Bristol On-Bus Survey 2017

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Contents

Abstract

This report contains findings from a bus survey undertaken in 2017 of 1085 passengers on six routes in Bristol UK. The survey sought to understand: passenger perceptions of their bus experience, their travel time use, and perceptions surrounding the anticipated MetroBus service, as well as accessing buses using taxi-bus services. The survey was related to two other surveys: a largely similar study conducted in 2010 in Bristol, and a parallel survey with questions in common conducted in Brescia, Italy also in 2017[1].

1. Introduction

The bus survey conducted in 2017 was motivated by the aim of updating understanding from Clayton's (2012) CTS doctoral research into bus experience, passenger perceptions and travel-time use. The 2017 study sought to update insight on these topics. It also asked for demographic and other contextualising information from respondents (see appendix 6 for the questionnaire form used). As such the findings are of interest for those interested in the factors that constitute bus passenger experiences and how these can be improved.

In addition, the 2017 survey collected data of relevance to the anticipated MetroBus service. MetroBus will be a rapid public transport system in Bristol, consisting of buses using 'segregated busways, bus lanes, priority at junctions and off-bus ticketing' (Travelwest, 2017). Questions investigated perceptions and attitudes towards MetroBus and accessibility to the new service.

Questions asked were also of relevance to MODLE. This project is developing a taxi-bus service that can provide last mile solutions and facilitate journeys in conjunction with existing public transport (Esoterix, 2017). The survey asked questions around the potential desirability of this service, particularly for providing access to the MetroBus service. In addition, the understanding of what is generally desirable in the 'bus experience' would be of relevance to the MODLE service.

The second section of this document describes the relevant aspects of the methodology used, to collect and analyse the data. Section three reports findings. The importance of demographic factors is presented first, with a particular focus on age. The degree of journey liking, and factors affecting them, are examined next, including some surprising factors that were not found to affect journey liking. Travel time use (activity that respondents conducted whilst travelling) is then discussed, including social aspects of travel time, before sections on MetroBus and On-demand services. Conclusions are then drawn.

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[1] A journal article is available reporting a comparative analysis (Bonera, M., Maternini, G., Clayton, W., Paddeu, D., & Parkhurst, G., 2018. Analysis of the passengers' experience and travel time use on board urban buses. The case of Brescia. *Ingegneria Ferroviaria*, **73**, 12, 1007-1030. https://uwe-repository.worktribe.com/output/856248

2.   Methodology

The methodology for the Bristol based bus survey was closely modelled on Clayton's (2012) previous CTS doctoral research into bus experience. The questionnaire was handed out to bus passengers as they travelled. The questionnaire is shown as Appendix 2. Some of the survey questions were modelled on Clayton's study. They were broadly inspired by a national rail passenger survey (Passenger Focus, 2010a; 2010b, cited in Clayton, 2012) but adapted for a bus context. Further questions, that were not in Clayton (2012) were motivated by the aims of the Urban ID project and were designed to find out specifically about perceptions of MetroBus. Other questions were motivated by the MODLE project, and examined the potential relevance of on-demand shared taxi services.

Survey questions were ordered so that questions earlier in the questionnaire would have minimal biasing effect on those following later (McFarland, 1981, cited in Clayton, 2012). Thus more general questions about liking bus travel, that could be easily influenced by responses to more specific questions were placed at the start of the questionnaire. Demographic questions were asked at the end of the questionnaire, as these questions, about gender, age etc. would be robust against being biased by responses to the previous questions. Questions were kept clear and short, with a simple tick box format employed where possible, in order to maximise the ease of completion in potentially cramped or 'jerky' conditions (Clayton, 2012).

Bus routes were chosen for the survey in order to mirror, as far as possible, a previous bus survey in 2010. Some routes were chosen as they were relevant to the future MetroBus routes. The Bristol bus routes chosen were the Nos. 72, 73, 75, 18/18A, X48 and 3. Maps of all these routes, except for 18/18A, are shown in Appendix 1.

Pilot runs of the questionnaire were carried out, on four buses. Questionnaires were handed out on various shifts running between eight am and six pm. Questionnaires were, when possible, handed to a passenger at least ten minutes after boarding. Questionnaires were not given to passengers at the start of their journey so that they would have time to 'experience' some of their journey, before filling the questionnaire in. All passengers appearing to be 18 years or older were approached to fill the survey. The respondents were given the survey to fill in themselves. This enabled a larger volume of data to be collected (Clayton, 2012). If respondents had difficulty completing the survey, due to travel sickness, visual impairement or language difficulties, researchers helped with its completion.

The following analysis contains some ordinal regressions that were used to assess whether various measures of journey-liking reported in the survey were associated with any of the journey characteristics as reported in the survey. This analysis was conducted by Michela Bonera. Ordinal regression is used when the outcome variable is in discreet categories which can be ordered. For instance, in the present study the outcome variables (variables that might be affected by other variables) asked for agreement on a scale from 1 to 7 with a statement such as 'my time on this bus today has been enjoyable (extreme enjoyment indicated by 7) or boring (extreme boredom indicated by 1). The numbers between 1 and 7 are distinct catagories, but are in a numerical order.

Before conducting the ordinal regression a likelihood-ratio chi-square test was conducted to assess the model's fit. The significance value of less than 0.05 indicated the model outperformed the null model. Negelkerk's R-Square was also conducted before the analysis, in order to determine how much of the variance in the dependent variables was associated with predictor variables (IBM, 2018). Some of these R-Square numbers were poor. This is possible due to the complexity of the factors that in reality affect bus users' perceptions of their journeys.

For ordinal regression the two main statistical results are the p-value and the estimate coefficient. The p-value indicates whether the possibility that one variable did not affect another (for instance whether window gazing had no effect on the passengers' enjoyment of travelling) can be discounted. If the p-value is sufficiently small

then it is concluded that there was in fact an effect of one variable on the other. The present analysis assessed whether p-values were smaller than three cut off points. Significance was assessed at the following levels: $p < 0.05$, (represented in tables by *) $p < 0.02$, (represented by **) and $p < 0.01$ levels (represented by ***). For these cut off points, the 0.01 level indicates the greatest indication that one variable was affecting the other. The estimate coefficient indicates whether there was a positive or negative association between the two variables. For example, whether if people used a mobile device, they were more likely to enjoy their journey or less likely to.

The outcome variables used in the ordinal regression tests related to liking of the journey. They were 'like or dislike' of riding the bus in general, and whether the journey experience was considered 'enjoyable or boring', 'relaxing or stressful', 'comfortable or uncomfortable', and 'useful or wasted.'

3. Findings

Demographics and journey purpose

The total number of respondents, from whom these data are presented, was 1085. However, for most questions, some responses were missing or otherwise incorrect so N numbers (total number of valid responses for that question) vary. Some questions were only to be answered if the respondent was aware of MetroBus, so these questions had smaller N numbers.

Clayton (2012) had previously found age to be an important factor in perceptions of bus journeys. The sample of the present study was young, with 43.9% aged between 16 and 24 and 64.4% between 16 and 34. More females (54.9%) than males (45.1%) filled out the survey (Figure 1).

Figure 1: Age of respondent
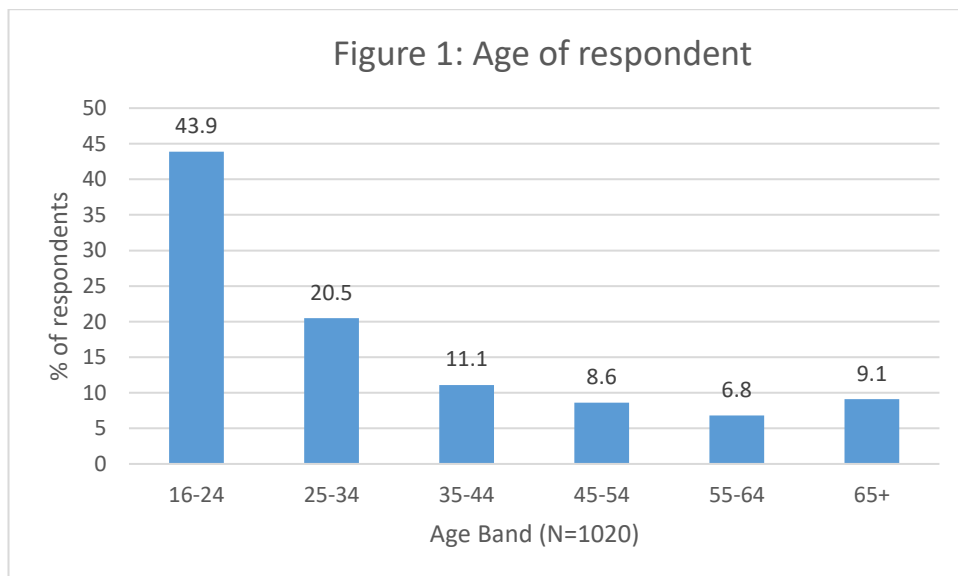
In 2012, Clayton found a significant association between age and and positive journey experiences, such that the younger passengers tended to rate them more negatively. The present data contrasted with this finding. Some age ranges were found to be significantly negatively associated with various journey liking variables. These associations found are shown in Table 1 (Note that only age ranges that had at least one statistical association are shown). These associations do not give a clear message. However, while negative associations were found across the age ranges, it can be highlighted that the 45 to 54 age range was negatively associated with four of the five journey-liking outcome variables, with two of these associations being significant at the $p < 0.01$ level. So perhaps this age range was found to particularly dislike the bus journey experience, in a number of respects.

Table 1: Effect of age range on journey liking

Age range[1]	Like or dislike[2]		Enjoyable or boring[3]		Relaxing or stressful[4]		Comfortable or uncomfortable[5]		Useful or wasted[6]	
	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.
16-24	***	-1.096	___	___	*	-0.686	___	___	___	___
25-34	***	-1.168	___	___	___	___	___	___	*	-0.725
25-44	***	-1.147	___	___	___	___	___	___	___	___
45-54	*	-0.824	***	-1.165	***	-1.087	___	___	*	-0.791
55-64	***	-1.171	___	___	***	-1.171	___	___	___	___

1 Note that only the age-ranges with at least one significant association with a journey-liking variable are shown.
2 χ^2 (59df)=118.41, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.161. Reference category: 'Really like it'
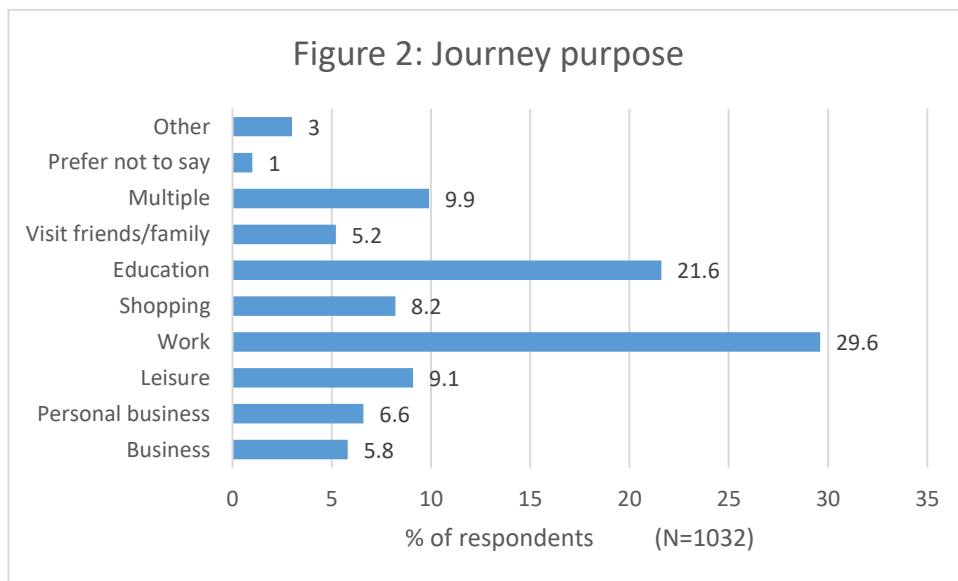3 χ^2 (59df)=145.73, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.190. Reference category: 'Really enjoyable'
4 χ^2 (59df)=138.89, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.180. Reference category: 'Really relaxing'
5 χ^2 (59df)=103.92, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really comfortable'
6 χ^2 (59df)=101.56, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really useful'

The survey also asked for journey purpose. As shown in Figure 2, 51.2% of respondents were travelling for either work or education purposes.

Figure 2: Journey purpose

Category	% of respondents
Other	3
Prefer not to say	1
Multiple	9.9
Visit friends/family	5.2
Education	21.6
Shopping	8.2
Work	29.6
Leisure	9.1
Personal business	6.6
Business	5.8

% of respondents   (N=1032)

The majority of respondents (73.7%) had used the service they were on more than 10 times, 7.6% were on it for the first time. The low numbers of first-time travellers and high numbers of passengers who had travelled more than 10 times were broadly consistent across age ranges (Figure 3).

Figure 3: How many times have you used this bus service?
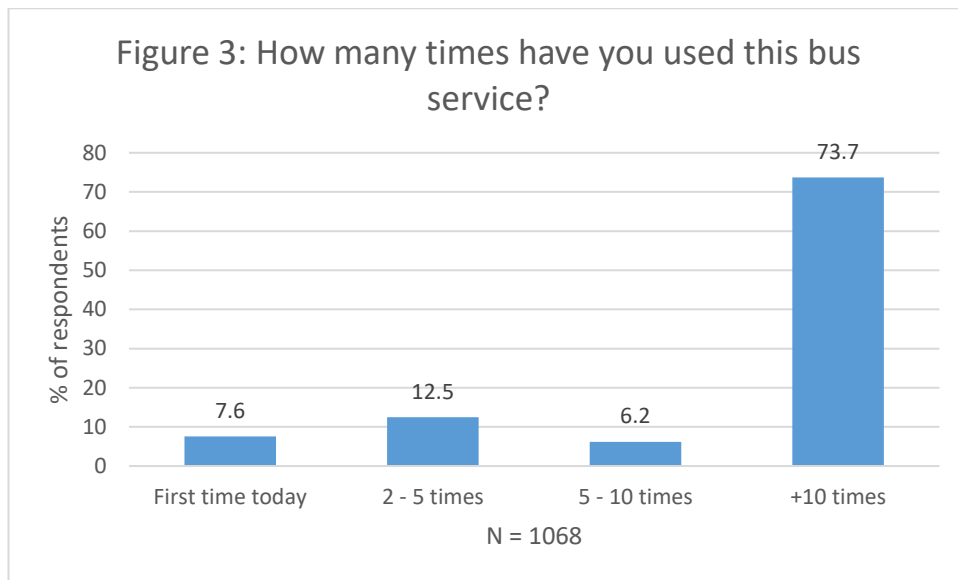
Journey-liking and journey-liking outcome variables

Attitudes towards, and perceptions of, bus travel were generally positive. Substantially more people liked or 'really liked' riding the bus (45.1%) than disliked or 'really disliked' it (13.4%) (Figure 4). There was a large proportion of respondents who felt neutrally about it (41.5%).

Figure 4: What do you think about riding the bus in general?
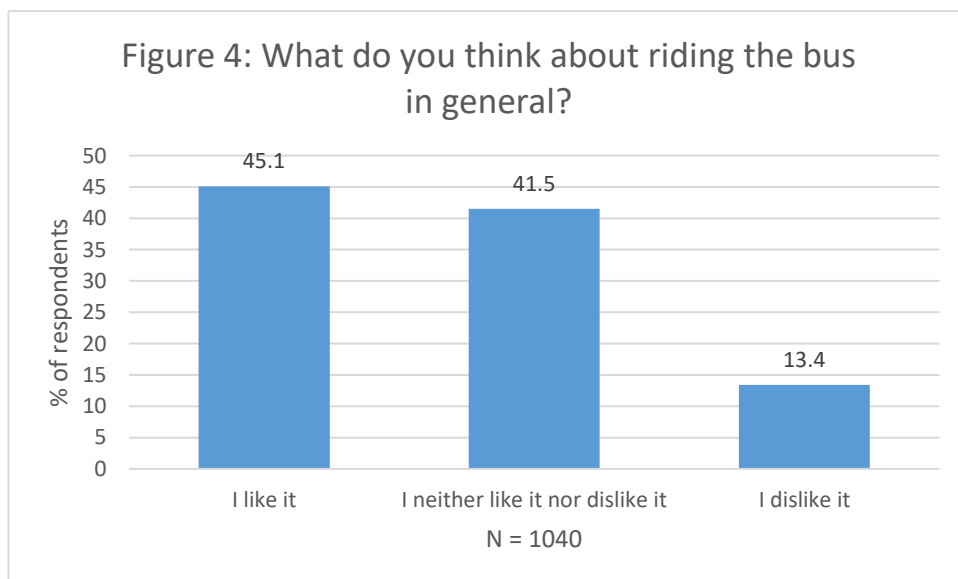
A question about general bus use, (and not the present journey only,) also suggested a positive perception of buses: 50.8% of respondents felt that 'generally getting the bus is…good' (Figure 5). 'Good' is a fairly generic positive word. This may explain why more people felt getting the bus was 'good' (50.8%) than specifically 'enjoyable' (10.9%) or 'relaxing' (20.2%). Alternatively, the latter two descriptions are more specifically experiential and it may be that people felt getting the bus was 'good', but not because of the experience. It could be suggested from the data that the bus travel experienced by respondents may be low in psychological arousal. Hence more considered it relaxing than enjoyable. However, in terms of negative descriptions, roughly equal numbers of people considered the mode boring (22.9%) (suggesting low arousal) and stressful (21.5%) (suggesting higher arousal). This suggests that for some bus travel can be seen as being either too

arousing in a negative sense or not arousing enough in a positive sense. However, whilst around a fifth of passengers described bus use with these specific negative experiences, only 6.1% or roughly 1 in 20 considered the getting the bus to be generally 'bad'. Perhaps again this points to a positive perception of bus use, apart from specific experiential elements.

Figure 5: 'Generally, getting the bus is...'

N= 1070
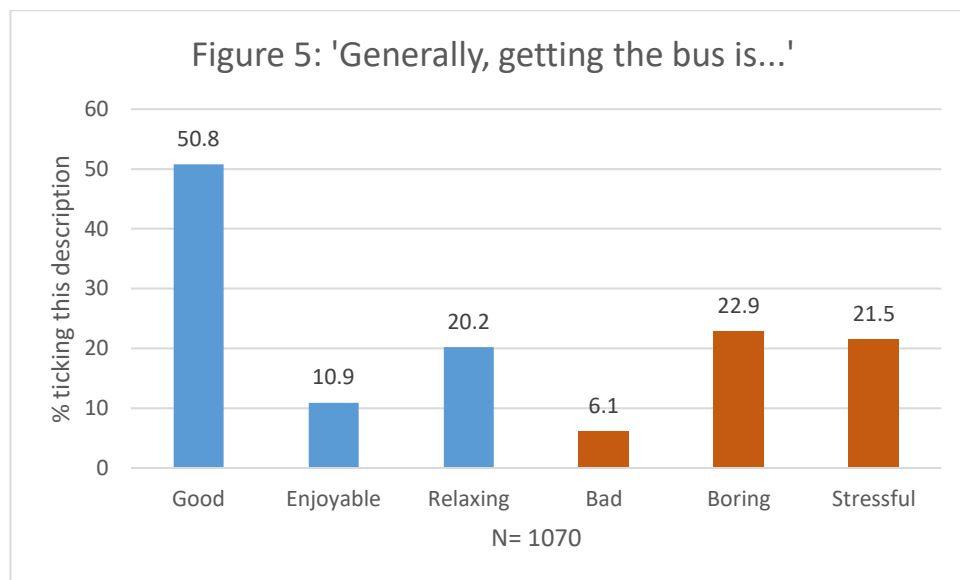
Respondents were asked about the journey they were currently taking. Questions asked respondents to rate their journey experience between two opposites: Relaxing verses Stressful for example. These ratings for the current journey were very positive. Many respondents considered their journey unthreatening (88%), safe (87.1%) useful (78.7%) comfortable (57.2%) and relaxing (56.4%) rather than neutral or the negative opposite (Figure 6). The only pair of opposites where the specific journey didn't score so well was 'enjoyable/fun' verses 'boring dull' on which roughly equal proportions of passengers responded positively, neutrally, or negatively. Consideration of the results from this question, and the chart above, suggests that enjoyment is not a strength of the bus experience. Bus use is appreciated more as being relaxing, and appreciated far more as being safe, useful and unthreatening.

Figure 6: My time on this bus today has been...
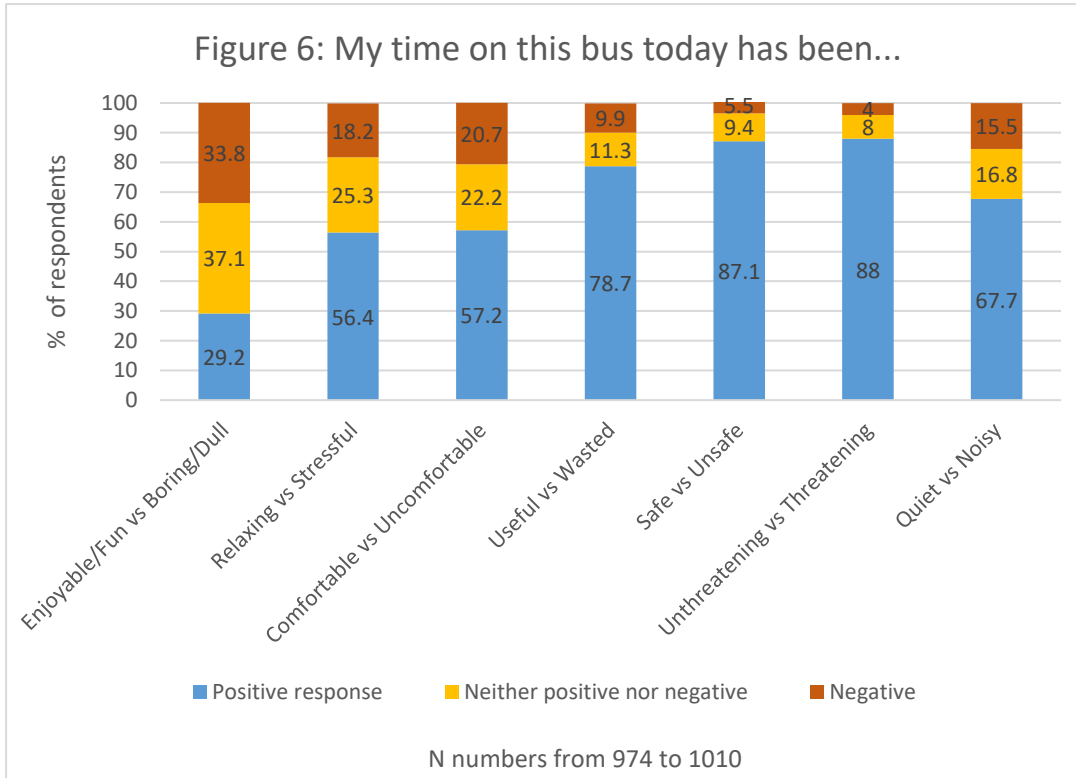
Ordinal regression presented a number of variables that were not found to have a significant impact on many of the journey-liking outcome variables (like or dislike, enjoyable or boring, relaxing or stressful, and useful or wasted). Some of these were suprising. They included the time of day, the patronage level on the bus and whether the respondent had sat or stood for their journey, which all failed to show a significant correlation with any of the journey-liking outcome variables. Punctuality of the bus was not found to have a stastically significant correlation with most of the journey-liking outcome variables. The bus being late was however negatively correlated with the bus being perceived as comfortable.

Ticket type was not found to be correlated with most of the journey-liking outcome variables, except that having a monthly pass was associated with the journey being perceived as useful rather than wasted. A large majority of respondents (79.5%,) of respondents had no car available to them. Availability of car also failed to show a significant correlation with any of the journey-liking outcome variables. This replicates the same finding by Clayton (2012).

Travel time use
The survey asked respondents to tick all activities that they had carried out during that journey (see Figure:7). The most frequently ticked activity, by some distance, was 'window-gazing/people watching' (57.3%). This is a 'low tech' pastime. However, 6 of the next 7 most frequently ticked activities required technology. These included text messages, phone calls, internet browsing, social network sites, listening to music/podcasts and emails. One in ten respondents had eaten or drank on the journey. Around one in twenty had slept or snoozed on the journey.

Figure 7: How have you spent your time on this bus today?

N numbers ranging from 1061 to 1085
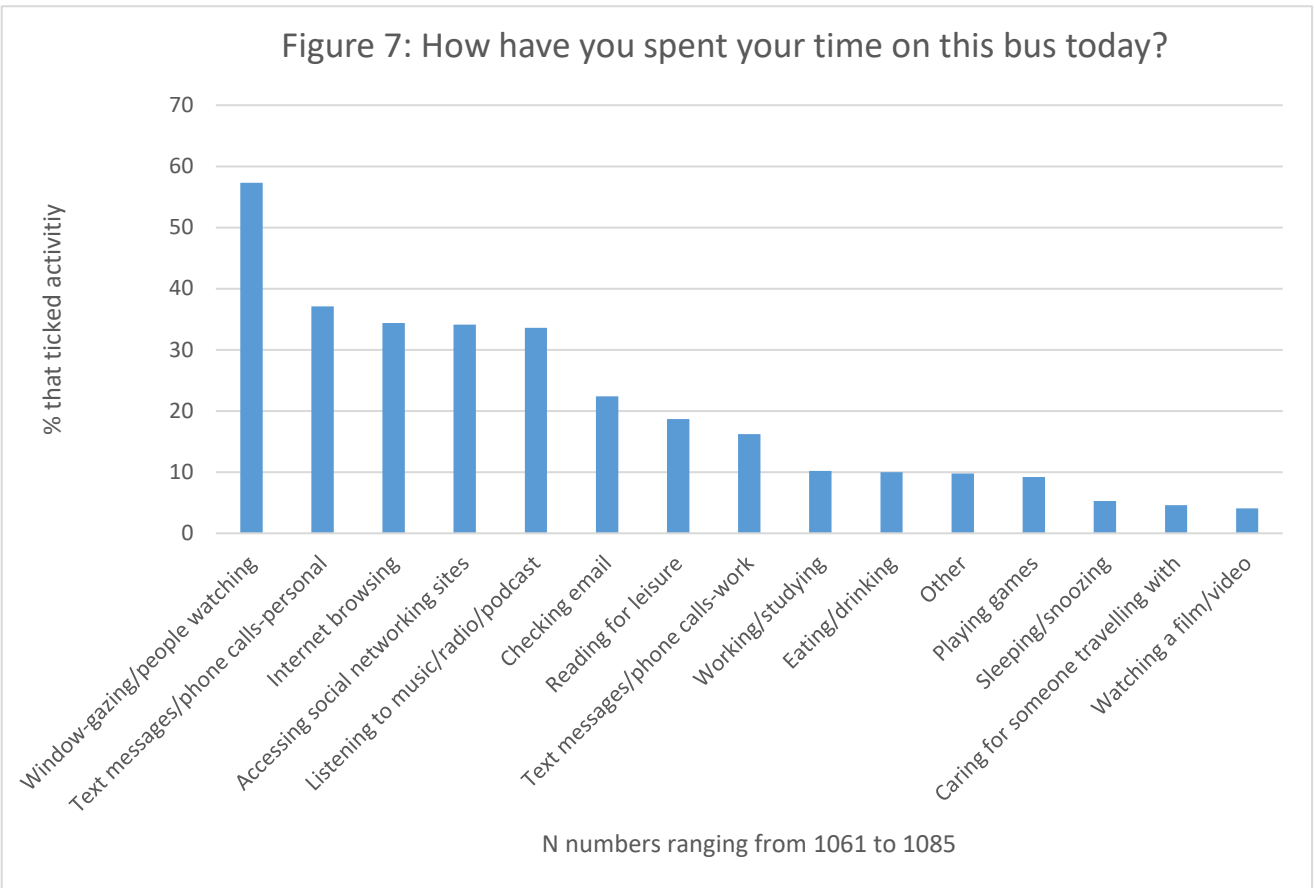
Some journey activities were found to be statistically associated with the Journey-liking outcome variables. As can be seen from Table 2, using a mobile device whilst on the bus was the activity that had a positive association across the most journey-liking outcome variables, affecting four of them. Eating and Sleeping affected two outcome variables positively and the other activites affected one outcome variable. Making a personal phone call was negatively associated with relaxation, i.e. it made the journey more stressful. The finding that some activities had strong stastical associations with journey-liking outcomes contrasts Clayton's (2012, p.200) quantitative finding that specific travel activities and carried objects had weak or 'inconsistent' associations with journey-liking. It should be noted though that in his *qualitative* research Clayton found more explicit links between travel activity and journey-liking.

Table 2: Effect of travel time uses on journey liking

	Like or dislike[1]		Enjoyable or boring[2]		Relaxing or stressful[3]		Comfortable or uncomfortable[4]		Useful or wasted[5]	
	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.
Sleeping	*	0.666	—	—	***	0.885	—	—	—	—
Using mobile device	*	0.592	**	0.776	*	0.572	*	0.569	—	—
Eating	***	0.831	*	0.591	—	—	—	—	—	—
Reading for leisure	—	—	***	0.687	—	—	—	—	—	—
Making personal phone call	—	—	—	—	*	-0.409	—	—	—	—
Watching videos	—	—	—	—	**	0.850	—	—	—	—

[1] χ2 (59df)=118.41, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.161. Reference category: 'Really like it'
[2] χ2 (59df)=145.73, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.190. Reference category: 'Really enjoyable'
[3] χ2 (59df)=138.89, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.180. Reference category: 'Really relaxing'
[4] χ2 (59df)=103.92, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really comfortable'
[5] χ2 (59df)=101.56, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really useful'

Activities conducted whilst travelling were also examined for different age ranges (Figure 8). Differences found according to age included a larger percentage of 65+ year olds window gazing/people watching, than younger passengers (although this remained the most popular pastime for all ages); larger proportions of under 35 year olds listening to music, radio or podcasts than older passengers; older passengers not watching films on the bus (only 1 person aged 35 or older did, compared to 42 people aged 16 to 34; and in general, predictably, older passengers using technology dependent pastimes less than younger

Figure 8: Travel time activities by age range
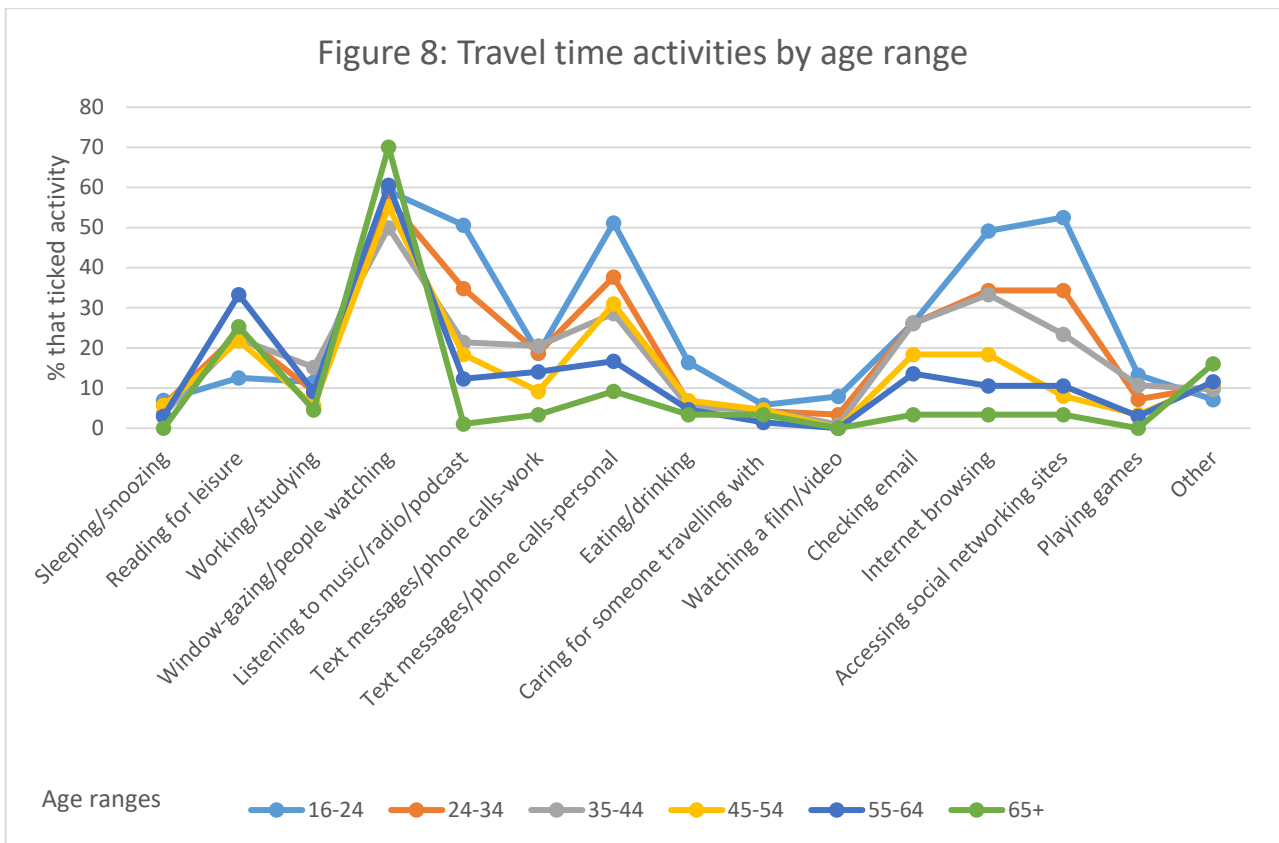
The popularity of some activities, by age, were compared with Clayton's (2012) data from 2010 (Figure 9). This comparison indicates that ICT activities on the bus has generally increased. This includes sizeable increases in the 16-24 and 25-54 age ranges, and more modest increased in the 55+ category. These two sets of data were gained from different sets of respondents and so do not together form longitudinal data. However, the comparison does suggest that for users on the routes studied, internet use has spread up through the age brackets more quickly than the ageing of the cohort. It also suggests a likelihood that the use of smart phones etc. on buses will continue to increase in older passengers as cohorts age and that there is not something about being 25+, or 55+ for example that leads to lower use of such devices on buses.

Figure 9: Activities conducted on bus in 2010* and 2017
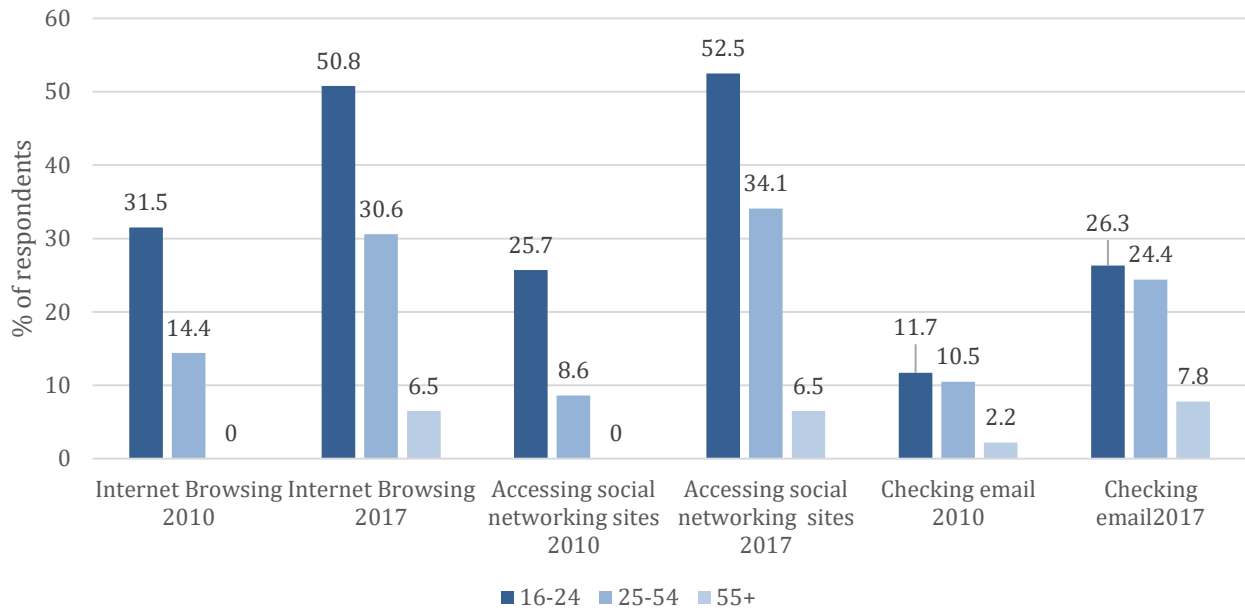
*2010 data taken from Clayton (2012)

The number of activities that respondents reported engaging in was also checked for its effect on journey liking. Clayton (2012) reported that in his 2010 data window gazing had positive association with journeys being liked. In the present study there were mixed levels of impact of this activity amongst the different journey-liking outcome variables. Table 3 shows there were mixed impacts of passengers 'just gazing' on their journey liking. Whilst 'just gazing' was found to have a positive significant association with liking the journey, it had strongly negative association with the journey being perceived as enjoyable, relaxing, comfortable, and useful. This must be understood in the wider context, shown in Table 3 that conducting less than 5 activities in general whilst travelling was similarly positively associated with liking the journey, but strongly negatively associated with perceptions of enjoyment, relaxation, comfort or usefulness. There is no clear message from Table 3 then on whether just window gazing, or conducting more activities whilst travelling leads to high or low journey enjoyment. However, it is worth remembering that respondents tended to rate the general liking of bus journeys higher than they did specific elements of liking, such as enjoyment or relaxation.

Table 3: Effect of number of activities on journey liking

	Like or dislike[1]		Enjoyable or boring[2]		Relaxing or stressful[3]		Comfortable or uncomfortable[4]		Useful or wasted[5]	
	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.
Just gazing	*	5.769	***	-12.93	***	-15.32	***	-15.31	***	-17.59
1-2 Activities	*	5.463	***	-13.52	***	-15.26	***	-15.16	***	-17.65
Less than 5 Activities	*	5.151	***	-14.11	***	-15.27	***	-14.86	***	-17.89

[1] $\chi 2$ (59df)=118.41, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.161. Reference category: 'Really like it'
[2] $\chi 2$ (59df)=145.73, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.190. Reference category: 'Really enjoyable'
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A range of objects were carried by respondents on their journey (Figure 10). Some they used on the bus and others were merely carried with them. The Smartphone was by far the most common item being carried (65.5%) and used (49.4%) on the journey. Whilst a reasonable percentage of respondents were carrying paperwork (9.2%), a laptop (7.6%) or a text book (6.9%), these were rarely used during the journey (2%, 1.3% and 1.9% respectively).

Figure 10: Objects carried and used on bus
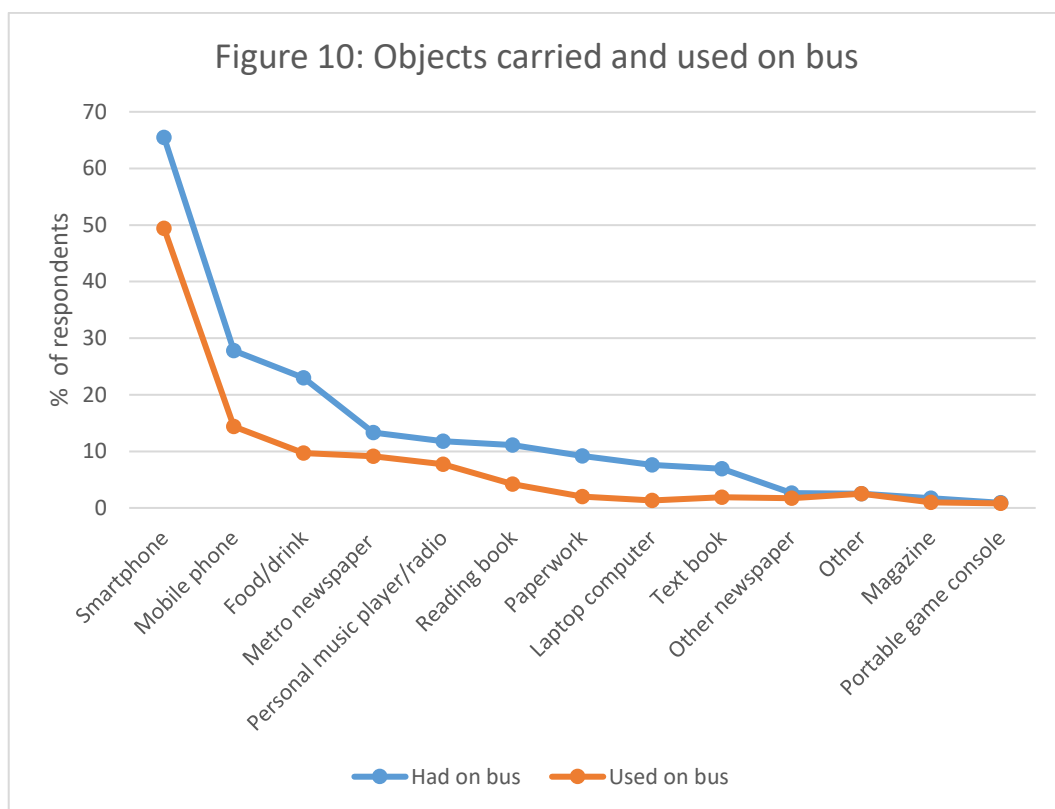
As Table 4 shows, ordinal regression on Carried and used items indicates that eating on the bus was associated with increased journey liking and enjoyment. Having a magazine was associated with more comfort, and using a smartphone was associated with a more useful journey. However, in general few of the objects and devices that are commonly carried on buses had significant impacts on the different elements of journey liking.

Table 4: Effect of carried and used objects on journey liking

	Like or dislike[1]		Enjoyable or boring[2]		Relaxing or stressful[3]		Comfortable or uncomfortable[4]		Useful or wasted[5]	
	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.
Food	*	0.613	**	0.664	—	—	—	—	—	—
Magazines	—	—	—	—	—	—	*	1.891	—	—
Smartphone	—	—	—	—	—	—	—	—	*	0.335

[1] $\chi2$ (59df)=118.41, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.161. Reference category: 'Really like it'
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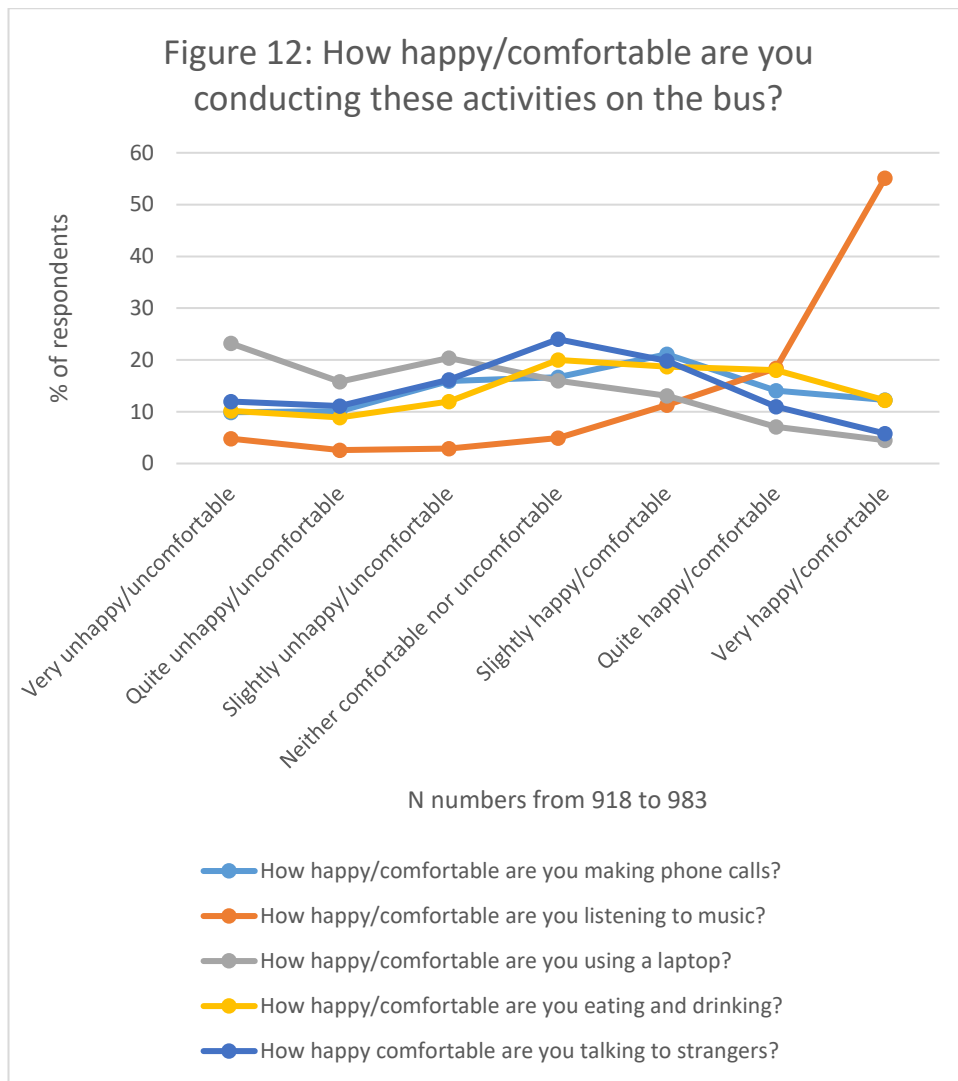
The objects carried on the bus were also examined by different age bands of passenger (Figure 11). For passengers under 55, the Smartphone was the most common object whilst for those 55 or over it was a (non-smart) mobile phone. The lower number of older respondents carrying a smartphone explains, to some degree, the lower prevalence of internet browsing, watching films etc. However, activities such as texting and phone calls can be carried out on a non-smart mobile, and so there may be other factors that explain, for example, 51.2% of 16 to 24 year olds making personal phone calls or texts, compared to 9.2% of over 65 year olds.

Figure 11: Objects carried on bus by age range
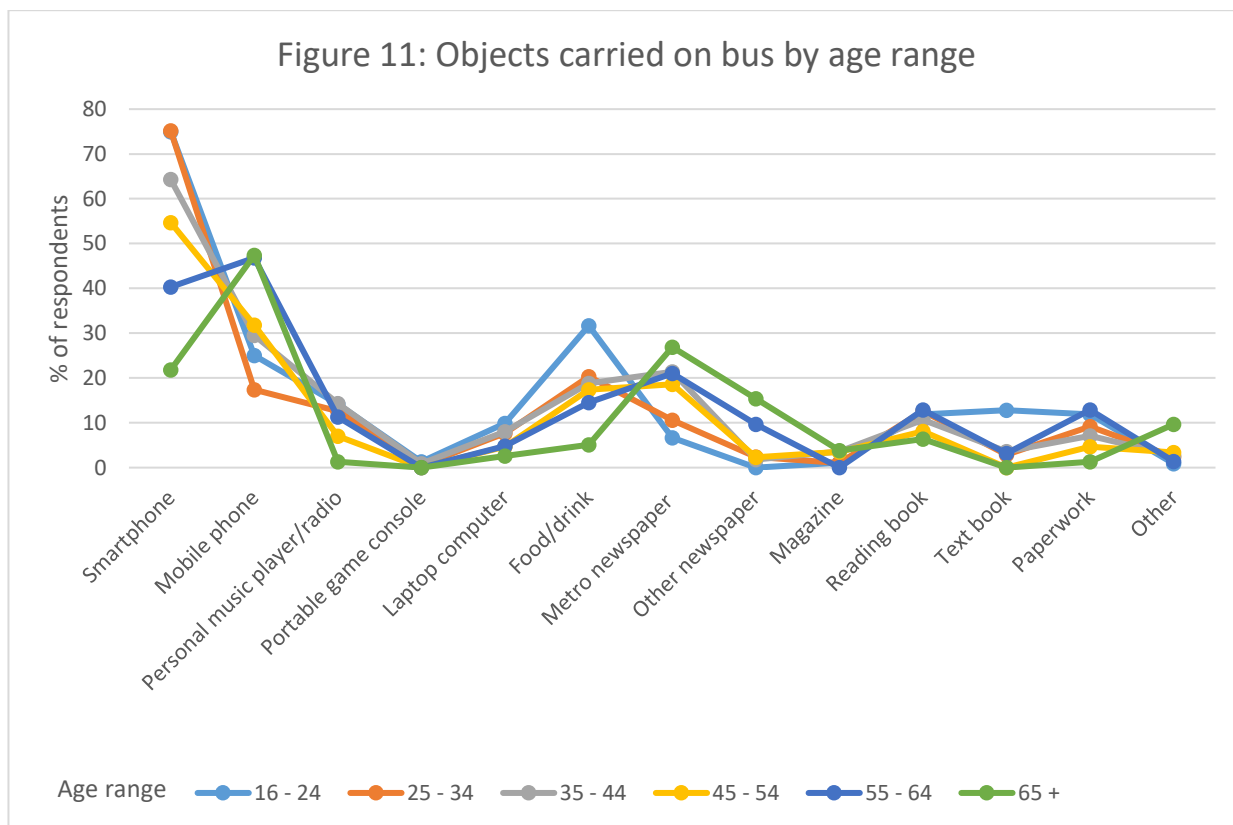
A disaggregation of objects used on the bus by age, found that consuming food and drink declined steadily as age increased. Whilst the number of respondents carrying a non-smart mobile phone generally increased with age, its use generally decreased. Perhaps then there are generational differences around texting and making phone calls in the environment of the bus (note Figure 8, p.15, above however which has been used to suggest that phone usage on buses is spreading up the age brackets, even more quickly than cohorts age). In general, younger people reported using devices more than older. The only objects that were used by a higher percentages of 65+ year olds than 16 to 24 year olds, were the Metro newspaper, other newspapers and 'other' (unspecified) objects.

More respondents reported being happy making phone calls on the bus, than being unhappy about doing so (Figure 12). A large majority of respondents (84.8%) reported being happy, to varying degrees, with listening to music on the bus. 55.1% were 'very happy/comfortable' listening to music. In contrast only 24.6% were happy/comfortable using a laptop on the bus and 23.2% were very unhappy. There was a fairly even spread in happiness or unhappiness with eating or drinking on the bus.

Figure 12: How happy/comfortable are you conducting these activities on the bus?

N numbers from 918 to 983

- How happy/comfortable are you making phone calls?
- How happy/comfortable are you listening to music?
- How happy/comfortable are you using a laptop?
- How happy/comfortable are you eating and drinking?
- How happy comfortable are you talking to strangers?

There was a fairly even spread of people happy/comfortable or unhappy to talk to strangers on the bus although more people felt neutral about it or mildly positive or negative rather than being very happy or very unhappy about it. 73.1% of respondents had talked to someone on the specific journey. Of those who had talked to someone 39.9% had talked to friends, 24.4% had talked to family and 22% had talked to strangers (Figure 13).

Figure 13: If you talked to someone on the bus today, who was it?

N = 291
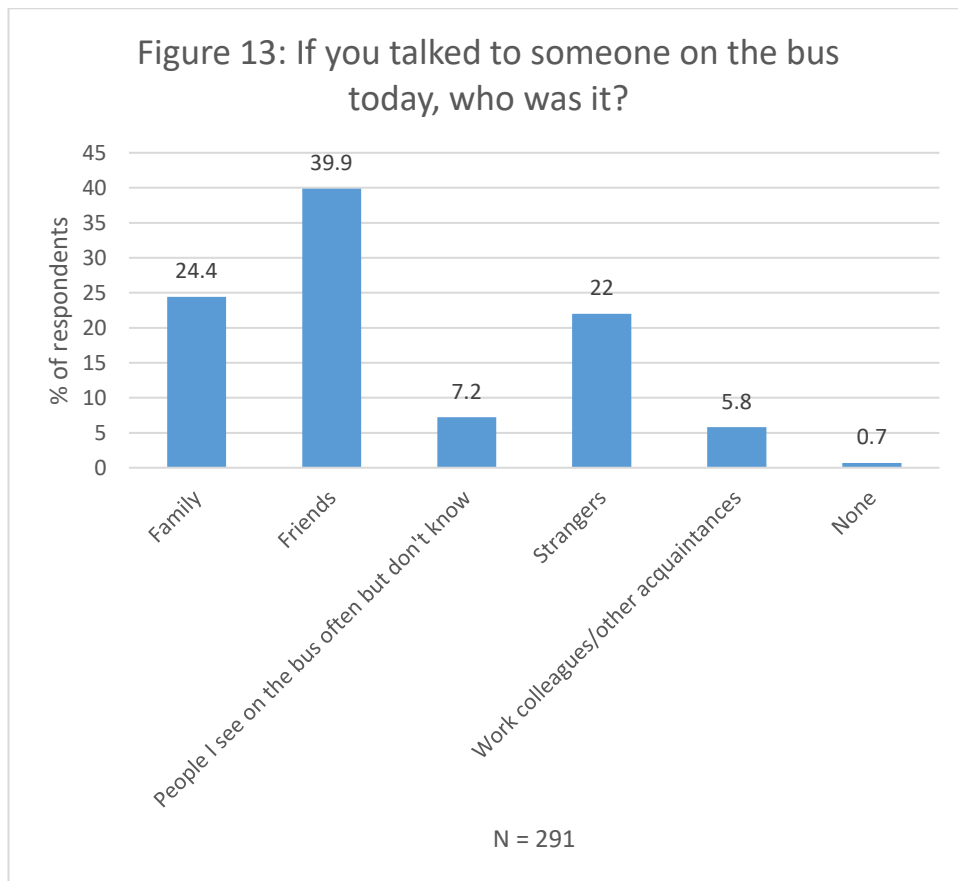
The survey also asked about reactions to other people's activities on the bus (Figure 14). There was an even spread of happiness/unhappiness towards other passengers making phone calls on the bus. 87.8% of respondents were either neutral or happy with other people listening to music on the bus. It is possible that the 5% who were very unhappy about it had in mind people playing their music without headphones. Alternatively, the problem could have been the lack of communicativeness of someone wearing headphones. Only 14% of respondents were unhappy with other people using their laptop on the bus. Respondents were generally happy with other passengers talking to strangers with only 13.9% of respondents were unhappy/uncomfortable with it and 47.3% quite or very happy/comfortable with it.

Figure 14: How happy/comfortable are you with other passengers doing these activities on the bus?

N numbers from 952 to 997

How happy/comfortable are you about other passengers making phone calls
How happy/comfotable are you about other passengers listening to music?
How happy/comfortable are you about other passengers using a laptop?
How happy/comfortable are you about other passengers eating and drinking?
How happy/comfortable are you about other passengers talking to strangers?

Clayton (2012) reported 'social comfort' having a consistently positive association with perceptions of the bus across all his regression analyses and concluded that it must thus be important in shaping journey experience. The present study supports this finding. A variable representing how comfortable respondents were socially was found to have a significant effect on all the journey liking variables (and at the most extreme significance level for four of the variables, see Table 5).

Table 5: Effect of social disposition on journey liking variables.

	Like or dislike[1]		Enjoyable or boring[2]		Relaxing or stressful[3]		Comfortable or uncomfortable[4]		Useful or wasted[5]	
	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.	Sig.	Est.
Socially more comfortable	***	0.271	***	0.258	***	0.304	***	0.242	**	0.109

[1] $\chi 2$ (59df) =118.41, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.161. Reference category: 'Really like it'

[2] $\chi 2$ (59df) =145.73, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.190. Reference category: 'Really enjoyable'

[3] $\chi 2$ (59df) =138.89, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.180. Reference category: 'Really relaxing'

[4] $\chi 2$ (59df) =103.92, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really comfortable'

[5] $\chi 2$ (59df) =101.56, Sig.=0.000, Pseudo R-Square (Nagelkerke) = 0.135. Reference category: 'Really useful'

MetroBus

Some questions on the questionnaire sought insight into perceptions of MetroBus. These were only answered by those who confirmed they were aware of MetroBus. This reduced the total N number for the Metrobus questions from 1085 (for the rest of the survey) to a maximum of 545.

53.2% of the respondents who answered the survey were aware of MetroBus, leaving 46.8% unaware (Figure 15). When disaggregated by bus route, on No.73 and No.3 more passengers were more unaware than aware of MetroBus. On all other routes more respondents were aware than unaware, with a particularly high percentage (72.5%) of No. X48 passengers aware.

Figure 15: Are you aware of MetroBus?
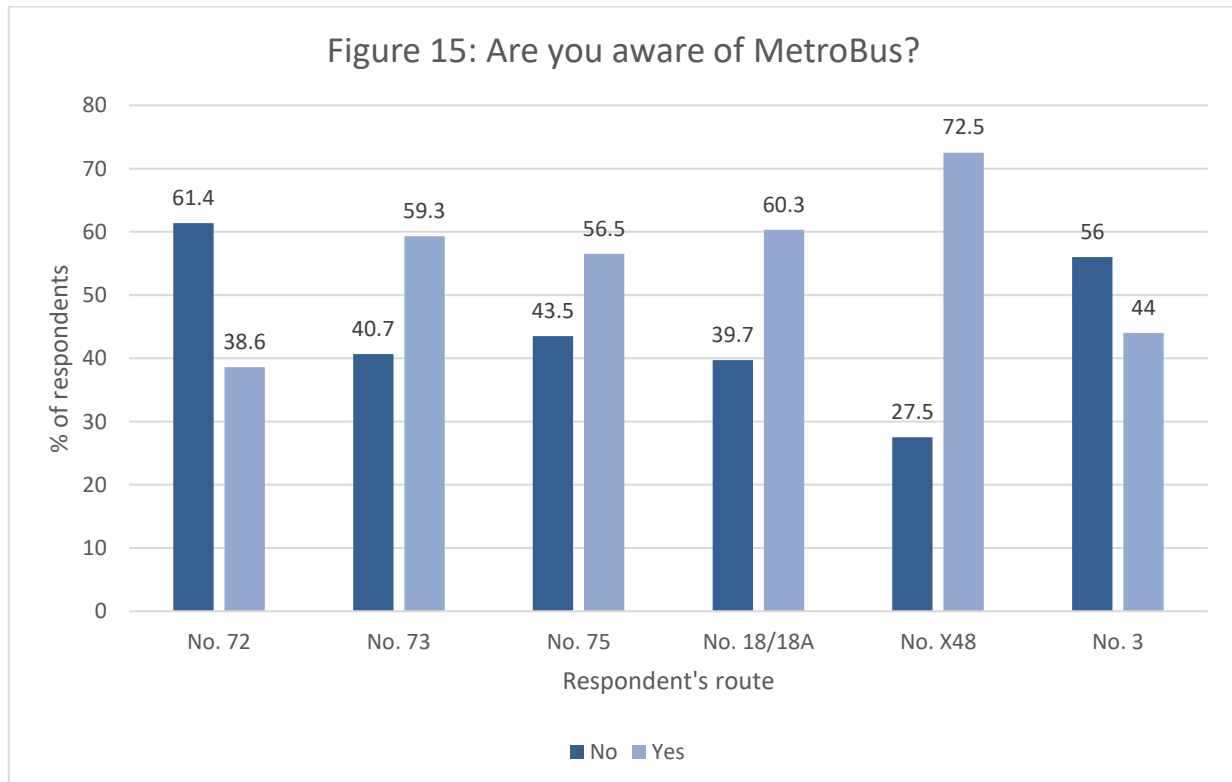
Those who reported being aware of Metrobus were asked how aware they were of the MetroBus routes. Only 6.6% reported being 'very aware' and only 31.8% were 'very aware' or 'quite aware' (Figure 16). Presumably those who were 'quite aware' might have known the general parts of the city that Metrobus will service.

Figure 16: Are you aware of where MetroBus will run?
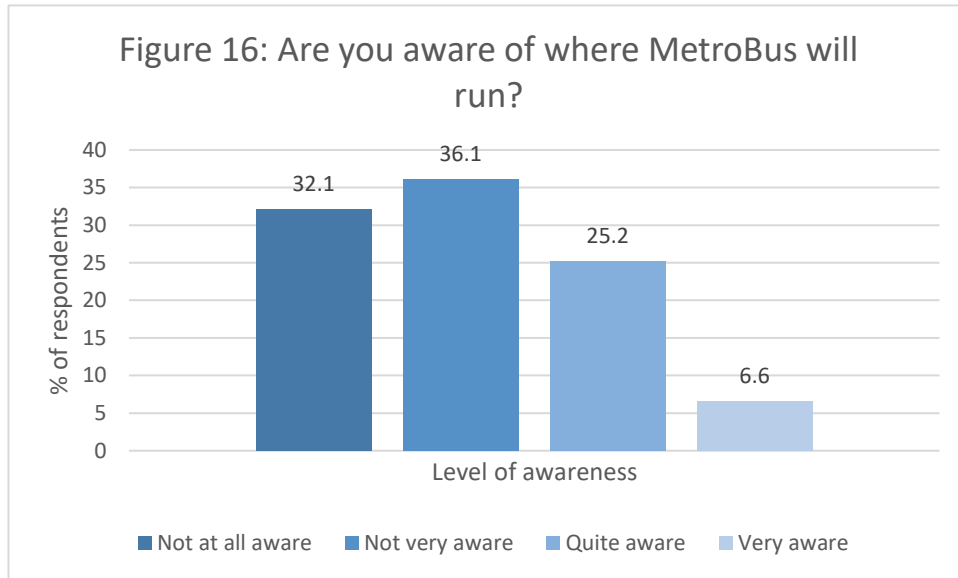
Only 22.9% of those who were aware of MetroBus knew how close the nearest MetroBus stop would be to their home. This is a large proportion of the 31.8% who were at least 'quite aware' of the MetroBus routes, suggesting that these respondents were clear on the route of MetroBus near to their home, but maybe less sure of other sections of the Service. The percentages aware of the nearest MetroBus stop were disaggregated by the respondents' present journey route, but these were broadly similar across the routes, except for the No. X48 on which a higher p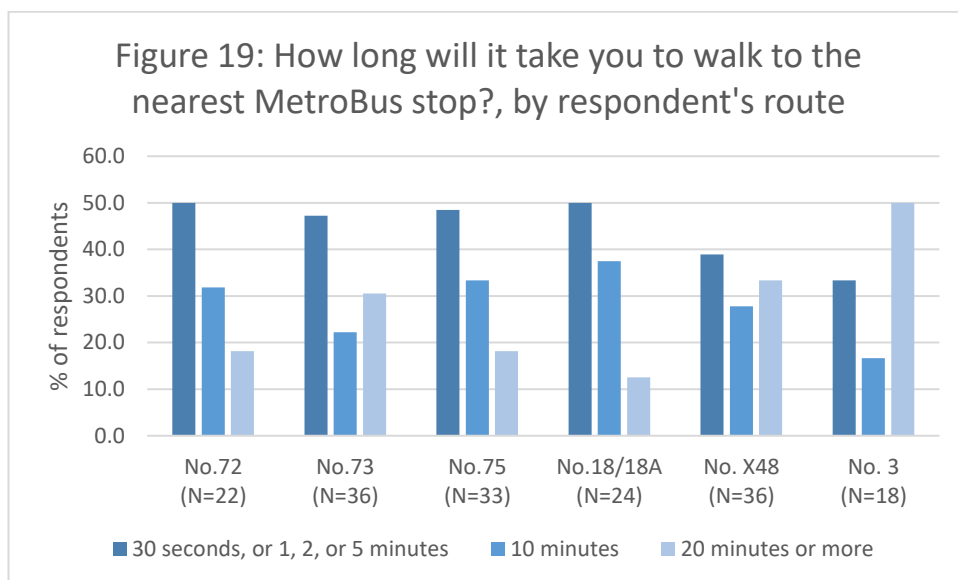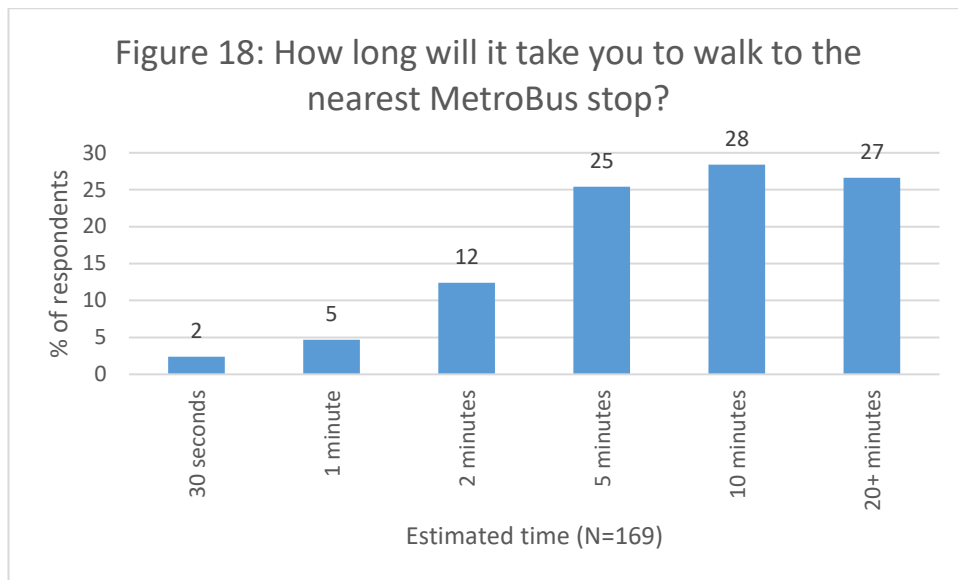ercentage (36.2%) were aware of nearest stop and No.3 on which only 14.9% were aware of the nearest MetroBus stop (Figure 17)

Figure 17: Do you know how close the nearest MetroBus stop will be to your home
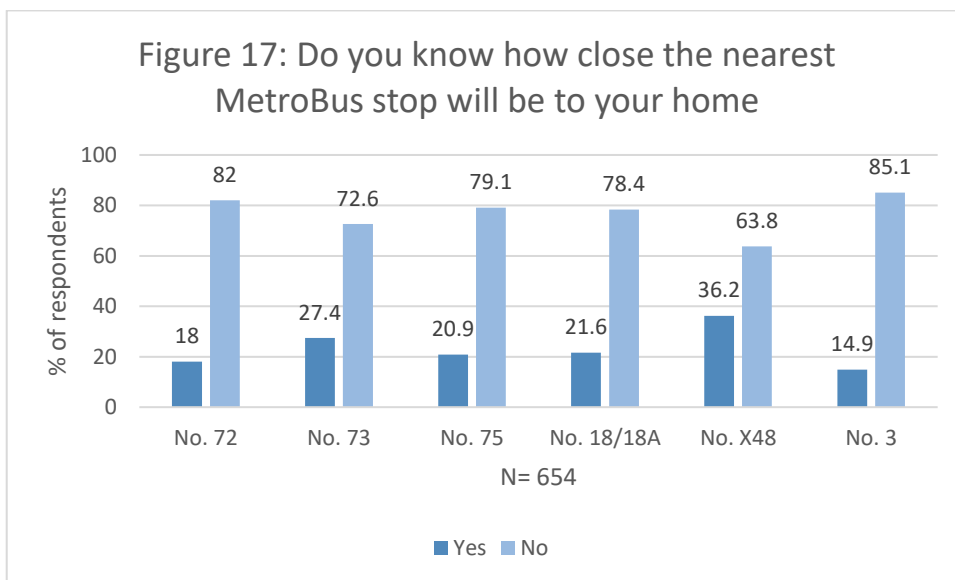
169 Respondents knew how close the nearest MetroBus stop would be to their home (Figure 18). 19.5% of these estimated a walk of 30 seconds, 1 minute, or 2 minutes to the stop, 25.4% estimated a 5-minute walk, 28.4% estimated a 10 minute walk and 26.6% estimated a walk of more than 20 minutes. These findings were disaggregated by respondent route (Figure 19). Longer walks to MetroBus stops were estimated by passengers on the No.X48 and particularly No. 3 routes. Although note the small N numbers for these findings.

Figure 18: How long will it take you to walk to the nearest MetroBus stop?

Figure 19: How long will it take you to walk to the nearest MetroBus stop?, by respondent's route

71% of respondents either agreed or strongly agreed that 'the route I would need to walk to the nearest MetroBus stop to my home would be convenient, safe and secure' (Figure 20).

Figure 20: The route I would need to walk to the nearest MetroBus stop to my home would be convenient, safe and secure

N = 681
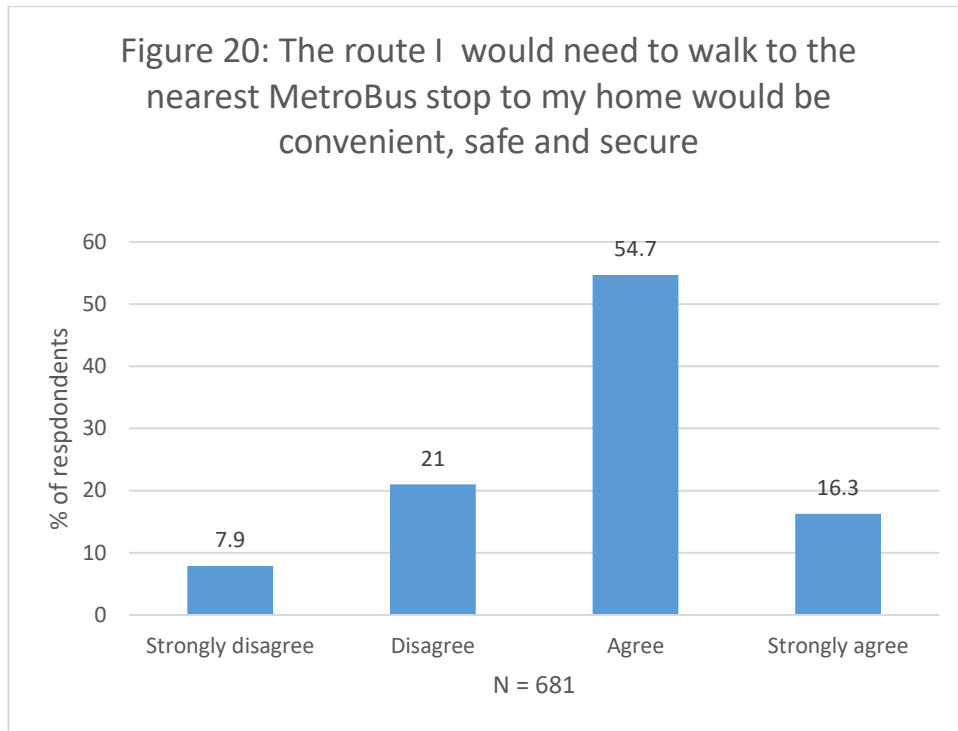
Respondents were asked for their predictions, or perceptions of various qualities of the MetroBus service, in comparison with existing services (Figure 21). Would they for example predict MetroBus to be more reliable or less reliable than existing services. The main feature of the predictions shown in the graph below is neutral prediction about MetroBus: that it would be neither much better nor worse, than extant services. This may reflect a prediction that the service would be neither better nor worse, or may have indicated an 'I don't know' response. There were particularly high neutral responses in relation to the security and cost of the new service. Respondents were most optimistic about Reliability and speed and most pessimistic about closeness to home.

Figure 21: Positive/negative predictions of different aspects of the Metrobus service, in comparison to existing bus services
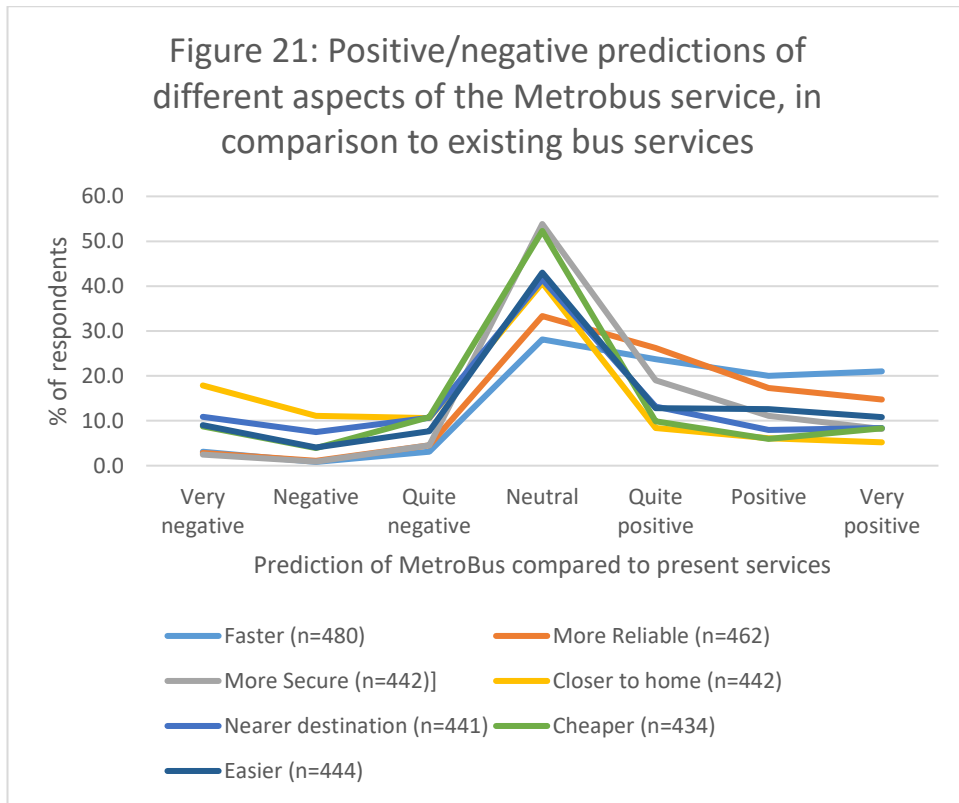
Respondents were asked how likely it would be that they would use MetroBus (Figure 22). 38.7% of respondents thought themselves, quite likely or very likely to use the service, this is more than the 26.5% who would be unlikely to. 34.7% considered they would be neither likely nor unlikely to use the service. Perhaps such passengers would have stronger views once the service is in operation. Possibly the neutral response relates to the 68.2% of respondents who reported being unaware of the MetroBus routes.

Figure 22: How likely are you to use MetroBus
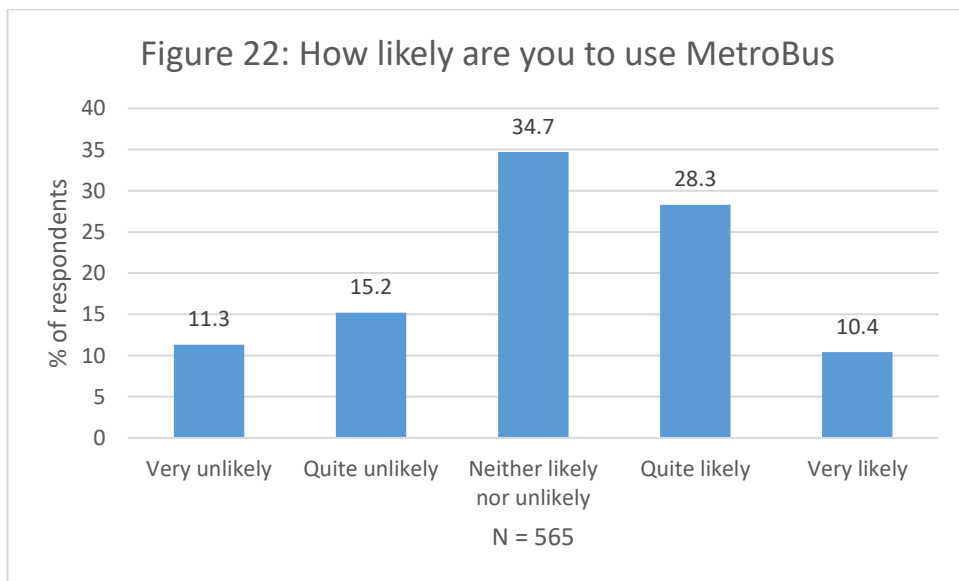
Separating results by bus route showed broadly similar results across bus routes except for passengers on the No. 3, of whom more considered they would be unlikely to use the new service (Figure 23).

Figure 23: How likely are you to use MetroBus?

	No. 72 (n=99)	No. 73 (n=98)	No. 75 (n=115)	No. 18/18A (n=90)	No. X48 (n=87)	No. 3 (n=76)
Very likely	9.1	10.2	10.4	8.9	18.4	5.3
Quite likely	27.3	29.6	25.2	30	36.8	21.1
Neither likely nor unlikely	42.4	35.7	41.7	30	27.6	26.3
Quite unlikely	16.2	13.3	12.2	15.6	11.5	25
Very unlikely	5.1	11.2	10.4	15.6	5.7	22.4
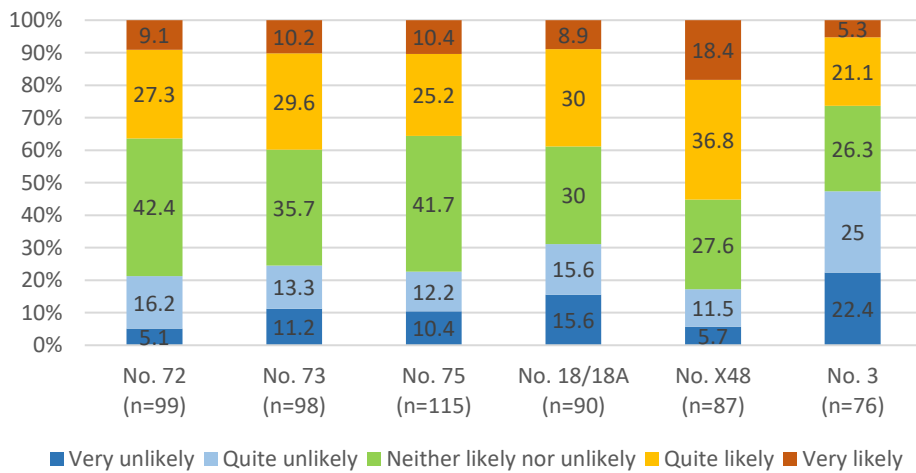
Respondent postcodes were used to map likelihood of using MetroBus, by home location. As can be seen in Figure 24, unsurprisingly concentrations of those likely to use the service form around the routes' stops. However, a group of respondents towards the centre of the city thought themselves unlikely to use the service. This perhaps suggests the service is seen in terms of reaching the centre from the city's peripheral rather than intermediate suburbs, in line with its limited stop service. Those who were neutral (and not negative) about the possibility of using the MetroBus were widespread throughout the city.

Figure 24: Postcodes of those likely, neutral or unlikely to use MetroBus.
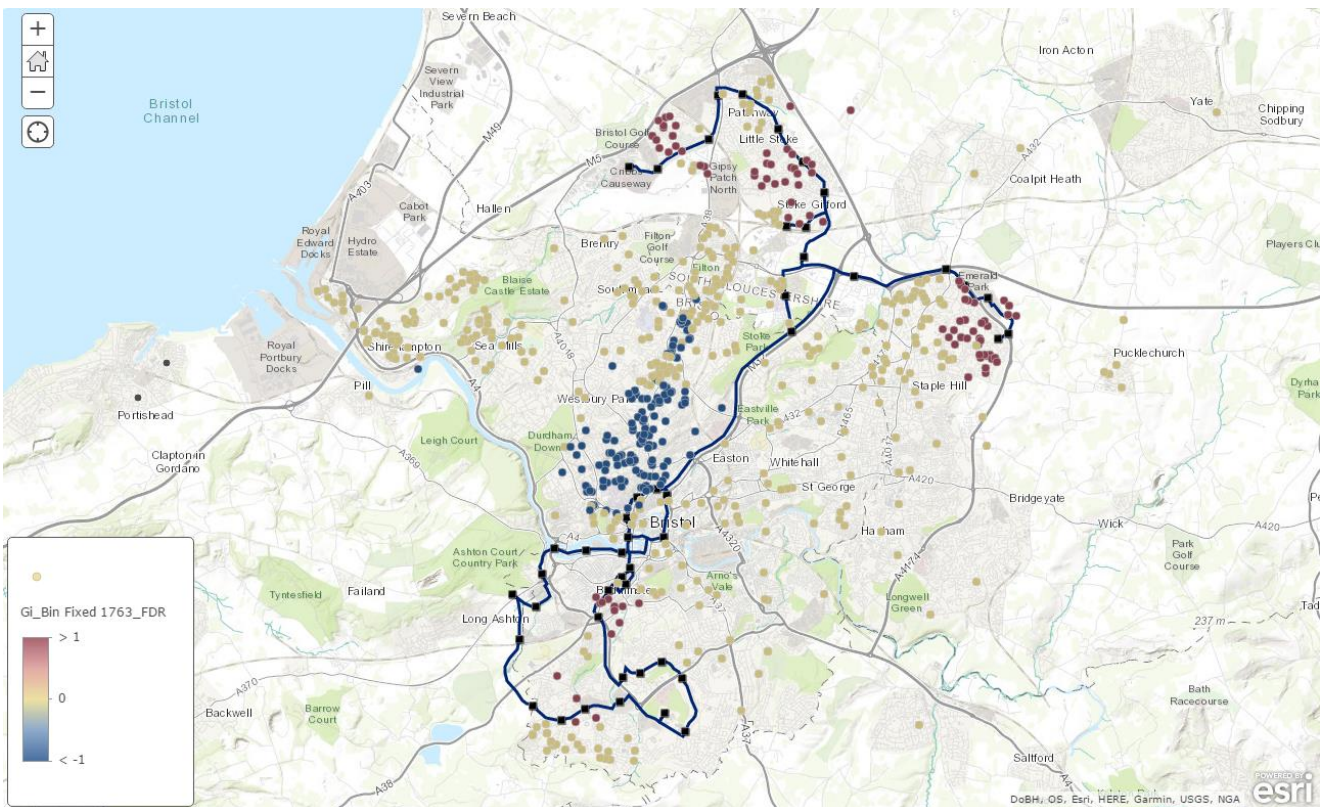
(Red dots indicate a postcode of a respondent likely to use MetroBus, gold is neutral and blue unlikely.)

On-demand shared-taxi access to MetroBus

To understand ways in which on-demand services can be profitable providers of access to larger bus services, it is important to know which other modes bus passengers tend to use. Respondents were thus asked to tick other modes that they had used on the day of the survey. More than one of these other modes could be ticked, so the category of 'multiple' in Table 6 is an important one, reflecting any respondent who ticked more than one mode. All the other categories reflected *only* that mode being ticked. Large percentages of passengers had used walking (27.9%), other bus (12.8%) or no other mode (25.4%), that day, whilst only small percentages had used bicycle (1.2%), train (2.5%) and taxi (1.2%). Low percentages had also used a car as a driver (4.7%) or passenger (4.6).

Table 6: Other modes used on day of survey

		Number of respondents	%
Other Modes Used	Car (Driver)	48	4.7
	Car (passenger)	47	4.6
	Bicycle	12	1.2
	Train	26	2.5
	Taxi	12	1.2
	Walking	287	27.9
	Other Bus	132	12.8
	Multiple	198	19.3
	Other	5	0.5
	None	261	25.4
	Total	1028	100

Respondents were asked how likely they would be to use a local on-demand shared-taxi service to connect to a nearby MetroBus stop. 26.1% gave a neutral response, 51.2% thought they would be unlikely to use it, and 22.7% thought they might be likely to use it (Figure 25).

Figure 25: How likely would you be to use a local on demand shared-taxi service to connect to a nearby MetroBus stop?

N = 563
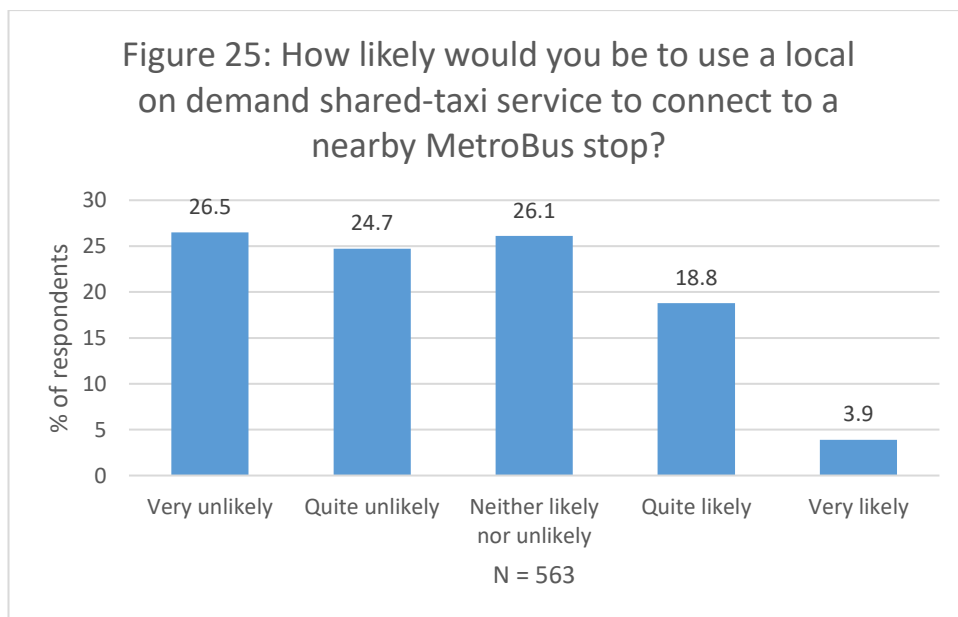
Responses were also disaggregated by bus route but showed broadly similar responses across the different bus routes (Figure 26).

Figure 26: How likely would you be to use a local on demand shared-taxi service to connect to a nearby MetroBus stop?

	No. 72 (n=98)	No. 73 (n=101)	No. 75 (n=115)	No. 18/18A (n=87)	No. X48 (n=87)	No. 3 (n=75)
Very likely	3.1	3	3.5	3.4	5.7	5.3
Quite likely	14.3	19.8	22.6	9.2	26.4	20
Neither likely nor unlikely	27.6	21.8	28.7	26.4	27.6	24
Quite unlikely	33.7	25.7	21.7	26.4	17.2	22.7
Very unlikely	21.4	29.7	23.5	34.5	23	28
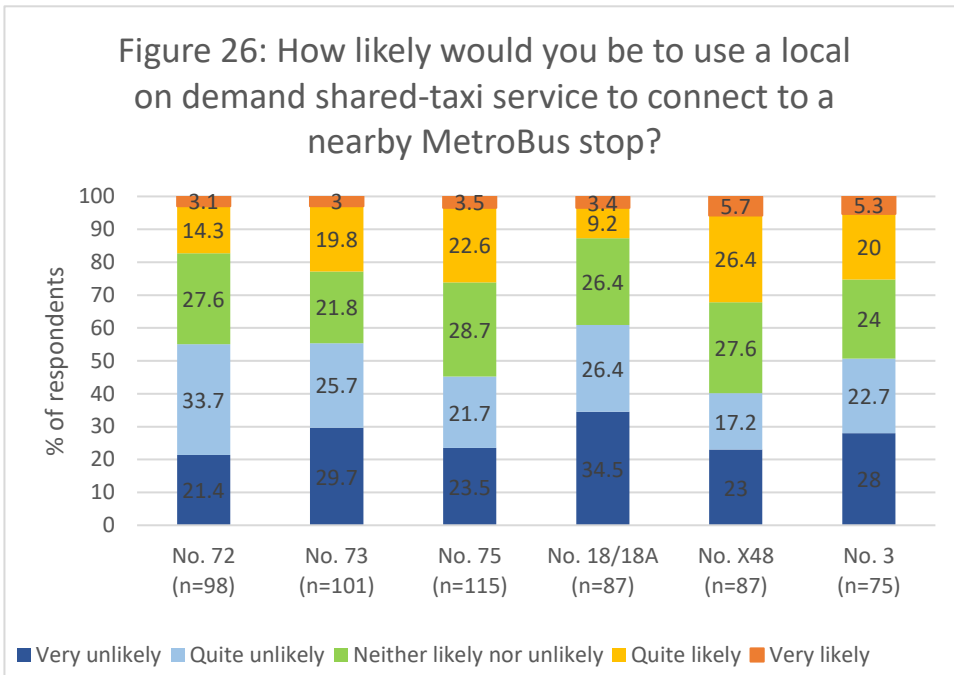
Respondents generally thought that it would be reasonable to charge only a small amount for such a shared-taxi link. 86.5% of respondents thought the service should charge £2.50 or less (Figure 27).

Figure 27: How much would be reasonable to charge for a one-way journey using the shared-taxi service?

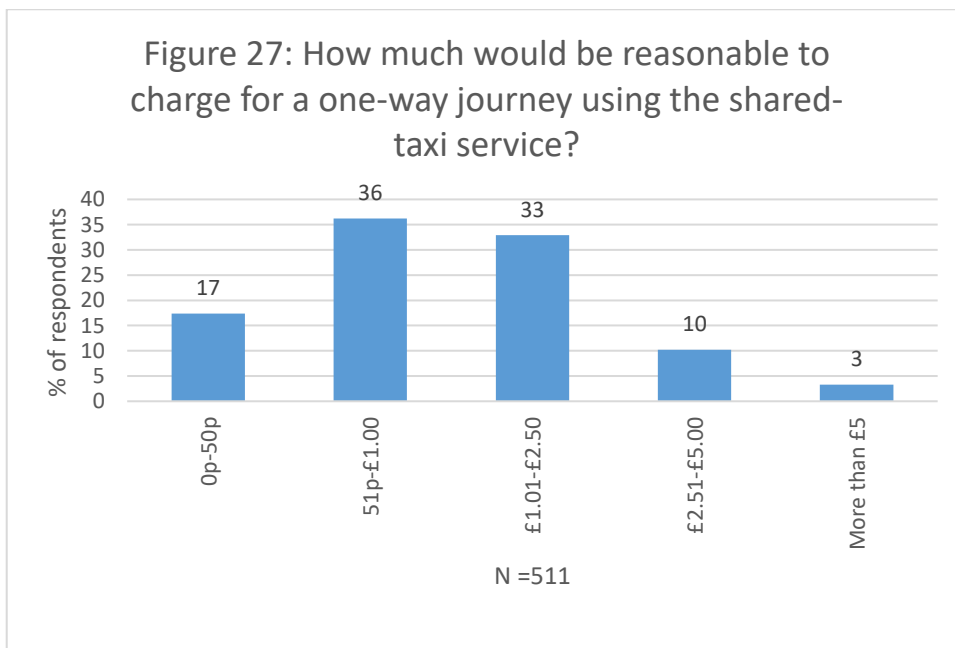| Charge	% of respondents
0p-50p	17
51p-£1.00	36
£1.01-£2.50	33
£2.51-£5.00	10
More than £5	3

N =511

Likelihood of using the shared-taxi service was examined in relation to the availability of car as an alternative to the respondent's present bus journey. A smaller percentage of people who didn't have the option of the car (19.1%) thought they would be 'quite likely' or 'very likely' to use the service than those who did have the option of the car (30.6%). Estimates of a reasonable charge for the service were similar regardless of whether the respondent could have used a car for their present journey.

The likelihood of using the shared-taxi service was also examined by gender. Broadly similar estimations of likelihood were given by both genders. The likelihood was also examined by age, but this too showed broadly similar patterns across age ranges.

4. Conclusions

Implications for buses in general

In conclusion the study suggests that perceptions of bus travel were generally positive (although less so with 45–54-year-olds.) This is in a context where 74% of respondents had used the service more than ten times. Findings suggest that bus use is far more valued for being relaxing, safe and useful than for being enjoyable.

The findings highlight a number of factors that had surprisingly small effects on journey-liking, these included the number of people on the bus, time of day and punctuality of the bus.

Respondents' own eating was associated with increased liking and enjoyment of the journey and other passengers' eating was not regarded particularly negatively.

Apart from the most popular pastime being window-gazing, the majority of popular pastimes on the bus required technology. The findings show that Clayton's (2012) suggestion that younger people use more ICT on the bus than older is still relevant. However, as might be expected the difference between the two groups has softened in this respect, with higher numbers of older people internet browsing etc. on the bus. It is worth noting that smartphones were still more common in passengers under 55 years, than for those over 55. Obviously, this difference can be expected to decline as cohorts age. As the use of smartphone continues to ascend age ranges, provision of Wi-Fi on buses might become increasingly relevant.

Respondents showed a range of happiness/unhappiness at conducting various activities on buses. The main exception was listening to music, which large numbers were very comfortable with. Quieter Electric buses might further enhance this popular use of bus travel time.

Generally, few clear messages about the effects of travel time use and objects carried on the bus on journey liking have emerged. Findings suggest that the bus is a space in which multiple travel time uses can be performed. However, small devices were preferred in this space, with smartphones being used far more than paperwork, laptops or books.

The present study supports Clayton's (2012) finding that social disposition was found to be strongly associated with liking the journey experience. As Clayton suggests, if it is accepted that smartphones and their use are going up the age brackets, then this may increasingly endanger enjoyment of bus use, due to its tendency to socially isolate passengers. However, association does not necessarily imply causation and it may be that those who felt at ease with people, were more likely to have positive attitudes whilst answering survey questions generally.

Implications for on demand taxi-bus services

- Some of the conclusions above for traditional bus services also inform on demand taxi-bus services. For instance, such services may consider the benefits of providing Wi-Fi, permitting consumption of food and using electric vehicles that better allow for using headphones for music, and other media.
- Findings indicate that the most frequent mode used in combination with bus on the survey day, was walking. Very low percentages used taxi or bicycle. Around 9% used car, either as passenger or driver.
- Around 23% of Respondents thought they might be likely to use an on demand shared-taxi service to access MetroBus. However, 51% thought they would be unlikely to.
- In general, unsurprisingly respondents thought such a service should have low charges, with 86% thinking it should be less than £2.50.
- Gender and age did not appear to have strong effects on likelihood of using the on-demand service, in our study.

Implications for Metrobus

- Findings suggest that almost 50% of the bus passengers surveyed were unaware of MetroBus. These were particularly on routes 73 and 3.
- Only 6% of the respondents were 'very aware of where the MetroBus will run.
- The two above points suggest poor public awareness of the forthcoming service (Clayton et al. 2018).
- There were some differences between the bus routes studied, of percentages of respondents who were aware how close to their home the nearest MetroBus stop would be. The No.48 had the highest proportion of respondents aware of this, whilst the No.3 had the least proportion. Respondents on the No.3 tended to predict longer walks to the nearest MetroBus stop than the other routes.
- The majority of respondents seemed to think that walking to a MetroBus stop would be 'convenient, safe and secure'.
- Respondent's predictions about the quality of the MetroBus service, tended towards neutrality. The predictions about speed of the service and its reliability were slightly more positive. There was also neutrality in many respondents regarding whether they would be likely to use MetroBus.

Limitations of the study

The study is in some ways limited to its local and national context, although a sister survey conducted in Brescia, Italy, offers avenues to provide data from beyond the Bristol context. Another limitation is that the survey applied only to adult passengers.

References

Clayton, W. (2012) Bus Tales: Travel-time use, technologies, and journey experiences on the bus. PhD, University of the West of England. Available from: http://eprints.uwe.ac.uk/17967

Clayton, W., Parkhurst, G., Calvert, T., Rosenberg, G., Taylor, C. (2018) Bristol Urban Integrated Diagnostics Project Case Study Report. MetroBus.

Esoterix (2017) Projects. Available online at: https://esoterix.co.uk/projects/ Accessed 04/12/2017.

IBM (2018) Pseudo R-squared measures. Available online at https://www.ibm.com/support/knowledgecenter/en/SSLVMB_23.0.0/spss/tutorials/plum_germcr_rsquare.html. Accessed 08/05/2018

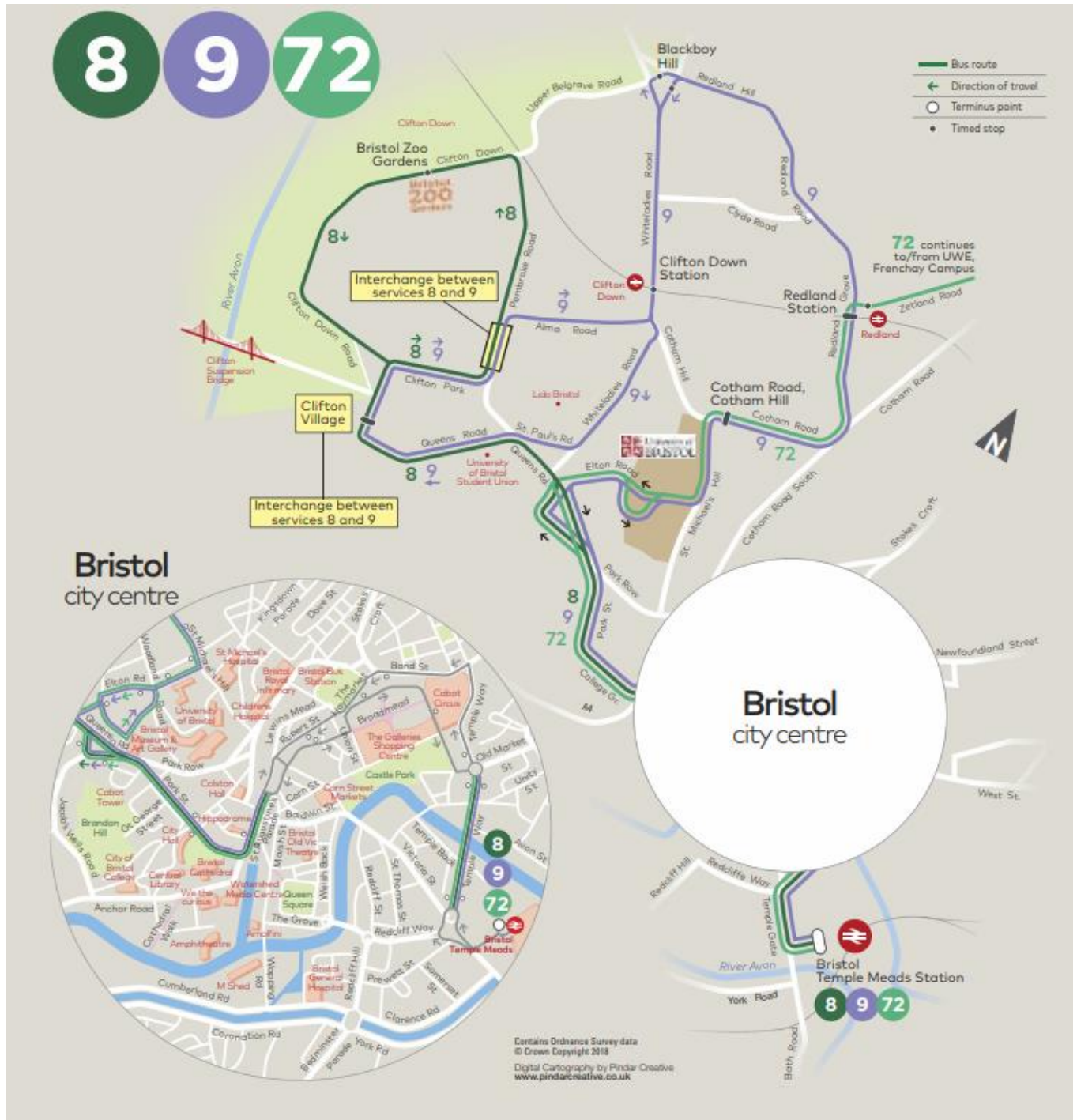TravelWest (2017) MetroBus. Available online at: https://travelwest.info/metrobus Accessed 04/12/2017.

Appendices

Appendix 1: Route Maps

A published map was not available for Route 18

Route 72

Route 73

Route 75

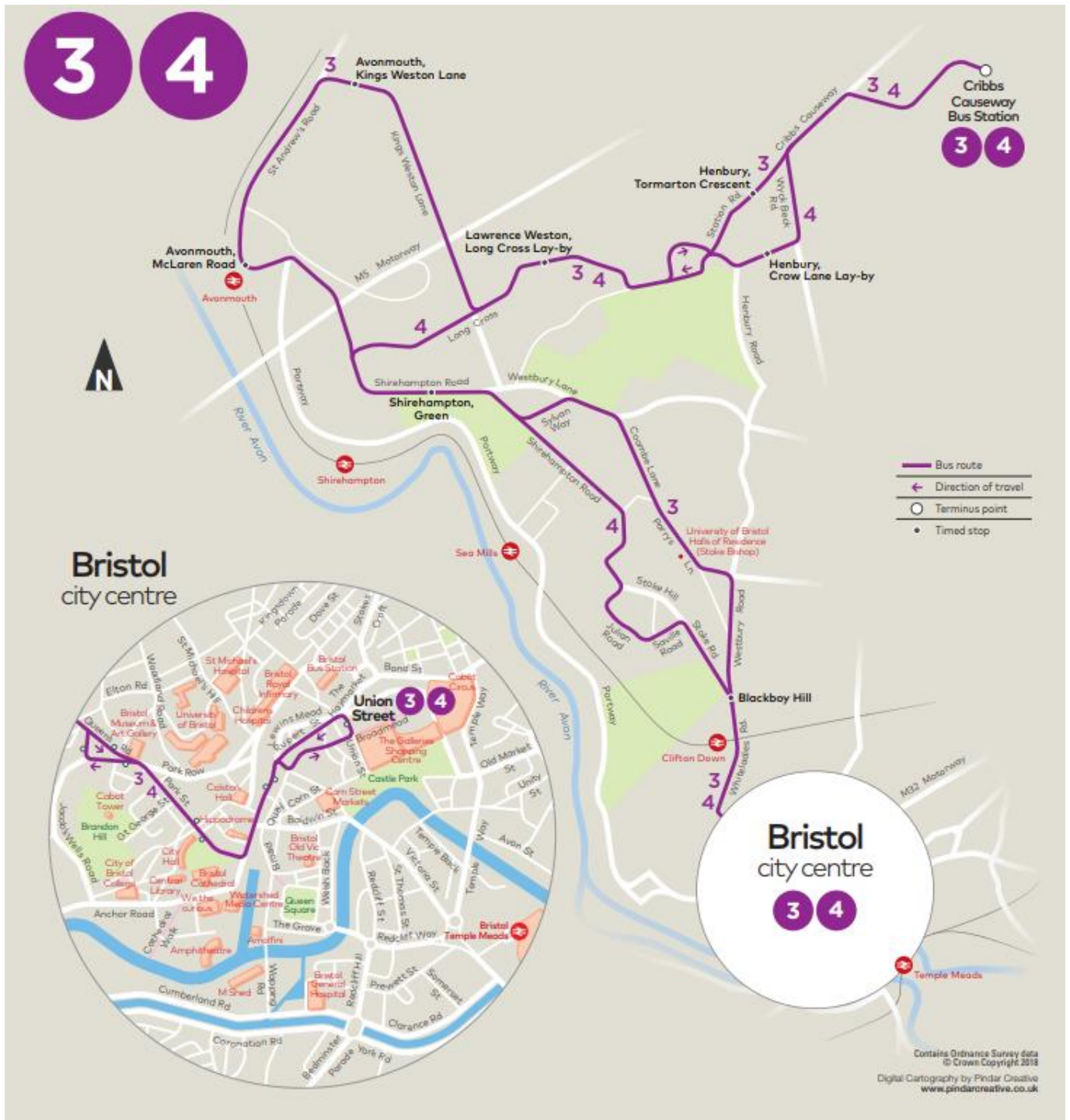75 76 Route Map

Route X48

Route 3

UWE Bristol | University of the West of England

Bus Journey Survey

Centre for Transport & Society

This form is asking about your experiences as a bus user. The information that you provide will help researchers at the University of the West of England (UWE) understand how people's use of buses. Your answers are important because they may assist in improving services.

The form will take approximately 5 - 10 minutes to complete. Please answer all the questions as best you can.

Before you start, please tick the box below if you agree to be a part of this research:

☐ *I am willing for my answers to be used anonymously as a part of this research*

If you would like further information about this survey, please ask the researcher on the bus for a leaflet.

Thank you!

First, please tick **twice**: One tick in the **stop nearest to the one you got on at** and another tick in the **stop nearest to the one you are travelling to**:

75		
Direction		
Cribbs Causeway - Hengrove Depot		

	Got on	Got off
Cribbs Causeway, Bus Station		
Filton, Gipsy Patch Lane		
Henbury, Crow Lane Lay-by		
Southmead, Arnside Road		
Horfield Common, Muller Road		
Montpelier, Colston Girls School		
City Centre, Broad Quay		
Bedminster Parade		
Bishopsworth, Library		
Hartcliffe, Bishport Ave Lay-by		
Hareclive Road, Symes Avenue		
Hengrove Park, Community Hospital		
Hengrove Depot, Entrance		

Question 1 *(please circle one)*

What do you think about riding the bus in general?

I really like it	I like it	I neither like it nor dislike it	I don't like it	I really don't like it

Question 2 *(please tick all that apply)*

Generally, getting the bus is:

☐ Good ☐ Enjoyable ☐ Relaxing

☐ Bad ☐ Boring ☐ Stressful

Optional word 1:	*Optional word 2:*

Question 3

Please think about the experience of the time you've spent on this bus **today** and fill in the table below.

*(Please work down through **all lines (A) – (G)** and indicate which feeling you most agree with on each line: 7 positive – 1 negative).*

My time on this bus today has been...

(A)	**Enjoyable/Fun**	7	6	5	4	3	2	1	**Boring/Dull**
(B)	**Relaxing**	7	6	5	4	3	2	1	**Stressful**
(C)	**Comfortable**	7	6	5	4	3	2	1	**Uncomfortable**
(D)	**Useful**	7	6	5	4	3	2	1	**Wasted**
(E)	**Safe**	7	6	5	4	3	2	1	**Unsafe**
(F)	**Unthreatening**	7	6	5	4	3	2	1	**Threatening**
(G)	**Quiet**	7	6	5	4	3	2	1	**Noisy**

Question 4

Could you have **used a car** for your journey today? ☐ Yes ☐ No

Question 5

How have you spent your time **on this bus today**?

	Tick all that apply	Tick **max. two** spent most time on
Sleeping/snoozing...		
Reading for leisure (book/other newspaper/magazine)...................		
Working/studying..		
Window-gazing/people watching...		
Listening to music/radio/podcast...		
Text messages/phone calls – work..		
Text messages/phone calls – personal....................................		
Eating/drinking..		
Caring for someone travelling with you (including children)..............		
Watching a film/video...		
Checking email..		
Internet browsing..		
Accessing social networking sites (Facebook, Twitter, etc.)..............		
Playing games (electronic or otherwise)...		

Other *(please write in)*:

Question 6 *(please tick all that apply)*

Which of the following items did you **have at hand** and which did you **use** on this bus today?

	Have at hand	Used		Have at hand	Used
Smartphone			Metro newspaper		
Mobile phone			Other newspaper		
Personal music player/radio			Magazine		
Portable game console			Reading book		
Laptop computer			Text book		
Food/drink			Paperwork		

Other *(please write in)*:

Question 7
How many times have you travelled on this particular bus service?

☐ First time today   ☐ 2-5 times   ☐ 5-10 times   ☐ Over 10 times

Question 8
Please work down through the list of activities in the table and indicate **how happy/comfortable <u>you</u> would feel doing these on the bus:**

	Very happy/comfortable						Not at all happy/comfortable
Making phone-calls	7	6	5	4	3	2	1
Listening to music	7	6	5	4	3	2	1
Using a laptop computer	7	6	5	4	3	2	1
Talking to strangers	7	6	5	4	3	2	1
Eating/drinking	7	6	5	4	3	2	1

Question 9
Please work down through the list of activities in the table and indicate **how happy/comfortable you are with <u>other passengers</u> around you doing these on the bus:**

	Very happy/comfortable						Not at all happy/comfortable
Making phone-calls	7	6	5	4	3	2	1
Listening to music	7	6	5	4	3	2	1
Using a laptop computer	7	6	5	4	3	2	1
Talking to strangers	7	6	5	4	3	2	1
Eating/drinking	7	6	5	4	3	2	1

Question 10

Have you talked to **anyone on this bus** today – *not including the driver and the researcher?*

☐ Yes   ☐ No

If you answered 'yes' above, did you talk to:

☐ Family   ☐ Friends   ☐ People I see on the bus often but don't know

☐ Strangers   ☐ Work colleagues/other acquaintances

Question 11

On this bus, are you: ☐ Sitting   ☐ Standing

Question 12 *(Please tick all that apply)*

What is the **purpose of your trip** today?

☐ Business   ☐ Personal business   ☐ Leisure   ☐ Work

☐ Shopping   ☐ Education   ☐ Visit friends/family   ☐ Prefer not to say

Other *(please write in)*:

Question 13

Which **type of ticket** did you use to get this bus?

☐ 3 stop hop   ☐ Single   ☐ Dayrider   ☐ Multi-operator ticket

☐ Weekly Pass   ☐ Monthly Pass   ☐ Annual pass   ☐ Concessionary Pass

Other *(please write in)*:

Question 14 *(Please tick all that apply)*

In addition to **this bus**, have you, or will you, use any **other type of transport today**?

☐ Car (driver)   ☐ Car (passenger)   ☐ Bicycle   ☐ Train

☐ Taxi   ☐ Walking   ☐ Other bus   ☐ None

Other *(please write in)*:

Question 15

Are you aware of **MetroBus**?

☐ Yes   ☐ No (**go to Question 24**)

Question 16 *(please circle one)*

Are you aware of **where** MetroBus will **run**?

Very aware	**Quite aware**	**Not very aware**	**Not at all aware**

Question 17

Do you know **how close** the nearest MetroBus stop will be **to your home**?

☐ Yes   ☐ No

If you answered 'yes' above, roughly **how long will it take you to walk** to the nearest MetroBus stop?

☐ 30 seconds   ☐ 1 minute   ☐ 2 minutes

☐ 5 minutes   ☐ 10 minutes   ☐ 20+ minutes

Question 18

Please respond to the statement below:

"The **route I would need to walk** to the nearest MetroBus stop to my home would be **convenient**, **safe**, and **secure**."

Strongly agree	Agree	Disagree	Strongly disagree

Question 19

Please think of what you currently know about the MetroBus service, and fill in the table below:

In <u>comparison with existing bus services</u>, MetroBus will be:

	7	6	5	4	3	2	1	
Faster	7	6	5	4	3	2	1	**Slower**
More reliable	7	6	5	4	3	2	1	**Less reliable**
More secure to use	7	6	5	4	3	2	1	**Less secure to use**
Closer to my home	7	6	5	4	3	2	1	**Further from my home**
Nearer to my destinations	7	6	5	4	3	2	1	**Further from my destinations**
Cheaper to use	7	6	5	4	3	2	1	**More expensive to use**
Easier to use	7	6	5	4	3	2	1	**Harder to use**

Question 20 *(please circle one)*

How **likely are you** to use MetroBus?

Very likely	Quite likely	Neither likely nor unlikely	Quite unlikely	Very unlikely

Question 21 *(please circle one)*

If there were **a local on-demand shared-taxi service,** which could **connect you to a nearby MetroBus stop**, how likely would you be to use it?

Very likely	Quite likely	Neither likely nor unlikely	Quite unlikely	Very unlikely

Question 22

How much would it be **reasonable to charge** for a **one-way journey** using this add-on shared-taxi service to link people to MetroBus?

☐ 0p - 50p   ☐ 51p - £1.00   ☐ £1.01 - £2.50

☐ £2.51 - £5.00   ☐ More than £5

Question 23

Do you cycle?

☐ Yes   ☐ No

If you answered 'yes' above, please respond to the statement below:

"I would **use a bicycle to reach MetroBus stops** if the route is safe and the bicycle parking is secure."

Very likely	Quite likely	Neither likely nor unlikely	Quite unlikely	Very unlikely

Question 24

Please tell us just a little bit about yourself and your normal travel.

Are you: ☐ Male ☐ Female

Please tick the age range you fit into: ☐ 16-24 ☐ 25-34 ☐ 35-44

☐ 45-54 ☐ 55-64 ☐ 65+

Please write in your home postcode (this will be used to map people's access to bus services)**:**

We are planning more research into **people's opinions on local transport**. If you are **interested in taking part**, please write your contact details below (email or phone):

Contact:

If you have any additional comments, please write them in below:

That's the end of the survey. Thank you for your time