Royal Docks Digital Connectivity Study Executive Report

A report for the Royal Docks Team by Arcadis

Royal Docks

ARCADIS Design & Consultancy for natural and built assets

CONTENTS

APPENDICES

Version control

Version	Date	Author	Checker	Approver	Changes
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This report dated 01 April 2020 has been prepared for The Royal Docks Team (the "Client") in accordance with the terms and conditions of appointment dated 27 September 2019(the "Appointment") between the Client and **Arcadis LLP** ("Arcadis") for the purposes specified in the Appointment. For avoidance of doubt, no other person(s) may use or rely upon this report or its contents, and Arcadis accepts no responsibility for any such use or reliance thereon by any other third party.

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1.0 Executive Summary – Main Findings

The Royal Docks Team (RDT) have been undertaking a series of reviews to ensure that the infrastructure within the Enterprise Zone is of a scale and standard commensurate with the growth ambitions for the area, and to recommend any necessary supportive interventions.

In September 2019 Arcadis were appointed by the Royal Docks Team to undertake a review of the existing digital infrastructure and make recommendations.

In carrying out this work, we conducted 30 stakeholder interviews spanning the developer and operator communities. We met with both Local and Central Government (LB Newham (LBN), GLA and DCMS) and 'exemplar' authority bodies such as the West Midlands 5G team. The level of engagement was highly encouraging. For developers, communications is a critical enabler. For operators there is recognition of the scale of the opportunity and a desire to avoid the fate of other major development areas in London where coverage is still playing catch up because opportunities to co-ordinate activities were missed.

Our key observations were: -

- The telecoms market will respond to demand from the Royal Docks so no *direct* RDT interventions in the provision of fibre or mobile infrastructure/services are envisaged. With an estimated £30Bn likely to be invested by the private sector in fibre broadband network builds over the next five to ten years[1] (and mobile operators investing heavily in 5G over the same period) , the opportunity for RDT is to ensure that a proportion of that investment is applied to the Royal Docks. So whilst no direct intervention is required, we do see a significant enabling and supportive role for RDT (and LBN and the GLA) to ensure that operators build network in the Royal Docks in part because the enabling authorities are proactive and easy to work with.

- The Royal Docks represents a significant opportunity for growth. To the extent that digital connectivity will support this growth, the ability and willingness of digital operators to invest and improve services will, in part, be dependent on sufficient capacity, support and policy endorsement by LB Newham. If LB Newham promotes a best practice approach, then it can help support growth across the community. This best practice approach requires LBN to take action now to ensure sufficient capacity and capability is in place.

- Three high speed broadband network operators with a capability to deliver Gigabit speeds are already active within the Royal Docks Area (Virgin Media, Openreach and Hyperoptic). Customers already have choice both at a primary level and a secondary

[1] Source : National Infrastructure Committee estimate

level and this will only develop in the future through further planned and proposed. investment.

- There is clear interest from other Operators including GNetworks and Community Fibre in investing in FTPP within the Royal Docks.
- Whilst fibre provision is almost analogous to a 'traditional' utility (with developers and operators engaged proactively) and can build on existing ducting and connectivity, mobile coverage in the Royal Docks faces some very specific challenges. Not least is the proximity of the Royal Docks to London City Airport which brings height restrictions that will limit the use of rooftop 'macro' sites and radar interference considerations prohibit the use of certain spectrum bands. Technical challenges apart, there is a risk that some developers assume that mobile coverage will 'just happen'. It won't. Other developers are however alert to the importance of mobile coverage and see an opportunity to build shared 'neutral host' networks which operators will have to use (note that the operators have a very different perspective), generating revenue and keeping expensive streetscapes relatively free from telecoms clutter. It is important for the RDT to work with LBN, developers and operators to improve understanding of the context and reality as well as the mismatched expectations created by the operators' New Code Powers rights to access new sites have contributed to this inconsistent and probably unsustainable position.
- Unless mobile coverage is proactively and collectively addressed, there is a very real risk that network performance in the Royal Docks will lag demand, delivering a poor user experience. The RDT should work with developers to ensure this is addressed.
- 'Mobile coverage as an afterthought' has plagued other recent scale developments in London (Nine Elms and Kings Cross to name but two). Royal Docks (with support from LBN and GLA) could implement an open and engaged policy and become the 'Barrier Busting' exemplar for London and other future scale developments. There is interest from the mobile operators and GLA in creating this repeatable model which will proactively identify challenges and barriers and address these issues through practical and realistic processes and measures.
- In addition, LBN could give serious consideration to opening up the 75km of ducting it owns. By working with the private sector it could be possible to shape the planned expansion of that ducting network (Ducting is obviously of interest to fixed fibre operators, but mobile operators may also chose to avail themselves of the opportunity to build their own fibre backhaul ring to connect radio sites together). There are other good examples of Local Authority models to consider here, including West Midlands and Wolverhampton (who have built a well-regarded engagement model as part of their WM5G project).

- RDT plan to run an open day where the results of this report are presented to an audience of developers, operators as well as LBN and GLA representatives. We expect that this initial meeting will be a catalyst for specific and more focussed engagements that will help deliver the outcomes needed for Royal Docks and to create a replicable 'best practice' model.

- LB Newham is a key stakeholder in Royal Docks. 100% of the development area falls within LB Newham's boundaries. The business rates potential of Royal Docks and the potential for the development to become a catalyst for Borough-wide social and economic improvements cannot be overstated. As such a major stakeholder in the Royal Docks, LBN policies and processes largely define the ease with which operators can build network infrastructure. With operators increasingly using New Code Powers to acquire sites at reasonable rents, the old model of site rental revenue stream being the primary focus for a Local Authority (and other landlords) is shifting towards maximising operator investment within the authority boundaries to underpin economic growth and deliver positive social outcomes. The Covid-19 pandemic has reinforced the importance of digital infrastructure.

  In order to maximise the benefits of investment and growth, LBN should review its approach to Operators and the expansion of services and infrastructure. We have recommended that RDT consider funding additional capacity within LBN to help support a refreshed approach to policy and process so that the Borough can fulfil its 'Barrier Busting' potential and positively embrace and enable the opportunities for continuing to improve connectivity in the Royal Docks.

- Given the scale of development in the Royal Docks (and elsewhere in the Borough), LBN could consider senior level sponsorship of this issue, similar to the GLA's Chief Digital Officer role. This would help to drive both the pragmatic 'Barrier Busting' policy changes and the broader transformative digital vision that the Royal Docks opportunity demands.

- Information sharing about existing telecoms infrastructure in the area is limited, fragmented and confused. We saw evidence of commercial organisations concerned about network resilience, unaware of alternatives that already exist. Making stakeholders aware of existing and planned resources detailing infrastructure including Digdat https://www.digdat.co.uk/ (hosted by Anglia Water) and GLAs 'underground infrastructure' initiative would be of considerable value.

- Beyond the foundations of fibre and mobile coverage, we believe that other digital layers could be deployed in public realm to add value to those who live and work in the Royal Docks, and could play a part in defining and differentiating a unique identity for the Royal Docks. For example, an open IOT network such as a LoRaWAN could be deployed at low cost, supporting a range of smart sensor applications and potentially acting as both a 'digital sandpit' for technology students at the UEL campus as well creating a platform

which pilot approaches to sup[porting the delivery of council services to tenants in Social Housing (Silvertown) including building maintenance, damp monitoring etc. We see enormous potential in such an investment and how this could act as a catalyst for future service provision to residents and businesses alike.

- There is the potential of developing a digital narrative to contribute to the wider 'place' strategy for the Royal Docks. We are not proposing that Royal Docks echoes the digital focus of the Google Sidewalk sponsored redevelopment of the Toronto waterfront, but digital capability and capacity certainly has a role to play in defining the Royal Docks and encouraging businesses and individuals to locate in the area. Our approach is predicated on the base requirement for ubiquitous and high-quality coverage. If greater emphasis were to be placed on 'digital' as part of the defining experience of the Royal Docks, further consideration would be required. Interventions like a smart IOT platform would be low cost and simple to deliver. But signature activities like autonomous buses (an alternative to the 'hopper' bus a few developers mentioned) would require contiguous coverage and specific operator engagement.

2.0 Introduction

2.1 Your Digital Vision

The Royal Docks as London's only Enterprise Zone (EZ) has an enormous and unique opportunity to develop and proactively implement a digital strategy that complements planned public realm and infrastructure improvements, creates the opportunity for digital innovation and is supportive of the wider 'Place Making' ambitions of the Royal Docks Team.

To realise the wider aspiration of RDT being one of the very best connected place in London it is imperative that RDT actively now explores and understands the current and future levels of digital provision, with a view to determining what role RDT need to play (if any) in creating a digital environment which offers choice, access to Gigabit fibre services and 'state of the art' mobile coverage and capacity, which will ultimately enable those who live and work within the Royal Docks to enjoy the very best digital connectivity.

Building upon some meritable work already undertaken by the Connected London Team and other teams in the GLA (Mobile Infrastructure Legal Templates, Policy S16 within the London Local Plan and the London Connectivity Map, the London Infrastructure Mapping Application) and RDT, the focus of this Report has been to engage with fixed and mobile telecommunications service providers, public sector partners, developers and key local businesses to capture current and future connectivity requirements. By understanding the dynamics of both supply and demand, we have identified risks, mitigations and opportunities that will ensure that RDT's digital vision for the Royal Docks is realised.

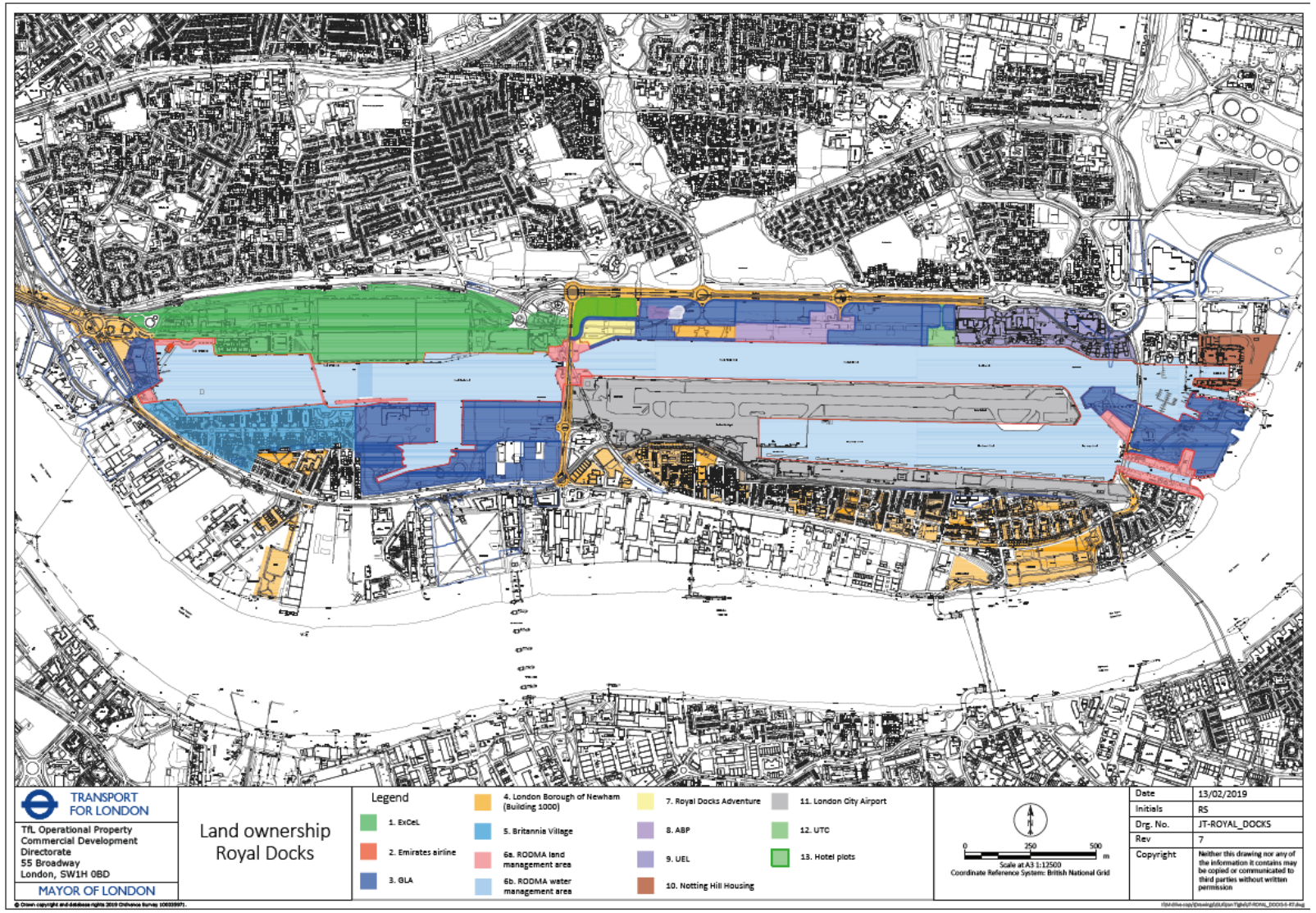

Figure 1 - Royal Docks Development Map; a diverse range of developers and intended use

2.2 Strategic Review

With the clear aspiration to make the Royal Docks one of the best-connected areas of London RDT have initiated this detailed strategic review to address the following key questions:

- Recognising the fundamental importance of fibre, what is the current level of fibre connectivity within the Royal Docks? Assess the current digital capability and infrastructure and understand how this is overcoming traditional capacity issues and how it will support existing communities and businesses as well as be in a position to respond to future growth.
- Assess how the current digital capability and infrastructure will support the planned redevelopment and regeneration schemes within the Royal Docks Area.
- What are the current investment plans of fibre carriers' providers into the Royal Docks Area?
- What is the current level of mobile coverage within the Royal Docks?
- What are the current investment plans of the Mobile Operators into the Royal Docks Area?
- What needs to be addressed to ensure that the future delivery of mobile coverage is accommodated within future planning, building design and engagement with developers?
- Through consultation with key stakeholders, landowners, developers and businesses in the Royal Docks what is the current landscape of connectivity and what are the individual and collective digital aspirations for the Royal Docks.
- What level of digital connectivity will be required in the future and how is this going to be addressed?
- How does the Royal Docks respond to the emerging opportunities of IOT and the future development of a 'Smart Place' Strategy?
- What role should RDT and GLA now and in the future play in ensuring that the Royal Docks becomes one of the best-connected places in London.
- Is there a need for direct financial intervention, or will the market through existing and future investment ensure that digital connectivity and access to such connectivity will capture all communities, businesses and developments?
- What barriers and risks exist which could prevent this aspiration being realised and how can these barriers be addressed?

2.3 Aims of the Report

This Report will describe how RDT through enabling policy, strategy and engagement can and should be a catalyst for realising considerable digital benefit for the Area in attracting private sector investment.

In seeking to address the key questions of the strategic review, this Report will describe the process undertaken and the key outcomes, findings and recommendations.

RDT and its key partners have through Planning Policy, Strategy, Public Sector Assets and Infrastructure and Land Ownership within the Royal Docks to be an enabler in:

- Driving improvements in connectivity and ensuring the right infrastructure is in place to attract further fibre and mobile investment.
- Enabling a consistent approach to digital connectivity across the Royal Docks bringing together the public and private sectors in contributing to a consistent and deliverable digital narrative.
- Driving a holistic approach to developing a digital narrative which can form the basis of a wider masterplan for the Royal Docks. Which will support and enable communities and businesses and be the catalyst for continued transformation and growth. Consequently, through this evaluation and subsequent analysis, the Report will present a series of strategic findings and recommendations, that contribute to the:
- Development and delivery of a strategy which will accelerate and co-ordinate future digital investment within the Royal Docks.
- Development of a more collaborative approach between all stakeholders in responding to the opportunities and challenges of digital connectivity
- Underpinning of the Growth and Investment Strategy for the Royal Docks.
- Emergence of the Royal Docks as a place which can support and enable communities and businesses with access to the very best connectivity and ensure that the Royal Docks becomes a leader in stimulating digital innovation.
- RDT by learning from projects such the West Midlands 5G Project (WM5G) and by adopting a 'one truth' view of infrastructure becoming an exemplar for delivering digital connectivity within Enterprise Zones and Regeneration Projects within the UK.

2.4 Key Findings

This Report would wish to commend RDT for its clear aspiration in ensuring that the Royal Docks is one of the best-connected places in London. To deliver this aspiration the RDT must work closely with LBN. There is an essential role for LBN to play in realising this vision and securing the beneficial impact of the growth of digital services to communities and businesses within the Royal Docks..

Through engagement with key stakeholders across both the public and private sectors the objectives of this connectivity review were welcomed and what emerged was a consensus that more could be done individually and collectively in supporting RDT in realising this aspiration.

In highlighting this support, this report has in a constructive manner has identified strategic findings which we believe need to be positively noted and addressed if RDT's vision is to be realised.

2.4.1 Fibre Access

The Royal Docks already has three active providers of high-speed Gigabit capable broadband namely Openreach, Virgin and Hyperoptic and will benefit from further planned investment in the future (Reference Section 3.1 Fibre Coverage and Investment).

On the basis that this investment is providing sufficient and future capacity to address potential demand there is no obvious, current requirement for the GLA or the RDT to make a significant capital investment intervention in funding further fibre or ducting infrastructure to attract full fibre investment to the Area. However, RDT have a significant enabling role in ensuring that the developer community is aware of the fibre options available through facilitating meetings between Carriers and Service Providers.

2.4.2 Ducting Infrastructure

The 75km of LB Newham-owned ducting infrastructure does constitute a viable option which could play a role in accelerating fibre and mobile deployment within the Royal Docks. LBN should explore options to open up access to its ducting to the telecom sector and the potential to expand further with private sector support. An open approach to ducting would be a powerful signal of LBN's intent and a strong first step on the road to becoming a proactive enabler and being seen as a Barrier Busting' exemplar.

See Figure 2 overleaf

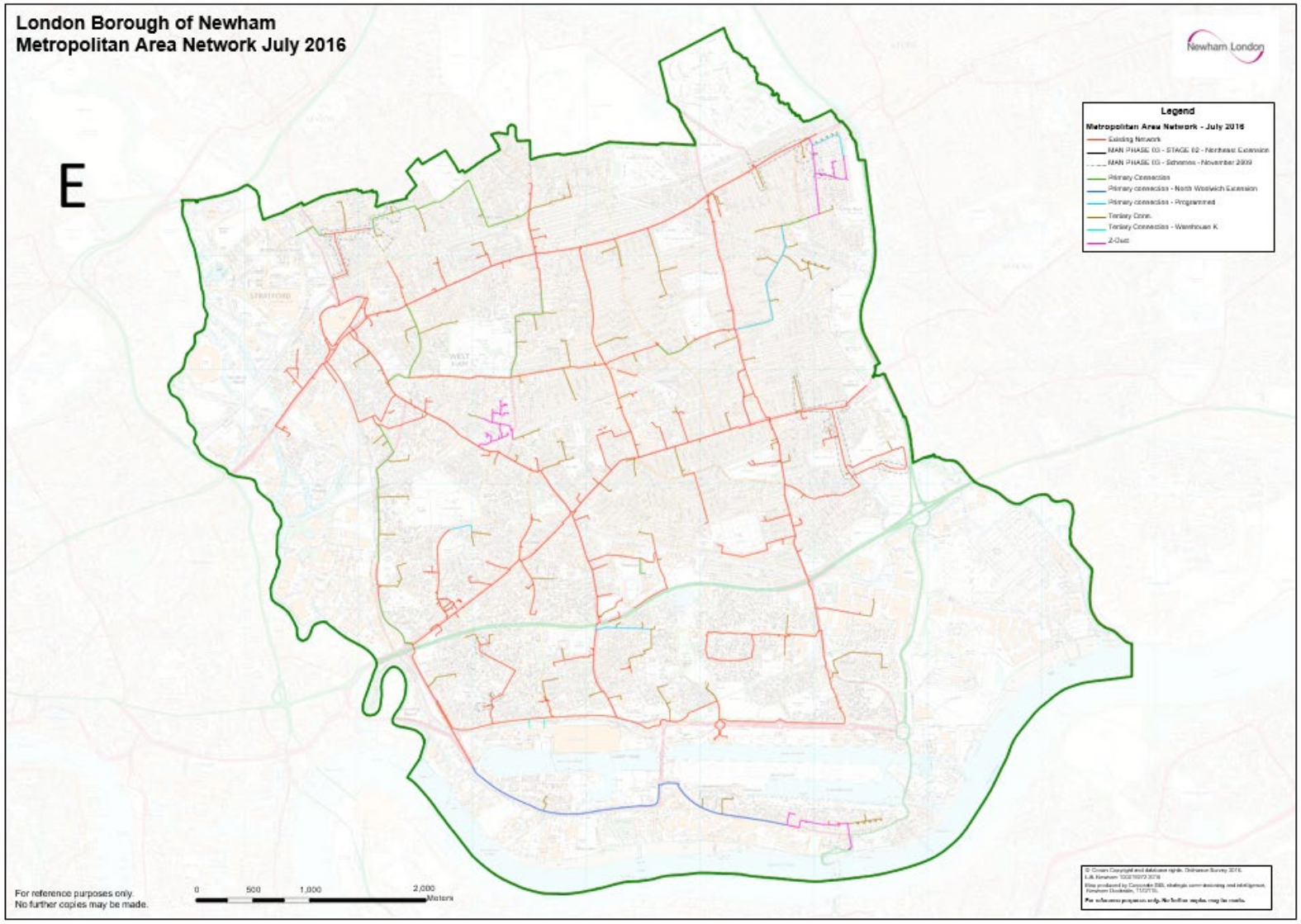

Figure 2 – London Borough of Newham owned ducting infrastructure mapping

2.4.3 Mobile

Based on the outcome of our work, the market does appear to be prepared to invest and address future 4G and 5G requirements within the Royal Docks, however developers might want to consider how they can work with and partner the Mobile Operators to address the real risk that coverage and capacity will lag behind demand and how does all parties collectively address these particular challenges in how buildings are designed and how indoor coverage is addressed. The RDT should work with development partners to ensure this is addressed.

There is no current requirement for the RDT, GLA or LBN to make a significant capital investment intervention in funding mobile/wireless infrastructure within the Royal Docks. However, RDT have a significant opportunity in assuming an enabling role in ensuring that this coverage is delivered in a timely fashion and educating the developer community and facilitating meetings between operators, developers and WIP's.

LBN may wish to consider how they proactively engage with the Mobile Operators to address existing and potential barriers with a view to attracting investment and ensuring that the London Borough of Newham is regarded as a Borough at the forefront of improving mobile coverage and future 5G innovation in London.

2.4.4 Royal Docks as Smart Place IOT

RDT should consider working with LBN in adopting a proactive approach to the development of a Smart Place Agenda for the Royal Docks, possibly extending to the funding and construction of a development wider open IOT network, which is a low-cost option and would send a strong message of intent in respect to fulfilling the wider connectivity requirements and aspirations and how such connectivity could realise this outcome.

2.4.5 Market Engagement

- Our work has highlighted that there appears to be limited engagement between the developer community and service providers/carriers/mobile operators. If the level of dialogue was increased it would substantially reduce the risk of strategic decisions being taken in isolation. More coordination would open up more opportunities and ensure that, with the right information, well-founded judgements can be made in respect to future digital requirements.
- Linked to this, there is generally very limited information being shared by the market. This is accentuated by multiple and separate collection points for information on the authority side (GLA, LBN and RDT) which results in the information that is being provided is not accessible or cross-referenceable. There is little evidence of the MNO's having been directly engaged by various stakeholders with a view to sharing their requirements and challenges and for the MNO's sharing their plans. This has resulted in an adhoc strategy developing in respect to the delivery of mobile coverage both external and inbuilding.

- There is no central mapping resource which the likes of the RDT, GLA, LBN and Developers could have access to which would assist each respective party to determining what is available and what is planned. Data ownership is an issue but the RDT should explore with LBN, GLA, Developer and Operators how to resolve this ensure a better flow of information.
- There is no existing channel of engagement which can be used by the market to engage with the RDT, LBN and the GLA. The RDT should discuss with LBN and the GLA how best to provide this, potentially through a new resource and ensure that interest in future investment in digital connectivity within the Royal Docks is proactively captured and addressed..

2.4.6 Developer Engagement

Whilst certain Developers and Stakeholders are actively exploring and implementing a digital strategy, the RDT needs to work more closely with Developers with a view to developing a series of common principles which could be applied to engaging with the market, creating a design template and ensuring that an element of consistency and coverage continuity is delivered across the Royal Docks. The RDT should consider how best to manage this process and how this will be aligned with the London Plan..

2.4.7 London Borough of Newham Engagement:

The RDT should work with LBN to explore what support and role LBN can play to maximise the benefits of the digital sector investment. This should focus on playing a leading role in developing and promoting a digital narrative for the Royal Docks and the wider Borough. LBN and RDT should consider playing an enabling role with all parties including Carriers and Developers to ensure that this narrative is realised and that the benefits of improved access to connectivity is shared across all communities and businesses. This should then constitute as an exemplar which could be replicated as part of a wider digital strategy for Newham. Newham has a real opportunity to lay the foundations for an IoT Platform in Royal Docks which can help with the wider agenda for Smart City initiatives across the Borough and in doing so create the conditions to transform service delivery for LBN.

RDT and LBN should consider what additional internal resource at LBN is needed to deliver this outcome and what senior level sponsorship in LBN is needed to enable the optimum digital infrastructure outcome for the Royal Docks.

2.4.8 RDT, GLA and LBN as collective enabler

RDT, the GLA, and LBN should jointly seek to enable the digital vision through policy initiatives, strategic co-ordination and closer engagement with stakeholders. Excellent digital connectivity has the potential to be a key differentiator for the Royal Docks; at the very least it will be a basic utility for businesses and individuals looking to relocate to the area.

With a large number of developers, businesses, landowners and community groups active in the Royal Docks, there is an opportunity to have a more coordinated connectivity strategy and to maximise the opportunity for digital capability whilst also recognising the diversity of objectives of the stakeholders. Given that 100% of the Royal Docks development sits within Newham, there is a clear role for LBN to support and champion a strong digital vision.. The GLA and specifically RDT also have a vital role to play in supporting

LBN, potentially through a funded post within LBN, to assist in accelerating the evolution of carrier engagement processes and its wider digital strategy. The borough has ambition for improving borough wide connectivity which will aim to deliver on the social value for residents of the borough. Working collectively with the partners and stakeholders will help accelerate that ambition.

RDT also need to rapidly address the wider challenge of creating a unique and unifying identity for the Royal Docks. If Digital is to play a role in that identity, the implications need to be quickly distilled and turned into deliverables.

2.5 Overview Key Recommendations

Based on these strategic findings this Report will make a series of recommendations which this Report believes will contribute significantly to contributing to and realising RDT's digital vision:

1. Coverage Information: This is a London-wide issue. As a matter of priority Royal Docks and the GLA should seriously consider how we engage with Ofcom and in doing so develop a 'one truth' strategy for operator data collection is agreed and subsequently shared between the various stakeholders, with the GLA being the most obvious custodian. Digdat (underground asset database hosted by Anglian Water and used by Virgin Media) may be a good starting point for this activity.

2. Modelling future Mobile Coverage: noting the unique combination of mobile coverage and capacity challenges the Royal Docks faces undertake a more detailed future scenario modelling exercise which will assist in projecting future requirements and help RDT engage with operators and support the developer community.

3. Common planning for Fibre Deployment: common planning practices relating to fibre deployment are adopted across the Royal Docks development area ensuring consistency in any subsequent engagement across the whole site.

4. Mobile Coverage education: RDT to play a role in supporting the developer community, one facilitating the creation of a forum for operators and developers to collaborate and two create a portfolio of potential technical solutions that developers can choose from to deliver their mobile coverage.

5. Mobile Deployment Template: LBN and RDT could consider engaging with other local authorities who have tested new approaches in this field. For example, the West Midlands Combined Authority (WMCA) have made significant strides in bringing telecoms planning requirements and process into one common model across the eight authorities that make up the WMCA region. RDT to engage with WMCA to develop a template approach that key development areas across the UK could adopt.

6. Royal Docks Mobile Coverage Potential Funding Role: RDT to consider the options of making provision for 'hotel' base-station accommodation for mobile operator equipment within public buildings within the Royal Docks or being incorporated within a new public sector development within the Area.

7. Telecoms Workshop/Market Information Day: RDT should facilitate an initial Telecom Workshop with subsequent quarterly workshops for key stakeholders with a view to developing and sharing a shared digital narrative for the Royal Docks.

8. Promote a LBN ICT/Digital Strategy: the RDT should discuss with LBN who to maximise the potential opportunity. Clearly, LBN is a key stakeholder in Royal Docks and 100% of the development area falls within LB Newham's boundaries. There is an opportunity to increase resource, review processes and show clear support for the digital sector. RDT should support (and potentially fund) LBN in accelerating their Digital Strategy by supporting a review of related policies and strategies across the Council.

9. Open up LBN Ducting Infrastructure: LBN to afford serious consideration in respect to determining how access could be provided to the existing ducting infrastructure (open access basis and subject to current market rates) to accelerate further fibre investment and deployment. LBN have the opportunity to engage with other local authorities such as LB Hackney who are in the process of developing a similar strategic model A move to open up ducting could be a powerful early signal of a new digital intent at LBN.

10. LBN Extension to Existing Ducting Network: LBN to explore in further detail the technical and commercial options of extending their existing ducting network with potential private sector to support the delivery of fibre-based connectivity into public sector sites within Silvertown and North Greenwich.

11 5G Infrastructure: RDT working with LBN and the operator community to develop and implement a Public Realm Telecom Policy with a view to ensuring that public realm design and street scene proposals accommodate the infrastructure to support future 5G deployment.

12. LB Newham Highways Telecom Strategy: to align with DCMS's Barrier Busting initiatives supported by the GLA, LBN to undertake an audit of their current approach to wayleaves and permitting. In undertaking this audit LBN should consider how their current approach aligns with both DCMS and GLA policy and whether there is a need to revise current processes and polices learning from other practical case studies (Westminster & Leeds) with regard to introducing Bulk Wayleaves, co-ordinated approaches to utility digs (option to deploy telecom infrastructure at the same time) and reducing current fee policies (is there way of waiving or reducing permitting fees).

13. LB Newham Utility Board: LBN should ensure that the as part of the future remit of the existing LBN Utility Board that telecom requirements and plans should be part of a quarterly review. This review should take the form of inviting Carriers to attend the Utility Board and to share their current and future deployment plans within the London Borough of Newham including the Royal Docks.

14. Royal Docks IOT Platform: RDT to afford consideration to investing in and deploying a LoRa Internet of Things network across the Royal Docks, bringing in UEL and developers as potential stakeholders. This would be a low-cost demonstrator of a digital agenda for the Royal Docks.

3.0 Fibre Connectivity and ducting

3.1 Current Fibre Coverage and Future Fibre Investment

- There is clear evidence that the Royal Docks have already benefited from recent investment in fibre deployment in anticipation of the regeneration of the Royal Docks. Investment that could benefit existing businesses and communities.
- There does exist a genuine and real interest in the market to continue to invest in the Royal Docks and extend where Carriers already have an existing presence within the Royal Docks their existing fibre connectivity footprint.
- This market engagement was undertaken with three key carriers namely Openreach, Virgin Media and Hyperoptic. Further engagement was also made with Community Fibre who have an existing relationship with a number of Developers present in the Area and with GNetworks who have a stated ambition to invest in the London Borough of Newham including the Royal Docks as part of their strategic fibre investment in London..
- There does exist a genuine and real interest to engage with RDT, the GLA and LBN in identifying further opportunities to actively invest in and deliver a Full Fibre Strategy within the Royal Docks.
- There was a clear focus from the market that LBN should continue to review and develop their strategies towards, planning, highway permitting and wayleaves with a view to ensuring that LBN is seen by the market as a place willing to partner the market and attract investment through its policies and processes. This we believe will have a significant bearing on how the Royal Docks and the wider Borough of Newham is prioritised for future investment.
- Considerable interest was expressed by the market to engage with LBN with a view to investing in and delivering a fibre to the premise solution into Social Housing, managed by LBN which exists in Silvertown. Through developing such a partnership LBN could have the opportunity to actively address inequality around connectivity and facilitate discussions on how such connectivity could be an enabler to drive other digital and service related outcomes.
- Interest expressed in working with LBN and RDT to deliver a strategy which would attract greater interest and investment to support in the future the Area's wider Smart Place /IOT Agenda for example potential alignment with electrical charging points based on street furniture cabinets.
- There was support for a Market Information Day to be hosted by RDT. An Information Day which would provide the opportunity for Developers and other key stakeholders to gain a more extensive insight into the fibre currently available and for Carriers to engage directly with potential clients and understand how further market engagement and fibre investment could be promoted.
- Endorsed by this engagement and a subsequent engagement with existing businesses within the Royal Docks it is very apparent that there is very little information available to direct companies within the Royal Docks who are seeking to add resilience with alternative routing to their networks. The likes of both Tate

and Lyle and London City Airports highlighted the challenge of resilience as a key issue for them and were having to make future investment plans to realise this objective without full knowledge of the connectivity and infrastructure currently available. For example, there was no knowledge of the investment made by Virgin Media within the Royal Docks.

- This has we believe been caused by network information not being shared with different parties without it being co-ordinated and shared with key stakeholders.
- If this situation continues this can only exacerbate and impact upon the digital narrative for the Royal Docks as silo-based information will influence a more silo-based approach by Developers and other parties within the Royal Docks.

3.1.1 Openreach

Openreach is a functional division of telecommunications company BT plc, that maintains the telephone cables, ducts, cabinets and exchanges that connect nearly all homes and businesses in the United Kingdom to the national broadband and telephone network. In March 2017, , BT plc agreed to divest Openreach's staff and non-network assets into a legally separate company, Openreach Limited. However, the network assets would still be owned by BT plc to ensure the longevity of leases and covenants, and Openreach Limited would still be wholly owned by BT plc's parent holding company, BT Group plc. Openreach has refocused on full fibre FTTP delivery and by May 2019, when it had connected 1.2 million premises to FTTP, Openreach aimed to have connected 4 million premises by 2021 and 15 million by around 2025.

- Openreach indicated that LBN and particularly the Royal Docks had currently not been identified as one of their Full Fibre investments, however Openreach expressed a clear willingness to engage with LBN and RDT with a view to developing its awareness of the area and raising its profile within Openreach.
- Whilst recognising the limitations of FTTC (Fibre to the Cabinet) Openreach (through confidential mapping data) confirmed that Openreach ducting and fibre – at least to FTTC cabinets – is already prevalent throughout the Area.

- To support RDT and LBN, Openreach outlined how the London Borough of Newham could promote the Royal Docks as an investment opportunity with a view to implementing policies and strategies which would remove some of the perceived barriers to investment including the Council's approach to street works, permitting, planning, traffic management and bulk wayleave.

3.1.2 Virgin Media

Since 2013, Virgin Media has been a subsidiary of Liberty Global plc, an international television and telecommunications company. The company was founded in March 2006 by the merger of NTL and Telewest, which created NTL:Telewest. In July 2006, the company purchased Virgin Mobile UK, creating the first "quadruple-play" media company in the United Kingdom, offering television, internet, mobile phone and fixed-line telephone services in addition to business services.

- Virgin Media, anticipating the planned regeneration within the Royal Docks, has already invested in and deployed a DOCSIS based network which (subject to upgrade to DOCSIS3.1) can deliver Gigabit speeds within the Royal Docks and has been designed with a break out point aligned to each planned regeneration project.
- Virgin Media expressed a willingness to work with RDT and LBN to explore additional strategic value being leveraged from their network including the delivery of electrical charging points both within the Public Realm and specific Developments.

3.1.3 Hyperoptic

Founded in 2011 Hyperoptic have become a significant player in delivering Gigabit Broadband Services and have invested and worked with freeholders, property managers and local authorities to deliver their services principally into new developments and social housing stock across London. Beyond London they have extended their investment into 39 other UK Cities and Towns. Across London. Beyond London they have extended their investment into 39 other UK Cities and Towns.

- Hyperoptic have recently deployed a fibre network utilising the Openreach PIA Ducting Infrastructure and created a fibre ring across the Royal Docks, which is now delivering Hyperoptic only services.

3.1.6 Other Suppliers/Carriers

- Community Fibre has made a clear expression of interest to deliver their own fibre infrastructure within the Royal Docks.
- G Networks has made a clear expression of interest to deliver their own fibre infrastructure within the Royal Docks.
- Zayo was approached but no response was forthcoming.
- Optimity was approached but no response was forthcoming.
- A number of Wireless Infrastructure Providers (WIPs) expressed interest in offering shared 'neutral host' solutions to mobile operators also stated they would be interested in building fibre networks to support their deployment with the potential to drive other non-mobile outcomes. Whilst the WIP model has obvious attractions to developers in that it requires only one set of equipment to be deployed, operators are not supportive (see section 4.1.5 of this report for an assessment of neutral host solutions).

3.2 London Borough of Newham Ducting Infrastructure

- With over 75Km of fibre and ducting infrastructure running through the London Borough of Newham running from Stratford in the north of the Brough to the Royal Docks in the south, the Council owns and operates a unique and potentially very valuable strategic asset.
- LBN having invested in and delivered this ducting and fibre network are already deriving considerable benefit by reducing the cost of delivering connectivity to Council Sites, supporting the delivery of public space CCTV and in some instances extending the network to include other public sector bodies within the Borough of Newham (As an example, UEL noted plans to use LBN provided connectivity between its Royal Docks and Stratford campuses).
- As part of an earlier ducting evaluation an audit of the ducting infrastructure was undertaken with a technical briefing (Appendix A) being created which detailed a technical specification of the ducting deployed and the potential capacity available.
- On the basis of this earlier evaluation and subsequent stakeholder engagement what has emerged is clear evidence that the ducting infrastructure and potential access to the ducting would be of interest of the market and that further steps should be taken to explore this interest in further detail.
- What is apparent is that whilst the commercial potential previously highlighted may no longer apply this has been replaced by a recognition that the existing ducting infrastructure could and should play the role of enabler in accelerating fibre deployment within the Royal Docks and in turn drive economic and social benefit. Furthermore, given our view that RDT (and therefore LB Newham) should make investment and use of digital infrastructure simple and clear in the Royal Docks, providing access to a significant 75km of ducting would be seen as a significant and positive move by the operator community.
- Such a strategic approach still needs to be explored in detail within LBN and would need very clear sponsorship for such a strategy to be delivered. RDT and LBN should explore how best to provide a simple and easy process for Operators to invest in the Royal Docks and how developers can access the key information.
- The Developer Community whilst aware by inference that a ducting network owned by LBN extended into the Royal Docks, requires more specific information regarding the network. In terms of their potential interest this could be multi-faceted from offering another routing for resilience, delivering point to point fibre between developments within the Royal Docks and providing a more accessible ducting network to deliver a fibre to the premise solution into a new development. Without greater collaboration and a more proactive the strategic benefits of this valuable sunken asset will undoubtedly be lost
- Various stakeholders within the Royal Docks and potentially carriers would like to understand in more detail, what is available and how access could be facilitated.

4.0 Mobile Coverage: Current and Future Investment

Based on Ofcom and data received from the Mobile Operators current outdoor and indoor 4G mobile coverage in the Royal Docks area is currently regarded as 'good' in ensuring a good level of reception and capacity which will support the services currently required. This however is more of a reflection of the lack of demand than the state of provision. Understandably, 5G coverage is at this stage limited.

It is also worth noting that proximity to the London City Airport brings some unique problems with height and radar interference considerations potentially limiting rooftop mast sites and the use of some spectrum bands.

Operators will upgrade existing sites first and then will resort to street works. As a general observation, indoor coverage is already a problem for many businesses and residential users and is expected to become worse with 5G. In this respect Developers need to more aware of the inbuilding design requirements as part of building design and construction.

With respect to mobile coverage, RDT has two roles: -

1. Build on the operator engagement started by this Digital Capability Review process supported by the new London Plan
2. Help educate developers about the challenges of mobile coverage and to bridge between the operator and developer communities to avoid conflict and promote solutions that work for both.

We have also recommended a detailed modelling exercise to create a topology of predicted mobile demand; this is a specialist activity, but the resulting scenario modelling will be a useful accelerator for much-needed operators and developer collaboration.

In terms of current coverage levels, it should be noted that the Royal Docks occupancy levels today are far below the projected 50,000 workers and 30,000 residents. We are predicting that the combination of this growth in occupancy and underlying data traffic growth patterns will undoubtedly place increasing strain on the current network architecture (as will the physical impact of coverage shadows and not-spots caused by the new buildings being constructed) which will require a proactive approach by operators and developers if current coverage and capacity levels are to be maintained.

Operator coverage in the Royal Docks is delivered today from 'macro' rooftop type sites in the surrounding area. Upgrades to these sites will be the first obvious step for operators, but ultimately more sites will be required, and airport restrictions (see section 4.1.3 below) will require street level build, be that monopole and small cell.

Mobile operator network investment tends to be focussed on maintaining customer experience objectives, with priority given to locations where heavy usage is leading to a deterioration in network performance. This model works well for existing high footfall areas but is less appropriate for new developments where volumes of users can arrive over a short period of time in an area where historically demand has been low.

A further disincentive for mobile operators to invest speculatively ahead of demand is a fundamental difference in the economic business case for mobile coverage when contrasted with the fixed fibre business case. Fibre operators will assume that they will take a certain percentage of the homes and businesses that their network passes so hence there is an incentive to build new fibre, particularly in new development areas where there is less existing competing fibre so the opportunity to 'win' a higher proportion of residential and commercial customers. By contrast, mobile operators tariffs are close to 'all you can eat' so there is little or no incremental revenue to be had from connecting a new area (you could actually argue that the only impact is to drive cost, given it is unlikely customers will churn just because coverage is deficient in one small area). With the current focus on rolling out 5G (with the focus being on existing areas of high 4G demand) and – following the forthcoming 700MHz spectrum auctions – rural coverage to achieve the 95% of UK land mass target agreed between UK Government and the mobile operators, new development areas will not be high priority focus areas for the operators.

4.1 Opportunities and Challenges Future Mobile Coverage

4.1.1 Current Climate

The mobile coverage 'supply chain' is much more complex than a simple transactional developer – operator model. There are third parties in play; Wireless Infrastructure Providers (WIPs) like WIG, Digital Colony and Arqiva are trying to build shared infrastructure solutions and get all operators to work together. Developers and landlords have agents who are used to maximising the rent mobile operators pay for rooftop sites.

The more forward-thinking developers are aware that mobile operators have New Code Powers which give them a near-compulsory purchase rights and much lower rental. They see a substitutional revenue opportunity in working with WIP's to 'sell' shared infrastructure to mobile operators.

4.1.2 The implications of Operator Code Powers

In December 2017 fixed and mobile operators were given a set of revised Code Powers which were part of the Government's strategy to remove the barriers likely to slow the future rollout of 5G. The UK was very late to 4G and the strategic importance of 5G meant there was real interest in shifting the UK's position from that of laggard to market leader.

The implications were significant for land and property owners, with the New Code Powers amounting to near- compulsory purchase rights for operators. Further, the purchase price would be set at an 'opportunity cost' level reflective of the alternative revenue sources a landowner may have to forgo to provide accommodation for an operator's radio equipment. So, for a mobile tower site in a farmer's field, that opportunity cost may be the loss of agricultural production. For building owners, the value of a rooftop is more complex to articulate, and even more difficult to defend the 'ransom' pricing that operators felt were being unreasonably required by landlords and their agents. The legal definition of 'land' also includes other types of assets potentially required by mobile operators. In the past Local Authorities have sold rights to attach radio equipment to its street furniture as an exclusive 'concession'. Intermediaries (the Wireless Infrastructure Providers such as Arqiva and even BT prior to EE ownership) bought these concessions to be able to sell managed small cell services combining street furniture site, power, installation and sometimes backhaul to the mobile operator. It is now increasingly the view that street furniture is legally defined as land and therefore the exclusive concession model is no longer valid in the face of operator New Code Powers. BT certainly took this view in handing back its nine exclusive city concessions to the Local Authorities providing the Local Authorities adopted an open approach to its assets to allow all operators direct access.

Whilst the Government's intention is clear; progress has been slow as landowners have resisted the operator application of Code Powers. Landowners and their agents have got used to an attractive revenue stream from site rental at 'market prices' (often more expensive than renting an office in the building below). The drafting of the New Code Powers was deliberately lacking in detail, with the expectation that case law would fill in the gaps. This has led to a painful, slow and expensive legal process as cases have moved through the dispute resolution process concluding in Court action. Case history is beginning to build; EE secured an Islington Council rooftop for £500 per annum rather than the £25K the council were seeking. Other operators

have had similar successes. Landlords had been blocking operators from even surveying sites because without a survey demonstrating the viability of a site, operators could not even start the dispute process. In a recent 'blocking' case brought by CTIL, judges found in favour of the operators and have required the landowner to grant access.

Timing of this 'discovery' phase of the interpretation of Code Powers has been unfortunate as it has coincided with the operators needing to upgrade and add new sites to support 5G. Getting cooperation from landlords to ease the 5G build whilst offering a significant rental reduction has not an easy message to land.

The long-term trajectory is however very clear. Landlords (and Local Authorities are a significant landlord) will see an erosion of site rental revenues and need to think about a more collaborative model that will at least help them to address some of their own digital challenges (like good mobile coverage) as compensation for loss of revenue.

There are already good examples of Local Authorities changing their stance and seeking to assist rather than 'tax' fixed and mobile network deployment. Norfolk County Council made all its assets available free of charge to operators willing to help close 'not spot' coverage gaps and have used Local Full Fibre Network (LFFN) funding to provide fibre backhaul to some of those sites. West Midlands Combined Authority provide possibly a better urban reference point for Royal Docks. As part of the £70M WM5G DCMS funded programme, the WM5G team working with Wolverhampton Council have offered thousands of Authority owned assets to the operators and have begun to simplify and standardise planning processes across the WMCA footprint. WMCA hosted an Open Access Forum meeting bringing together all the operators and a number of other UK city digital leaders to export this collaborative approach as a replicable model. Glasgow and Manchester are particularly closely engaged. We recommend a similar approach for LBN and RDT.

In this context this Report commends the work of the GLA in formulating the GLA Telecom Lease Template which is being promoted by the MNO's and its key asset management partners CTIL and MBNL. RDT should work with LBN to explore what resources and processes in LBN can maximise the opportunities of this.

New Code Powers have significant ramifications for developers beyond simply the loss of site rental revenues to operators. Some developers want to build 'neutral host' networks (see section 4.1.5) and compel operators to share the resulting solution. These developers see revenue from neutral host as a replacement for lost site rental revenue and as a way of minimising visual impact, with only one lot of equipment shared by four operators' rather than four separate builds: a potential double benefit. This approach is short sighted though; operators are not positively predisposed to outdoor neutral host (indoor is a different matter, as we explore in section 4.1.6) and a punitive neutral host rental expectation will simply encourage the operators to use Code Powers and build their own solution.

4.1.3 Royal Docks – Impact London City Airport

The location of the Royal Docks, particularly the proximity to London City Airport places further significant limitations on mobile coverage in the Royal Docks area. Radar interference concerns impose a 7KM restriction around the airport which will inhibit the use of certain 4G and 5G spectrum bands, potentially reducing network capacity (The Port of London Authority has its own radar site adjacent to Royal Albert Wharf. This site will have similar interference considerations, but we have not investigated fully).

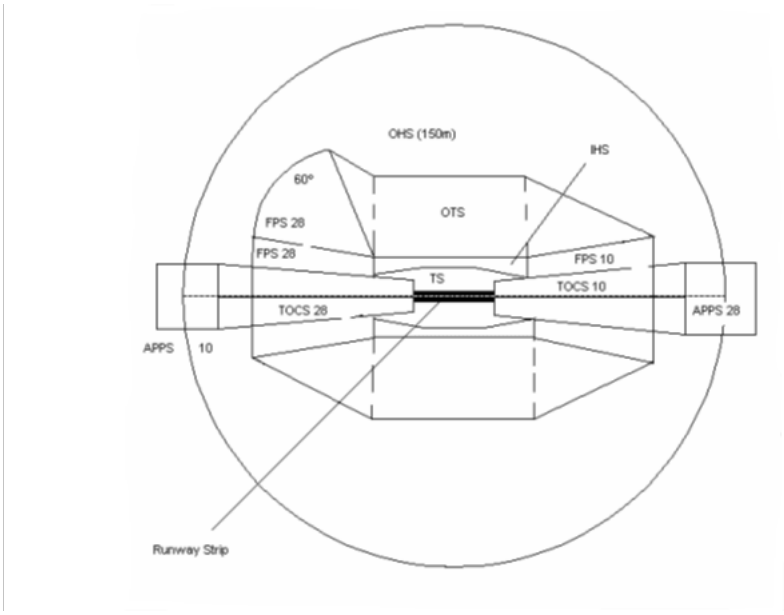

Figure 3 - height restrictions on force around London City Airport

The airport also imposes a maximum build height of 21M in the two miles around the airport. Many developers are building up to this limit, removing the option for rooftop antenna. Whilst operators are seeking sites for 'macro' rooftop or tower locations (and will upgrade existing sites adjacent to the Royal Docks as a first step), there will be obvious pressures to opt for a 'street level' build using monopole's on public highway sites (see figure 7 below) and mini-mobile base stations known as small cells, which typically attach to street furniture or building walls. RDT have invested in the redevelopment of the TfL DLR stations in the Royal Docks area. Some of these stations are on raised sections of the line and therefore could constitute interesting site options for mobile operators, potentially as a less visually impactful replacement for the monopole-type deployments discussed previously (It is also worth noting that TfL also deployed significant fibre capacity along the DLR route so there are potentially further synergies) .

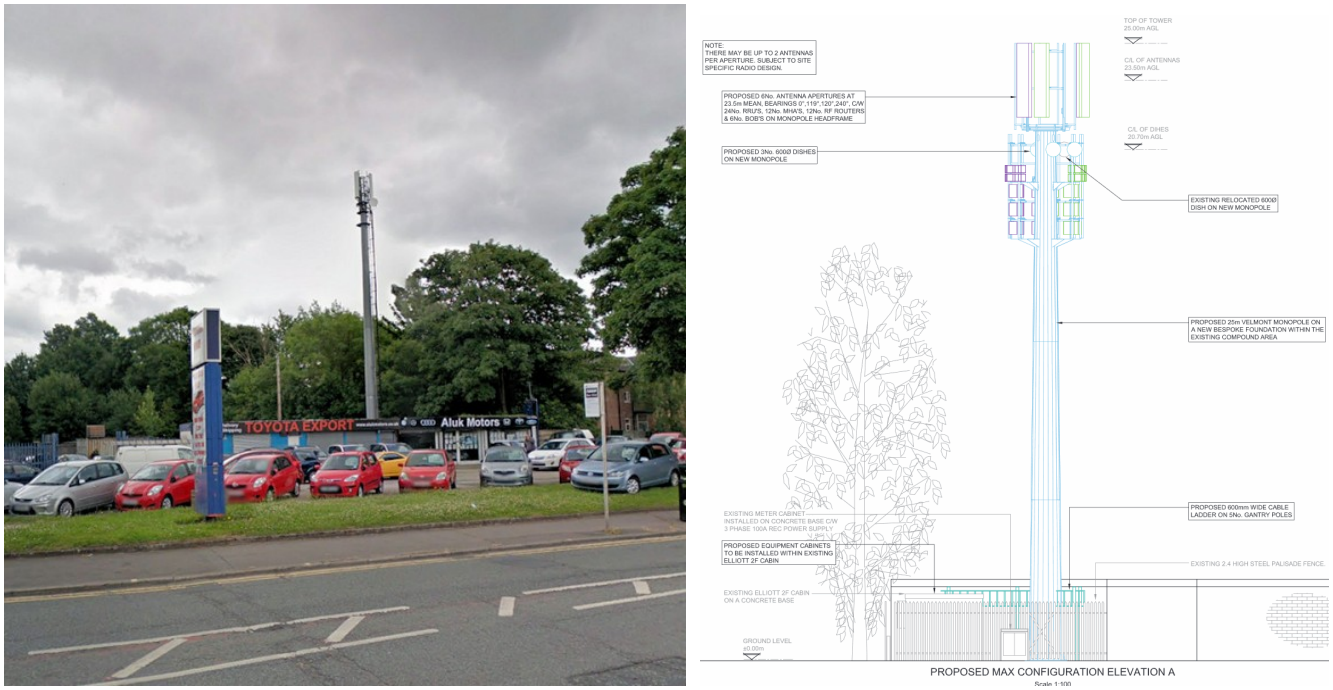

Figure 4 – MBNL monopole design being deployed to support 5G

4.1.4 Small Cells; not a scale requirement yet but considered 5G essential

Small cells are mini mobile base stations that are designed to attach to street furniture or building walls. For the last decade or so, the mobile industry (or at least the vendor community) has been prophesising the adoption of small cells by operators. Whilst this is happening in some markets like the US, it has yet to really accelerate in the UK. Only O2 (Telefonica) have really experimented at scale with small cells, largely because they have less 4G spectrum than other operators and they needed to make best use of what they do have by rebroadcasting that spectrum from as many places as possible – hence small cells.

Whilst the initial operator 5G network builds have focussed on traditional rooftop and tower deployments, the very high frequency bands 5G is expected to use in the future will have immense capacity - but only over a short range. This range limitation will make the use of multiple small cells, with each covering only a small area but contributing to the combined network capacity, an attractive potential solution for operators.

The real 'handbrake' on small cells has been the relative cost and complexity of deploying on street furniture. As a rule of thumb, a small cell is viewed as having one tenth the capacity of a rooftop site, so needs to be at most one tenth the cost of a rooftop site[2]. The problem is that rather than a repeatable low-cost option, small cells on street furniture end up being highly bespoke and there are multiple stakeholders in the supply chain, all seeking income from small cells.

[2] This reference point of the cost of a rooftop site does not stay constant. The cost of rooftop sites is falling as Code Powers take effect (see section 4.1.2) so the target price for small cells moves accordingly. The new 'Massive MiMo' antenna's operators are using can deliver more capacity from a rooftop site, further reinforcing the superior economics of the rooftop site.

RDT should discuss with LBN how the process for use of street furniture sites can be streamlined and made cost effective.

It is this vision of each operator building its own 'dense' street level small cell networks that concerns developers and the planner-custodians of the streetscape. Concern sometimes gives way to commercial interest; how can operator activity be monetised?

It is worth noting that the current concern over the visual impact of small cells may well diminish in the timeframe that small cells for 5G become a real operator requirement (although in the case of the Royal Docks, constraining factors like the proximity of the airport may bring forward small cell demand).

Figure 5– Evolution of small cells

Figure 5 above summarises the small cell journey. To the left is a Verizon small cell installation in Chicago. The developer and planner reaction is understandable, as is the resistance of local residents in downtown residential areas. The middle two images though show how small cells will potentially disappear inside street furniture; a JCDecaux bus shelter with small cells hidden inside the advertising panel and an Ericsson – Philips Lighting streetlight column with integrated small cell. On the right is a prototype 'bird shaped' 5G small cell from Deutsche Telekom, a demonstrator for how small cells could be designed to adapt more sympathetically to the urban environment. Small cells will inevitably get smaller, so the visual impact of even 'naked' small cells may well be much more acceptable by the time they are required at scale.

4.1.5 Neutral Host: attractive to everyone (apart from mobile operators?)

To a certain extent, outdoor 'neutral host' is an attractive solution for developers and planners in that it requires only one 'ugly' antenna rather than one for each operator. And that antenna can be hidden to some extent, as a cylindrical 'pole topper' on the telegraph pole or streetlight column. Neutral Host solutions are typically provided by Wireless Infrastructure Providers (WIPs) like Wireless Infrastructure Group (WIG), Digital Colony or Cellnex / Arqiva. The WIP will argue that mobile operators are used to sharing infrastructure indoors in high footfall locations like transport hubs, so an expansion of this approach to high footfall outdoor

locations makes sense. The relatively clutter-free attraction of Neutral Host to local authority planners is obvious – as is the potential to create a revenue share opportunity.

WIG (Wireless Infrastructure Group) have been very active in piloting neutral host solutions. Their Aberdeen pilot saw fibre deployed along the main road from the city centre to the University, with green street cabinets hosting mobile operator equipment near a series of streetlights and traffic signal poles, each topped with a shared antenna. The solution is neat but expensive (according to one operator). O2 are the only operator on WIG's Aberdeen system today. O2 have also opted to be part of WIG's more ambitious planned build in Birmingham and Coventry, which is intended to provide continuous coverage on a key road route to support connected vehicle trials.

Figure 6 – Wireless Infrastructure Provider WIG have installed a neutral host network on a main raid in Aberdeen. Mobile operator equipment is housed in standard green cabinets adjacent to street furniture

In the case of Royal Docks, a number of WIP's we have spoken to would be willing to build a neutral host network across the Royal Docks but would require exclusivity (and potentially funding in an anchor tenant capacity). Exclusivity would de-risk WIP investment by reducing the risk of competitive build – or mobile operator self-build. But as we have seen in section 4.1.2, New Code Powers would allow operators to build around a neutral host solution, if costs, coverage or technical specifications of the neutral host solution were unattractive.

From an operator perspective, outdoor neutral host solutions have limitations that outweigh the potentially beneficial shared economics. All operators have existing coverage from their rooftop networks in urban areas. The coverage patterns for each operator will vary though depending on which rooftop sites they are using, and the amount and type of radio spectrum used at each site. H3G have a heavily consumer -centric customer base compared to O2 and Vodafone who have a lot of business users, so user density and even

traffic profiles will also vary by operator. So, the 'one size fits all' approach of a neutral host network – with its pre-determined antenna locations – is not ideal. Some antenna sites will be in areas where the operator has capacity issues, but equally others may well be in areas that are already well served. This wasted 'duplicate' coverage (which can also create interference issues) still must be paid for, negating some of the claimed 'shared economics' benefits of neutral host. Operators are also concerned that the equipment used by neutral host vendors is often from a vendor other than the ones they use in their own network, bringing compatibility and complexity challenges.

4.1.6 In -building coverage is a real risk

Whilst mobile coverage considerations are dominated by outdoor demand, indoor coverage is likely to be the most significant challenge that developers face.

Today most indoor mobile coverage is provided from rooftop 'macro' radio sites. Working with the operators to maximise outdoor coverage will therefore have the additional benefit of ensuring that indoor coverage challenges are minimised. But developers cannot be complacent and will need to proactively consider how they will address the risk or even seek to use excellent mobile coverage as differentiation for their development (e.g. using WiredScore 'platinum' status in marketing material).

Mobile operators are not especially focussed on indoor coverage beyond high footfall venues like transport hubs and shopping centres. Mobile signals from outdoor sites are finding it increasingly hard to punch through into buildings. Energy efficiency measures (heat reflective films on windows and insulation) required by building regulations and modern construction techniques are making buildings harder to penetrate and the high frequency spectrum that will be used by 5G in the future is even less able to reach indoor users than todays 3 and 4G services. Whilst certain strategic venues such as the Excel Centre and London City Airport have adopted an inbuilding mobile strategy based on a DAS (Distributed Antenna Solution) operated by a third party, most developers will face a significant challenge in addressing the issue of inbuilding coverage and choosing the cost-effective model to realise the desired level of coverage. The issue is already manifest in Royal Docks; UEL commented on the existing levels of poor coverage in its student accommodation.

For offices with poor coverage, large corporates can usually rely on their mobile provider to solve indoor coverage as part of their corporate mobile contract or for a not insignificant additional payment. But increasingly offices are multi-tenanted, and even for large Corporates, the single operator coverage solutions offered by mobile operators are becoming less attractive as employees increasingly bring their own devices (and networks) into the workplace.

There are a range of options open to developers and landlords. Some will choose to leave it to tenants to deploy their own coverage solutions as part of the fit out, potentially using signal boosters where necessary. The WIP's are beginning to offer a version of the outdoor Neutral Host solution (described above) for indoors. Companies like StrattoOpencell (Part of Digital Colony) have developed 'landlord pays' multi-operator indoor coverage models which are beginning to get traction in the market. For this approach to work landlords must recognise they have a problem in the first place and that is not always the case.

From the operator perspective, the technology and interference issues that make outdoor Neutral Host a challenge are less concerning indoors (where the walls that make it hard for the outdoor network to reach users indoors prevent an indoor solution causing problems for the outdoor network). Mobile operators are more supportive of a shared approach – particularly if landlords are footing the bill. Mobile operators are working together to help standardise a toolkit for WIPs looking to offer indoor solutions[3], the idea being that supporting a standard model will reduce technical and operational issues. But the reality is indoor coverage remains a low priority for operators.

Because there is no consistent approach, mobile experience is likely to be very variable across the Royal Docks development, with carriers expected to engage with a variety of point solutions.

5.0 Stakeholder Engagement

The findings and recommendations of this Report are based on an actual stakeholder engagement exercise (over 30 individual meetings conducted) which took place during the period of late September to early December 2019.

As far as possible each stakeholder engagement was undertaken as an individual meeting in person or conference call. The purpose of each session was to engage with each stakeholder with a view to sharing the objectives of this strategic exercise, seeking their strategic input in respect to the role of the Royal Docks and most importantly understanding in more detail their own strategies, policies and digital aspirations.

What should be acknowledged at this stage is that in case of each developer and private business they retain the commercial decision-making process to determine their own investment and digital strategy. The purpose of this report and its recommendations is not seeking to impose any solution or model on individual developers or businesses but is seeking to identify ways in which RDT can be an enabler to support the growth of digital connectivity within the Royal Docks.

The stakeholders interviewed comprised a number of interested parties ranging from the public sector including the London Borough of Newham (LBN), the GLA and DCMS, capturing the developer community (existing and planned developments) and key existing stakeholders within the Royal Docks such as the Excel Centre, London City Airport, and Tate and Lyle. In each instance we would like to place on record our thanks to each organisation who supported this exercise and the invaluable contribution they have made in ensuring that this Report is both meaningful and realistic.

In terms of the engagement a list of the parties involved is listed below:

Main Enterprise Zone Development Sites

- ABP, Royal Albert Dock
- London & Regional Albert Island
- Lendlease, Silvertown Quays

[3] Collaboration through the Joint Operator Technical Specification ('JOTS') forum

Royal Dock Developers

- Mount Anvil (Royal Docks West)
- Silvertown Homes (Thameside West)
- Notting Hill Genesis (Royal Albert Wharf)
- Grainger (Limmo Peninsula)
- Ballymore (Royal Wharf)
- Keystone (Thameside West)

Public Sector

- DCMS Barrier Busting
- West Midlands Combined Authority (WM5G)
- GLA Connected London
- GLA Infrastructure
- London Borough of Newham (Planning, Digital One Source, Regeneration)
- TfL

Existing Stakeholders Royal Docks

- London City Airport
- Excel Centre
- Tate & Lyle
- University of East London

Fixed and Mobile Operators

- Openreach
- Virgin Media
- Hyperoptic
- Community Fibre
- G Networks
- O2 Telefonica
- Vodafone
- EE

Mobile Telecom Infrastructure Companies

- Cornerstone (CTIL)
- Mobile Broadband Network Limited (MBNL)
- Cellnex
- Digital Colony
- Wireless Infrastructure Group

6.0 Strategic Findings

In detailing an overview of the strategic findings, note should be made of the positive and invaluable contribution made by all stakeholders interviewed in support of this Report and their ultimate contribution to this Report.

Whilst it is acknowledged that various stakeholders will for commercial reasons wish to progress their own narrative in respect to defining and marketing their development, what clearly emerged from the engagement exercise was a real sense that digital connectivity and strategy did matter and that the Royal Docks would benefit in ensuring that a digital narrative for the Area would be beneficial for the Royal Docks.

6.1 Fibre broadband treated like a utility (and is being actively progressed); mobile coverage like an act of god

The developer community takes a hierarchical approach to fixed and mobile communications. As illustrated in figure 7 below, broadband is seen as almost another utility and as a consequence there is an expectation by developers that broadband providers will connect their development and they have largely been actively engaged with fibre network providers to ensure that connectivity is designed in from day one. Mobile coverage is not approached in a consistent way. Apart from a number of 'proactive developers' who see mobile coverage as both a challenge and an opportunity for differentiation, most developers are relying on mobile coverage to 'just happen', possibly lulled into a false sense of security by the 'good' coverage on the site today – which we expect to deteriorate rapidly as building work accelerates and tenants move in.

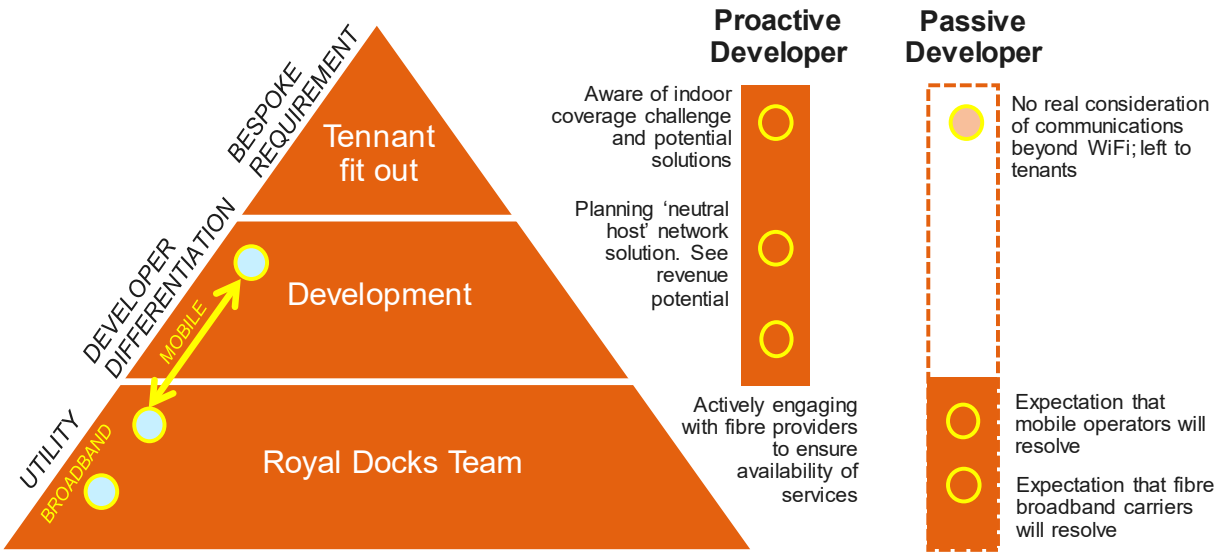

Figure 7 – Broadband is treated (and its providers behave) like a utility. Mobile is less clear. Passive developers expect mobile coverage to 'just happen' whereas the more enlightened are alert to the challenges and actively considering solutions

6.2 Fibre coverage outlook is positive given the proactive work of three carriers

Fibre is viewed as digital utility and developers and carriers are actively engaged. Fibre broadband is increasingly seen as an essential utility by developers and the customers who buy or rent property from those developers. The Government is in agreement; in October 2018 the Government consulted on requiring developments to have fibre broadband as a condition of planning approval. Whilst this provision has yet to reach the statue books, some progressive authorities have already added mandatory fibre to their planning process.

Fixed operators are incentivised to build fibre networks into new developments or poorly served areas, if there are sufficient customers requiring connectivity, there is an economic business case for operators to invest as customer connections generate revenue (whilst this sounds obvious, the situation for mobile operators is very different as we shall see). Whilst the Labour Party plan to part-Nationalise BT and provide free broadband has (probably temporarily) stalled the investment market, the Governments recently stated intent to bring forward the 'full fibre' vision to 2025 has attracted huge investment in UK fibre Altnets as well as stirring significant fibre accelerations by the incumbent duo Virgin-Media and BT owned Openreach. Altnet competitors like City Fibre are particularly active in dense urban areas, so for urban local authorities the consideration has shifted rapidly from self-funded and LFFN interventions to channelling commercial operator build activity to meet local digital strategy objectives.

The important factor is that fibre providers are increasingly behaving like the traditional water, gas and electricity utilities. Even the civil engineering process of digging trenches and burying duct and fibre assets would be familiar to traditional utilities. Fixed operators engage with developers at an early stage and are prepared to invest ahead of demand. Developers also understand that absence of broadband is a serious issue for would-be buyers or tenants, so the days of isolated new-build estates with no broadband are becoming a thing of the past.

Current Fibre Coverage and Access to Fibre

Current fibre coverage has been detailed in Section 3

Future Fibre Investment

Community Fibre has made a clear expression of interest to deliver their own fibre infrastructure within the Royal Docks leveraged through their relationship with Notting Hill Genesis. G Networks have similarly expressed interest in extending their fibre build activities into the Royal Docks. Wireless Infrastructure Providers WIG, Cellnex and Digital Colony who would like to offer 'neutral host' solutions to mobile operators (see section 4.1.5) also stated they would be interested in building fibre networks to support their deployment.

Conclusion:

On the basis of these findings this Report is of the opinion that there is no current requirement for the GLA or the Royal Docks to make a significant capital investment intervention in funding further fibre or ducting infrastructure to attract full fibre investment to the Area. The Royal Docks is already benefiting

from recent fibre investment and will benefit from further planned investment in the future however issues and concerns still are being expressed in respect to full diversity and resilience for businesses which should improve as further investment takes place and awareness increases of existing additional fibre networks. This in turn we believe will stimulate competition and provide choice for residents and businesses.

We do however make recommendations about how LBN and GLA should capitalise on this current fibre momentum by opening up existing LA owned ducting assets and integrating duct laying into any scale road of cycle way activity.

6.3 Ducting Infrastructure:

- LB Newham have already invested in and developed a ducting network across the Borough of Newham including the Royal Docks which is already delivering considerable benefits in the way public sector services are delivered within the Borough. In this respect have a significant 'sunken asset' which is already realising important outcomes within the Borough.
- Based on the overarching connectivity audit and the use of Openreach's PIA Infrastructure by carriers and service providers the need for direct funding intervention by the RDT/GLA in investing in further ducting infrastructure may be limited , however the potential does exist to consider how the current LBN ducting/fibre network could be extended not through public funding but either through private sector investment or mutual access to ducting infrastructure (Private ducting in Silvertown how could this drive an extension to LBN fibre network.
- Extension of existing LBN network into Silvertown and North Greenwich based on public sector need.
- Extension of this ducting network as part of planned road or cycle path developments within the Royal Docks including the Woolwich Road redevelopment where it is mandated that in the event of a utility dig a telecom ducting provision is built into specification.
- In terms of the existing ducting infrastructure and subject to survey, it is the opinion of this Report that this infrastructure should play an enabling role in accelerating the delivery of fibre connectivity within the Royal Docks Area.
- Based on engagements with Developers, Carriers and Mobile Infrastructure Companies interest does exist from these parties in understanding in more detail the condition and availability of this ducting network and how and under what terms could this ducting be accessed on an open access and market rental basis.
- Indicative interest was expressed in respect to the following opportunities:
    - Deliver access into new developments (breakout points in close proximity to sites)
    - Access to Public Realm Furniture (Street Lighting/CCTV Columns) enabling the delivery of 4G and 5G Small Cell.
    - Delivery of dedicated private point to point fibre links (buildings/data centres)

Conclusion:

On the basis of these findings this Report is of the opinion that the LBN owned ducting infrastructure does constitute a viable option which could play a role in accelerating fibre and mobile deployment within the Royal Docks.

In this respect LBN should proactively review the ducting infrastructure with a view to determining how access could be provided.

6.4 Mobile Coverage is more complex and less certain:

Through previous investment by all the mobile operators the current level of mobile coverage in respect to 4G is deemed as good in terms of user experience, coverage and capacity. However, it should be noted that the Royal Docks occupancy levels today are far below the projected 50,000 workers and 30,000 residents. We are predicting that the combination of this growth in local residents and underlying data traffic growth patterns will undoubtedly place increasing strain on the current network architecture which will require a proactive approach by operators and developers if current coverage and capacity levels are to be maintained.

The economics of mobile networks are fundamentally different from fixed broadband and this is reflected in the way mobile operators approach new build. Unlike fixed broadband, where connecting new customers creates revenue and a positive business case, adding new incremental areas of coverage has little or no impact on subscriber acquisition (or churn). Given the propensity towards bundled 'all you can eat' type tariffs, mobile operators see no additional revenues from extending coverage and enabling customers to make calls in a new coverage area. The only impact of adding coverage is to increase costs; build and operate costs of new mast sites and the cost of any incremental calls made. So when operators consider where to spend their network capex budget, they tend to prioritise maintaining customer experience in existing high footfall areas, so as a priority will add new spectrum and additional radio equipment where they can see their network is under stress, rather than proactively engaging with developers to pre-provision new build locations.

This is why many new brownfield or edge of town developments have poor coverage. Brownfield and edge of town locations have low footfall, so coverage and capacity requirements are low. The mobile operators' reactive approach – waiting to see a deterioration of customer experience before acting – means that coverage frequently lags behind customer needs in new development areas, coming long after businesses and residents have moved in and service experience leads to eventual build prioritisation.

The above central dynamic of the mobile market is not well understood by the developer community (there are some exceptions) or by local authorities trying to shape economic development in their towns and cities. Consequently, there is a general belief that mobile coverage 'just happens'; the same utility expectation that fixed fibre broadband is increasingly moving towards.

By contrast, a group of companies called Wireless Infrastructure Providers (WIP's; traditionally owners of many of the mast sites used by mobile operators – companies such as Cellnex, Wireless Infrastructure Group

and StrattoOpenCell) are very alive to trends in the mobile market and see the gaps created by mobile operator demand lag as a profitable opportunity. These companies are promoting the idea of 'Neutral Host' networks, where one set of equipment is shared by all mobile operators, the idea being that by sharing sites and equipment, mobile operators' cost are shared and therefore reduced. Neutral Host is also attractive to developers and Local Authorities; neutral host promises less visual clutter than four separate operator builds and comes with a revenue generation opportunity if the network is jointly owned with a WIP. The concept is not popular with mobile operators as potential savings are outweighed by compatibility issues (choice of equipment) and sub-optimal site choices (some of which may be in areas where the operator already has good coverage). Nor can operators be mandated to use Neutral Host solutions; at the end of 2017 the rights of operators to acquire sites (Code Powers) were shifted significantly towards a near-compulsory purchase model. Operators can (subject to a currently long and drawn out resolution process) pretty much put equipment wherever they want at a low 'opportunity cost' price. Consequently, if a Neutral Host solution does not meet an operators technical and commercial expectations, they can simply build over and around the Neutral Host solution, leaving the developer or local authority with unwanted street clutter and a share of an uneconomic Neutral Host solution.

Whilst the focus of mobile coverage considerations is dominated by outdoor coverage and capacity, indoor coverage is likely to be the most significant challenge that developers face

If indoor coverage lags behind outdoor coverage which already lags behind the development cycle, the prospects are bleak unless landlords take matters into their own hands. We see a range of maturity in developer indoor thinking; from coverage 'denialists' to developers who see indoor coverage as an essential enabler to attracting and retaining tenants and rental maximisation.

What is currently apparent and of concern is that is no evidence of engagement of the Mobile Operators engaging with RDT or vice versa. If this situation continues this will perpetuate a reactive approach by the Mobile Operators to future mobile coverage issues as opposed to a more holistic and co-ordinated strategy being adopted. This Report is pleased to note that both MBNL and CTIL are now actively seeking to be engaged and this should be welcomed and promoted going forward.

Conclusion:

On the basis of the above findings we have concluded that there is no requirement for the GLA or RDT to make a significant capital investment intervention in funding mobile/wireless infrastructure within the Royal Docks.

However, consideration should be afforded to funding or creating in partnership base station hotels which help reduce street realm clutter for the Operators.

Based on our engagement the market appears to be prepared to invest and address future 4G and 5G requirements within the Royal Docks. However, as we will detail later in this Report LBN, RDT and the GLA will have a significant enabling role in ensuring that this coverage is delivered in a timely fashion

and does not 'lag' significantly behind demand. Engagement with the Mobile Operators will play a key role in achieving this outcome.

We believe this will require RDT to assist in educating the developer community and facilitating meetings between operators, developers and WIP's. Operators will benefit indirectly from measures to incentivise fixed operators to build fibre networks needed for backhauling radio traffic. Direct incentives worth considering are planning policy concessions and access to public realm infrastructure.

6.5 Connectivity Data Resource

There is a perception that fixed and mobile operators are reluctant to share information about where their networks run (or detailed coverage maps in the case of mobile operators).

Whilst there is a high degree of commercial sensitivity, particularly about sharing future plans, we have found the operators to be very collaborative. Indeed, the real problem would seem to be how (or where) within the GLA and the respective London Boroughs the information from operators is collected and made available. We found multiple examples of data being provided by the operators into various Authority sponsored activities and new mapping activities being progressed, but largely in an uncoordinated way, with overlaps For example Virgin Media network plans are available on DIGDAT https://www.digdat.co.uk/ an infrastructure register managed by Anglia Water with access provided to the Public Sector under licence.

Conclusion:

Coverage data does exist but there is no co-ordination of this data in a way which is meaningful to all parties.

6.6 Public Wi-Fi

Whilst Public Wi-Fi is delivered within certain private sites within the Royal Docks including London City Airport and the Excel Centre and currently is seen as a key component in delivering a valuable customer and visitor experience and is still being considered by Developers as part of their public realm strategy there is increasing evidence to suggest that the delivery of Public Wi-Fi in public spaces is no longer a necessary feature.

Although the availability of Public Wi-Fi in public spaces has previously being regarded as constituting a key means of improving access to the internet and an opportunity to generate a commercial return for local authorities, we see no value in progressing a concession type model to realise these outdated aspirations.

Conclusion:

With improvements in 4G coverage and the emergence of 5G the need for public space Wi-Fi is lessening and it on this basis that the Report believes that there is no strategic value in RDT progressing a public space Wi-Fi strategy for the Royal Docks.

6.7 A Broader Digital Agenda; Internet of things and movement analytics

The digital agenda for the Royal Docks could be drawn much broader that basic connectivity. The same fragmented 'by developer' approach that overshadows mobile coverage also applies to more specialist digital activities. At least one developer is planning a data centre on site. A small number are interested in Internet of Things (IOT) applications for both intelligent building applications and outdoors. The important point is that fibre is the only element of the digital agenda where there is a consistent approach across the Royal Docks; everything else is left to the individual developers who are making individual and inconsistent choices. This means there is no clear digital agenda for the Royal Docks and to a certain extent this is reflective of a wider need; if Canary Wharf is the hub of the financial services industry, how would Royal Docks be described? Whilst not a perfect reference point, Google's Sidewalk Labs plans for the Toronto waterfront show how a strong digital agenda can help define the identity of a regeneration project. Whilst probably not a realistic ambition for the Royal Docks, it is a useful illustration of how technology can underpin the narrative for a development.

Whilst IOT is still in its infancy there are a number of interesting developments and initiatives which RDT working with the GLA and LBN could potentially benefit from exploring at this stage.

An example of such an initiative is how data can be focused on a set of visitor centric insights which could inform the Royal Docks Masterplan in respect to analysing visitor movement, behaviour and spend. Such an approach has been proposed by Movement Insights which were engaged as part of our stakeholder engagement.

In this instance Movement Insights through its partnerships with the likes of O2 and Visa are proposing to deploy 5 small cell sites in key pedestrian areas around the Royal Docks and to use Visa data to build a detailed understanding of spend and movement characteristics for the Royal Docks footprint. The data generated will go beyond footfall but will provide insights of people visiting the area.

Such an approach would have the potential to drive a number of outcomes:

- Evidence base on the long-term impact of regeneration
- Supporting the delivery of LBN's Digital Transformation Strategy
- Demographic overview of residents, workers and visitors in the area and how these are changing
- Effectiveness of events and future activities – ability to attract new and returning visitors
- Improve place making and wayfinding around the Royal Docks

Conclusion:

On the basis of these findings we would recommend that RDT accelerates its Master Planning activities and considers how digital can contribute to the definition of a unique identify for the Royal Docks.

7.0 Market Engagement:

Based on the engagement exercise with key stakeholders it is very apparent that there would be significant benefits from a much broader and more coordinated engagement process. This would bring together the local authority, developers and operators and secure a better outcome.

This Report would wish to note the following key findings:

- There is generally very limited information being shared by the market i.e.; current fibre coverage with key stakeholders which does result in stakeholders being unable to make the most well-founded decision re future connectivity needs. This is exasperated by multiple and separate collection points for information on the authority side (GLA, LBN and RDT) which results in information not being shared or is not recorded. (see section 6.5). The RDT should work with LBN to establish a simpler system of data sharing.
- There is generally little engagement with the fixed connectivity market in understanding what already exists in terms of fibre within the Royal Docks. Consequently, assumptions are being made about what or what not exist (two scale businesses with presence in the Royal Docks have been concerned by lack of full resilient routing options. Our research suggests this is available already – but the information is not readily accessible).
- There is little evidence of the MNO's having been directly engaged by various stakeholders with a view to sharing their requirements and challenges and for the MNO's sharing their plans. This has resulted in an adhoc strategy developing in respect to the delivery of mobile coverage both external and inbuilding.
- There is evidence to suggest that some developers still see mobile enablement as a revenue opportunity and not as an essential utility and that operators will respond with their New Code Powers. More work needs to be done to bring developers and operators to a mutually beneficial solution.
- Whilst recognising the confidential nature of the commercial networks available there is no central mapping resource which the likes of RDT, the GLA and Developers could have access to which would assist each respective party to determining what is available and what is planned.(Leeds City Council are encouraging contribution to a similar model with easement on wayleaves for those who support).
- There is no existing channel of engagement which can be used by the market to work with RDT and the GLA. Different information is being shared with different departments or organisations.

Developer Engagement:

The role of the Developers as well as City Airport and the Excel Centre will be and is making an enormous contribution to the digital narrative within the Royal Docks. What is apparent however is the diverse contrasts in approaches being adopted from very focused strategies for their respective development to strategies still in their infancy.

Whilst fibre is seen as an essential utility by the developer community and more importantly by their customers, mobile coverage does not yet command the same attention. Developers appear to be more proactive in securing good fibre connectivity but tend to assume others will ensure mobile coverage is addressed. The overriding developer expectation is that mobile coverage will just happen. This is a riskier approach.

Some developers are alert to the risk of poor mobile coverage (both outdoor and indoor) and are actively planning interventions they hope will guarantee high quality coverage and potentially create a differentiator between their development and the rest of the Royal Docks. But this is far from the consistent response. There are developers who have a reactive stance towards mobile coverage and are making no real provision. The RDT have a role in using this report to ensure a consistent understanding and more comprehensive response.

Whilst fibre is increasingly built in anticipation of demand, mobile coverage tends to lag, leaving users with a poor experience from the moving in period to the point when operators spot that they have a cohort of poorly served users and invest in the required coverage upgrade. In addition to this supply 'lag' the proximity of the Royal Docks to the Docklands Airport places further constraints on mobile operators, with radar interference issues and height restrictions on developments limiting spectrum usage and availability of favoured rooftop sites for radio equipment. In short, the RDT should take a proactive approach to ensuring that developers are aware of the options and the risks are properly mitigated with a clear approach with London City Airport.

Whilst we expect fibre to appear everywhere (as you would expect for a utility) there are seventeen main developers and landowners active in Royal Docks and they are all proceeding on slightly different approaches to mobile coverage, mostly assuming that others will deliver the service required. The same fragmented approach applies to more specialist digital activities. At least one developer is planning a data centre on site. A small number are interested in Internet of Things (IOT) applications for both intelligent building applications and outdoors. The important point is that fibre is the only element of the digital agenda where there is a consistent approach across the Royal Docks; everything else is left to the individual developers who are making individual and inconsistent choices. This means there is no clear digital agenda for the Royal Docks and to a certain extent this is reflective of a wider need; if Canary Wharf is the hub of the financial services industry, how would Royal Docks be described? Whilst not a perfect reference point, Google's Sidewalk Labs plans for the Toronto waterfront show how a strong digital agenda can help define the identity of a regeneration project. Whilst probably not a realistic ambition for the Royal Docks, it is a useful illustration of how technology can underpin the narrative for a development.

These overall strategic findings are supported by several key themes and concerns captured during the stakeholder engagement and detailed below for reference:

1. No overall digital strategy or narrative currently exists for the Royal Docks but there was an appetite to develop such a narrative. This was evident from a number of conversations with Developers who participated in the market engagement.
2. Stakeholders interviewed were supportive of RDT taking a more proactive strategic approach to co-ordinating and promoting digital initiatives within the Royal Docks
3. For some developers a more dynamic and developed strategy was seen as constituting a distinct USP for their development
4. There was a desire from a number of parties to understand what connectivity currently existed whether in addressing existing resilience issues (seeking to identify alternative routing), understanding how existing fibre could be accessed and who they should engage with.
5. In the case of mobile coverage there was a sense that current mobile coverage was sufficient and that the mobile operators would address future coverage issues without having to engage with them directly.
6. RDT and the GLA were credited with adopting a proactive process towards engagement.
7. LBN were viewed as a key player and there was clear wish for LBN to become an enabler through its assets (including the ducting infrastructure). However, it was felt that LBN needed to be more proactive in engaging with stakeholders and making stakeholders aware of the infrastructure options available.
8. Developers would welcome the opportunity to engage collaboratively through the leadership of RDT In not engaging with the Mobile Operators decisions relating to inbuilding mobile solutions were being constrained by a lack of technical and commercial background information.

Conclusion:

It is the considered opinion of this Report that whilst certain Developers and Stakeholders are actively exploring and implementing a digital strategy, the Royal Docks needs to work much more closely with Developers with a view to developing a series of common principles which could be applied to engaging with the market, creating a design template and ensuring that an element of consistency and coverage continuity is delivered across the Royal Docks.

London Borough of Newham Engagement:

LBN has a fundamental role in defining and enabling the digital experience in the Royal Docks. In this respect this Report would wish to encourage LBN to rapidly review how it will encourage operators to build fixed and mobile coverage and indeed its wider digital strategy that could be accelerated by the activity in the Royal Docks. This unique opportunity: -

- Providing access to the existing ducting network
- Developing and delivering a public realm policy involving Street Lighting, Planning and Highways to address future 5G coverage requirements within the Royal Docks.
- Build upon the commendable work previously undertaken by Planning both through the OAPF and IDP documentation by strengthening current planning policy in respect to requiring Developers to deliver a telecom ducting solution as part of any future planning application.
- Work with the GLA and DCMS to develop a local 'Barrier Busting Team' within the Council who could engage with the Market, identify and proactive remove such barriers and accelerate digital investment.
- Work with RDT and the GLA to continue to engage with the telecom market which will benefit multiple departments within LBN (including Planning & Regeneration) to make well founded strategic and policy decisions based on up to date data and strategy.
- Work with RDT and the GLA to develop and implement a co-ordinated IOT Strategy for the Royal Docks.
- Utilise the existing LBN Utilities Board which oversees utility digs within Newham to include future fibre deployment. This will enable LBN to co-ordinate fibre deployment and enable Carriers to share in confidence their future deployment plans which in turn could be co-ordinated with other utility digs and major highway improvements.
- The RDT should proactively review with LBN the resourcing and senior level sponsorship to co-ordinate the Council's engagement.
- LBN to proactively contribute to any digital workstream within the Royal Docks with serious consideration being afforded by LBN to nominating an appropriate Council Officer (recommended that this should be CIO level) to contribute to such workstreams in the future.

Conclusion:

On the basis of these findings, this Report is of the opinion that LBN have a tremendous opportunity to be at the heart of developing and promoting a digital narrative for the Royal Docks. In undertaking a proactive enabling role with all parties including Carriers and Developers will ensure that this narrative is realised and that the benefits of improved access to connectivity is shared across all communities and businesses.

GLA/Royal Docks Strategic Engagement:

What is evident from this process of engagement is that RDT and the GLA have a very important strategic enabling role to play through clear and focused policy intervention.

Operator engagement and therefore the digital capability of the Royal Docks is highly dependent on the processes and policies of LB Newham. Given the scale of development and growth projected in the Royal Docks, the RDT and LBN should work together to explore how the current processes and resources can be enhanced to maximise the opportunity. We have recommended that LBN set a target to become the 'Barrier Busting' exemplar for London.

There is a sense amongst stakeholders that there is an appetite to share and promote a common digital narrative which can form part of the future branding and positioning of the Royal Docks as a digital exemplar through, strategy, policy and investment. The issue that exist however is who should own this narrative and how should parties work together.

As part of this strategic role there is a crucial need to ensure that there is closer alignment between the GLA and RDT in respect to how connectivity data is shared and how decisions adopted are aligned with National and GLA Policies and Strategies. Indeed, this Report believes that there is an opportunity to develop the Royal Docks Digital Narrative as an exemplar and case study for public/private collaboration through the creation of a framework

To support this role there will be a real need to address the following issues:

- The elevation of digital as a separate workstream within the Royal Docks Masterplan where sufficient focus and time can be devoted to understanding future plans and co-ordinating strategies and policies.
- Sharing of connectivity data who should be the custodian of this data and how should it be shared?
- How should the Royal Docks engage with Developers in respect to digital – should it be more proactive and become the conduit for the market to inform the Developers?
- How can and should the Royal Docks working with the GLA and LBN work more closely in partnership to deliver a holistic IOT Strategy which can support the public sector as well enable developers, existing local residents and businesses. In the absence of such a strategy there is a risk that the Royal Docks will be left behind which will impact upon its future digital narrative. In this instance is there an option for direct intervention in respect to funding a LoRaWAN IOT network.
- How could the GLA/RDT leverage additional social value in respect to improved connectivity for existing communities and businesses.
- These overall strategic findings are supported by several key themes and concerns captured during the stakeholder engagement and detailed below for reference:

Conclusion:

The GLA and the Royal Docks need to play a more proactive enabling role through policy initiatives, strategic co-ordination and closer engagement with stakeholders. Digital connectivity must be a key differentiator for the Royal Docks in promoting the Royal Docks as a destination going forward. Accordingly, investing time and resources to this key area will be of considerable value.

Without such leadership there is a risk that connectivity within the Royal Docks will become fragmented and will become a place for reactive initiatives as opposed to a structured and well thought through digital strategy.

Other Key Stakeholders:

- Current businesses have suffered in the past from a lack of good connectivity.
- Little information is available in respect to what fibre exists in the Royal Docks this in great part is the responsibility of the Carriers but could a more proactive approach be adopted by RDT and the GLA in coordinating connectivity data which could be made available to stakeholders.
- Currently exploring inbuilding upgrades (Excel Centre 5G) or exploring a new technical solution for mobile inbuilding coverage (London City Airport). Are there lessons engagement, market knowledge that could be shared with other stakeholders.
- London City Airport looking to identify and secure alternative fibre routing within the Royal Docks to improve network resilience.
- Poor mobile coverage on the UEL Royal Dock campus which has an impact on their 'Knowledge Dock' Innovation Centre initiative, which supports c30 start-ups. How can engagement with the Mobile Operators be progressed to rectify this issue?
- UEL developing a Smart Campus Strategy how could RDT play a role in this initiative. Interest in collaborating with RDT on an IOT network project.
- UEL have been seeking to migrate their fibre provision onto the Newham Public Sector fibre network but experiencing considerable delays and barriers to realising this objective.

8.0 Recommendations

To build upon both the stakeholder and market engagement as well the strategic findings detailed and to realise the enabling role that RDT could and should play it is important at this time to keep a clear and defined focus on identifying deliverable opportunities.

It is imperative that these recommendations should be closely aligned to the wider strategic vision for the Royal Docks. With clear sponsorship and continuing internal and external engagement it is the considered opinion of this Report that with clear leadership and sponsorship these recommendation as detailed below can be implemented within the six months.

8.1 Coverage Information – What Actually Exists

It is recommended that as a matter of priority RDT and the GLA should seriously consider developing a 'one truth' strategy for operator data collection is agreed between the various stakeholders, with the GLA being the most obvious custodian.

Key Actions

- GLA to build upon the data collected through this exercise and create a database relating to connectivity both fixed and mobile which can be shared with LBN (Planning), Royal Docks and other key stakeholders including Royal Docks Developers and other key partners including City Airport and the Excel Centre.
- Royal Docks to continue to engage with the market both fixed and mobile to validate coverage
- RDT working with GLA to create a portal with a generic heat map with links to coverage information (where data can be shared) or to respective Carriers or MNO's.

Key Objectives

- Create a single database of coverage and telecom infrastructure data which can be co-ordinated and updated by one nominated party ie: the GLA.
- Enable RDT, GLA and LBN to make well founded decisions in respect to future investment, connectivity needs and future digital strategy

Timescale

- To be completed by the end of September 2020.

Key Outcome

Creation of a connectivity database for the Royal Docks which will contribute to future digital narrative of the Area and ensure that decisions relating to current and future digital requirements are addressed on well founded and up to data.

8.2 Mobile Coverage

Whilst this Report believes that the Royal Docks are well on the way to having the necessary fibre infrastructure, the mobile situation is more concerning.

Given the unique combination of mobile coverage and capacity challenges the Royal Docks faces, we would recommend that RDT consider

- a more detailed future scenario modelling exercise. For example, the likes of Real Wireless a very reputable company in the field of mobile telecommunication have developed specific modelling tools and have delivered similar studies. The resulting model can be used to engage with operators and educate the developer community.
- engage with Belfast Harbour Airport who have worked with EE to address similar issues.
- Instigate an immediate and more proactive engagement with the Mobile Operators as well as with MBNL and CTIL.

Key Actions

- Instigate an immediate engagement with the Mobile Operators.
- Undertake a detailed modelling exercise of the Royal Docks in respect to projecting future mobile demand and challenges
- Engage with the MNO's in advance of the modelling exercise with a view to confirming scope and objectives.
- Engage with London City Airport in advance of the modelling exercise with a view to confirming scope and objectives.

Key Objectives

- Clear understanding of future mobile requirements and how these could impact upon current thinking and how they will align with the requirements of London City Airport.
- Help to understand future requirements of MNO's and assist RDT in future engagement with the MNO's.
- Highlight potential challenges and risks

- Contribute to strategic approach towards future planning and public realm policy – recognise and accommodate future mobile requirements
- Learn from other schemes which have had to address similar challenges and incorporate where possible lessons learnt

Timescale

- To be completed end of September 2020

Key Outcome

- Modelling will provide a clear and evidence-based overview of future mobile coverage requirements within the Royal Docks and will benefit future engagement with the Mobile Operators

8.3 Fibre Deployment

To all intents and purposes the fibre network providers behave like the other more traditional utilities (electricity, gas and water) and are well engaged with the developer community in addition to having substantial existing fibre assets in the Royal Docks area (particularly Virgin-Media, Hyperoptic and Openreach). Developers typically (although not universally) consider good fibre connectivity as essential to attracting good commercial tenants and enabling residential sales and have been proactive in ensuring both connectivity and choice of connectivity provider.

This proactive engagement should be encouraged and we believe the GLA and LBN can play a part in encouraging proactivity by ensuring open access to the substantial fibre duct assets that are already held by LBN and the opportunity to fund ducting and fibre access whenever significant roadworks or other infrastructure programmes are planned (eg cycle paths). We recommend that common planning practices across the Royal Docks development area so that the engagement model is consistent across the whole site.

Key Actions

- LBN and the GLA to build upon existing initiatives and strategies with a view to developing a template for engagement with the Carriers.
- LBN & RDT to proactively engage with Developers with a view to ensuring that there is an awareness of the mechanisms available to facilitate fibre connectivity to each development (ducting specifications, public realm designs)
- LBN to draft a specific Telecommunication Supplementary Planning Document (SPD) which would be both be aligned with the London Plan and impending changes to National Planning Policy which would require developers to install ducting for future fibre deployment in any new development.

Whilst this Report notes that legislation is pending in respect to addressing this issue there is no clear indication when such legislation will be secured hence the need to adopt this recommendation.

Key Objectives

- Develop and share a common template relating to design and specification in respect to any new ducting infrastructure.
- Drive a common and consistent engagement narrative in respect to enabling access to fibre infrastructure.

Timescale

- To be completed end of September 2020

Key Outcome

- Development of a consistent telecom planning policy

8.4 Mobile Coverage – Technical and Commercial Solution

There is real complexity in mobile coverage and RDT have a role to play in educating the developer community and creating a forum for operators and developers to collaborate to ensure that mobile coverage does not become an expensive afterthought.

Part of the developer education role for RDT should be give insight and create a portfolio of potential solutions that developers can choose from.

Key Actions

- RDT to facilitate an engagement with the MNO's and the Developer Community in the form of a workshop with a view to initiating a dialogue between both parties and addressing key issues of deployment, design and commercial model.
- RDT to facilitate a separate workshop with Infrastructure third parties with a view to educating Developers in respect to potential public realm and inbuilding solutions.
- RDT to create a portfolio of options (technical and commercial) which can be made available to Developers and which Developers can progress on an individual commercial basis without interference from RDT.

Key Objectives

- Increase awareness to all Developers in respect to addressing mobile coverage within Developments (Public Realm and Inbuilding) and the future landscape for mobile coverage (5G).
- RDT to be conduit for educating the Developers in respect to the technical and commercial options available

Timescale

- End of September 2020

Key Outcome

- RDT to be an enabler in making Developers aware of the challenges and options available in respect to addressing mobile coverage.

8.5 Royal Docks Build on Current Initiatives

As part of the engagement process we have held discussions with the West Midlands Combined Authority (WMCA). As part of their ambitious DCMS funded 5G programme (WM5G) WMCA have been making positive strides in bringing telecoms planning requirements and process into one common model across the eight authorities that make up the WMCA region.

As a follow up to this engagement, meetings have been progressed with CTIL and MBNL who have been active participants in the WMCA initiative and both have indicated a willingness to engage with the RDT, GLA and LBN with a view to building upon the outcomes already being realised in the West Midlands.

It is the considered opinion of this Report that a concession model is no longer the most viable nor constructive approach to engaging with the MNO's and that other models offer a far greater level of sustainability and potential partnership with the MNO's. This proposed approach this Report believes offers considerable value and merit.

Key Actions

- LBN to proactively implement the GLA Telecom Greenfield/Rooftop Lease Template and review its current policy in respect to charging the MNO's on a commercial basis.
- RDT to engage with WMCA to develop an asset template approach that other UK cities and development areas can adopt.
- RDT to progress discussions with both CTIL and MBNL with a view to developing this template to capture new developments and public realm initiatives. Opportunity for the Royal Docks to become an exemplar for other Enterprise Zones and major regeneration projects. It is worthy to note that the Nine Elms Development are now retrospectively seeking to rectify major issues with mobile coverage a lesson that the Royal Docks can and should avoid.

Key Objectives

- Create a framework which can accelerate mobile deployment within the Royal Docks
- Raise the profile of the Royal Docks with the Mobile Operators. As indicated in our findings very little engagement with the Mobile Operators has taken place in respect to the opportunities offered by the Royal Docks Redevelopment and this needs to be addressed as a matter of priority.

Timescale

- End of September 2020

Key Outcome

- Improved engagement with the Mobile Operators and ensuring that future mobile coverage requirements can be enabled through advance planning and collaboration.

8.6 Royal Docks Mobile Coverage Potential Funding Role

As technical solutions evolve in respect to how mobile coverage is delivered and the potential focus in respect to how Small Cell Solutions will be realised there is an opportunity for RDT and LBN to consider the options of making provision for 'hotel' base-station accommodation for mobile operator equipment within public buildings within the Royal Docks or being incorporated within a new public sector development within the Area. The benefit of adopting such an approach would be to encourage operators to build network which avoid street clutter and in doing so minimise the visual impact of small cell deployment in the future.

Key Actions

- Engage with the Mobile Operators with a view to understanding their potential requirements.
- RDT to review the technical requirements for creating a 'hotel' base station (specification, location etc).
- RDT to determine whether funding will be required to support the development of these 'hotel' base stations.

Key Objectives

- Ensure that the appropriate infrastructure is available to facilitate such a technical solution.
- Determine role to be undertaken by RDT.

Timescale

- End of September 2020

Key Outcome

- Ensure that fit for purpose facilities are available to deliver the best level of mobile coverage within the Royal Docks.

8.7 Telecoms Workshop/Market Information Day

Based on the stakeholder engagement exercise it was evident that:

- many stakeholders were progressing their individual telecom and digital strategies without have access to the overall picture in respect to the current and future telecom market and what was currently available with the Royal Docks area.
- there was interest from many parties in understanding how they could engage with RDT with a view to developing and sharing a broader digital narrative for the Royal Docks.

It is recommended that RDT should facilitate a Telecom Workshop for key stakeholders with a view to developing and sharing a shared digital narrative for the Royal Docks.

Key Actions
• RDT to arrange an initial workshop to share the findings of this Report
• RDT to work with Stakeholders and host a Telecom Workshop to which representatives of the telecom market could attend with a view to addressing the following key issues:
  ○ Current coverage
  ○ Future changes in how connectivity will be accessed and delivered
  ○ Challenges and Barriers
  ○ Opportunities for collaboration

Key Objectives • Build upon the findings of this Report • Increase awareness of the challenges and opportunities in respect to delivering digital connectivity • Initiate a more proactive engagement between stakeholders and the market. • Identify opportunities for collaboration
Timescale • End of September 2020
Key Outcome • Develop a digital narrative for the Royal Docks Area

8.8 Accelerate LB Newham Digital Strategy

LB Newham is a key stakeholder in Royal Docks and therefore the policies and processes adopted and implemented by LBN are central to how operators will perceive the Royal Docks as a place for investment and innovation. It is recommended that RDT should support (and potentially fund) LBN in accelerating their Digital Enablement and Engagement Strategy by learning from other London Boroughs who have progressed an enablement strategy (LB Hackney) and supporting a review of related policies and strategies across the Council.

Key Actions

- RDT to work with LBN to determine the scope and outcome to a strategic digital review
- RDT to support LBN in identifying the key policies, practices and strategies which will form part of this review, including market engagement, planning policy, asset reuse and enablement (telecoms), highways policy.
- LBN and RDT to agree key deliverables and timelines.
- Strategic review to be undertaken involving fact finding stakeholder engagement and engagement with the market.

Key Objectives

- Accelerate development and approval of LBN's Digital Strategy
- Highlight and promote the enabling role of LBN through its policies and as a place which attracts and encourages investment.
- Contribute to the delivery of a holistic and co-ordinated digital strategy within the Royal Docks
- Drive key outcomes for the delivery of public services within LBN

Timescale

- End of Auugust 2020

Key Outcome

- Contribute to the digital narrative of the Royal Docks and how LBN will ensure that they proactively contribute to the future digital landscape within the Royal Docks.

8.9 LB Newham Existing Ducting Infrastructure

This Report believes that the current ducting infrastructure which is both deployed within the Royal Docks Area as well as the wider Borough still constitutes in strategic terms a valuable 'sunken asset' which should be regarded as an enabler in accelerating fibre deployment within the Royal Docks Area,.

It is recommended that urgent and serious consideration is afforded by LBN in respect to determining how access could be provided to the existing ducting infrastructure on an open access basis and subject to current market rates.

Key Actions

- LBN to undertake any necessary survey audits to determine the current condition of the network (is there capacity with the ducting and associated chambers to deploy additional fibre)
- Undertake a soft market testing exercise with the market with a view to sharing, mapping details, specifications and condition reports and subsequently determining level of potential interest, nature of interest and preferred channel of the market to access the ducting. Whilst not wishing to prejudge the outcome of any market engagement this Report would wish to note that a concession approach previously adopted by other local authorities is no longer considered to offer either best strategic, social and economic value.
- LBN with other local authorities who are currently progressing a similar strategy with a view to understanding lesson learnt and identifying what works in realistic and sustainable terms.
- LBN to complete an internal option appraisal with clear recommendations in respect to access to the ducting could be facilitated. .

Key Objectives

- Enabling role of public sector assets and infrastructure
- Accelerate fibre deployment, increase competition
- Leverage social value through providing access to the ducting infrastructure – benefit local communities

Timescale

- End of Augustl 2020

Key Outcome

- Determine the strategic value of providing access to a public owned ducting asset and what enabling role it could play in driving digital connectivity within the Royal Docks Area and the wider Borough of Newham

8.10 LB Newham Extension to Existing Ducting Network

Whilst the area appears generally well served by existing Openreach and Virgin Media ducting there still exists the opportunity for the LBN to extend their existing ducting network to support the delivery of fibre-based connectivity into public sector sites within Silvertown and North Greenwich.

It is therefore recommended the Royal Docks working with LBN should:

- undertake further detailed modelling in respect to how through providing access to the ducting infrastructure (across the entire 75km) private investment opportunities could be leveraged to invest in and extend the existing ducting network (indicative pricing £75,000 per Km) to public sector sites within the Silvertown and North Greenwich at no cost to the Council and at the same time drive wider social and economic benefits.
- Initiate as part of any planned road or cycle path developments within the Royal Docks including the Woolwich Road redevelopment a requirement to include a ducting capability which will form part of the Newham ducting network.

Key Actions
• Identify potential public sector sites currently not linked to the ducting network • Formulate a proposed network design • Through the soft market testing exercise Section 8.8 seek indicative interest in progressing such an approach
Key Objectives
• Improve access to fibre connectivity for public sector sites • Extend ducting into areas not well served by ducting infrastructure • Stimulate further ducting and fibre investment from the private sector
Timescale
• Option Appraisal End of June 2020
Key Outcomes
• Extend and improve access to telecom ducting infrastructure across the Royal Docks Area. • Explore how this could expedite the LBN's IOT ambitions

8.11 LB Newham – 5G Infrastructure

To prepare for the evolution of 5G coverage and whilst mindful that Small Cell technology has not as yet not as visible as previously projected this Report remains of the view that Small Cell deployment based on a street level/public realm basis will still emerge as a key component of small cell infrastructure in the future.

It is recommended RDT working with LBN should develop and implement a Public Realm Telecom Policy with a view to ensuring that public realm design and street scene proposals accommodate the infrastructure to support future 5G deployment

Key Actions

- Engage with the MNO's to understand their current and planned approach to small cell deployment.
- Engage with Highways Street Lighting LBN to understand current street furniture designs proposed for the Royal Docks Area and whether small cell currently forms of that design and capability
- Engage with the DLR to explore how the existing DLR infrastructure (Stations) could play a role in enabling Small Cell and other radio equipment.
- Create a portfolio of street furniture options with such a small cell capability which could form part of future public realm specifications.
- Mandate a requirement that future public realm designs must accommodate a 5G Small Cell capability
- Through the DLR Station Improvement scheme being funded by RDT determine how through new station design a 5G capability could be incorporated within a new structure

Key Objectives

- Ensure that any new public realm street furniture has an inbuilt capability to support a small cell deployment
- Ensure the appearance of street furniture design is preserved as opposed to multiple and unsightly attachments
- Working in collaboration explore ways in which the cost of such installations could be shared
- Create a Public Realm framework solution for 5G Small Cell deployment in new developments which could be a template for the GLA and DCMS.

Timescale

- End of September 2020

Key Outcome

- Creation of a Public Ream Small Cell Design Framework

8.12 LB Newham Highways Telecom Strategy

How local authorities engage with telecom carriers in respect to managing deployment is a key component in ensuring that investment is committed to an area. Where barriers relating to wayleave processes, permitting schemes or additional costs are put in place, such barriers can unquestionably deter or delay investment.

Accordingly, and with a view to ensuring the Royal Docks Area is seen by the market as an area which wishes to attract investment it is recommended that LBN undertake an audit of their current approach to wayleaves and permitting. In undertaking this audit LB Newham should consider how their current approach

aligns with both DCMS and GLA policy and whether there is a need to revise current processes and polices with regard to introducing Bulk Wayleaves, co-ordinated approaches to utility digs (option to deploy telecom infrastructure at the same time) and reducing current fee policies (is there way of waiving or reducing permitting fees).

Key Actions

- Undertake an audit of current highway telecom processes and documentation
- Engage with DCMS and adopt the principles detailed in the DCMS Barrier Busting Highways Toolkit
- Create a standard Wayleave MOU which all Carriers can subscribe to (consider adopting the Leeds CC model)
- LBN, RDT and the GLA to host a workshop with Carriers and Contractors to discuss the principles of a Shared MOU and identify additional issues which need to be addressed or accommodated within the MOU

Key Objectives

- Create through a single and consistent MOU one process for working on the highway within the Royal Docks and across the Borough of Newham

Timescale

- End of July 2020

Key Outcome

- Ensure that the processes implemented will attract and accelerate further fibre investment

8.13 LB Newham Utility Board – Digital Market Engagement

The London Borough of Newham should ensure that the as part of the future remit of the existing LBN Utility Board that telecom requirements and plans should be part of a quarterly review. This review should take the form of inviting Carriers to attend the Utility Board and to share their current and future deployment plans within the London Borough of Newham including the Royal Docks.

Key Actions

- LBN to define scope of engagement
- LBN to invite Carriers on an individual basis to attend the Utility Board and share in confidence their investment and delivery plans.
- LBN Utility Board to align telecom plans with other planned utility work with a view to identifying opportunities to co-ordinate street works across the Borough including the Royal Docks.

Key Objectives

- Understand telecom deployment plans for the Borough
- Align telecom street works with other utility street work plans. Opportunity to reduce disruption or accelerate fibre deployment by taking advantage of other utility works.

Timescale

- End of July 2020

Key Outcome

- Ensure that fibre deployment forms part of a more co-ordinated approach to street works

8.14 Royal Docks LoRaWAN Platform

This Report recognises the growing importance and opportunity offered by the Internet of Things and creating the Royal Docks Area as a 'Smart Destination' where real outcomes could be enabled through technology.

As part of the Royal Docks response it is recommended that a LoRa Internet of Things network could be deployed by RDT. This network we believe could be delivered for under £10,000 and could be used to pilot a variety of applications from supporting smart lighting to environmental sensors such as soil moisture sensors to regulate plant watering in the summer months. The same network could be used by utilities to monitor smart water meters, for example.

The network could underpin an agenda of sustainability and could support the digital curriculum at the University of East London (UEL), providing a network 'sandpit' for students to develop and trial applications (UEL could also play a wider role in helping to reinforce a wider digital narrative for the Royal Docks, delivering graduates with appropriate skills drawn heavily from the surrounding London Boroughs).

An open IOT network (based on the LoRA standard) is cheap to build and run and could allow a variety of smart sensors to be connected. UEL could use the same network as a sandpit for students on its growing range of technology courses. We would also suggest that consideration is given to an intelligent movement network, which will allow planners to understand how people move to, from and within the Royal Docks and would be a real value add to attract retailers to the development.

Key Actions

- Engage with other Local Authority partners (LB Sutton/Norfolk CC) who have experience of deploying a LoRaWAN Network.
- Undertake an indicative design of a LoRaWAN network utilising public sector buildings within the Royal Docks Area (rooftop requirement).

- Finalise potential costings (capex & opex) in relation to the proposed network
- Engage with LBN and the GLA to determine how this proposed deployment could become a testbed which could be replicated across the wider Borough

Key Objectives

- Enable a platform to drive IOT initiatives within the Royal Docks Area
- Provide an open access network which is available for business to pilot new solutions and sensors
- Realise data which will assist RDT in developing a more extensive and achievable Smart Strategy
- Contribute to LBN wider IOT Agenda

Timescale

- End of September 2020

Key Outcome

- Contribute to the Roya Dock's Digital Narrative as a place of digital innovation

8.15 Royal Docks IOT Platform

To contribute to both RDT's understanding of IOT and to proactively develop the Royal Docks Area as a 'Smart Destination' where real outcomes could be enabled through technology it is also recommended that RDT should explore with Movement Insights the opportunities of developing a funded pilot to evaluate footfall movement and spend data within the Royal Docks which in turn could enable RDT with to drive a number of outcomes:

- Evidence base on the long-term impact of regeneration
- Supporting the delivery of LBN's Digital Transformation Strategy
- Demographic overview of residents, workers and visitors in the area and how these are changing
- Effectiveness of events and future activities – ability to attract new and returning visitors
- Improve place making and wayfinding around the Royal Docks

Key Actions

- Engage with Movement Insights to develop a specification which would be outcome based in respect to delivering data insights which will contribute to strategic thinking.
- Finalise potential costings (capex & opex) in relation to the proposed pilot

• Engage with LB Newham and the GLA to determine how this proposed pilot could become a testbed which could be replicated across the wider Borough and other key destinations in London
Key Objectives • Enable a an IOT pilot which will drive other key initiatives within the Royal Docks Area • Realise data which will assist RDT in developing their Masterplan Strategy. • Contribute to LB Newham's Smart Agenda
Timescale • End of October 2020
Key Outcome • Contribute to the Roya Dock's Digital Narrative as a place of digital innovation

8.16 Wider Strategic Opportunities

Whilst not directly part of the scope of this exercise this Report would wish to draw to an issue several developers raised in respect to the development of a 'hopper bus' connection to get worker from the Crossrail and DLR stations to the distribution centres and light industrial units they are constructing.

Whilst not an obvious digital intervention, this short route might be the ideal trial location for an autonomous bus which could be a centre piece for a digital 'forward looking' narrative for the Royal Docks. This would require contiguous coverage along the route and a co-ordinated construction plan to build the necessary infrastructure but is worthy of consideration.

In addition to this initiative reference should be noted of Virgin Media's interest in exploring with RDT the deployment of electrical vehicle charging points based on their recently deployment network infrastructure within the Royal Docks

Glossary

RDT - The Royal Docks Team

GLA - Greater London Authority

LBN – London Borough of Newham

DCMS – Department Culture, Media and Sport

UEL – University of East London

DLR – Docklands Light Railway

TfI – Transport for London

WMCA – West Midlands Combined Authority

WM5G – West Midlands 5G

LoRaWAN – Low-powered devices to communicate with Internet-connected applications over long range wireless connections.

IOT – Internet of Things

FTTP – Fibre to the Premise

FTTC – Fibre to the Cabinet

DOCSIS – Data over Cable Services

PIA – Passive Infrastructure Access

WIP's – Wireless Infrastructure Providers

WIG – Wireless Infrastructure Group

MNO's – Mobile Network Operators

CTIL – Cornerstone

MBNL – Mobile Broadband Network Ltd

DAS – Distributed Antenna Solution

APPENDIX A

Technical Background London Borough of Newham

Technical Background London Borough of Newham

Overall scope

The LBN network consists of approximately 55,000m of ducts and chambers installed to NRSWA (New Roads and Street Works Act) and HAUC (Highways and Utilities Committee) specifications, installed in 3 main phases.

Phase 1

During the first phase, the duct specified was of the 118mm(OD)/100mm (ID) rigid HDPE 'twinwall' type, two of which were deployed side-by-side in a similar way to that shown in the image below (but laid in a sand bed and surround providing approx. 50mm of separation between the two).

N.B. OD = Outside Diameter; ID = Inside Diameter

Phase 2 & 3

During Phase 2 (which began in in 2008), and Phase 3 network's development, a different topology consisting of a single, rigid PVCu duct was adopted, the specification for which is as follows:

OD size (nominal) mm	ID size (nominal) mm	Wall thickness (nominal) mm	EN 50086 2-4 (compression strength) in Newtons	EN 50086 2-4 (impact strength) in Joules	Colour
96.5	90	3.1	450	28	Purple

Chamber analysis:

During Phase 1, chambers measuring 450mm x 450mm were installed at approx. 40m intervals, but in Phases 2 & 3, the topology consisted of alternate small and large chambers at 125m intervals: the former measuring 600mm x 450mm, and the latter 1200mm x 600mm, and the majority of the chambers are installed in the footway. Depth of cover 'to invert' in the often-congested footway varies according to the prevailing space available, but the build specification was for this to be a minimum of 350mm.

Cable specification

The fibre-optic cable installed throughout the network consists of 9/125µ singlemode complying with the ITU-T G.652.D specification. Throughout the first phase, the network was based on a 96f perimeter trunk route, with connections to each building made from strategically-located 'node' sites via a 'hub and spoke' type arrangement; for the second and third phases, the topology was based on a 144f cable, a series of splice joints (situated within large chambers constructed at strategic locations along the main trunk route) providing the means to connect sites to the network.

Spare capacity within the ducts varies considerably from place-to-place, but although (in most locations) both bores contain a number of cables, on average these occupy no more than 35% of the available cross-sectional area.

In order to increase the flexibility of the network infrastructure, the duct of which the main 'Phase 2' trunk route consists is equipped with 4-way sub-ducts conforming to the following specification:

OD/ID (nominal) mm	Tensile test load (N)	Expected tensile yield load (N)	Minimum stiffness ASTM 2412 kPA	Expected load at 15% compression on 200mm length		Minimum bend radius	
				Newtons	kg	over 5°C	under 5°C
32/27	2200	5320	1500	1200	120	0.45m	0.65m

Since 2012, in conjunction with the migration of the CCTV system installed throughout the Olympic Village (now known as 'East Village') to Local Authority control, ICT services were instructed to utilize one of the three banks of ducts (specifically, 'Bank B'), to install the requisite fibre-optic cabling to connect a number of the cameras to the council's 'in-house' Enforcement & Safety service. Although the public highway in the north-west of the borough (i.e. the Olympic Park, Westfield and East Village areas) adopted by LBN is not shown in the drawing of the MAN with which you've been supplied, and although it's proved difficult to obtain all of the relevant documentation from the ODA (Olympic Delivery Authority), and later, the LLDC (London Legacy Development Corporation), given that, through a process of surveying parts of the area, we've confirmed that the 'Bank B' ducted infrastructure installed in conjunction with the London 2012 Games is, a). plentiful (consisting of at least 4No. 100mm ducts arranged in a 2-over-2 configuration), and, b). extensive (in that chambers relating to the 'B' bank have been identified throughout, the expectation is that, if a specific project requires the use of this 'legacy' ducting, at least another 10,000m of ducting is available for Newham Council, and its partners, to utilise..

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Connectivity
Digital Strategy Programme

Royal Docks

The Royal Docks Digital Strategy

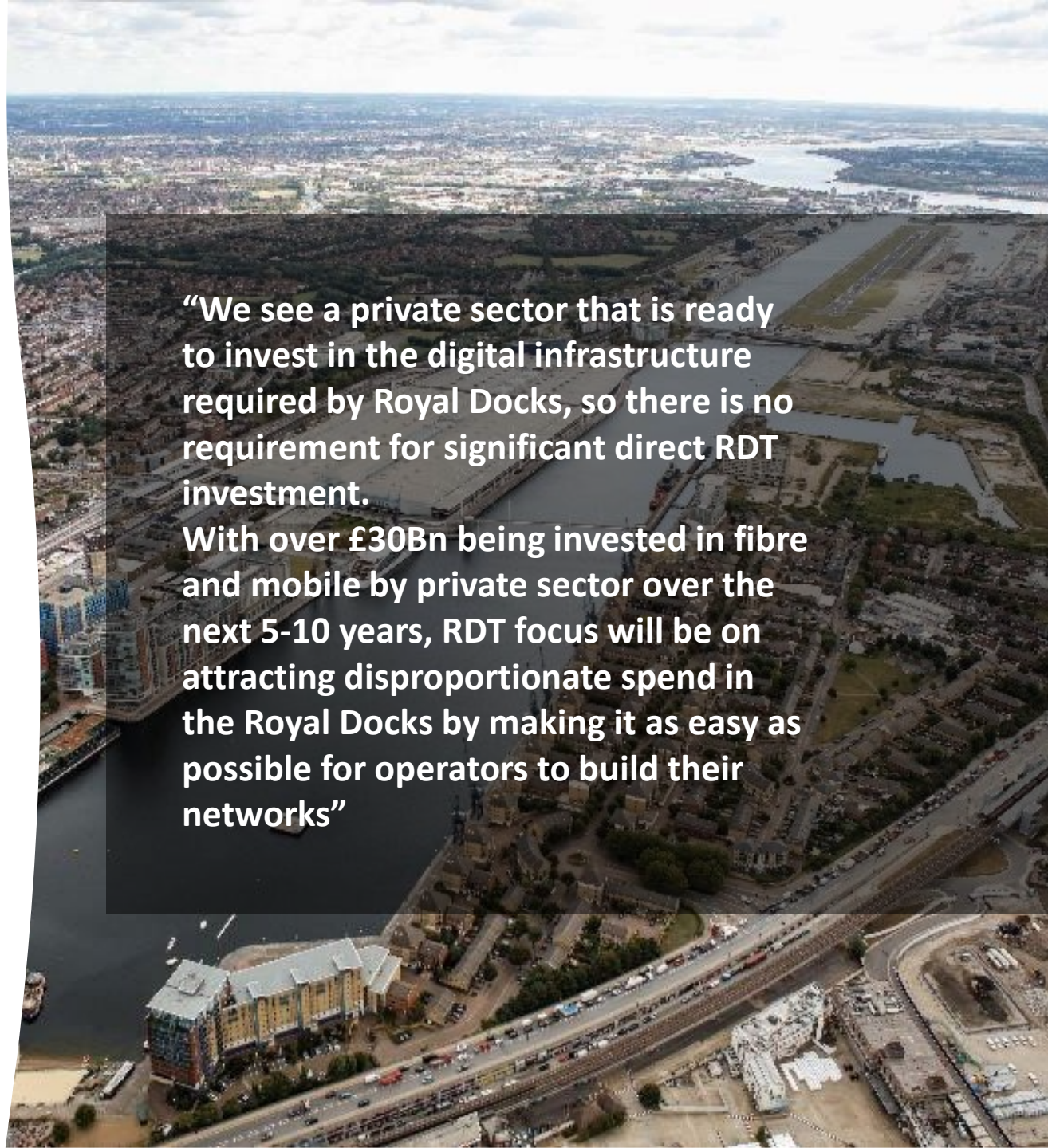
- As London's only Enterprise Zone, and with over 1,200 acres of land, the Royal Docks is the most important and exciting regeneration project in London. It is a joint initiative between the Mayor of London and the Mayor of Newham, with over £8bn being invested in the area over the next 20 years to create 30,000 new homes, 60,000 new jobs and provide an exemplar for regeneration and placemaking.

- A key ambition is for the Royal Docks, and as set out in the Delivery Plan, is to be one of the best-connected places in London. For this to be realised effectively, and for the Royal Docks to act as a successful hub for residents and businesses alike, digital connectivity must form a part of the solution. The outcome must be one that is of a scale and standard that is commensurate with its growth ambitions and offers choice, access to gigabit fibre services and state of the art mobile coverage and capacity.

- Significant work has already been undertaken by the Connected London Team and others across the GLA to support digital delivery across London. However, it is important that these are built on and adapted to support the scale, opportunities and issues faced in the specific context of the Royal Docks.

- The Royal Docks Team appointed Arcadis in September 2019 to review existing digital infrastructure across the Royal Docks and engage with a variety of stakeholders to identify current and future connectivity requirements. The Royal Docks Digital Connectivity Study (April 2020) sets out a number of recommendations to successfully deliver a digital vision for the Royal Docks.

- We have taken those recommendations to develop a clear programme and set of prioritised actions to deliver a Digital Strategy for the Royal Docks.



Royal Docks

Priority 1: Successful delivery requires a clear digital narrative and stakeholder commitment to delivery

Bringing together stakeholders from the public and private sector will create the foundation of a digital strategy…

- Various stakeholders must work together to ensure successful delivery of a digital strategy including the Royal Docks Team, LBN, the wider GLA, developers, Mobile Operators and fibre carriers and providers.
- Coordination of the strategy and its implementation will be led jointly by the Royal Docks Team and LBN.
- This must be supported by the right policies, processes and governance to ensure ongoing stakeholder engagement and coordination.
- This is a key first step in the project and establishing 'buy in' must take place quickly to ensure project momentum.

…that must be informed by best practice and industry experience…

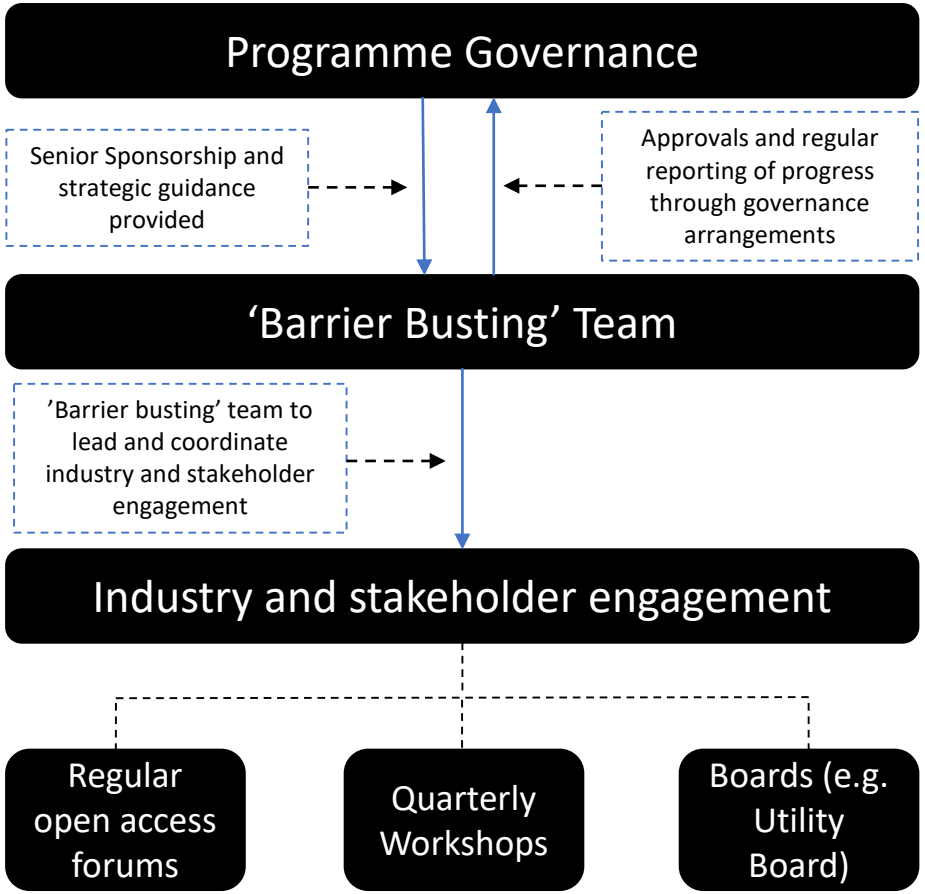
- Engagement with the wider GLA's Digital Board to integrate best practice thinking into the strategy and building on existing workstreams (i.e. Connected London).
- The sharing of experience and 'Barrier Busting' strategies with other authorities will contribute to success (i.e. WMCA, Hackney, Westminster Council and Leeds City Council).
- We must build on previous successful engagement with mobile operators and fibre carriers and providers to ensure the best solutions inform strategy, narrative and approach.

…to create a clear shared digital narrative for the Royal Docks and programme for delivery

- Develop a vision and strategy for the digital delivery for the Royal Docks.
- Where appropriate, this must be linked to wider delivery strategies across LBN and the GLA to ensure stakeholder buy-in.
- It is important that this is articulated clearly through a refresh of the Royal Docks Delivery Plan.
- And must also be captured within the relevant policies and 'business as usual' processes of the Royal Docks Team and the LBN.

Royal Docks

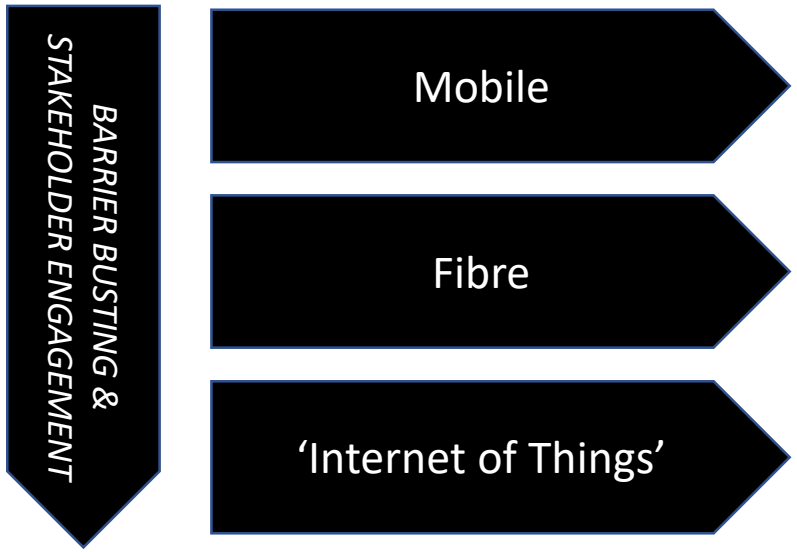
Priority 2: Establishing the right governance, delivery teams and means of engagement



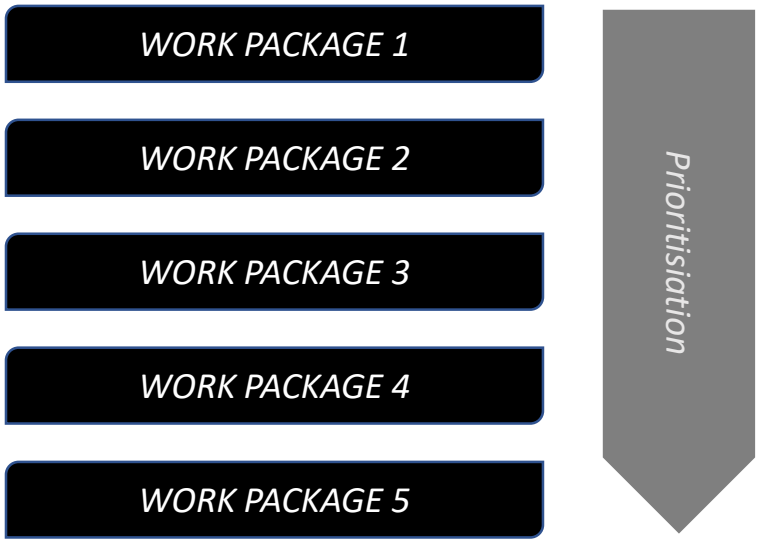
- Programme governance is key and should be led by LBN and the Royal Docks Team. A number of workstreams are for LBN to progress that will define operator interface, This must be supported by senior sponsorship within LBN to ensure appropriate importance is given to the digital agenda, to timely delivery and to ensure accountability.
- The priority is to establish a cross-organisational ‘barrier busting’ team led by RDT and LBN and will coordinate the key work packages across the programme, proactively remove barriers and accelerate digital investment. Opportunities will be explored for the funding of a dedicated resource within LBN.
- Successful delivery will require engagement with industry (including mobile operators and fibre providers and carriers) as well as local stakeholders including developers and landowners.
- Establishing a range of vehicles to allow for regular engagement will be developed as a priority and may include open access forums, quarterly workshops and invitations to governance boards (i.e. the LBN Utility Board).
- **Implementation for Priorities 1 and 2 are set out in the programme on the final slide.**

Priorities 1 and 2 will provide the foundations to support the delivery of four key strands of work

There are four key strands of work…



…broken down into a series of distinct and prioritised work packages (shown on the next slides)



Prioritisation is within work packages and based on sequencing of events

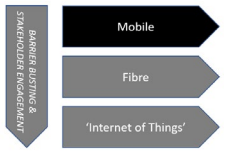
Delivery is reliant on stakeholders and interdependencies with other projects across the Royal Docks and Newham. An agile approach to implementation will therefore be needed, reprioritising actions and responding to opportunities for delivery as they arise.

London Borough of Newham Strategic Approach to Barrier Busting

Purpose of Engagement:	Process	Outcome & Value of Process:
• Work in Partnership • Constructive Review Policy (Planning/Highways) • Constructive Review Current Mobile Telecom Strategy • Review Current Market Engagement Telecom Sector • Identify areas where barriers, strategy or policy are or could create a barrier to investment.	• Individual Stakeholder Meetings - Virtual Session no more than an hour - Issue in advance information Open Dialogue • Identify key barriers and challenges • Engage with the Market understand and share with LB Newham the Market's current perception of the LB Newham • Share good practice with LB Newham and work with LB Newham to accommodate such beneficial processes and practices	• Identify Potential Barriers • Identify areas where support is required • Contribute to developing new strategic approaches to the way LB Newham engages with the Market • Contribute to LB Newham's understanding as an enabler and how through changes to policy and strategy LB Newham can play a proactive role in enabling improvements to connectivity across the Royal Docks and the wider Borough.

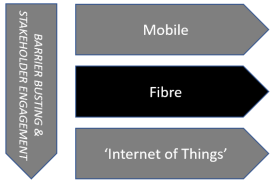
London Borough of Newham Strategic Approach to Internal Stakeholder Engagement

Purpose of Engagement:	Process	Outcome & Value of Process:
• Work in Partnership • Focused Information Gathering • Identify projects & outcomes where connectivity is required or is a challenge • Alignment of digital related projects – business cases relating to the Royal Docks	• Individual Stakeholder Meetings - Virtual Session no more than an hour - Issue in advance information gathering questions (makes meetings more focused) • Encourage an open and constructive dialogue • Identify key barriers and challenges • Feedback – keep stakeholders engaged after such sessions	• Identify Silos • Identify Potential Barriers • Identify areas where support is required • Contribute to wider business cases • Avoid duplication – potential opportunities for combined solutions • Enhance understanding where Digital Kirklees can play a proactive enabling role



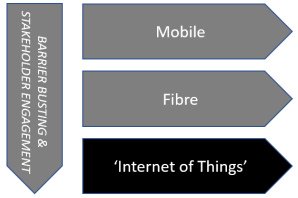
Implementation Plan: Mobile

ISSUE	SOLUTION / WORKPACKAGE
• Data on current and proposed mobile coverage is in multiple ownerships and does not support partners in planning future coverage.	• Work with the Connected London team to create a database of fixed and mobile connectivity building on work already undertaken by Arcadis.
• Mobile operators will not plan effectively without engagement and an understanding of future requirements, leading to network capacity and coverage lagging behind demand.	• Create a future looking demand model to assist operators and developers to collaborate and create appropriate mobile connectivity strategies.
• 5G deployment may be undertaken by mobile operators in an uncoordinated way that impacts on public realm and placemaking in the Royal Docks and across Newham.	• RDT and LBN to work with the operator community to develop and implement an approach to public realm design to accommodate infrastructure to support future 5G deployment. This may ultimately be adopted into a new Public Realm Telecoms Policy.
• Restrictions as a result of LCA may limit the opportunities for deployment of equipment on building roofs across the Royal Docks and may require more innovative solutions if optimal coverage and capacity is to be delivered.	• Explore implementation of mobile masts and receptors within new DLR station designs as part of existing upgrade works. • Explore opportunities to incorporate mobile operator equipment in new public buildings across the Royal Docks and LBN, including the provision of 'hotel' base station accommodation and the funding options available to support its provision. • Creation of a portfolio of options (technical and commercial) to be made available to developers that they can progress on an individual commercial basis.
• Indoor coverage is a significant problem for businesses and residents and will get worse with 5G. Planning appropriately for this in design will differentiate the Royal Docks as a destination.	• Proactively coordinate engagement of developers and mobile operators to ensure that building are designed to support high quality indoor mobile coverage.
• The planning and leasing process often acts as a potential barrier to investment in new mobile technology, particularly ahead of demand. The leasing process is becoming of less significance particularly in the face of New Code Powers.	• Review and streamline the approach to leasing arrangements to mobile operators, including giving consideration to the adoption of the GLA Telecom Lease Template, working with CITL, MBNL and other local authorities. • Explore opportunities to simplify the planning process for the installation of mobile operator technology drawing on the experience of other local authorities.



Implementation Plan: Fibre

ISSUE	SOLUTION / WORKPACKAGE
• There is no requirement for significant additional investment in the existing ducting infrastructure. However, the opportunity this presents to developers and occupiers is not widely known, primarily given a lack of engagement and the lack of a single source of data.	• LBN to undertake necessary survey audits to determine the current condition of the network and mapping details, specifications and codition of th network. • Ensure sharing of information between Carriers, Service Providers and the development community on fibre options available in the Royal Docks and LBN through appropriate engagement forums, as well as for Carriers and Service Providers to update on future deployment plans in LBN and the Royal Docks. • Soft market testing to determine potential interest in access to the network and consider options in respect of how access to ducting could be facilitated. • Continuous review and sharing of information on infrastructure works being undertaken across LBN and the Royal Docks with Carriers, Providers, developers and occupiers to ensure a coordinated approach to fibre provision and an understanding of opportunities to increase the resilience of existing networks.
• Full Fibre to Property is not always possible as a consequence of the provision of appropriate ducting solutions.	• Explore opportunities to strengthen current planning policy to require developers to deliver a telecom ducting solution as part of any future planning applications and engage developers in the Royal Docks in taking this approach through developer agreements. • Barrier Busting Team to engage with developers to ensure an awareness of the mechanisms available to facilitate fibre connectivity to each development (i.e. ducting specs, designs etc).
• LBN owns over 97km of ducting. However, the traditional approach to the granting of wayleaves and permitting can often act as a barrier to delivery, particularly when uncoordinated.	• Review of relevant policies and processes on wayleaves and permitting to produce a Highways Telecoms Strategy and MOU that ensures a coordinated approach to utility digs and reduces associated fees. This will be informed by DCMS best practice and successful approaches of other authorities. • Explore the opportunities for open access of LBN's ducting infrastructure to the telecoms sector subject to current market rates, working alongside other local authorities developing similar models. • Open up the Utilities Board for carriers to attend and ensure that the Board considers alignment with a view to coordinating streetworks across the Borough.
• Opportunities exist to expand fibre based connectivity into new developments across the area, including in public sector and social housing sites in Silvertown and North Greenwich.	• Explore the technical and commercial options available through soft market testing to further expand the ducting network into public sector sites in Silvertown and North Greenwich, utilising private sector support either through investment or mutual access to ducting infrastructure. • Formulate a proposed network design. • Ensure a coordinated approach to delivery, including through major public works taking place including in the Royal Docks.



Internet of Things

ISSUE	SOLUTION / WORKPACKAGE

• An 'Internet of Things' network is low cost to deploy, will provide a platform for a range of 'smart' applications and will help to define strong digital agenda for a regeneration projects through a Smart Place Agenda.
• A number of stakeholders expressed interest in an Internet of Things network for both intelligence building applications and outdoors.
• A number of potential outcomes are envisaged:
  • Support of smart applications such as air quality and other environmental sensors, smart lighting and parking etc.
  • Potential for developers to use the network to support specific applications in their developments
  • Potential for University of East London to provide a network 'sandpit' to support expansion of tech syllabus.
  • Pilot smart applications to inform LB Newhams wider digital strategy.
  • Interpreting footfall and usage patterns to monitor impact of RDT initiatives to ensure desired outcomes are delivered.
  • Effectiveness of events and future activities
  • Improve placemaking and wayfinding around the Docks
	▪ Develop an Internet of Things strategy;
	▪ Qualify and prioritise potential trial applications
	▪ Learn from other Local Authorities who have experience of deploying such networks.
	▪ Develop an indicative design for a network using public sector buildings within the Royal Docks.
	▪ Finalise project costings.