

VALUE OF TIME FOR BUS PASSENGERS



Accent is registered to the market, opinion and social research International Standard ISO 20252

- ❑ The Business Case Development Manual (BCDM) defines the value of time for buses, using generic system wide assumptions on journey purpose split, at £7.55 per hour
- ❑ Currently, bus passenger waiting time is valued as 2.5 times the value of in-vehicle journey time*
- ❑ The value of waiting time is calculated by multiplying £7.55 by 2.5 (per person/hour)
- ❑ Hypothesis: Recent technological changes allowing bus passengers to access live waiting time information while waiting for a bus or before arrival at the stop may change (negative) perceptions of waiting time
 - It is also thought that the availability of such information may lead to behavioural change such as delaying departure to stop, changing stop, changing route or mode
- ❑ Therefore, research was required to assess whether there is a case for adjusting the wait time multiplier and, if so, by how much

***Definition of VoT multiplier**: *Passengers perceive waiting time to be 2.5x greater than riding time – for example, 4 minutes is equivalent to/perceived as 10 minutes on the bus...*

Objectives

- ❑ TfL wished to understand the impact of ‘live’ bus arrival information on perceived waiting times to ensure the continued accuracy of the multiplier
- ❑ There were six key research objectives:
 - To understand the impact of live bus arrivals information on passenger’s perception of waiting time
 - To establish the multiplier of bus passenger waiting time ‘at stop’ vs ‘on the bus’
 - To establish passengers perceptions’ of waiting time through the different channels
 - To understand the propensity for passengers changing their behaviour as a result of knowing the bus arrival times in advance
 - To understand if the value of real time information differs in different circumstances
 - To understand what factors influence expectations of average/usual wait time and overall journey time

Key insights

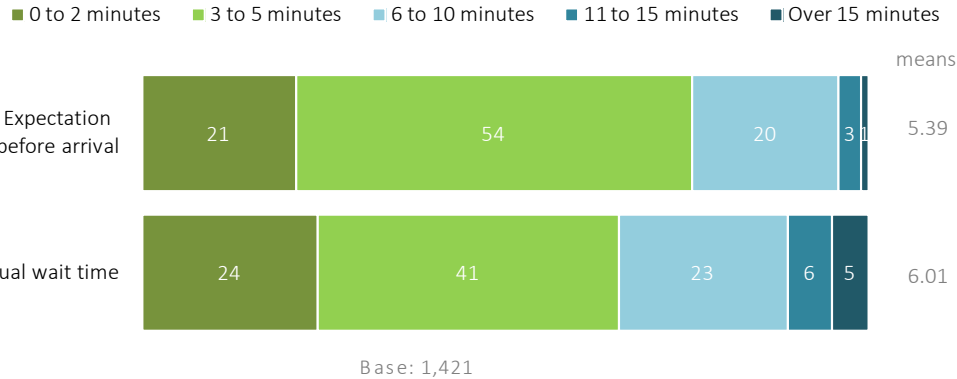
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- ❑ Live bus information has a significant impact on bus users' value of expecting waiting time
 - Overall, current London bus passengers value changes in their 'at bus stop' waiting time twice (2x) as much as changes to their in-vehicle time
- ❑ Bus customers who check live bus information prior to travelling have lower expected waiting times, especially those on low frequency routes
- ❑ The waiting time multiplier varies by; real time information channels available, journey length/purpose and the age of the traveller
- ❑ For bus users who check live bus information before their trip:
 - There is no significant difference in the expected waiting time between high and low frequency routes
 - They are also are less sensitive to changes in the expected waiting time (at stop) and more sensitive to changes to their in-vehicle time
 - *This implies that for a well pre-planned bus journey, passengers value their waiting time the same or even less than their in-vehicle time.*

Main Findings

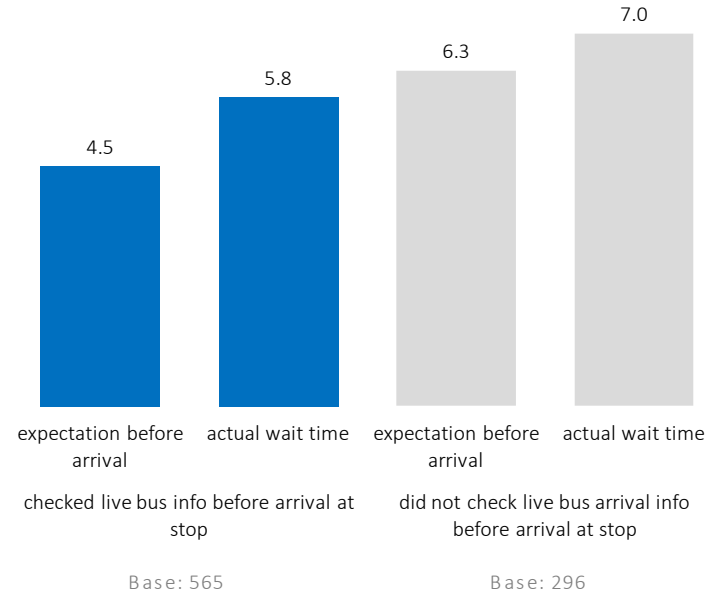
Expectations of wait times at stop slightly shorter than actual wait times

- Expectation of wait time was slightly shorter than actual wait time



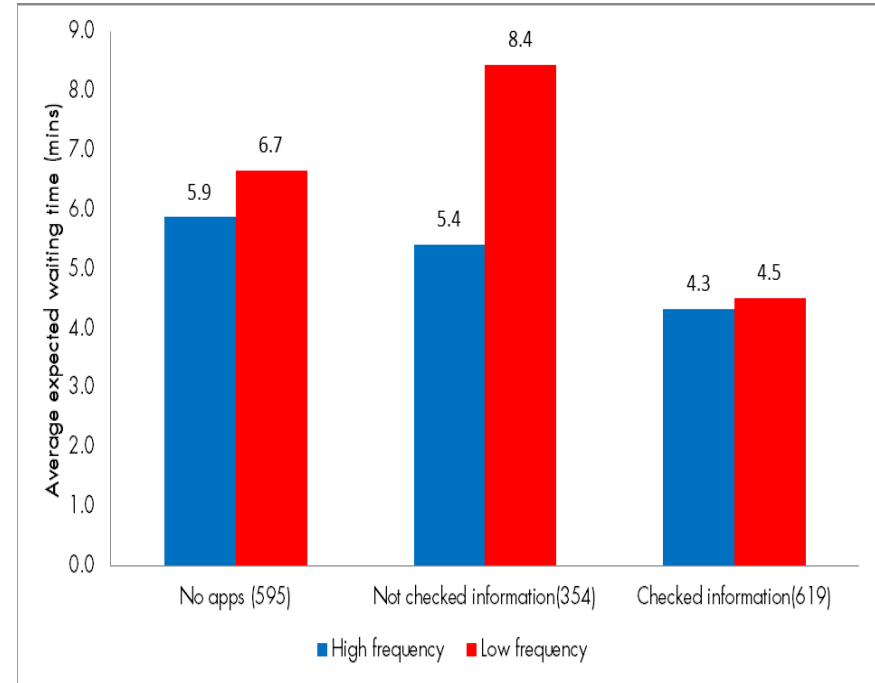
- Those who did **not use** live bus arrival times had longer expected wait times than those who did: 6 minutes on average compared to 5.1 minutes

- Those who **checked** live bus times had shorter expected and actual wait times than those who didn't



Customers checking live bus information have reduced/similar expected wait times for low and high frequency routes

- ❑ Bus users on low frequency routes have a slightly longer expected waiting time compared to those on the high frequency routes (as would be expected)
- ❑ However, this difference varies across the different information provision groups
 - Those with no access to live information or who don't check live information have longer expected waiting times for low frequency services
 - Those who check live bus information have similar expected wait times for low and high frequency routes



Current bus customers value changes in their waiting time 2 times* more than changes to their in-vehicle time – reduced by use of real time information

- ❑ Overall, current London bus customers value changes in their waiting time 2 times* more than changes in their in-vehicle time
- ❑ This takes account of the emerging impact of real time information which lowers the average multiplier values
- ❑ Bus users who checked live bus information prior to making their journey had a lower multiplier
- ❑ A reduced multiplier of 2 is recommended

	Sample %	Multiplier
Haven't checked or no access to information	61	2.2
Checked waiting time using Mobile	32	1.7
Checked waiting time using Internet	4	1.0
Checked waiting time using both Mobile and Internet	2	0.8
Overall	100	2.0

*This multiplier is smaller than the currently recommended value by DfT (WebTAG of 2.5 for commuting and other purposes)

How the VoT Multiplier works...

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Current VoT multiplier = '2.5'

Expected waiting time = 4 minutes



Actual waiting time = 4 minutes



Equivalent riding time = 10 minutes

Potential new VoT multiplier = '2'

Expected waiting time = 4 minutes



Actual waiting time = 4 minutes



Real time bus information

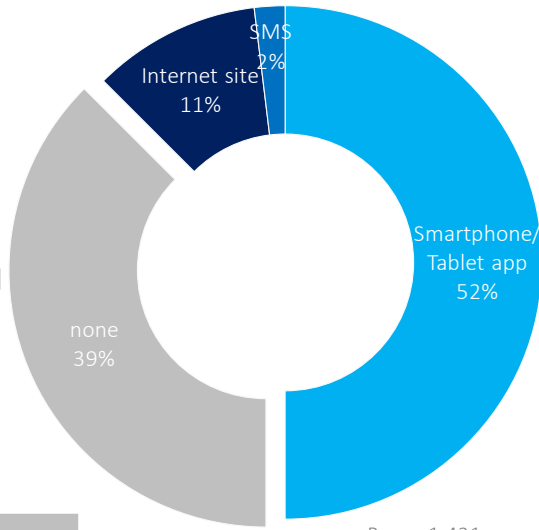


Equivalent riding time \leq 8 minutes

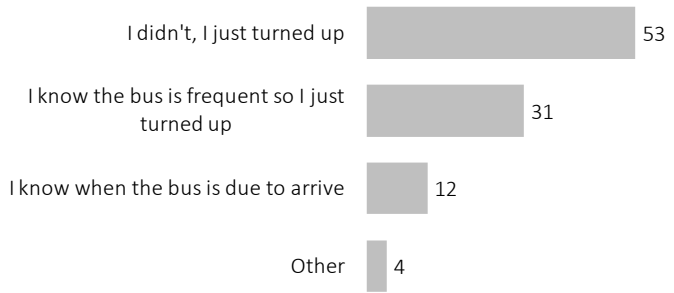
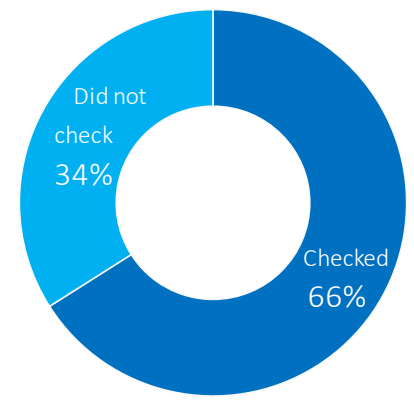
2 in 3 customers use live bus information

61% got live bus information

Those who didn't typically just turned up

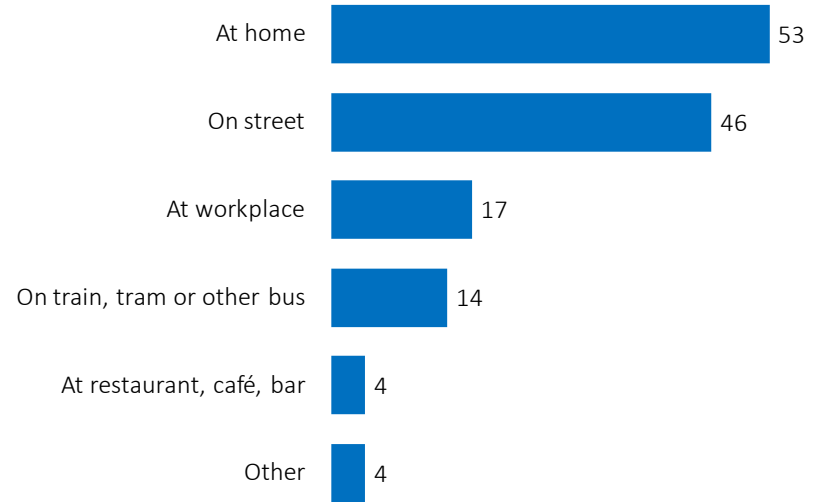


Two thirds who got live bus information checked it **before** arrival at the stop



A balance between 'at home' and 'on street' checking of live bus information

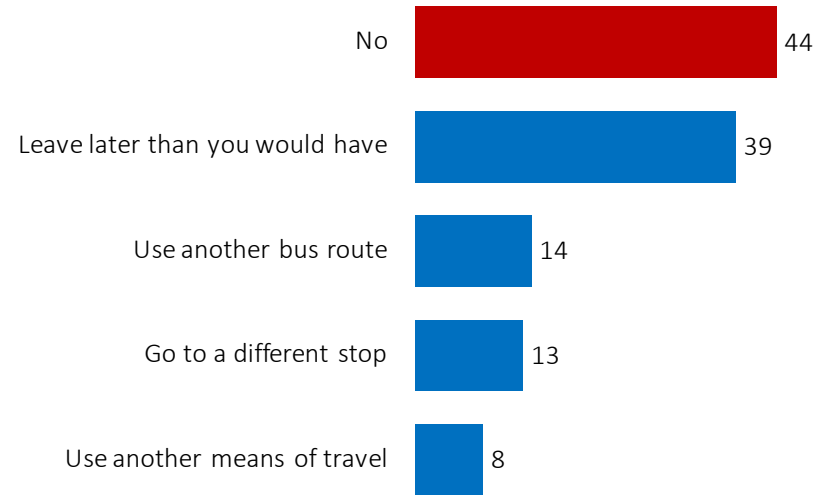
- The 66% who checked the live bus arrival information **before** arrival at the stop did so mostly at home or on street:
 - 53% at home
 - 46% on street



Base: 565

Live bus information has an impact on customer behaviour

- 56% of those who checked live bus arrival information before arriving at the bus stop changed their behaviour based on that information:
 - 39% leave later than they would have
 - 14% used another bus route
 - 13% went to a different bus stop

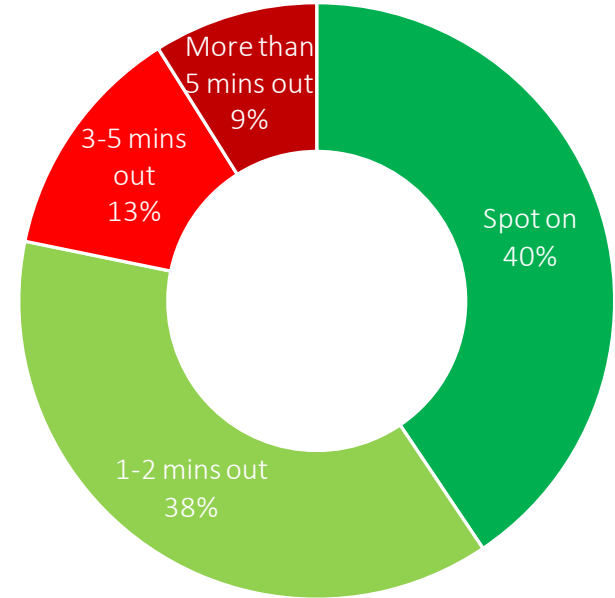


Base: 565

Perceptions of accuracy of information are high

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- The 56% who checked live bus information **before** arrival were asked how accurate they thought the information was:
 - Over three quarters said it was spot on or 1-2 minutes out
 - However, 9% said it was 5 minutes or more out
- 44% of people interviewed claimed the stop had a Countdown sign present*
 - 9 in 10 used Countdown at stops where it is present (i.e. to check arrival times)



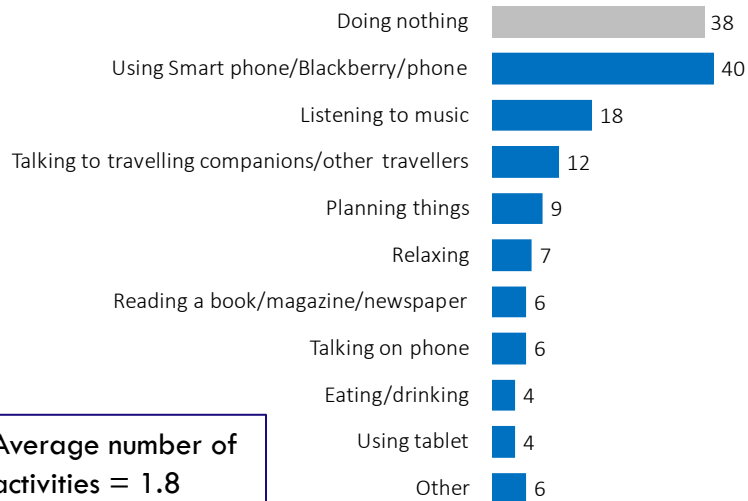
Base: 565

*There are actually 19,000 bus stops – of which 2,500 have a Countdown sign (the sample quota was not set by Countdown for this project)

At stop slightly less productive than on bus – smart phone is main activity used

At stop

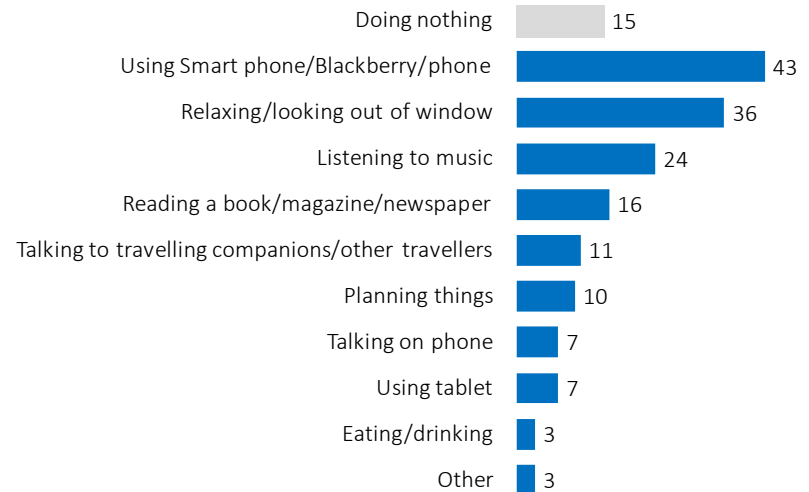
- Using smart phone is main activity
- Little variation by time at stop



Average number of activities = 1.8

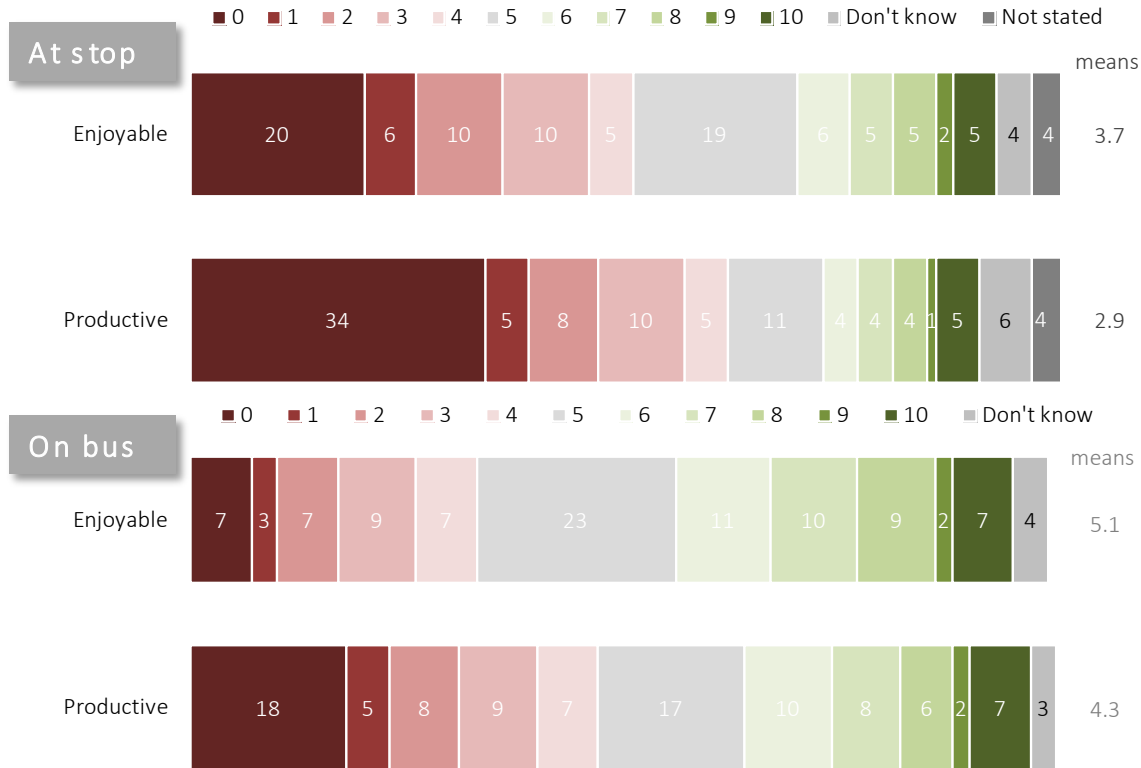
On bus

- Using smart phone is main activity
- The longer the journey the more activities



Time on the bus much more enjoyable & productive than at the stop

- Time on bus much more enjoyable and productive than time at stop:
 - Those who didn't use live bus information found time at stop more enjoyable & more productive
- Those at Countdown stops found time more enjoyable than those at non Countdown stops



Policy implications and recommendations

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- ❑ Live bus info can improve the bus users' experience by changing how long they have to wait, particularly for those on low frequency routes
 - When evaluating the benefit of live bus information, the impact on waiting times should be considered
- ❑ We recommend using a bus wait time multiplier of 2.0 - lower than the current DfT WebTAG recommended value (of 2.5)
- ❑ Access to live bus information acts to reduce the multiplier so over time we would expect the average multiplier to be reduced further
- ❑ When appraising future London bus schemes it will be important to take into account the lower penalties now being placed by some groups on bus waiting times
- ❑ In the short term, it would be possible to adjust the overall multiplier by changing the proportions of bus users checking waiting times in advance.

Appendices

Methodology/sampling

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- Two sampling methods:
- **Oystercard Database:**
 - TfL Oystercard Database sampled
 - Those who used a bus at least twice in last 8 weeks
 - 20,000 invites = 1,006 online completes
- **At stop recruitment:**
 - Intercept CAPI survey using Android tablets
 - 1 in n random sampling approach
 - 1,397 recruited = 415 interviews
- Quotas on; journey purpose, access to stop, age and gender
- Participants invited to undertake a follow-up survey on-line or by phone (£5 incentive offered)
- Bus stops locations chosen to represent a range of types covering Countdown, frequency, geography
- Fieldwork between 12th and 29th March 2016
- 1,397 recruitment interviews:
 - 1,156 emails = 318 online completes
 - 241 by phone = 97 CATI interviews
- Total interviews = 1,421

Sample, Pilot and Weighting

- ❑ **Online**
 - 1,324 online completes:
 - 318 from at stop recruitment (28% response rate)
 - 1,006 TfL sample (5% response rate)
 - The average questionnaire length was 13.5 minutes to completion
- ❑ **CATI**
 - 97 interviews completed from 241 tel. numbers (40% response rate)
 - The average interview length (by phone) was 17 minutes
- ❑ Total completed interviews = **1,421**
- ❑ **Pilot**
 - A pilot was undertaken in Jan/Feb 2016 to test the method, questionnaire and stated preference
- ❑ **Weighting**
 - Data was weighted to the Bus User Survey 2014 by:
 - age, gender and journey purpose

Just over half waited as long as they expected

- Slightly over half (53%) actually waited about as long as they expected to wait at the stop:
 - 27% waited longer and 20% waited shorter than expected

Expected wait time	Actual wait time					base
	0 to 2 minutes	3 to 5 minutes	6 to 10 minutes	11 to 15 minutes	Over 15 minutes	
0 to 2 minutes	12	6	2	0	0	299
3 to 5 minutes	10	29	10	2	1	740
6 to 10 minutes	2	5	10	3	2	310
11 to 15 minutes	0	1	1	1	1	47
Over 15 minutes	0	0	0	0	1	25
Base	348	582	331	90	70	