SUB-REGIONAL DIGITAL INFRASTRUCTURE STRATEGY

FOR LOCAL LONDON AND
SOUTH LONDON PARTNERSHIP

local london

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South London Partnership
'Representing and connecting'

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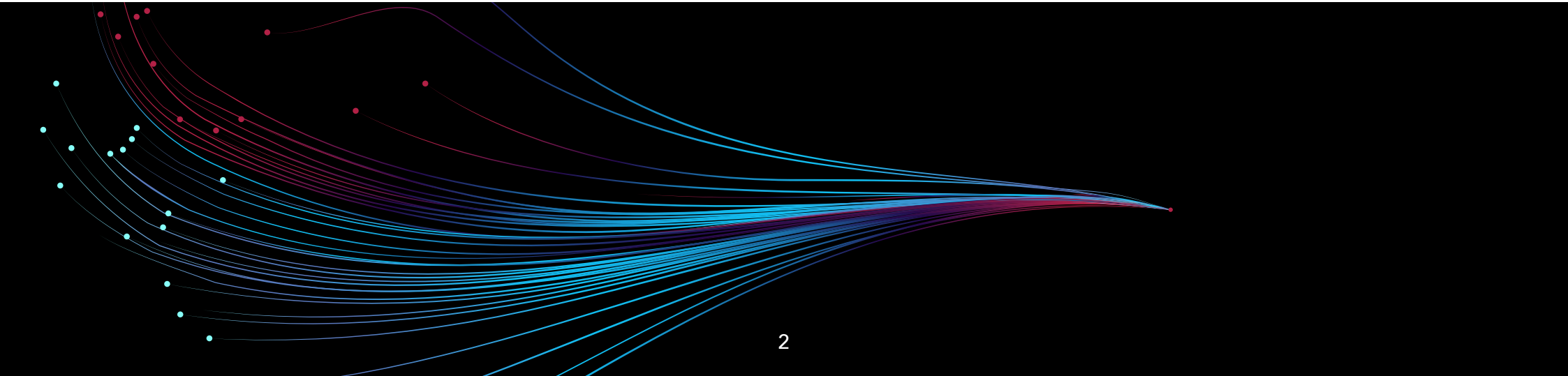


Foreword

The ubiquitous availability of world class fixed and mobile digital infrastructure is widely viewed as key to enabling growth. It is essential for our public sector services, private businesses and individual residents. Digital connectivity enables social inclusion and cohesion, innovation and the creation of new businesses.

Yet contrary to perception, there are parts of London that suffer from a lack of commercial investment in digital infrastructure, and this results in gaps in delivery capability and 'not spots'.

We must address these gaps in London and drive the up the quality and accessibility of the services that are already available to support London to be a fairer, more prosperous, and more equal place for all Londoners.

The learning and recommendations in this report make clear the issues, but importantly the best practices, learning and actions London boroughs and partners can take to attract and catalyse world leading digital infrastructure.

Commissioned by the Mayor of London's Infrastructure Coordination Service and led by two of the Capital's sub-regional partnerships, Local London and South London Partnership, this comprehensive report is a significant milestone in the delivery of the overarching Digital Infrastructure Strategy for East and South London.

This report provides clear guidance and demonstrates the benefits of a cross-boundary subregional approach, facilitated through these partnerships and their collaboration, that can unlock rapid deployment of next generation wireless infrastructure and gigabit capable full fibre to levels enjoyed in other urban areas in the UK, whilst responding to member boroughs' distinct social and economic needs.

Theo Blackwell MBE
Chief Digital Officer

Executive Summary and Recommendations

Background

In 2019, with backing from the Mayor of London Infrastructure Group (LIG), the Mayor established the Mayor's Infrastructure Coordination Service (ICS) at the Greater London Authority (GLA) to support better planning and delivery of infrastructure across London.

The ICS has commissioned this pilot strategy study across boroughs within the South London Partnership (SLP) and Local London (LL) sub-regions to better understand the use case of sub-regional scale digital infrastructure planning, and how such a model can apply across London. This pilot will serve to build a more granular understanding of the barriers to investment, the implications of poor digital connectivity on the economies of north east, south east and south west London, and will inform other parts of London of steps that can be taken to close the gaps and boost investment.

Strategic Case

There is broad and proven recognition that the provision of full fibre and 5G digital infrastructure drives economic growth and enables social inclusion and cohesion. Numerous reports have identified such benefits. For example, the Centre for Economics and Business Research (Cebr) stated that full fibre could provide a real boost to communities across the country and boost labour productivity by nearly £59 billion by 2025.

The delivery of London's net zero ambitions also relies on the availability of digital infrastructure.

World class digital connectivity stimulates innovation, boosts digital service businesses and creates new business streams. London must address any shortfall in the availability of digital connectivity in the region and drive up the quality and accessibility of the services already available.

> “Contrary to perception, parts of London have suffered from a lack of commercial investment in digital infrastructure and this has resulted in underlying gaps in delivery capability.”

Contrary to perception, there remain parts of London that have suffered from a lack of commercial investment in digital infrastructure that consequently has resulted in underlying gaps in delivery capability. These gaps need to be closed in order for boroughs within the Local London and the South London Partnership sub-regions to achieve their growth goals and, in particular, their Levelling Up ambitions.

At the time of writing there are over 151,000 premises in Local London and 73,000 premises in South London Partnership unable to obtain a Gigabit capable broadband service. Over 29,000 premises sit in a ‘not spot,’ unable to receive even a 30 Mbps service. Across London has a whole Building Digital UK estimate this gap in service provision to be over 600,000 premises after taking into account the existing investment plans of operators over the next 3 years.

London Plan SI6 states that ‘Development Plans should support the delivery of full-fibre or equivalent digital infrastructure, with particular focus on areas with gaps in connectivity and barriers to digital access.’

London Boroughs require a clear digital strategy and on-going regional interventions to increase the availability of full fibre to the premise in key urban areas and ensure rapid deployment of next generation wireless infrastructure to levels enjoyed in other urban areas in the UK.

Experience across London, and indeed across the UK as a whole, has shown that local authorities that are the most proactive benefit from the greatest level of inward investment.

Examples of proactive local authorities benefitting from greater levels of inward investment:

Aberdeen

Over £40m of inward investment was stimulated by the Council by developing a digital infrastructure plan, an investment of £2m from the local regional City Deal and using the Council's purchasing power to anchor inward investment.

Sunderland

Investment in digital infrastructure has been estimated to boost the local economy by over £690m. A report by economists Hatch estimated that over 15 years an investment of £62m by the commercial sector leveraged by the City upgrading its digital infrastructure will result in £441m in productivity and innovation in local businesses, £30m of local authority savings, £97m of enhanced workforce skills and £226m of increased property values.

Other Cities

A number of other cities and regions across the UK have benefited from a proactive approach to encouraging digital investment and have leveraged commercial finance. This has increased the availability of gigabit capable infrastructure that has in turn resulted in improved delivery of public services and economic development. Examples include Peterborough, Edinburgh, Greater Manchester, Coventry and York.

Locally some of our Boroughs have successfully leveraged inward investment. These include:

Royal Borough of Greenwich:

A new company, Digital Greenwich Connect Ltd, has been incorporated to design, build, maintain, and commercialise a 21 km full-fibre, gigabit-capable network infrastructure.

The new digital highway is a £2m joint venture between DG Cities, an innovation company set up and owned by Greenwich Council, and full-fibre provider ITS Technology Group. Each company has invested £1m into the programme. Initially serving Woolwich, the plan is to deploy across the Borough as revenues are generated.

London Borough of Bexley:

Bexley consolidated its wide area network and CCTV connectivity to procure over 70km of new fibre infrastructure across the Borough using SIP funding. This in turn has leveraged match funding from the commercial sector and stimulated inward investment. Bexley is projected by the telecoms industry to have the highest penetration of gigabit infrastructure to its business and residents in London over the next three years.

London Borough of Richmond:

The scope of the project is to provide gigabit capable connectivity to public sites in the London Borough of Richmond. The project includes the delivery of dark fibre to 28 sites including a Dark Fibre Ring.

The project results in 20% of residents/businesses in the Borough having the fibre pass their premises, so it would mean up to c. 40,000 locations are to be passed by Gigabit fibre by the end of this project that would otherwise not be.

However, investment in South and East London has not been as high as seen in many other parts of the country, or indeed in Central and parts of West London. This is a due to:

- Many parts of the sub-regions do not have the penetration of large businesses that attracts commercial investment. It is of greater commercial challenge to target a SME business base.
- Deployment in London is more challenging from a cost perspective compared with other UK cities.
- Build challenges are perceived to be greater in London due to issues around legacy infrastructure.
- The fragmentation of responsibilities between Boroughs and within Boroughs can lead to barriers in investment. Issues such as planning, permits, highways policies have led to delays and increased cost.
- Wayleave agreements have sometimes been slow and complex to obtain. This is a contractual agreement between an operator and a Borough to enable them to access land/property to install telecommunications infrastructure and deliver services, notably in social housing. Investment is accelerated where this is in place, ideally with multiple operators.
- There has been a relative lack of public sector Gap funding compared with other parts of the UK.
- Legacy Borough-owned infrastructure such as ducting is often not fit for purpose from a commercial perspective and requires upgrading and a high administrative overhead.

Experience from Boroughs in other areas has shown that inward investment is more readily secured where resources are prioritised for the development of digital infrastructure or where a clearly articulated strategy and allocated key roles and responsibilities to deliver it is established. Testimony from operators has confirmed that investment has been redirected to other parts of the UK with a resulting loss of economic and social benefits to our Boroughs.

It is essential that all Boroughs across sub-regions are proactive in their digital infrastructure planning, with a clear strategy articulated to all internal stakeholders and a plan to stimulate inward investment to ensure socio-economic benefits are realised. Failure to do so will risk investment moving elsewhere in London or the rest of the UK with a resulting loss of economic and social benefits.

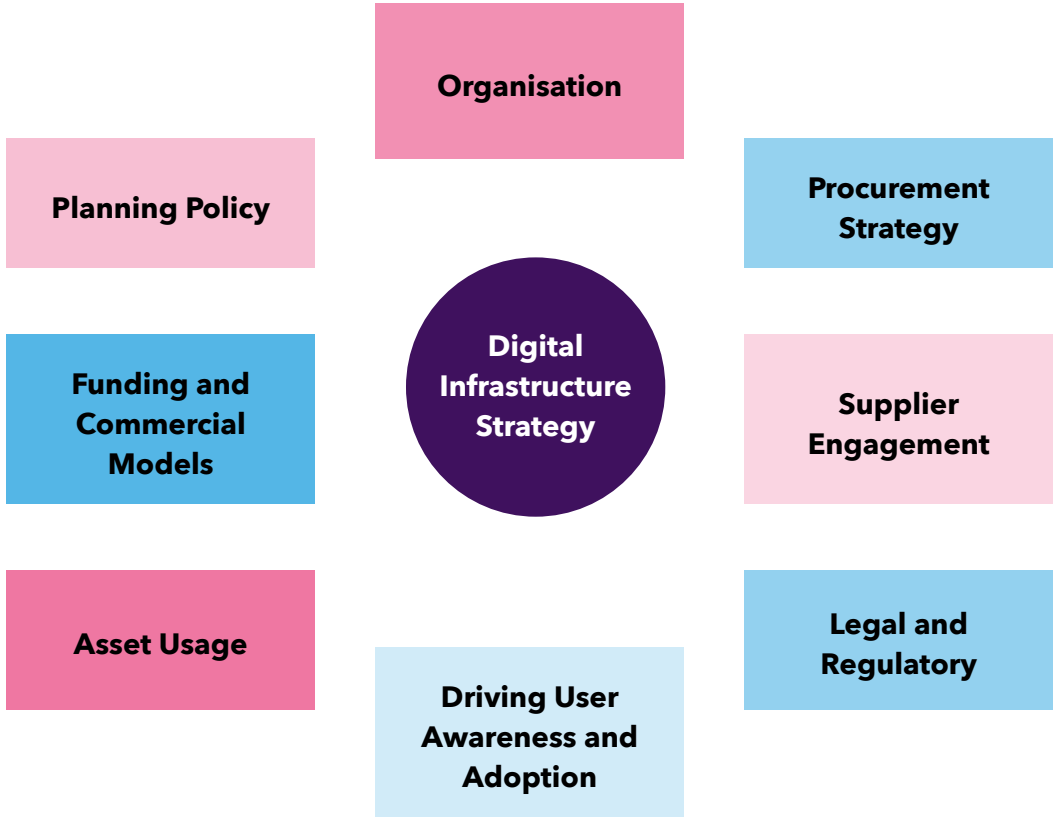
Developing a Digital Infrastructure Strategy

Boroughs require:

- **A clear and well-articulated digital infrastructure strategy** understood by both internal stakeholders and external digital infrastructure and service providers.
- **Dedicated resources** to digital infrastructure planning and deployment. This is to overcome the need for extensive an on-going engagement with the telecommunications industry and to co-ordinate internal stakeholders. The successful deployment of digital infrastructure crosses many departments including economic development, housing, highways, IT, health, education, climate change, community safety, legal, planning and finance.

Components of the Digital Infrastructure Strategy

The key issues to be defined within each Borough that form the essential components of a digital strategy are presented below.



As part of this strategy Local London and South London Partnership have developed a website that provides resources and advice around each of these areas.

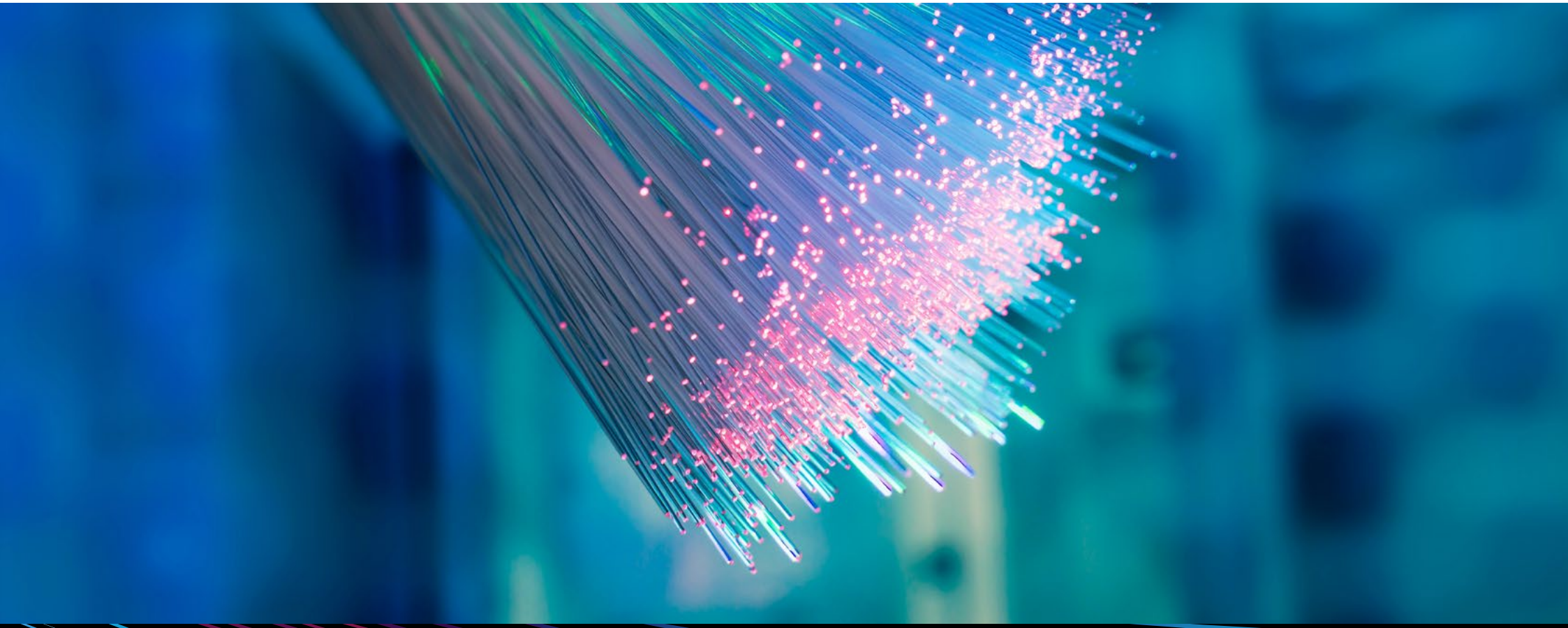
In order to effectively utilise these resources the following path should be taken:

1. Establish organisation and resources

2. Industry engagement

3. Define implementations options

4. Delivery



Step 1: Organisation Recommendations for Boroughs

Boroughs should prioritise resource to develop digital infrastructure by allocating resources to key roles and responsibilities to secure inward investment. The following key roles are proposed at a Borough level:

- **Digital Ambassador** – Elected member who can provide a link with elected members and their constituents.
- **Digital Lead** - A Senior Executive responsible for the definition and on-going delivery of a digital infrastructure strategy and who has the authority to enforce the council's digital policy.
- A **Digital Champion** whose duties should include addressing barriers to the rollout; mapping and making assets available to operators to support the rollout; identifying opportunities for public use of digital connectivity; and changing the culture of the organisation to recognise the importance of digital connection to the local area. They act as the single point of contact between industry and the Borough.
- The appointment of a **Digital Programme Board** with representatives of each department with clear senior management buy-in and a single political lead. These representatives are **Digital Facilitators** – Subject matter experts of department representatives, for example in street works, planning, property/housing. The Digital Board works with the industry to facilitate telecoms and digital infrastructure work in the boroughs and provides an escalation route to ensure a prompt resolution to any queries from the industry.

Step 2: Industry Engagement

A proactive programme of supplier engagement needs to take place including briefings, promotion of the region to the telecoms industry, lobbying for inward investment and the co-ordination of investment programmes. Such activity has proven a key catalyst for inward investment elsewhere in the country and there have been examples of plans changed by operators. Suppliers are faced with multiple opportunities and are often responsive in their planning. There is a need for such activity to be co-ordinated at both a sub-regional and Borough level.

Sub-regional dialogue is beneficial because:

- Procurement activities can be co-ordinated.
- Telecommunications operators tend to look at investment in London at a sub-regional rather than Borough level and will plan their network deployments accordingly creating a critical mass in terms of the attractiveness to investors
- It enables the sub-regions to take advantage of economies of scale and sharing resources between Boroughs that are not well-resourced to engage.
- Tools can be utilised such as Connected London mapping tools and ICS's Streets Service and tools for collaborative street works to reduce cost and disruption: The ICS has developed the Infrastructure Mapping Application (IMA) platform, which hosts speculative investments and upcoming works programmes from across the infrastructure sector.

However direct Borough engagement is also required with industry to address issues such as:

- Individual stakeholder requirements.
- Local priorities (eg economic development areas.)
- Co-ordination of existing Borough contracts. Local demand stimulation and engagement activities.
- Removal of local barriers to investment and reduction of operational challenges.

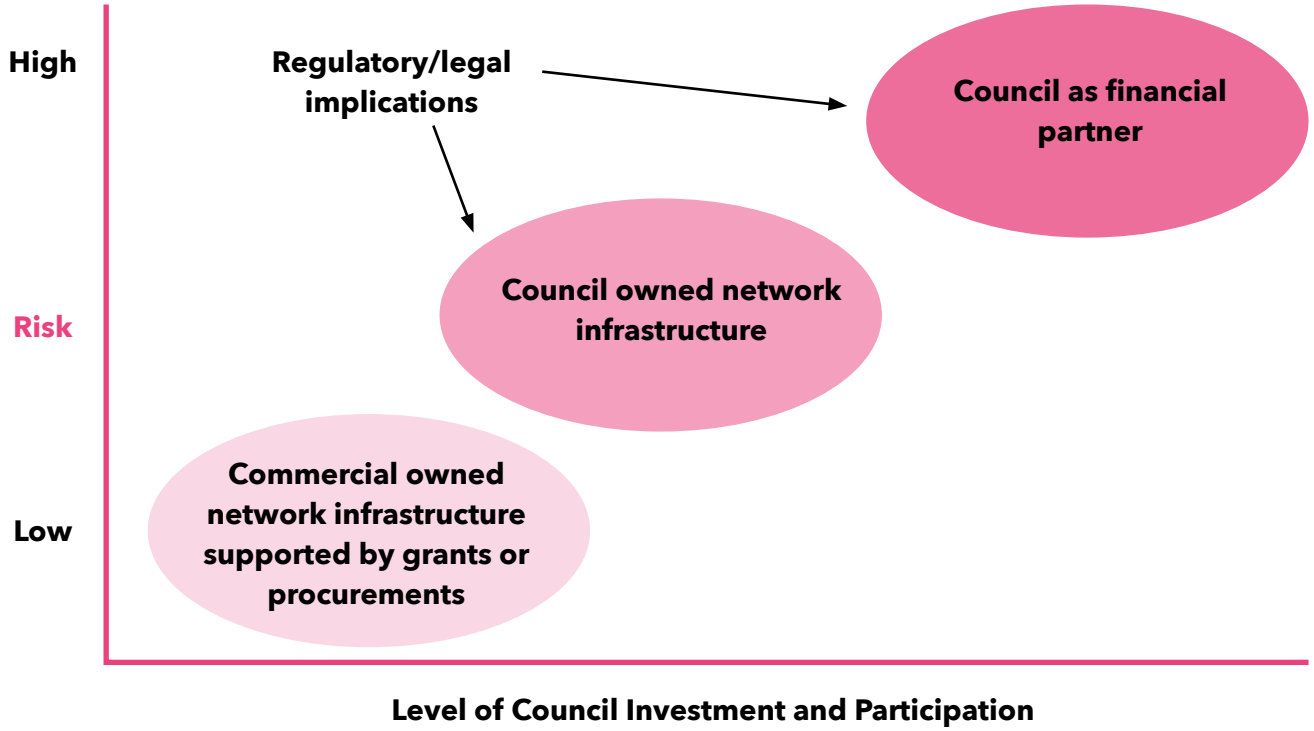
Wired Westminster is a good example of where a Borough has developed such a stakeholder engagement process.

Step 3: Defining Intervention Options

A range of procurement options and commercial models have been identified for use by Boroughs. In determining the appropriate procurement approach and commercial model to be adopted each Borough needs to assess the following:

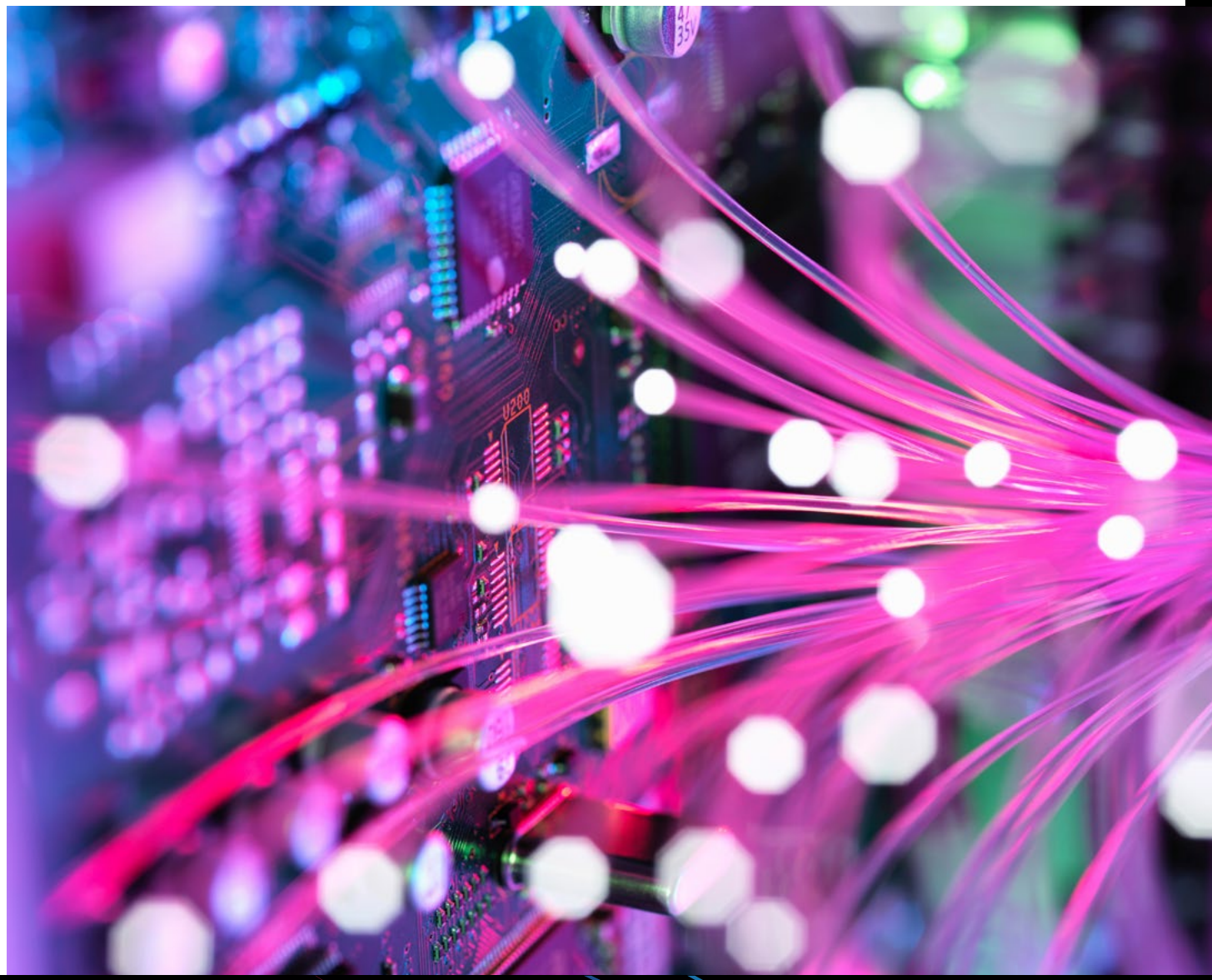
- Are assets Council owned? Is there a desire to own and potentially offer to market council owned assets? This is the case where there are assets of interest to the market and the authority is willing to operate and support such assets.
- Are assets commercially owned? Under this model the Council stimulates investment in commercially owned digital infrastructure through gap funding or an anchor tenancy procurement. The Council will provide gap funding or procure services, typically in return for a right to use of the digital assets deployed. In the case of fibre, typically this is deployed using the infrastructure of Openreach.
- Is the Council willing to make an equity or debt investment in local infrastructure?

There is a trade-off between the degree of Council participation and investment and risk as shown below:



Key issues to consider are as follows:

- Boroughs may choose to invest in assets (notably duct infrastructure, but also poles and rooftops) for future leasing opportunities or encourage third parties to do so. Duct infrastructure should be built in key transport corridors and economic development areas as a form of local investment. In parallel local policies and initiatives should be put in place to encourage usage, adopting an approach that prioritises collaborative and dig once approaches in the first instance and utilising future proofing where possible - laying spare ducts in key corridors and junctions for future adoption while avoiding repeat disruption.
- All Boroughs should utilise their purchasing power to procure either a gigabit capable managed service and/or dark fibre infrastructure to all public sites across their estate. This anchor investment by the public sector will seek to stimulate additional private sector investment by commercial sector in area. The goal is to deliver full fibre connectivity across Boroughs and drive connectivity to be contiguous to key economic development zones.



Step 4: Delivery

The key components of delivering the strategy are:

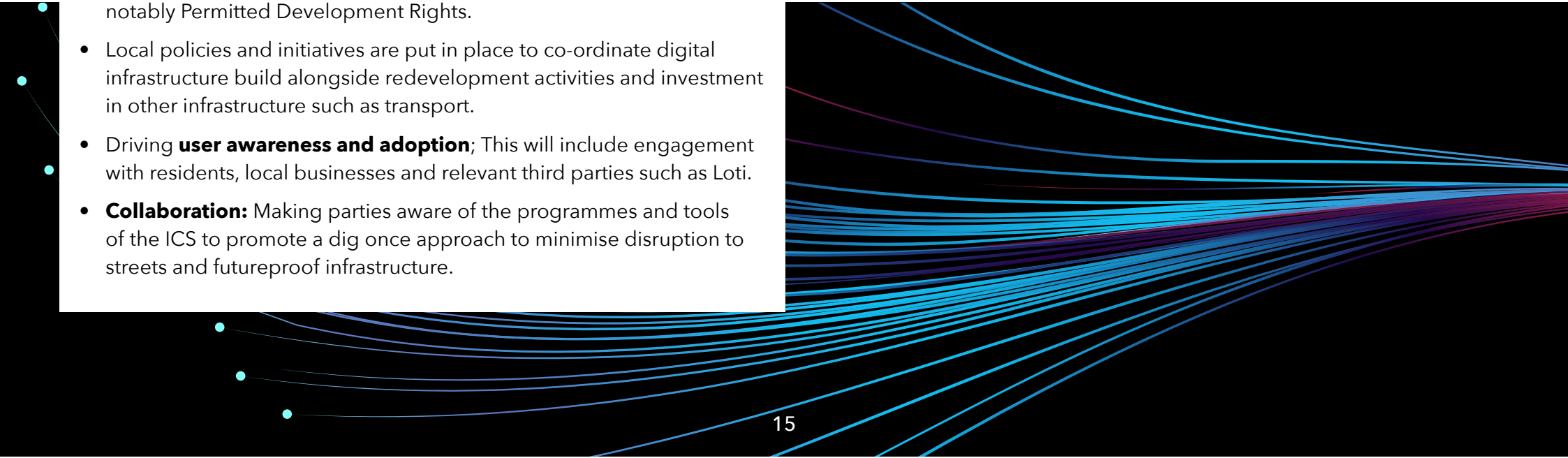
- **Finance:** This may be sourced from central government (notably DSIT), London bodies (GLA, City of London Corporation) through SIP and SIF or commercial investment. A number of bodies across the country have also raised investment capital through the capitalisation of forward revenue expenditure on digital services.
- **Borough assets:** Any assets offered by the Boroughs to the telecommunications industry (eg ducts, street assets) should be fit for purpose, unencumbered and effectively offered to the market though mapping, marketing and transparent charging.
- Ensuring compliance with **legal and regulatory** policies. This should include a subsidy assessment and compliance with regulatory policies including Electronic Communications Code.
- Ensuring compliance with **planning** policies and other guidelines, notably Permitted Development Rights.
- Local policies and initiatives are put in place to co-ordinate digital infrastructure build alongside redevelopment activities and investment in other infrastructure such as transport.
- Driving **user awareness and adoption**; This will include engagement with residents, local businesses and relevant third parties such as Loti.
- **Collaboration:** Making parties aware of the programmes and tools of the ICS to promote a dig once approach to minimise disruption to streets and futureproof infrastructure.

Conclusion

In conclusion Boroughs and sub-regions within London need to adopt a proactive and responsive approach to the telecommunications industry to drive digital infrastructure investment. Investment tends to be more successfully leveraged by those parts of London (and indeed other parts of the UK) where such an approach has been taken.

This digital infrastructure strategy provides recommendations to ensure that:

- There is a common understanding amongst all participating boroughs of what is required to advance digital infrastructure investment.
- There is a common approach across sub-regions that will remove investment barriers and stimulate inward investment.



1 Strategic Case

1.1 Background

There is broad and proven recognition that the provision of high speed and high-quality digital infrastructure drives economic growth and enables social inclusion and cohesion. There is also acceptance that the availability of world class digital connectivity stimulates innovation, boosts digital service businesses and creates new business streams. The clear conclusion is that London must address any shortfall in the availability of digital connectivity in the region and drive the up the quality and accessibility of the services already available.

Contrary to perception, there remain parts of London that have suffered from a lack of commercial investment in digital infrastructure that consequently has resulted in underlying gaps in delivery capability. These gaps need to be closed in order for Local London and the South London Partnership to achieve their goals, in particular their Levelling Up ambitions.

Regional support is required to increase the availability of full fibre to the premise in key urban areas and ensure rapid deployment of next generation wireless infrastructure to levels enjoyed in other urban areas in the UK.

In particular, this needs to be targeted at areas of social need and at key industrial areas and economic growth zones. This in turn will lead to:

- Improvement in the quality of public service delivery by ensuring all public buildings are digitally connected facilitating improved efficiency and public access to services.
- Cost savings to the public sector for digital connectivity.
- Stimulation of competition in digital services.
- Inward investment in the region by telecommunications industry and hence improve access to services for residents and businesses.
- Delivery of economic benefits through the usage of digital infrastructure, notably increased efficiency and enhanced productivity in existing firms and the attraction of new firms to the sub-regions.
- Improvements in digital inclusion.

Investment by the major incumbents Openreach and Virgin Media is on-going but is not ubiquitous and timescales are less than ideal with the roll out to many premises being planned for the middle of the decade. In addition, many alternative carriers are deterred from investment in London due to cost, fragmentation, planning challenges and scale. Similarly, investment in next generation wireless infrastructure is constrained by technology, commercial sensitivity and planning constraints. The lack of any pan-London voucher schemes, comparable to what is available in other parts of the country with support from DSIT, further makes London less attractive to operators.

A further issue is that key development corridors such as the Thames Estuary and the UK Innovation Corridor require access to digital infrastructure but brownfield redevelopment land does not typically benefit from proactive speculative commercial investment and will require pro-active engagement to achieve the level of connectivity required.

Additional challenges are as follows:

A lack of resources and appropriate organisational structure

- There is a lack of capacity and expertise in certain Boroughs regarding the development of a digital infrastructure strategy and implementation. This is also the result of funding and resources.
- The interface between authorities and the telecommunications industry is fragmented and covers Housing, Highways, Planning, IT, Community Safety and Economic Development. In some Boroughs, departments working in isolation are unaware what each is doing and there is not a holistic approach.

Industry Engagement

- There is a need to bridge the gap between the telecommunications industry and local authorities. There is an opportunity to strengthen the working relationships at a strategic and operational level across telcos and Boroughs.
- At a high-level, the telecommunications industry is often unaware of the priorities of Boroughs, together with the internal operational and resource challenges they face.
- In terms of implementation, highway authorities across London – Boroughs and Transport for London (TfL) – have a statutory duty to coordinate infrastructure works and play a key role in approving permits required for works happening on the carriageway and footway. Whilst other utilities are accustomed to openly sharing their upcoming investment strategies with highway authorities, Boroughs have struggled to gain an insight into long-term build programmes.
- The telecommunications industry has struggled to replicate data-sharing and communication practices present in other sectors due to the competitive nature of the telecoms sector.
- Similarly, Boroughs are well placed to actively engage the telecommunications industry to resolve implementation challenges whilst lobbying for and promoting inward investment.

Implementation challenges

These are wide ranging and cover areas such as:

- Planning.
- Access and use of Borough assets.
- Co-ordination of activities across departments.
- Competing demands on London's borough and TfL networks.
- Communication of medium to long term commercial strategies.
- Wayleaves.
- Co-ordination of procurement activities.
- Access to funding – notably vouchers.
- Co-ordination of activities across Boroughs.
- Driving take-up and adoption of services.
- Investment planning and Open Market Reviews.

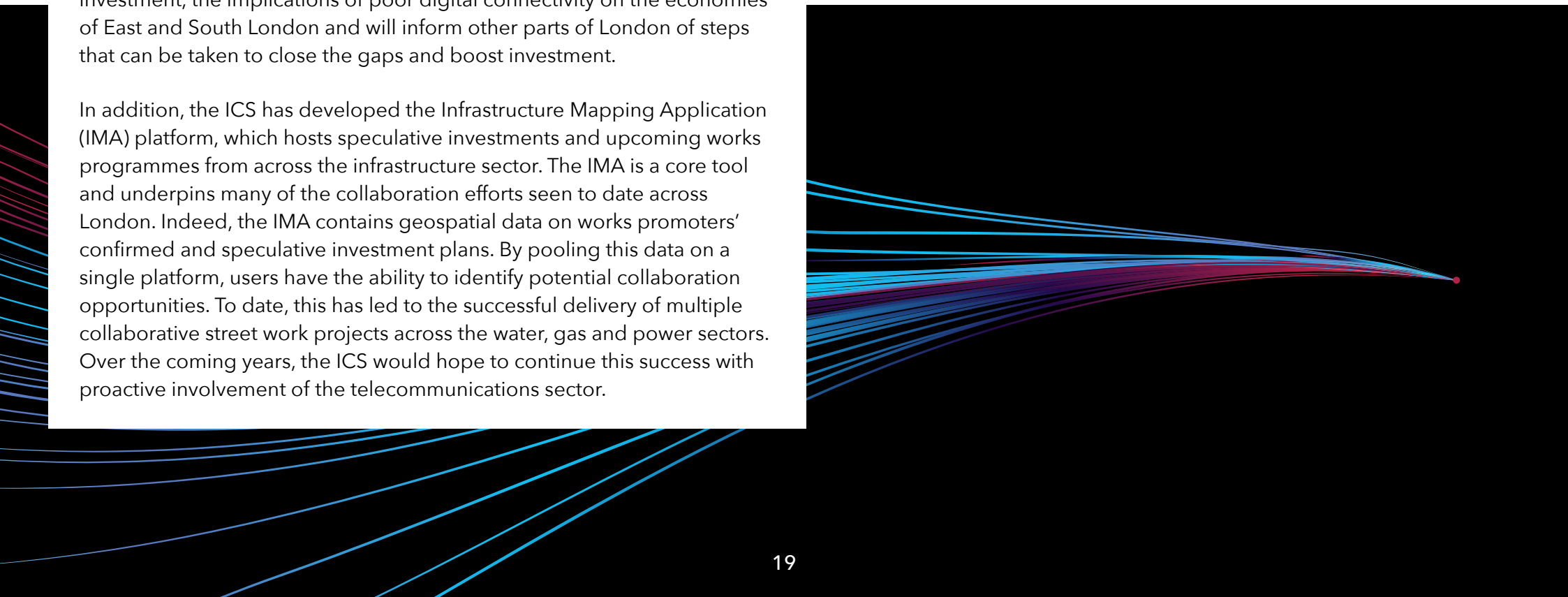
The wider context

In 2019, with backing from the Mayor of London Infrastructure Group (LIG), the Mayor established the Mayor's Infrastructure Coordination Service (ICS) at the Greater London Authority (GLA) to support better planning and delivery of infrastructure across London. The ICS works to improve efficiency, reduce disruption and address the key – current and upcoming – infrastructure challenges facing the sector.

The ICS is partially commissioning this pilot strategy study project to better understand the use case of sub-regional scale digital infrastructure planning, and how such a model can apply across London. This pilot will serve to build a more granular understanding of the barriers to investment, the implications of poor digital connectivity on the economies of East and South London and will inform other parts of London of steps that can be taken to close the gaps and boost investment.

In addition, the ICS has developed the Infrastructure Mapping Application (IMA) platform, which hosts speculative investments and upcoming works programmes from across the infrastructure sector. The IMA is a core tool and underpins many of the collaboration efforts seen to date across London. Indeed, the IMA contains geospatial data on works promoters' confirmed and speculative investment plans. By pooling this data on a single platform, users have the ability to identify potential collaboration opportunities. To date, this has led to the successful delivery of multiple collaborative street work projects across the water, gas and power sectors. Over the coming years, the ICS would hope to continue this success with proactive involvement of the telecommunications sector.

Lastly, there are a number of innovation areas that the ICS is proactively analysing, which hold the potential to reduce disruption and add value. In particular, the ICS has been reviewing the potential to utilise existing infrastructure that has been abandoned. These "abandoned assets" may support the delivery plans of multiple telecommunications companies that are operating in congested areas where existing assets pose implementation challenges, as well as providing opportunities for less disruptive delivery practices. Moreover, there is interest in the potential to align the delivery of upcoming Healthy Streets infrastructure – such as street furniture – with the needs of the telecommunications sector.



1.2 Fixed Infrastructure and Asset Mapping

1.2.1 Commercial Broadband Services

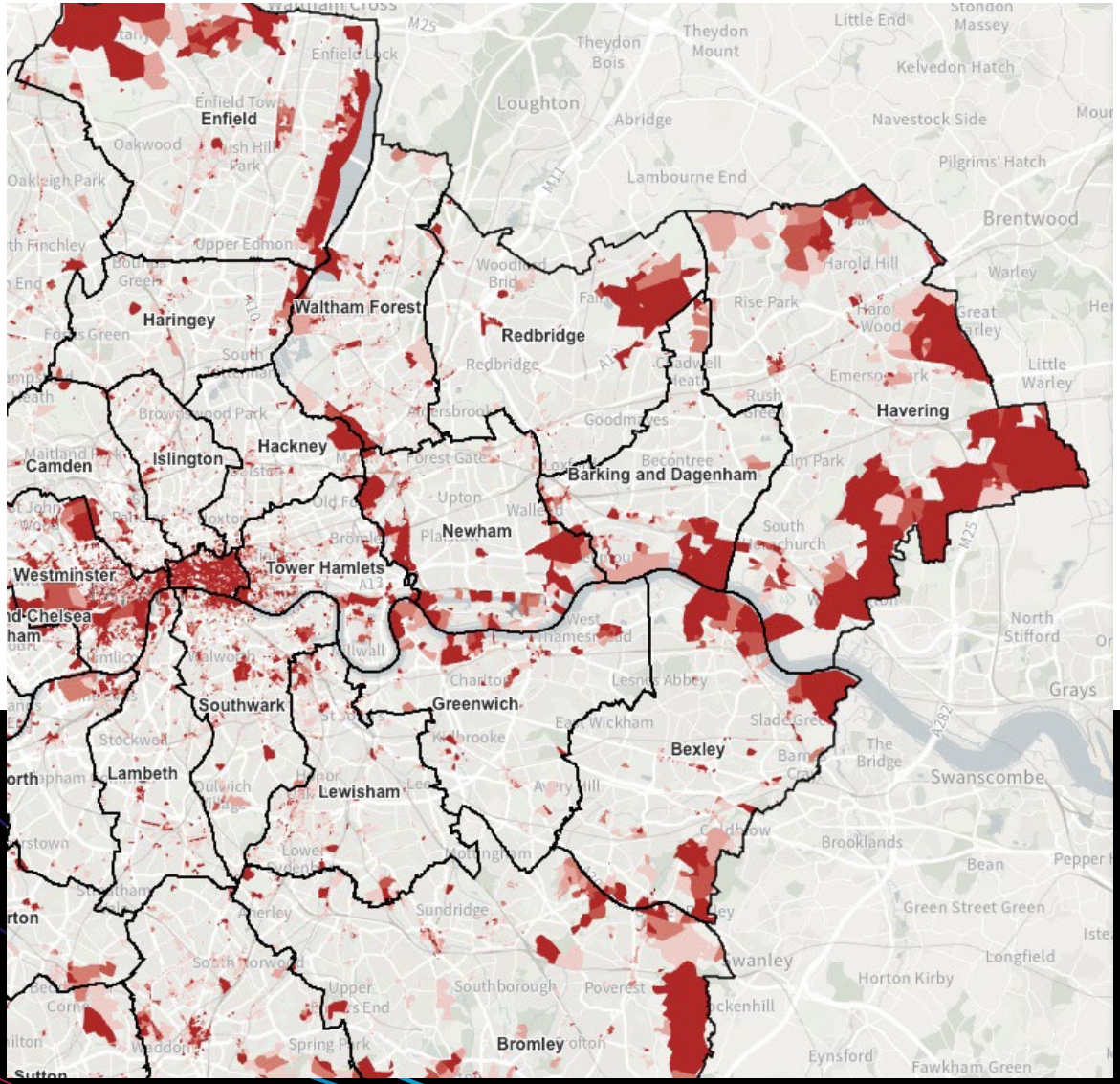
Overview

As part of this study an interactive map has been developed showing existing and planned commercial infrastructure. This is overlaid with details of development zones and public sector assets.

Access to ubiquitous gigabit capable broadband coverage is viewed as an essential component to delivering economic growth and social well-being in the region. However, as a region there remain considerable challenges to deliver this goal. This can be seen in the following Local London table (source Ofcom Autumn 2022 Update.)

Borough	Nb of Premises	% Gigabit capable	Nb Not Gigabit Capable	% Not spots	Number Not Spots (<30Mbps)
Barking and Dagenham	80,816	89.6%	8,407	1.4%	1,167
Bexley	104,167	80.8%	20,000	1.9%	1,942
Bromley	146,920	88.6%	16,749	1.7%	2,4S4
Enfield	134,634	85.8%	19,118	2.0%	2,633
Greenwich	126,492	79.6%	25,804	1.2%	1,547
Havering	112,533	80.4%	22,056	2.5%	2,861
Newham	130,597	83.9%	21,026	1.3%	1,707
Redbridge	111,781	85.9%	15,761	1.5%	1,724
Watham Forest	112,336	86.6%	15,053	3.3%	3,694
Total Local London	956,109	84.6%	163,974	1.87%	17,275

There are over 163,000 premises in the Local London sub-region unable to receive gigabit capable broadband and of these over 19,000 premises are a not spot. The locations of the not spots are illustrated below:



Ofcom Premises Unable to receive 30Mbps (postcode)

Unable to receive 30Mbit/s

- >0% - 20%
- 20% - 40%
- 40% - 60%
- 60% - 80%
- 80% - 100%

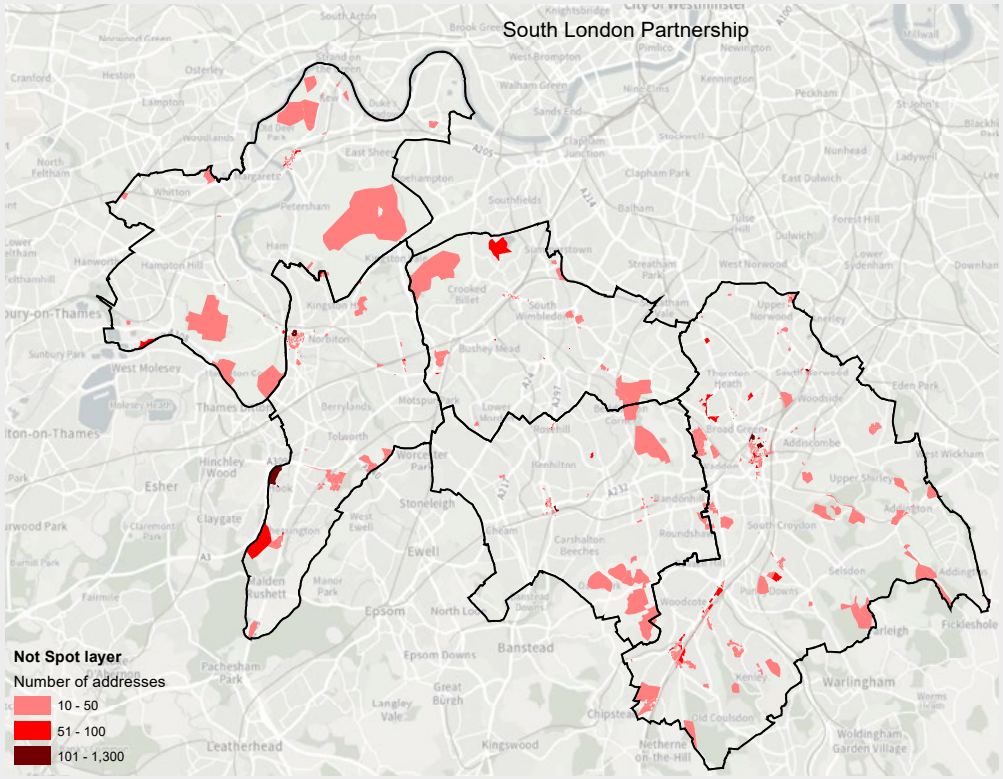
It is worth noting that only 35% of Local London premises have access to full fibre and two of our Boroughs have <10% full fibre coverage.

This picture is mirrored in South London Partnership as shown below (Figures as of Jan 23):

Boroughs	Nb of ALL Premises	Gigabit capable coverage %	Nb Not Gigabit Capable	Not spot %	Number Not Spots (<30Mbps)
Croydon	171,416	86.6	22,969	3.3	5,638
Kingston	71,190	87.4	8970	1.7	1,176
Merton	91,282	90.3	8,854	0.9	823
Richmond	89,091	87.5	11,,136	1.5	1,340
Sutton	87,981	88.1	10,469	1.4	1,248
TOTAL	510,960		62,398		10,225

There are almost 73,000 premises in the region unable to receive gigabit capable broadband and over 10,000 of these are a not spot.

Only 43% of the premises in the sub-region have full fibre access.



To accompany this report an interactive GIS has been created to enable officers to see broadband penetration and planned roll out in their area, along with demographic data and public sector assets.

1.2.2 Project Gigabit

Objective

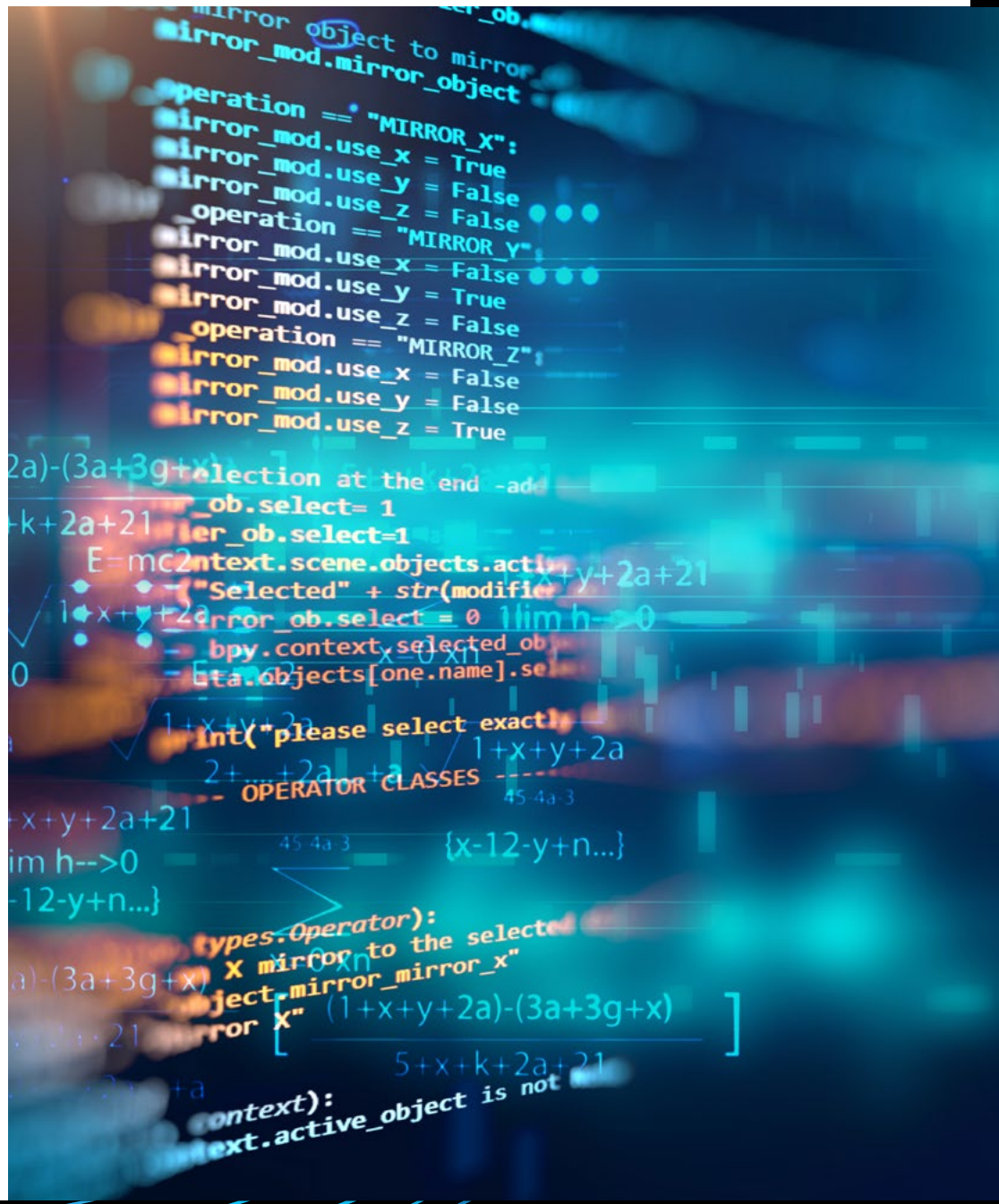
Project Gigabit is a central government £5 billion programme to enable hard-to-reach communities to access gigabit-capable broadband that is being led by DSIT.

As part of this programme BDUK is launching phased contracts to those hard-to-reach parts of the UK that will need government support towards the cost of gigabit-capable broadband. London is Lot 37 of this programme.

Planned Project Gigabit deployment by year

At the time of writing this, a Pilot is being conducted by DSIT following which, there will be a review of urban areas for potential intervention plans.

A detailed mapping of potential intervention areas and premises to be served is held by GLA under NDA. However, there are over 600,000 premises across London identified as not having gigabit capable services. Over 50,000 are within South London partnership and > 100,000 lie in Local London. Particularly poorly served Boroughs include Croydon, Newham, Greenwich and Waltham Forest.



1.2.3 SIP and SIF Funded Programmes

Overview

South London Partnership secured funding from the Strategic Infrastructure Fund via GLA - £1m per borough to increase fibre footprint in their borough (especially into under-served areas) via their public sector sites, which would be used to stimulate further investment from the operators.

Kingston, Sutton and Croydon were part of the initial pilot.

GLA trialled 2 procurement routes:

1. Crown Commercial Services for Croydon.
2. TfL and Boldyn Networks concession agreement for Kingston and Sutton.

TfL awarded a 20-year telecoms concession to Boldyn Networks.

All four major mobile operators, Three, EE, Vodafone and Virgin Media O2 have signed up to bring high-speed 4G and 5G-ready mobile connectivity across the Tube, including within the tunnels.

Work on delivering 4G coverage across the Tube network is well underway on the Jubilee line, Northern line and Central line.

The mobile network will also host the new Emergency Services Network (ESN). This will give first responders immediate access to life-saving data, images and information in live situations and emergencies on the frontline.

By the end of 2024, Tube customers will be able to access full mobile connectivity and the Internet within every London Underground station and tunnel, including the Elizabeth line. This investment will remove one of the most high-profile mobile 'not-spots' in the UK.

Adding to fibre connectivity

London's Tube tunnels will host a new high-capacity fibre optic network across London which will be used to provide full fibre connectivity across the city. Our Tube stations will be the connectivity hubs and our street assets such as lighting columns and bus stops will host a network of small mobile transmitters which will bring city-wide connectivity improvement and ready London for 5G.

The new high-capacity fibre network will take fibre directly into London's neighbourhoods, creating new opportunities for commercial and domestic usage with gigabit-capable speeds that will support digital inclusion and future growth.

More than 2,000km of cabling will be installed on the network, all of which will be fitted outside of operating hours. In addition to benefitting customers, the network will host the Home Office's new Emergency Service Network used by the Police, Fire and emergency response services.

The partnership with Boldyn Networks will also generate additional revenue for TfL across the 20-year lifespan of the contract and help our operations teams.

All 3 boroughs upgraded their CCTV networks with Kingston and Sutton adding dark fibre connections between council HQs.

TfL ran a Value for Money exercise between both procurement routes based on:

- Commercials.
- Number of sites.
- Flexibility of contract.
- Products offered.
- Term.

Boldyn Networks concession agreement was proved best Value for Money and the route to market for Merton and Richmond.

Borough	Approach	Summary
Croydon	CCTV sites upgraded to full fibre via Crown Commercial Services Framework and awarded to BT	84 CCTV circuits – 54 completed to date (August 2023)
Kingston	CCTV sites upgraded to full fibre, plus dark fibre links in the borough via the TfL/Boldyn Networks Framework	Project Completed
Merton	Amalgamating CCTV and WAN infrastructure onto one network via the TfL/Boldyn Framework and have used own Capex to match fund the project to complete 100% sites	Project Kick-off meeting completed and awaiting delivery of Phase 1
Richmond (and Wandsworth)	Used SIF to consolidate the both separate council WAN's into one network and upgrade to full fibre/ dark fibre at sites via TfL/Boldyn Networks Framework	Project Kick-off meeting completed and awaiting delivery of Phase 1
Sutton	CCTV sites upgraded to full fibre, plus dark fibre links in the borough via the TfL/Boldyn Networks Framework	Project completed July 2023

In parallel Local London Boroughs secured funding from the Strategic Investment Pot to upgrade the digital infrastructure between public sector sites in its Boroughs. The goal was to drive fibre connectivity into poorly served areas of the sun-region and, in doing so, leverage further commercial investment.

A framework procurement was established by London Borough of Bexley to enable the Boroughs to procure digital infrastructure. Each of the Boroughs is able to invest in one or more of the following streams:

- Build Borough owned ducting and fibre linking public sector sites. This duct capacity could then be offered to the telecommunications industry to stimulate inward investment.
- The procurement of Gigabit capable fibre based services to public sector sites to anchor investment by the commercial sector and extend the footprint and availability of such services.
- Procuring fibre capacity from wholesale telecommunications service providers. This will stimulate commercial in-fill of gaps in broadband and mobile provision as the wholesaler will market additional fibre capacity to mobile operators and internet service providers to drive commercial service delivery.

The strategy of all Boroughs is based on the connection of public sector sites to be subsidy law complaint.

The suppliers engaged in this process include:

- Wholesale infrastructure providers: Zayo, Neos and Glide.
- Managed service providers: ITS and MLL.
- Civil engineering companies: Conway and Kenson.

The Boroughs have differing approaches, largely based on whether they already own their own duct infrastructure or whether they wish to partner with commercial operators and deploy fibre using PIA.

Borough	Approach	Status
Barking and Dagenham	Expansion of fibre into key economic development zones on North Thames.	Procurement complete and awarded to ITS. Build to be complete 2023.
Bexley	Wholesale dark fibre circulating Borough. Key areas served include south bank of Thames including Thamesmead and Erith. Anchored by Bexley WAN and CCTV.	Contract awarded to ITS. Build completed and additional network reach provided from ITS funding.
Enfield	Expansion of ducting into key economic development zones such as Meridian Water.	Initial phase of duct build awarded to Kenson. Second phase to be procured.
Greenwich	JV with commercial partner ITS to deliver wholesale fibre in Woolwich passing 1450 business premises and up to 173 MDUs.	Launched February 2023.
Havering	Wholesale dark fibre circulating Borough.	Contract awarded to ITS. Build in progress. To be completed Autumn 2023.
Newham	Expansion of duct footprint across Borough linking all public sector sites.	Design complete. Likely to go to market in Autumn 2023.
Redbridge	Duct investment in Hainault followed by wider procurement of wholesale fibre.	First phase awarded to Kenson. Phase 2 procurement mid/late 2023.
Waltham Forest	Expansion of duct and fibre capacity into Lee Valley.	Procurement completed and awarded to Neos. To be completed early 2024.

1.3 Wireless Infrastructure

1.3.14G

The current availability of cellular mobile services in the region is shown in the following table (Source Ofcom: Autumn 2022). This is measured by looking at the % of premises in a region able to receive indoor and outdoor services from each of the operators.

In fact, outdoor coverage across each operator is near to ubiquitous in the sub-regions.

Borough	Premises unable to receive a service	Premises able to receive a service from 1 operator	Premises able to receive a service from 2 operators	Premises able to receive a service from 3 operators	Premises able to receive a service from 4 operators
Barking and Dagenham			0.01	1.81	100
					98.17
Bexley				0.03	99.97
		0.02	0.25	3.1	96.63
Bromley			0.05	0.26	99.69
	0.04	0.22	1.02	6.35	92.36
Croydon				0.21	99.79
	0.03	0.19	0.63	3.5	95.65
Enfield				0.01	99.99
		0.02	0.18	1.64	98.16
Greenwich					100
			0.14	2.06	97.81
Havering				0.06	99.4
		0	0.14	4.9	94.99
Kingston				0.01	99.9
			0.14	1.18	98.67
Merton				0.01	99.9
		0.01	0.1	0.52	99.38
Newham					100
				0.12	99.88
Redbridge				0.14	99.86
		0.06	0.58	3.09	96.28
Richmond				0.03	99.97
		0	0.12	3.43	96.45
Sutton					100
			0.01	0.71	99.28
Waltham Forest					100
			0.3	7.05	92.25

4G Coverage in Region (Pink = outdoor; Blue = indoor) Source Ofcom Autumn 2022 Update.

1.3.2 5G

On 11 April 2023 the UK Government launched their Wireless Infrastructure Strategy, which sets out a policy framework to affirm our unwavering commitment to extending 4G coverage to 95% of the population, deliver high quality 5G to all populated areas in the UK by 2030, and investing £40 million to drive take up of innovative 5G-enabled services for businesses and the public sector.

Key policies set out in the strategy include:

- A new ambition of nationwide coverage of standalone 5G to all populated areas by 2030 - so everyone can take advantage of new technology.
- Fixing coverage reporting, including on trains, shining a light on where coverage needs to be improved.
- £40 million new funding to establish 5G Innovation Regions across the UK. This funding will encourage 5G take-up in the public sector and in industry. We will establish a regional taskforce to encourage take-up and investment at the local level, and we will ensure new hospitals have access to 5G or similar advanced wireless connectivity, allowing major improvements in healthcare delivery.
- Investing £100 million in the future of 6G, so the UK plays its role as a science superpower.

More information available at:
UK Wireless Infrastructure Strategy - GOV.UK (www.gov.uk)

All of the mobile operators have launched 5G services in both sub-regions although capacity and coverage remains far from ubiquitous.

As technology is refreshed commercial investment by the mobile industry will deploy 5G services across the region. The challenges for the sub-regions are:

- To ensure that deployment is rapid and not constrained by barriers
- Some of the key sectors in the sub-region do not just require a 'vanilla' service. They require a 5G ecosystem incorporating not just connectivity but also data platforms and computing. They will need to harness artificial intelligence, machine learning, video analytics amongst others to drive productivity and innovation.

Hence we have a two layer approach.

Firstly, we will work with our local authorities to stimulate rapid investment in 5G across the region by:

- Simplifying and accelerating the planning and other policies.
- Facilitating the use of public sector and other assets such as street furniture.
- A pro-active programme of engagement with industry to encourage service deployment.
- Engaging the 'dig once' approach promoted by the ICS to explore less disruptive and more efficient collaborative opportunities, and promote the benefits to all parties from adopting this approach.

Secondly, we will engage with our key industry sectors/clusters to define the applications, use cases and technologies required to drive innovation and competitiveness. We will interface with the telecommunications industry and act as a catalyst to deliver a number of Innovation Areas where 5G private networks and advanced computing will deliver world class innovation and productivity.

The Boroughs in the region are interacting with the mobile operators and third-party intermediaries such as Cellnex, Ontix and Freshwave to accelerate progress on these issues.

In addition, the sub-regions have been engaging with a number of key local industry sectors that require investment of more than a pure vanilla service. In such sectors 5G use cases have been defined to drive efficiency and competitiveness. Often private 5G networks have been deployed in a defined area upon which use cases are tested along with 5G features such as network slicing – effectively a 5G corporate network.

1.4 Public Sector Infrastructure

1.4.1 Ducting

Some of the Boroughs in the region have an extensive council owned duct network This is currently used for applications such as the WAN, CCTV, traffic control, street lighting and power.

The Boroughs with the most extensive council-owned duct networks are:

- Newham
- Enfield
- Redbridge
- Bromley
- Waltham Forest
- Richmond
- Sutton

Spare duct capacity could be offered to the telecommunications market at benchmarked tariffs. The telecommunications industry can use this to deliver connectivity between Council and other public sector buildings, the provision of backhaul for small cells and to underpin Smart City initiatives.

However, it should be stated that have been challenges with the use of such legacy duct infrastructure:

- In many cases it has not been adequately maintained and is not of commercial standard.
- Boroughs do not have the resources to promote spare capacity to the telecoms industry and provide the necessary on-going service and support.
- Operators are often reluctant to use such assets. Since the advent of PIA telecoms operators favour a single contractual relationship with Openreach rather than numerous local authorities across the country.

1.4.2 WAN Infrastructure

WAN infrastructure provision is delivered through different approaches across the region. This includes:

- Council owned ducting and fibre (eg Enfield and Newham.)
- The use of dark fibre from a commercial third party, typically delivered using PIA (eg Bexley, Havering, Merton and Richmond.)
- Managed services (Barking and Dagenham.)

1.5 Conclusion

1.5.1 Fixed Infrastructure

Across London as a whole, the availability of gigabit capable full fibre broadband services is now 44% of all premises (source Ofcom: December 2022)

However there remain considerable gaps in the sub-regions with Local London and SLP both having less than the London average. This is illustrated below:

Subregional	Total ALL Premises	Gigabit capable Prems	Full Fibre Prems	% Gigabit Capable	% Full Fibre
Central London Forward	1,515,538	1,187903	778181	78.4%	51.3%
Local London	1,063,837	912,265	430,119	85.8%	40.4%
West London Alliance	877,824	684,454	330,977	78.0%	37.7%
South London Partnership	510,033	436,961	188,691	85.7%	37.0%
London	3,967,232	3,221,583	1,727,968	81.2%	105,371

This is because:

- Commercial investment in full fibre infrastructure by Openreach and Virgin Media is not ubiquitous, and the timescales and depth of coverage are unclear.
- The build out under the Project Gigabit contract is welcome but there remain challenges to be addressed. In particular timescales mean that many sites will not receive service until 2025-2027.
- National Gigabit vouchers run by DSIT have been targeted at rural areas with most London postcodes excluded.
- A number of national operators have shown a reluctance to proactively invest in London, particularly in outer Boroughs. Work has been carried out, engaging with all registered local and national telecoms operators capable of deploying superfast broadband solutions, either through fixed broadband solutions or through alternative technology. Challenges are cost, fragmentation, scale and lack of resources.

1.5.2 Mobile Infrastructure

The commercial deployment of 5G infrastructure is on-going and will continue as operators refresh their 4G infrastructure.

The challenge for the sub-regions is to ensure that key strategic industry sectors are supported to adopt 5G use cases and deliver a sustainable, completive advantage for the region.

In addition, there is a need to remove barriers to deployment such as:

- Planning.
- Utilisation of street assets.

2 Strategic Objectives

2.1 Gigabit Broadband Targets

At a national level the UK Government target is for gigabit broadband to be available nationwide by 2030 with a minimum of 85% of premises by 2025.

Full details are provided in the House of Commons Library in research briefing cbp 8392

London targets are aligned to these national goals. It is desirable that:

- All businesses premises in the region to have access to gigabit capable full fibre services by 2025.
- All residential premises to have access to gigabit capable services by 2030.

Part of the Government's strategy on gigabit broadband roll-out is to bring policy reforms to make it easier for the telecoms industry to build infrastructure and to promote a competitive market for new networks.

London has embraced such an approach.

In addition, it is also important to ensure:

- South and East London has all necessary infrastructure to be 'Smart' and deliver accompanying targets such as environmental goals and public service delivery.
- There is the development of 'Innovation Locations' that are an ecosystem encompassing connectivity, data platforms and applications to serve our key sectors ie:
  - Finance.
  - Logistics and Distribution.
  - Creative.
  - Digital.
  - Food processing.
  - Next generation manufacturing.
- Facilitate equality of access and affordability.
- Service adoption amongst local businesses and residents is stimulated though:
  - Skills.
  - Awareness.

London Plan SI6 states that 'Development Plans should support the delivery of full-fibre or equivalent digital infrastructure, with particular focus on areas with gaps in connectivity and barriers to digital access.'

2.2 Mobile Infrastructure

The UK Government Levelling-Up White Paper included two targets for mobile coverage by 2030:

- 4G mobile coverage is available nationwide, and
- the majority of the population has access to a 5G signal.

Nationwide 4G coverage means that 95% of the UK landmass should receive signal from at least one mobile operator.

The 2030 timeframe aligns with the Government's other levelling up missions. However, the Government says it aims to reach the mobile coverage targets earlier. For 4G, the Government aims for 95% coverage by 2025 as part of the Shared Rural Network (SRN) agreement.

In April 2023 the Government announced the **Wireless Infrastructure Strategy** that detailed further the approach and targets for 5G.

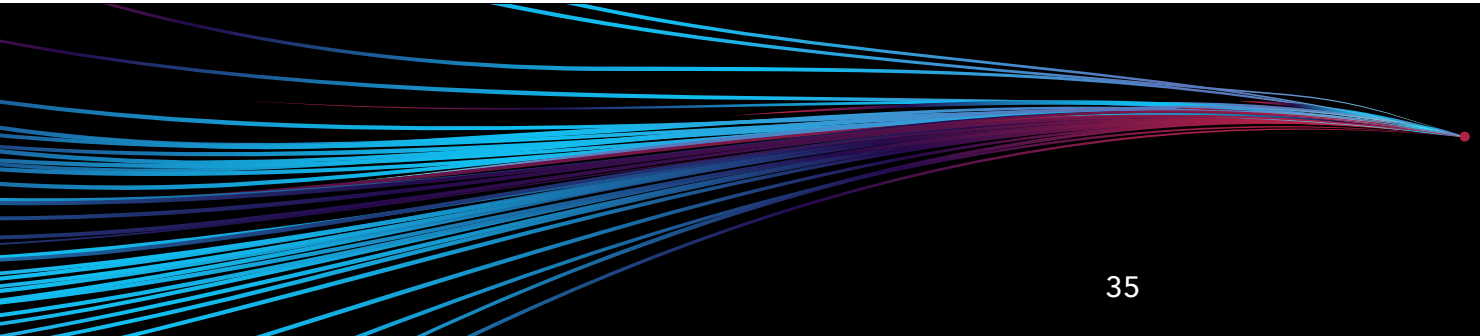
In a London context the challenges are not around coverage but capacity. Mobile operators need to deploy extensive infrastructure across the sub-regions to ensure that demand can be addressed.

Currently, mobile network operators (MNOs) are directed to the pre-app service for mobile mast applications within each borough. This approach is being reviewed via the London Plan to create a more streamlined, strategic way of working between Local Authorities and the industry.

Arcadis Consultants were awarded the contract to carry out the review and help implement the London Plan Digital Connectivity ambition.

In addition:

- Development proposals should demonstrate that mobile connectivity will be available throughout the development and should not have detrimental impacts on the digital connectivity of neighbouring buildings. Early consultation with network operators will help to identify any adverse impact on mobile or wireless connectivity and appropriate measures to avoid/mitigate them.
- Access for network operators to rooftops of new developments should be supported where an improvement to the mobile connectivity of the area can be identified.
- Where possible, other opportunities to secure mobile connectivity improvements should also be sought through new developments, including for example the creative use of the public realm.



3 Options Analysis

3.1 Options

The outcomes from the strategic case are to ensure that:

- The sub-regions and development zones have access to ubiquitous full fibre infrastructure to deliver economic growth and inward investment.
- There is widespread equality of access to broadband services across the region to deliver social cohesion, efficient delivery of public services and economic growth.
- Delivery of digital infrastructure is proactively designed to utilise innovative and collaborative approaches to reduce disruption to Londoners and its potential environmental impact.

In order to deliver such goals, we cannot rely on market forces alone and the sub-regions will need to undertake a series of interventions and activities.

In this section a long list of potential options has been defined and evaluated.

The following sections describe the merits of each of these in turn.

Long List Options

Option 1: Do Nothing

Description and Rationale:

- No actions or funding undertaken by Local London and South London Partnership. Market players left to deploy infrastructure against their own investment criteria.
- No co-ordination or aggregation of purchasing power of public sector in the region to stimulate additional investment.

Costs: £0

Benefits: £0

Issues/Risks:

- There is a risk that there will be a concentration of investment into the key commercially attractive centres of London only. e.g. Openreach has announced its full fibre programme into some but not all exchange areas in our sub-regions. Other exchange areas may not see investment in the foreseeable future. The impact would be negative, with limited or no inward investment and digital transformation, including digital led innovation. It would inevitably reinforce the drift of employment towards more commercially viable parts of London or outside the region.
- Feedback from Open Market Reviews has revealed extensive gaps in coverage and investment in the sub-regions.
- There will be a lack of competition and choice in the region that will impact service availability and pricing.
- Social loss – very limited improvement to households with access to healthcare, education, access to social care and public services.
- Economic loss – productivity, inability to telework, reduced employment opportunities.
- Reduced ability to attract digital intensive sectors into region (e.g. media, finance.)
- Reactive delivery – disruptive and uncoordinated infrastructure delivery.

Option 2: Do Minimum: Supply Side Engagement

Description and Rationale:

Local London and South London Partnership to proactively engage with market. Activities to include:

- Briefing industry on regional plans and requirements.
- Co-ordinate public sector procurement activities.
- Lobby for inward investment.
- Promotion of region as test bed for new technologies and services
- Arranging site visits, events etc.
- Actively encouraging and supporting cross sector delivery collaboration.
- Providing single interface between industry and the regional public sector bodies and a point of contact for issues such as planning, wayleaves etc.
- Co-ordination of programmes with UK Gov, GLA, other sub-regions etc.

Such activity has proven a key catalyst for inward investment elsewhere in the country and there have been examples of plans changed by operators such as ITS, Neos and Virgin Media. Suppliers are faced with multiple opportunities and are often responsive in their planning.

There is a need for such activity to be co-ordinated at a sub-regional level. In addition, the level of competition in the sub-region is low compared with central London that has resulted in a limited incentive for investment by incumbent infrastructure providers.

Costs: £ 100k - £150k per annum per sub-region

Benefits:

Easier to target support and to coordinate other funding channels to benefit the sub-regions.

Increased investment by operators over and above 'Do Nothing'. Harmonisation with other initiatives such as project Gigabit and building on procurements such as SIP and CIF.

To be monitored against clearly defined targets for inward investment and service provision. An indicative target could be to attract an additional £5m of inward investment stimulated over the five-year programme plus successfully obtained £10m of public grant funding.

Issues/Risks:

- Limited financial exposure for sub-regions. A natural extension of existing GLA funding stream.
- Time to implementation reducing potential impact achieved.
- Regional priorities may be ignored.
- Competition for investment from other parts of UK.
- Supplier appetite for regional investment may be limited.

Option 3: Do Something: Asset Investment Programme

Description and Rationale:

- Boroughs to invest in duct infrastructure for future leasing opportunities or encourage third parties to do so. Duct infrastructure to be built in key transport corridors and economic development areas as a form of local investment.
- Local policies and initiatives put in place to encourage duct build whenever regional building or transport infrastructure is being deployed.
- Utilise future proofing where possible - lay spare ducts in key corridors and junctions for future adoption while avoiding repeat disruption.
- Adopt an approach that prioritises collaborative and dig once approaches in the first instance.
- Potential to support third party telecommunications operators to deploy fibre in abandoned assets or existing ducting to reduce deployment costs.

Costs:

- Estimated duct costs of £50-£100per metre dependent on terrain. May be reduced if sharing dig costs with other infrastructure.
- Cost savings in terms of traffic management and collaborative efficiencies.

Benefits:

- Reduced cost of investment for fibre service providers seeking to invest into region.
- Builds positive working relationships with Highway Authorities and other utilities.
- A return on the investment can be gained over a 15-year timeline from access charges.
- Stimulate inward investment and deployment by commercial operators.
- As there is no guarantee of investment by operators in laying and operating new fibre in the ducts, the economic impact is not certain. If routes are carefully chosen and the roll out is staged by only preceding with phases when some commitment is given by the private sector, then economic benefits and faster deployment will be delivered.

Issues/Risks:

- Ducting will have to be offered to the market in compliance with subsidy regulations. Will require subsidy assessment and benchmarked pricing.
- Boroughs are responsible for ownership, sales and operational maintenance and operation of ducting.
- May be limited appetite by industry to use the ducting outside of key commercial areas.
- Ducting will have to be built to a standard acceptable to the industry for use (Carrier Grade).
- The procurement, planning and build of infrastructure is likely to be take a minimum of 1-2 years to deliver.

Option 4: Do Something: Borough Procurements/Anchor tenancy

Description and Rationale:

- Boroughs to procure either a managed service and/or dark fibre infrastructure to all public sites across their estate. This may be WAN sites, CCTV etc. defined development zones. (Note public sector sites only chosen to comply with subsidy regulations). Service definition may be a blend across the region based on local requirements and commercial appetite to deliver services.
- Anchor investment by the public sector will seek to stimulate additional private sector investment by commercial sector in area.
- Procurement to deliver full fibre connectivity across Boroughs and drive connectivity to be contiguous to key economic development zones.

Costs:

- Estimated capital investment of £1m - £2m per Borough across the region.
- Note this estimate in an upper ceiling based on building new duct and fibre to an indicative footprint on public sector sites in the region.

Benefits:

- Stimulate inward investment by commercial telecoms sector into the region. Experience has shown that commercial investment in a city region typically delivers commercial match funding and a leverages additional commercial investment.
- Enhanced service choice in the region.
- Lowers cost of entry for ISPs in the region.
- Lowers cost of deployment for mobile operators to deliver 5G services.

Issues/Risks:

- Boroughs will need to undertake the procurement. Procurement channels have been identified (including use of frameworks) and presented in a toolkit for Boroughs as part of this project.
- Funding would need to be sourced by a blend of public sector and commercial contributions (note: in other areas of the UK some authorities have capitalised future telecoms revenue expenditure as a contribution to projects of this nature.)
- The Boroughs will need to deliver its services over any new infrastructure built/deployed in the region. This will need co-ordination and possible investment in new equipment and service provision.
- The question remains, will there be industry appetite to invest across the regions.
- The procurement can only address connectivity to public sector sites to avoid the risk of subsidy challenge.

Option 5: Do Something: Financial Measures – Investments/Loans

Description and Rationale:

The sub-regions could move away from a subsidy/gap funding approach and instead adopt an investment driven model. This may involve equity investment in joint ventures/SPVs or even facilitating loans to digital infrastructure providers to enable investment in the region.

A recent example is **Digital Greenwich Connect** the joint venture between Royal Borough of Greenwich and ITS to stimulate investment in Woolwich.

Costs:

Investments are made by the Borough into a joint venture. This would be equity (or possibly debt) funding, matched by the commercial partner are made by the City Deal to the commercial sector.

The proposed investment fund is a minimum of £1m per Borough.

Benefits:

The benefits of such an approach are:

- Local businesses and residences will be passed with fibre in a more timely manner.
- It will make the sub-regions viewed as a more attractive and welcoming location in which to invest by the investment community.
- Boroughs will have input as to targeting investment locations.
- The provision of open access infrastructure will stimulate competition
- Backhaul costs to ISP's and MNO's could be reduced.
- Investment of this nature has been shown to deliver a Benefit Cost Ratio of 14:1 as well as additional social benefits.

Typically such ventures are sought from smaller operators that lack access to investment capital at attractive rates or have the challenge of raising funds from the private equity markets.

Issues/Risks:

Points to note are that:

- The public sector bodies in the region would be involved in complex governance and on-going management.
- Technical and commercial due diligence is required, and a process defined for the identification of commercial partners.
- In the event that the investment venture fails, the public sector would have step in rights and would take ownership of any assets deployed.
- Subsidy approval would need to be made.

3.2 Options Appraisal

In order to assess which of the above options should be undertaken it is of value to define a series of success factors that the chosen option(s) must achieve. These are shown in the table below.

Success factor	Measurement Criteria
Strategic fit	• Meets the strategic goals of the sub-regions. • Delivers commercially viable future proofed digital infrastructure to enable to achieve economic and social objectives. • Is at least comparable with elsewhere in UK.
Economic return	• Achieves a viable cost benefit ratio when compared with the other available options.
Achievability	• Fits with the sub-region's resources. • Follows a clear, timely and deliverable approval route and delivery timeframe. • Has political and stakeholder support across the region and delivers benefits to all parties. • Is fully state aid compliant and does not require new state aid applications. • Is sustainable with the flexibility and scalability to serve the regions requirements as the economy grows.
Attractiveness to supply side	• A clear delivery model is agreed. • There is supplier appetite for investment in the region. • Scalable to other parts of London.
Compatibility with other programmes	• No overlap or duplication of effort with other national or regional digital infrastructure investment programmes. • Does not overbuild commercial investment programmes.
Risk Management	• Financial. • Operational. • Legal and Regulatory, notably subsidy.

3.3 Analysis of Options

An analysis of each of the options against these criteria is shown in the table below.

The table presents each option against each of these success factors and colour codes accordingly with blue strongly achieving the criteria through, pink have limited alignment to red where there is limited benefit or high risk.

Option	Strategic Fit	Economic return	Achievability	Attractive to supply side?	Compatibility	Risk
Supply side Engagement	High	Medium	High	High	High	Low
Asset Investment	High	Moderate	Requires resources and processes	Low depending on usability of assets	Complements other investments	Resources for on-going management Suitability of assets
Anchor Procurement	High	High	High	High	Likely to leverage commercial investment	Procurement required Possible service / contract migration
Financial Measures	High. In-fills gaps in urban broadband provision in a timely manner	Positive Cost Benefit Ratio	Requires fund management	More attractive to smaller players	Might overbuild but stimulates competition	End user adoption Delivery by market Complex monitoring process

Options Appraisal

It should be noted that all options deliver a positive level of economic impact as all are focused at addressing the gaps in service provision in the sub-regions.

4 Commercial Case

4.1 Market Appetite

A major challenge has been the commercial market appetite to invest in the Local London and South London Partnership sub-regions. In the past this has been limited resulting in the large gaps in coverage highlighted in this report. The reasons for this are as follows:

- Many parts of the regions do not have the penetration of large businesses that attracts commercial investment. It is of greater commercial challenge to target a SME business base.
- Deployment in London is more challenging from a cost perspective compared with other UK cities.
- Build challenges are perceived to be greater in London due to issues around legacy infrastructure.
- The fragmentation of responsibilities both between Boroughs and within Boroughs has led to barriers in investment. Issues such as planning, permits, highways policies have led to delays and increased cost.
- Wayleave agreements are slow and complex to obtain.
- There has been a relative lack of public sector Gap funding compared with other parts of the UK.
- Legacy Borough owned infrastructure such as ducting is often not fit for purpose from a commercial perspective and requires upgrade and a high administrative overhead.

All of these issues have meant that alternative carriers have often placed London low on their investment plans. This is turn has resulted in a lack of competition and the need for the two major incumbents (Openreach and Virgin Media) to invest.

The boroughs that have achieved the greatest success in the sub-regions have been those that that proactively worked with the telecommunications industry to address these challenges through a blend of the measures identified in the options analysis, namely:

- Extensive supplier engagement and working together to remove barriers to inward investment.
- Asset upgrade.
- Using purchasing power and contracts to anchor investment.

With such measures in place the commercial attractiveness of the region has been raised with investment from players such as Boldyn Networks, ITS, Neos and Glide having been made over recent years.

4.2 Procurement Strategy

The procurement of digital infrastructure by the public sector is often complex, slow and costly. Many procurements across the UK have taken a number of years and cost the sponsors six figure sums.

To avoid such challenges the Boroughs in Local London and South London Partnership should utilise the frameworks and agreements that are already established. These include CCS, TfL and Bexley SIP framework. These are described below.

4.2.1 Crown Commercial Services

Crown Commercial Services plays an important role helping the UK public sector save money when buying common goods and services.

It is the biggest public procurement organisation in the UK and help buyers in central government and across the public and third sectors to procure.

➔ Find out more at www.crowncommercial.gov.uk

Within CCS are frameworks on specific relevance to the procurement of digital infrastructure and services notably:

- Network Services 2: Agreement ID: RM3808.
- Gigabit Capable Connectivity DPS Agreement ID: RM6095.

4.2.2 Transport for London

London's underground rail (tube) tunnels will host a new high-capacity fibre optic network across London which will be used to provide full fibre connectivity across the city. These stations will be the connectivity hubs and our street assets such as lighting columns and bus stops will host a network of small mobile transmitters which will bring city-wide connectivity improvement and ready London for 5G.

The new high-capacity fibre network will take fibre directly into London's neighbourhoods, creating new opportunities for commercial and domestic usage with gigabit-capable speeds that will support digital inclusion and future growth.

More than 2,000km of cabling will be installed on the network, all of which will be fitted outside of operating hours. In addition to benefitting customers, the network will host the Home Office's new Emergency Service Network used by the police, fire and emergency response services.

This is being delivered in partnership with Boldyn Networks will also generate additional revenue for TfL across the 20-year lifespan of the contract and help our operations teams.

This agreement can be used to award any future connectivity council contracts directly as a government approved framework.

➔ Contact Sara Kelly at the Connected London team for more details Sara.Kelly@london.gov.uk

4.2.3 London Borough of Bexley SIP Framework

In order to facilitate the procurement of digital infrastructure in the Local London region (and beyond), the London Borough of Bexley establish a procurement framework. This has three lots:

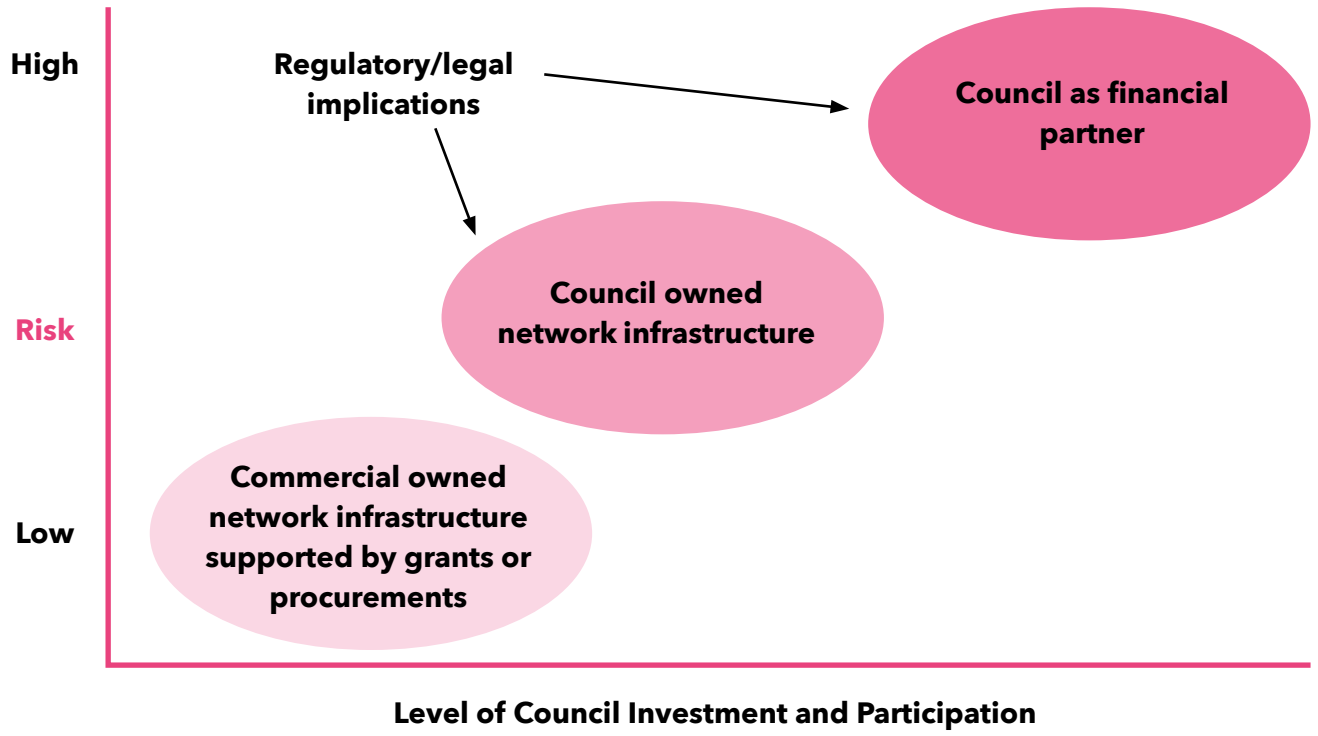
- **Lot 1: Duct Build/ Installation/Upgrade:** This should include general civil engineering work including but not limited to excavation of and reinstatement of existing surfaces, pavement laying and removal, service ducting requirements, drainage and service ducting, excavation around trees, kerbs, footways and paved areas, street furniture removal and replacement and traffic management.
- **Lot 2: Gigabit Capable Managed Services provides the following:**
  - Gigabit Ethernet services of varying bandwidths, the minimum being 1 Gbps.
  - The Supplier should be able to deliver other types of active services upon request from the Contracting Authority as may be required to keep up with technological evolutions and bandwidth increases during the lifetime of the contract.
  - The services shall be fully managed including provision and support of terminating equipment and proactive monitoring of the circuits and commitment to agreed service levels.
- **Lot 3: Infrastructure Services. This includes**
  - Dark fibre delivered using Physical Infrastructure Access (PIA.)
  - Dark fibre virtual equivalent circuits providing the following:
    - Ability to flex capacity from 100 Mbps to a minimum of 40 Gbps.
    - Symmetrical capacity (upload and download).
  - Wavelength services.
  - Full fibre public sector sites upgrades. This should include full fibre to the premise and upgraded street furniture providing a fibre distribution point making the site able to receive gigabit capable fibre access services.

4.3 Contractual Considerations

In determining the appropriate procurement approach and commercial model to be adopted each Borough needs to assess the following:

- Are assets council owned? Is there a desire to own and potentially offer to market council owned assets? This is the case where there is assets(s) of interest to the market and the authority is willing to operate and support such assets.
- Are assets commercially owned? Under this model the council stimulates investment in commercially owned digital infrastructure through gap funding or an anchor tenancy procurement. The council will provide gap funding or procure services, typically in return for a right to use of the digital assets deployed. In the case of fibre, typically this is deployment in Openreach ducting using PIA.
- Is the Council willing to make an equity or debt investment in local infrastructure.

There is a trade of between the degree of council participation and investment and risk as shown below:



4.4 Subsidy Control

It is not envisaged that any of the measures represented in this strategy form a subsidy.

Prior to Brexit public sector bodies could only buy connectivity to their own sites to serve their own needs. This was to comply with EU telecommunications regulations. The DSIT assessment was that 'the purchase of gigabit capable connections by public bodies, either as an aggregated, regional approach or for individual sites is 'no aid' on the basis that it is not market distorting, as long as the public bodies only 'buy what they need.'

As a result, London Boroughs were advised to plan their infrastructure to link their own sites, notably CCTV and offices.

Since Brexit the UK is operating under WTO regulations. Under this scenario London Boroughs in theory have flexibility to build infrastructure to other sites within their region. However, there must be an assessment on whether the investment would be viewed as a subsidy under the World Trade Organisation rules and what, if any, international obligations are relevant to the use of the fibre asset.

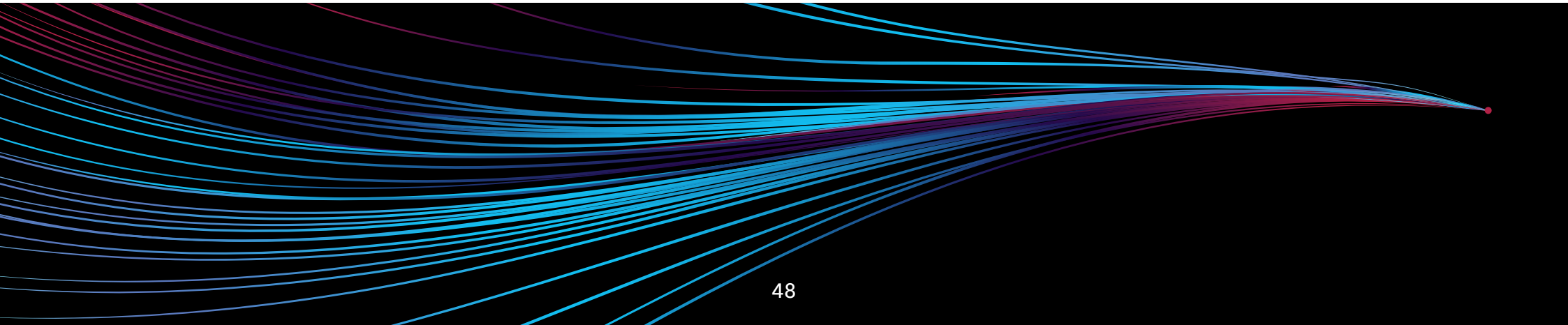
The definition of a subsidy, is a measure which meets all the following tests:

- Constitutes a financial (or in kind) contribution such as a grant, loan or guarantee.
- The financial contribution must be provided by a "public authority", including, but not limited to, central, devolved, regional or local government.
- The award of the subsidy must confer a benefit on the recipient in the sense of an economic advantage that is not available on market terms.
- The subsidy must not cause a distortion in or harm to competition, trade or investment.

Boroughs must assess if this is the case for their project.

In summary if a borough is connecting their own sites there will be no subsidy.

If it seeks to connect other sites they need to assess the above criteria. This should look at the above issues, the goals of the project, rules for accessing the fibre and whether there is market failure.



4.5 Challenges and Risks

An initial register of risks to be considered is shown below:

	Risk	Mitigation
Technical/ Operational	Need for co-ordination and service migration within Boroughs.	Ensure co-ordination of procurements across Boroughs and a holistic digital infrastructure deployment plan.
	Boroughs will require a dedicated Digital team to manage the range of interventions envisioned. This will include, funding applications, procurements, stakeholder liaison, supplier engagement and interaction with external national and regional schemes.	Funding of dedicated posts. Senior Management engagement.
	Operators act in a proprietary manner and are unwilling to share infrastructure.	Policy lobbying. Utilisation of planning regimes?
Legal and Regulatory	Subsidy law.	Subsidy assessment to be undertaken for each intervention.
	Planning.	Identifying best practice in engagement with operators and developing standard pan-London approaches to support digital connectivity/infrastructure through the planning system, which are communicated and implemented across boroughs.
	Wayleaves.	Ensure internal Borough stakeholders have co-ordinated response and interface to telecoms industry. Removal of deployment barriers. Streamline costs and processes.
Commercial	User adoption once commercially deployed is low.	Utilise demand side stimulation and innovation support.
	Lack of appetite for backhaul in sub-regions.	Promotion to local ISPs and mobile operators.
	Limited commercial interest to invest in the region.	Local London and South London Partnership to undertake programme of engagement with operators and service providers to encourage inward investment.
	There is a risk that operators may be selective in their deployment within the region. Supplier appetite is not stimulated.	The telecommunications industry has finite capacity and multiple opportunities. Potential participants should be encouraged to consider the opportunity, particularly the lowering of their risk.

5 Financial Case

5.1 Funding Streams

At the time of writing the following funding sources are potentially accessible to stimulate digital infrastructure investment in the sub-regions:

- Department for Science, Innovation and Technology (DSIT): Project Gigabit; DSIT is currently evaluating intervention into London. This is likely to take form of one or both of the following:
  - An urban connection voucher scheme.
  - DSIT led procurement of gigabit capable infrastructure targeted at eligible premises. Such a procurement(s) may take place at a regional, sub-regional or local level.
- UK Shared Prosperity Fund (UKSPF): An application has been to the UK Shared Prosperity Fund for £2m to establish a business connection voucher scheme. This will be administered and led by central government.
- Strategic Investment Fund (SIP): £800k has been allocated per Local London Borough. This was topped up by a further £222k per Borough from the GLA.
- Strategic Innovation Fund (SIF): The GLA has facilitated to £1m per Borough to be distributed to Boroughs that have not received SIP Funding.

5.2 Economic and Social Benefits

The proposed programme of work will have the following benefits:

- Reduction of superfast broadband not spots and reduction of wait for service provision.
- Operational cost savings and increased productivity for local businesses.
- Reduction in dependency on in-person social service delivery, this could include health and social care.
- Enhanced environmental monitoring.
- Access to education and health services for residents.

A range of studies can be cited highlighting both the economic and social benefits of public sector investment to achieve these goals. These include:

- Economic growth efficiency - Research by the International Telecommunications Union (ITU) has revealed that a 10% increase in broadband penetration results in a per capita GDP increase of 1.3%.
- Public service delivery - Full fibre will allow residents and businesses to interact with local government and public services in a more seamless way as full fibre opens additional means of delivering public services.
- Environment - In Europe, fibre investment is proven to have a positive impact on the environment with 88% less greenhouse gas emissions per Gigabit compared to other access technologies
- FTTH Council (2014) suggests that providing full fibre to just half of all premises could result in a 1.1% rise in annual GDP over 15 years.
- There is clear evidence that interventions stimulate further commercial investment. For example in Aberdeen an anchor tenancy agreement between Aberdeen City Council and City Fibre has leverage over £40m of inward investment.

6 Management Case

6.1 Governance and Roles

London is unique in its structure of local government.

There are three layers:

6.1.1 Greater London Authority (GLA)

The strategic regional authority with responsibilities in transport, economic development, environment, housing, policing, fire, culture, planning and health. The work programme of the Connected London team at the GLA forms part of economic development and planning responsibilities.

The Connected London team was set up to improve digital connectivity in London and fulfil statements made in the Mayoral Manifesto. The team includes a Principal Policy Officer for Digital Connectivity, Digital Connectivity Borough Officer and Digital Connectivity Officer.

6.1.2 Sub-regional Partnerships

There are four sub-regional partnerships in London, Local London, South London Partnership, West London Alliance and Central London Forward. The sub-regional partnerships manage major programmes on behalf of their respective member boroughs. These programmes address issues that are relevant to multiple boroughs and create economies of scale. In our sub-regions, funding has either been devolved to Local London and South London Partnership from Government, GLA, or allocated to us following successful bids.

The sub-regional groups are constantly monitoring opportunities and the needs of our boroughs to identify where future funding bids should be made.

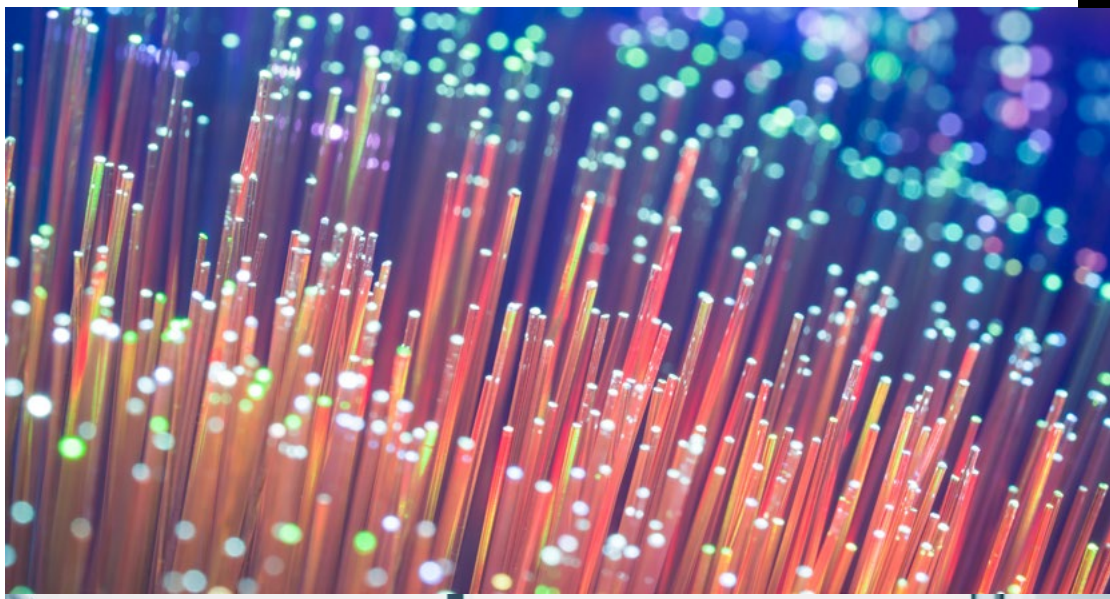
6.1.3 Boroughs

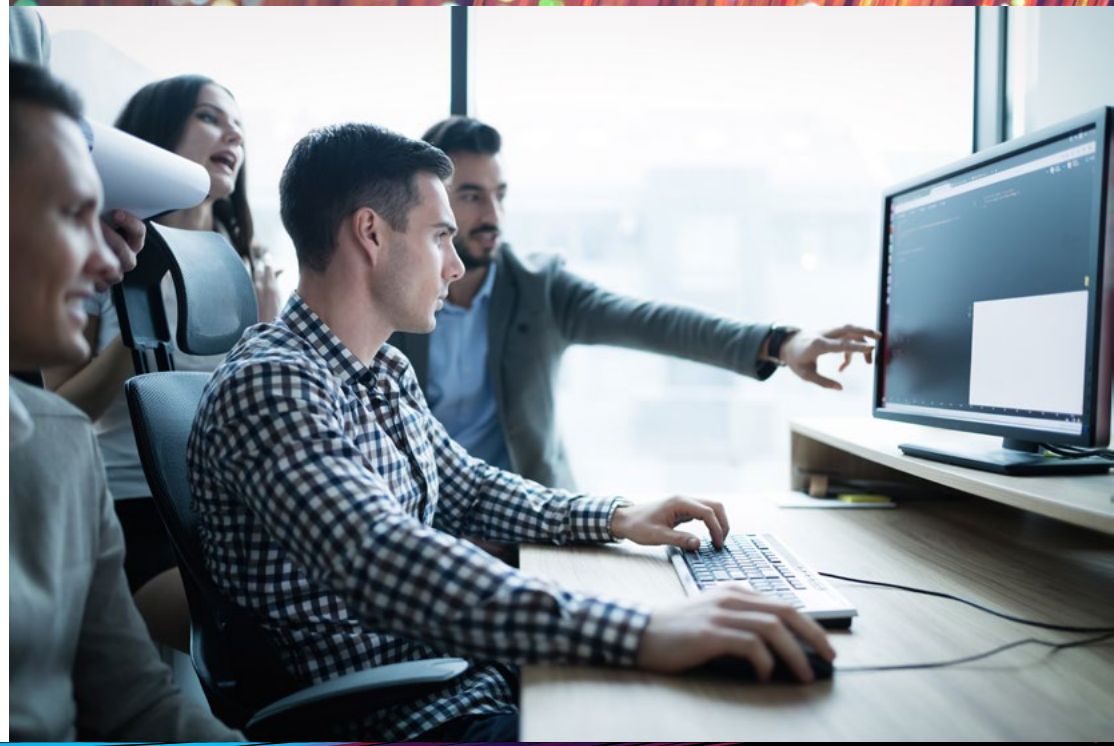
London boroughs are unitary local authorities, responsible for all statutory local government functions.

6.1.4 Roles and Responsibilities

The roles of each of these bodies in the context of digital infrastructure projects is as follows:

- **Boroughs:** Each borough will be the end customer for the telecommunications industry of any proposed intervention and will be the key delivery partner. This includes all procurements, contracts, planning and legal agreements.
- **Sub-Regional Partnerships – Co-ordination**
  - Engaging boroughs.
  - Coordinating borough responses to requirements for data, documents and/or delivery.
  - Sub-regional market engagement on public review/OMR/ procurement through key contacts on existing projects.
  - Engagement with suppliers following procurement.
- **GLA – Support**
  - Engagement with Central Government.
  - Policy guidance
  - Providing resource.
  - Funding Digital Champions in sub-regions.
  - Providing GIS and other data analysis resource – eg Data, Evaluation, Validation, Assurance for OMR.
  - Regional market engagement on public review/OMR/procurement through key contacts in London networks.
  - Supporting where requested by sub-regions and BDUK, including in strategic escalation.





6.2 Organisation Recommendations

A major challenge is the need for dedicated resources within each of the Boroughs dedicated to digital infrastructure deployment. The following key roles are proposed:

6.2.1 Borough Digital Champions

A Digital Champion's duties should include addressing barriers to the rollout; mapping and making assets available to operators to support the rollout; identifying opportunities for public use of digital connectivity; and changing the culture of the organisation to recognise the importance of digital connection to the local area.

There should be one Digital Champion per borough funded by government or in partnership with operators.

6.2.2 Borough Digital Board

The interface between authorities and the telecommunications industry is fragmented and covers:

- Housing (wayleaves)
- Planning (mobile)
- IT
- Community safety
- Economic development
- Health and Social Care
- Education.

In many Boroughs, departments are unaware what each is doing and there is not a holistic approach.

There is a need to establish within each Borough a Digital Programme Board with representatives of each department with clear senior management buy in and a single political lead.

The Digital Board works with the industry to facilitate telecoms and digital infrastructure work in the boroughs and provides an escalation route to ensure a prompt resolution to any queries from the industry.

This has all been underpinned by a vision to re-engineer the internal council processes that are needed to facilitate deployment in the region.

To greatly simplify the process of all fixed and mobile connectivity deployment benefiting the council as it increases internal efficiency, benefiting MNOs, infrastructure providers and ad agents by streamlining their council interactions and benefiting the boroughs by facilitating increased connectivity to the residents and businesses of the regions.

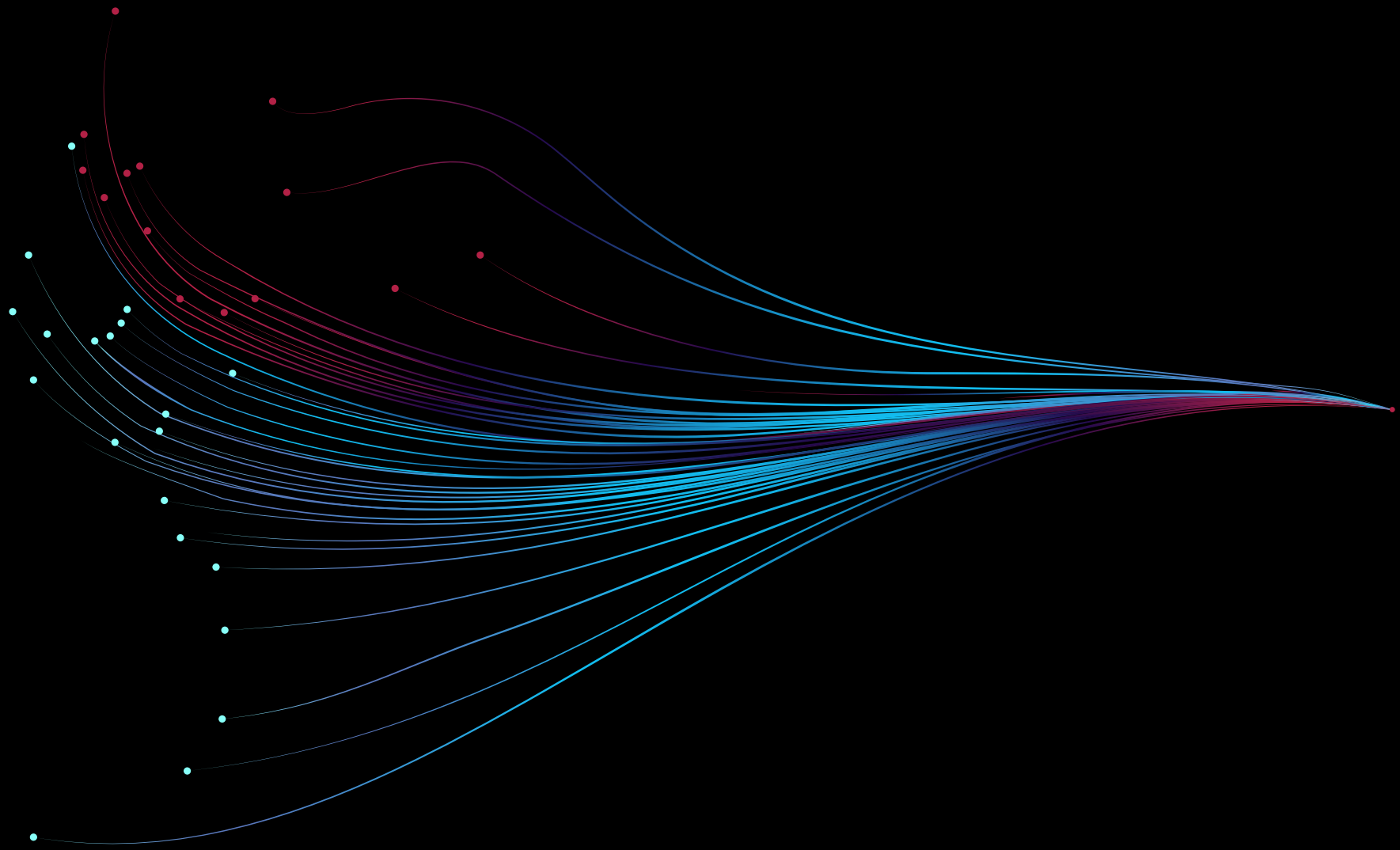
All of this has all been undertaken to accelerate investment across boroughs in the Local London and South London Partnerships and enable delivery of more full fibre across the regions, better 5G coverage and allow for the rapid deployment of 6G.

Key Stakeholders

Key stakeholders should include but not limited to:

- Digital.
- IT.
- CCTV.
- Economic Development.
- Streets/Highways.
- Planning.

A monthly recurrence to jointly assess the progress of digital investment and an open forum to discuss any concerns/updates from council or operators.



Report produced August 2023 by Robin Bosworth and Stacey McAdie on behalf of Local London and South London Partnership.