-YLTS-TGYY)
12-20 Baron Street
Angel, London N1 9LL

transportfocus

Appendix 2: PV2 models

The following models were used to estimate the number of unique passengers on board each bus service, from one end of its route to another.

Models were found to provide a better fit if the specific local authority area (or operator area) was used, than if the area type (PTE, Unitary, Two Tier) was used. Therefore where the specific local authority (or operator) area was surveyed in the previous year and thus had its own data, the specific area model was used. Where the local authority area was not surveyed previously and there was no specific model available, the relevant area type model was used. Similarly, if one of the "big five" operators was present in the area, a better model fit was found when the operator was factored into the model; therefore models were generated with and without this factor in order to provide the best estimates possible. In Autumn 2017, a further development was made to the operator factor, where it was found that some other large or dominant operators in certain areas (other than the "big five") could also be factored in to create a better model fit for those PSUs.

As such in Autumn 2017 there were six possible models.

The model for an area that had been surveyed before included a constant specific to that area, and then coefficients covering the time of day, duration of journey and operator. For an area that had not been surveyed before, the model was of the same structure but with coefficients depending upon the type of area (PTE, unitary, Two Tier).

	model number	**1**	**2**	**3**	**4**	**5**	**6**
	Basis	Area	Area Type	Area	Area Type	Area	Area Type
	big 5	Yes	Yes	No	No	No	No
	big5 or other dominant local	No	No	No	No	Yes	Yes
	Constant	29.81	29.81	29.81	29.81	29.81	29.81
Duration	30 minutes or less	-16.35	-16.10	-16.11	-15.06	-16.37	-16.87
	30 and up to 45 mins	-9.60	-9.91	-10.15	-10.09	-9.45	-9.31
	45 mins and up to one hour	0.51	0.05	0.60	0.31	0.22	0.19
	over 1 hour	15.06	15.46	15.26	14.85	15.16	15.34
Day-part	Evening peak	-4.88	-4.57	-5.17	-5.98	-5.29	-5.06
	Morning peak	-0.27	1.08	-0.76	0.69	0.41	0.88
	Offpeak	0.67	0.95	0.65	0.99	0.60	1.27
	Weekend	-0.11	-2.06	0.38	-1.36	-0.05	-2.91
Operator ("big 5")	Arriva	-6.43	-2.58	0.00	0.00	0.00	0.00
	First	-2.26	-3.88	0.00	0.00	0.00	0.00
	Go ahead	3.64	2.51	0.00	0.00	0.00	0.00
	Natex	9.04	13.15	0.00	0.00	0.00	0.00
	Other	-0.85	1.43	0.00	0.00	0.00	0.00
	Stagecoach	1.72	-1.53	0.00	0.00	0.00	0.00
Large operators (including "big 5" in areas where another of these other	big5plusArriva	0.00	0.00	0.00	0.00	-7.11	-3.46
	big5plusBlackpool Transport	0.00	0.00	0.00	0.00	-8.16	-17.53
	big5plusFirst	0.00	0.00	0.00	0.00	-0.78	-3.80
	big5plusGo-Ahead	0.00	0.00	0.00	0.00	3.11	2.16
	big5plusLothian Buses	0.00	0.00	0.00	0.00	35.24	37.80
	big5plusMcgills Bus Service	0.00	0.00	0.00	0.00	10.35	5.29
	big5plusNational Express	0.00	0.00	0.00	0.00	7.75	12.66
	big5plusNottingham City	0.00	0.00	0.00	0.00	-3.60	8.21

named large operators is also present)	Transport big5plusOther	0.00	0.00	0.00	0.00	-3.76	-2.57
	big5plusReading Buses	0.00	0.00	0.00	0.00	-8.16	-2.31
	big5plusStagecoach	0.00	0.00	0.00	0.00	2.45	-1.00
	big5plusTrent Barton	0.00	0.00	0.00	0.00	-8.16	3.37
Area type	PTE	0.00	0.92	0.00	1.87	0.00	1.42
	Scottish RTP	0.00	-7.14	0.00	-8.38	0.00	-10.10
	Two Tier	0.00	-2.59	0.00	-1.87	0.00	-2.70
	Unitary	0.00	3.18	0.00	2.43	0.00	3.95
Actual PSU	Anglian Buses	-4.43	0.00	-0.68	0.00	-4.11	0.00
	Blackpool Transport Services Ltd	-11.77	0.00	-12.32	0.00	-4.67	0.00
	Bluestar	-16.23	0.00	-12.85	0.00	-15.53	0.00
	Brighton & Hove	15.67	0.00	19.40	0.00	16.32	0.00
	Carousel Buses	-18.51	0.00	-14.30	0.00	-18.06	0.00
	Cornwall	3.32	0.00	1.11	0.00	2.28	0.00
	Durham	6.42	0.00	-0.13	0.00	7.26	0.00
	Essex	-25.23	0.00	-27.40	0.00	-26.40	0.00
	First Buses Glasgow	8.83	0.00	6.45	0.00	7.52	0.00
	First Buses Scotland East	-9.14	0.00	-11.59	0.00	-10.62	0.00
	First Potteries	-0.17	0.00	-2.32	0.00	-1.57	0.00
	First South Coast	-6.71	0.00	-9.09	0.00	-8.18	0.00
	HITRANS	-21.53	0.00	-20.62	0.00	-21.03	0.00
	Leicester City	-7.51	0.00	-14.39	0.00	-6.87	0.00
	Mersey	13.28	0.00	10.57	0.00	14.27	0.00
	Mersey & Halton Better Bus Area Boost	5.17	0.00	0.19	0.00	5.36	0.00
	Mersey QP	-0.93	0.00	-1.60	0.00	-1.26	0.00
	Metrobus	-6.36	0.00	-3.13	0.00	-5.86	0.00
	Milton Keynes Council	1.31	0.00	-2.93	0.00	2.75	0.00
	NESTRANS	-28.51	0.00	-30.80	0.00	-29.84	0.00
	Norfolk	10.11	0.00	9.72	0.00	10.31	0.00
	Northumberland	6.27	0.00	0.17	0.00	6.71	0.00
	Nottingham City	13.60	0.00	12.61	0.00	17.21	0.00
	Nottinghamshire	-1.13	0.00	-2.00	0.00	2.59	0.00
	Oxford P&R	-7.35	0.00	-3.54	0.00	-6.96	0.00
	Oxfordshire	-2.71	0.00	-0.09	0.00	-2.51	0.00
	Plymouth CityBus	10.78	0.00	14.42	0.00	11.54	0.00
	Reading Buses	2.75	0.00	1.96	0.00	9.89	0.00
	SESTRANS	14.56	0.00	13.95	0.00	-8.01	0.00
	South Yorkshire	-7.23	0.00	-7.62	0.00	-7.57	0.00
	Southern Vectis	-6.89	0.00	-3.36	0.00	-6.41	0.00
	SPT	-7.31	0.00	-8.86	0.00	-14.66	0.00
	Stagecoach East Midlands	3.99	0.00	6.03	0.00	3.48	0.00
	Stagecoach South East	1.42	0.00	3.09	0.00	0.67	0.00
	Stagecoach South West	-21.70	0.00	-20.61	0.00	-22.40	0.00
	Stagecoach West	-9.69	0.00	-7.97	0.00	-10.37	0.00
	SWESTRANS	-13.21	0.00	-12.75	0.00	-12.98	0.00
	TACTRAN	2.42	0.00	2.26	0.00	1.46	0.00
	Tees Valley Partnership	9.89	0.00	5.92	0.00	10.11	0.00
	TfGM	-4.66	0.00	-5.30	0.00	-5.91	0.00
	Tyne & Wear	-2.23	0.00	-0.40	0.00	-1.70	0.00
	WECA & N.Somerset	15.85	0.00	13.96	0.00	15.04	0.00
	West Midlands	4.60	0.00	10.86	0.00	6.00	0.00
	West Yorkshire	7.22	0.00	3.07	0.00	7.61	0.00
	Wiltshire & Dorset	0.33	0.00	4.03	0.00	0.63	0.00
	York CC	-4.66	0.00	-7.96	0.00	-4.31	0.00

Example, based on local authority area West Midlands:

- This specific area was covered in 2016 and therefore the specific area was able to be modelled. Some services in this area were run by "big five" operators (National Express). Therefore the West Midlands used model number 1
- In this case we started with the base assumption that all buses had 29.81 people on board (this was the constant)
- Then this figure was increased by 4.60 for all individual bus services for the fact that they were all in the West Midlands local authority area
- It was then increased or decreased depending on the other attributes of each bus; for instance:
    - If one whole journey for that bus service was less than 30 minutes in duration, it would be decreased by 16.35
    - If the bus service was also travelling in the morning peak it would be decreased by 0.27
    - If it was run by National Express it would be increased by 9.04
- In this case then, the 'passenger value' (PV2) for this bus service (i.e. the estimated total number of unique passengers on board throughout its journey) would be 26.83. That is [constant 29.81] + [West Midlands 4.60] – [<30mins 16.35] - [morning peak 0.27] + [National Express 9.04].

A hypothetical, similar journey (less than 30 minutes long, in the morning peak, run by National Express) but in a PTE area not surveyed in Autumn 2016 would have had a PV2 of 28.86. This is because it would have used model 2 (where the local authority area does not have its own specific data but the area type is known), and the values would be: [constant 29.81] + [PTE 0.92] – [<30mins 16.10] + [morning peak 1.08] + [National Express 13.15].