

Public Review

Dates: 18 June 2021 – 18 July 2021



Department for
Digital, Culture,
Media & Sport

PROJECT GIGABIT

REQUEST FOR INFORMATION



Index

1. Introduction	3
2. Purpose of this Public Review	4
3. Use of Public Subsidy	6
4. Proposed Intervention Area	8
5. Procurement and Commercial Approach	8
6. Timescales	9
7. Participating / responding to this Public Review	9
8. Supplier Submission Requirements	10
9. Date for Return	12
10. Next Steps	12
Annex A - Maps to show intervention areas	14
Annex B - Supporting Evidence	20
Annex C: Technology Definition	23



North East of England region Public Review

New procurement to extend coverage of gigabit-capable broadband across North East of England region

Duration: To commence on Friday 18 June 2021 and close on Sunday 18 July 2021

1. Introduction

The Government's ambition is to deliver nationwide gigabit-capable broadband as soon as possible. The market is making great progress in delivering a huge uplift in provision, but we recognise that there is a need for government intervention in the parts of the country that are not commercially viable. This is why the Budget in 2020 committed £5bn for the hardest to reach parts of the country, ensuring that all areas of the UK can benefit.

The £5bn will be spent through a package of coordinated and mutually supportive interventions, collectively known as Project Gigabit. As part of this, BDUK is developing a procurement approach for funding contracts to suppliers delivering gigabit-capable wholesale infrastructure. This procurement approach will be a successor to the highly successful Superfast broadband programme.

We wish to work collaboratively with industry to maximise efficiency, minimise market distortion and achieve our objectives within a tight time frame. To do this, we must first identify the areas that are not commercially viable.

BDUK conducted an Open Market Review (OMR) on 17 March 2021 – 14 April 2021. This OMR requested information from suppliers regarding details and supporting evidence of any current or planned investment over the next three years in broadband infrastructure (Next Generation Access broadband, ultrafast and gigabit-capable) in the identified geography.

BDUK now seeks to validate the outcome of the OMR through a Public Review process. The Public Review process aims to validate BDUK's mapping to ensure that it correctly represents the information provided by suppliers in the course of the OMR and to ensure that the right areas are targeted for government investment.

New UPRNs on Scottish borders and part of North Yorkshire were not originally included in the OMR release but form part of the forthcoming procurement. For this reason, we are seeking information from all suppliers regarding existing and planned infrastructure (over the next 3 years) - against an updated list of UPRNs in this review - Additional UPRNs have now been included for Scottish borders and North Yorkshire - indicated in orange on the attached maps, below. Please see section 8 below for submission requirements.



We invite stakeholders (e.g. including the public, businesses, internet service providers and broadband infrastructure operators) to provide us with feedback about the proposed eligible areas for government investment (intervention) set out in this document. **Please include in your submission, any existing or planned (within 3 years) infrastructure you have gained with assistance from Government subsidy for example, Vouchers, Superfast (NBS 2012 or NBS 2016) and Hubs.**

Suppliers who missed contributing to the preceding OMR, or had no definitive plans and/or evidence base on which to substantiate claims at that earlier stage, now have a final opportunity to notify BDUK before the procurement stage. The premises identified by BDUK as eligible, as described in section 3, may be grouped into one or more appropriately sized Intervention Areas (IAs). The IAs will be issued to the market so that suppliers can bid for funding to support delivery to those areas.

Why BDUK is seeking your support

BDUK's goal is to ensure the parts of the country that need government investment are accurately targeted. Each contributor to this public review will help to optimise the use of public subsidy in helping to provide faster and better connectivity across all parts of the UK.

Please respond if you have information to contribute to this data validation process. If you did not respond to the recent Open Market Review, and have existing network coverage, or plan to build infrastructure within the next three years, please submit your plans so that public subsidy can be targeted more accurately and over-building commercial infrastructure can be avoided.

You can also provide your views about the accuracy of the data and mapped areas to inform the final Intervention Areas, by reporting whether they do, or do not have existing or planned gigabit-capable broadband coverage.

2. Purpose of this Public Review

This Public Review sets out a description of the proposed subsidy measure and defines the proposed eligible areas, to enable all interested stakeholders (e.g. including the public, businesses, internet service providers and broadband infrastructure operators) to comment on those proposals.

Supplier data submitted during the Open Market Review (OMR) has been incorporated into BDUK maps using a methodology that protects commercially sensitive supplier data. BDUK corresponded with suppliers during the OMR to advise how their data was treated in developing the maps.

All meaningful responses to the Public Review will be carefully considered and where necessary will be utilised to determine eligible premises. The final eligible area maps and a



summary report confirming details of the changes will be published on dot.gov website after the close of the review period. Where further responses to the review are received, BDUK will respond to these and provide an explanation of how the information submitted has been treated. The finalised eligible premises and proposed Intervention Areas will then be submitted to BDUK's National Competence Centre (NCC) for approval against the UK Subsidy Control Regime.

Current context - North East of England region

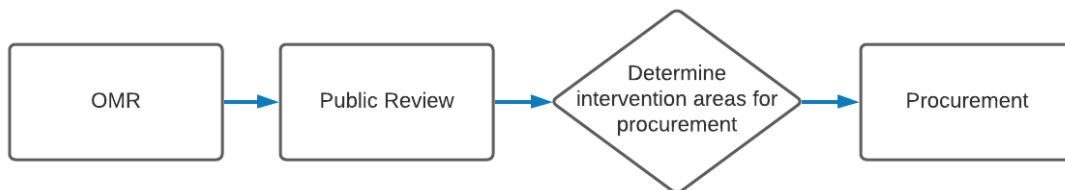
BDUK initiated an Open Market Review (OMR) for the North East of England region on 17 March 2021 – 14 April 2021. You can view the OMR publication here:

<https://www.durham.gov.uk/article/25284/Broadband-coverage-Open-Market-Review>

The OMR indicated that planned commercial coverage for gigabit-capable broadband would reach approximately **714,281** premises within the next 3 years, and would therefore leave the remaining **654,093** premises without access to gigabit-capable broadband.

As part of this public review, we will evaluate any further responses and may engage with suppliers further to discuss and confirm their coverage claims. Following this, we will be able to validate the eligibility of the premises for government subsidy. The flowchart below shows a summary of how the public review process works.

Once concluded, this Public Review will confirm the premises to be included in procurements. The flowchart below shows the order of processes, from OMR to procurement.



Role of Local Bodies

BDUK will work with the relevant local bodies to answer questions, evaluate supplier responses, assess data accuracy, manage the build phase and engage with the local community. BDUK, in consultation with North East Combined Authority (NECA), North of Tyne Combined Authority (NTCA) and Tees Valley Combined Authority (TVCA) will confirm the eligible premises to be included in the Intervention Area at the end of the Public Review.

The responses and output from the Public Review will therefore help us gain further confidence that the proposed interventions are in areas that are eligible for subsidy, i.e., areas which are not commercially viable and require government intervention to address market failure.

BDUK will be responsible for maintaining a central dataset and will work with authorities to assess and review the data in the areas relevant to the respective local body and interventions areas.



This Public Review is being carried out independently of any activities that local bodies may be undertaking, for example, under the National Broadband Scheme 2016 known as the Superfast Programme.

3. Use of Public Subsidy

This section provides a brief introduction to the application of public subsidy for the provision of gigabit-capable broadband coverage.

Following the UK's departure from the European Union on the 31st January 2020, the award of public subsidy needs to take account of World Trade Organisation rules and any international commitments made in free trade agreements. BDUK considers that this proposed subsidy falls under the subsidy control principles in Section 3 of the Trade and Cooperation Agreement¹ (TCA) agreed between the European Union and UK Government on the 24th December 2020. The TCA places an obligation on both the UK and EU to have an effective system of subsidy control with independent oversight.

BDUK will ensure that it meets these subsidy principles in awarding public subsidy for gigabit-capable broadband infrastructure, for example, by ensuring subsidy is designed to target failure in the market to achieve full UK coverage while minimising negative effects on competition. Public subsidy will be targeted to limit the risks of crowding out private investment, altering commercial investment incentives and ultimately distorting competition. Projects will continue to be procured under the Public Contracts Regulations (2015), to help meet our subsidy control requirements.

Requesting a review of a subsidy award

Under UK subsidy control requirements, anyone can request for a review about the award of subsidy. Requests must be submitted no later than one month from the date of the award of the subsidy for the North East of England region. The award of subsidy will follow the procurement and contract award and BDUK's National Competency Centre will consider requests submitted within the one month timescale, under the terms of the TCA.

This proposed award will be published by the Department of Business Energy Industrial Strategy (BEIS). The process for making such a request will be published here too.

Information about the UK's Subsidy Control regime may be found on our government website: <https://www.gov.uk/government/news/government-sets-out-plans-for-new-approach-to-subsidy-control>

Key eligibility requirements for public subsidy

1

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948119/EU-UK Trade and Cooperation Agreement 24.12.2020.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948119/EU-UK_Trade_and_Cooperation_Agreement_24.12.2020.pdf)



For the purposes of the design of this intervention, BDUK has considered gigabit-capable broadband networks set out in **Annex C**.

Further guidance on the characteristics of qualifying technologies is available from BDUK.

BDUK also requires that public intervention should be able to ensure a 'step change' in broadband availability from that currently available. This is demonstrated by:

- Generally, download speeds must be at least doubled and upload speeds substantially higher as a result of the intervention when compared with existing download and upload speeds
- Significant new investments in the broadband network are undertaken (i.e. investments that must include civil works and installation of new passive elements)
- The new infrastructure brings significant new capabilities to the market in terms of broadband service availability, capacity and speeds and or competition.

The 'step change' in broadband availability shall be compared to that of existing as well as credible planned networks.

BDUK classify premises on the basis of their existing or planned broadband infrastructure:

- 'White' premises are those in which there is no qualifying broadband infrastructure and none is likely to be developed within 3 years;
- 'Grey' premises are those where only one qualifying broadband infrastructure is present or is to be deployed within the coming 3 years; and
- 'Black' premises are those where at least two qualifying broadband infrastructures of different operators exist or will be deployed in the coming 3 years.

In addition, the proposed intervention area includes a number of 'under review', or 'conditional white' areas. These are areas where suppliers have reported planned commercial broadband coverage, but those plans have been judged through the OMR as potentially being at risk of not being completed. These areas will be subject to continued monitoring and verification of supplier plans within the 3 year period by BDUK. BDUK may request commitment from the supplier that significant progress is made within three years. In the event that these commercial plans fall away these premises will be mapped as eligible and form part of the proposed intervention area and so eligible for intervention via this aid measure.

BDUK will target only those premises identified as 'white'.



4. Proposed Intervention Area

Postcodes have been used to summarise the premise classifications and map the proposed eligible areas. For this purpose the postcodes have been classified as follows:

- A postcode is **White** if any 'White' premises are present; else
- A postcode is **Under Review** if any 'Under Review' premises are present; else
- A postcode is **Black** if all premises in the postcode are classified 'Black'; else.
- A postcode is **Grey** i.e., all premises are 'Grey' or a mixture of 'Grey' and 'Black'.
- A postcode is **Orange** if no data is available.

The outcome of the OMR is summarised in terms of 'White', 'Grey', 'Black', 'Orange' and 'Under Review' postcodes and premises below.

Postcode Classification	Number of Postcodes	Number of Gigabit Black Premises	Number of Gigabit Grey Premises	Number of Gigabit Under Review Premises	Number of Gigabit White Premises	Number of Gigabit Orange Premises
White	44,834	8,441	168,408	66,781	540,981	
Under Review	4,365	840	11,427	42,012		
Grey	25,026	31,586	484,418			
Black	574	9,161				
Orange	558					4,319
Total	75,357	50,028	664,253	108,793	540,981	4,319

5. Procurement and Commercial Approach

BDUK has undertaken extensive early market engagement in relation to procurement for interventions. This engagement has included consulting on the programme design, different potential target areas, technical specification (including wholesale access), procurement types and contractual terms. Feedback from broadband suppliers and other stakeholders has been taken into account in all these areas.

Procurements will be carried out in accordance with the [Public Contracts Regulations 2015](#) (PCR2015). BDUK procurement approaches are designed to address the scale of the individual procurements. The procurements will be conducted in a transparent and non-discriminatory manner.



Forthcoming procurement - North East of England region

The total public funding investment will be based on the final number of premises requiring subsidy. BDUK will allocate a specific budget drawn from public funding, for this area, at the procurement stage. The budget will be specified within the Invitation To Tender (ITT) documentation, following the Public Review. Details of any restrictions on the use of public subsidy will be explained in the tender documentation. BDUK intends to procure gigabit-capable solutions – those capable of achieving a minimum of 1Gbps download speed - for the identified areas in scope for gigabit-capable deployment shown in Premises Data Postcode list.

Suppliers have the opportunity during the OMR and Public Review stages, to share with BDUK, any firm and credible investment plans that may mean that public subsidy will not be warranted. It will be important for this Public Review to establish where these plans exist.

6. Timescales

This review will be open until 5pm on Sunday 18 July 2021.

Once the review is closed and BDUK has finalised the Intervention Areas, an Invitation to Tender (ITT) will be issued via a procurement portal, for suppliers to bid for the opportunity to deliver extended gigabit-capable broadband coverage within 6 months. The portal address is to be confirmed in advance of the ITT. The intention is to award a contract during 2022. The related extended deployment plans for broadband infrastructure should begin at the earliest opportunity, but by 2022.

7. Participating / responding to this Public Review

BDUK requests information and supporting evidence from suppliers - in relation to the presence of gigabit-capable broadband infrastructure within the project area. We wish to hear from all relevant stakeholders - including the public, businesses, internet service providers and broadband infrastructure operators - particularly in relation to the proposed mapped eligible areas - **Annex A** and associated postcode list.

For the avoidance of doubt, please only respond to this Public Review if you have a meaningful contribution to make.

Please tell us about your:

- Broadband infrastructure - existing
- Plans for developing / improving broadband infrastructure over the next 3 years.
- Please include in your response, any existing or planned (within 3 years) infrastructure you have gained with assistance from Government subsidy for example, Vouchers, Superfast (NBS 2012 or NBS 2016) and Hubs.



Suppliers who are interested in developing a bid for the forthcoming procurement are encouraged to make use of existing infrastructure. More information about existing infrastructure access remedies can be found on the [Ofcom Website](#)

Responses from residents, businesses and other stakeholders

For residents and businesses, responses should relate to whether you have, or expect to have gigabit-capable broadband service coverage in the next 3 years. Any information provided in response to this Public Review should as a minimum include (but need not be limited to) the address of the property, or the area that the submission relates to and the nature of the concern.

For all submissions, BDUK would be grateful if you would contact us to register your intention to submit a response and could confirm in your submission the following:

- Your organisation's name (if applicable)
- Your organisation's, or residential address (if applicable)
- Your name
- Position
- Contact telephone number
- Email Address

Members of the public and other respondents should follow the above format and email their submissions to digital.durham@durham.gov.uk

Suppliers - In addition to providing contact details in the above format above and when making a data response - **See section 8 - Submission Requirements Suppliers below.**

Suppliers - providing us with feedback on our procurement approach

Suppliers should provide us with feedback as soon as possible about the changes in coverage. However, feedback on the procurement approaches can be supplied via the supplier engagement and under the Planning for Gigabit consultation process. You may for example separately want to tell us about your capacity to make a bid.

8. Supplier Submission Requirements

We request the following information from suppliers

Please provide information on, and supporting evidence for, any current or planned (within the next 3 years) investment in broadband infrastructure in the North East of England region area, where this may not be already reflected within the proposed gigabit-capable broadband maps attached.



For any current, or planned coverage not included within the proposed intervention areas shown on the attached map Annex A, BDUK is requesting information at premise level, using the template issued on 17 March 2021 to show existing or planned coverage by your broadband infrastructure investment.

Making a Data Response

To submit a data response, please follow these steps:

1. If you have not already done so, contact digital.durham@durham.gov.uk with either a copy of your Ordnance Survey License Number or to request a copy of the Ordnance Survey Public Sector Geospatial Agreement (PSGA) Contractors Licence and Non-Disclosure Agreement (NDA), which will be required before the data templates are provided to you.
2. Please return the signed forms as soon as possible to digital.durham@durham.gov.uk.
3. Once you have done this, we will provide you with login details to our secure file transfer portal where you will be able to download the response templates.
4. You may seek clarification (except on weekends), on making a data response, at any time from Friday 18 June 2021 and Sunday 18 July 2021. Please send these questions to us at digital.durham@durham.gov.uk.
5. You should make your data submission to us via the secure file transfer portal. Please upload the data response template and any further supporting evidence you feel you should send. The final deadline for data responses is 5pm on Sunday 18 July 2021.

UPRNs on the Scottish borders, and in North Yorkshire, were not originally included in the OMR release but form part of the forthcoming procurement. These new UPRNs are indicated in orange, on the maps below. Please can all suppliers submit their coverage data for existing and planned infrastructure (over the next 3 years) for Scottish borders and Northumberland, in addition to the UPRNs released at the start of the OMR and also included in this review.

The portal will enable suppliers to authenticate themselves and to upload their responses. It will ensure that data collected from each supplier is held securely and separately. Please note that the data you provide in your response will be treated as commercially confidential, albeit that it may be necessary to share some/all of your response data with our professional advisors and/or local bodies, Ofcom and BEIS State Aid Branch. We will use this information to define the intervention areas for the Public Review.

Please ensure that you engage with us as soon as possible to confirm whether you would require to put in place a non-disclosure agreement (NDA) enabling us to share data between each other as part of this NDA process.



It should also be noted that it is a requirement to use this information to produce maps to define 'White', 'Grey', 'Black' and 'Under Review' areas for gigabit-capable broadband. However, the published maps will show the aggregated 'White', 'Grey', 'Black' and 'Under Review' broadband areas, not the data provided on a per-operator basis. The final maps that will be used for procurement purposes will be published shortly after the conclusion of this Public Review and once approved by the National Competence Centre.

If you have any questions about any of the above, please contact digital.durham@durham.gov.uk

Data Submission Requirements

Responses to this Public Review must include the following:

1. A data submission that should cover your current and planned premise coverage:
 - The required data fields are provided through the secure file transfer portal.
 - The premises list will also be made available.
2. Your written supporting evidence to the points outlined in **Annex B**.
3. BDUK would also like to hear from operators their views as to the types of wholesale access products they would like to see offered on any newly created subsidised network infrastructure. This information may inform the intervention design. Please note that we are not obliged to include these products in the invitation to tender.

Note also the Technical Definition guidance at **Annex C**

9. Date for Return

You can upload your data from **Friday 18 June 2021 up to and including 5pm on Sunday 18 July 2021**.

10. Next Steps

Please submit responses to this Public Review by the closing date of 5pm on Sunday 18 July 2021. BDUK plans to publish the final maps showing finalised Intervention Areas shortly after the close of the review period.

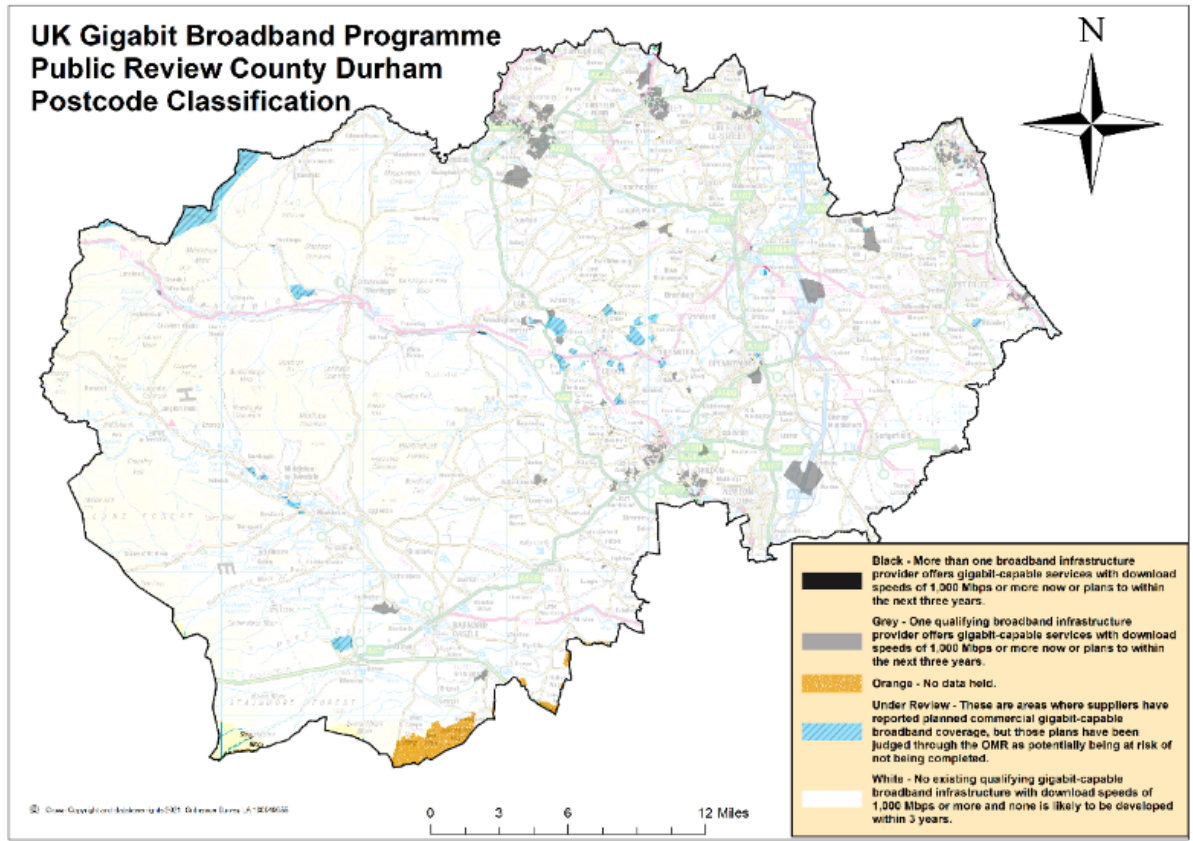
This will be followed by the launch of the Invitation To Tender to suppliers, enabling them to bid for the opportunity to fulfil a new contract to deliver the extended coverage.





Annex A - Maps to show intervention areas

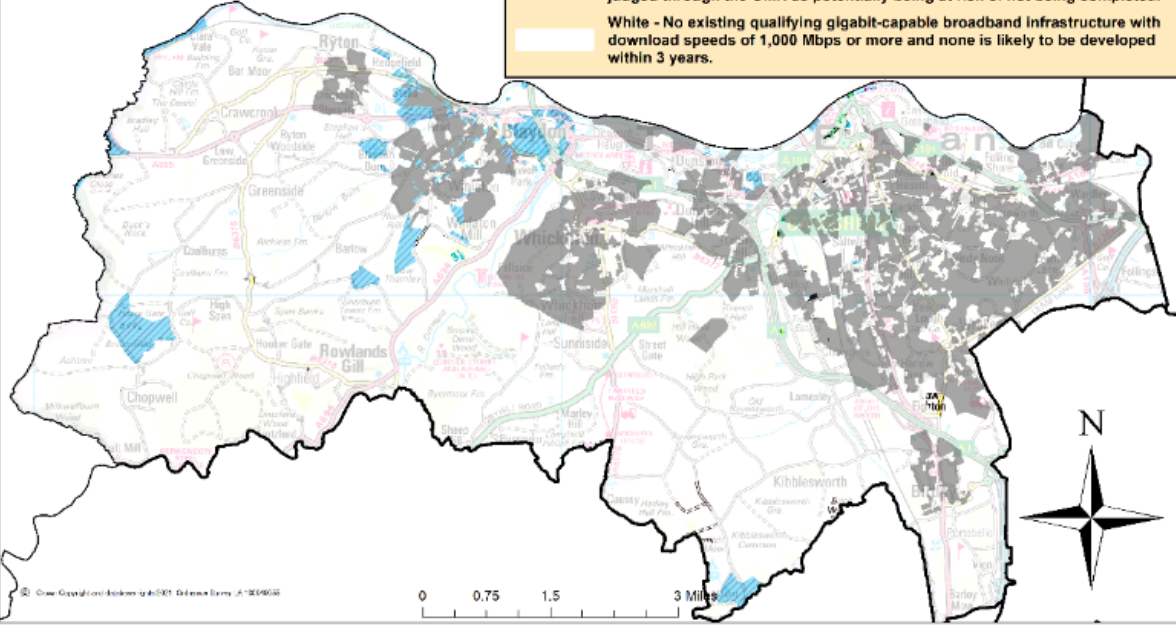
Suppliers can access the supplier response template via the portal by emailing digital.durham@durham.gov.uk





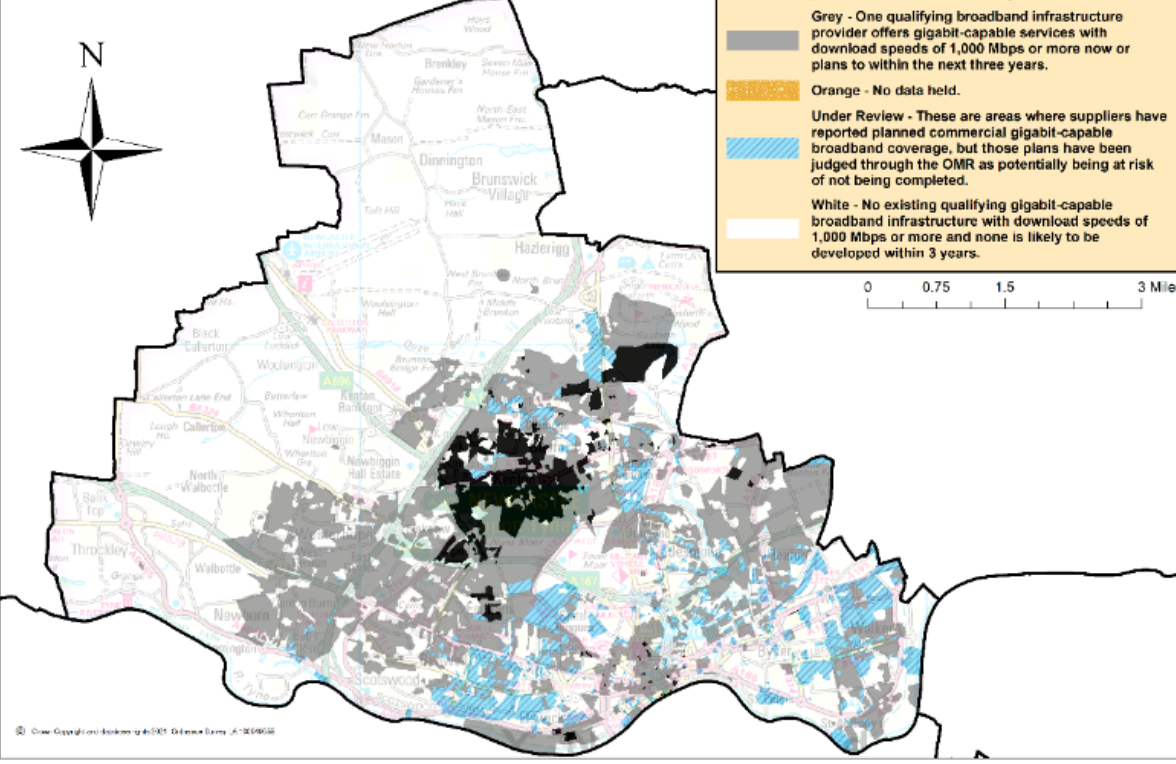
UK Gigabit Broadband Programme Public Review Gateshead Postcode Classification

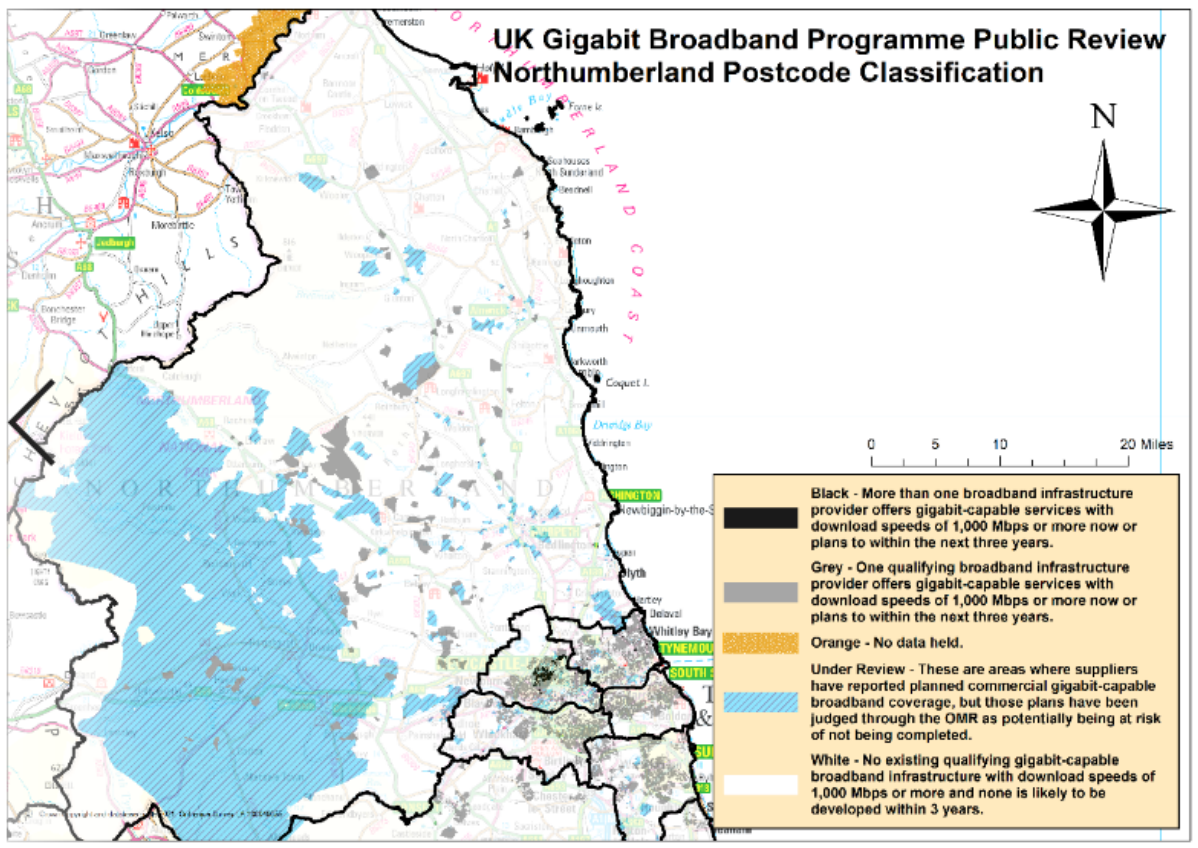
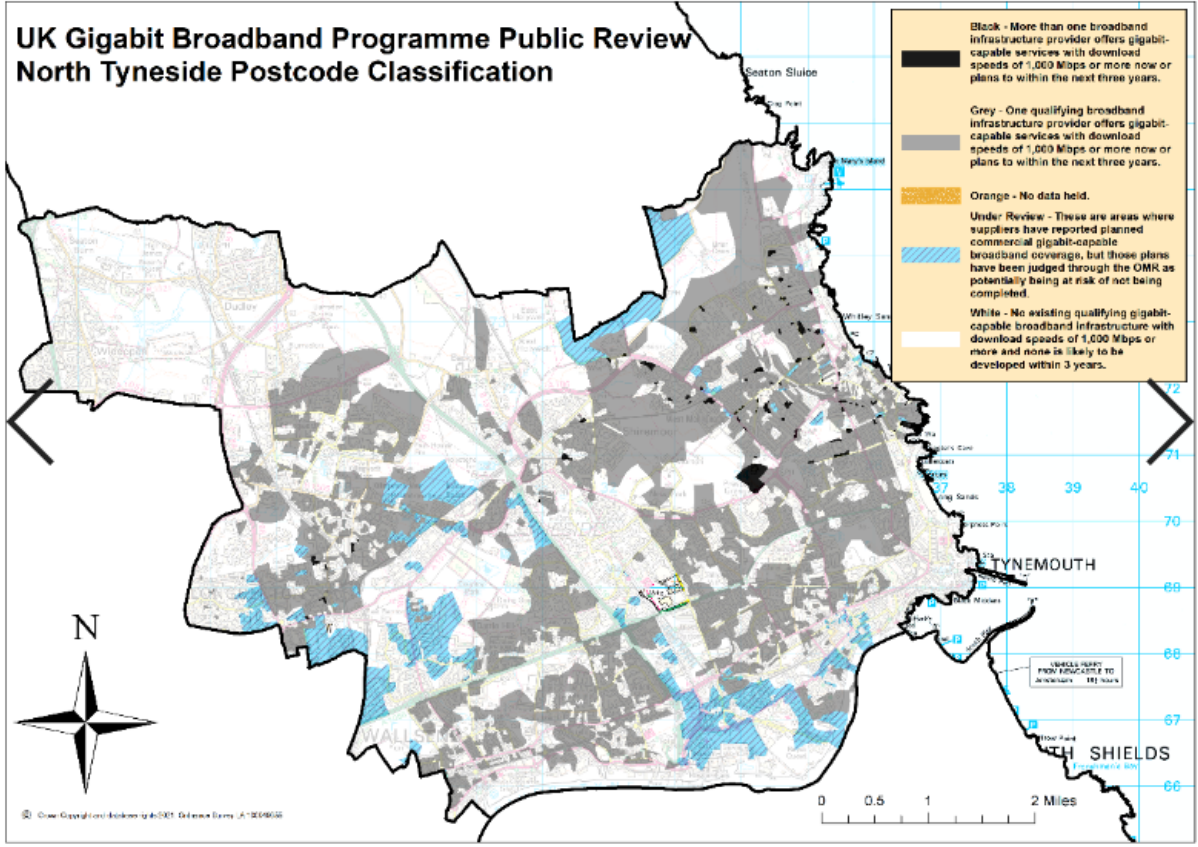
- Black - More than one broadband infrastructure provider offers gigabit-capable services with download speeds of 1,000 Mbps or more now or plans to within the next three years.
- Grey - One qualifying broadband infrastructure provider offers gigabit-capable services with download speeds of 1,000 Mbps or more now or plans to within the next three years.
- Orange - No data held.
- Under Review - These are areas where suppliers have reported planned commercial gigabit-capable broadband coverage, but those plans have been judged through the OMR as potentially being at risk of not being completed.
- White - No existing qualifying gigabit-capable broadband infrastructure with download speeds of 1,000 Mbps or more and none is likely to be developed within 3 years.

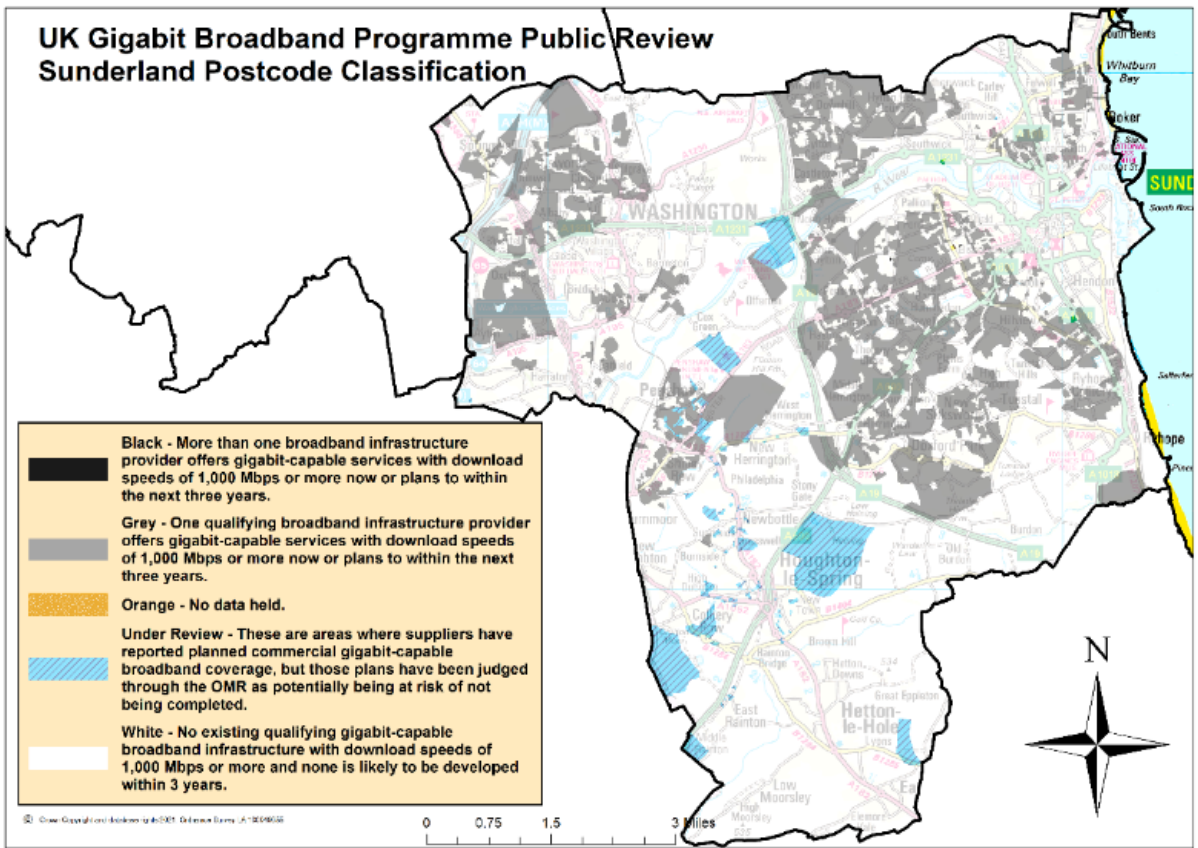
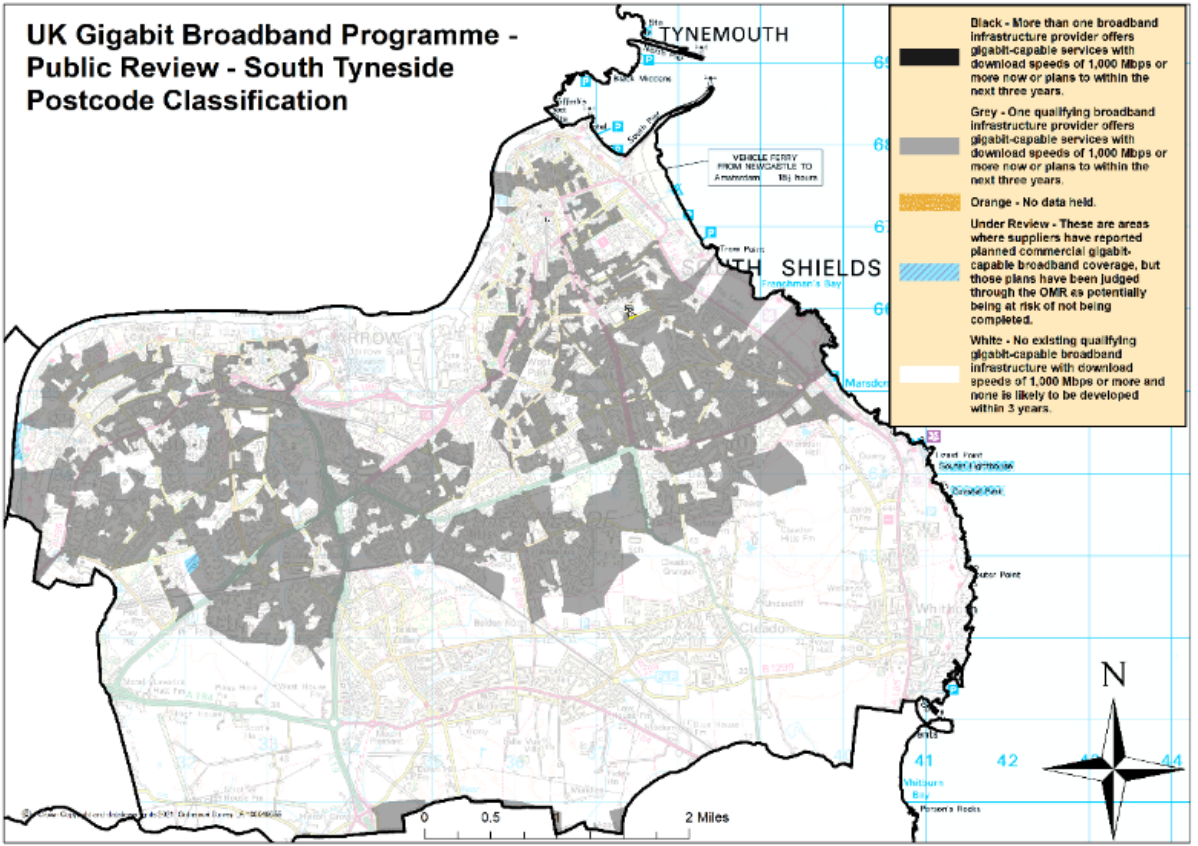


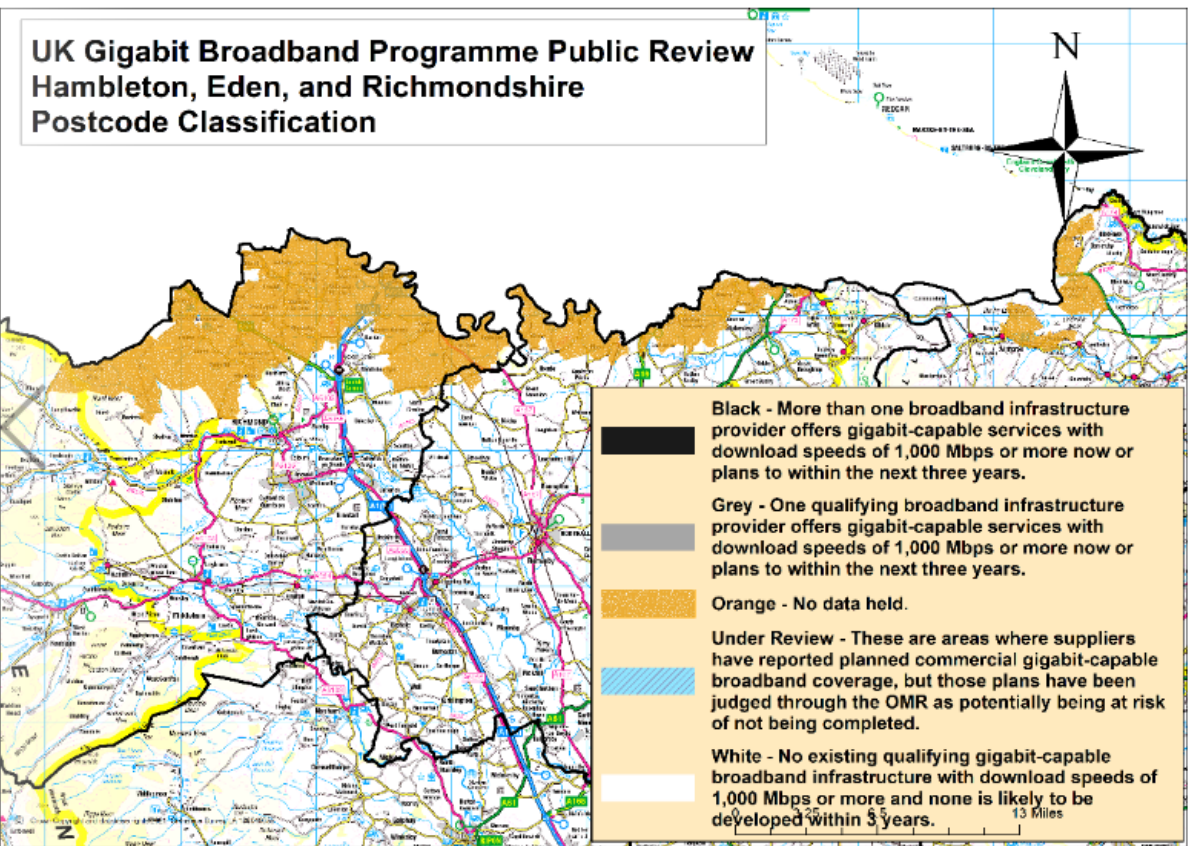
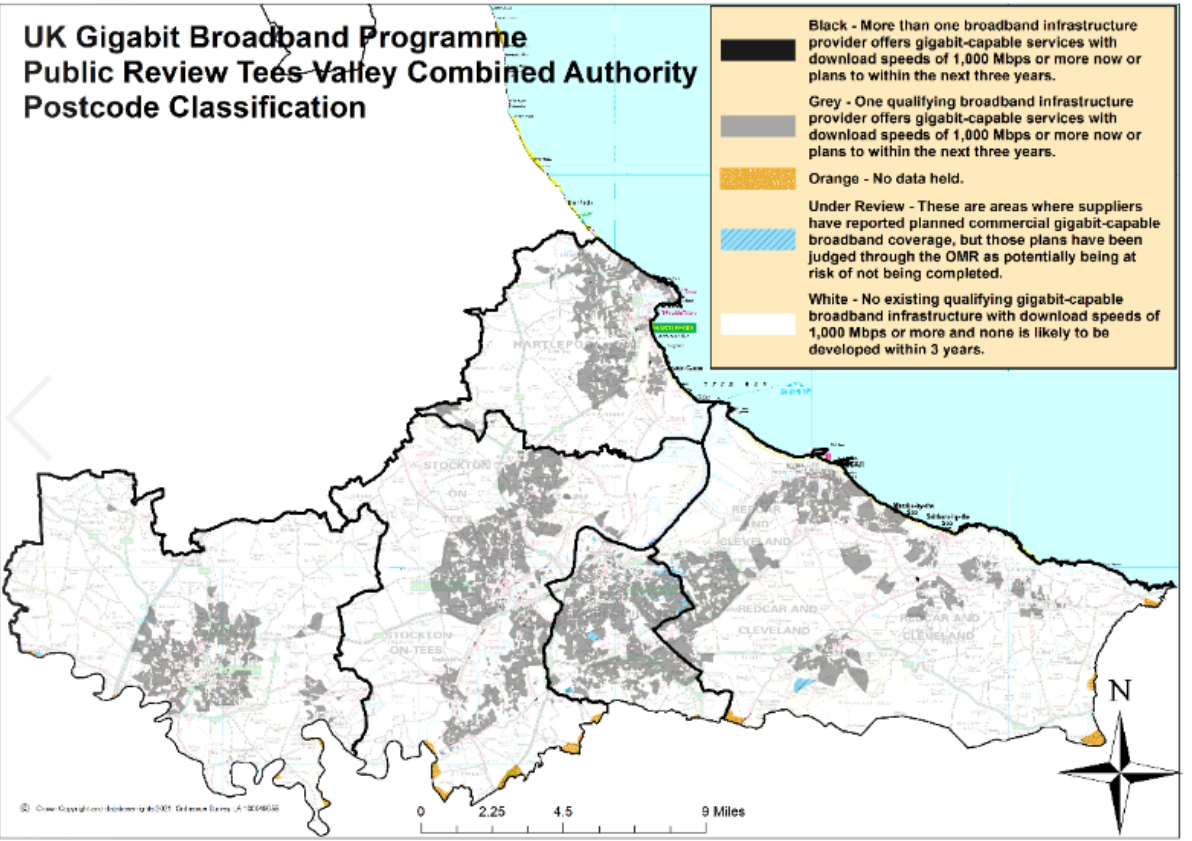
UK Gigabit Broadband Programme Public Review Newcastle Upon Tyne Postcode Classification

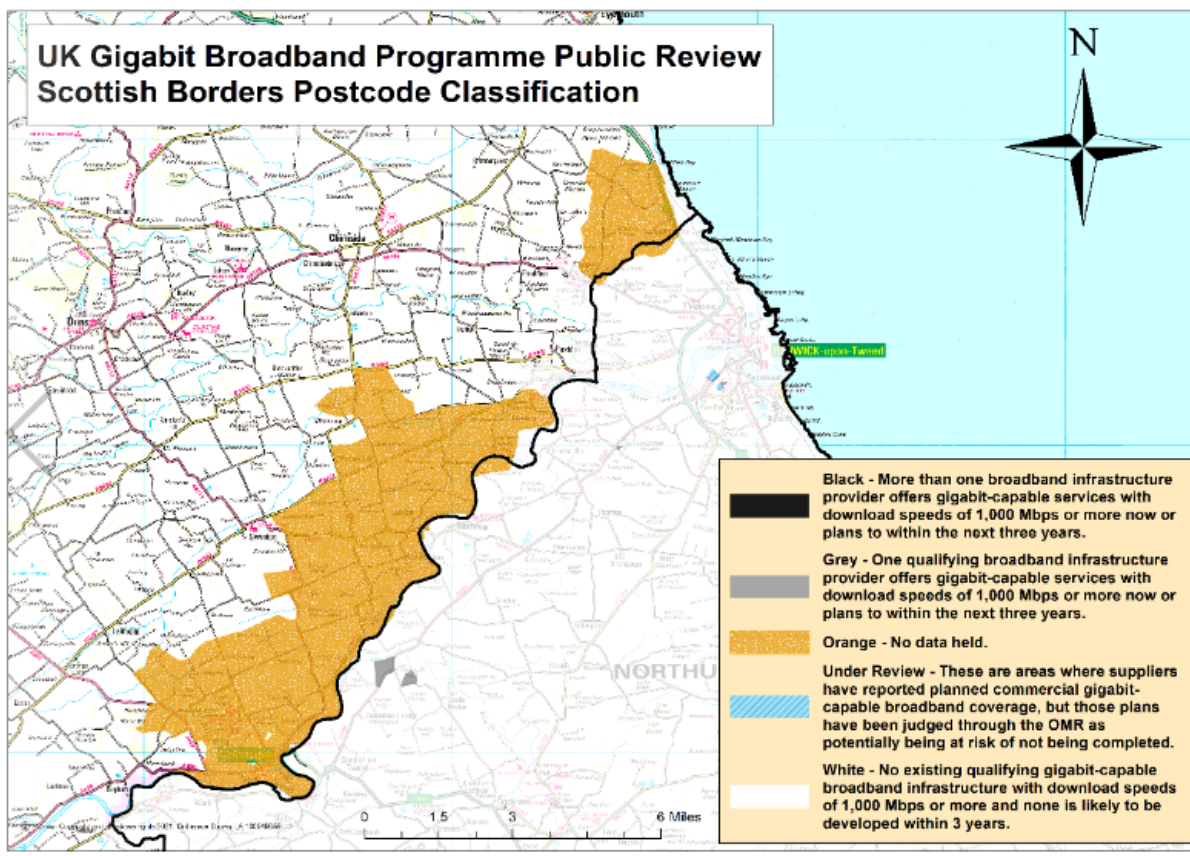
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- White - No existing qualifying gigabit-capable broadband infrastructure with download speeds of 1,000 Mbps or more and none is likely to be developed within 3 years.











Located on the Durham County Council website there are two Excel formats that allow you to check a postcode classification. These are an Excel Postcode Checker and an Excel Postcode List.

Please find below a direct link to the Excel Postcode Checker located on the Durham County Council website where you can check postcode classifications.

<http://www.durham.gov.uk/media/35694/find-your-postcode-in-an-excel-spreadsheet/xls/PostcodeChecker1.xlsm>

Please find below a direct link to the Excel Postcode List located on the Durham County Council website where you can check postcode classifications.

<http://www.durham.gov.uk/media/35695/find-your-postcode-in-a-csv-file/csv/PostcodeChecker.csv>

Please contact Digital Durham if you require support accessing the information detailed in this report digital.durham@durham.gov.uk



Annex B - Supporting Evidence

Please provide details and additional supporting evidence of any current or planned investment in broadband infrastructure (Next Generation Access broadband, ultrafast and gigabit-capable) in the identified geography. In the case of planned investment, we are particularly interested in plans for the forthcoming three years. In addition to the completion of the attached CSV file template, any information provided in response to this request should include but not be limited to:

- An appropriate demonstration/explanation as to how your broadband infrastructure or suppliers' service(s) meets with minimum standards where these claim to be Next Generation Access, ultrafast or gigabit.
- For information only, capability definition is consistent with the definitions set out in Ofcom Connected Nations Reports, e.g.,
 - decent (10 Mbps and above),
 - superfast (30 Mbps and above),
 - ultrafast (300 Mbps and above) and
 - gigabit-capable broadband, which can offer speeds of 1 Gbps and above.
- Note: where a supplier's service offer is limited to passive services *only* (e.g. dark fibre, duct access, mast access), this would not generally be considered to be an Next Generation Access, ultrafast or gigabit-capable broadband network, unless the supplier provides a description of how an active services provider is technically and commercially able to support Next Generation Access, ultrafast or gigabit-capable services over the infrastructure.
- Nevertheless, if a passive infrastructure supplier is offering access to infrastructure in the identified geography, it is encouraged to provide further details of its location in order that bidders for any future procurement process might consider its use in designing their solutions.
- Within each broadband category (Next Generation Access, ultrafast or gigabit-capable) please indicate: (i) what level of take-up is expected in total; and (ii) what level of take-up can be sustained by the network design and dimensioning.
- For example, a fixed wireless supplier may only be expecting 10% take-up of premises covered by its superfast network, and only be able to support a total of 20% of all premises passed converting to customers without significant capacity upgrades to the network.
- Please indicate the "normally available" and "minimum" speeds for the customers of each service e.g.



Service	Download “normally available”	Download “minimum”	Upload “normally available”
100Mbps	100Mbps	80Mbps	20Mbps
300Mbps	300Mbps	240Mbps	60Mbps
1Gbps	980Mbps	800Mbps	200Mbps

Please refer to the full text of the Ofcom’s [Voluntary Code of Practice](#) for Better Broadband Speeds (March 2019), however, these definitions can be summarised as follows:

Summary Extract from the Ofcom Voluntary Code of Practice

“Normally available” speed is defined as the speed a customer could expect to receive during peak times - measured as 8-10pm for residential services and 12-2pm for business services and reflecting when customers are most likely to use the service.

“Minimum speed” is defined as the minimum guaranteed speed a customer should expect from the service, which would trigger the customers right to exit the contract if speeds fall below this minimum level and are unable to be resolved within a 30-day period.

- Appropriate indicators of quality of the service e.g., contention ratio and/or bandwidth allocation per end user, together with a technical explanation of how these will support the achievement of the normally available and minimum speeds for all users.
- A description of the technical architectures that demonstrate how the claimed data speeds and performance will be maintained end-to-end across the deployed infrastructure. This could include, for example, network connectivity diagrams, deployment/coverage maps, design/dimensioning rules for network elements, backhaul capacity information, types and quantities of equipment, technical specifications, network performance measurements etc.
- Description of all services/products offered over the infrastructure including any wholesale provision to any retail service providers currently offered and any planned extension to these services within the next 3 years. Please indicate which retail service providers are using these services and what services are being taken?
- Installation and rental tariffs for those services/products clearly identifying whether they are inclusive or exclusive of VAT.
- For future coverage and plans the broadband infrastructure provider will need to provide evidence to demonstrate credible and plausible character of the planned investment and as a minimum should include a business plan, a detailed calendar deployment plan, proof of adequate financing, proposed technical architecture (see above).



- Confirmation from an authorised signatory that all information provided is of suitable accuracy.

Please supplement with supporting evidence as you consider appropriate e.g. public websites, published reports, etc.



Annex C: Technology Definition

The UK will review the criteria for gigabit-capable networks within three months of the launch of the Dynamic Purchasing System, based upon the consultation with industry, and the UK regulator, around the criteria below. In the meantime BDUK will work with the following technical definition:

- 1) infrastructure that can support gigabit-capable downstream services directly or via third-party providers without restriction, as set out below:
 - a) connections that are gigabit-capable (capable of delivering 1000Mbps or more download speeds) at the time of delivery of the connection without the need for future hardware upgrades or modification² i.e., gigabit-capability to be available from day one and if the consumer takes a slower speed it must be soft upgradeable without undue delay;
 - b) products with a clear and comprehensible explanation of the minimum³ and maximum advertised download and upload speeds;
 - c) products with 100 Mbps download speed as a minimum;
 - d) upload speeds in line with industry norms for corresponding download speeds (e.g. typically 20 Mbps and above for 100 Mbps download services, and proportional for higher download speed services);
 - e) low data latency in line with recent industry norms and/or the requirements of real-time services (e.g. 10 ms and below);
 - f) maintenance of other technical performance indicators (e.g. jitter, packet loss, contention ratio etc.) in line with recent industry norms and/or the requirements of real-time services (e.g. voice/video calling, telematics, telemedicine etc.);
 - g) actual data speeds and performance during the busiest hours of the day (not more than 4 out of every 24), that do not degrade more than 50% below the higher of these criteria⁴ and providers' service specifications (note: for performance where lower values are better, such as latency, jitter and packet loss, then a factor of 100% above would apply instead);

² This principally applies to CPE but also backhaul/other network upgrades.

³ Minimum download speeds may include the usual framing and packet overheads of the technologies used, provided that they amount to no more than a few percent of the total traffic i.e. data speed is defined as (user data traffic + overheads) / time

⁴ Typically contention ratios of around 20:1 to 30:1 have been found to meet these criteria and should not be exceeded unless it can be otherwise demonstrated how these criteria would be met. For the avoidance of doubt, the performance criteria take precedence over contention ratio considerations.



- h) actual data speeds and performance that do not degrade outside of the busiest hours below 95% of the higher of these criteria and providers' service specifications;
- i) actual data speeds and performance that do not degrade as take-up of services approaches 100% of the addressable market (including any part arising from switch-off of legacy networks), to be demonstrated by firm commercial and technical (including capacity upgrade) plans.
- j) where service offerings and performance vary by locality e.g. as a result of subscribers' distances from infrastructure, gigabit-capability to be maintained for all potential customers;
- k) order fulfilment and rectification within typical industry timescales, supported by demonstrably efficient wholesale service management processes;
- l) maintenance of customer service levels and network availability in line with industry norms, ideally supported by service level agreements;
- m) service provision that does not unfairly discriminate against particular types of services, providers, subscribers or third parties (e.g., via traffic shaping or quality of service measures); and
- n) for subsidised networks only; offering of wholesale access products on open and non-discriminatory terms in line with the principle of technological neutrality, to enable the interconnection to the subsidised network of any technology which other communications providers and/or retail providers may reasonably consider appropriate in accordance with the wholesale access requirements.