# December 2020 Initial market analysis paper

**Ipsos MORI** 



18-101398-01 | Final Version | This work was carried out in accordance with the requirements of the international quality standard for Market Research, ISO 20252, and with the Ipsos MORI Terms and Conditions which can be found at http://www.ipsos-mori.com/terms. © Department for Digital, Culture, Media and Sport 2020

### Contents

1	State	e aid market analysis	.4
	1.1	Key terms and acronyms	4
2	Has	the aid had a material effect on the market position of the direct beneficiaries?	. 6
	2.1	Key findings	6
	2.2	Methodological approach	7
	2.3	All broadband provision	9
	2.4	NGA market	13
3	ls th	ere evidence of changes to parameters of competition arising from the aid?	19
	3.1	Key findings	19
	3.2	Methodological approach	21
	3.3	Results	22
4	Disc	ussion of data used	35
	4.1	Data used	35
	4.2	Data validation	36
A	nnex	es	42
A	nnex	1	43
A	nnex	2 – Sample sizes by contract area	46

## **1 State aid market analysis**

This document presents the early findings from the Superfast Broadband market analysis research. This research involved an analysis of datasets provided by ThinkBroadband to provide evidence to answer State Aid Questions four and five from the State Aid evaluation plan, namely:

- Has the aid had a material effect on the market position of the direct beneficiaries? And
- Is there evidence of changes to parameters of competition arising from the aid?

#### 1.1 Key terms and acronyms

#### Table 1.1: Key terms and acronyms

Term / acronym	Meaning
NGA	<b>Next Generation Access</b> – This refers to new or upgraded access networks that will allow substantial improvements in broadband speeds. This includes Fibre to the Cabinet, Fibre to the Premises (Fibre to the Home), Wireless and Cable broadband connections.
FTTP / FTTH	<b>Fibre to the Premises / Fibre to the Home</b> – This refers to an access network structure in which the optical fibre runs from the local exchange to the end user's living or office space.
FTTC	<b>Fibre to the Cabinet</b> - An access network structure in which the optical fibre extends from the exchange to the cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.
Cable	Telecommunications infrastructure which utilises cable networks, such as Data Over Cable Service Interface Specification (DOCSIS-3) networks.
Wireless	High-speed internet access where connections use radio signals rather than cables.
ADSL	<b>Asymmetric Digital Subscriber Line</b> - A technology used for sending data quickly over a conventional copper telephone line. It is used in current internet services with download speeds up to 24Mbit/s.
ISP	Internet Service Provider – An organisation which provides households / businesses access to the internet. ISPs do not always own the infrastructure used to provide services, and can utilise the infrastructure owned by network providers to provide services.

.

Network provider	Telecommunications providers which own infrastructure which is used to deliver internet services
LLU	<b>Local Loop Unbundling</b> - When communication providers can gain access to the network by placing their own equipment at the exchange. The communication providers then gain control of the line from the local exchange to the customer and the backhaul runs from the local exchange to their core network

## 2 Has the aid had a material effect on the market position of the direct beneficiaries?

The National Broadband Scheme evaluation plan described question 4 of the State Aid evaluation plan as:

"For each supplier awarded a contract under the scheme, the evaluators will compare the supplier's market share of all active (i.e. connected) NGA lines within the relevant county/unitary local authority areas (i.e. those areas in which the supplier was subsidised) at end June 2020 versus end June 2016."

"For each supplier awarded a contract under the scheme, the evaluators will also compare the supplier's market share of all active NGA lines within the UK at end June 2020 versus end June 2016."

#### 2.1 Key findings

The key findings presented here are based on an analysis of the ThinkBroadband speed test dataset. As such, the findings should be viewed the following caveats:

- The speed test data does not collect information for every customers' take-up, or even a random sample of customers (it only collects data for customers that undertake a speed test on the website), and therefore may be subject to some reporting bias;<sup>1</sup>
- Not all ISPs providing connections in a local area may be included in the dataset as customers may not have completed a speed test.

The key findings from the analysis are:

- The market share of the UK market (share of broadband connections) of the Superfast Broadband Programme beneficiaries has not changed substantially between 2012 and 2020. At a UK level, the Superfast Broadband programme does not seem to have had a substantial impact on the market position of the programme beneficiaries. The market share for Openreach was high in 2012 (representing 71 percent of connections in 2012, including Sky and TalkTalk connections) and this remains the case in 2020 (75 percent) although there has been a slight decrease in the market share of Openreach (excluding Sky and TalkTalk) between 2016 and 2020. The four other network providers that have received support represent 0.3 percent of the UK total broadband market.
  - A similar pattern is seen in the NGA market, with Openreach having a market share of over two thirds of the NGA broadband market in 2020, and the other beneficiaries having a market share of around 0.4 percent.
- The market share of beneficiaries in broadband market in the areas the Superfast Broadband Programme has delivered to has not changed substantially between 2012 and 2020. At an overall programme level (all areas the Superfast Programme has delivered to combined), the

<sup>&</sup>lt;sup>1</sup> Despite the potential for reporting bias, we do not believe that any bias in the dataset will affect the conclusions of the research, as the reporting bias should be similar in all areas of the UK.

Superfast Broadband programme again seems to have had little impact on the market share of programme beneficiaries. The market share for Openreach has remained fairly constant between 2016 and 2020, and above the UK average in the areas supported by the Superfast Broadband programme (90 percent compared to the UK average of 75 percent nationally in 2020). The market share of the other beneficiaries has increased in the treatment areas, but these providers still represent under one percent of the market in the Superfast Broadband programme areas in 2020.

The market share of beneficiaries at a contract level (in the individual areas Superfast Broadband Programme contracts have been delivered) have changed substantially between 2012 and 2020. In the local areas where projects have been delivered, the beneficiary delivering the contract has seen an increase in their market share. At a more local level, the programme does seem to have had impact on the market share of the programme beneficiaries. In the areas where Openreach were awarded contracts, they have maintained their market share of around 90 percent of connections. However, in the areas where Gigaclear or wireless providers have been awarded contracts, the market share for Openreach has fallen – though they are still have the largest market share – to closer to 70 percent of the market. In areas where Gigaclear have delivered contracts, they have an estimated market share of 25 percent (compared to 0.2 percent nationally); and wireless / satellite providers have a market share of six percent in the areas they have delivered contracts in (compared to 0.1 percent nationally). This suggests that at a very local level the Superfast Broadband programme has had an effect on the telecommunications market.

#### 2.2 Methodological approach

There are five network providers which have been awarded contracts through the Superfast Broadband Programme. These are:

- Openreach
- Gigaclear
- Callflow
- Airband
- UK Broadband / Relish.

The first stage of the analysis to provide evidence of each providers market share was to identify the ISPs which utilised each network providers infrastructure. This information was collected from a web search of the ISPs' websites, the Openreach website (which lists ISPs which utilise their wholesale products) and the ThinkBroadband website. A complete list of ISPs included in the dataset and the network providers they have been mapped to is included in the Annex.

There is no methodology set out in the evaluation plan for how to undertake the analysis of market share. The analytical approach described below has been used to provide evidence to answer the state aid evaluation question.

 Analysis of all broadband provision. The market share of the take-up of broadband connections for the five network providers to benefit from the Superfast Broadband programme as a percentage of the whole broadband market has been analysed and presented. This has been included because of the relatively small number of observations among some groups for the analysis. This analysis includes:

- The UK broadband market, assessing the market share of programme beneficiaries.
- The areas where the Superfast Broadband programme has delivered to, assessing the market share of programme beneficiaries.
- Comparator area<sup>2</sup> analysis, assessing the market share of programme beneficiaries in areas the Phase of the programme did not operate in.
- The individual contract areas that the programme has operated in, assessing the market share of programme beneficiaries in these areas.<sup>3</sup>
- Analysis of NGA provision. The market share of the take-up of broadband connections for the five network providers to benefit from the Superfast Broadband programme as a percentage of NGA connections taken up has been analysed and presented. This includes:
  - The UK broadband market, assessing the market share of programme beneficiaries.
  - The areas where the Superfast Broadband programme has delivered to, assessing the market share of programme beneficiaries.
  - Comparator area<sup>4</sup> analysis, assessing the market share of programme beneficiaries in areas the Phase of the programme did not operate in.

The individual contract areas that the programme has operated in, assessing the market share of programme beneficiaries in these areas. To undertake this analysis, the ThinkBroadband speed test data was used as a proxy measure of take-up of connections. The speed test data does not collect information for every customers take-up, or even a random sample of customers (it only collects data for customers that undertake a speed test on the website), and therefore may be subject to some reporting bias. Additionally, not all ISPs providing connections in a local area may be included in the dataset as customers may not have completed a speed test. However, when the data has been compared to actual take-up measures at a regional and UK level, the speed test data does provide an accurate approximation of take-up. Therefore (and in the absence of other data) the speed test data has been used for this analysis.

The speed test data was matched to the Superfast Broadband programme Management Information (C3 reports from February 2020 and SCTs) to identify the areas which each Superfast Broadband contract has been delivered, and to identify comparator areas for the Superfast Broadband delivery areas (postcodes which were identified as white in the SCTs but were not included in the build plans, and had not been built to). This matching was undertaken using the postcode entry in the datasets.

<sup>&</sup>lt;sup>2</sup> Comparator areas were selected as postcodes that were identified as white in the Open Market Review for each phase of the Superfast Broadband programme, but that were not included in build plans or delivered to in that phase of the programme. It is possible that postcodes included in the comparator area for Phase 1 have been delivered to subsequently in Phase 2 or Phase 3 of the programme (and likewise for comparator postcodes for Phase 2 have been subsequently delivered to in Phase 3 of the programme)

<sup>&</sup>lt;sup>3</sup> Due to small sample sizes, Airband and UK Broadband / Relish contract areas have been combined into a "Wireless"

<sup>&</sup>lt;sup>4</sup> Comparator areas were selected as postcodes that were identified as white in the Open Market Review for each phase of the Superfast Broadband programme, but that were not included in build plans or delivered to in that phase of the programme. It is possible that postcodes included in the comparator area for Phase 1 have been delivered to subsequently in Phase 2 or Phase 3 of the programme (and likewise for comparator postcodes for Phase 2 have been subsequently delivered to in Phase 3 of the programme)

The market shares have been calculated for three points in time – 2012 (the start of the Superfast Broadband programme), 2016 (when the current State aid decision was introduced) and 2020 (the most recent data available).

#### 2.3 All broadband provision

#### 2.3.1 UK market share

The market share for network providers has been estimated by the proportion of speed tests completed for ISPs which were mapped to the network provider (see Annex 1). At a UK level, connections supplied through the Openreach network dominate the market – with around 40 percent of take-up in all years being made through the Openreach network. This percentage increases if the Sky and TalkTalk networks are included as being provided through the Openreach network (as these networks do utilise the Openreach network) to between 71 percent (2012) and 78 percent (2016) of take-up.

The other suppliers awarded Superfast Broadband contracts represent a very small proportion of the broadband market – cumulatively less than one percent of the total broadband market in 2020 (see table below).

At a UK level, there has not been a large increase in the market share of the programme beneficiaries – in fact between 2016 and 2020, there has been a decrease in the market share of the beneficiaries, driven by a decrease of the market share for Openreach (including Sky and TalkTalk).

Network provider	2012	2016	2020
Openreach	42.82%	38.61%	39.64%
Openreach (plus Sky and TalkTalk)	71.10%	78.08%	75.16%
Airband	0.00%	0.01%	0.09%
Gigaclear	0.00%	0.08%	0.18%
Callflow	0.00%	0.02%	0.02%
UK Broadband / Relish	0.00%	0.00%	0.01%
Total programme participants	71.10%	78.26%	75.52%
Virgin Media	27.66%	19.86%	17.10%

Table 2.1: Market share of the total broadband market for SuperfastBroadband beneficiaries

Source: ThinkBroadband data

#### 2.3.2 Superfast Broadband programme delivery and comparator area market share

The market share of the total broadband market for the network providers in the areas that the Superfast Broadband programme has been and is currently operating was analysed using the same approach. The market share for Openreach in these areas remained fairly static between 2012 and 2020, at around 90 percent of all connections (including Sky and TalkTalk), which is higher than the UK average (between 70 and 80 percent).

The Openreach market share was generally slightly lower in the comparator areas in all years than in the Superfast Broadband delivery areas (Phase 2 in 2016 being the exception), but the market share for Openreach remained fairly steady in the comparator areas (between 85 percent and 95 percent in Phases 1 and 2, and between 82 and 87 percent in Phase 3 comparator areas), and higher than the UK average (see figure below).

## Figure 2.1: Market share for Openreach (including Sky and TalkTalk) in Superfast Broadband treatment and comparator areas







Phase 2 comparator areas



#### Source: ThinkBroadband data

The market share for all broadband connections for all other network providers awarded contracts through the Superfast Broadband programme is presented in the figure below. This shows that the market share for these network providers has grown to 0.8 percent of connections in 2020 in the Superfast Broadband areas. This is larger than the 0.3 percent market share these network providers hold nationally. However, these network providers hold an even larger market share of 1.2 percent in the comparator areas for the programme, driven by Airband and Gigaclear market share in these areas and the comparator areas for Phase 1 of the programme.<sup>5</sup> This is also still a very small proportion of the total broadband market.

Phase 2

<sup>&</sup>lt;sup>5</sup> This is most likely because the comparator areas for Phase 1 project areas include areas which were included in Phase 2 and Phase 3 of the project ,of which many areas have now been delivered to by the programme. As some Phase 2 and Phase 3 contracts have been delivered by beneficiaries other than Openreach, their market share in these areas will increase.

#### Figure 2.2: Market share of total broadband market for all other Superfast Broadband programme beneficiaries in Superfast Broadband and comparator areas



#### Source: ThinkBroadband data

NOTE: Please be aware of scale of the charts when comparing to Figure 2.1

#### 2.3.3 Superfast Broadband delivery contract areas

The analysis of the market share at the delivery contract area has been aggregated to the network provider contracted to deliver the local project. This is because of small sample sizes available at specific contract areas. More details of the sample sizes in each project area is provided in the Annex.

This analysis shows that there are differences in the local telecommunications market depending on which beneficiary was selected to deliver the project. In areas where Openreach deliver the local project, the market share of Openreach remains relatively steady, with over half of the take-up through ISPs using the Openreach network (and around 90 percent if Sky and TalkTalk take-up is included). This is illustrated in Figure 2.3 below.

However, in areas where Gigaclear deliver the local project, the market share of Openreach falls from over two thirds in 2012 and 2016 (and 90 percent including sky and TalkTalk take-up) to just over half (and just over two thirds including Sky and TalkTalk). The market share for Gigaclear increases from zero in 2012 to seven percent in 2016, to 25 percent in these areas by 2020. In the areas where Openreach or wireless providers have delivered contracts, Gigaclear has a market share of zero (see Figure 2.4).

This pattern is repeated for areas where wireless providers have been contracted to deliver Superfast Broadband projects (see Figure 2.5). The market share for Openreach declines from 2012 to 2016 and 2020, with a larger market share taken by the wireless providers, up to six percent in 2020. In areas where Openreach or Gigaclear have delivered projects, the market share of the wireless providers is close to zero (see figures below).



#### Figure 2.3: Openreach market share

Source: ThinkBroadband data





Source: ThinkBroadband data

#### Figure 2.5: Wireless/satellite provider market share



Source: ThinkBroadband data

#### 2.4 NGA market

The market share of all NGA connections (FTTC, FTTP, cable, wireless and satellite connections) for network providers has been estimated by the proportion of speed tests completed for ISPs which were mapped to the network provider that utilised these technologies. This analysis therefore excludes all speed tests for ADSL, wifi and leased lines. This reduces the sample sizes the analysis is based upon, and particularly in 2012 the sample sizes are very small, therefore the results for 2012 should be viewed with caution.

#### 2.4.1 UK market share

At a UK level, as with the total broadband market, NGA connections supplied through the Openreach network dominate the market, though to a lesser degree than the broadband market as a whole. In 2012 under a quarter of NGA connections were supplied by Openreach<sup>6</sup>, and although this has risen to 37 percent by 2020. This percentage increases if the Sky and TalkTalk networks are included with Openreach (as these networks do utilise the Openreach network) to around a third of NGA connections in 2012 and around two thirds in 2020. This suggests that Openreach is more dominant in the ADSL broadband market than in the NGA broadband market (as their market share of the total broadband market is higher than their market share for the NGA market), and that between 2012 and 2016 Sky and TalkTalk were successful in recruiting new customers to NGA connections / converting existing customers to NGA connections than other providers using the Openreach network.

The other suppliers awarded Superfast Broadband contracts represent a very small proportion of the NGA broadband market – cumulatively less than one percent of the market in 2020 (see table below). At a UK level, there has not been a large increase in the market share of the programme beneficiaries – in fact

<sup>&</sup>lt;sup>6</sup> It should be noted that in 2012 the majority of broadband connections were provided through ADSL, therefore the small market share of Openreach in the NGA market is being driven by the smaller total population of NGA connections in 2012 than in subsequent years.

between 2016 and 2020, there has been a decrease in the market share of the beneficiaries, driven by a decrease of the market share for Openreach.<sup>7</sup>

Table 2.2: Market share of the broadband market for Superfast Broadband
beneficiaries

Network provider	2012	2016	2020
Openreach	23.84%	35.46%	36.97%
Openreach (plus Sky and TalkTalk)	30.27%	60.46%	67.23%
Airband	0.00%	0.12%	0.12%
Gigaclear	0.00%	0.15%	0.25%
Callflow	0.00%	0.02%	0.02%
UK Broadband / Relish	0.00%	0.00%	0.02%
Total programme participants	30.27%	60.76%	67.63%
Virgin Media	69.42%	36.90%	23.30%

Source: ThinkBroadband data

#### 2.4.2 Superfast Broadband delivery and comparator area market share

The analysis of the NGA market share of the network providers in the areas that the Superfast Broadband programme has and is currently operating shows that the NGA market share for Openreach in these areas remained fairly constant between 2012 and 2020, at around 90 percent of all connections (including Sky and TalkTalk), which is higher than the UK average (30 percent in 2012 and 67 percent in 2020). The Openreach market share was slightly higher than in the treatment areas for Phases 1 and 3, although in Phase 2 the market share of NGA take-up for Openreach was higher in the comparator areas. However, in all Phases and areas the market share of NGA take-up for Openreach remained fairly steady between 2016 and 2020, and higher than the UK average (see figure below).

<sup>&</sup>lt;sup>7</sup> There has been an increase in the market share of the programme beneficiaries other than Openreach between 2016 and 2020 – but given the small market share these beneficiaries have of the total NGA market this increase has little impact on the overall market share of the programme beneficiaries.

## Figure 2.6: Market share of NGA broadband market for Openreach in Superfast Broadband treatment and comparator areas









All Superfast Broadband delivery areas



#### Source: ThinkBroadband data

The market share for NGA connections for all other beneficiaries is presented in the figure below. This shows that the market share for these network providers has grown to 1.4 percent of connections in 2020 in the Superfast Broadband areas. This is larger than the 0.4 percent market share these network providers hold nationally. By phase, the beneficiaries (other than Openreach) have the largest market share of NGA connections in Phase 3 contract areas with nearly four percent of the market share (driven by Airband and Gigaclear market share). This is unsurprising, as the beneficiaries (other than Openreach) did not deliver any contracts in Phase 1 of the programme, therefore would not be expected to have a large market share in Phase 1 areas.

#### Figure 2.7: Market share of NGA broadband market for all other Superfast Broadband programme beneficiaries in Superfast Broadband and comparator areas



#### Source: ThinkBroadband data

NOTE: Please be aware of scale of the charts when comparing to Figure 2.6

#### 2.4.3 Superfast Broadband project level analysis

When examining the market share by the network provider contracted to an area, it can be observed that there are differences in the local telecommunications market. In areas where Openreach deliver contracts, the market share of Openreach remains relatively steady between 2016 and 2020, with over half of the connections through ISPs using the Openreach network (and around 90 percent when Sky and TalkTalk customers are included). This is illustrated in Figure 2.8 below.

However, in areas where Gigaclear are contracted, the market share of the NGA broadband market of Openreach falls from over two thirds in 2016 (and 90 percent including Sky and TalkTalk) to just over half (and just over two thirds including Sky and TalkTalk). The market share for Gigaclear increases from zero in 2012 to 24 percent in 2016, to 43 percent in these areas by 2020. In the areas where Openreach have delivered contracts, Gigaclear's market share is zero (see Figure 2.9 below).

This pattern is repeated for areas where wireless providers have been contracted to deliver Superfast Broadband contracts. The market share for Openreach is relatively stable between 2016 and 2020, and Gigaclear's market share remains close to zero for both years. However, the market share of NGA connections for the wireless providers is 11 percent in areas where they have delivered the Superfast Broadband contracts, and is close to zero in all other Superfast Broadband delivery areas. This is illustrated in the Figure 2.10 below.



#### Figure 2.8: Openreach market share

#### Source: ThinkBroadband data



#### Figure 2.9: Gigaclear market share

Source: ThinkBroadband data

#### Figure 2.10: Wireless/satellite provider market share of NGA market



Source: ThinkBroadband data

## 3 Is there evidence of changes to parameters of competition arising from the aid?

The National Broadband Scheme evaluation plan described question 4 of the State Aid evaluation plan as:

For each local body involved in the scheme, the evaluators will compare the June 2020 versus June 2016 situations at a UK and local level in terms of:

- NGA take-up as a share of all broadband take-up
- market share (of take-up) for each NGA technology (FTTC, FTTP, Cable, fixed wireless)
- number of infrastructure providers offering NGA services
- number of unique operators making use of the open access made available under the 2016 NBS.

#### 3.1 Key findings

The key findings presented here are based on an analysis of the ThinkBroadband speed test and coverage datasets. As such, the findings should be viewed the following caveats:

- The speed test data does not collect information for every customers' take-up, or even a random sample of customers (it only collects data for customers that undertake a speed test on the website), and therefore may be subject to some reporting bias. For example, customers' with slower internet connections (for example using ADSL technology) may be more likely to undertake a speed test as they are dissatisfied with their speed;
- Not all ISPs providing connections in a local area may be included in the dataset as customers may not have completed a speed test;
- There are weaknesses in the coverage dataset, particularly relating to the Virgin Media footprint.

The key findings are:

- NGA take up has increased in the UK between 2012 and 2020. The share of NGA broadband take-up as a proportion of total broadband take-up in the UK has increased markedly since 2012. The take-up of NGA connections represented less than half of all broadband connections in 2012, but that this has grown to over 70 percent of internet connections in 2020. A similar pattern is seen in Superfast Broadband Programme areas, with the share of NGA connections increasing from around 10 percent in 2012 to over 60 percent in 2020.
- There is little difference in the change in technologies used for broadband connections at a UK level and in Superfast Broadband Programme delivery areas, which suggests the programme has had little impact on the technologies used by consumers. At a UK level, the Superfast Broadband programme does not seem to have had a substantial impact on the technologies that are used to provide broadband connections to households and businesses. The

same trends in the type of technology used to provide broadband connections is observed nationally, in Superfast Broadband delivery areas and in comparator areas. This is namely that there has been a steep decrease in the market share of ADSL connections, and a steep increase in NGA connections. There are some differences in the proportion of each type of NGA solution between the UK pattern and those in Superfast Broadband delivery and comparator areas – but this can be attributed to the starting position (namely the market share of cable technology). The dominant NGA technology in all areas is FTTC connections.

- There are differences between the technologies being used by customers in the Superfast Broadband areas depending on which network provider is delivering the contract. In Openreach contract areas, FTTC connections represented nearly 60 percent of all broadband connections in 2020, with FTTP connections representing under five percent of connections and wireless under one percent of connections. However, in areas where Gigaclear delivered the contract, FTTC, although still the largest share by technology, represented 28 percent of broadband connections and FTTP connections 27 percent of the market (with wireless connections under one percent of the market). Finally, in areas where wireless providers delivered the Superfast Broadband contract, FTTC was again the most prevalent NGA technology (32 percent of connections) but wireless connections had a larger market share than in areas where Openreach or Gigaclear delivered the contract (14 percent of take-up). This suggests that at the local level, the Superfast Broadband programme (and in particular the supplier selected to deliver the project) has had some impact on the type of technology used in the area.
- There has been a large increase in the number of network providers operating in the UK between 2012 and 2020. This increase is also observed in Superfast Broadband Programme areas, although most network providers only cover a small proportion of postcodes in the Programme areas. The number of network providers operating nationally, in Superfast Broadband delivery and comparator areas has grown from 2012 to 2020, with the largest increase being between 2016 and 2020. It should be noted that although the number of network providers operating in Superfast Broadband areas has increased over time, the majority of network providers operating in these areas provide services to only a small proportion of postcodes in the delivery area. The increase in network providers nationally, and within Superfast Broadband delivery areas suggests that the programme is not preventing new network providers from entering the UK broadband market (and particularly the NGA market).
- There has been a large increase in the number of Internet Service Providers operating in the UK and in Superfast Broadband Programme areas between 2012 and 2020. The number of ISPs providing services in the UK has also increased over time, with 155 providing broadband connections nationally in 2020 compared to 126 in 2016 and 39 in 2012. This increase has been mirrored in Superfast Broadband delivery areas cumulatively, with 145 ISPs providing connections in Superfast Broadband delivery areas in 2020, compared to 111 in 2016 and 36 in 2012. The average number of ISPs operating in Superfast Broadband contract areas has also increased, from just over 12 in 2012 to around 28 in 2020.
  - There are some noticeable differences in the average number of ISPs in project areas by phase and by the network provider that delivered the contract. There are more ISPs operating in Phase 1 contract areas than in Phase 2 and Phase 3 areas – as would be expected as the areas are generally larger and the projects have been completed, meaning ISPs have had more opportunity to utilise the networks built by the project.

 Additionally, there are more ISPs operating in areas where Openreach delivered the Superfast Broadband project than in areas where Gigaclear or a wireless provider have delivered projects. This could be related to the size of the areas and the timing of the projects (all Gigaclear and wireless provision is in Phase 2 and Phase 3 of the programme) – but could also indicate that more ISPs utilise the networks built by Openreach than those built by alternative network providers.

#### 3.2 Methodological approach

The analytical approach described below has been used to provide evidence to answer the state aid evaluation question.

- Analysis of broadband take-up by technology. The market share of seven different types of broadband connection has been calculated. These are:
  - FTTP
  - FTTC
  - GFast
  - Cable
  - Fixed wireless / satellite connections
  - ADSL
  - Other connections (leased line and wifi connections).8
- The market share by type of technology has been calculated at three points in time (2012, 2016 and 2020) and at four geographic levels, namely:
  - nationally (for the whole of the UK);
  - for all areas where the Superfast Broadband programme has been delivered (combined);
  - for comparator areas to the Superfast Broadband programme (as specified in section 2); and
  - at an individual contract level.
- The number of network providers operating in the areas that the Superfast Broadband programme has been calculated using the ThinkBroadband coverage dataset. The number of network providers offering services has also been calculated for comparator areas to the Superfast Broadband delivery areas, to explore if there are any differences between the areas the programme has delivered to and other comparable areas.
- The number of ISPs operating in an area has been estimated using the Speed Test data. The number of ISPs operating has been estimated at a UK, Superfast Broadband treatment area, comparator area and individual contract level for 2012, 2016 and 2020. It should be noted that the speed test data does not include all ISPs offering services in an area, or the number of ISPs with customers in each area. It measures the number of ISPs where customers have completed speed tests. Therefore, there could be inaccuracies in this data. Additionally, there are a number of contracts with low numbers of speed tests completed, therefore the analysis for these areas lacks robustness.

<sup>&</sup>lt;sup>8</sup> Mobile internet connections were excluded from the analysis

#### 3.3 Results

#### 3.3.1 Broadband take-up by technology

#### **UK** analysis

At a UK level, the share of NGA broadband take-up as a proportion of total broadband take-up has increased markedly since 2012. The figure below shows that take-up of NGA connections represented less than half of all broadband connections in 2012, but that this has grown to over 70 percent of internet connections in 2020. FTTC connections represent the largest proportion of NGA connections in both 2016 and 2020 (around a third of all broadband connections in 2016 and just over a half in 2020) – with cable connections representing the next highest proportion of NGA connections (just under 20 percent of all connections in both 2016 and 2020). FTTP and wireless connections represent under five percent of the broadband market in 2020 and under two percent in 2016.





#### Source: ThinkBroadband data

#### Superfast Broadband delivery and comparator area analysis

A similar pattern can be seen in the areas where the Superfast Broadband programme has operated. There has been a steep decline in the market share of ADSL connections, and an increase in the market share of NGA connections (see figure below). The market share of NGA connections in the Superfast Broadband areas is below the UK average (at just over 60 percent of the broadband market compared to over 70 percent nationally in 2020). This is to be expected, as some areas have only recently had NGA connections made available to them, which would limit the opportunity of households and businesses to take up these connections. As with the UK pattern, FTTC is the dominant technology for NGA connections, representing around one third of total broadband connections in 2016 and over half of broadband connections in 2020. However, cable connections are a lot less prevalent in Superfast Broadband delivery areas (under three percent of total broadband connections in both 2016 and 2020). FTTP and wireless

connections are slightly more prevalent in Superfast Broadband delivery areas than nationally, representing 5.5 percent of connections in the delivery areas in 2020.





#### Source: ThinkBroadband

This analysis was undertaken separately for the delivery areas and comparators for Phases 1, 2 and 3 of the Superfast Broadband programme, and compared to comparator areas for each phase. This, unsurprisingly, found that the largest decrease in ADSL take-up between 2012 and 2016 was in Phase 1 delivery areas, with a smaller increase in Phase 2 delivery areas (as would be expected as not all Phase 2 delivery had been completed by 2016). More surprisingly, there was a reported increase in NGA take up in Phase 3 delivery areas between 2012 and 2016 – despite no Phase 3 roll out having taken place, and this increase was larger than for Phase 2 areas (see Table below). The increase in Phase 3 seems to be driven by increases in reported FTTC connections. However, these areas would have been marked as 'white' postcodes in the Phase 3 OMR process in 2016. This suggests there may have been some inaccuracies in the OMR process for Phase 3 contracts (if the speed test technology has been reported accurately).

The overall change in NGA take-up is higher in the Phase 1 treatment area than in the relevant comparator area between 2012 and 2020, whereas for Phase 2 and Phase 3 the changes in take-up are comparable between the treatment and comparator groups. In Phase 2, the change in NGA take-up in the treatment area increases at a faster rate between 2016 and 2020 than in the comparator group, which as expected suggests that the increase in take-up followed the network build in these areas.

Area	Change in ADSL take-up		Change in NGA take-up		
	2012-2016	2016-2020	2012-2016	2016-2020	
Treatment area – Phase 1 contracts	-33.7p.p.	-24.9p.p.	33.3p.p.	24.7p.p.	
Treatment area – Phase 2 contracts	-11.1p.p.	-33.4p.p.	10.5p.p.	33.1p.p.	
Treatment area – Phase 3 contracts	-17.8p.p.	-21.6p.p.	17.5p.p.	21.5p.p.	
Comparator area – Phase 1 contracts	-7.9p.p.	-28.0p.p.	7.3p.p.	27.8p.p.	
Comparator area – Phase 2 contracts	-25.6р.р.	-19.8р.р.	25.0p.p.	19.6p.p.	

 Table 3.1: Change in ADSL connections and NGA connections taken up in

 Superfast Broadband treatment areas and comparator areas, 2012 to 2020

Comparator area – Phase 3 contracts	-15.8p.p.	-21.9p.p.	15.4p.p.	21.5p.p.
Source: ThinkBroadband				

Superfast broadband programme delivery contract area analysis

The treatment areas have also been analysed by the beneficiary delivering the contract in the area. This presents some interesting, but not unexpected results regarding the market share of different technologies in contract areas. For areas where contracts have been delivered by Openreach, the majority of NGA takeup is using FTTC technology. While this is also the case for areas where contracts have been delivered by Gigaclear, Airband and UK Broadband, the degree to which FTTC dominates NGA take up is less noticeable. This indicates that the supplier selected to deliver Superfast Broadband contracts influences the type of NGA taken up in those areas (see Figures below).

Figure 3.3: NGA technology type market share in Superfast Broadband areas with contract delivery from Openreach



Source: ThinkBroadband



### Figure 3.4: NGA technology type market share in Superfast Broadband areas with contract delivery from Gigaclear

#### Source: ThinkBroadband





#### Source: ThinkBroadband

#### 3.3.2 Number of Network providers

#### Superfast Broadband delivery and comparator areas

The number of network providers operating in the Superfast Broadband contract areas has increased from 2012 to 2020. This pattern is observed for all phases of the Superfast Broadband programme – but the number of network providers operating in Phase 1 contract areas is higher than those operating in Phase 2 and Phase 3 contract areas (44 network providers in Phase 1 areas in 2020 compared to 38 in Phase 2 and 30 in Phase 3 areas). This is not surprising, as the Phase 1 contract areas were generally larger (in terms of postcodes and premises) than Phase 2 and Phase 3 contract areas, and more economically viable – therefore would be more commercially attractive to network providers.

This pattern is matched in the comparator areas for the Superfast Broadband treatment areas and nationally – there has been an increase from ten network providers in 2012 to 55 in 2020 nationally – with most of the increase in network providers being between 2016 and 2020. In 2012, only one network provider which operated in the UK did not have presence in the Superfast Broadband area, and in 2016 all network providers operating nationally had a presence in the Superfast Broadband delivery area. However, by 2020, with the large number of new network providers, there were 12 network providers which operated within the UK but did not provide services to Superfast Broadband areas.

### Figure 3.5: Total number of network providers in Superfast Broadband treatment and comparator areas



Source: ThinkBroadband





Source: ThinkBroadband



### Figure 3.7: Total number of wireless broadband suppliers in Superfast Broadband treatment and comparator areas

#### Source: ThinkBroadband

Although there were a large number of network providers with services in Superfast Broadband delivery areas, most tended to provide services to only a small number of postcodes within the area. Those network providers without a Superfast Broadband contract had a maximum coverage of nine percent of the delivery areas in Phase 1 contracts, 12 percent in Phase 2 contracts and three percent in Phase 3 contracts (all Virgin Media), and below three percent for all other providers in all phases (with the highest levels of coverage among wireless providers.

### Table 3.2: Percentage of postcodes covered by selected network providersin Superfast Broadband delivery areas, 2020

	Phase 1	Phase 2	Phase 3
Virgin ashla	0.000/	10 110/	0.000/
Virgin_cable	9.28%	12.11%	3.62%
Vfast wireless	2.68%	0.74%	0.00%
Kijoma wireless	1.39%	1.06%	0.51%
Boundless wireless	0.71%	0.96%	0.50%
Solway comms wireless	1.41%	0.74%	0.16%
Greenco wireless	0.83%	1.72%	0.00%
Truespeed wireless	0.21%	0.00%	0.72%
Gigafast FTTP	0.22%	0.08%	0.22%
Hyperoptic FTTP	0.14%	0.11%	0.04%
Glide FTTP	0.11%	0.31%	0.37%

Source: ThinkBroadband data

#### Superfast Broadband programme delivery contract level analysis

When looking at a project level, the average number of network providers operating in a project area has risen from under four per contract area in 2012 to over six per project area in 2020. There has also been an increase in network providers for each type of technology (except for cable), although there are still a small number of FTTP and wireless providers operating in each contract area.

Examining the average number of network providers operating in a project area by Phase of the Superfast Broadband programme, the average number of network providers is highest in Phase 1 of the programme. This is not surprising, as these areas are larger than the areas in Phase 2 and Phase 3, but in all phases the pattern remains the same – there is an increase in the average number of network providers for total broadband providers, FTTP and wireless providers.





#### Source: ThinkBroadband data

The Superfast Broadband delivery contracts were again divided up by the supplier delivering the local project, and the areas aggregated by supplier. This showed that in areas where Openreach were responsible for delivering the Superfast Broadband project, there was a slightly higher average number of network providers operating than in areas where Gigaclear or the wireless providers delivered the contracts. This is not surprising, as Openreach contracts (particularly Phase 1 contracts) were delivered over larger geographic areas and in the most economically viable areas. This is the case for both 2016 and 2020.

In areas where the contract is delivered by Gigaclear the average number of FTTP network providers in each contract area was just over one. This suggests that in most Gigaclear contract areas, Gigaclear are the sole FTTP network provider operating. This again is unsurprising, given that the delivery areas were selected for the projects did not have existing NGA coverage and many of the projects are not yet completed.

A similar pattern is seen for the wireless network providers – in the Superfast Broadband contract areas there is on average around one wireless network provider (the fact that there is less than one could be due to some of the areas still being in delivery). There are also only a small number of FTTP or cable providers operating in the project areas – suggesting there is limited competition for the Superfast Broadband contract provider.



Figure 3.9: Average number of network providers in Openreach contract areas

Source: ThinkBroadband



### Figure 3.10: Average number of network providers in Gigaclear contract areas

Source: ThinkBroadband



Figure 3.11: Average number of network providers in Wireless contract areas

#### Source: ThinkBroadband

#### 3.3.3 Number of ISPs

#### UK analysis

The number of ISPs with customers in the UK (proxied as the number of ISPs where customers have completed a Speed Test on the ThinkBroadband website) has increased over time. In 2020, over 150 ISPs had customers in the UK (see figure below). A small number of ISPs which had customers in 2012 and 2016 did not have customers in 2020 (six in total, of which one had customers in 2012 and 2016, three had customers in 2012 but not in 2016 or 2020, and two had customers only in 2016). This shows that there has been a lot of new entrants into the ISP broadband market over this period. In 2012, only a small

proportion of ISPs had customers using NGA services – by 2020 this had grown to nearly all ISPs – and by 2020 over 90 percent of ISPs had the majority of their customer base on NGA connections.



Figure 3.12: Total number of ISPs and ISPs with customers using NGA services

#### Source: ThinkBroadband

#### Superfast Broadband delivery areas

A similar pattern to that seen nationally is observed in the Superfast Broadband delivery areas. There has been a large increase in the number of ISPs with customers between 2012 and 2020. A similar (although slightly less) number of ISPs have customers in Superfast Broadband delivery areas than nationally (see Figure below).

Figure 3.13: Number of ISPs with customers in Superfast Broadband treatment areas



Source: ThinkBroadband data

When comparing between phases, it can be seen that there are a higher number of ISPs with customers in Phase 1 contract areas than Phase 2 and Phase 3. This would be expected, as Phase 1 contracts were delivered larger contracts covering a higher number of premises and in more economically viable areas, therefore there are more customers for different ISPs to access. Additionally, these contracts were completed at an earlier stage, meaning there has been more time for ISPs to utilise the networks built by the Superfast Broadband programme.





#### Source: ThinkBroadband data

#### Superfast Broadband Programme delivery contract area analysis

The analysis of the number of ISPs operating in each project area has been aggregated to the network provider contracted to delivery the local project and the phase of the programme the project falls into. This is because of small sample sizes available at specific contract areas. More details of the sample sizes in each project area is provided in the Annex.

The figure below shows that the average number of ISPs servicing customers in Superfast Broadband contract areas has grown since 2012, in line with the patterns seen in the sections above. The average number of ISPs providing services in Superfast Broadband delivery areas has increased from just over 12 in 2012 to nearly 28 in 2020. Most of this increase in provision was between 2012 and 2016, with smaller increases between 2016 and 2020.

However, there are noticeable differences between the number of ISPs servicing customers in the different phases of the programme. There are more ISPs providing services in Phase 1 areas than in Phase 2 and Phase 3 areas. Additionally, the change between 2016 and 2020 for Phase 2 and Phase 3 project areas is small (an increase of 3.1 average ISPs in Phase 2 areas and 1.6 ISPs in Phase 3 areas) compared to the change for Phase 1 contract areas (an increase of 6.3 ISPs). As stated earlier, this would be expected, as Phase 1 contracts were delivered larger contracts covering a higher number of premises in more economically viable areas, therefore there are more customers for different ISPs to access. Additionally, these contracts were completed at an earlier stage, meaning there has been more time for ISPs to utilise the networks built by the Superfast Broadband programme.



#### Figure 3.15: Average ISPs per contract area by phase

#### Source: ThinkBroadband

There are noticeable differences between the number of ISPs servicing customers in areas that Openreach delivered projects in and areas where Gigaclear and wireless providers delivered contracts in. There are more ISPs providing services in areas Openreach have delivered in (29.8 ISPs in 2020) than in areas where Gigaclear or wireless providers have delivered contracts in (16.8 ISPs for Gigaclear areas and 19.3 in areas wireless providers deliver contracts in). This pattern is the same in all years. For each area, there has been an increase in the number of ISPs with customers between 2012 and 2016, and 2016 and 2020, although the increase is smaller between 2016 and 2020 – particularly in areas where Gigaclear are delivering contracts.

The larger number of ISPs in Openreach contract areas should be expected, as Openreach contract areas (particularly Phase 1 contract areas) were delivered larger contracts covering a higher number of premises, therefore there are more customers for different ISPs to access. Additionally, these contracts were completed at an earlier stage, meaning there has been more time for ISPs to utilise the networks built by the Superfast Broadband programme. Finally, the technology used to deliver contracts in Phase 2 and Phase 3 contract areas (particularly by Gigaclear) is more advanced (using FTTP connections as standard rather than FTTC connections which Openreach have used in many of their contracts). This means that alternative network providers would not have a technology comparative advantage over the programme beneficiary in areas that Gigaclear have delivered to, but they might have this advantage in Openreach areas.



## Figure 3.16: Average ISPs per project area by network provider contracted to deliver contract

Source: ThinkBroadband data

## **4 Discussion of data used**

#### 4.1 Data used

The original state aid evaluation plan agreed with the EU Commission stated that Ofcom Connected Nations data at premise level would be used for this analysis. Due to the commercial sensitive nature of this data, it has not been possible to access it for the purposes of the evaluation. BDUK explored alternative sources, including obtaining the data from network providers. BDUK managed to collect data directly from a large number of suppliers including some programme beneficiaries. However, the dataset from network providers is incomplete and was deemed insufficient for the evaluation. In order to fulfil the requirements of the State Aid evaluation plan, BDUK decided to purchase a dataset from ThinkBroadband.

ThinkBroadband is an independent organisation which collects information and data about internet coverage in the UK. It also runs an online 'speed test' function, where individuals can provide a limited amount of data about their broadband package and test the connection speed that they receive. ThinkBroadband have made available two sources of data to be used in this evaluation. These are data which provide data on broadband coverage by supplier (stating which suppliers offer broadband services to all postcodes in the UK) and data which presents the number of speed tests undertaken.

Both of these datasets have been used for the market analysis. The data is described in more detail below.

#### 4.1.1 ThinkBroadband coverage data

This data includes which postcodes 60 network providers offered broadband coverage to, in 2020, 2016 and 2012. The data includes providers of all broadband services, including ADSL and all NGA services (FTTC, FTTH, cable, wireless and satellite services). The data includes the type of technology used to provide these broadband services, the name of the supplier and the connection speeds available to households. This data has been collected in three main ways:

- **Desk research of the Openreach network:** Identifying the location of Openreach cabinets and the postcodes they serve, the technology used in the cabinet and when this has been upgraded.
- Press releases and network provider engagement: ThinkBroadband staff monitor press releases
  made by network providers, which state where they have built networks and where they are planning
  to build networks in the future. Additionally, network providers engage with ThinkBroadband directly,
  telling them where they have existing networks and are going to build networks. The information
  received from network providers and press releases is validated by ThinkBroadband staff, who check
  that broadband coverage is available from the network provider in the postcodes they claim to cover.
- Cross reference with speed test data (see below): The data generated by the Speed Tests is checked against the coverage data collected by ThinkBroadband. Where a speed test flags that a network provider (through providing access to ISPs) has coverage in an area that the coverage data states the network provider does not, this area is validated. If the network provider does have coverage in the area highlighted in the speed test, this is added to the coverage database.

#### 4.1.2 Speed test data

ThinkBroadband offer an online speed test service to individuals visiting their website. In order to complete a speed test, individuals are asked to provide details about their postcode and their Internet Service Provider (ISP). The speed test then collects data to estimate the upload and download speeds the

individual is able to receive from their supplier. From the information collected ThinkBroadband can also identify the technology that the individual is using for the speed test.

The speed test data includes the following fields:

- Postcode the postcode of the individual completing the speed test (self-reported)
- Internet Service Provider the ISP the individual provides (self-reported), which is cross checked against ThinkBroadband internal data (to ensure that the stated provided does offer services to that postcode)
- Download speed the average download speed for individuals at the postcode (using a specific supplier and technology type) – data collected from the speed test
- Upload speed the average upload speed for individuals at the postcode (using a specific supplier and technology type) – data collected from the speed test
- Technology the technology of the internet connection used for the speed test
- Number of speed tests the number of speed tests completed in a postcode (for each ISP and technology type). The number of speed tests for a postcode, ISP and technology type is capped at 30 speed tests per year.

Data was provided for 302,400 speed tests in 2012, 3.9 million speed tests in 2016 and 2.5 million speed tests in 2020.<sup>9, 10, 11</sup>

#### 4.2 Data validation

A comprehensive data validation exercise was undertaken by the research team, to test the accuracy of the data provided by ThinkBroadband. This data validation exercise included an internal validity check of the ThinkBroadband data, to check that the coverage dataset listed at least one network provider to all postcodes where broadband services were available, using other publicly available datasets to check the validity of coverage data, comparing the ThinkBroadband coverage data to coverage data provided to BDUK by network providers (as discussed in the section above), and comparing the ThinkBroadband coverage and speed test databases to identify any differences between the datasets.

#### 4.2.1 Internal consistency of ThinkBroadband coverage data

The first step of the validation was to check for any remaining postcodes where no providers were listed as providing coverage. This meant:

• Identifying any postcodes which had technology "unknown" and had no other provider listed:

<sup>&</sup>lt;sup>9</sup> This is the equivalent of 1 percent of premises in 2012, 14 percent in 2016 and 9 percent in 2020. This shows that the sample of speed tests is low for 2012 and relatively large for 2016 and 2020.

<sup>&</sup>lt;sup>10</sup> This does not include speed tests for "mobile" internet connections – which have been excluded from the data set.

<sup>&</sup>lt;sup>11</sup> There are substantially fewer speed tests in 2012 than in 2016 and 2020. In 2012, there were fewer options for consumers in the broadband market (and broadband was less important than in subsequent years) therefore fewer consumers undertook speed tests on the ThinkBroadband website. In 2020, there has been an increase in competition in the speed test market, meaning there are slightly fewer tests completed than in 2016.
- 837 postcodes were identified in 2020. Of these, 674 are thought to be PO boxes / banks (nongeographical postcodes). A further 89 postcodes were identified as being in Hull, and therefore being covered by Kcom. This left a total of 74 postcodes to be checked.
- 6,222 postcodes were identified in 2016. Of these, 897 are thought to be PO boxes / banks. (nongeographical postcodes). A further 5,180 postcodes were identified as being in Hull, and therefore being covered by Kcom. This left a total of 145 postcodes to be checked.
- 8,918 postcodes were identified in 2012. Of these, 488 are thought to be PO boxes / banks. (nongeographical postcodes). A further 8,283 postcodes were identified as being in Hull, and therefore being covered by Kcom. This left a total of 147 postcodes to be checked.
- Some of these postcodes were the same postcodes in different years. This means that there were a total of 201 postcodes to be investigated (See Tab 1 of the excel sheet).

We examined the technology listed for cabinets to check that there was "no backward step" – i.e. technology becoming less advanced as time passed (for example being listed as FTTC in 2012, and then listed as ADSL in 2016). We found no cases of this.

#### 4.2.2 External consistency of ThinkBroadband coverage data

#### National Statistics Postcode Lookup (NSPL)

We compared the postcodes listed in the ThinkBroadband dataset with the NSPL dataset. This showed that all the postcodes listed in the ThinkBroadband data (except for three) were matched into the NSPL data. Therefore there were no concerns that there were inaccuracies in the postcodes used.

#### **Connected Nations**

We have explored the coverage speeds listed for postcodes in the ThinkBroadband data to identify which postcodes can be considered as receiving Superfast Broadband coverage. This was then compared to the level of coverage listed in the Connected Nations data for 2019 and 2016 (this data is not available for 2012). However, in Connected Nations, the Superfast Broadband connections are listed as a percentage of households that can receive connections at this speed, whereas in ThinkBroadband it is a binary measure. Therefore, the following assumptions have been made:

- In ThinkBroadband, if the postcode is listed as having a connection speed of above 24 Mbps, it has been assigned a binary value of 1, meaning that the postcode has Superfast Broadband coverage.
- In the Connected Nations data, if the postcode is listed as having more than half of premises with Superfast Broadband coverage (50 percent or higher), the postcode is assigned a binary value of 1, meaning that the postcode has Superfast Broadband coverage.
- When these two values were compared for the 2016 data, 56,592 postcodes were identified that had differences between the ThinkBroadband data and the Connected Nations data. However, where ThinkBroadband have said that the technology in the cabinet is FTTC, we have stripped these postcodes out of the comparison,<sup>12</sup> and the postcodes where suppliers other than those using the Openreach network were also removed. This left 32,389 postcodes to be examined.

<sup>&</sup>lt;sup>12</sup> These postcodes were striped out in order to focus on the postcodes that ThinkBroadband were potentially overclaiming FTTC coverage. Additionally, we have removed all postcodes in Hull, due to the unknown nature of the technology in the cabinet

• The same process was followed for 2020 (although this was comparing 2020 ThinkBroadband data with 2019 Connected Nations data). This yielded 36,691 postcodes in the first instance, but with the same approach to stripping out postcodes as described above left 5,812 postcodes to be examined.

A total of 2,630 postcodes showed differences between the ThinkBroadband data in 2020 and 2016 – therefore there were a total of 35,571 postcodes where there were mismatches between the Connect Nations dataset and the ThinkBroadband dataset (under two percent of all postcodes), suggesting that the mismatches are a small proportion of all postcodes.

#### Network provider data

Five network providers that are included in the ThinkBroadband coverage data responded to a request by BDUK to provide information about the postcodes and premises they provide coverage to. These suppliers were:

- Callflow
- Community Fibre
- Gigaclear
- OFNL
- Virgin Media<sup>13</sup>

The postcodes that these suppliers stated they provided coverage to was compared to the postcodes ThinkBroadband listed they supplied to. When these were compared, there were a small number of differences. These were that the suppliers claimed they had network provision to postcodes where ThinkBroadband did not list them as covering the postcode. The absolute number of postcodes for all the network providers was considered to be small, except for Virgin Media, where there was a large number of postcodes that did not match (although the proportion of postcodes that were mismatched). The fact that there were mismatches was raised with ThinkBroadband, who acknowledged that there were inaccuracies in their Virgin Media dataset. This fact has been noted in the State Aid report. The number of postcodes where this happened are presented in the table below:

# Table 4.1: Differences between self-reported Network Provider coverage and stated ThinkBroadband coverage

#### [Redacted]

#### 4.2.3 ThinkBroadband Coverage and Speed Test data set validation

The speed test data provided by ThinkBroadband was also compared with the ThinkBroadband coverage dataset, to check that suppliers stated they provided coverage in all the areas in which they had speed tests reported in. This was checked for the largest ISPs and network providers. These ISPs and network providers are listed in the table below:

# Table 4.2: Network providers and Internet Service Providers included in validation exercise

Network providers	Internet Service Providers				
Openreach (wholesale)	• AOL				

<sup>13</sup> Quickline also submitted a response, but are not included in the ThinkBroadband dataset

•

	• BT
	<ul> <li>Daisy Wholesale</li> </ul>
	<ul> <li>Eclipse Internet</li> </ul>
	• EE
	<ul> <li>IDNet</li> </ul>
	<ul> <li>M247</li> </ul>
	<ul> <li>Plusnet</li> </ul>
	<ul> <li>Zen internet</li> </ul>
Sky Ilu	<ul> <li>Sky</li> </ul>
TalkTalk Ilu	<ul> <li>TalkTalk</li> </ul>
	<ul> <li>Post Office</li> </ul>
Virgin Media	<ul> <li>Virgin Media</li> </ul>
Hyperoptic	Hyperoptic
Gigaclear	Gigaclear
	· · · · · · · · · · · · · · · · · · ·

- Speed tests submitted by consumers where stated ISP did not match the 2020 coverage dataset: There were 26,007 postcodes in 2020 where a speed test for an ISP was not matched by coverage from the relevant network provider. This is out of 695,968 postcodes where a speed test was registered in the 2020 dataset (3.7 percent of all postcodes in the dataset and 1.4 percent of all postcodes in the NSPL).
  - It could be assumed that where there is no Sky or TalkTalk LLU coverage that the ISP providers utilise Openreach wholesale products. If this is the case, the number of postcodes where there is a mismatch between the ISP and network providers falls to **12,582** (1.8 percent of postcodes in the dataset and 0.7 percent of all postcodes in the NSPL).
  - **Speed tests submitted by consumers where stated ISP did not match the 2016 coverage dataset:** In 2016, there were **77,173** postcodes where a speed test for an ISP was not matched by coverage from the relevant network provider. This is out of 849,185 postcodes where a speed test was registered in the 2020 dataset (9.1 percent of all postcodes in the dataset and 4.1 percent of all postcodes in the NSPL).
    - Again, if it is assumed that where there is no Sky or TalkTalk LLU coverage the ISP providers utilise Openreach wholesale products, the number of postcodes falls to 56,423 (6.6 percent of all postcodes in the dataset and 3.0 percent of all postcodes in the NSPL).
  - **Speed tests submitted by consumers where stated ISP did not match the 2012 coverage dataset:** In 2012, there were **21,048** postcodes where a speed test for an ISP was not matched by coverage from the relevant network provider. This is out of 307,458 postcodes where a speed test was registered in the 2020 dataset (6.8 percent of all postcodes in the dataset and 1.1 percent of all postcodes in the NSPL).
    - Again, if it is assumed that where there is no Sky or TalkTalk LLU coverage the ISP providers utilise Openreach wholesale products, the number of postcodes falls to **17,025** (5.5 percent of all postcodes and 0.9 percent of all postcodes in the NSPL).

The number of postcodes with mismatches by ISP and network provider, and therefore requiring further investigation, is presented in the table below. Note some postcodes have mismatches for multiple network providers, therefore the sum of the network provider totals does not equal the overall total for the year. As

can be seen, the largest number of mismatches are for the Virgin Media network. However, by the proportion of the total number of speed tests, the Hyperoptic network has the largest share of mismatches. The absolute number of mismatches has been assessed as tolerable. This issue was raised with ThinkBroadband, who stated that there are inaccuracies in their network coverage dataset for Virgin Media, and that the speed test data is likely to be accurate.

Table 4.3: Number of mismatches by network provider and year (and
percentage of the total number of speed tests for network provider this
represents)

Network provider	2012	2016	2020
Openreach (wholesale)	130	882	802
	(0.0%)	(0.2%)	(0.2%)
Sky llu	1,485	14,386	11,009
	(3.8%)	(4.2%)	(4.7%)
If exclude postcodes with wbc coverage	8	148	502
	(0.0%)	(0.0%)	(0.2%)
TalkTalk Ilu	2,568	8,008	3,383
	(6.5%)	(3.4%)	(2.3%)
If exclude postcodes with wbc coverage	14	130	233
	(0.0%)	(0.1%)	(0.2%)
Virgin Media	16,870	54,910	10,962
	(21.8%)	(23.5%)	(6.6%)
Hyperoptic	5	498	424
	(62.5%)	(33.7%)	(16.3%)
Gigaclear	0	29	99
	(-)	(3.9%)	(7.5%)
Total	21,048	77,173	26,007
	(6.8%)	(9.1%)	(3.7%)
Total if excludes TalkTalk and Sky postcodes	17,025	56,423	12,582
where wbc available	(5.5%)	(6.6%)	(1.8%)

#### Source: ThinkBroadband data

#### 4.2.4 Summary and implications

As is highlighted above, a number of inconsistencies and gaps in the data have been identified in the data validation exercise. These were reported back to ThinkBroadband. ThinkBroadband provided some reasons as to why there may be differences between the datasets. These included:

- Sky and TalkTalk both offering some services in areas where they do not have LLU networks by utilising Openreach wholesale products,
- Potential lags in the footprint datasets of network providers ThinkBroadband aim to update the network footprints within ten weeks of new networks being rolled out, but there may be some issues due to this lag; and
- There is a known difficulty with the Virgin Media data, both in terms of customers claiming they have Virgin Media coverage in areas where there is none and the accuracy of the Virgin Media coverage dataset. ThinkBroadband attempt to rectify these issues on an ongoing basis, but are less confident in their Virgin Media data than for all other network providers / ISPs. Therefore, this caveat should be acknowledged when looking at analysis of the Virgin Media data.

The findings in this paper present the analysis using the existing ThinkBroadband datasets. ThinkBroadband have not recommended any changes to the original dataset, but the caveats above should be considered when looking at the findings of the research. Despite these caveats, the ThinkBroadband data was considered the most appropriate and robust data source available to answer the research questions. These caveats are:

- Speed test data is self-reported by customers that complete a speed test online. Therefore, there is
  potential bias in the sample, and the data may not include all ISPs that provide connections in a
  particular area (if customers from an ISP do not complete a speed test). However, at a large
  geographic level (regions) the speed test data has been found to be an accurate approximation of
  the take-up by ISPs.<sup>14</sup>
- Speed tests can be completed multiple times by the same IP address, up to 30 times. Therefore, the speed test data could be bias by the same customer completing multiple speed tests and being counted as multiple individual entries.
- The sample sizes for completed speed tests was not sufficient to undertake an analysis for all Superfast Broadband contract areas. Therefore, contract areas delivered by the same programme beneficiaries have been combined to improve the robustness of the findings when examining the local impacts of the programme.
- There are known weaknesses in the network provider coverage, particularly for Virgin Media. These weaknesses relate to under 10 percent of the Virgin Media footprint.

<sup>&</sup>lt;sup>14</sup> Despite the potential for reporting bias, we do not believe that any bias in the dataset will affect the conclusions of the research, as the reporting bias should be similar in all areas of the UK.



# Annex 1

This annex presents the list of network providers included in the ThinkBroadband dataset, and the mapping of ISPs to network providers.

Network providers in ThinkBroadband								
Airband (including Airband_wireless								
and	fibre_nest_persimmon_f							
Airband_FTTP)	ttp	kcom_lightstream_fttp	tove_valley_fttp					
aylesbury_vale_ftt								
р	FibreFirst_FTTP	kijoma_wireless	trooli_fttp					
b4rn_fttp	fullfibreltd_fttp	lothian_wireless	truespeed_fttp					
balquhidder_fttp	gigaclear_fttp	ofnl_ifnl_fttp	vfast_wireless					
blockfibro fttp	aigefest fttp	Openreach (including Openreach WBC and Openreach FTTP)	virair wireless					
blackfibre_fttp	gigafast_fttp	Openieach FTTF)						
			Virgin (including virgin rfog fttp,					
boundless wirels			virgin gig1 gigabit 1000					
s	glide fttp	purefibre fttp	50, virgin cable)					
box broadband ft	<u>g</u>	raveningham residents f						
tp	gnetwork_fttp	ttp	vision fibre fttp					
Callflow	grain connect fttp	reeth wireless	voneus wireless					
Cityfibre (including Cityfibre and	- <b>-</b>	Relish (including Relish_fibre, Relish_wireless and Relish_swindon_wireless	Wessex (including Wessex_fibre and					
Gigler)	greenco_wireless	)	Wessex_wireless) Wight (including					
colchester fttp	hampshire_broadband_f ttp	ridgehill residents fttp	Wight_ftttp, Wight_wireless and Wight_cable)					
Community Fibre	•		<u> </u>					
FTTP	hereford_cic_fttp	ruralcomms_wirelss	zoom_wireless					
County Broadband (including County Broadband Wireless and County								
Broadband FTTP)	hiwifi wireless	sky llu	zzoomm fttp					
ecom fttp	hyperoptic fttp	solway comms wireless	— ·					
	<u> </u>	spectrum_internet_wirele						
f4rn_fttp	internetty_fttp	SS						
factco_fttp	its_fttp	talktalk_llu						

#### Table 4.4: Network providers included in ThinkBroadband dataset

#### Table 4.5: ISP to network provider mapping

ISP	Network	ISP	Network	ISP	Network
	provider		provider		provider
186k	Openreach	AAISP	Openreach	AB Internet	Openreach
			OFNL/		
Ai Networks	Openreach	Air Broadband	Gigaclear	Airband	Airband
Amatis Networks	Openreach	AOL	Openreach	AQL	Openreach
		Avanti Satellite			
Ask4	Ask4	Broadband	Avanti	Avonline	Openreach
Aylesbury Vale	Aylesbury				e p e m e e e e m
Broadband	Vale	B4RN	B4RN	Beeline Broadband	Beeline
Bentley Walker				Boundless	
Satellite Broad	Bentley	bigblu	bigblu	Communications	Boundless
Box Broadband	Pure	Bridge Fibre	Openreach	BT	Openreach
BT Business			• • • • • • • • • • • • • •	Buckminster	
Broadband	Openreach	BT WiFi	Openreach	Broadband	Openreach
	operineden	CableCom	operinederi	2.000.00	operineden
Cable and Wireless	Cable and Wireless Vodafone Network		Openreach	Call Flow Solutions	Callflow
Cerberus Networks	Openreach	CityFibre	Cityfibre	Claranet SOHO	Openreach
					Community
CloudScape	Openreach	Commsworld	Openreach	Community Fibre	Fibre
connexin	Openreach	CORETX(C4L)	Openreach	Cotswold Wireless	Cotswold
	County				
County Broadband	Broadband	Daisy Wholesale	Openreach	Datanet	Openreach
Demon Internet	Vodafone	Dragon WiFi	Dragon	Dyfed Superfast	Openreach
Eclipse Internet	Openreach	Ecom	Ecom	EE	Openreach
Elite	Openreach	Entanet	Cityfibre	Evolving Networks	Openreach
Exa Networks	Openreach	Exascale	Fluiddata	exponential-e	Openreach
EXAINELWOIKS	Openreach	EXASCAIE	Fiuluuala	Fibre for Rural	Openieach
Fast	Ononroach	FastNet	Ononroach		B4rn
Fibre Nest	Openreach		Openreach	Nottinghamshir	
	Openreach	FidoNet	Openreach	Fluidata	Openreach
FluidOne	Openreach	G Network	G Network	Gamma	Openreach
GCI (Edge	Onenneed	<b>O</b> larahaana	Olarah a ana	<u> Cima ala an</u>	O interal series
Telecoms)	Openreach	Gigabeam	Gigabeam	Gigaclear	Gigaclear
<b>O</b> lympic t	Owenerseeh	Olida Duainaaa		Goscomb	Onemassel
Giganet	Openreach	Glide Business	Glide	Technologies	Openreach
Gradwell	Openreach	Green Co	Openreach	HighNet	Openreach
HiWiFi	HiWifi	Hotchilli Internet	Openreach	hSO	Openreach
Hyperoptic	Hyperoptic	I Love Broadband	Sky	ICUK	Openreach
				Internet For	
IDNet	Openreach	ineedbroadband	Fullfibreco	Business	Openreach
InTouch Systems	Intouch	IP River	TalkTalk	its Technology	Openreach
Jersey Telecom	Jersey	Juice Broadband	Juice	KCOM	KCOM
Keycom	Keycom	Kijoma Broadband	Kijoma	LonsdaleNET	Lonsdale
		Luminet (Urban			
Lothian Broadband	Openreach	Wimax)	Luminet	M247	Openreach
			Michaelston-		
		Michaelston-y-	y-Fedw		
Merula Limited	Openreach	Fedw Internet CI	Internet CI	02	Openreach
		Oakford			
O2 Wifi	Openreach	Technology	Openreach	Optimity	optimity
Orbital Net	Openreach	Origin Broadband	Openreach	Pembs Wifi	Openreach
Pine Media	Pine	Plusnet	Openreach	Post Office	talktalk
		PureFibre (Also			
Pure Broadband	Pure	Derwenthorpe +	Pure	Quickline	Quickline
				Resqnet Wireless	
Redcentric	Openreach	Relish	Relish	Broadband	Resqnet
RM Broadband	Openreach	Satellite Internet	Openreach	Scotnet	Openreach
		SES Satellite			
SeeTheLight(IFNL)	OFNL	Broadband	SES	Sky	Sky

ISP	Network	ISP	Network	ISP	Network
	provider		provider		provider
		Solway			
Sky Corporate	Sky	Communications	Solway	Spectrum Internet	Spectrum
				Structured	
				Communications	
Spitfire	Openreach	Stream Networks	Openreach	Ltd	Openreach
Sure	Openreach	SW Internet	SW	SWS Broadband	Openreach
TalkTalk	TalkTalk	TalkTalk Business	TalkTalk	Technological	Openreach
Telcom Networks	Openreach	Tesco Broadband	TalkTalk	The Cloud	Openreach
				Total Web	
Timico	Openreach	toob	Toob	Solutions Ltd	Openreach
Tove Valley		Truespeed			
Broadband	Tove	Communications	Truespeed	Trunk Networks	Openreach
		uno		Userve (Unitron	
UK Broadband	UKB/Relish	Communications	Openreach	Systems)	Userve
vaioni	Openreach	Velocity1	Openreach	Vfast Internet	Openreach
		Virgin Media			
Virgin Media	Virgin	Business	Virgin	VISPA	Openreach
		Vodafone			
Vivaciti	Openreach	Broadband	Vodafone	Voipfone	Openreach
		W3Z Wireless			
Voneus	Voneus	Broadband	W3Z	Watchfront	Openreach
Waveney Internet	Openreach	webmate	Openreach	Wessex Internet	Wessex
-					Wild West
wifinity	wifinity	Wight Fibre	Wight fibre	Wild West Net	Net
wildcard networks	Wildcard	WiSpire	WiSpire	Zen Internet	Openreach
Zoom Internet	zoom	Zzoomm	Zzoomm		

# Annex 2 – Sample sizes by contract

### area

Area	Contract ID	Beneficiary	Phase	Speed tes	Speed tests - total			ests - NGA	
				2012	2016	2020	2012	2016	2020
Suffolk	SUFF101	Openreach	1	1,269	17,988	12,071	62	6,947	7,288
Suffolk	SUFF201	Openreach	2	485	8,936	6,941	19	1,543	3,458
Suffolk	SUFF202	Openreach	3	-	-	-	-	-	-
Bedford & Milton	BEDS101	Openreach	1						
Keynes				519	7,191	4,299	49	3,344	2,830
Bedford & Milton	BEDS201	Openreach	2						
Keynes				256	3,340	2,777	33	513	1,619
Bedford & Milton	BEDS202	Openreach	3					_	-
Keynes				2	8	3	0	2	0
Bedford & Milton	BEDS203	Openreach	3		10	0	0	0	0
Keynes				1	10	8	0	0	0
Berkshire	BERK101	Openreach	1	261	3,144	1,810	27	1,647	1,297
Berkshire	BERK201	Gigaclear Callflow	2	237	3,337	2,041	18	1,177	1,133
Berkshire	BERK202		3	- 10	- 122	- 123	- 1	-	-
Berkshire	BERK203	Gigaclear	3	13 63	132 527	631	1	44	63 282
Berkshire Bucks & Herts	BERK204 BUCK101	Openreach Openreach	3	847	10,709	6,847	77	141 5,555	4,719
Bucks & Herts	BUCK101 BUCK201		2	578	8,160	7,054	52	1,043	3,274
	CAMB101	Openreach Openreach		965	20,532	13,642		9,846	,
Cambridgeshire	CAMB101 CAMB101a	Openreach	1	- 905	- 20,552	-	- 84	9,040	9,053
Cambridgeshire Cambridgeshire	CAMB101a CAMB202	Openreach	3	-	-	-	-	-	-
Cheshire	CHES101	Openreach	1	- 1,150	- 14,165	- 9,198	- 96	- 6,170	- 5,732
Cheshire	CHES201	Openreach	2	1,150	4,026	3,215	13	689	1,039
Cumbria	CMBR101	Openreach	1	1,378	21,241	12,705	37	8,958	8,535
Cumbria	CMBR201	Openreach	2	1,378	2,516	1,727	<u> </u>	250	858
Derbyshire	DRBY101	Openreach	1	1,083	17,805	10,880	69	7,589	7,053
Derbyshire	DRBY201	Openreach	2	216	3,658	2,566	24	537	1,001
Devon &	DEVO101	Openreach	1	210	3,030	2,500	24		1,001
Somerset	DEVOIDI	Operiredon		4,197	73,065	42,252	154	28,234	25,301
Devon &	DEVO201	Airband	2	1,101	10,000	12,202	101	20,201	20,001
Somerset	5210201	, and and	_	-	-	-	-	-	-
Devon &	DEVO205	Airband	3						
Somerset			_	95	1,767	1,771	2	392	855
Devon &	DEVO101a	Openreach	1						
Somerset				-	-	-	-	-	-
Dorset	DORS101	Openreach	1	1,097	17,020	10,930	87	8,078	7,505
Dorset	DORS201	Openreach	2	69	908	725	2	167	304
Dorset	DORS202	Openreach	3	37	525	570	1	63	175
Durham	DURH101	Openreach	1	1,104	18,322	10,304	99	8,642	7,199
Durham	DURH201	Openreach	2						
Durham	DURH202	Openreach	2	231	3,512	2,303	34	632	1,383
East Riding	EYRK101	Openreach	1						
(Yorkshire)				552	8,585	5,278	18	4,020	3,667
East Riding	EYRK201	Openreach	2						
(Yorkshire)				97	2,412	1,584	3	655	792
East Riding	EYRK202	Openreach	3						
(Yorkshire)				84	1,407	1,171	10	266	442
East Sussex	ESUS101	Openreach	1	816	11,530	7,382	35	4,715	4,398
East Sussex	ESUS201	Openreach	2	120	1,577	1,118	4	212	454
East Sussex	ESUS202	Openreach	3	0	240	210	5	90	123
Essex	ESSX101	Openreach	1	840	12,487	8,119	67	5,966	5,711
Essex	ESSX201	Openreach	2	856	10,926	9,032	51	1,614	5,112
Essex	ESSX202	Gigaclear	2	32	649	338	0	137	165
Essex	ESSX203	Gigaclear	3	16	266	166	1	97	82
Essex	ESSX204	Gigaclear	3	17	403	315	3	70	158
Essex	ESSX205	Openreach	3	44	1,248	965	4	342	404

Essex	ESSX206	Openreach	3	53	622	744	2	133	296
Essex	ESSX200	Gigaclear	3	- 55	-	- 744	-	-	- 290
Essex	ESSX208	Openreach	3	- 0	29	- 22	- 0	- 18	- 15
Essex	ESSX200	Openreach	3	0	132	105	3	27	33
Essex	ESSX209	Openreach	3	-	-	- 103	- 5	-	- 55
Essex	ESSX210	Openreach	3	-	-	-	-	-	-
	ESSX212		3	-			-		
Essex Greater	MANC101	Openreach	1	-	-	-	-	-	-
	MANCIUI	Openreach	1	414	6,207	3,598	64	2,827	2 609
Manchester Greater	MANC101a	Onenneeh	2	414	0,207	3,596	64	2,021	2,608
	MANCIUIA	Openreach	2						
Manchester		Ononroach	1	- 770	- 14,281	-	-	- 6,242	-
Hampshire	HAMP101	Openreach	1	770		10,119	44		6,360
Hampshire	HAMP201	Openreach	2	364	10,630	8,033	49	2,046	3,914
Herefordshire &	HERE101	Openreach	1	4 400	00.040	45 004	50	0.010	0,400
Gloucestershire		0. 1		1,460	26,049	15,021	50	9,018	8,426
Herefordshire &	HERE201	Gigaclear	2	440	0.000	4 400		70.4	0.07
Gloucestershire		0. 1	-	116	2,383	1,139	4	734	667
Herefordshire &	HERE202	Gigaclear	3	-	-	-			
Gloucestershire		0. 1			-	-	-	-	-
Herefordshire &	HERE204	Gigaclear	3	100	0 5 4 0			004	
Gloucestershire		0		120	2,516	1,554	14	631	898
Herefordshire &	HERE205	Gigaclear	3		000	074	10		
Gloucestershire		0		56	992	674	12	268	365
Herefordshire &	HERE206	Gigaclear	3		1				100
Gloucestershire				42	1,366	735	4	358	432
Herefordshire &	HERE203	Openreach	3						
Gloucestershire				44	684	398	8	153	217
Herefordshire &	HERE207	Openreach	3						
Gloucestershire				19	340	199	4	83	93
Herefordshire &	HERE208	Airband	3						
Gloucestershire				-	-	-	-	-	-
Highlands &	HIGH101	Openreach	1						
Islands				1,138	34,981	21,504	19	10,948	11,683
Isle of Wight	IOFW101	Openreach	1	57	3,035	2,152	0	1,278	1,178
Kent	KENT101	Openreach	1	1,925	25,332	16,789	130	11,073	10,363
Kent	KENT201	Openreach	2						
Kent	KENT202	Openreach	2	234	4,107	2,683	6	601	1,422
Lancashire	LANC101	Openreach	1	1,322	24,219	15,598	72	10,520	10,143
Lancashire	LANC201	Openreach	2	78	1,812	1,088	6	343	532
Leicestershire	LEIC101	Openreach	1	1,322	24,219	15,598	72	10,520	10,143
Leicestershire	LEIC201	Openreach	2	78	1,812	1,088	6	343	532
Leicestershire	LEIC202	Openreach	3	-	-	-	-	-	-
Lincolnshire	LINC101	Openreach	1	1,744	33,284	20,674	75	14,290	12,712
Lincolnshire	LINC201	Openreach	2	150	3,602	2,380	9	370	952
Merseyside	MERS101	Openreach	1	446	7,674	4,169	97	3,862	2,937
Newcastle	NCST101	Openreach	1	94	1,349	797	15	567	614
Norfolk	NORF101	Openreach	1	1,004	32,439	22,589	36	14,192	14,721
Norfolk	NORF201	Openreach	2	211	9,139	6,636	5	1,623	3,439
Norfolk	NORF202	Openreach	3	-	-	-	-	-	-
North	NLNC101	Openreach	1						1
Lincolnshire	NENGIOI	oponiodon	•	370	5,131	2,985	51	2,721	2,184
North	NLNC201	Openreach	2	010	0,101	2,000	01	2,721	2,101
Lincolnshire	INLING201	Openieach	2	70	1,457	658	23	650	390
North Yorkshire	NYRK101	Openreach	1	1,770	21,838	15,317	74	9,763	10,402
North Yorkshire	NYRK201	Openreach	2	274	4,767	3,079	22	1,226	1,529
North Yorkshire	NYRK201	Openreach	3	214	4,707	3,079	0	1,220	1,529
	NTNS101		1	- 797	- 10,361	- 6,381	48	5,399	4,561
Northamptonshire		Openreach							
Northamptonshire	NTNS201	Openreach	2	253	3,983	2,596	20	910	1,654
	NTNS202	Gigaclear	3	14	274	218	3	87	134
Northamptonshire	NITNICOCC	I LIGOCIOOT	3	12	111	140	2	48	68 2,746
Northamptonshire	NTNS203	Gigaclear							· 7746
Northamptonshire Northern Ireland	NIRE101	Openreach	1	567	10,004	5,989	57	3,202	
Northamptonshire Northern Ireland Northern Ireland	NIRE101 NIRE201	Openreach Openreach	1 2	511	8,798	7,544	21	1,576	3,259
Northamptonshire Northern Ireland Northern Ireland Northumberland	NIRE101 NIRE201 NTHM101	Openreach Openreach Openreach	1 2 1	511 605	8,798 8,524	7,544 5,767	21 21	1,576 3,499	3,259 3,635
Northamptonshire Northern Ireland Northern Ireland Northumberland Northumberland	NIRE101 NIRE201 NTHM101 NTHM201	Openreach Openreach Openreach Openreach	1 2 1 2	511 605 68	8,798 8,524 1,910	7,544 5,767 1,455	21 21 1	1,576 3,499 264	3,259 3,635 512
Northamptonshire Northern Ireland Northern Ireland Northumberland Northumberland Nottinghamshire	NIRE101 NIRE201 NTHM101 NTHM201 NOTT101	Openreach Openreach Openreach Openreach Openreach	1 2 1 2 1	511 605 68 0	8,798 8,524 1,910 10,397	7,544 5,767 1,455 5,413	21 21 1 54	1,576 3,499 264 5,461	3,259 3,635 512 3,950
Northamptonshire Northern Ireland Northern Ireland Northumberland Northumberland	NIRE101 NIRE201 NTHM101 NTHM201	Openreach Openreach Openreach Openreach	1 2 1 2	511 605 68	8,798 8,524 1,910 10,397 5,132	7,544 5,767 1,455	21 21 1	1,576 3,499 264	3,259 3,635 512

Oxfordshire	OXFD101	Openreach	1	1,268	15,719	9,887	132	7,647	7,058
Oxfordshire	OXFD101a	Openreach	2	- 1,200	-	3,007	-	-	- 7,000
Oxfordshire	OXFD101a OXFD202	Openreach	3	1	- 23	- 9	- 0	- 19	- 4
Oxfordshire	OXFD202 OXFD204	Airband	3	-	20	9	0	19	- 4
Rest of Scotland	SCOT101	Openreach	1	7,509	- 121,922	80,100	- 753	43,566	49,146
Rutland	RUTL101	Openreach	1	101	1,299	998	5	804	755
Rutland	RUTL201	Openreach	2	15	292	142	1	102	101
Rutland	RUTL202	Openreach	2	6	169	94	0	30	39
Shropshire	SHRP101	Openreach	1	891	12,404	7,118	37	4,549	4,317
Shropshire	SHRP201	Openreach	2	69	957	926	0	103	386
Shropshire	SHRP202	Airband	3	127	1,616	1,109	17	490	581
South Yorkshire	SYRK201	Openreach	2	980	16,060	11,015	84	3,604	7,469
South Yorkshire	SYRK202	Openreach	3	19	502	258	1	117	125
Staffordshire	STAF101	Openreach	1	894	16,007	8,810	114	7,539	6,015
Staffordshire	STAF201	Openreach	2	215	4,180	2,907	9	662	1,003
Surrey	SURR101	Openreach	1	1,146	12,372	8,655	147	6,175	5,569
Surrey	SURR201	Openreach	2	114	1,252	1,082	9	169	410
Wales	WALE101	Openreach	1	7,394	120,026	74,848	275	47,817	45,923
Wales	WALE101	Openreach	2	- 7,004	-	-	- 215	-	-
Wales	WALE201	Openreach	3	19	387	251	0	121	136
Wales	WALE202	Openreach	3	22	748	356	0	332	231
Wales	WALE202	Openreach	3	16	551	389	1	208	237
Wiltshire	WILT101	Openreach	1	918	13,988	8,268	55	6,674	5,660
Wiltshire	WILT201	Openreach	2	4	81	45	2	44	37
Wiltshire	WILT202	Gigaclear	3	16	473	327	1	180	115
Wiltshire	WILT203	Openreach	3	24	566	400	2	134	138
South	SGLO101	Openreach	1	21	000	100		101	100
Gloucestershire	OGLOTOT	Openicaen		225	3,053	1,892	13	1,613	1,421
South	SGLO201	Openreach	2		0,000	1,002	10	1,010	1,121
Gloucestershire	0020201	oponiodon	-	0	1,169	816	21	241	434
South	SGLO202	Openreach	3		.,	0.0			
Gloucestershire		- 1	_	25	260	277	2	175	265
Worcestershire	WORC101	Openreach	1	867	10,902	6,525	58	4,686	4,186
Worcestershire	WORC201	Openreach	2	281	4,285	2,742	15	930	1,314
Worcestershire	WORC202	Openreach	3	17	286	307	2	52	84
Warwickshire	WWCK101	Openreach	1	546	7,895	5,145	43	3,903	3,700
Warwickshire	WWCK201	Openreach	2	303	4,357	3,450	7	718	1,613
Warwickshire	WWCK202	Openreach	3	35	571	599	0	0	0
West Yorkshire	WYRK101	Openreach	1	546	7,895	5,145	43	3,903	3,700
West Yorkshire	WYRK201	Openreach	2	303	4,357	3,450	7	718	1,613
West Sussex	WSUS101	Openreach	1	720	9,326	5,905	45	4,283	3,867
West Sussex	WSUS201	Openreach	2	143	2,459	1,735	12	251	688
Black Country	BLAC201	Openreach	2	384	6,346	3,765	165	2,622	2,830
Telford & Wrekin	TELF201	Openreach	2	145	2,760	1,417	30	854	950
Cornwall	CORN201	Openreach	2	160	2,835	2,038	6	389	640
Cornwall	CORN202	Openreach	3	87	1,450	1,301	1	98	88
Swindon	SWIN201	UKB	2	274	3,823	2,725	54	981	1,468
West Oxfordshire	WOXF201	Gigaclear	3	110	1,488	1,119	8	524	707
Hertfordshire	HERT202	Openreach	3	-	-	-	-	-	-
Buckinghamshire	BKSR202	Openreach	3	-	-	-	-	-	-
Scottish	SGOV202	Openreach	3						
Government				-	-	-	-	-	-
Scottish	SGOV203	Openreach	3						
Government				-	-	-	-	-	-

# For more information

3 Thomas More Square London E1W 1YW

t: +44 (0)20 3059 5000

www.ipsos-mori.com http://twitter.com/lpsosMORI

#### About Ipsos MORI Public Affairs

Ipsos MORI Public Affairs works closely with national governments, local public services and the not-for-profit sector. Its c.200 research staff focus on public service and policy issues. Each has expertise in a particular part of the public sector, ensuring we have a detailed understanding of specific sectors and policy challenges. Combined with our methods and communications expertise, this helps ensure that our research makes a difference for decision makers and communities.



