

Willingness to pay for different broadband speeds

Further details on survey methodology and results - Non-Confidential Version

In the paper “Appropriate approach to pricing remedies on Openreach’s Wholesale Local Access (WLA) services”, we assessed whether Ofcom’s chosen WLA pricing remedies in its 2021 Wholesale Fixed Telecoms Market Review (WFTMR) would continue to be appropriate for the Telecoms Access Review (TAR), covering the period 2026-31. This included assessing whether Ofcom’s so-called “pricing continuity” approach, in which Openreach’s prices for its WLA FTTC and FTTP 40/10 products were subject to a CPI-0% price cap and flexibility then allowed on higher-speed product prices, is likely to sufficiently contain Openreach’s FTTC and FTTP prices over the TAR period.

We outlined that a continued price cap on 40/10 WLA prices is unlikely to effectively constrain higher-speed prices going forward. This is because there are a number of behavioural effects (such as status quo bias, loss aversion, and regret aversion) that mean that once consumers are on higher-speed products, they may not choose to downgrade to 40/10 products even in the event of significant price increases.

We supported this using results of a survey recently commissioned by Frontier, which was designed and implemented in collaboration with the market research company RedBlue. RedBlue has been used extensively by Sky UK in order to provide insights on consumer behaviour and preferences in the markets that they operate in, including the fixed broadband market.

In this note we provide further details on this survey, including the survey methodology and survey results. This note is accompanied by other supporting documents, including the survey questionnaire and survey data underlying the presented results. These documents are referred to in the relevant sections of the note below.

1 Survey methodology

1.1 Survey objective and overarching analysis methodology

The overarching objective of the survey was to understand how consumers of retail fixed broadband services in the UK trade-off between the speed and price of their broadband service, and the extent to which this may differ depending on the current broadband package that they have.

More specifically, the objective was to assess the amount that consumers would be willing to pay to “upgrade” the speed of their broadband package, and the price they were willing to accept to “downgrade”. This then allows us to assess the extent to which lower speed broadband offers would be effectively constraining higher speed broadband offers.

As noted above, the hypothesis we wanted to test was that, due to the existence of behaviours such as the ones mentioned above, and potentially consumers’ consumer surplus being relatively higher on higher speed products, the price consumers would accept to downgrade from their current broadband package to a lower-speed package (say from A to B), would be higher than the price they would be willing to pay to upgrade to that package (i.e. from B to A).

Past research on approaches to measuring WTP has shown that directly asking consumers about their willingness to pay, or “stated preference” approaches, are unlikely to result in accurate estimates.¹ We have instead taken an approach based on “revealed preference”, whereby we aim to “infer” willingness to pay based responses to questions presenting respondents with a range of potential realistic combinations of prices and speeds.

To do this in practice, we aimed to identify the speed and price that survey respondents currently pay for their fixed broadband package, and then provided them with a series of questions in which they were asked to choose between that package and a range of alternative lower-speed (lower-priced) and higher-speed (higher-priced) packages.

Where respondents chose to switch from their current package, this allowed us to identify the price differential that prompted them to upgrade or downgrade their speed. The average price differential across respondents when moving from each package to another then provides a measure of willingness to pay: the average price differential when respondents chose to upgrade from a package to a higher-speed provides a measure of the willingness to pay to upgrade from that package, while the average differential when respondents chose to downgrade from a package provides a measure of willingness to pay to accept a downgrade from that package. We recognise that this is simple analysis based on responses to

¹ Stated preference approaches tend to suffer from hypothetical bias, resulting in WTP estimates that significantly exceed reality. For example see [John Loomis](#) (2011) and [Murphy et al.](#) (2005).

hypothetical questions, however we consider that the results are still informative, as consumers are presented with realistic alternative choices.

Our primary focus was on willingness to pay to upgrade from / downgrade to lower-speed products, particularly the 40Mbps product, given Ofcom's current price caps focus on these products. However for completeness, the survey and our analysis also considers willingness to pay to switch to/from higher-speed products (i.e. to speeds up to and including 330Mbps).

1.2 Survey sample

The survey was an internet-based survey carried out in July 2024. The survey was completed by 1,942 respondents who answered on behalf of their household.

The sample was designed to be representative of UK households with internet access. As is standard market research practice, the sample was recruited using quotas to ensure that the mix of the sample was broadly representative of the target population. Quotas were set for a range of factors, including gender, age, UK region, household income, and broadband provider. More details on the quotas are provided in Annex A.

In practice, the survey included questions relating to these factors, with the sample then weighted to achieve a more precise representation of the target population.² The survey weights are provided alongside the survey data in the accompanying file "*Survey weights.xlsx*".

Beyond these questions, the core questions of the survey related to identifying the respondents' current broadband speed and price, and the choices they would make between various alternative broadband packages. The full survey questionnaire including all questions asked to respondents is provided in file "*Broadband WTP Questionnaire - 2024 – FINAL*" accompanying this document.

1.3 Identifying respondents' current broadband speed and price

As noted above, respondents were first asked to identify the download speed provided by their current broadband package, and the price they pay for that package.

- In terms of the definition of speeds, the questions focussed on the maximum download speed available on the customers chosen package, as opposed to the average speeds that they will achieve. This is because retailers market their broadband packages in different ways, with some retailers advertising these based on the maximum speeds on the package, others the average speed, and others both. Also, where average speeds are advertised retailers take different approaches, with some stating the actual average

² We note that the key results of the survey are the same whether the sample is weighted or unweighted.

speed they expect to be achievable on the package, whilst others presenting lower speeds in order to be conservative.³ The use of the maximum speed was therefore chosen as it ensured package speeds could be defined consistently across retailers.

- In identifying a respondent's package speed, respondents were first asked to identify the name of their current package from the set of packages provided by their current provider, and the maximum speed of their package from the list of available maximum speeds.
- In terms of the package price, respondents were asked directly about the price that they currently pay, focussing on their monthly rental price. The survey considered the price of the broadband element of their package. This meant that where the respondent purchased broadband in a bundle with other services from their retail provider, they were asked to specify the price for the broadband element of that package.

Where a respondent was unable to identify the maximum speed and / or price of their broadband package, a speed and price was assigned to them, with the respondent then asked to have these assigned values in mind when completing the rest of the survey:

- Where the respondent knew their current package speed but not price, they were assigned the current price of the associated package from their current retail provider.
- Where they were unable to identify both their speed and price, but were able to identify the name of their current package, they were assigned the current speed and price of that package.
- Where the respondent was also unable to identify the name of their current package, the speed and price was imputed from responses to other questions within the survey. This included if they knew whether they were on "standard" (ADSL) broadband or fibre-based broadband, and if the latter, whether this was provided via FTTC or FTTP. They were then assigned the speed and price of the most popular package with those characteristics across the UK.⁴

In practice, we anticipate that when engaging in the market in reality, consumers would gather basic information on their existing package first. As such, we consider responses from respondents that do not know the speed or price of their current package to be less informative about actual switching behaviour than the responses from the "informed" respondents. We therefore exclude the "uninformed" respondents from our preferred analysis sample, which resulted in a sample of 1,322 respondents.⁵

³ For example, this is the case for Vodafone's "Fibre" and "Full Fibre" packages.

⁴ By most popular, we mean the package which the most number of customers take. If a customer stated they took their broadband from Virgin Media, they were assigned the speed and price of Virgin Media's 160Mbps package, which we assume is their most popular product. Full details on the speed and price imputation is set out in the file *Survey data.xlsx* accompanying this document.

⁵ Annex C shows that the key findings from the survey would be the same if the uninformed respondents are included in the analytical sample.

Table 1 Preferred survey sample for analysis

Group of respondents	Number	% of full sample
Full sample	1,942	100%
Respondents who did not know their broadband speed	506	26.1%
Respondents who did not know their broadband price	279	14.4%
Preferred sample	1,322	68.1%

Source: Frontier Analysis

Note: There is overlap between the respondents who didn't know their speed and price i.e. 165 (8.5%) of respondents knew neither their current speed or price.

1.4 Broadband package “choice task” design

Once the existing broadband speed and price for the respondent was identified, they were then asked to complete eight “choice tasks”. In each task they were presented with four broadband packages:

- One product was always the respondent’s current broadband package. It had the price that the respondent reported to be paying for their current package, and offered the maximum download speed that the respondent reported to be receiving.
- The remaining three packages were the alternative broadband packages, with different maximum speeds and a different price. Alternative speeds were randomly chosen from possible alternative speeds that are available in the market, and then package prices were selected at random from a feasible range, which reflected prices of offers that are available today – see Table 8 in Annex B. Prices for packages which had higher broadband speeds were set to always be greater than the prices for slower packages.⁶

The prices of alternative packages were presented in absolute terms, and relative to the price of their current package. This reflects the information we would expect consumers to have in practice when making these choices, as its reasonable to expect that they will take the time to calculate the difference in price between alternatives and their current price before making decisions. Respondents are also told that the alternatives were provided by their current provider, in order for their choice to be driven primarily by the differences in broadband speed and price, rather than being influenced by their experience with their current provider.

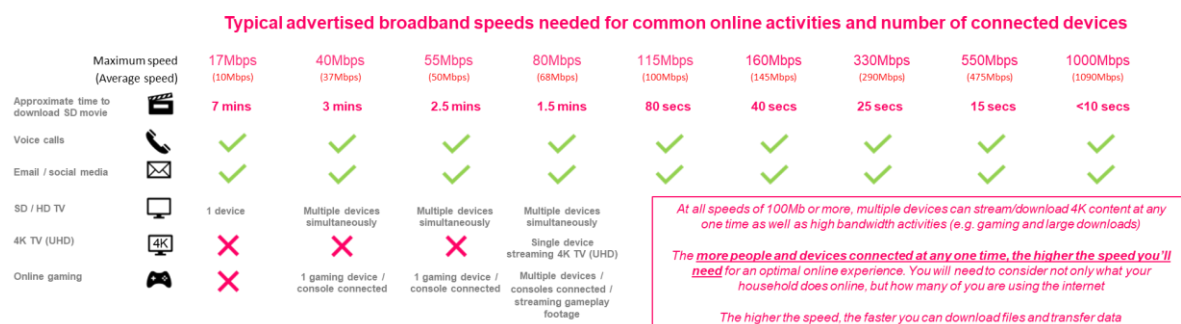
⁶ More details in Annex B

Before being provided with the choice tasks, the respondents were also shown an infographic highlighting the broadband experience that could be expected under different speeds – see Figure 1 below. This again aims to reflect that in practice the average consumer would be expected to gather similar information, and tailor their choice of broadband package to the needs of their household. Such information is available from a range of public well-known websites such as Which.co.uk⁷, MoneySavingExpert⁸, and Cable.co.uk⁹, and is also provided directly by retail providers.

Figure 1 End-user experience under different broadband speeds - infographic presented to respondents

To help you better understand advertised broadband speeds and how these relate to your household needs, please review the information below

Note that advertised connection speeds are the maximum speed you can get with a package, and the actual speed achieved will vary from household to household based on factors like the quality of the line and the distance from the exchange. You are likely to achieve speeds closer to the advertised speed for higher-speed packages



Source: RedBlue, based on information presented on Which.co.uk, MoneySavingExpert, and Cable.co.uk

2 Survey results

This section presents the key results from the survey, including the outcomes of the choice tasks, and the average price differentials that respondents were willing to pay (accept) when they chose to upgrade (downgrade) from their current package.

2.1 Outcomes of the choice tasks

Table 2 below provides the outcome of the choice tasks, which shows the % of tasks for which the respondent chose their current package or chose to downgrade or upgrade, split by the current package of the respondent.

⁷ <https://www.which.co.uk/reviews/broadband/article/what-broadband-speed-do-i-need-aRxZX0q3jiekp>

⁸ <https://www.moneyexpert.com/broadband/what-speed-do-i-need/>

⁹ <https://www.cable.co.uk/broadband/guides/what-broadband-speed/>

Table 2 Outcomes of choice tasks by speed of existing package

Existing speed	Choice tasks resulting in a downgrade (%)	Choice tasks resulting in no change (%)	Choice tasks resulting in an upgrade (%)	Number of choices
17	Not possible	39%	61%	1,074
40	5%	62%	33%	1,406
55	9%	54%	38%	604
80	13%	60%	27%	2,296
115	18%	55%	26%	371
160	20%	65%	14%	1,641
330	17%	74%	8%	668
Total	16%	59%	21%	8,061

Source: Frontier analysis of RedBlue survey data

The results show that respondents were generally reluctant to change speed: 59% of choice tasks of respondents with current speeds at or below 330Mbps resulted in neither upgrading nor downgrading, with this outcome not varying significantly according to their existing package speed.

2.2 Average price differentials when switching package

Table 3 and Table 4 show the average price differential across respondents when they chose to switch from and to 40Mbps and 80Mbps packages in the choice tasks.

Table 3 indicates that there is significant asymmetry in respondents' willingness to pay when switching between the 40Mbps product and other lower-speed products. For example, the average reduction in price that a respondent was willing to accept to downgrade from 80Mbps to 40Mbps (£11.38 per month) was significantly larger (more than double) the average price a respondent was willing to pay to upgrade from 40Mbps to 80Mbps (£5.32 per month). The asymmetry is also significant (although smaller in magnitude) for respondents switching between 40Mbps and 115Mbps, 160Mbps, and 330Mbps products.

Table 4 indicates that there is also asymmetry between respondents' willingness to pay to switch between 80Mbps and 115Mbps products (average of £8.83 to downgrade from 115Mbps to 80Mbps, versus £5.28 to upgrade from 80Mbps to 115Mbps), but less clear evidence of asymmetry for those switching between 80Mbps and 160Mbps+ products.

Table 3 Average monthly price differential to switch to and from 40 Mbps

Speed	Price reduction to downgrade to 40 Mbps	Price increase to upgrade from 40 Mbps	Difference, £ (downgrade minus upgrade)	% Asymmetry (downgrade as % of upgrade)
80	£11.38	£5.32	£6.06	214%
115	£15.13	£9.91	£5.22	153%
160	£14.11	£8.44	£5.67	167%
330	£17.87	£11.53	£6.34	155%

Source: Frontier analysis of RedBlue survey data

Table 4 Average monthly price differential to switch to and from 80 Mbps

Speed	Price reduction to downgrade to 80 Mbps	Price increase to upgrade from 80 Mbps	Difference, £ (downgrade minus upgrade)	% Asymmetry (downgrade as % of upgrade)
115	£8.83	£5.28	£3.56	167%
160	£7.53	£6.92	£0.61	109%
330	£10.76	£9.12	£1.64	118%

Source: Frontier analysis of RedBlue survey data

The results indicate there is an asymmetry in willingness to pay when customers switch between lower-speed products, but this is less the case when switching to / from higher-speed products.

2.3 Results for vulnerable customers

In addition to the results for the full preferred sample, we also aimed to investigate results for the set of respondents that could be considered “vulnerable customers”. This is because, as noted in our “main paper”, research by Ofcom and others shows that the behavioural effects that drive the potential asymmetry in willingness to pay could disproportionately affect vulnerable customers. As such, it could be expected that the asymmetries highlighted above are greater for the vulnerable customers that were surveyed.

To test this, we proxied vulnerable customers by looking at the results for respondents in lower-income households.

- This reflected Ofcom's definition of vulnerability in its 2020 review of pricing practices in the fixed broadband market, where they defined vulnerable customers as including "*those who are **disabled**, those who are **aged 65+**, and those who are **financially vulnerable***".¹⁰
- The survey did not include questions on disability, meaning we were unable to define vulnerability based on this. While the survey did have information on the age of respondents, we did not choose to define vulnerable customers based on respondents that were over 65 and in lower-income households. This is because the sample size of respondents in this group is very small, making any conclusions drawn from results for this group is unlikely to be robust.¹¹

In practice, we have considered the results for respondents whose reported gross household income was less than £30,000 per annum (see Table 5 and Table 6 below), as approximately just less than half of the preferred sample who stated their household income had incomes at or below this level.

The results support the hypothesis that the asymmetry in willingness to pay to downgrade and upgrade speeds is larger for vulnerable customers. In particular,

- The average reduction in price that those with incomes below £30,000 are willing to accept to downgrade from 80Mbps to 40Mbps is approximately 3 times larger than the willingness to pay to upgrade from 40Mbps to 80Mbps (£14.10 vs £4.75 per month), compared to just over twice as high in our full preferred sample (£11.38 vs £5.32 per month).
- Similarly, the average price reduction to accept a downgrade from 115Mbps to 80Mbps among this group is approximately twice the willingness to pay to upgrade from 80Mbps to 115Mbps (£9.13 vs £4.67 per month), compared to only c65% larger in our full preferred sample (£8.83 vs £5.28 per month).

¹⁰ <https://www.ofcom.org.uk/siteassets/resources/documents/consultations/category-2-6-weeks/130197-helping-consumers-get-better-deals-on-their-broadband/associated-documents/secondary-documents/bb-pricing-update-july-20.pdf?v=325104>

¹¹ For example, the number of tasks of respondents with age over 65 and income less than £30,000 who upgraded from 40 Mbps to 80 Mbps was only seven, while the number of tasks where such respondents downgraded from 80 Mbps to 40 Mbps was four. The equivalent number of tasks when just looking at those with income less than £30,000 (i.e. without the age criteria) is 46 for both the 40-to-80 upgrade and 80-to-40 downgrade.

Table 5 Average monthly price differentials for those with gross household incomes below £30,000 – to and from 40 Mbps

Speed	Price reduction to downgrade to 40 Mbps	Price increase to upgrade from 40 Mbps	Difference, £ (downgrade minus upgrade)	% Asymmetry (downgrade as % of upgrade)
80	£14.10	£4.75	£9.35	297%
115	£21.66	£8.82	£12.84	245%
160	£12.90	£8.29	£4.60	156%
330	£20.20	£11.65	£8.55	173%

Source: Frontier analysis of RedBlue survey data

Table 6 Average monthly price differentials for those with gross household incomes below £30,000 – to and from 80 Mbps

Speed	Price reduction to downgrade to 40 Mbps	Price increase to upgrade from 40 Mbps	Difference, £ (downgrade £ minus upgrade £)	% Asymmetry (downgrade as % of upgrade)
115	£9.13	£4.67	£4.46	195%
160	£6.51	£8.54	-£2.03	76%
330	£10.90	£8.71	£2.19	125%

Source: Frontier analysis of RedBlue survey data

3 Conclusion

The survey provides an indication of what price reductions consumers on 80Mbps and 115Mbps speeds would need to obtain in order to downgrade their speeds. The results indicate that the price reductions when moving to lower-speed products would need to be significant in order for these customers to accept downgrading their speed. The results therefore demonstrate that the prices of 80Mbps and 115Mbps products could increase quite significantly before consumers decide to downgrade.

We recognise that despite the ‘sophistication’ of the conjoint analysis, it relies on asking consumers to choose between ‘hypothetical alternatives’. This potential drawback would be

expected to be less relevant when comparing the estimated willingness to pay to avoid a downgrade, relative to the estimated willingness to pay for an equivalent upgrade. In this regard, the results provide evidence that at lower speeds, the amount consumers are willing to pay to avoid a reduction in broadband speeds is likely to be significantly greater than what consumers are willing to pay for an equivalent upgrade. For example, the estimated amount that the average consumer would pay to avoid downgrading from an 80Mbps package to a 40Mbps package is an order of magnitude greater than what that consumer would pay for an upgrade in reverse. The finding also holds particularly true for lower-income households.

The market research evidence therefore indicates that once consumers have upgraded to higher-speed products, they may not choose to downgrade to the 40Mbps product even in the event of significant price increases, and may particularly be the case for vulnerable lower-income households.

The same is also true for customers switching to and from 80Mbps to 115Mbps packages, albeit to a less extent.

Annex A: Survey quotas

Table 7 summarises the quotas designed by the survey company to achieve statistical representation of the UK broadband population.

Table 7 Quotas representative of UK broadband population

Demographic	Subgroup	%
Age	18-34	30%
	35-54	37%
	55+	33%
Gender	Male	49%
	Female	51%
	Other	1%
Kids in household	Yes	27%
	No	71%
	Refused	2%
HH income	£0 - £30k	40%
	£30k +	47%
	Don't know/refused	13%
Broadband provider	BT	19%
	Sky	21%
	Virgin	20%
	TalkTalk	9%
	EE	7%
	Other	24%
TV platform	Sky	31%
	Virgin	15%
	BT/TalkTalk	7%
Region	North	22%
	Midlands/East	25%
	Wales and West	15%
	London and Southeast	27%
	Scotland	8%

Demographic	Subgroup	%
	Northern Ireland/Channel Islands	3%
Home ownership	Home owner	63%
	Private renter	21%
	Other	13%
	Prefer not to say	3%

Source: RedBlue survey documentation

Annex B: Approach to defining alternative broadband packages in the choice tasks

In order to define the alternative broadband packages available to respondents in each choice task, the speeds of these packages were first randomly chosen from eight possible alternative speeds. These reflecting the range of maximum speeds available in the market at the time of the survey, covering packages offered over ADSL, FTTC, FTTP and Cable technologies.

Package prices were then selected at random from a feasible range, based again on the range of prevailing retail prices for those speeds at the time of the survey. Prices for a higher speed package were set to always be greater than the price of lower speed packages in that task.

In practice, for each alternative in a task, prices were computed based on the stated or imputed price of the respondent's existing package. The price generation algorithm had two stages:

1. Prices were generated for packages faster than the respondent's existing package (if any). Prices were generated for the fastest package first, followed by the next fastest package and so on.
2. Prices were generated for packages slower than the respondent's existing package (if any). Prices were generated for the slowest package first, followed by the next slowest package and so on.

More specifically:

- If the fastest package in a task was not the respondent's existing package, then the price of this package was randomly generated, following a uniform distribution, in the range of $p^* + 2.5 \times (r_p - r^*)$ to $p_{max} + p^* - p_{mid}^*$. Where p^* is the price of the customer's existing package; r_p is the ranking of the package according to speed (descending); r^* is the ranking of the respondent's existing package (on the same basis); p_{max} is the value for the speed of the package given in Table 8, and p_{mid}^* is the value for the speed of the existing package given in Table 8.
- If the second or third fastest packages were not the respondent's existing package, then the price of these package was randomly generated in the range of $p^* + 2.5 \times (r_p - r^*)$ to $p_{nf} - 2.5$; where p_{nf} is the randomly generated price of the next fastest package.
- If the slowest alternative was not the respondent's existing package, then the price of this package was randomly generated in the range of $p_{min} + p^* - p_{mid}^*$ to $p^* - 2.5 \times (r_p - r^*)$; where p_{min} is the value for the speed of the package given in Table 8.
- If the second or third slowest alternative were not the respondent's existing package, then the price of the package was randomly generated in the range of $p_{ns} + 2.5$ to $p^* - 2.5 \times (r_p - r^*)$; where p_{ns} is the randomly generated price of the next slowest package.

The generation of the alternatives in the choice asks is set out in the file “*Conjoint design*” that accompanies this document.

Table 8 Parameters for the price algorithm

Speed (Mbps)	Mid	Min	Max
17	£24	£10	£38
40	£27	£13	£40
55	£32	£18	£45
80	£34	£21	£47
115	£38	£25	£50
160	£40	£26	£54
330	£44	£29	£60
550	£51	£33	£69
1000	£59	£39	£78

Source: RedBlue and Frontier, based on range of prevailing retail prices in the UK broadband market

Annex C: Alternative analysis results

As indicated in the main body, our baseline analysis focussed on respondents who knew information about both the speed and price of their current broadband package. This resulted in the exclusion of 31.9% of respondents.

Table 9 and Table 10 below present the key survey results when considering the “full sample” i.e. when including respondents for whom their current speed and or price was imputed before the choice task questions were asked. This covers the average price differentials when respondents chose to switch to and from 40Mbps and 80Mbps products.

This shows that the key findings from the analysis do not change when considering the full sample i.e. it indicates that there is significant asymmetry in willingness to pay when consumers upgrade versus downgrade between 40/80Mbps products and other lower-speed products.

Table 9 Average monthly price differentials when switching to and from 40Mbps – preferred vs full sample

Speed	Downgrade to 40 Mbps	Increase from 40 Mbps	Asymmetry (downgrade as % of upgrade)	Downgrade to 40 Mbps	Increase from 40 Mbps	Asymmetry (downgrade as % of upgrade)
Preferred sample			Full sample			
80	£11.38	£5.32	214%	£11.76	£5.58	211%
115	£15.13	£9.91	153%	£12.87	£10.19	126%
160	£14.11	£8.44	167%	£15.84	£8.64	183%
330	£17.87	£11.53	155%	£17.73	£11.76	151%

Source: Frontier Analysis based on RedBlue survey data

Table 10 Average monthly price differentials when switching to and from 80Mbps – preferred vs full sample

Speed	Downgrade to 80 Mbps	Increase from 80 Mbps	% Asymmetry (downgrade £ as % of upgrade £)	Downgrade to 80 Mbps	Increase from 80 Mbps	% Asymmetry (downgrade £ as % of upgrade £)
	Preferred sample			Full sample		
115	£8.83	£5.28	167%	£7.83	£5.59	140%
160	£7.53	£6.92	109%	£7.79	£6.93	113%
330	£10.76	£9.12	118%	£11.11	£9.46	117%

Source: Frontier analysis based on RedBlue survey data

Table 11 Outcome of choice tasks

Existing speed	Choice tasks resulting in a downgrade (%)	Choice tasks resulting in no change (%)	Choice tasks resulting in an upgrade (%)	Number of choices
17	Not possible	39%	61%	1,074
40	5%	62%	33%	1,406
55	9%	54%	38%	604
80	13%	60%	27%	2,296
115	18%	55%	26%	371
160	20%	65%	14%	1,641
330	17%	74%	8%	668
550	23%	71%	6%	944
1000	18%	82%	Not possible	828
Total	13%	62%	24%	9,833

Source: Frontier analysis based on RedBlue