Promoting investment and competition in fibre networks: Further response on geographic markets analysis

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CityFibre

Contents

1 Introduction and Executive Summary

1.1 This document builds on previous CityFibre submissions in response to Ofcom's proposed approach to geographic markets from 2021 onwards, for those markets downstream from the physical infrastructure level.

1.2 This document sets out new evidence that Ofcom should have due regard to when considering its approach to geographic markets. Specifically, CityFibre have undertaken detailed postcode analysis to assess whether Ofcom's proposed allocation of UK postcode sectors between Areas 2 and 3 are appropriate. This is highly relevant for Ofcom's assessment of relevant geographic markets (as well its assessment of any potential competition concerns).[1]

1.3 Furthermore, and to support Ofcom's assessment of these matters, we set out in this document the key parameters that operators like CityFibre take into account when they decide where to deploy new fibre networks.

1.1 Introduction

1.4 In Ofcom's December 2018 '*Approach to geographic markets'* consultation, Ofcom undertook an assessment of UK postcode sectors, in consideration of how they should be allocated between what it called 'Potentially competitive areas' and 'non-competitive areas'. In Ofcom's subsequent publications it has referred to these as 'Area 2' and 'Area 3', respectively.[2]

1.5 Ofcom's geographic analysis is based on postcode sector data and involves considering market size (e.g. population and number of households in a postcode sector) and density characteristics, to inform its view about which areas (postcode sectors) are likely to see full fibre deployment by non-Openreach (i.e. 'alternative') operators.

1.6 In those areas where Ofcom consider there will be no full fibre deployment by alternative providers, Ofcom propose to deem these 'non-competitive areas' (Area 3). Ofcom's initial analysis suggested that they believe that almost one-third (31%) of UK premises (9 million premises) fall into this category.[3]

1.2 Executive Summary

1.7 CityFibre consider that Ofcom's initial finding that 31% of UK premises will not see entry by an alternative operator deploying full fibre is a significant overestimate. Once all the factors affecting incentives to invest by alternative full fibre operators (like CityFibre) are considered, it can be seen that in fact Area 3 is likely to be much smaller than 31% of UK premises.

1.8 As a starting point we believe that Ofcom have not considered all the relevant investment factors in its assessment of where alternative full fibre operators are likely to deploy their networks. To explain this, we note that there are four general categories of factors that an operator (like CityFibre) is likely to take into account when deciding where to deploy assets:

1. Market size and characteristics;
2. Proximity of existing assets and relationships with local authorities;
3. Competitive presence in an area; and
4. Deployment costs and availability of DPA.

1.9 Of these, Ofcom appear to have only undertaken an assessment of the first, and have therefore not considered other critical factors, such as whether the operator has nearby/adjacent infrastructure, or how build costs may vary across regions.

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[1] This document builds on work previously undertaken by SPC Network and DAS Ltd for CityFibre, TalkTalk and Vodafone.

[2] Ofcom (2018) '*Promoting investment and competition in fibre networks: Approach to geographic markets*.' Paragraph 2.15 [Link]

[3] Ofcom (2018) '*Promoting investment and competition in fibre networks: Approach to geographic markets*.'. Table 4.9 [Link]

1.10 Not including these relevant factors within the assessment of geographic markets, results in a significant overestimate of Area 3. This is because many of the factors not assessed by Ofcom would in fact increase the likelihood of investment. Furthermore, Ofcom's analysis of market size and characteristics errs in the allocation of many postcode sectors to Area 3, which have relatively high levels of density (comparable to Area 2).

1.11 Overallocation of postcode sectors to Area 3 is a material issue, because Ofcom is proposing to implement RAB-based regulation in Area 3, which would significantly reduce investment incentives for alternative operators (like CityFibre), and essentially become a self-fulfilling prophecy. If Ofcom do misallocate postcode sectors, and implement regulation that deters investment in Area 3, then this would lead directly to regulatory failure by undermining investment that otherwise (i.e. absent regulator intervention) would have taken place.

1.12 The key messages of this paper are set out below:

- **The majority of postcode sectors currently allocated to Area 3 have equal or higher density than those allocated to Area 2**: While the average density across all of Area 3 is much lower than in Area 2, when investigating further, one can see that the average belies the reality that many post code sectors allocated to Area 3 have a density equal to or higher than postcode sectors allocated to Area 2. The low average density for Area 3 is explained by a number of extremely low-density postcode sectors, which bring down the average significantly. If we instead take the highest 80% of postcode sectors (provisionally allocated by Ofcom) in Area 3, ordered by density, we see that their average density is almost exactly equal to the average density across all of Area 2. This suggests that Ofcom have mis-allocated potentially up to 80% of Area 3 postcode sectors, representing 7.25m premises.
- **Postcode sectors cannot be considered in isolation, as regard must be given to their physical location and whether they are within a town/city that is commercially attractive, or near to one**: Postcode sectors that do not appear to be commercially attractive in isolation, may be so if they are located within a contiguous town/city area, for which it is natural and logical to deploy across the entire contiguous area. In addition, there may be postcode sectors (e.g. villages) near to a commercially attractive town/city that would not attract commercial deployment in isolation but could if a network were deployed into the nearby town/city. There may also be the case where a city/town on its own is not commercially attractive, nor would be the surrounding villages, however they all may become commercially attractive once the total demand potential of the area (e.g. town/city plus neighbouring villages) is aggregated together.
- **Relationships with local authorities can materially influence where an operator deploys its network:** Negotiations with local authorities are critical to successful deployment and it is not at all unusual that they seek to influence and expand coverage areas to include locations that would not naturally fit our selection criteria if reviewed individually outside the context of other local deployments.
- **Full fibre deployment costs can vary significantly by region and are likely to be independent from population size and density:** Perhaps the most significant factor influencing build cost is the availability of DPA, which has the ability to significantly reduce the costs of full fibre deployment. As a result, the decision of where alternative operators choose to deploy full fibre will be largely influenced by where DPA can be effectively utilised.
- **Ofcom should take due account of deployment announcements:** Ofcom have stated that one of the criteria it will take into account in determining 'potentially competitive areas' (i.e. Area 2), is where "an alternative network provider has announced plans to build in the area". However, it appears that Ofcom have not given full regard for recent announcements. We encourage Ofcom to give all due consideration to planned deployments, to ensure the areas that are planned for commercial deployment by alternative operators are not inadvertently and incorrectly designated as Area 3.

2 How operators decide where to deploy full fibre networks

2.1 The decision of where a network operator decides to deploy full fibre assets is complex and multi-faceted, as a number of different parameters and issues need to be factored in. In addition, it should be recognised that deployments are a dynamic process, and as such locations can be added to or removed from the deployment plans at short notice, as the local market conditions change.

2.2 Most of the parameters/factors considered by operators deploying full fibre networks (such as CityFibre) can be grouped into the following four categories:

1. Market size and characteristics,
2. Proximity of existing assets and local authority relationships
3. Competitive presence in an area, and
4. Deployment costs and availability of DPA

2.3 Consistent with the above (as we discuss in more detail in this section) CityFibre's full fibre deployments are focussed on entire contiguous areas of a town/city. CityFibre's deployment approach is to ensure that the vast majority of premises within a contiguous city/town are served by our network. To date CityFibre has committed to delivering full fibre connective across the entirety of some 26 towns and cities, and there are plans for many more towns to be announced over the coming 12 months. CityFibre's current objective is to build full fibre to at least 5m premises in the UK by 2025.

2.4 In the past, CityFibre's choice of towns and cities would have been influenced by where it was possible to find anchor tenants to de-risk an initial metro network deployment. This approach allowed us to build substantive metro networks in 60 towns and cities, connecting primarily local authority locations, businesses, and/or mobile cell sites.

2.5 At present, CityFibre is seeking to make widespread use of duct and pole access (DPA) in order to significantly reduce both the cost and time for deploying full fibre. This follows from Ofcom's critical intervention to lift the usage restrictions on the DPA remedy. As a result, CityFibre has been seeking to use DPA in all cities in which we are rolling our full fibre. Our experience of using DPA is that it is not yet fit for purpose for scale deployment, but we are working with other operators and Openreach, inter alia, through the OTA facilitated industry working group to overcome the issues we have identified. Where we have been able to make use of DPA (such as in Coventry) our build costs have been reduced significantly.

2.6 In the remainder of this section we discuss each of the above four key considerations, that Ofcom should take into account when assessing which postcode sectors are likely to see deployment of full fibre networks by alternative operators.

2.1 Market size and characteristics

The majority of postcode sectors currently allocated to Area 3 have equal or higher density than those allocated to Area 2

2.7 Ofcom's criterion (as set out in its December 2018 Consultation on 'Approach to geographic markets') for determining whether a UK postcode sector will attract commercial full fibre investment, is the number/density of premises within that postcode sector.

2.8 CityFibre agrees that the number/density of premises in a given area is an important factor for the business case for commercial fibre deployment, however CityFibre does not consider that this is the only or even the most important criterion.

2.9 CityFibre accepts that there are parts of the UK where deployment of full fibre is unlikely to be commercially viable for an alternative operator such as CityFibre, e.g. due to the high costs of deployment. However, we would expect that these areas would comprise a fairly small proportion of UK premises.

2.10 To consider this, we start by presenting Ofcom's own assessment of how many premises fall within each of Area 2 and Area 3. We can see that on average the density[4] of postcodes in Area 3 (87 premises per km) is much lower than Area 2 (149 premises per km on average):

Table 1: Number of premises and average density based on Ofcom's allocations of postcode sectors to Areas 2 and 3

	Area 2	Area 3
Number of premises	19,957,528	9,063,791
Average density (premises per km)	149	87

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.11 However, critically, there is a great diversity across the 3,912[5] postcode sectors allocated to Area 3 by Ofcom, most especially in terms of density. As such, while the average density across all of Area 3 is much lower than in Area 2, when investigating further, one can see that the average belies the reality that many post code sectors allocated to Area 3 have a density equal to or higher than postcode sectors allocated to Area 2. Therefore, the low average density figure for Area 3 is in fact explained by a number of extremely low density postcode sectors.

2.12 For instance, while the average density across all Areas 3 postcode sectors is 87 premises per km, if we instead take the highest 80% of postcode sectors by density (equivalent to 7.25m premises, i.e. remove the lowest 20% of postcode sectors by density, we see the average premises per km rises to 148, which is almost exactly equal to the average across all of Area 2. We show this in Table 2 (below).

[4] We define density as number of premises per km of underground infrastructure, which is the measure that Ofcom uses in its full fibre model to determine average cost by postcode sector.

[5] Ofcom (2018) '*Promoting investment and competition in fibre networks: Approach to geographic markets*.' Table 4.1 [Link]

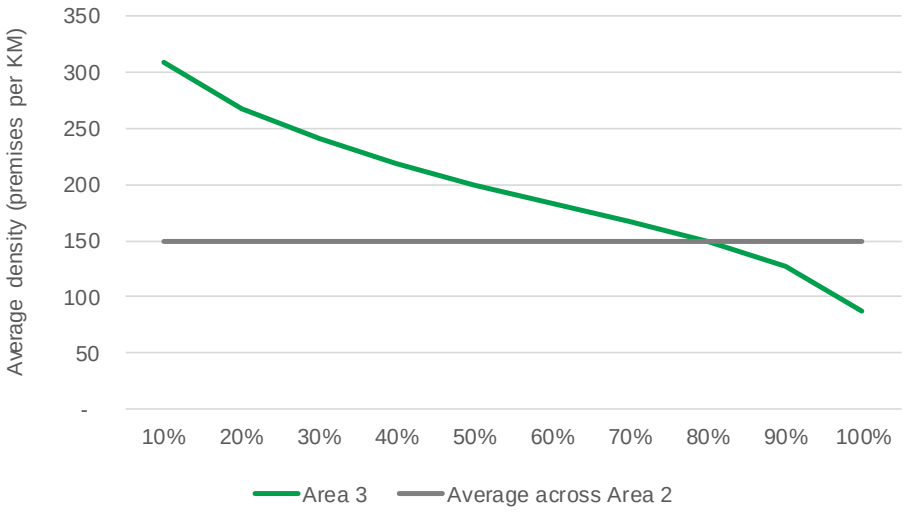
Table 2: Average density in Area 3, based on differing cumulative postcode sectors

	Top 70% of postcode sectors	*Top 80% of postcode sectors*	*Top 90% of postcode sectors*	*All postcode sectors in Area 3*
Number of premises	6,344,654	7,251,033	8,157,412	9,063,791
Average density (premises per km)	166	148	127	87

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Area 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.13 We can present this information graphically and do so for all deciles of postcode sectors in Area 3 (when ranking them from highest to lowest density). Comparing this to the average density across all of Area 2 (i.e. 149 premises per km as shown in Table 1) we see that the vast majority of post code sectors allocated to Area 3, have a density that is above the average for Area 2.

Figure 1: Cumulative density plot for Area 3 postcode sectors



Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

Notes: The Area 3 postcode sectors have been ranked from highest to lowest density. These postcode sectors are then grouped into ten equal groups, i.e. the first 10%, the second 10%. We successively add these together to get the 'cumulative' density plot shown above.

2.14 Given that around 80% of the currently defined Area 3 postcode sectors have an average density very similar to the average density across all of Area 2, it would seem that these postcode sectors (amounting to 7.25m premises) are as attractive on average as the Area 2 sectors. If these premises were moved to Area 2, then Area 3 would amount to only around 6% of total premises, rather than the 31% which Ofcom have currently mapped.

Ofcom overestimates the size of the minimum efficient regional full fibre deployment

2.15 In addition to considering population density, Ofcom has also considered the size of any town/city and proposed that Area 3 may not contain towns or cities with more than 20,000 premises. However, CityFibre

considers that smaller locations are often commercially viable if they are near existing assets (which we discuss below, and also in Section 2.2) and/or it may be that the operator offers to include such smaller towns and villages as goodwill gestures towards the local authorities.

2.16 As such, Ofcom's use of 20,000 premises as a threshold for determining the potential for competitive networks in a town appears to overestimate the minimum efficient scale for localised deployment.

2.2 Proximity of existing assets and relationships with local authorities

2.17 Proximity to existing network assets is a key factor in determining the attractiveness of a geographic area for fibre investment. This includes proximity to existing infrastructure owned by a CP (for example within an existing town/city or nearby it) as well as proximity to existing BT infrastructure.[6]

2.18 CityFibre's current network densification is an example of how the existence of our metro network built primarily for serving the leased lines and dark fibre markets, makes it commercially attractive to deploy other assets i.e. to provide broadband services, in that area or near to it. This is because the incremental investment necessary to deploy broadband networks is reduced due to the existing metro networks.

2.19 Similarly, the costs of building network to reach locations in the vicinity of existing network assets, means that the one-off, sunk costs of the existing assets (such as for example the costs of the PoP[7]), can be spread across a larger number of customers. Although the locations near existing assets may not qualify for network deployment as stand-alone investments, the economies of scale (and scope in some cases) mean that they become viable when added to existing assets.

2.20 Ultimately, the above approach help's CityFibre to achieve sufficient economies of scale and scope, to deploy widespread full fibre asses.

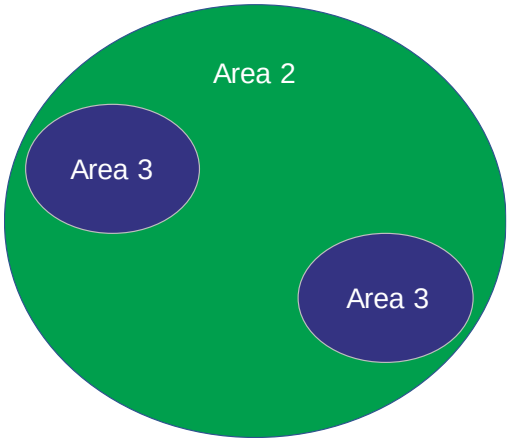
Postcode sectors cannot be considered in isolation, as regard must be given to their physical location and whether they are within a town/city that is commercially attractive, or near to one

2.21 While density of premises is a significant driver of costs, and hence does affect viability of areas for network build, it cannot be considered in isolation at a postcode sector level. This is because there are significant advantages to be gained from building fibre networks in contiguous clusters, covering entire cities/towns.

2.22 A stylised example of this can be seen in the below figure, which shows a contiguous town/city area (in green), in which there are clusters of premises (i.e. postcode sectors) within the contiguous area that have been allocated to Area 3 (i.e. because they have a lower density of premises). CityFibre considers that in such a case, the entire area should be allocated to Area 2.

[6] Existing presence in BT exchanges is likely to be an important factor for many CPs, as those CPs will have an existing customer base in those locations and also have existing backhaul facilities from the exchanges, thus reducing the incremental costs and accelerating take-up by being able to migrate existing customers on to their own new fibre infrastructure.
[7] Point of presence.

Figure 2: Stylised contiguous town/city area, in which a subset of postcodes have been allocated to Area 3



Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.23 In addition to the above example, there may be nearby villages for which deployment may not be viable in isolation but may become viable as a result of deployment in the nearby town/city. A stylised example of this is shown below, which shows a town/city (in green) which is attractive for commercial deployment, and two nearby villages which are allocated to Area 3. These villages could attract commercial deployment as an extension of the build within the main town/city.

Figure 3: Stylised contiguous town/city area, in which nearby/neighbouring postcodes have been allocated to Area 3

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.24 Both of the above two scenarios show why it is not appropriate to consider postcode sectors in isolation, and instead regard must be given to whether or not those postcodes are within a contiguous town/city area, or near to one. If they are, then it may be appropriate to allocate them to Area 2.

2.25 A scenario closely related to the above, but distinct, is the case where a city/town on its own is not commercially attractive, nor would be the surrounding villages, however they all may become commercially attractive once the total demand potential of the area (e.g. town/city plus neighbouring villages) is aggregated together. This highlights again how one needs to consider the market size in a holistic way, and not simply individual postcode sectors.

2.26 In order to estimate the potential impact of the scenarios illustrated above, CityFibre has analysed 225 towns with between 10k and 20k premises,[8]in order to identify:[9]

a. postcode sectors allocated to Area 3 which are within a commercially attractive town/city (i.e. examples of the situation set out in Figure 2), and

b. postcode sectors allocated to Area 3 that neighbour a commercially attractive town/city (i.e. examples of the situation set out in Figure 3).

2.27 This analysis is presented in Table 3 (below) and shows that there are ~900k premises associated with the first of these (i.e. within the contiguous boundary of towns/cities that are currently defined as Area 3). There are an additional 1.16m premises in neighbouring areas which could be commercially attractive. In total this suggests that as many as 2m premises should be reallocated from Area 3 to Area 2, purely on the basis of nearby infrastructure.

Table 3: Number of Area 3 premises that are within contiguous town/city areas, or in neighbouring areas (towns/cities of between 10k and 20k premises)

Premises within towns/cities	Premises in neighboring areas
899,894	1,159,993

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

Notes: Postcode sectors within towns/cities were determined by visual inspection of maps showing sectors and town boundaries. Neighbouring sectors were identified as being adjacent to the in-town sectors, provided that they contained significant suburban development or villages (adjacent sectors that were clearly rural in nature were excluded).

2.28 Further to the above, we have also analysed 72 larger towns, with greater than 20k premises[10], and find that there are around 400k additional premise that have been allocated to Area 3 that could be attractive for commercial full fibre deployment. The results are shown in Table 4 (below).

Table 4: Number of Area 3 premises that are within contiguous town/city areas, or in neighbouring areas (towns/cities of over 20k premises)

Premises within towns/cities	Premises in neighboring areas
9,184	392,395

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.29 To further demonstrate the above, we have identified two real-world case-studies, which we set out below including with postcode mapping.

[8] In order to identify the towns with 10k-20k premises, we assumed an average of 2.5 people per premises and identified towns of between 25k – 50k population, based on 2011 census data.
[9] This analysis also formed part of our response to Ofcom's fibre modelling consultation. However we have now extended this analysis.

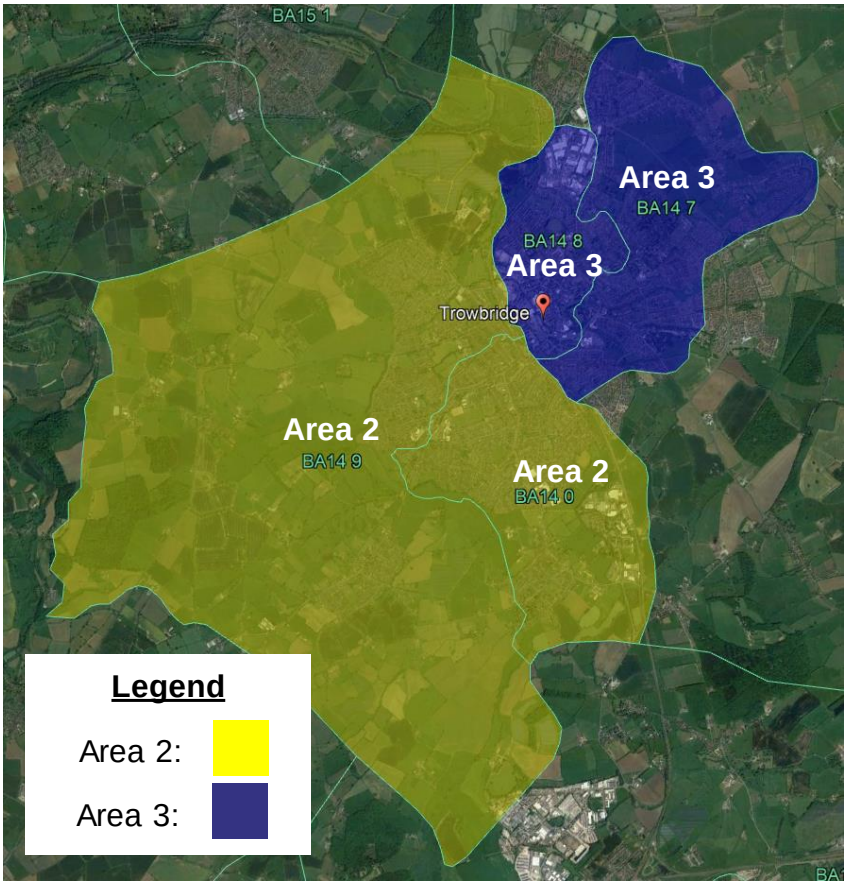
[10] These towns were selected as having populations over 50k, equivalent to 20k premises using an assumption of 2.5 people per premises.

2.30 The first example is the town of Trowbridge in Wiltshire, which has a population of around 43,000, and around 20,000 premises. The town is covered by four postcode sectors (listed below, and shown visually on the map in Figure 4):

- **BA14 0** - which is to the south, has 5,621 premises and which Ofcom currently defines as Area 2;
- **BA14 8** - which includes the town centre, has 3,540 premises and which Ofcom currently defines as Area 3;
- **BA14 7** - which lies to the north east, has 7,010 premises and which Ofcom currently defines as Area 3;
- **BA14 9** - which lies to the west and encompasses part of the town along with some more rural areas, has 3,844 premises and which Ofcom currently defines as Area 2.

2.31 It is most unlikely that a CP would build fibre networks only in BA14 0 and BA14 9 (i.e. those postcode sectors allocated to Area 2, comprising 9,465 premises), and not also deploy in BA14 7 and BA14 8 (which together comprise 10,550 premises, over half of the premises within the town). The map below also shows how the postcode sectors form a contiguous area.

Figure 4: Analysis of post code sector allocations in Wiltshire town of Trowbridge



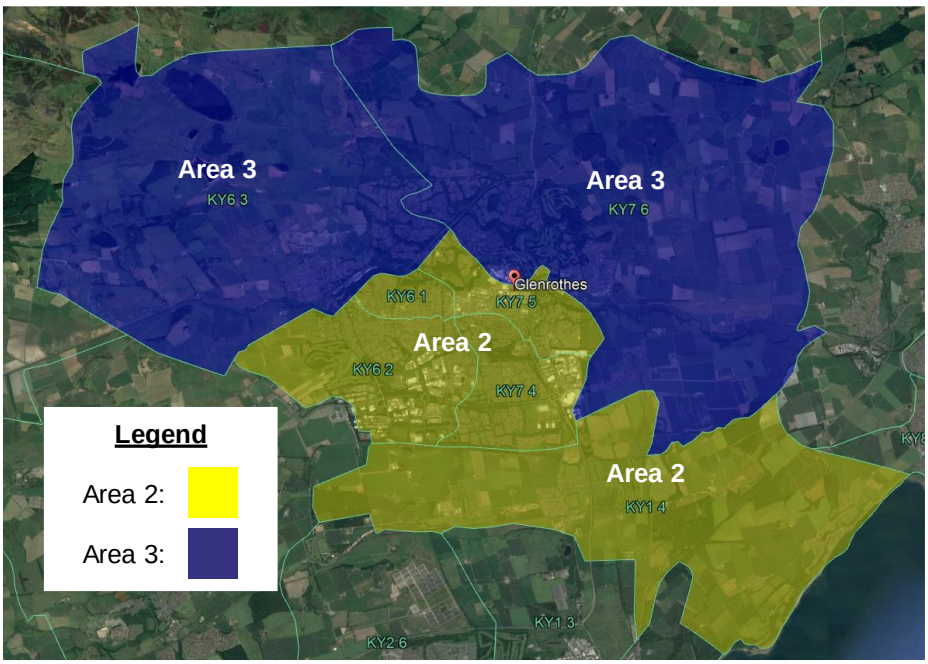
Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

2.32 The second case study example is the Scottish town of Glenrothes which has a population of around 40,000, with around 13,000 premises. The town is covered by four postcode sectors (KY6 1, KY6 2, KY7 4 and KY 7 5), and these are all mapped as Area 2 by Ofcom. However there are three surrounding postcode sectors which have significant development, two of which are mapped as Area 3:

- **KY1 4** - which lies to the south, and has 2,830 premises which Ofcom map to Area 2;
- **KY6 3** - which lies to the north west, and has 2,694 premises which Ofcom map to Area 3;
- **KY7 6** - which lies to the north east, and has 6,119 premises, which Ofcom map to Area 3.

2.33 While these sectors may contain some rural areas with few premises, the majority of the premises in KY6 3 and KY7 6 form a contiguous development from the town itself and would be likely to form part of an operator's rollout plan. It does not seem logical to map these two sectors to Area 3.

Figure 5: Analysis of post code sector allocations in Scottish town of Glenrothes



Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3 in file 'Illustrative assessment results (postcode sectors by category)'

Relationships with local authorities can materially influence where an operator deploys its network

2.34 Deployment of fibre networks can involve significant disruption to the local community. CityFibre works hard to minimise this disruption and to develop positive and constructive relationships with key stakeholders in deployment areas, most especially the local authorities.

2.35 Building positive relationships with local authorities is essential for CityFibre. We invest in these relationships and local authorities understand their importance to us, and to the industry as a whole. With respect to determining the local network deployment coverage, our negotiations with local authorities are critical and it is not at all unusual that they seek to influence and expand our coverage areas into locations that would not naturally fit our selection criteria if reviewed individually outside the context of other local deployments. This may be formalised in the form of local full fibre network (LFFN) tenders.

2.36 An example of this can be seen in Inverness, where the local authorities asked that CityFibre include other areas that were not in our original coverage map, including Fort William which is 66 miles from Inverness and only hosts around 4,000 premises, and Wick and Thurso which are even smaller towns more than 100 miles from Inverness.

2.37 Table 5 (below) shows the key statistics for the main anchor location (Inverness) as well as the additional areas we agreed to deploy in, all of which are currently allocated to Area 3.

Table 5: Key stats on CityFibre deployments in Inverness and adjoining areas

Ofcom Area	Town	Population	Premises (approx.)
2	Inverness	48,201	19,280
3	Fort William	5,883	2,353
3	Thurso	7,933	3,173
3	Wick	7,155	2,862

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3, and population data from 2011 census, assuming 2.5 people/premise.

2.38 Another example of this can be seen in CityFibre's deployments in West Sussex (under the LFFN scheme) to a group of towns; Bognor Regis, Burgess Hill, Chichester, Crawley, Haywards Heath, Horsham, Littlehampton, Shoreham and Worthing, not all of which would have made it on to CityFibre's initial deployment list if evaluated separately. We note that two of these areas are currently allocated to Area 3.

Table 6: Key stats on CityFibre deployments in West Sussex

Ofcom Area	Town	Population	Premises (approx.)
2	Bognor Regis	63,885	25,554
2	Burgess Hill	30,635	12,254
3	Chichester	28,657	11,463
2	Crawley	106,943	42,777
3	Haywards Heath	33,845	13,538
2	Horsham	48,041	19,216
2	Littlehampton	55,706	22,282
2	Shoreham-by-Sea	48,487	19,395
2	Worthing	109,120	43,648

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3, and population data from 2011 census, assuming 2.5 people/premise.

2.39 A third example can be seen from CityFibre's deployments in Suffolk (under the LFFN scheme), where CityFibre is teaming up with MLL Telecom to deploy fibre to connect ten county towns; Bury St Edmunds, Felixstowe, Haverhill, Ipswich, Lowestoft, Mildenhall, Newmarket, Stowmarket, Sudbury and Woodbridge.

2.40 Again, we note that two towns (Haverhill and Sudbury) are categorised as Area 3, despite CityFibre's deployment plans. We also highlight that Haverhill has a high premises count; indeed higher than five towns in the list which are allocated to Area 2.

Table 7: Key stats on CityFibre deployments in Suffolk

Ofcom Area	Town	Population	Premises (approx.)
2	Bury St Edmunds	41,113	16,445
2	Felixstowe	23,564	9,426
3	Haverhill	27,041	10,816
2	Ipswich	144,947	57,979
2	Lowestoft	70,945	28,378
2	Mildenhall	13,388	5,355
2	Newmarket	20,384	8,154
2	Stowmarket	19,280	7,712
3	Sudbury	22,213	8,885
2	Woodbridge	11,341	4,536

Source: CityFibre/GOS analysis based on Ofcom's allocation of postcode sectors to Areas 2 and 3, and population data from 2011 census, assuming 2.5 people/premise.

2.41 CityFibre's experiences are not unique and other providers will most likely have very similar situations in their fibre deployments. Ultimately, deployments will not be limited to the lowest cost postcode sectors, but will be based on contiguous clusters of premises, as well as adjacent/neighbouring premises, that may become desirable to service once nearby assets have been deployed.

2.3 Competitive presence in an area

2.42 A key criterion for operators deciding where to deploy full fibre, and which Ofcom have not included in their analysis, is the number of likely competitors that an operator will face.

2.43 It is clear that the more competitors that are present, the lower will be expected customer penetration. Lower levels of penetration mean there are fewer customers over which to recover the costs of the investment, ultimately lowering the business case for deployment. This directly relates back to market size, and therefore ultimately comes back to the minimum efficient scale for deployment. They key here is that the minimum efficient scale will vary depending on the number of likely competitors in an area.

2.44 Given this, even announcements by other operators could influence decisions about where to invest, such that areas that previously may not have seemed attractive for an investor, may become less so if they were to learn of others' intentions to deploy there. As a result, the operator may divert capital to areas which previously it had not intended to enter, perhaps in areas that were previously thought of as unattractive for commercial deployment. This highlights the dynamic nature of this issue and that any deployment decision is time dependant.

2.4 Deployment costs and availability of DPA

2.45 The costs of deploying full fibre networks can vary substantially between locations, for a variety of reasons including:

- Availability of DPA
- Nature of terrain (e.g. cobbled streets vs cement pavements)
- Wayleaves and access to MDUs

2.46 As a starting point, we note that there is no reason to believe that any of these are correlated with city/town size or density. As such these factors must be considered independently.

2.47 Of the above factors, the availability of DPA is likely to be the most significant impact on deployment decisions. This is because DPA can substantially reduce the build costs and thus improve the business case for deployment.

2.48 Based on CityFibre's current estimates, the average cost of deployment of full fibre using only DPA is likely to be between £300 and £400 per premise passed. However, this can be even lower in cities which have even more favourable circumstances (for example very high population density, or high proportion of poles as opposed to ducts). In contrast, if DPA is not used, and complete self-build is required, the costs per premise passed increases significantly, to around £500.

2.49 This can be seen from ongoing CityFibre deployments, for example Aberdeen in which we currently have [✂] premises passed (as of August 2019) and have not been able to utilise any DPA, has an ongoing average cost per premise passed of [✂].

2.50 In stark contrast, in Coventry we have been able to make high usage of DPA, most especially on poles, which has significantly reduced build costs to [✂] per premise passed.

Table 8: Cost per premises passed, to date, in CityFibre's Aberdeen and Coventry deployments

City	DPA used to date	Premises passed (as of Aug 19)	Capex per premises passed (excl. drop)
Aberdeen	None	[✂]	[✂]
Coventry	High	[✂]	[✂]

Source: CityFibre analysis

2.51 Given the significant impact of DPA on costs, it could be that postcode sectors that have a high density could be unattractive if DPA is not available. Conversely, postcode sectors with low density could become attractive for commercial deployment if the build costs are sufficiently low, i.e. if DPA can be effectively utilised. As such, the locations across the UK in which DPA is available and can be effectively utilised will be a critical factor in determining which parts of the UK are attractive for commercial deployment.

2.52 While DPA is a very important factor affecting costs, there are other important factors, including the terrain (assuming some self-build is required) in that certain terrain is more expensive than others to build ducts. A good example of this are cobbled streets which are significantly more expensive for self-build than other forms of duct deployment.

2.53 Another cost factor is wayleaves and issues of access to MDUs, both of which can materially increase deployment costs.

3 Announced full fibre deployments

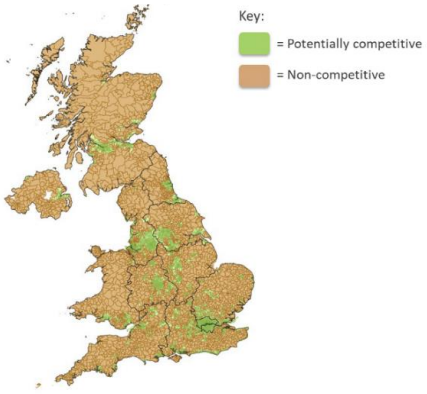
3.1 Ofcom set out in its '*Promoting investment and competition in fibre networks: Approach to geographic markets*' that one of the criteria it will take into account in determining 'potentially competitive areas' (i.e. Area 2), is where "an alternative network provider has announced plans to build in the area".[11]

3.2 The evidence we have set out above highlights a number of cases in which CityFibre's own planned deployments have not been taken into account by Ofcom (given that they currently have been allocated to Area 3).

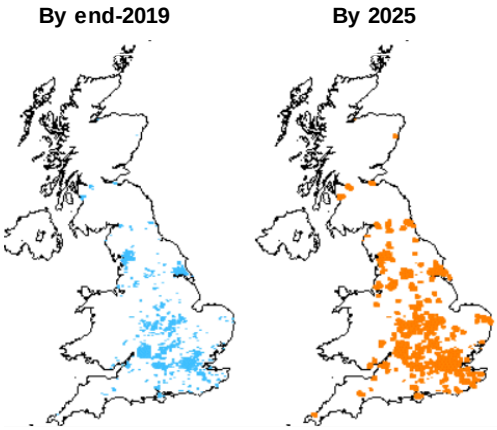
3.3 Looking at the planned deployments across the industry, it seems that Ofcom is not taking due account of them in defining which areas fall into Area 2 and 3. To see this, CityFibre refers to the responses submitted by INCA to Ofcom's 'approach to remedies' consultation, which includes maps produced by Point Topic on the announced deployments of full fibre by alternative operators. When visually comparing these to Ofcom's proposed Area 2 and 3, we see a mismatch, which suggests that Ofcom are not giving due regard to such announcements.[12]

Figure 6: Comparison of Ofcom's proposed geographic market designation and announced alt net full fibre deployments

Ofcom proposed designation of areas



Point Topic maps of alt nets full fibre deployment announcements



Source: Ofcom map [left] comes from: Ofcom. (2019) *'Promoting competition and investment in fibre networks Initial proposals – Approach to remedies'* Figure 1. March 2019. [Link] . Point Topic maps [right] come from; '*Metrics for the UK altnet sector – autumn 2018 Scale and coverage update'.* Figure 3. October 2018. [Link]

3.4 These maps highlight areas like the Lancashire region as well as Kent and East Sussex, in which there are obvious discrepancies between those areas which Ofcom consider to likely to see entry by alternative operators, and the areas operators have announced intentions to enter.

[11] Ofcom (2018) '*Promoting investment and competition in fibre networks: Approach to geographic markets*.' Paragraph 1.11 [Link]

[12] CityFibre does not have access to the source data for the maps.

4 Conclusion

4.1 The analysis we have set out in this document demonstrates that, once all the factors affecting incentives to invest by alternative full fibre operators (like CityFibre) are considered, Area 3 is likely to be much smaller than the 31% of UK premises that Ofcom is proposing.

4.2 Owing to the complexities involved in the decision of where to invest, and the many different relevant factors, it may in fact be more practical at this time for Ofcom to withhold from defining binary geographic boundaries based on market circumstances as they are today. Ofcom should instead focus its efforts on promoting investment in as many areas of the UK as possible.

4.3 If Ofcom are minded to continue to pursue their approach of defining an 'Area 3' (and plan to implement a regulatory regime in Area 3 that does not promote investment by alternative operators) then Ofcom must be very careful about which postcode sectors it allocates to Area 3, for if Ofcom incorrectly allocate postcode sectors to Area 3, then this would lead directly to regulatory failure by undermining investment that otherwise (i.e. absent regulator intervention) would have taken place.