

## Digital Connectivity in London

June 2017

London's economic productivity and international competitiveness face a significant threat in the form of poor digital connectivity. The capital is poorly served, suffering from 'not-spots', 'digital deserts' and a lack of fibre connections. Because big telecommunications companies have struggled to deliver for the capital's businesses and residents, London lags behind smaller UK cities such as York, Coventry and Edinburgh despite its role as a global competitive city. These cities are all significantly better connected, being 'Gigabit Cities' where download and upload speeds reach 1,000 megabits per second (Mbps). Across Europe, London also performs poorly, ranking 26 out of 33 capital cities in 2014 for its average download broadband speed.<sup>1</sup>

The London Assembly Regeneration Committee took evidence from London residents, local authorities, businesses and internet providers to understand what is needed, in terms of digital connectivity, for London to remain an inclusive and attractive place to live and do business.

This report collates these views into a set of priorities that should shape the Mayor's new digital strategy and the action of the future Chief Digital Officer.

If you have any comments or would like to find out more, you can get in touch via [Julien.Danero-Iglesias@london.gov.uk](mailto:Julien.Danero-Iglesias@london.gov.uk).

### Digital Connectivity: What is it and why does it matter?

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Digital connectivity is about access to fast and reliable internet connection (fixed or mobile) which enables users to benefit from smart and digital services.<sup>2</sup> It is the 'fourth utility', an everyday necessity alongside water, gas and electricity.

Superfast broadband can be a useful indicator for measuring a place's digital connectivity.<sup>3</sup> Superfast fixed broadband of 24 Mbps or more<sup>4</sup> is likely to be needed in households where different people use the internet at the same time, download films or large files on a regular basis, use multiple devices to access online services, play video games or use video calling services.<sup>5</sup> Superfast fixed broadband enables small and medium enterprises to do more for less, is better value for money, and is more cost effective than regular broadband provision. Facilitating Skype and Cloud computing, it helps reduce the need to travel, and as a result reduces overheads, provides greater convenience, saves time, ultimately reducing carbon footprints and improving efficiency and work/life balance.<sup>6</sup> With a 24 Mbps superfast connection, downloading a 25MB file would take about 10 minutes. In comparison, it would take about 20 minutes with a 10 Mbps connection and about 10 seconds with a gigabit connection. Data consumption is growing at around 50

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per cent or more per year<sup>7</sup> and the 10 Mbps deemed currently enough for an 'acceptable user experience' may soon not be for most.<sup>8</sup>

At the same time, mobile broadband is, and will continue to be, an essential complement of fixed broadband. For 71 per cent of small businesses, mobile phones are crucial or very important to their business.<sup>9</sup> London must invest in, and prepare for, the next generation of wireless mobile technology, 5G.<sup>10</sup> It will be able to carry more data, at higher speeds, potentially 40 times faster than the current 4G.<sup>11</sup>

**Download times for various download speeds for a full feature film or a Power Point presentation (estimates for a 1.5 GB movie file and a 25 MB ppt file, source download-time.com)**

Download speed	Movie	Power Point
2 Mbps	01:47:22	00:01:44
10 Mbps	00:21:28	00:00:20
24 Mbps	00:08:56	00:00:08
4 G (80 Mbps)	00:02:41	00:00:02
100 Mbps	00:02:08	00:00:02
1 Gigabit	00:00:12	Virtually 00:00:00

### What is London's position?

In the UK, the communications regulator, Ofcom, decided in 2005 to encourage service competition on the infrastructure of British Telecom (BT) by creating BT Openreach, a subsidiary that owns pipes and cables connecting to the national broadband and telephone network. Since then, service competition has been promoted by establishing Openreach, by and large as a national infrastructure monopoly. As a result, the UK has benefitted from lower costs and increased competition at service level, but the monopoly model has not seen the corresponding investment in the physical infrastructure.<sup>12</sup>

Against this background, in assessing London's current digital connectivity, there are a number of issues to take into consideration:

- **The lack of an extensive fibre network**

London does not have extensive full fibre connections. Spain now has 83 per cent of all of its buildings across the country connected to pure fibre. The UK has much less – around 3 per cent or even less – and not in London.<sup>13</sup> The vast majority of the fibre broadband offered by the UK's main service providers in London is Fibre to the Cabinet (FTTC). In this setting, fibre only runs as far as the exchange cabinets in the street and customers have to rely on old copper wiring for the 'last mile'. This

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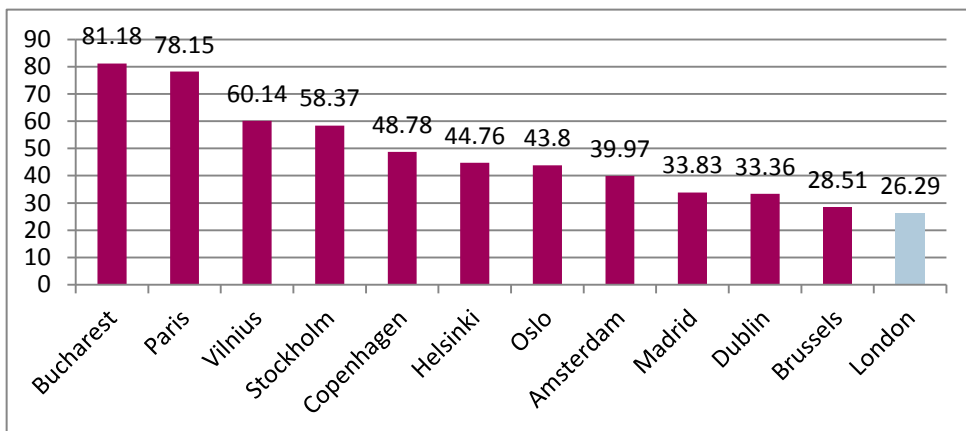
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reduces speed dramatically. Fibre to the Home (FTTH) is needed to bypass the copper problem, with fibre going directly to the premises and providing speeds faster than 1 Gigabit per second.<sup>14</sup> In competitor cities such as Paris or New York, there are fairly substantially large full fibre investment programmes underway in those cities that are not to be seen in London.<sup>15</sup>

- **Poor download (and upload) speeds**

In terms of download and upload speeds, there is little data available to compare London's performance with international competitors. A survey by provider Hyperoptic showed in 2014 that London was ranked 26 out of 33 other European cities in terms of broadband speeds, with an average download speed of 26.3Mbps. Romanian capital Bucharest topped the table with speeds of 81.2Mbps, followed by Paris and Lithuania's capital city Vilnius.<sup>16</sup>

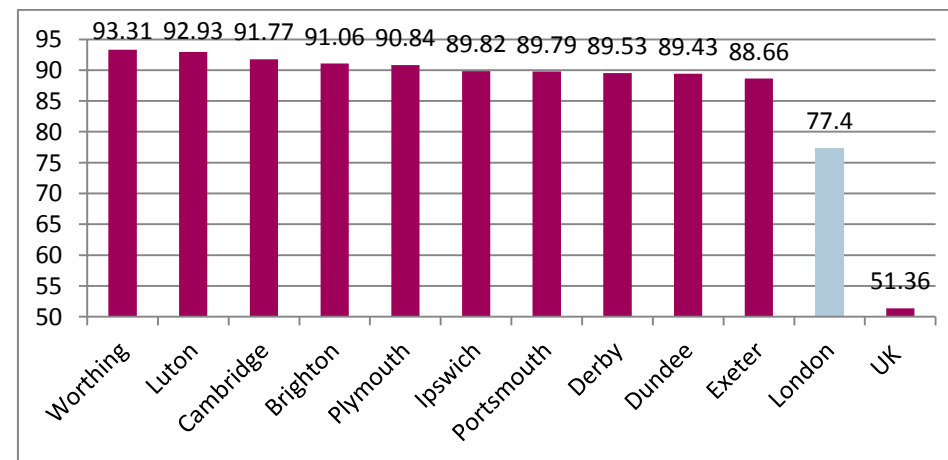
Average broadband speeds in Mbps in European Cities in 2014 (Source: Hyperoptic)



- **Modest coverage of high speed broadband**

Measures have been put in place to improve London's digital connectivity (for example, the 2013 Smart London Plan) and between 2014 and 2016, there has been a slow and gradual improvement in the availability of fast broadband access in London.<sup>17</sup> Still, data from Thinkbroadband collected for 63 UK cities at the end of 2016 show that London ranked 30 with 77.4 per cent of premises covered by ultrafast broadband connections, above the national average of 51.36.<sup>18</sup>

Percentage of premises covered by ultrafast broadband (>100 Mbps) as at end of 2016 (Source: Thinkbroadband.com and Centre for Cities)



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- **Too many 'not-spots'**

London is also held back by limited mobile 4G coverage. From December 2016 to February 2017, consumer group Which? and analyst OpenSignal measured data from mobile phones across 20 cities in the UK. London ranked in the bottom 5 with 73.6 per cent of 4G coverage.<sup>19</sup> In the capital, areas that have very low or no broadband access and/or mobile connectivity are numerous. These 'not-spots' and 'digital deserts'<sup>20</sup> are usually found in remote corners of rural Britain, but even central locations such as Westminster, the City of London and Southwark are affected, because of the length of copper lines, the street layout or the height of buildings.<sup>21</sup>

- **Unacceptable length of time for setting up a connection**

While speeds and coverage are below other cities in the UK and worldwide, the problem of connectivity is also related to the time it takes to install a new connection. For example, according to Jonathan Glanz, lead member for broadband and connectivity at Westminster City Council:

'Residents who come to live in Westminster from other great cities across the world find it absolutely incredible that they cannot do what they can do in Seoul, Singapore, Sydney or New York and just have their connection put in as they move in at a level that will allow them to do everything they need to do.'<sup>22</sup>

BT was recently fined £42 million by regulator Ofcom over delays installing high-speed internet connections.<sup>23</sup> In the UK, between January and March 2017, the average time to install an internet connection was 48 working days for businesses, with about 55 per cent of the connections delivered within 30 working days and 7 per cent within 159 working days.<sup>24</sup>

### Digital connectivity – a government priority

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Enhancing digital connectivity is a Government priority. In the 2016 Autumn Statement, the Chancellor called for a £1 billion investment in a 'world class digital infrastructure' that would support current and future 'transport, business and lifestyle needs'. The Government is seeking a 'step-change in speed, security and reliability', based on full fibre and an ambition for the UK to be a world leader in 5G. The Government has moved from its strategy of service competition with a monopoly infrastructure provider to a strategy of infrastructure competition. Ofcom has set a target of 40 per cent of premises having access to at least three infrastructure providers.<sup>25</sup>

So far, Broadband Delivery UK (BDUK), part of the Department for Culture, Media and Sport (DCMS), has been implementing the Government's policy on broadband roll-out in three phases:

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- Phase 1, which aimed at providing superfast broadband coverage for 90 per cent of UK premises, is now complete. BDUK developed a delivery framework for use by local bodies to assist in the procurement process, although local bodies could procure outside this framework. The contract was signed by DCMS and BT, which was awarded all 44 Phase 1 contracts.
- Phase 2 started in 2016 and is currently under way, with a target of 95 per cent of premises covered by December 2017.
- Phase 3 will explore options for the hardest to reach parts of the UK. The remaining 5 per cent, about 1.4 million premises, are dispersed across the country but can be found in densely populated areas, including central London.<sup>26</sup>

In London, the previous Mayor addressed connectivity in his 2013 Smart London Plan and set up a Smart London Board of experts to put in place a strategy to make sure digital technology improves for everyone. The aim was also to help make 'superfast broadband available to everyone in London and to invest in digital skills'.<sup>27</sup>

The previous Mayor:

- facilitated the Government's Super Connected Cities vouchers scheme (2013-2015). The scheme enabled small and medium-sized businesses to claim up to £3,000 to cover the cost of superfast broadband

- launched a connectivity rating scheme, delivered by WiredScore, to enable tenants and property brokers to identify spaces which meet their connectivity needs
- created a connectivity map to assist the decision making of digital connectivity providers based on current availability and demand<sup>28</sup>

Altogether, the various programmes so far have used a conventional approach that has not been fully successful. For example, the BDUK programme has tackled easier to reach premises first and has not delivered coverage for particular areas as a whole. Many premises have been counted as covered but they still appear unlikely to receive superfast speeds owing to the poor quality or length of the old copper lines.<sup>29</sup> In places such as Rotherhithe, in Southwark, copper wire still traces older roads it used to take around the dock rather than following the street layout of today. Such a circuitous route bleeds speed since the longer the copper wire, the lower speed and bandwidth at the end of it.<sup>30</sup>

A clear and ambitious vision for the future needs to be put forward. London lags behind York, Coventry and Edinburgh, all 'Gigabit Cities' where download and upload speeds reach 1,000 megabits per second. London should be a Gigabit City.

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### What has been done elsewhere through public sector intervention?

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There are a number of examples of cities in the UK and worldwide that have benefitted from national or local government intervention to enhance digital connectivity, and they all share common elements, namely dedicated public investment and strong leadership:<sup>31</sup>

- **Strong levels of public investment to upgrade local infrastructure.** In Seoul, a city of comparable size to London, the tech sector has seen government invest £1.1 billion with local firms in a 5G service, with a view to making it commercially available by the end of the decade.<sup>32</sup> In Chattanooga, in the US state of Tennessee, the city government used the city-owned electric utility company to upgrade its infrastructure to a fibre-based 'smart grid'.<sup>33</sup> The network is credited with the creation of thousands of new jobs and the regeneration of the downtown area.<sup>34</sup>
- **City government forging new partnerships to deliver improved connectivity.** The Royal Borough of Greenwich founded Digital Greenwich in 2015 to implement its Smart City Strategy. Digital Greenwich acts as a catalyst on behalf of the borough and includes an innovation centre with office spaces for small and medium-sized digital businesses. With the University of Surrey, they have been developing

smart city technologies, with a focus on creating 'resource-efficient, low-carbon, healthy and liveable neighbourhoods'.<sup>35</sup> In Peterborough, the local city council and CityFibre, an internet provider, deployed an ultrafast citywide fibre network which connects public sector sites with gigabit-speed services. The cloud service<sup>36</sup> was then extended to all businesses. The move attracted new SMEs and led to the creation of 7,000 jobs in all sectors over three years.<sup>37</sup>

### The Mayor's plans: A new strategy and a Chief Digital Officer

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The Mayor has significant influence on the number and location of the new homes and jobs London will need in the future in major regeneration areas across the capital. It is important that he uses this power to address the current barriers to enhanced digital connectivity across the capital. There are numerous opportunities across London, such as the regeneration of Old Oak and Park Royal and London's Opportunity and Intensification areas<sup>38</sup>, where digital connectivity can be addressed from the start and at the centre of a smart strategy for development, to ensure they have the most up-to-date standards of connectivity built into the first stages of planning as befits the fourth utility.

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The Mayor has acknowledged the benefits of ‘digital connectivity’ and ‘will do all [he] can to improve digital connectivity in London, establishing it firmly as a key utility central to planning and new development’. The Mayor will also appoint London’s first Chief Digital Officer (CDO) to oversee growth in this sector, as well as leading on digital inclusion across the city.<sup>39</sup> The Mayor will create a ‘not-spot’ team to work with stakeholders ‘to address areas where specific improvements are needed’.<sup>40</sup>

The Regeneration Committee welcomes such an ambition and the appointment of a Chief Digital Officer that would lead on issues of connectivity in the capital. But these are early days and the CDO faces a range of challenges.

New York’s first Chief Digital Officer, appointed in 2010, began to coordinate activity by creating a Digital Roadmap. The roadmap provided a snapshot of the city’s technology efforts and digital achievement to date and chartered a course for realising the city’s potential. We support calls for the Mayor to commission a similar review.<sup>41</sup>

We recommend that the CDO adopts the following checklist to help move London towards becoming one of the most digitally connected cities in Europe:

- Tackle digital exclusion with better information and digital skills
- Enable digital connectivity through the London Plan
- Lobby for making existing infrastructure available for fibre
- Tackle ‘not-spots’ and ‘digital deserts’

### Tackling digital exclusion: Better information

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#### **The CDO must support Londoners to make well-informed decisions with regards to their connectivity needs.**

- Little reliable information is available for future tenants, residents and businesses before moving into an area. The committee welcomes initiatives such as WiredScore which have improved the situation. WiredScore informs tech companies and small businesses about the connectivity levels of buildings they are considering occupying before they agree to take out a lease. Through a certification programme called Wired Certification, the team helps landlords to market their buildings as tech-friendly destinations, and businesses can use this information to find buildings that meet their telecommunications needs.<sup>42</sup>

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- Large businesses across London do not seem to suffer from a lack of connectivity as they can afford to privately fund the high cost of fast and reliable connectivity. However, transient and renting tenants have more difficulties accessing faster broadband, since they might not stay in the same place for more than a year or might not be able to commit to a long-term contract. Improving access for these tenants will require putting pressure on providers to offer shorter-term contracts and tailored payment options.

### Tackling digital exclusion: Better digital skills

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#### **The CDO must also support Londoners, individuals, businesses and charities, to develop and enhance their digital skills.**

- In 2016, 6 per cent of London households did not have access to internet; 7.2 per cent of Londoners had never used internet; and 16 per cent did not have basic digital skills.<sup>43</sup> The lack of digital skills holds back economic development: most small businesses that use digital functions (ranging from email to cloud-computing) are twice as likely to report increase in turnover than the 30 per cent of small businesses in London that do not have basic digital skills. At the same time, more digitally mature charities<sup>44</sup> are 28 per cent more likely to report an increase in

funding than the 49 per cent of charities that do not have basic digital skills.<sup>45</sup>

- In this regard, although the Mayor has promised that the CDO would prioritise digital inclusion,<sup>46</sup> the committee regrets that, according to the advertised job description, digital inclusion is only a small part of the role's principal accountabilities.<sup>47</sup>
- The committee however welcomes the recently approved pilot project, *Mi Wifi*, at the GLA. The idea is to lend WiFi enabled tablets to specific groups of Londoners, such as older Londoners, disadvantaged Londoners, Londoners with a disability and community groups. The aim of the project is to reduce digital exclusion by empowering community groups and providing them with basic digital skills training.<sup>48</sup> However, without a reliable and cheap internet connection, such a programme will not be of help.

### Enabling digital connectivity through the London Plan

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#### **The CDO and the GLA must work with boroughs to remove the current administrative and planning barriers to enhanced digital connectivity. These include:**

- **Different planning rules across London's boroughs and a costly planning application process.**<sup>49</sup> 85 per cent of the costs of expanding



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the broadband network in the capital are so-called 'civil' costs, such as planning regulations and other red tape.<sup>50</sup> For example, stakeholders we met explained how the process of applying for planning applications should be simplified, particularly for listed buildings.<sup>51</sup>

- **Inconsistent wayleave processing across London's boroughs.** To address this barrier, the Mayor and the CDO should go further in the promotion of the City of London Corporation's 'wayleave toolkit' that informs landowners and their legal advisors on what they must do when, for example, they receive a wayleave request (the agreement between the owner and the provider to install a new connection). The toolkit gives broadband providers, SMEs, landlords and developers the documentation they need to deliver digital infrastructure in a fast and effective way. Standardised documents will speed up the installation of broadband for all parties which would also benefit from lower costs and more efficient ways of working.<sup>52</sup>
- **Poor coordination** between providers, local authorities and key property owners. The GLA could start by organising a high level meeting with all stakeholders to meet and exchange best practice.<sup>53</sup>
- **A lack of flexibility.** Broadband cabinets are permitted development<sup>54</sup> and, while they do not require planning permission, telecom operators need to get 'prior approval' from the local authority, which can be refused only on amenity or safety grounds within 56 days of the prior approval application being sought. The CDO should encourage boroughs

to be flexible in their approach to prior approval applications, especially in areas where there is evidence of the need for improvement in digital connectivity – where broadband speed is unacceptably slow or where there is the need for more capacity to satisfy local demand for connections.

- **A lack of guidance in the London Plan.** The majority of policies in the London Plan are structured at three levels: strategic statements of Mayoral policy; planning decisions to be applied by the Mayor and planning authorities; and advice to boroughs in preparing their Local Development Frameworks and neighbourhood plans. In the current version of the London Plan, recommendations about digital connectivity have been made only at the first, strategic level. Previous versions of the London Plan have placed more emphasis on action to be taken at borough level to enhance digital connectivity. In his current review of the London Plan, the Mayor should offer stronger guidance to boroughs and encourage boroughs to address connectivity issues in their local development framework. The London Plan should encourage boroughs to produce a local connectivity plan that reflects the actions necessary to ensure there is sufficient access to a minimum level of broadband service. Boroughs should also ensure that any application for new development provides the necessary upgrade to connectivity to meet the level of service specified in the connectivity plan. At the same time, having a digital champion in each borough would be useful to undertake

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coordination activities and ‘join the dots between the various components of a very complex picture.’<sup>55</sup>

### **Making existing infrastructure available for fibre**

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**The CDO must encourage bodies such as Transport for London to grant providers access to the ducts they own.**

- While Government has made clear that full fibre and 5G are the future, the current wire infrastructure needs significant investment to upgrade it and make superfast broadband a reality. Much of London’s critical last-mile infrastructure is copper telephone wire running over long distances directly from the exchange.<sup>56</sup> Premises at the end of the wires often have very poor internet speeds. For a provider, like Community Fibre, the biggest infrastructure cost is related to digging and cabling in order to roll out their fibre network.<sup>57</sup>
- Work needs to be done on the ‘backbone’ or ‘spine’ infrastructure, the initial core infrastructure, from which to roll out fibre across the capital. The Government last year placed an obligation on all duct owners to make their infrastructure available to operators and Ofcom published guidance.<sup>58</sup> In a city of the size of London, multiple construction gangs in different parts of the city can be used because they are not going to be tripping up on each other.<sup>59</sup> Providers could use existing networks as

opportunities, including the current transport infrastructure owned by Transport for London, to roll out fibre using the 250 miles of Underground network, the 2,300 km of roads or the 6,000 traffic signals throughout the capital.<sup>60</sup>

### **Tackling ‘not-spots’ and ‘digital deserts’**

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**The CDO must provide leadership to the public and private sectors and initiate partnerships to tackle ‘not-spots’ and ‘digital deserts’ across London.**

- Because of infrastructure costs, there seems to be little incentive for providers to upgrade connections for small businesses and residents in areas of high commercial density but low residency. Commercial viability is also more challenging for parts of London where residential density is very low.<sup>61</sup> Upgrading the infrastructure also means cabling, digging up roads and pavements which are all costly and cause disruption. In various parts of London, the old infrastructure has not been updated and many areas in the capital are considered to be ‘not-spots’ or ‘digital deserts’. As shown in the City of London and Westminster, leadership and partnership can help solve the issue.
- The City of London Corporation has worked on its own solutions to improve the situation within the Square Mile and to keep on attracting

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SMEs after declaring in 2014 that ‘Big Telecom’ had failed to deliver for its SMEs and residents.<sup>62</sup> The City worked on different solutions, including a free WiFi service. It is currently provided by the Cloud but will be replaced later this year with a new gigabit WiFi mesh network. The £5m investment will be the single largest investment in wireless infrastructure in the City of London. To boost wireless coverage, more than 400 4G small cells will be mounted on street objects such as lamp posts, street signs, buildings and CCTV columns. The third party chosen to manage the assets will start to deploy the cells in 2017 and the rollout will be completed in 2019. The City of London expects that the new service will create attractive market conditions that will make it easier to deploy and adopt 5G technology.<sup>63</sup> Such a decision seems costly, but delivering small cells will bring profits to the City which will be reinvested to fund the gigabit WiFi network. £30 million revenue is expected over the next 15 years.<sup>64</sup>

- Similarly, in 2015, Westminster City Council launched a campaign to improve high-speed broadband in central London by urging BT to step up the pace of installation. According to Ofcom data at the time, less than half of businesses and residential premises in Westminster had access to the BT Openreach fibre network or Virgin fibre broadband.<sup>65</sup> Thanks to this pressure, it was announced at the end of 2015 that BT Openreach would invest significantly in superfast broadband within the area taking the company’s total coverage for fibre in the borough to

nearly 106,000 premises.<sup>66</sup> The council is also in the process of rolling out a number of high quality, free public WiFi schemes across its estate and is working to improve 4G mobile phone connectivity through the addition of more mobile phone masts and street level micro cells. In addition, Community Fibre has completed deployment of full fibre to the home to Westminster’s largest housing estate with over 1,700 properties on the Churchill Estate in Pimlico now having access to gigabit broadband services.

### The CDO’s Checklist

- **The CDO must support Londoners to make well-informed decisions with regards to their connectivity needs.**
- **The CDO must also support Londoners to develop and enhance their digital skills.**
- **The CDO and the GLA must work with boroughs to remove the current administrative and planning barriers to enhanced digital connectivity.**
- **The CDO must also encourage bodies such as Transport for London to grant providers access to the ducts they own.**
- **The CDO must provide leadership to the public and private sectors and initiate partnerships to tackle ‘not-spots’ and ‘digital deserts’ across London.**

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### Case Study: How to address the lack of connectivity in Rotherhithe?

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Rotherhithe, a residential district in south east London, is a striking illustration of all the barriers identified in this report. Living in this infamous 'not-spot', one of the residents told us that his connection regularly hovers at around 0.26 Mbps.

Access to good broadband has become a significant local issue, as shown in the two maps on the following page. Local residents feel frustrated and excluded, living in central London but having to go to the local library or a café to be able to send emails with attachments.<sup>67</sup> Local residents and businesses have created a pressure group, the Rotherhithe Broadband Group, and have drawn the matter to the attention of the London Borough of Southwark. They have also been lobbying internet service providers for improved services in the area.<sup>68</sup> The group is considering developing its own fibre network based on models of similar groups elsewhere in the UK. A feasibility study was carried out in 2014 and the scheme now needs financing.

Southwark Council has tried to respond to local needs. In 2014, it commissioned engineering consultants Atkins to review broadband access in Rotherhithe. The report identified that poor access in

traditional docks areas is not unusual: they have historically been poorly served and the expansion of broadband services has not kept up with the development of homes and businesses in these areas.

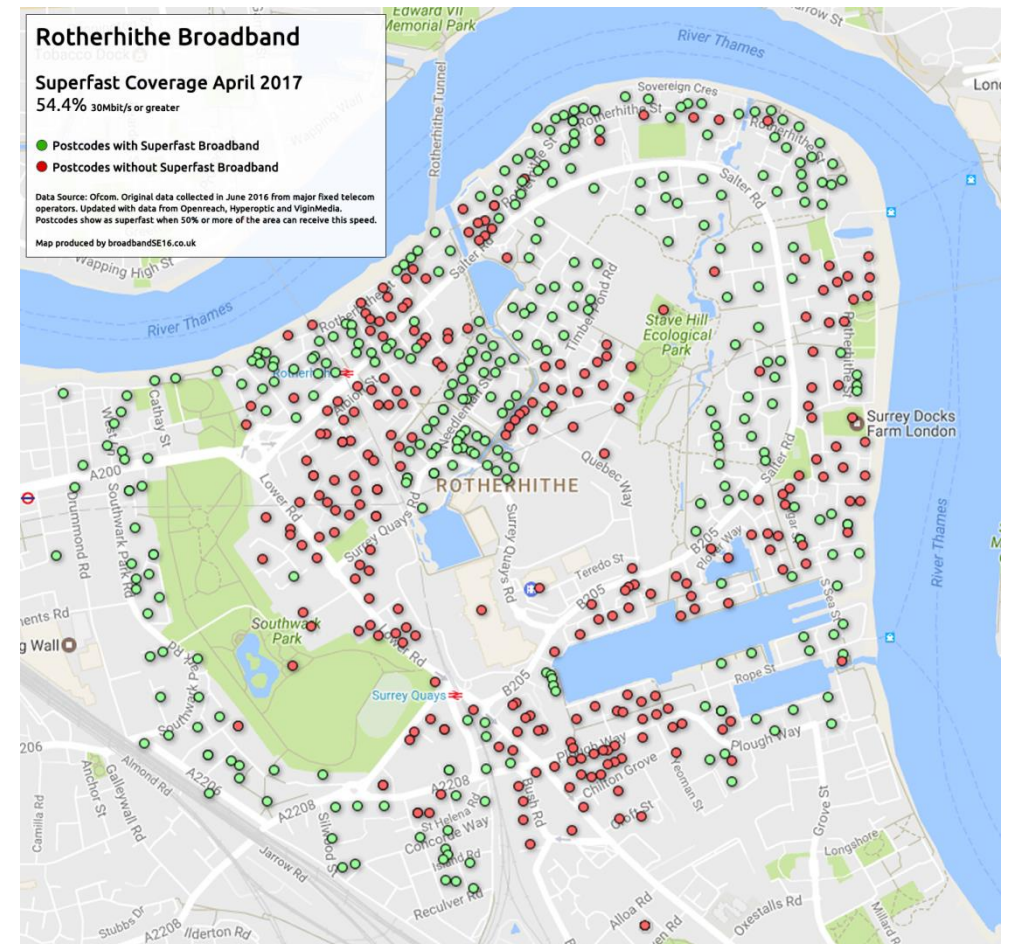
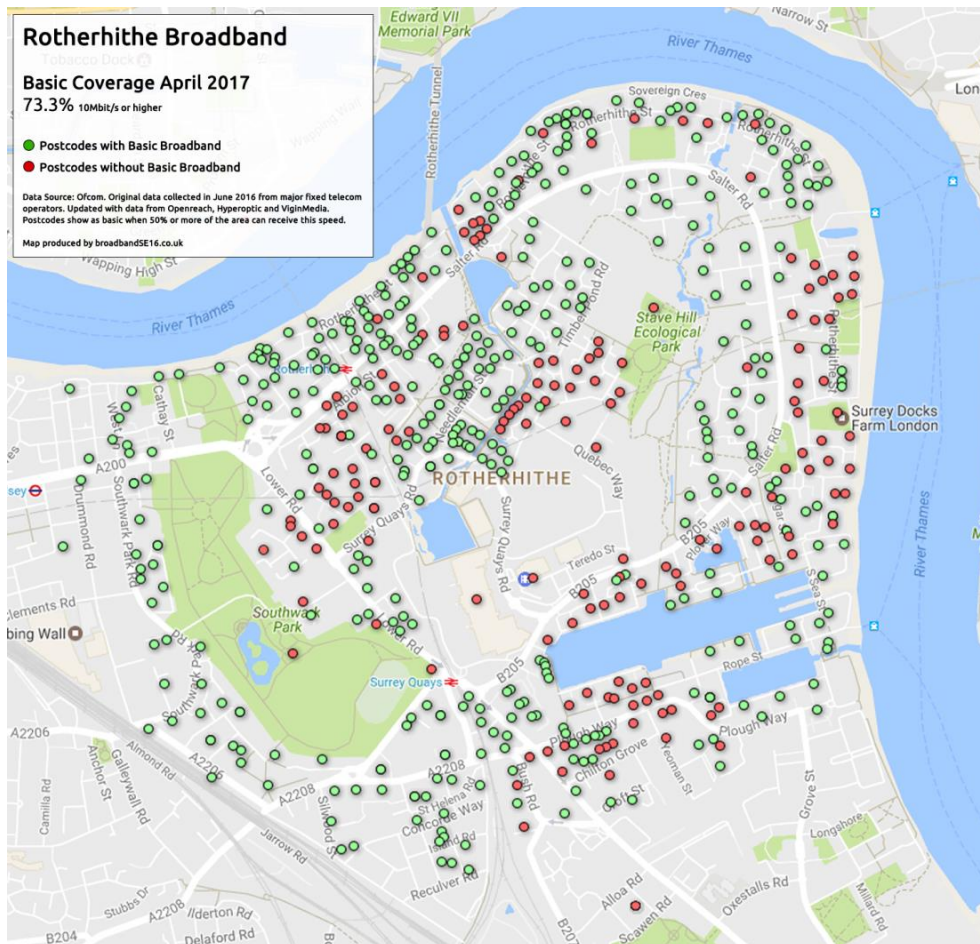
The council has brokered a number of meetings with the Rotherhithe Broadband Group, BT, council officers and other stakeholders. Council officers have been working with BT Openreach to encourage them to expand their broadband presence in Rotherhithe and elsewhere in Southwark.

The chosen approach focused on the installation of new cabinets across the borough. In 2015 BT Openreach committed to connect 18,000 premises in the borough. Since April 2016, they have delivered 21 new broadband street cabinets borough wide, providing the opportunity for approximately 6,880 properties to connect to superfast broadband. Nine of those cabinets have been delivered on the Rotherhithe peninsula, representing 2,922 possible new connections.<sup>69</sup>

However, progress is slow and alternative options are needed. Southwark Council met with Oxfordshire County Council to learn from their experience of rolling fibre with BT and BDUK. However, such a programme would not be allowed in London under current state-aid rules. Southwark Council is now setting out a new strategic plan to be published in 2017 and exploring new business models and innovative projects for broadband infrastructure improvements.<sup>70</sup>

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The committee welcomes the Mayor's intention to establish a 'not-spot team', which will work on a location-by-location basis with all stakeholders. A solution should be found as a matter of priority. The committee heard a call for lobbying Government to change state-aid rule<sup>71</sup> but it seems unlikely to be a Government priority. The Mayor should also look at other solutions, such as supporting the expansion of the City of London's WiFi mesh network, providing a free WiFi service, or an investment in local community schemes.

The example of Rotherhithe shows digital connectivity issues are linked to social exclusion, caused by past investment decisions and programmes that have been market-oriented and have targeted businesses or residents.

The Mayor has planning policies aimed at reducing the inequality and exclusion experienced by sections of Londoners, such as Policy 3.2 in the London Plan on improving health and addressing health inequalities. The policy states that 'boroughs should work with key partners to identify and address significant health issues facing their area and monitor policies and interventions for their impact on reducing health inequalities.' The committee recommends the Mayor uses the London Plan in the same way to encourage boroughs to address digital exclusion.

### Endnotes

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<sup>1</sup> R Williams, '[Poor broadband hindering London's digital economy](#)', *The Telegraph*, 9 December 2014.

<sup>2</sup> [The fourth utility: Delivering universal broadband connectivity for small businesses across the UK](#), Federation of Small Businesses, July 2014.

<sup>3</sup> [Cities Outlook 2015](#), Centre for Cities, 19 January 2015.

<sup>4</sup> Defined as such by the UK Government. OFCOM and the EU use at least 30Mbps as the definition.

<sup>5</sup> S Priestley and C Baker, [Superfast Broadband Coverage in the UK. Briefing Paper](#), House of Commons Library, 9 March 2017, p 7 and J Barrow, '[What broadband speed do I need?](#)', Which?.

<sup>6</sup> As shown by the impact of the SuperfastCornwall project on local SMEs. See H Lacohee and A Phippen, [SME Benefits and Business Opportunities with Superfast Broadband: the Virtuous Circle of Connectivity](#), September 2013.

<sup>7</sup> D Lewis, '[Connecting Britain faster – the UK's broadband future](#)', *Director.co.uk*, 11 March 2016.

<sup>8</sup> S Priestley and C Baker, [Superfast Broadband Coverage in the UK. Briefing Paper](#), House of Commons Library, 9 March 2017, p 7

<sup>9</sup> [The fourth utility: Delivering universal broadband connectivity for small businesses across the UK. FSB Discussion Paper](#), Federation of Small Businesses, July 2014.

<sup>10</sup> 5th generation mobile networks or 5th generation wireless systems, abbreviated 5G, are the proposed next telecommunications standards beyond the current 4G network.

<sup>11</sup> S Curtis and R Barrat, '[What is 5G? Everything you need to know about the next generation of mobile network technology](#)', *The Mirror*, 8 March 2017.

<sup>12</sup> Mark Collins, Director of Strategy and Public Affairs, CityFibre, speaking to the committee, 1 March 2017.

<sup>13</sup> *Ibid.*

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<sup>14</sup> A Wade, '[Broadband bottlenecks: The trouble with the UK's fragile internet network](#)', *The Engineer*, 26 February 2016.

<sup>15</sup> Mark Collins, CityFibre, speaking to the committee, 1 March 2017.

<sup>16</sup> R Williams, '[Poor broadband hindering London's digital economy](#)', *The Telegraph*, 9 December 2014.

<sup>17</sup> Sara Kelly, Senior Policy Officer - Science and Technology, GLA, speaking to the committee, 1 March 2017.

<sup>18</sup> Data by *Thinkbroadband.com* published in the Centre for Cities' [Cities Data Tool](#).

<sup>19</sup> '[UK's best and worst cities for 4G mobile coverage revealed](#)', *BBC News*, 3 May 2017.

<sup>20</sup> R Mason, '[UK 4G coverage worse than in Romania and Peru, watchdog finds](#)', *The Guardian*, 14 December 2016.

<sup>21</sup> [Speedtest Market Report](#), Ookla, 15 November 2016.

<sup>22</sup> Councillor Jonathan Glanz, Lead Member for Broadband and Connectivity, Westminster City Council, speaking to the committee, 1 March 2017.

<sup>23</sup> M Sweny, '[BT fined £42m over delays to high-speed cable installation](#)', *The Guardian*, 27 March 2017.

<sup>24</sup> See Openreach [performance](#) for January to March 2017.

<sup>25</sup> Tim Stranack, Business Development Director, Community Fibre, speaking to the committee, 28 March 2017.

<sup>26</sup> S Priestley and C Baker, '[Superfast Broadband Coverage in the UK. Briefing Paper](#)', House of Commons Library, 9 March 2017, pp 9 to 14 and 25-26.

<sup>27</sup> [The Future of Smart](#), GLA, March 2016.

<sup>28</sup> See the [Connectivity Map of London](#) on the GLA website.

<sup>29</sup> S Priestley and C Baker, '[Superfast Broadband Coverage in the UK. Briefing Paper](#)', House of Commons Library, 9 March 2017, p 23 and '[Establishing world-class connectivity throughout the UK](#)', Second Report of Session 2016-17, p 16.

<sup>30</sup> '[Joining the Dots: Building the Infrastructure for London Tech](#)', Tech London Advocates, April 2015, pp 20-21

<sup>31</sup> Full fibre solutions have also been brought by private investment, as shown by the example of Google Fiber in Kansas City, see P Sisson, '[In Kansas City, Google Fiber has mixed results](#)', *Curbed*, 17 January 2017.

<sup>32</sup> J McCurry, '[South Korean 5G internet move to further increase download speeds](#)', *The Guardian*, 23 January 2014.

<sup>33</sup> [Chattanooga Forward](#), March 2014.

<sup>34</sup> J Koebler, '[The city that was saved by the internet](#)', *Motherboard*, 27 October 2016.

<sup>35</sup> See the [website](#) of the 5G Innovation Centre at the University of Surrey.

<sup>36</sup> 'Cloud computing' means storing and accessing data and programs over the Internet instead of a computer's hard drive, see E Griffith, '[What Is Cloud Computing?](#)', *UK PC Mag*, 3 May 2016.

<sup>37</sup> L Evenstad, '[Peterborough launches Digital City programme](#)', *Computer Weekly*, 31 December 2015 and '[Peterborough City Council leader John Holdich: 2,096 new jobs already in 2016](#)', *The Peterborough Telegraph*, 20 August 2016.

<sup>38</sup> Opportunity areas are the capital's major reservoir of brownfield land with significant capacity to accommodate new housing, commercial and other development. Intensification areas are typically built-up areas with good existing or potential public transport accessibility which can support redevelopment at higher densities. They too have significant capacity for new jobs and homes. Together, the opportunity areas have capacity for 575,000 additional jobs and 303,000 additional homes; the intensification areas can accommodate 8,000 new jobs and a further 8,650 homes.

<sup>39</sup> [A City for All Londoners](#), GLA, October 2016, p 47.

<sup>40</sup> Sara Kelly, GLA, speaking to the committee, 1 March 2017.

<sup>41</sup> K Hanna and T Scott, '[A Chief Digital Officer for All Londoners](#)', Centre for London, 2016.

<sup>42</sup> See the website of [Wiredscore](#).

<sup>43</sup> Signed decision document [ADD2081 Mi Wifi](#), GLA, 27 February 2017 using 2016 data on home internet and social media usage from the Office for National Statistics.

<sup>44</sup> According to Lloyds Bank's UK Business Digital Index 2016, a business or a charity is 'digitally mature' when it is able to manage and store digital information and content;

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digitally communicate, interact, collaborate, share and connect with others; digitally purchase and sell goods and services, organise finances, register for and use Government digital services; engage digitally with communities and create basic digital content; increase independence and confidence by solving problems using digital tools and finding solutions. See [UK Business Digital Index 2016. Benchmarking the digital maturity of small businesses and charities in the UK](#), Lloyds Bank, October 2016, p 10.

<sup>45</sup> [UK Business Digital Index 2016. Benchmarking the digital maturity of small businesses and charities in the UK](#), Lloyds Bank, October 2016.

<sup>46</sup> Mayor's answer to [Question 2017/0663](#) by Navin Shah, AM, 20 February 2017.

<sup>47</sup> Chief Digital Officer job description as published in May on the website of the Greater London Authority.

<sup>48</sup> Signed decision document [ADD2081 Mi Wifi](#), GLA, 27 February 2017.

<sup>49</sup> Sara Kelly, GLA, in [Joining the dots. Building the infrastructure for London Tech](#), Tech London Advocates, p 40.

<sup>50</sup> A Hern, '[London has the worst broadband in Britain, government statistics show](#)', *The Guardian*, 9 February 2015.

<sup>51</sup> Jeremy Chelot, CEO, and Tim Stranack, Community Fibre, speaking to the committee, 28 March 2017.

<sup>52</sup> This document relates to individual tenant fixed line and wireless (not mobile) telecommunication service connections and does not extend to cover public network infrastructure apparatus. See the [website](#) of the City of London Corporation.

<sup>53</sup> Philip Saunders, Parliamentary Affairs Counsel, City of London Corporation, speaking to the committee, 22 February 2017.

<sup>54</sup> Permitted development rights are types of work that can be performed without needing to apply for planning permission. They derive from a general planning permission granted not by the local authority but by Parliament.

<sup>55</sup> Mark Collins, CityFibre, speaking to the committee, 1 March 2017.

<sup>56</sup> [A Mayoral Manifesto for the Digital Economy](#), London Assembly Economy Committee, GLA, December 2015.

<sup>57</sup> Jeremy Chelot and Tim Stranack, Community Fibre, speaking to the committee, 28 March 2017.

<sup>58</sup> [Guidance under the Communications \(Access to Infrastructure\) Regulations 2016](#), Ofcom, 2016.

<sup>59</sup> Mark Collins, CityFibre, speaking to the committee, 1 March 2017.

<sup>60</sup> Tim Stranack, Community Fibre, speaking to the committee, 1 March 2017.

<sup>61</sup> J Sibley, '[Digital connectivity. High-speed internet access is critical for London's businesses and residents](#)', London Councils.

<sup>62</sup> A Scroxton, '[City of London Corporation fed up with BT broadband](#)', *Computer Weekly*, 13 November 2014.

<sup>63</sup> S Fenwick, '[City of London to roll out gigabit Wi-Fi mesh network this year](#)', *Land Mobile*, 9 January 2017.

<sup>64</sup> Steve Bage, City Infrastructure Adviser, City of London Corporation, speaking to the committee, 22 February 2017.

<sup>65</sup> R Lynch, '[Firms call on BT to speed up London's 'too slow' broadband](#)', *The Evening Standard*, 26 May 2015.

<sup>66</sup> '[BT announces investment to expand fibre broadband rollout in Westminster](#)', Press release – *Mynewsdesk*, 14 October 2015.

<sup>67</sup> Rotherhithe resident speaking to the committee, 22 March 2017.

<sup>68</sup> See the [website](#) of the group, Broadband SE16.

<sup>69</sup> Figures for March 2017.

<sup>70</sup> Southwark Councillor Fiona Colley, Cabinet Member for Finance, Modernisation and Performance, speaking to the committee, 22 March 2017.

<sup>71</sup> *Ibidem*.