



# DCMS – Future Telecoms Infrastructure Review

**Additional Evidence**

6th April 2018

CityFibre

## 1. Executive Summary

- 1.1. DCMS is conducting a Future Telecoms Infrastructure Review to determine what further policy measures are required to deliver the goal of full fibre reaching 10m UK premises by 2025 and a path to nationwide coverage within a decade. DCMS has asked CityFibre to submit further evidence to support our response to the FTIR's Call for Evidence in January 2018.
- 1.2. This paper provides that further evidence by supporting the following principal arguments in our original submission:
  - To enable the UK to reach its economic and digital potential, the Government must promote a market structure that delivers the stated objective of **an accelerated nationwide full fibre rollout as quickly as possible**, rather than a market structure that leads to further investment in copper-based legacy networks (including G.fast) and a prolonged and piecemeal full fibre rollout.
  - Openreach's ownership of the national legacy network and its weak business case for full fibre motivates it to sweat its legacy network, by upgrading it to G.fast and selectively drip feeding full fibre into its network at its own pace. **An Openreach-dominated market will result in a prolonged and piecemeal upgrade to full fibre – if at all – as well as wholesale price rises and a complicated and politically risky copper switch off process.** To achieve its full fibre objectives, Government must therefore encourage a **market structure that enables long-term competition between multiple scale operators**, with strong alternative players (who are able to deploy quickly and at better value than Openreach, without price increases and copper switch off), building a substantial proportion of the full fibre required and putting competitive pressure on Openreach to follow suit.
  - Duplication (overbuild) of full fibre networks by other full fibre networks in the same location, as well as strategic PR announcements that signal potential overbuild, represents one of two chief risks to nationwide full fibre deployment and the emergence of a healthy multiplayer market. This major risk exists despite overbuild offering few competition or innovation benefits when the passive layer is open access, i.e. available to multiple service providers. Duplication also significantly increases the disruption experienced by residents for little additional economic benefit. To address this risk, Government must set out a **"build once"** policy framework that aims to **minimise overbuild and encourage investment to be spread geographically** until such time as sufficient coverage has been achieved.
  - The second key risk is consumers being deterred from migrating to new full fibre networks from legacy networks through a combination of: tactical rollout of G.fast where full fibre is due to be deployed; aggressive pricing of legacy products; misleading advertising which fails to allow consumers to differentiate between full fibre and legacy products; and inadequate processes to enable consumers to switch away from the Openreach network. Poor take up of full fibre will also prevent the UK from deriving maximum benefit from these new networks. To address this risk, Government must set a framework that **limits legacy networks' ability to undermine investment in and take-up of future-facing full fibre networks.** Much of this falls to the regulator(s) to address, but Government can help by making explicit that its policy requires firm action to mitigate this risk.
- 1.3. We also submit further evidence to support our view that **the current market structure** – which is explicitly encouraged by the current regulatory framework – **will not deliver nationwide full**

**fibre coverage within a time period that will be of benefit to the UK and risks up to 50% of the country being left behind on copper**, because it does not sufficiently address the two key risks identified. Our evidence supports our view that to achieve its full fibre objectives, Government must signal **a fundamental reorientation of the regulatory framework** away from one that encourages end-to-end infrastructure competition throughout the market towards one that minimises overbuild and addresses the incumbents' incentive and ability to undermine the business case for full fibre.

1.4. Given the current framework is not fit for purpose we propose that to bring about an accelerated nationwide full fibre rollout, Government moves to a framework that aims to **optimise the investment momentum in today's market by:**

- enabling scale investment from multiple providers to continue to come forward, with providers continuing to compete to deploy in geographic locations (competition *for* the market);
- encouraging full fibre to be built *once* in as much of the UK as possible, as quickly as possible, by using a basket of measures to disincentivise overbuild;
- helping providers to rapidly expand their networks by encouraging and enabling co-investment arrangements, which de-risk investment and reduce cost;
- ensuring that regulation reduces legacy networks' ability to undermine investment in and take up of full fibre.

1.5. The basket of measures could include:

- The Government acting as a **safe harbour for co-investment discussions** between all operators – including Openreach – and removing any regulatory barriers or uncertainties that currently inhibit such arrangements;
- **Increasing transparency of build plans and accountability in the industry**, for example by requiring that providers' build plans are submitted to an independent third party (e.g. Ofcom) and then published, thereby guiding the market towards the most geographically extensive "landrush" possible and preventing speculative plans from deterring others from building in the same areas;
- **Decreasing the incentives to overbuild at local level**, by encouraging local authorities to use existing powers in relation to permits and street works to discourage overbuild and introducing new powers if required;
- **Re-orientating the regulatory framework** to one that unequivocally supports the full fibre policy objective, including:
  - Prohibiting Openreach from overbuilding full fibre networks until a fit for purpose Duct and Pole Access remedy is in place and being used at scale;
  - Imposing stronger rules on G.fast pricing to prevent targeted and predatory pricing;
  - Making it easier for consumers to switch from copper to FTTP;
  - Achieving clarity around advertising to prevent FTTC and G.fast being passed off as "fibre".

1.6. It is our strong recommendation that Government focuses on these short- to medium-term measures *before* contemplating a more interventionist long-term "franchising" approach, which despite having the benefit of more directly addressing the overbuild risk, would likely slow or even halt the private investment now coming into the market and jeopardise the prospects of a healthy multiplayer market and with it the ability to quickly achieve nationwide full fibre rollout.

## 2. Introduction

- 2.1. Over the past year the Government has clearly outlined its vision for the UK's digital infrastructure, as emphasised by the Secretary of State for DCMS at the recent CEO's round-table:
- ubiquitous world-class, future-proof digital infrastructure based on full fibre and 5G;
  - at least 10 million premises connected to full fibre by 2025, with a clear path to national coverage by the end of the decade;
  - digital connectivity that is seamless, reliable, long-lasting and also widely available and affordable to UK businesses and consumers.
- 2.2. Government has also said that to deliver this vision it aims to promote:
- the right competitive structures;
  - a stable market for investment;
  - a move away from “monopolistic markets”;
  - collaboration within the industry.
- 2.3. As the UK's leading independent full fibre builder, with £1bn of capital already committed and a framework in place with Vodafone to deliver full fibre to 5m homes by 2025, CityFibre wholeheartedly agrees with this vision and the approach identified to deliver it. We are motivated to work constructively with Government to identify the right market structure and policy and regulatory framework to realise our shared goal – a full fibre future for the UK.
- 2.4. DCMS is conducting a Future Telecoms Infrastructure Review (FTIR) to assess whether changes to policy and regulation are required to deliver these objectives. CityFibre submitted a considered response to the Call for Evidence (CfE), arguing that a shift away from the current framework is required.

### Evidence to support our arguments that the current framework cannot deliver the policy objective

- 2.5. At the heart of our original submission lies the following arguments, which we believe must be understood, accepted and addressed by revisions to the policy and regulatory framework if the Government's digital infrastructure objectives are to be realised:
- a. To reach its economic and digital potential the UK needs **nationwide full fibre as quickly as possible**, not ‘make do and mend’ solutions, such as widespread G.fast rollout and a prolonged and piecemeal full fibre rollout;
  - b. Only a **healthy multi-player market and long-term competition** can deliver an accelerated nationwide full fibre rollout; it cannot be delivered by an Openreach-dominated market, given that the latter is uniquely conflicted by its sizeable legacy of copper;
  - c. Overbuild (duplication) of full fibre by full fibre at the infrastructure level – as well as the threat of overbuild – represents one of two main risks to accelerated nationwide full fibre deployment and the emergence of a multiplayer market, despite offering few competition or innovation benefits. Only Openreach has a rational case for overbuilding to protect its monopoly position. **Minimising overbuild** and encouraging investment to be spread geographically is key to achieving maximum coverage of full fibre over the shortest time possible.
  - d. Low take up of full fibre products – because of tactical G.fast deployment; aggressively priced legacy products; advertising rules that allow legacy products to masquerade as “fibre”; and inadequate switching processes – represents the second main threat. **Regulation must**

**prevent the owners of the legacy networks from undermining investment in and take-up of future-facing full fibre networks.**

2.6. Given these arguments, we said that **the current market structure will not deliver the Government' full fibre objectives** because:

- the current regulatory model not only tolerates but encourages overbuild, which, combined with fundamental economics of full fibre deployment and the motivations and business models of the main players in the market, means that there will be a “landrush” of commercial full fibre investment in the same economically attractive dense urban locations (segment 1) without progressing to less economically attractive areas (segment 2) or economically challenging rural areas (segment 3);
- the current regulatory model does not sufficiently address BT/Openreach’s motive or means to use its legacy network tactically – whether using FTTC or G.fast products – to undermine investment in and take-up of alternative players’ full fibre products.

2.7. At a meeting on 22 February, and via a follow up email on 19 March, DCMS asked CityFibre to submit further evidence to support these arguments<sup>i</sup>. This paper provides that additional evidence through the following annexes, which draw on economic and technical analysis, real-time commercial and strategic perspectives, as well as lessons to be learnt from overseas markets, where rapid full fibre roll out has already been achieved or is underway. In some cases we point to third party evidence, in others we refer to original work commissioned or undertaken by CityFibre:

- Annex 1: “The Economic impact of full fibre in 100 UK towns and cities” Regeneris, March 2018
- Annex 2: “Future benefits of broadband networks”, Frontier Economics for National Infrastructure Commission: Commentary from CityFibre, March 2018
- Annex 3: “The socio-economic impact of FTTH”, WIK-Consult GmbH for FTTH Council Europe, February 2018
- Annex 4: “Short term investor confidence-raising measures”, CityFibre, March 2018
- Annex 5: FTTH/B Panorama, iData Digiworld Consulting, February 2018
- Annex 6: “Why local full fibre networks can deliver innovation and competition without the need for infrastructure replication”, CityFibre, March 2018
- Annex 7: “The economics of full fibre in the ‘three segments’”, CityFibre, March 2018
- Annex 8: “Options for accelerated full fibre rollout in the UK”, CityFibre, March 2018
- Annex 9: “Full fibre rollout European case studies”, CityFibre, March 2018

## Evidence to support our proposed solution

- 2.8. In our original submission we argued that because the current policy and regulatory framework will not deliver the policy objective, Government should move to a framework that “prevents inefficient duplication of infrastructure deployment and actively supports transition away from copper to full fibre”. We talked about whether a “utility-like” model would be more appropriate for the market than today’s end-to-end infrastructure competition model. By “utility-like” we meant a regulatory framework that – unlike Ofcom’s current focus on end-to-end infrastructure competition – recognises the utility-like status of full fibre at the passive layer, which make duplication both economically challenging and unnecessary, given that duplication of passive FTTP networks confers little additional competition or innovation benefit. We noted that a radical alternative approach would be the adoption of a formal franchising mechanism for FTTP across the country.
- 2.9. In this follow up submission, we explain that we have refined our opinion of *how* Government should bring about the evolution from one market structure and regulatory framework to another.
- 2.10. We strongly maintain that key to ensuring nationwide coverage as soon as possible is accepting that full fibre at a passive level is a natural monopoly and that inefficient duplication of passive infrastructure at scale should be avoided where possible. We also maintain that the way in which the “landrush” is currently being played out is likely to lead to potential or actual overbuild, as well as tactical use of PR announcements and deployment of services on legacy networks, which will in turn threaten sustainable full fibre investment and the emergence of a healthy multiplayer market.
- 2.11. However, since our original submission **the “landrush” has gathered pace**: the first cities in our own 1m rollout with Vodafone have been announced and building has begun; Openreach has announced an extension of its own FTTP plans to 3m; and a new scale player, TalkTalk and Infracap, has announced plans to target 3m premises. It is worth noting that all these current and proposed deployments focus on Segment 1 locations.
- 2.12. Given these market developments, combined with emerging views from within the industry about how the market should evolve, it is now our view that any Government policy aimed at swiftly moving the market away from the current model to impose a “utility-like model” through the introduction of **franchising could risk substantially slowing down or halting investments** from all players whilst the rules of engagement are determined, a competition for franchises is conducted, and the consequences of franchise awards are resolved. In turn, this hold-up problem would threaten the current emergence of a strong multiplayer market that is essential to achieve the policy goal. Pragmatically, the risks and delay of such an approach outweigh its theoretical merits as a radical and decisive shift to a “utility model”.
- 2.13. Therefore, whilst recognising the utility characteristics of the passive full fibre infrastructure, we set out two approaches as potential solutions: one which looks to work *with* the grain of the market, but seeks to optimise the momentum of the “landrush” by introducing measures that address the risks we have identified in the current model; a second, which looks at how franchising might work and the attendant risks. We set out our proposals, evidence and analysis below and in Annexes 8 and 9.

### 3. The UK needs nationwide full fibre – not G.fast – as quickly as possible

- 3.1. The Secretary of State has repeatedly made clear that he wants the UK telecoms market to build a world-class digital infrastructure, which in the case of fixed networks means full fibre. The timeline that the FTIR has outlined – “over the next decade, we want to have at least 10 million premises connected to full fibre, with a clear path to national coverage” – also implies that it is a policy objective for this rollout to be an accelerated one, and for it to reach all premises in the UK, not only the most commercially attractive locations.
- 3.2. In our original FTIR submission we strongly supported these objectives and urged the Government to stay resolute to all three – specification of full fibre (rather than copper-based networks), nationwide coverage and accelerated speed – and argued that if these objectives are watered down, parts of the UK risk being left behind digitally and therefore also economically.
- 3.3. In this paper, we point to additional evidence that supports this view.

#### **Annex 1:** “The Economic impact of full fibre in 100 UK towns and cities” Regeneris, March 2018

- 3.4. CityFibre commissioned economic consultants Regeneris to evaluate the economic impact of full fibre – over and above other broadband network technologies – in 100 local economies. Given that data is only now emerging from communities where full fibre has been deployed at scale, and that some of the likely future applications that are dependent on full fibre are yet to reach the mainstream, it is not yet possible to predict a single, all-encompassing economic impact figure. Instead, we asked Regeneris to select 10 impact areas where full fibre is likely to generate benefits – and where sufficiently robust research and data already exists – and to analyse those benefits across 100 towns and cities in the UK. These 10 estimates sit alongside each other, rather than summing to create one hard and fast prediction.
- 3.5. The result is an illustration of the immense scale and scope of the potential economic impact of full fibre. Significant benefits are notable for the business community, and for SMEs in particular: in the 100 locations examined, access to full fibre could unlock £4.5bn in business productivity, innovation and access to new markets; a further £2.3bn from catalysing new business start-ups; while the increased ability for companies to support flexible working could add £1.9bn.
- 3.6. The report also underlines that full fibre is essential for substantial economic value to be generated from emerging technologies – full fibre is linked to £28bn in benefits from 5G; £10bn from the Internet of Things and Industry 4.0; and £5bn from Smart City enablement, while technological improvements in the delivery of healthcare services are worth £1.1bn.

**Table 1.1 Headline Impacts over 15 Years**

Impact Category		Impact Focus	Value, 50 Towns & Cities	Value, 100 Towns & Cities
Core Economic Impacts (Part 1)	Direct Employment	1. Network build	£1.4bn	£2.1bn
	Business Impacts	2. Productivity improvements	£1.5bn	£2.2bn
		3. Innovation	£1.6bn	£2.3bn
		4. Flexible working	£1.4bn	£1.9bn
		5. New business start-ups	£1.5bn	£2.3bn
Private Benefit to Households	6. Housing wealth	£4bn	£7bn	
Wider Impacts (Part 2)	5G	7. Total economic value	£20bn	£28bn
	Smart Cities Infrastructure	8. Energy use & congestion	£3.6bn	£5bn
	Industry 4.0 / IoT	9. Manufacturing productivity	£7bn	£10bn
	Health Care	10. Cost savings	£0.7bn	£1.1bn
	Environmental Impacts	CO2 reductions	1.5Mt CO2	2.3Mt CO2
Value applying Shadow Price of Carbon			£100mn	£160mn

Source: Regeneris Consulting. Values over £5bn rounded to the nearest billion.

- 3.7. As evidence continues to emerge from locations where scale full fibre has been deployed, and as full fibre-dependent applications become mainstream, it will be possible to add to and refine these 10 economic estimates. However, the picture this study paints is already clear: economic and social opportunity, with full fibre providing the springboard for increased productivity and business innovation, more efficient public services and business processes, and the “smart” transformation of our urban areas and infrastructure.

**Annex 2: “Future benefits of broadband networks”, Frontier Economics for National Infrastructure Commission: Commentary from CityFibre**

- 3.8. To inform their National Infrastructure Assessment, the National Infrastructure Commission commissioned Frontier Economics to undertake an assessment of the benefits of different types of next generation broadband networks, including FTTP, G.fast and 5G. The NIC invited feedback on this report and we submitted a paper summarising our views very recently. Given that the FTIR is also referring to this report during its own evidence gathering process, we are keen to share our views – and in particular our concerns – about this piece of work.

- 3.9. Our key points, which we urge the FTIR team to bear in mind when making use of this report, are that:

- We question whether the scenarios outlined align to the actual technology evolution paths currently in prospect and the timescales over which different technologies will be able to generate benefits: in particular we think that the report has over-estimated the time it will take for 5G to be deployed at scale and underestimated 5G’s dependence on the pre-existence of existing full fibre networks given that extensive new fibre deployments will be necessary to support 5G small cell rollout.
- We question Frontier’s narrow range of use cases, which are biased towards private consumption by residential customers. The report has excluded business, public service,



infrastructure, smart city and wider societal benefits that are expected to be dependent on full fibre. By comparison, the Regeneris report in Annex 1 demonstrates that there are considerable benefits in these impact areas, perhaps exceeding those likely to emerge from residential uses: this point is clear even if the evidence base is not yet complete. As a result the economic benefits of full fibre in the Frontier report are likely to have been substantially under-estimated and potentially slants the balance of benefits in favour of the evolution of existing networks. The failure to look at the widest range of benefits is particularly important when considering that the sister report produced for the NIC on costs looked at deployment costs for the whole network, not just the costs associated with deploying to residential settings.

**Annex 3: “The socio-economic impact of FTTH”, WIK-Consult GmbH for FTTH Council Europe, February 2018**

3.10. This recently published report offers further evidence to support the argument that full fibre networks are capable of delivering a wide range of socio-economic over and above other broadband technologies, as well as attitudes to full fibre. Notable highlights include:

- On average FTTH broadband subscribers perform 11% more activities online than subscribers with other Internet access technologies, especially activities regarding entertainment or connecting with other people;
- FTTH users are consistently more likely to own connected devices than non-FTTH users thus indicating a more progressive Internet usage pattern for FTTH users;
- 94% of non-FTTH users would consider subscribing to FTTH if it was made available in their area;
- Only 13% of non-FTTH users claim that they have consciously decided against an FTTH subscription;
- More than 70% of those who made the switch to fibre noticed a difference to their previous Internet access technology.

**4. Only a multi-player market can deliver accelerated nationwide full fibre rollout**

**An Openreach-dominated market will not deliver the policy objective**

4.1. In our original FTIR submission we argued that Openreach’s ownership of the legacy network fundamentally dictates its incentives with regards full fibre roll out and leaves it with a weak full fibre business model:

- It forces it to require an incremental business case for full fibre, over and above its copper business, which is why it is demanding large wholesale price increase from its ISP customers;
- It forces it to require that consumers are “cut over” en masse from copper to full fibre, necessitating a complicated and potentially politically risky “copper switch off” as this transition takes place in each location;
- It forces it to want to continue to sweat its existing copper network, by rolling out G.fast quickly and cheaply even though it is not the right long-term technology choice for consumers, while undertaking a prolonged and piecemeal upgrade to full fibre;
- It motivates it to spoil competitors’ intentions to deploy full fibre at pace, so that it can reduce the competitive threat from alternative players and be left to upgrade its network to full fibre in its own time, in locations of its choosing.

- Uniquely, Openreach has an economic incentive to overbuild rivals' networks. In the absence of its dominant position and copper legacy, the market could be expected to evolve towards a reciprocally built full fibre network reflecting the "utility model" approach.
- 4.2. Amendments to its regulation, including its relationship with BT, do not change these motivations. Even full ownership separation would leave the eventual owners of Openreach facing the same basic dilemmas and with the same unique motivations to use their available capex to 'spoil' others' FTTP deployments.

**Annex 4: Short term investor confidence-raising measures**

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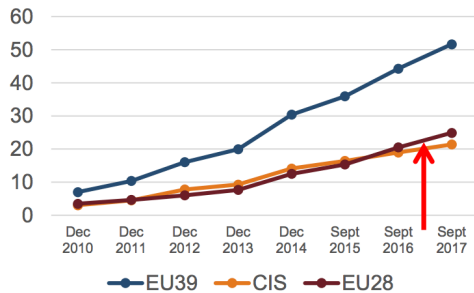
**The necessity of a strong multiplayer market**

- 4.3. We argued in our original submission that because of Openreach's inbuilt incentives *not* to build full fibre at an accelerated rate across the whole of the UK, strong alternative players in the market are required both to build full fibre networks themselves, and to put competitive pressure on the incumbent to do likewise.
- 4.4. Without legacy networks to dictate their strategy, alternative players are able to:
- focus entirely on building full fibre as quickly as possible in as many locations as possible, rather than defending legacy income streams;
  - build more cheaply than Openreach and without requiring inflated wholesale (and therefore also consumer) prices, because they do not have to make an incremental business case;
  - make a business case without requiring that consumers are "cut over" and necessitating a complex and politically risky copper switch over process.
- 4.5. We argued that the competitive pressure that alternative providers are able to place on incumbents is required over the duration of the nationwide build phase, not just as an initial spur to prompt Openreach to commence FTTP rollout, because Openreach's weak business model dictates that as soon as competitive pressure eases, so does its need to keep building full fibre rather than G.fast. In other words, the UK needs a healthy competitive multi-player market over the long-term, rather than altnets being used as a sacrificial lamb to get Openreach going.

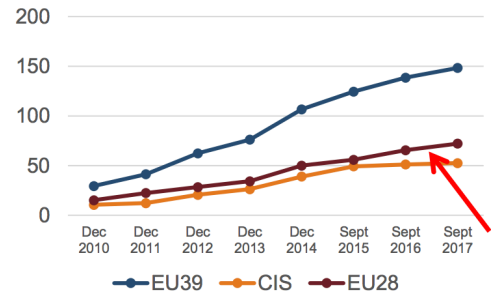
**Annex 5 : FTTH/B Panorama, iData Digiworld Consulting, February 2018**

- 4.6. By way of further evidence to support this argument, we point to Annex 4, as just discussed, and also to Annex 5, the FTTH Council's recent [FTTH/B Panorama](#), which demonstrates the importance of multiplayer markets, rather than incumbent-dominated markets, in achieving widespread and accelerated full fibre rollout. The report shows a clear trend across 39 EU countries, where collectively FTTH deployment is rising steadily: alternative players led deployment of full fibre at the start of the decade, which has triggered a response from incumbent players, who are now rapidly increasing their market share, as the number of homes passed rises steadily, but that alternative players continue to make up a substantial portion of the market.

**Growth of FTTH/B subscribers (million)**



**Growth of FTTH/B Homes Passed (million)**



Source: IDATE for FTTH Council Europe

**% of Homes Passed per category of player**



Source: IDATE for FTTH Council Europe

- 4.7. These findings are echoed by Annex 9 – “Full Fibre Rollout - European Case Studies”, which underlines the pivotal role of alternative players not just in triggering accelerated full fibre roll out, but in maintaining significant market share and therefore also competitive pressure on the incumbent, right the way through to the point at which very high levels of deployment have been achieved.

## 5. Minimising overbuild is key to achieving nationwide full fibre coverage as quickly as possible

### There are few competition or innovation benefits in duplicating passive full fibre networks

- 5.1. In our original FTIR submission we argued that “clarity is required about what types of “infrastructure competition” are in the national interest” and in particular whether end to end infrastructure competition resulting in two or more full fibre networks being built past the same premises – the focus of the current regulatory framework – is beneficial or detrimental to the public policy goal of achieving nationwide full fibre roll out.
- 5.2. We went on to argue that if two basic principles are established – that all full fibre networks today are being constructed to a future-proofed standard regardless of which operator is building them and that networks can be offered on an open access basis in order to maintain downstream

competition – then the benefits of replication of the passive network components falls away, and the static costs of building side-by-side full fibre networks are being borne for no offsetting benefit.

- 5.3. We used these principles to argue that full fibre at a passive level should be viewed as a natural “utility-like” monopoly and that it should be regulated accordingly, with downstream competition safeguarded and unnecessary duplication of passive infrastructure avoided.

**Annex 6: Why local full fibre networks can deliver innovation and competition without the need for infrastructure replication**

5.4. We now substantiate these arguments in Annex 6, which shows that:

- While there is merit in promoting competition between legacy and new infrastructures – where different networks are able to offer the consumer different capabilities;
- and there is merit in promoting competition over full fibre infrastructure – where distinct services and pricing can be offered at the active and service layers;
- there is little, if any merit, in promoting competition between two or more new full fibre infrastructures at the passive layer.

5.5. We demonstrate that:

- Scope for innovation and competition does reside in the active and service level: this has been proven by the LLU model, where multiple ISPs are offering different products over a single passive network infrastructure (Openreach’s legacy network);
- Scope for innovation and competition does not lie at the passive layer:
  - The quality and efficiency of construction of full fibre networks has already reached a level of maturity in the UK where a full fibre network deployed by one operator is unable to offer any material distinction from that deployed by another operator; the UK, as a relative late-comer to scale full fibre deployment, has been able to benefit from the evolution of network and construction standards elsewhere.
  - Full fibre being laid today in the UK is “future-proof” and unlikely to be rendered obsolete within the foreseeable future. Networks today are designed to address all potential future service requirement, with enough capacity built in to cope with bandwidth increases over 50 years and with further capacity able to be added without significant additional cost. Full fibre networks being constructed now are built to high QoS and resilience standards.
  - While 5G or other wireless technologies deployed in dense small cell configurations may in future negate the need for full fibre to perform the “final drop” to some customers’ premises, this prospect is some years off, and doesn’t negate the need for dense full fibre deployment down every street to support small cell infrastructure.
  - All major UK operators are now taking advantage of new construction techniques to minimise the actual quantity and impact of civil works, including narrow trenching techniques and the ability to “blow” additional fibres from one chamber to the next, with any further improvements likely to be resolved on an industry-wide basis.

- Regulation can preserve good consumer outcomes on a single passive full fibre local network, by guaranteeing non-discrimination, open access and (if necessary) fair pricing for access to the passive infrastructure.

### **Duplication of passive full fibre networks undermines full fibre investment**

5.6. While duplication of passive full fibre networks offers few competition or innovation benefits, it is one of the two main threats to full fibre investment and a healthy multiplayer market:

- One of the key conditions of Openreach’s FTTP business case, as demonstrated in their consultation, is that ISPs’ consumers are “cut over” en masse from the copper to the full fibre network, demonstrating that Openreach requires monopoly conditions – in other words an absence of competition either from its own copper network or a rival FTTP network – for its business case to stand up.
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## **6. Legacy networks must be regulated to prevent them from undermining full fibre investment and take-up**

6.1. In our original FTIR submission we argued that while Openreach now acknowledges FTTP’s superiority over G.fast, and appears to envisage launching the latter only in areas where it does not contemplate deploying FTTP, it has both the motive and the means to use services offered on its legacy network to thwart the FTTP investment plans of alternative players by deterring consumers from switching to FTTP.

6.2. Openreach, and the ISPs operating on it, have the ability to undermine full fibre investment in the following ways:

- Advertising – ISPs’ commonplace use of the word “fibre” to describe products on legacy networks impairs consumers’ ability to make an informed choice about whether to switch from copper to full fibre;
- Pricing – aggressively under-pricing legacy products (which are being sold to consumers using the same “fibre” terminology as full fibre products), to compete against full fibre products;
- Switching – it is currently substantially easier to migrate a customer from one product or ISP to another within the Openreach environment than it is to switch from the Openreach platform to rival FTTP.

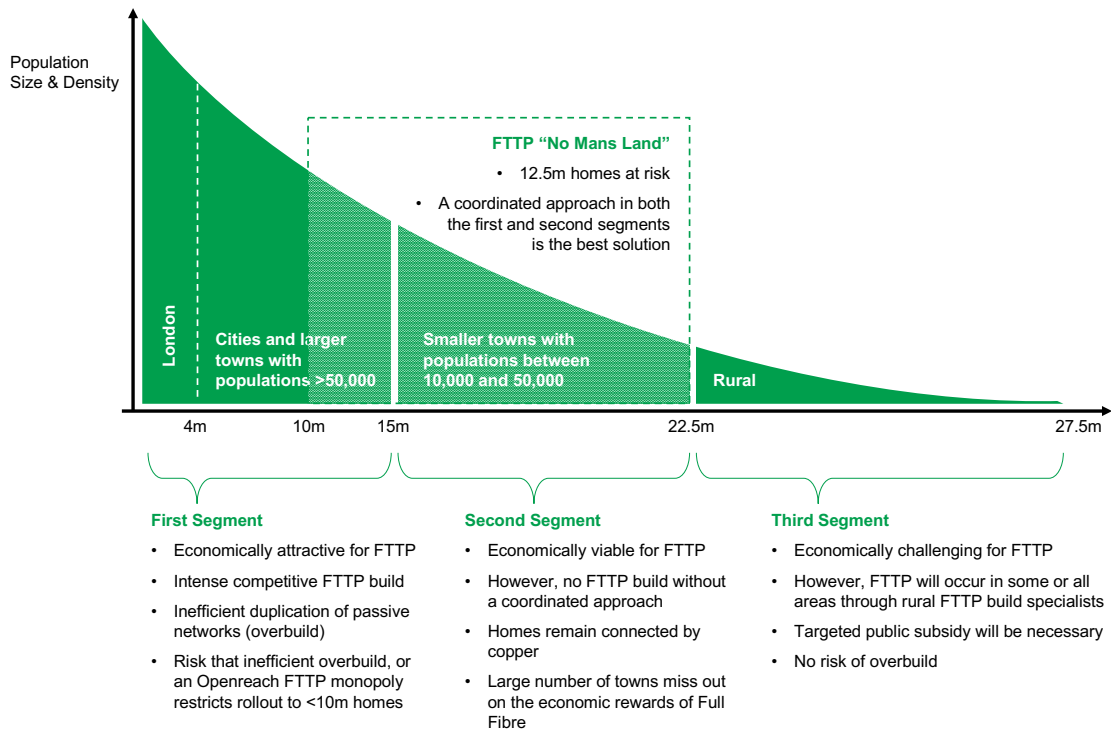
6.3. The regulatory and self-regulatory frameworks are currently not taking sufficient steps to address this imbalance:

- The ASA has ruled that it is permissible to describe part-fibre (or in our view “fake fibre”) products as “fibre” – CityFibre is challenging this ruling in the court;
- Ofcom has ruled against geographic pricing of G.fast but has declined to introduce clear rules on what would be acceptable pricing for G.fast, meaning that there is a significant risk of Openreach introducing G.fast on a limited footprint that aligns with the build areas of alternative FTTP and with predatory pricing;

- Remarkably, Ofcom recently decided to cease further work on cross-platform switching, meaning that this will remain a significant deterrent to customer migration. It means Openreach and ISPs remaining on its network will have the motive and means to make switching to FTTP as difficult and time-consuming as possible. Despite CityFibre raising this issue in the recent Wholesale Local Access Market Review, Ofcom does not even mention the issue in its recently-published WLAMR Statement.
- 6.4. Unless the regulatory framework is reset to ensure that legacy and full fibre products can compete on a level-playing field, legacy networks will significantly hamper the migration of consumers to new future-facing networks, and undermine the alternative provider investment case.
- 6.5. Further evidence to support these points can be found in Annex 4.

## 7. The current policy and regulatory framework cannot deliver the policy objective

- 7.1. In our original submission, CityFibre argued that the current market structure will not deliver the Government' full fibre objectives because:
- as above, the current regulatory model not only tolerates but encourages overbuild, which, combined with the fundamental economics of full fibre deployment and the motivations and business models of the main players in the market, means commercial full fibre investment will focus on the same economically attractive dense urban locations, leaving up to 50% of the UK behind on copper;
  - the current regulatory model does not sufficiently address BT/Openreach's motive or means to use its legacy network tactically – whether using FTTC or G.fast products – to undermine investment in and take-up of alternative players' full fibre products.
- 7.2. A key concept supporting this argument is the idea that the UK is divided into 3 economic segments, and that the full fibre business case is different in each case, as per the diagram below. We argued that:
- The 1st segment (the most densely populated cities and large towns), is economically attractive for commercial FTTP roll out and is therefore where the majority of commercial rollout will be focused;
  - In the 2nd segment (medium- and small-sized towns), commercial rollout of FTTP is viable under certain conditions, but challenging under intense competition – these are unlikely to be the primary targets for commercial full fibre builders;
  - The 3rd segment (villages and rural areas) is economically challenging unless approached by rural FTTP specialists and/or with targeted public subsidy.
- 7.3. The exact boundaries between each segment are a topic of discussion and evidence-gathering, but the fundamental principle is that different geographic areas will be approached differently by commercial builders.



## **Annex 7: The economics of full fibre in the 'three segments'**

7.4. REDACTED

## **8. Our proposed solutions**

8.1. In our original submission, we argued that because the current policy and regulatory framework is unable to deliver the policy objective, Government should move to a framework that "prevents inefficient duplication of infrastructure deployment and actively supports transition away from copper to full fibre". We talked about whether a "utility-like" model would be more appropriate for the market than today's "landrush" under an end-to-end competition model, with franchising being one potential "utility-like" model.

8.2. We also said that it was critical that "any resulting transition to a new policy and regulatory structure, does not risk or slow full-fibre current and planned commercial rollouts; especially those being made by CityFibre and other full-fibre specialists".

8.3. Since our original submission just a couple of months ago, the number of "current and planned commercial rollouts" from scale players has increased: our own plans with Vodafone to deliver full fibre to 1m homes and businesses has started in earnest, with deployments in Milton Keynes, Aberdeen and Peterborough now announced and nine more in preparation; Openreach has announced that it will increase its own full fibre plans by 1m, (although the exact extent of this announcement remains to be seen); and a new potential large-scale investor in the form of TalkTalk and Infracap: in other words the landrush has begun.

- 8.4. In light of these market developments, combined with views that are emerging from within the industry about how the market should evolve, we have refined our opinion of *how* Government should bring about the evolution from one market structure to another.
- 8.5. We strongly maintain that key to ensuring nationwide coverage as soon as possible is accepting that full fibre at a passive level is a natural monopoly and that inefficient duplication of passive infrastructure at scale should be avoided. We also maintain that the way in which the “landrush” is currently being played out is likely to lead to potential or actual overbuild, as well as tactical use of PR announcements and legacy networks, which will in turn threaten sustainable full fibre investment and the emergence of a healthy multiplayer market. Ofcom has confirmed to us that not only will it not take action to prevent overbuild (or restrict it until fit for purpose DPA is in place and used at scale), but it has said that it welcomes and wishes to encourage overbuild.
- 8.6. However, we are now of the view that any Government policy aimed at swiftly moving the market away from the “landrush” model to impose a “utility-like model”, would risk substantially slowing down or halting investment from alternative players, which in turn would threaten the emergence of a strong multiplayer market that is essential to achieve the policy goal.

#### **Annex 8: Options for accelerated full fibre rollout in the UK**

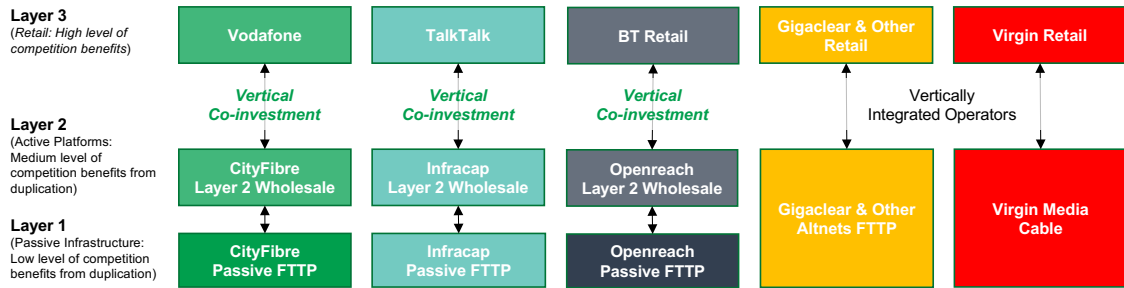
- 8.7. We set out two potential policy approaches in Annex 8:
- one that works *with* the grain of the market to address the two main risks we have identified – overbuild and threat of overbuild; and legacy networks undermining full fibre networks – rather than imposing a new structure on the market (“Optimised Landrush”); and
  - a second that explores more formal franchising approach that could be imposed on the market and attendant risks (“Franchising”).
- 8.8. The key points are:

##### **“Optimised Landrush”**

- Under an “Optimised Landrush”, we envisage a basket of measures that could be adopted by Government over the short- to medium-term (and without legislation) **to mitigate the risks of overbuild and unfair competition from legacy networks, while harnessing the investment momentum in today’s market**, with the aim of:
  - enabling scale investment from multiple providers to continue to come forward, with providers continuing to compete to deploy in geographic locations (competition *for* the market);
  - encouraging full fibre to be built *once* in as much of the UK as possible, as quickly as possible, by using a basket of measures to disincentivise overbuild;
  - helping providers to rapidly expand their networks by encouraging and enabling co-investment arrangements, which de-risk investment and reduce cost;
  - ensuring that regulation reduces legacy networks’ ability to undermine investment in and take up of full fibre.
- The basket of measures could include:

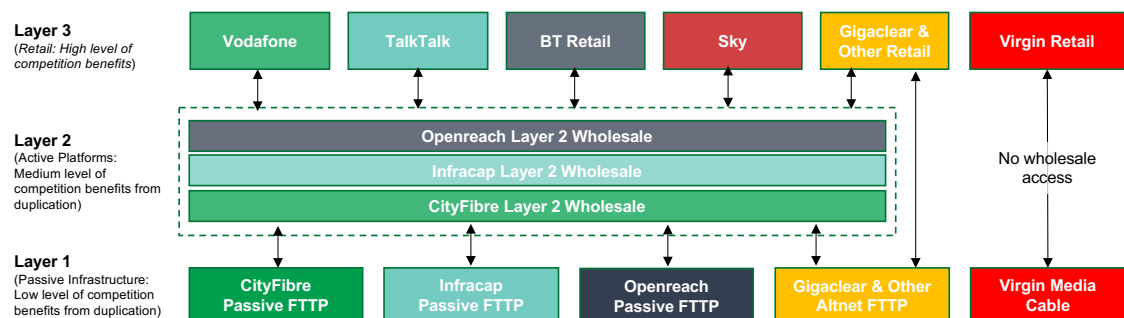


- The Government acting as a **safe harbour for co-investment discussions** between all operators – including Openreach – and removing any regulatory barriers or uncertainties that currently inhibit such arrangements;
- **Increasing transparency of build plans and accountability in the industry**, for example by requiring that providers’ build plans are submitted to an independent third party such as the regulator and then published, thereby guiding the market towards the most geographically extensive “landrush” possible and avoiding the “hold-up” problem resulting from speculative plans deterring others from building in the same areas;
- **Decreasing the incentives to overbuild at local level**, by encouraging local authorities to use existing powers in relation to permitting and streetworks to discourage overbuild and introducing new powers if required;
- **Re-orientating the regulatory framework** to one that unequivocally supports the full fibre policy objective, including:
  - Prohibiting Openreach from overbuilding full fibre networks until a fit for purpose Duct and Pole Access remedy is in place and being used at scale by alternative providers;
  - Imposing stronger rules on G.fast pricing to prevent targeted and predatory pricing;
  - Making it easier for consumers to switch from copper to FTTP;
  - Achieving clarity around advertising to prevent FTTC and G.fast being passed off as “fibre”.
- Co-investment models in particular, have played a critical role in other successful national full fibre rollouts because of their ability to de-risk investment, enabling providers to extend their geographic footprint and accelerate deployment. For this reason, collaborative co-investment is recognised as an important tool to accelerate full fibre deployment in the draft European Electronic Communications Code. We examine some of the most interesting examples in ***Annex 9: Full fibre EU case studies***.
- As per the diagram below, examples of vertical co-investment are starting to appear in the UK. These vertical co-investment agreements are risk sharing agreements that facilitate the investment in and delivering or large scale FTTP. For example CityFibre’s strategic agreement with Vodafone is a form of co-investment, whereby Vodafone has committed to a long-term contract with a ‘minimum volume commitment’ and agreed wholesale access charges, which in turn unlocks CityFibre’s investment in the passive full fibre infrastructure. The details that are publicly available about TalkTalk and Infracap’s planned full fibre rollout also indicate that this too might operate in this form of risk sharing structure. Under legal separation, it could be said that BT Retail and Openreach operate in a similar vertical co-investment arrangement.



Vertical Co-investment Models Emerging in the UK

- While vertical co-investment appears to be playing an important role in stimulating a landrush in Segment 1 in the UK, horizontal co-investment has the potential to extend FTTP into Segment 2 where the economics are more challenging.
- Horizontal co-investments recognise the natural monopoly characteristics of full fibre at the passive layer, and that there are no economic or competition benefits that can be derived from its duplication. Rather than 'overbuild', horizontal agreements enable the layer 2 active wholesale capabilities of one party to access the passive infrastructure of another party, and visa-versa. For example, a horizontal agreement between CityFibre (5m premises) and TalkTalk/Infracap (c.3m premises) would result in the active layer wholesale access systems of both CityFibre and Infracap being able to provide wholesale FTTP services to their ISP customers across a combined footprint of c.8 million premises – without the need to duplicate passive full fibre infrastructure to these 8 million premises (an estimated cost saving of circa £4 billion, assuming £500 per premise passed) and resulting in more robust business cases for the passive FTTP investments made by both CityFibre and Infracap due to higher penetration rates. Such horizontal risk sharing models are often referred to as 'reciprocal build' agreements.
- The following illustration reflects how these phases might play out in the UK, assuming Openreach also entered into horizontal co-investment agreements with other FTTP infrastructure builders. ISPs not committed to participation in the co-investment model (for example Sky in the illustration below) have a choice of competitive wholesale services operating across a geographically wider FTTP footprint.



**Horizontal Co-investment**

To avoid inefficient duplication of passive FTTP infrastructure and establish competitive wholesale provision over passive networks

Horizontal Co-investment Models Could Follow in the UK

- The international examples in Annex 9 highlight that some reciprocal build agreements have emerged organically, whilst in other cases the government and/or regulator has played a proactive role. Essentially, whether reciprocal build agreements arise organically is a function of the motivations of the respective market actors. In the UK, where Openreach has a unique motivation amongst market participants to prioritise crushing competition over extending the footprint of FTTP, the strong signals it is sending are that it has no interest in reciprocal build. This suggests that a more proactive approach by Government may be needed to ‘nudge’ the market in this direction. Given this Government and the regulator could proactively encourage horizontal co-investment – as has been the case in Switzerland – by providing a safe harbour for discussions and by clarifying rules relating competition law; in addition, the regulatory framework can also ensure that co-investment agreements are not subject to the same level of regulation as an SMP incumbent’s network.

### “Franchising”

- Alternatively, Government could choose to impose a franchising model, with the country divided into ‘franchises’. A wide range of crucial decisions would need to be made including which geographic areas (segments) to include in the model; how coverage areas are packaged; mechanisms for allocating the coverage areas; design of wholesale access obligations; the level of subsidy; the design of the auction process; and duration of the contracts – all of which are discussed in the annex.
- A franchising approach has the advantage of allowing the Government to set out the desired parameters in advance, including coverage, rollout times and rules on wholesale access, and thereby overcome the risks we have identified in the current framework.
- However, there are also a number of key limitation or risks:
  - it would seem that a necessary pre-condition of franchising would be new primary legislation, probably after Brexit and the conclusion of the transition period. We do not believe that the introduction of any meaningful ‘exclusive right’ to an FTTP franchise is possible under the current regulatory framework. This means there would be a significant gap in time between the announcement of a franchise policy and its enactment during which it is realistic to assume that the pre-existing ‘landrush’ would be frozen.
  - by the time the franchising model can be implemented, some areas in the UK would already be covered by full fibre networks. Therefore, the design of franchising model needs to recognise the pre-existence of full fibre in a coverage area. Specifically, there is a risk that setting coverage areas where there is already full fibre investment underway would undermine the economics of the pre-existing infrastructure.
- Extreme care would be needed in both the design of franchises and in the selection process for ‘bidders’ to avoid inadvertently giving Openreach an unassailable advantage simply as a result of its historic legacy of extensive network build.
- Finally, and perhaps more importantly, the design and announcement of a franchising model needs to avoid perverse incentives: there is a very real risk that full fibre rollouts that are already planned and contracted are postponed or halted altogether because of the uncertainty over franchising. This risk increases if there is a delay between franchising being announced as a policy choice, and franchises being awarded.

- 8.9. Having considered these two different approaches, CityFibre recommends that Government opts in the first instance to bring about an “optimised landrush”, including seeking to facilitate horizontal co-investment. Although franchising can more directly address the overbuild problem than “optimised landrush”, we consider that the potential unintended consequence of franchising halting the alternative full fibre investment case render this approach too risky at this point in the market’s development, now that firm contracts and deployments are underway. This would result in “destabilising” investment at a time when Government has said it wants to create a “stable market for investment”. Franchising would be available at a later stage to address a market failure arising from a badly-conducted landrush and/or the failure of horizontal collaboration to emerge. In other words, franchising would be a backstop were the other measures we propose fail to achieve their objectives.

## 9. Conclusion

- 9.1. In CityFibre’s view the Government has four options available to it:
- **Option A: Maintain the current market structure and policy and regulatory framework** – we do not believe this will deliver the full fibre policy goal and will result in substantial parts of the UK being left behind on copper.
  - **Option B: Re-orientate the market structure and policy and regulatory framework around Openreach as the national full fibre provider** – we do not believe this will deliver the full fibre policy goal and will result in substantial parts of the UK being left behind on copper; in addition, it will result in a complex and politically risky copper switch off, wholesale price rises and a return to a monopoly market.
  - **Option C: Introduce a franchising model** – while this could in theory better address the risk of overbuild and the weaknesses in the full fibre business case than Options A or B, in reality, and considering that ‘landrush’ has now begun in earnest with firm contracts and rollout plans in place, a root and branch reorganisation of the market structure could have the unintended consequence of stemming private investment from alternative players, and leaving Government more heavily reliant on Openreach and Option B, to the detriment of the policy objective.
  - **Option D: Optimise the current landrush**, by introducing measures that encourage co-investment approaches, curtail overbuild and limit legacy networks’ ability to undermine full fibre investment and take-up. These measures have the potential to help the market to organise itself, so that a multiplayer market is able to deploy successfully across Segment 1 and well into Segment 2 and deliver the objective, without substantial public funds or government imposed market restructuring.
- 9.2. CityFibre strongly recommends that Government pursues Option D: an optimised landrush approach aims to “nudge” the market towards a structure that recognises full fibre’s utility-like status at the passive layer, rather than enforce a market restructure by franchising too prematurely. It also has the advantage of not requiring primary legislation, which allows measures to be brought in more swiftly. As the landrush takes place, the Government could proactively encourage the market towards horizontal collaboration to extend full fibre into Segment 2. If these short and medium-term measures do not deliver the Government’s full fibre objectives, the more directly interventionist franchising approach could be considered, either to correct a market failure across

the majority of the market or as a means to promote rollout in areas that remain unserved even after landrush.

9.3. We hope that the additional evidence provided here assists the FTIR team in its works; we remain available to provide further evidence or assistance as required.

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<sup>i</sup> DCMS asked us:

- Please can you elaborate on the model you envision for widespread FTTP and mobile backhaul rollout?
- Please can you provide more detail on your vision for implementation?
- Please can you elaborate on your view of the counterfactual?
- Please could you elaborate on your views of the benefits / tradeoffs of different levels of competition at different parts of the value chain?
- How could the beneficial outcomes of competition be supported in parts of the value chain where there is only one provider?
- Please elaborate on your experience of existing remedies
- Fibre roll-out: the economic viewpoint vs the investor viewpoint.