

London Assembly Regeneration Committee – Wednesday, 8 May 2019

Transcript of Item 8 – Digital Connectivity and London as a Smart City

Tony Devenish AM (Chairman): Moving on to the main agenda item today, which is our discussion on Digital Connectivity and London as a smart city, may I start by welcoming our guests to the meeting and invite them to introduce themselves briefly – ‘briefly’ being the operative word – starting with Theo Blackwell, Chief Digital Officer at the Greater London Authority (GLA), please?

Theo Blackwell (Chief Digital Officer, GLA): Yes. I am Theo Blackwell. I am the Chief Digital Officer for London.

Tony Devenish AM (Chairman): That was very brief.

Tony Arbour AM: Yes. What does that mean?

Tony Devenish AM (Chairman): Go on. Say a little bit about what you do and how long you have been here at least.

Theo Blackwell (Chief Digital Officer, GLA): I have been in post 18 months and my primary responsibility is to develop the Smarter London Together roadmap, which we will be no doubt discussing today, and to provide better digital governance for London.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): I am Sara Kelly, Principal Policy Officer for Digital Connectivity. I head up the Connected London Team. We work with local authorities, providers and all stakeholders on improving the availability of full fibre and mobile in London.

Shashi Verma (Chief Technology Officer & Director of Customer Experience, Transport for London (TfL)): I am Shashi Verma. I have been at TfL for 17 years, the last three years as the Chief Technology Officer and the last year also as Director of Strategy for TfL. I have responsibility for all things technical in TfL.

Tony Devenish AM (Chairman): Can I ask you because I was asked this morning by some of my colleagues: are you the man who invented the Oyster card?

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): Yes, and contactless.

Tony Devenish AM (Chairman): I am very impressed. Follow that, Councillor Jonathan Glanz. I should declare an interest. Jonathan is an old friend and colleague on Westminster City Council and he is the Gig Economy and Broadband Champion at Westminster City Council.

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): As you say, it is a difficult act to follow in terms of that, but my role is to ensure that businesses and residents get the best connectivity available throughout Westminster and more particularly that they get it at affordable prices and avoid any issues in relation to digital deprivation.

Tony Devenish AM (Chairman): Thank you very much. Going straight into question one and starting with Theo, what is the role of the Smart London Board and the London Office of Technology & Innovation (LOTI) in making London a smart city and how are you contributing to the delivery of a Smarter London Together, please?

Theo Blackwell (Chief Digital Officer, GLA): Thank you for that question and thank you for the opportunity to address the Committee.

The role of the Smart London Board, to answer the first part of the question, is to give further strategic advice and opportunities for engagement, engaging the business community and civil society around the Smart London agenda. It was appointed just before I was appointed and continues its role as it was set up in the previous administration to provide that extra help, support and guidance on the sometimes quite thorny issues that arise from the implementation of technology solutions in the city. So far, the Smart London Board has met approximately six times. It has advised me and guided me on the development of the roadmap. There have also been opportunities that have arisen from the Smart London Board, most notably engagement in the development of the LOTI.

The LOTI is planned to launch in June [2019]. It has been in development for the last 18 months. It is a collaboration between the GLA, London Councils and a cohort of digitally leading boroughs. There is a workshop going on at the moment with borough Chief Information Officers (CIOs) to develop its work plan. It is a unique institution for London. It will be based at London Councils but slightly at arm's length from London Councils. It has a special funding model, part funded by the GLA, part funded by London Councils and then a kind of subscription from participating boroughs, including Westminster. It aims to do something that we have never really tried to do before and addressing a real problem, which is building the capabilities of that cohort of councils: sharing and reusing what works best, digital skills, creating common platforms, and solving those issues that have prevented the scaling of the best digital services before in London.

One of our big challenges as a city is that, on the TfL level, Shashi introducing contactless payment is of course a smart city solution delivered on a London-wide scale, but London is, as we found, a collection of 32 different smart cities. This is something that is almost mainstreamed into the United Kingdom (UK) political settlement: if we try scaling something from one council to another, we come up against localism. What do we do to take the advantages of being in a city and get over the disadvantages of that fragmentation? LOTI is specifically set up to help scale good ideas together.

Tony Devenish AM (Chairman): Sara, do you want to add anything? You do not have to.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): We are working with LOTI on identifying opportunities for Digital Connectivity as well.

Tony Devenish AM (Chairman): Jonathan, what is your knowledge and experience to date of LOTI, please, and how do you think it will benefit public services in Westminster?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): As Theo said, we are happy to work with LOTI and indeed we are happy to work with anybody who will help us achieve our objectives in Westminster. He has referred to aspects of digital service and my focus has been on the provision of the delivery mechanism as opposed to the product that is delivered over that. I know that he is working with our colleague [Councillor] Paul Swaddle [Westminster City Council] and others in relation to

how we can improve our digital offering at Westminster and continue to champion best practice in that respect.

Tony Devenish AM (Chairman): Moving back to Theo, what has the renewed Smart London Board contributed so far to the Mayor's plans for London to be a smart city? Could you give a couple of concrete examples, please?

Theo Blackwell (Chief Digital Officer, GLA): The Smart London Board essentially sits there and advises me and some colleagues on developing a better London-wide approach to things.

I suppose the main point I would make is that we have pivoted in the view or updated the view of a smart city from where we were around 2013 or 2014 to make it more relevant to the contemporary debates today. When we were considering as a city what a smart city was just after the [2012 London] Olympics, we were thinking perhaps about the challenges of the Olympics and how we deal with tens of thousands of extra people being moved around the city and how we get a greater sense of those big systems of the city and how they integrate together. Today when people talk about smart cities, they talk about them both in terms of a physical thing, a smart city platform that is evident in perhaps cities and countries in the Middle East or in China. They think about smart cities in terms of districts and they think about smart cities in terms of smart city technologies. These are all really important and critical to that of course is the provision of fibre.

However, the danger in that approach - and this is something that the Smart London Board has been really helping me think through - is that that suggests a technology-first approach rather than really understanding citizen need. There is something special going on in London. We are a global centre of the data economy and we are also a global hub for the design economy. We have major institutions such as the Government Digital Service here and, obviously, universities. All of these things together, the data and the design, really help us come up with a new conception of what it is to be a smart city, not so much a noun but an adjective and an approach.

The Smart London Board has helped me develop a new way of thinking about a smart city, one that focuses on five main aspects. These five what we call 'missions' are critically important to any organisation trying to adapt to the digital age. One is that we need to focus on design; design around the citizen, design around the user. Secondly, we need to enhance our capabilities about data sharing, not just a platform but how we actually share data, the culture of data sharing, the legal agreements and so on and so forth. Digital connectivity and how we make the city more connected; public service digital skills to build our capabilities to understand what is possible from technology to serve our citizens better; and also, collaboration, which is where LOTI comes into it. We need a new institution for the digital age to help us collaborate on projects better.

Those five areas - design, data, connectivity, skills and collaboration - are things that could be applied to any large organisation. All of those elements are really important to digitally transforming an organisation. Essentially, the Smart London Board has helped us understand that better.

There is one thing I would add about the role of the Smart London Board. We have focused particularly on one area post the publication of the Smarter London Together roadmap and that is on what we call the New Deal for City Data. They are specifically advising me on the City Data Analytics Programme, Artificial Intelligence ethics, and developing an approach to a city cybersecurity action plan. Their expertise is invaluable in helping us understand the dynamics of data and city data, which are really quite critical at this time.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): I would just reiterate that Digital Connectivity is fundamentally a part of the Smarter London Together roadmap because it is an enabling infrastructure, but not just that. The digital skills part of the LOTI work as well relates to digital infrastructure because we are not going to see the full benefits of enabling full fibre if people do not then do things with it. Our work programmes with across LOTI are very fundamentally tied together and the Smarter London Together roadmap.

Tony Devenish AM (Chairman): Great. Thank you.

Andrew Dismore AM: I am just going to talk with you about Digital Connectivity. We have an awful long way to go compared to international comparators. The figure we have here is that just 3% have pure fibre all the way through, compared to Spain, which has 83% connected to pure fibre so there is a long way to go.

Perhaps you give us an update, Sara, on progress by the Connected London Team in improving connectivity and in dealing with not-spots?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): You have in front of you three different maps, which are from using the latest dataset available from the Office of Communication's (Ofcom) *Connected Nations*, which is collected by Ofcom and providers are required to give coverage information to them. You will see super-fast coverage - that is fibre-to-the-cabinet (FTTC) technology - we have at around 97% in London now. Ultra-fast coverage is a technology that is FTTC but then uses a coaxial cable from the cabinet to the home. That is traditionally how cable television (TV) services were delivered and so providers are now using that to deliver a better and faster service than FTTC. Availability of that is at around 71% in London. The latest information we have on full fibre shows that that coverage is at around 12% in London compared to 8% in the UK. We are seeing some gradual improvements.

The work that my team does, as I mentioned, is with local authorities and providers and we really try to use the tools available to the Mayor to better enable investment into fibre infrastructure in London and address some of the barriers to delivery that providers often talk about. My team co-ordinates across all 33 local authorities in London. We have five regional working groups and we meet with them quarterly. We are just doing a round of them now. I was in Lewisham yesterday and I am going to be in Merton tomorrow. The purpose of those regional groups is to share best practice, like what is working really well in Westminster. We get local authorities in similar areas together to talk about what has worked for Westminster and whether it can work for another local authority. We try to share best practice and knowledge to try to tackle some of those barriers to delivery. We also meet with providers to get their views on where they would like to invest and what they would like to invest in and try to understand from their perspective the issues that they are facing as well.

Andrew Dismore AM: Looking at these maps, I suppose it is not surprising that areas around the periphery of London are less well connected, but what would surprise a lot of people is to see the extent to which the Central Activity Zone in Westminster and the City of London are not connected. If we are looking at Westminster as a whole - I do not know if Jonathan wants to comment on this - the Paddington end is reasonably connected but Marylebone and South Westminster are not. If we are looking at Westminster as a good example, what is going on?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): That is a very good question because we would have to look at the history of how connectivity has been supplied in the Central Activity Zone. Up until comparatively recently, the options that were available to businesses were to have a copper or asymmetric digital subscriber line (ADSL) connection or to pay for a leased line. The

leased lines were put in by Openreach and its predecessors and its commercial competitors at very expensive prices. If you were running a business in the centre of London and wanted to have the absolute certainty that you had sufficient bandwidth to do that, you had to pay hundreds or thousands of pounds a month to get a leased line. That has been a very lucrative business for the suppliers. My understanding and analysis is that one of the reasons we have not had the same kind of general rollout of better-quality connectivity is because that source of income has been maintained by the suppliers to the detriment of choice to residents and smaller businesses.

We have really been focusing on those not-spots that you highlighted as being there in the middle of Westminster like Soho, Marylebone, Mayfair, the areas that I represent on the Council. We have looked very hard as to how we can resolve that. There has been a range of solutions as to how that is now being addressed. I was just saying before that probably there is an element of a lagging indicator in terms of where we are with that journey because we now have fibre-to-the-premises (FTTP) being provided to most of the Central Activity Zone by, in some cases, several companies that have filled the vacuum Openreach left behind. In addition to that, we have also worked with Community Fibre to provide gigabit connectivity to our social housing and using those bases that have been created within the social housing buildings to spread tendrils out to a wider area to improve that connectivity quite significantly.

Where that has taken place, they have seen a very good take-up and transformation in terms of the old levels of connectivity, focused specifically really on the smaller businesses that were not able to pay the hundreds and thousands of pounds being requested for leased lines. Nevertheless, whether they are involved in the creative industries or medicine or the professional services side of things, they are now able to get that and have significantly improved their ability to go out to the market in the case of creative industries and to conduct their business generally across the piece. We have seen people move from speeds of 2 or 3 megabits up to hundreds of megabits, with the transformation that that has had for their businesses, allowing them to operate in a completely different way.

Andrew Dismore AM: Are we saying that this green map is out of date?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): My understanding is that there are elements of lagging indicator within that. We keep a very detailed map of connectivity within Westminster. Within the areas that are showing white, we now see significant penetration by other providers of FTTP services and there is an element of time lag and an element of recognition for those particular providers not being part of the standard process. As I understand it, if Openreach upgrades something it gets more or less put onto this [map] pretty quickly, but if the new providers such as G.Networks or Hyperoptic or Relish put in the same services there is a slightly more cumbersome process of recognition for the contribution they are making to the connectivity in the area.

Theo Blackwell (Chief Digital Officer, GLA): I agree. There is a challenge with getting accurate data about this vital service. It is something that we are keen to address with Ofcom.

Andrew Dismore AM: How are you working with the boroughs about progressing connectivity in these areas? How do you think they are doing? I see that Camden, where you came from, is looking quite good compared to Westminster, particularly in the coterminous bits where the businesses are probably not that different.

Theo Blackwell (Chief Digital Officer, GLA): Yes. My take on connectivity is that - remember - the provision so far has supported London to become one of the world's most recognised global tech hubs. What

we need to do now is go to the next level because something new is coming and that is 5G. 5G requires a significant investment in full fibre. We are OK for now but not fit for the future.

We need to put in place a number of very strong measures and that requires us to adopt a new approach. I would characterise our approach in a number of ways.

Firstly, we have invested in the Connected London Team, which for the first time is working with the boroughs really closely to do what the Government calls 'barrier busting', ie learning from best practice in boroughs like Westminster and Camden and others, those that have had more experience with investment, and sharing that right across the board. It is fair to say that not all boroughs see connectivity as their primary responsibility because the history has been that traditional providers have come in and done things. Not all boroughs have plans around connectivity.

Andrew Dismore AM: Name and shame. Which do not?

Theo Blackwell (Chief Digital Officer, GLA): In our last estimate, something like a third of London's boroughs do not have full plans around connectivity and about a third of London boroughs do not have digital strategies yet.

Those that do have shown significant changes. Southwark, for example, is an example of a borough that had a real problem with connectivity in the Rotherhithe Peninsula, has developed a digital strategy and has totally changed the nature of provision in the area over the last 18 months. It is quite a quick turnaround if a borough really focuses on things.

From my experience in Camden, I was a cabinet member for finance and I was often approached by connectivity providers. It sounded great. All we had to do was use our authority and we could boost connectivity. Actually, it is quite a hard thing for a borough to do if you think about it. In order to facilitate the appropriate digs, you often have to deal with the housing department, the highways department, legal, other bits of property and economic development. What it takes is not a junior officer but senior leadership to make it happen. Those boroughs that have really made a difference are those that have committed senior leadership to this. That is what we are trying to put across to other boroughs in London. The Connected London Team does that.

Planning policy is another major tool and we have argued for a quite significant upgrade in our provisions in the draft London Plan, currently with the Planning Inspector, including to ask that boroughs are required to have their own digital strategies around connectivity and a number of other provisions.

There is also a real role that is partly us and partly TfL and partly the boroughs. The public services estate is going to be vitally important for the rollout of connectivity and so it is about how we mobilise that estate, TfL's tunnels, the public buildings surrounding Tube stations. The public sector estate can act, almost uniquely in the world, as a hub for that connectivity, which can be a total gamechanger for this city. TfL's work and our associated work with TfL is going to be quite critical to all of those things.

Andrew Dismore AM: Going back to the question I asked you about naming and shaming, you will name and praise but you will not name and shame. In relation to boroughs that you would shame if you were prepared to do so, how do you actually relate to them? If they have no digital strategy or digital office or whatever, how can you spread good practice if there is no one to engage with?

Theo Blackwell (Chief Digital Officer, GLA): On the practice side, I will turn to Sara on that, but we have started conversations with London Councils around this to get that senior-level visibility around the importance of connectivity. Of course, we spend quite a considerable amount of time and effort going from region to region, identifying the right people to talk to.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): My team and I maintain up-to-date contact information for every local authority to make sure we have the right person that we are speaking to. We also run a number of initiatives that we hope are useful to local authorities. For instance, we run training on how to use standardised agreements. We have run training on the standardised wayleave agreement and we will be running one on our template mobile agreement that we are currently developing.

We also organise workshops around key issues; 5G, for instance. Also, previously, when there was funding available from the Department for Digital, Culture, Media and Sport, we brought everybody together to talk about what that was about and what the possibilities were with that funding. We have a number of tools in the kit that we can lend to boroughs and, hopefully, provide useful things for them.

Andrew Dismore AM: Through you, Chair, it might be helpful if we could have a list of the ones that were not complying with a digital strategy so that we could give them a bit of a push from our end.

Tony Devenish AM (Chairman): Are you happy to write to us on that, Theo?

Theo Blackwell (Chief Digital Officer, GLA): Yes, I am. There will be a number of caveats because it is not just boroughs that do not want to do things. It will be things like the transition of officers and things like that. The point is that it is not a consistent picture. The numbers of people in boroughs we cannot contact who have clearly not expressed an interest are extremely limited.

Andrew Dismore AM: It might be easier, Chair, if we get a snapshot of every borough and where they are at in the process.

Theo Blackwell (Chief Digital Officer, GLA): Yes, we can do that. A lot of this debate, because it is framed often as 'barrier busting', has put the burden on boroughs. It is also, as Councillor Glanz has suggested, quite a complex environment in terms of new providers coming onto the scene and the changing regulations. The Communications Code came in. Regulations attempting to codify and provide clarity that sometimes provide the opposite and are subject to further legal definition, which has given rise to an amount of litigation. Those authorities attempting to do things might often come across a legal letter from one of the providers. This is a complex utility field here.

Navin Shah AM (Deputy Chair): I want to pick up the issue about not-spot areas. A report that this Committee published roughly two years ago - it was in June 2017 - stated its finding that the capital is poorly served, suffering from not-spots and digital deserts in areas like Rotherhithe in Southwark, pretty much in this area. It is nearly two years since we published the report and recommendations.

Are you able to tell us whether there is any improvement in tackling not-spot areas right across London? That is the worst end of connectivity. Whilst we can talk about 4G, 5G, FTTP and so on, the fundamental requirement of having some connectivity is so critical. Can you give us an update on whether there is any improvement and what kind of areas it covers? Thank you.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Sure. I can speak to what we are doing now, what has been done and what is going to be done shortly to tackle not-spots specifically. We have been working with local authorities and local authorities like Westminster and Southwark have been leading to identify what assets they own, what housing stock and where it is located and to match it up with maps that we have available on current levels of provision so that, if housing stock is located in a really poorly served area, that asset becomes a key tool that we can use to better provide for the surrounding area. If you as a local authority get fibre served to that housing stock that is in a poorly served area, not only does the housing stock get improved connectivity but the surrounding area becomes more commercially viable for a provider to go to.

Utilising existing assets from a local authority's perspective is a key tool. We have seen many do that. Councillor Glanz is a great example of what is being done in Westminster. Southwark is doing this as well. Almost all local authorities are now working very closely with providers to understand and develop master wayleaves so that all their housing stock can become drivers for improving availability in poorly served areas. We are doing that now.

Also, we are working with TfL. Shashi [Verma] will talk more about the TfL Connected London network.

We have been working on developing plans with local authorities to use grant funding to serve some of their areas and some buildings where they are having services delivered with full fibre connectivity. That, again, will also greater incentivise commercial providers to serve surrounding areas. We are now working with almost 20 boroughs on that project. Should we go to Shashi now?

Tony Devenish AM (Chairman): We have a couple more questions, if you would not mind. Andrew?

Andrew Dismore AM: If that is the 20 [boroughs], presumably the other 13 are --

Theo Blackwell (Chief Digital Officer, GLA): Not quite. I can see where you are going. No, it is where we have been able to dedicate investment so far. We are very hopeful that further investment will go into the remaining area of London that has not had that. The Tube network is quite critical for that and so you can surmise from that where the challenges are.

Andrew Dismore AM: My last question from me for the time being is for Jonathan. You are obviously working very closely with City Hall. Is there any practical help that the Council would like to see from the Mayor that you are not getting at the moment and indeed that other boroughs are not getting at the moment?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): Most of the things that we are doing either relate to our own powers or our ability to work with other stakeholders. We have heard reference to the wayleaves. Westminster has entered into the standardised wayleave for all of its properties throughout the City. Also, it has worked with the large landowners that we have, representing big chunks of the central area. That is something that has not been easy because the Grosvenor Estate has its lawyers and the [Howard] de Walden Estate has its lawyers and the Crown Estate has its lawyers, but we have managed to get to a point where the wayleave agreement has been accepted, which has enabled large areas to be dealt with more quickly and more easily than dealing with individual negotiations every time somebody wants to put some fibre in.

If there was any way that that methodology could be further extended through the Mayor's influence or through the functional bodies of the GLA, that would also be appreciated because, clearly, there are other

property owners that we would like to continue to work with. I am not certain how far that has gone but I am sure it is something that Theo has been working on. We would be very happy to work with other owners either directly or under the influence of the Mayor to continue that and to spread things out as far and as fast as we can.

Theo Blackwell (Chief Digital Officer, GLA): The property sector has really come quite far, even in the time that I have been at City Hall, to realise the new demands of connected workplaces and spaces. The industry is changing and being more receptive, but I think I am right in saying that Westminster benefits in terms of connectivity from essentially a small number of large landowners. That is not replicated across areas of London. When we are dealing with many smaller land owners, that provides a real challenge. The authority of the Mayor and particularly the local council that has most connection with those landowners is critically important; hence the work we are doing with boroughs to ensure that that is happening.

Joanne McCartney AM: I want to come back to the issue of 5G. We are expecting it to start rolling out later this year [2019]. Is that likely? Are we going to be able to roll it out efficiently? What are the major challenges that you see? Perhaps I could start with Theo.

Theo Blackwell (Chief Digital Officer, GLA): Just on the strategic level, 5G is coming. A number of providers have been in contact with us and are launching their plans imminently and so we will begin to see it. The benefit of 5G is obviously faster speeds, but really it is going to be a question of what people call 'use cases'. How is it deployed in industry? How is it deployed in the public sector? Some of those are still being worked out. That will be a key factor in its demand of what you are going to use it for. As you imagine, if you think back to the days of moving from 3G to 4G, people knew that there would be more of a peer-to-peer economy but they could not imagine Uber and other providers and that came about. What kind of industry there will be in a 5G economy is yet to be seen but we know that there will be a substantial uplift.

In terms of the city, 5G will require a significant amount of fibre, which is why this is even more critical work, and it will also require the placement of hundreds of thousands of small cell technologies on things like buildings and lamp posts. The work we are doing here with the Smart Cities team funded by the European Commission and work with about 80 European cities is about how we can transform what the Commission charmingly calls 'the humble lamp post' into something that will effectively retrofit the city for 5G technologies in the future. It is not just a lamp post having a 5G functionality but things like air quality sensors, electric vehicle charging points and a number of other functions. How we use that city asset - which is owned by TfL, the Metropolitan Police Service - collectively to roll out smart city technology including 5G will be really critical. We are leading the way in Europe on this and our team here has delivered a significant amount of progress on that as that leading pilot project for the European Commission and creating a business model that we can explore with the city.

Joanne McCartney AM: Are there any special skills needed to be a 5G technician? Do we have the skills or is that a workforce issue that will be a challenge?

Theo Blackwell (Chief Digital Officer, GLA): It underlines the critical importance for digital skills in London, without a doubt. Our investment in the Mayor's Digital Talent programme and the investment that we will be doing through the skills budget are really important.

Joanne McCartney AM: I understand that it is estimated that about £2 billion worth of private sector investment is going to be needed for this.

Theo Blackwell (Chief Digital Officer, GLA): For fibre, yes. For 5G it is about £4.7 billion.

Joanne McCartney AM: Do you get the sense that the private sector is willing to invest in that or are there barriers to that? The cost might be off-putting for many people.

Theo Blackwell (Chief Digital Officer, GLA): The market is in a different place than it was four or five years ago. Councillor Glanz may well have a view on this from a Westminster perspective.

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): Yes. By way of an update, we have entered into a contract already in relation to all of our street furniture with a company to provide initially better 4G but also 5G as it rolls out. That means that each of those lamp posts by definition has an electricity supply, but it will also be ensuring that the fibre backhaul, which is at the other end of the equation required to make 5G work, is also part of that equation.

Interestingly - and a comment on one of the complexities of trying to deliver on this - the contract we entered into after the usual processes were followed has been challenged by BT on the basis that we are preventing competition on the individual lamp posts. This will be a recurring theme as other boroughs approach this. The case will be an interesting one to watch as to how we are able to resolve that with BT. Clearly, had it not been for that case, the investment would already be being made. With the uncertainty that that has created, it has created a reticence in proceeding with the costs to which you referred because they are substantial. I hope that that will not prevent a rollout across the city in a broader sense.

Joanne McCartney AM: The public sector is holding the assets, really, but the private sector leads?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): The lamp post is an obvious example, but of course each building could have a cell or more cells put on it, provided that they have the ability to communicate. It was described by one of the team that they need to be above the height of a double-decker bus to be effective. It is interesting if you think about where they might then go, whether it is lamp posts, signage or buildings themselves. As Theo said, we are looking at hundreds of these, thousands really, to provide the full connectivity that 5G would offer. It is still a work in progress.

Theo Blackwell (Chief Digital Officer, GLA): It is worth underlining that point. There is an inherent connection between the provision of fibre and 5G. Sometimes you hear from people, "We do not have to worry about digging up the road because 5G will be here". It is just not the case. The two are inexorably linked.

Joanne McCartney AM: One of the gamechangers is going to be TfL and the ability to use the Underground train network to lay cable. Do you want to tell us a little bit about that and give us an update on what stage you are at in your digital programme?

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): We have been working on a series of interconnected projects to deliver all kinds of connectivity in the Underground. The one that is really time critical and safety critical for us is the delivery of the Emergency Services Network (ESN) for the Home Office. That is about the delivery of a new radio system to be used by the police, the Fire Brigade and the other emergency services. That project has been in development for many years and it is now being progressed.

Connected to that is also the delivery of mobile connectivity into the Underground. Today it is 4G. It is 4G today only because 4G technology has matured. It could become 5G when 5G technology becomes more mature. We would not put anything into the tunnels that is not mature as a technology because it is quite a difficult environment in which to work anyway and is not the place to experiment with new technology.

The project to do ESN has been beset by all kinds of difficulties, which the Home Office has been dealing with nationally, and we have been caught up in that. Our project has stopped and started a few times. It is right now progressing but at a very slow pace. We have an agreement from the Home Office to try to align the work that we are doing for the ESN with the delivery of the mobile connectivity.

That is all being combined right now into a major project on which we will go to the market with a tender for a concessionaire to come in and build out the remainder of the technology. We expect to be in the market fairly soon. I cannot give you a date yet because there is a controlled procurement process and the date has to be announced through the procurement process, not here, but we will be in the market fairly soon to procure that concession. That will mean that the Home Office's project to do the ESN will progress and alongside that the work to bring mobile connectivity into the Tube will also progress. Alongside that, the laying of new fibre into the Underground to provide connectivity wherever the Tube goes is also going to be provided as part of that.

What the Tube provides is a relatively large tunnel to lay fibre in. It is not the easiest environment, I have to say, but equally it is not like digging up the roads. The idea is to provide fibre connectivity through the Tube. That of course is not enough because you need fibre connectivity to the end point and the idea is that this concession company will then work with other fibre providers or indeed if they have a fibre presence and London themselves to make that fibre available for others to provide connectivity to homes, businesses, 5G facilities or whatever else is needed.

Joanne McCartney AM: At that point, you should get a host of other providers that can come in because the cost of investment is not as great.

Theo Blackwell (Chief Digital Officer, GLA): Even more, our work with the boroughs, starting with the central London boroughs but also the ones in the northeast and the west, identifying those public buildings near to the Tube stations lowers the cost for investment even more because we are essentially making public buildings into fibre hubs, extending them into communities, lowering that cost of investment. We are essentially making that money that we need, the £2.5 billion for investment by 2025, go further. TfL and other public assets are really critical to this.

Joanne McCartney AM: Thank you.

Tony Devenish AM (Chairman): Can I welcome the London South Bank University journalism students? I am not sure if you will get a story out of this morning, but good luck.

Andrew Dismore AM: First of all, we have seen this dog-in-the-manger approach by BT before and it is not very helpful.

The point I wanted to probably ask Theo is that we have looked at TfL, but south of the river - if I may venture across the river - a lot of the network is Network Rail's. How are we relating to Network Rail over its pretty widespread coverage south of the river where the Tube is far less?

Theo Blackwell (Chief Digital Officer, GLA): It is an obvious point. Provision on TfL's network will be extended as far as the Tube goes in south London and we have a plan to connect up to Brixton. Is that right?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Yes.

Theo Blackwell (Chief Digital Officer, GLA): Discussions will be had with Network Rail to do the same. It is just that it will have to take place at a slower pace. Sara, did you want to add to that?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Yes. It is certainly our intention to work and it will be in the concessionaire's interest to work with anybody with existing assets in the ground to reduce the cost of delivery to presences across the capital, really. Network Rail will be a key partner that they will be looking to work with.

Theo Blackwell (Chief Digital Officer, GLA): And other utilities or companies.

Andrew Dismore AM: That is what will be. What have you been able to do so far with Network Rail to get it engaged?

Theo Blackwell (Chief Digital Officer, GLA): We have made progress on what we have done so far. We have not made progress with Network Rail so far. That is because of pretty much where we are in the stage of rolling this out. It is a crucial partner in this. Shashi might want to add to this.

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): It is quite a difficult job to get this into the Underground itself. The advantage that the Underground offers is that it is a tunnel. Network Rail offers a different advantage, which is that it has right-of-way at the surface level. Laying cable under the street is not impossible. Once you are above ground, the advantage that you get from the right-of-way along the Network Rail tracks is diminished by the fact that there are alternatives available. That is not true in central London where laying cable is genuinely difficult and digging up the street is more difficult than it is elsewhere. That is why laying fibre through the Tube tunnels provides an alternative.

The other thing that is quite important to recognise here is that one of the things that the city needs, or any economy needs, is not just fibre or not just telecommunications, but diversity of telecommunications so that if there is a problem with one set of lines another set of lines is available. That is fundamentally what the Tube offers. It is a completely diverse circuit. You can take a digger and dig through the street and cut through a fibre bundle and that can bring lack of connectivity to whoever is connected to that fibre. It does happen, unfortunately, from time to time. However, the idea that you would do that and disrupt the fibre in the Underground at the same time is very remote. That is what we are offering here.

Andrew Dismore AM: You have talked about the Tube tunnels. I do not know what percentage of the Tube is not actually underground, but it is quite a high percentage

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): About 40% of the Tube is underground. It happens to be --

Andrew Dismore AM: And 60% is not?

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): Yes. It happens to be the area where laying fibre is the most difficult. That is essentially why we are focusing so much on the underground tunnels.

Andrew Dismore AM: Going back to your answer on Network Rail, are you effectively saying that it is easier to dig up a road than run it next to a rail line?

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): It is not easy to dig up a road and it is not easy to lay fibre next to the railway, either. There are difficulties with both. Eventually the market will have to figure out whether it is easier to work with Network Rail or easier to dig up a road. To an extent, we can only help. It is eventually for the providers to figure out where it is easiest for them to lay fibre.

Andrew Dismore AM: We can probably guess the answer to that.

Theo Blackwell (Chief Digital Officer, GLA): It is also worth saying that the boroughs themselves have hidden assets. Sutton, Hackney and Waltham Forest have all commissioned studies to find out the suitability of their buildings and also what other assets they can bring into play to encourage investment. Hackney's closed-circuit TV (CCTV) network, which it installed 10 or 15 years ago, is being deployed as part of the package in its partnership with investors because, essentially, they have over 80 kilometres of dark fibre to put into place. Things that can be used for connectivity that were not necessarily installed for that purpose are actually the things that can be used as part of a wider negotiation. Not all boroughs know what they have and so our job is also to spread the good practice of those boroughs that have really made those first steps to ask what they have, not just buildings but their own hidden networks, and bring them into play.

Navin Shah AM (Deputy Chair): I want to raise issues about the new draft London Plan changes that we need to achieve, particularly in reference to FTTP connection to the premises. Policy S16 touches upon four key issues. One is building the exchanges to achieve greater connectivity. It talks about adequacy of ducting space. It refers to mitigating measures and then well-designed public-realm facilities for mobile infrastructure, etc. Only in justification paragraph 9.6.2 on London's capability, it refers to the limited availability of fibre and the speeds in London. Do you think that the policy should be strengthened to require new development proposals to have FTTP?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): You will be happy to hear that we have done. The version that you have read there was prior to the minor suggested changes. The version with the minor suggested changes calls for full fibre connectivity for all new developments.

Navin Shah AM (Deputy Chair): That is extremely useful to have and very important because, if you are serious about treating digital connectivity as the fourth utility, that is the right approach.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Absolutely.

Navin Shah AM (Deputy Chair): How will the policies that will come in place be implemented, enforced and monitored overall?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): We will be producing guidance to go alongside this policy that will give local authority officers the necessary information that they need to have those informed discussions with developers. In practice, developers, when they come to the planning stage,

will have to submit some evidence either in a utility plan or by way of agreement with providers that will demonstrate that they have considered the connectivity of their new development.

That is in line with the National Planning Policy Framework. It is also in line with Government intentions to introduce regulation eventually. Therefore, we think developers are going to be compliant with it. The guidance that we are offering will, hopefully, help with that as well.

Navin Shah AM (Deputy Chair): Will this fundamental change or addition that you mentioned be part of the S16 policy or is it another standalone policy?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): It is that policy, yes. It has been revised. I am sorry if you do not have the latest --

Navin Shah AM (Deputy Chair): No, I do not, unfortunately.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): -- but we can send that through.

Navin Shah AM (Deputy Chair): Can you add into the justification this requirement for new premises that proposals be submitted at planning level when you have a design and access statement where you are required to provide detailed proposals as part of the scheme? When you talk about the integrity of structure and the fire safety and so on, this could be part of the requirement as part of the application in design-and-access statements. That would then make sure that, right at the design and planning stage, it gets scrutinised by the planners as part of an essential requirement. This is something that would be tremendously useful and it would have legal bite to deliver what we are after.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): I will discuss it with the London Plan colleagues and see what is possible, but that sounds, to me, sensible.

Navin Shah AM (Deputy Chair): Can you please? I will be very happy to contribute and have a dialogue about this.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Thank you.

Navin Shah AM (Deputy Chair): We still have a window of opportunity with the Examination in Public [for the London Plan] taking place in this very room.

Theo Blackwell (Chief Digital Officer, GLA): What I would add having spent about eight years on a planning committee in Camden - and Councillor Glanz may well want to add to this - is that this approach, if accepted, introduces a real step change in connectivity. It just puts it on the agenda.

Navin Shah AM (Deputy Chair): Absolutely, yes.

Theo Blackwell (Chief Digital Officer, GLA): The democratic process can now really get its teeth into connectivity and use that in discussions on major developments and smaller developments as well. It is really important. Our job as well, working with London councils, is to work with councillors so that they are armed with the right questions as well.

Navin Shah AM (Deputy Chair): Jonathan, are you content with the package within the new draft London Plan that we talked about or could it be further enhanced or made stronger to deliver the connectivity we are talking about?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): I would certainly welcome the obligation being put on the developers to ensure that their buildings are fit for purpose, really, because, as you quite rightly said, connectivity is the fourth utility. Nobody would come along to offer a building without water, without electricity or without other connections, and the expectation that they will do that I hope is pushing at an open door in terms of the realisation by developers that they will not be able to market their buildings in a meaningful way without connectivity. It is now accepted that when people go to rent a property particularly, they will ask, "What is the connectivity like?". When people go into estate agents now, "What is the connectivity like?". People do not want to go back if they have had it elsewhere in the world or elsewhere within the UK. Having had the ability to have effectively unlimited connectivity, they do not want to go back to a situation where that is not the case. Through a combination of the changes in the Plan and market forces, we will see those two things coming together to ensure that we really do get FTTP on every new build throughout the city.

Navin Shah AM (Deputy Chair): I have one last question on this topic. Whilst we have seen a real step change in the new draft London Plan with the connectivity issues, something else that can be done outside the London Plan as part of providing leadership in the area and that is where the question is. What does the GLA do in its broader regeneration programme to promote better connectivity? Is there a requirement for FTTP in GLA regeneration programmes?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): My team has been meeting recently with all of our different regional housing teams to talk to them about this upcoming London Plan policy. Any new schemes or projects will require full fibre connectivity to any new housing. Certainly, we are asking any new developments now to comply with the future upcoming London Plan and that has all in principle been agreed. Yes, we are doing that through our housing team.

Navin Shah AM (Deputy Chair): Will you be closely, or are you already closely working with a whole range of agencies, in a sense, within the public sector, where the GLA certainly has influence as well as a stake? For example, there is a whole host of London properties that are being redeveloped, etc. TfL has a large property portfolio. I am not sure how much of the Fire Authority premises or assets are left that are being redeveloped. The National Health Service is not within the GLA but, again, is releasing quite a lot of land, etc, where we can directly influence. There are Housing Zones where large programmes are coming through for, like you mentioned, social housing and so on.

Is this something you are doing as part of the strategy to ensure that we do have FTTP in those new developments?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Yes, we work with all internal teams. We do a lot of work to make sure that everybody's aware of our programme and the Mayor's priorities in terms of what the new London Plan policy is going to be. We work with our Infrastructure Team, the Regeneration Team, the Creative Enterprise Zone Team and the Housing Team. We talk about full fibre a lot.

Navin Shah AM (Deputy Chair): My only concern would be that the new changes will be materially and legally effective only once that the Plan is adopted, which will be another year and a half. I do not know the timeframe, but it is something in that region. In the meantime, therefore, we have to be even more focused to

make sure that whilst it is not a legal requirement under planning laws, it is still provided or part of the schemes that are coming through.

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): For sure, and a big part of our role is demonstrating the benefits of it as well so that people are not just required to but want to invest in full fibre and demonstrating that people are not going to want to be in a building, as Councillor Glanz said, if there is no full fibre. We do a lot of work with the property industry to talk about that and highlight examples of best practice as well.

Theo Blackwell (Chief Digital Officer, GLA): There is a real opportunity in London. If you think about the developments that are going to happen over the next 20 years. Some of them are very significant: Royal Docks, Old Oak Common, Rotherhithe and Canada Water, which is now a very significant holding for British Land. We were recently down in Rotherhithe and Canada Water with British Land and its person who was appointed to look at connectivity and smart technology. The kind of infrastructure that will be put into these new developments will be of a completely different order to the developments that citizens today consider to be new such as King's Cross, which got planning permission in 2007, a year before the invention of the smartphone.

When we meet with connectivity providers, we are also telling the story of London about where these developments are and working with them to make sure that there is the proper connection with the private development sector, not just connectivity providers but also providers of new smart technologies. London not being just one smart city but many, these 40 opportunity areas of growth in London will be extremely significant.

Navin Shah AM (Deputy Chair): I have one last comment. Our report from two years ago I would quite like you to please go back to and have a look. If I am not mistaken, there was a very clear recommendation related to the London Plan changes, something along the lines of boroughs being required to prepare their own local infrastructure plans with reference to digital connectivity. That, again, would work very well with how overall you are working with the boroughs and that would strengthen your own capacity and the requirements from boroughs. If you can please have a look at that and come back to us?

Sara Kelly (Principal Policy Officer for Digital Connectivity, GLA): Sure. Absolutely. As part of our work through the TfL Connected London network and developing the plans for how we are going to use the grant funding to connect up various local authority properties, we are also developing what we are calling at the moment a 'pro forma', which is effectively a digital infrastructure strategy that sets out clearly the key contacts, the key processes and whether there are any key stakeholders that need to be consulted as part of delivery. We are doing that for every local authority that is involved with the Connected London network. We are also then using that template we are developing there to work with the other local authorities not involved in the TfL Connected London network to, hopefully, get them to adopt a similar process as well so that we can develop this catalogue of digital infrastructure strategies from across London.

Navin Shah AM (Deputy Chair): Thank you.

Tony Devenish AM (Chairman): Thank you very much. Finishing off with the final three questions, Assembly Member Arbour.

Tony Arbour AM: It will be more than three questions because some very interesting things have emerged from this. The first question I would like to ask is about futureproofing. I do not know when people first

started talking about 5G, but it seems to me to be months ago rather than years ago. I am very struck by the analogy that Theo has given about King's Cross and smartphones. Given the rapidity of change, are you sure that all your proposed plans for 5G will not simply become redundant because something is going to overtake it and you are going to make this vast investment - this is really something for you all - that may turn out not to be a smart investment at all?

Theo Blackwell (Chief Digital Officer, GLA): The approach we are taking is absolutely vital for the city, which is providing, effectively, the infrastructure. We do not know quite what will come with 5G, but we know that it will require fibre. The next generation beyond 5G, which some people talk about even now, 6G, will still require a fibre infrastructure there. This has now become, as Jonathan mentioned, just the fourth utility for London. That is where technological progress has taken us and that is our challenge to meet.

In London, if you are thinking about futureproofing, we are not placing a bet. If you think about the usefulness that comes from technology, London is so big and has such diverse specialisms. We are not placing a bet on one application of that technology or another in our digital economy. The application of technologies to London's growth and business come from many specialisms.

The GLA did a study back in 2014 that said there were 50 science and technology hubs in London. That would be at least doubled or tripled now just because of the pace of change. It is not one bet that comes from this. It is many different functions that we can offer our citizens and indeed the world.

Tony Arbour AM: Are you happy that TfL is futureproofed?

Shashi Verma (Chief Technology Officer & Director of Customer Experience, TfL): There are two different things that we are doing. One is that we are putting equipment in the tunnels and then we are putting switching equipment outside the tunnels to enable 4G and fibre connectivity.

The tunnels are a difficult environment where, once you lay cable, you do not want to go back in there frequently. Everything that we have seen about 5G so far is that the sort of cabling that we are putting into the tunnels will be adequate for both 4G and 5G. In terms of futureproofing and putting provision in that is resilient to change, the difficult environment is getting that futureproofed solution.

Where the 5G solution is not yet stable is in all the switching equipment. That is where the technology is rapidly evolving, and we have not seen the end of that evolution of technology. That is not going to be in the tunnels. It is still going to be in difficult environments, but it is not going to be in the tunnels. That is where, as I said, we do not want to experiment with technology, but we want to provide the space, the power, the cooling and things of that kind that will allow operators of that technology to switch from 4G to 5G or indeed anything in the future at a relatively low cost.

I say that because we do not know yet what the nature of this switching equipment for 5G is going to be and so all we can do is make sure that we are putting in the most resilient technology that can withstand the changes of technology as it comes along. Are we absolutely guaranteed to be completely futureproofed? No, because we do not know what that future evolution is going to be, but we have taken all the reasonable steps that one could possibly take to become resilient.

Tony Arbour AM: I am very interested in your assets here. Of course, one obvious piece of futureproofing you got wrong in this is the Elizabeth line. The only thing there that I could see that is definite is to say that

there has to be sufficient capacity within the ducts that you put in for the fibre or something else, which is manifestly true.

I recall when I was responsible for this area in a borough and we wanted to use the equipment assets that the borough owned like lamp posts. We found that we had let some of the lamp posts already to somebody else and we could not get hold of them.

What makes you think that the 80,000 street furniture assets that you have are available to you, or indeed that however many Westminster has, are freely available to you and that somebody has not already pre-empted them and can in effect blackmail you into buying them out?

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): That is interesting because we were early adopters of previous technology and we did a deal many years ago with BT for it to use lamp posts as part of what was then leading-edge technology, which now looks of course completely historic. That was a time-limited deal that was determined, and we know that we have those assets back and available to be used for the new technology. Of course, we keep an asset register of those. We have made the usual due diligence to ensure that we have not let them to somebody else and that they are available to enter into our contract. As I mentioned earlier, there are other people who have a different view about that and they are seeking to challenge that commercial arrangement. That could be replicated elsewhere, but certainly, it is something we have to resolve in Westminster.

Tony Arbour AM: That is precisely the point I made. You talked about how there ought to be a register of what the boroughs are doing, and borough assets and some borough have not done it and this, that and the other. It should be looked at very carefully. I am completely dumbfounded to think that any London borough, no matter how backward it might appear to be politically, is not absolutely at the cutting edge of this and does not have a register of assets. I just cannot understand it.

I recall some years ago the assets that the City [of London] Corporation had relating to its hydropower, which was used here for the bridge and for lifts and things of that sort, provided a vast amount of ducting and cabling and things like that. What has happened to all of those things? Are there others that ought to be on a register but are not?

Theo Blackwell (Chief Digital Officer, GLA): Just going back to the question of ownership of lamp posts, we know that approximately 18 boroughs are in a position to fully own their own lamp posts for discussions around joint working together. Others have leased their lamp posts off in commercial arrangements with providers as part of cost-cutting measures and some connectivity measures. There are, of course, some legal disagreements, as we have said, about that. There are approximately 20,000 lamp posts per borough and so this is a potentially large market, even if you are looking at only 18 boroughs. Of course, if the lamp posts were leased off to another provider, they would be in the game for these kinds of technology anyway but just not working in concert. It goes back to the question of LOTI and working together with boroughs and how we do things more together. These are all quite live questions for us.

On the question of asset registers, I have no doubt that every borough has an asset register. Whether it is in a shareable form, whether it has been pointed in the direction of digital connectivity, whether people fully know the capability of the assets that they have, whether they know where the ducting is, that is a slightly different question. What we need boroughs to do is to look afresh at their assets with the lens of digital connectivity.

Councillor Jonathan Glanz (Gig Economy and Broadband Champion, Westminster City Council): Can I just comment on that as well? It is not just boroughs that have assets that could be useful in this context. We had a very interesting presentation from the utilities companies and they have very significant numbers of redundant assets, which provide in some cases quite large tunnels going for quite long stretches within London. They have done quite a lot of work in terms of analysing what they have and I know that they are willing to share that with boroughs to look at being able to copy what is being done by TfL and to get fibre comparatively quickly and easily beneath streets without the need to dig them up.

Theo Blackwell (Chief Digital Officer, GLA): We have just won a bid from the Geospatial Commission to provide an underground asset register in central London so that we fully know what is underneath us, which is an immense benefit of course to connectivity and also to construction projects so that you know where you are going.

Tony Arbour AM: I can now revert to what I have been told to ask questions about. These sessions are quite pointless if they are not interactive and we can pick up stuff from you that we had not known about before. On the point about technology and so on, TfL's principal asset, according to this thing here, relates to a technology that is long gone when you talk about ducting for trams. The last tram ran more than half a century ago. It is quite extraordinary that that should be here.

The question I have been tasked to ask you, Theo, is: how are you ensuring that businesses have the skills to take it on? There is no point in providing the technology if people do not have the skills to take it on and businesses do not have the skills to take it on. What are we doing?

Theo Blackwell (Chief Digital Officer, GLA): There are a number of initiatives that the Mayor is undertaking. First of all, there is the Digital Talent programme, which was launched in 2015 with a number of commitments the GLA has made to this. The Digital Talent programme is an extremely important investment in underserved groups - the working class, black, Asian and minority ethnic people, women - and has been working with a range of new providers to get people apprenticeship-ready and to boost entrepreneurial skills among young people. It is a really exciting, well designed initiative, from which we are beginning to see some of the fruits.

Of particular concern for many in London is that Londoners are not left behind by technology and so we do need a strong focus on digital inclusion. The devolution of the Adult Skills Budget provides us a real opportunity to assist Londoners with low or no digital skills and we will be making an announcement in September [2019] on that provision for Londoners. That devolution gives us a really good opportunity to engage with the business community as well, not just in terms of their workers but also in terms of their customers. Previously with digital skills, there was money available from the Government, but it was not marketed very well. The logic was that if you marketed it, there was not enough resource to meet the demand.

We really need to look at how we work with the Citizens Advice Bureau and some of our large providers to identify people who could really benefit from better digital skills to make them more confident in the digital world. That is a really big focus for later this year that the Mayor has asked me to look at.

Tony Arbour AM: There is a report that was published only today talking about the decline in the number of students studying information and communication technology (ICT) at school. Presumably, that has a knock-on effect throughout the generations? I think the [Adult] Education Budget that has been devolved to us here is Jules Pipe's [Deputy Mayor for Planning, Regeneration and Skills] responsibility. Is that right?

Theo Blackwell (Chief Digital Officer, GLA): And Joanne's [McCartney AM, Statutory Deputy Mayor] as well. In my previous life, not just being a local councillor in Camden, I worked for the Association for UK Interactive Entertainment, which is a video games trade body. We had a campaign called Next Gen Skills, which convinced the Government to change the curriculum and put coding in the curriculum so that kids from primary school age onwards had computing skills, not just basic ICT skills.

Part of the Digital Talent programme supports not just the students but the teachers, enabling them to teach the new computing curriculum. It also supports them with pedagogy to teach the new curriculum in an exciting way because for too long perhaps we taught ICT and computing in a way that put some people off and appealed to others. That investment is critically important in not just helping with the new curriculum but also attracting people to take it up at each stage of the education cycle when they have a choice.

Tony Arbour AM: Given that City Hall now has the further education (FE) budget, for you and whoever is managing that FE budget, this clearly will be an area where there is a connection between the two, I should imagine.

Theo Blackwell (Chief Digital Officer, GLA): Without a doubt.

Tony Arbour AM: The second question I have seems to me to be kind of rhetorical but gives you a chance to say how wonderful you are and again it is to you, Theo. How do you think improvements to digital infrastructure will impact on London's competitiveness over the next decade? I am sure you are not going to say that it is not going to have any effect.

Theo Blackwell (Chief Digital Officer, GLA): I mentioned before that London is a city of convergence. The number of specialist tech sectors that we have here has grown and is growing at the moment. Every day people seem to put 'tech' at the end to make a new word, law-tech and prop-tech and things like that. It is absolutely fundamental for this city's growth.

The number one concern that people have put to us as a city in relation to their business growth - and this also applies critically to the public sector - is our ability to attract talent, to have homegrown talent - which is the skills challenge - and also to attract talent from across the world, the idea being that if we are going to create world-class products, we need to have world-class teams and be able to assemble them. That is one of our really fundamental challenges as a city, whether there is a delayed Brexit or not.

London has a real advantage in its brand across the world that we often see. There is a ranking system that happens at Davos and London for the last five or six years has come top, primarily because of its cultural offer, as well as the track record that we have in innovation. It is a great attractor for people. We are well placed for the future of this.

In terms of my role, which is primarily around public service transformation, our job is to mobilise all of that for civic benefit. We come from quite a good starting point. London has a great track record around data with the open data that was started in 2010 here that we are looking to advance in the future. TfL's unified application programming interface, now in its fifth year, was an immense achievement, opening up all of that data so that a huge family of developers could develop really cool applications for Londoners like Citymapper that have really transformed people's lives. There is an interrelationship between the two. The innovation we do as a city also has a knock-on effect.

Tony Arbour AM: Is there anybody snapping at your heels? My question is on competitiveness.

Theo Blackwell (Chief Digital Officer, GLA): It is a really good question. We are closer in what we do to quite a lot of European cities. When I look to things that other cities are doing that I would quite like us to do in the future, I see Amsterdam developing an open-source platform, as has Paris, which has enabled them to lower costs and provide a range of applications, usually quite simple but functional ones, to citizens and to city governments. That has meant that they are less reliant on big inflexible tech.

The direction of travel that I would like to take us is to enable our city to have more capability to shape more things around the needs of our citizens and to be less reliant on big tech. Big tech is of course necessary for many things, but it does not have to be overly dominant in our city services.

When I see things that I would like to emulate, I look to the work that Amsterdam is doing. There is some really good work also in Helsinki around --

Tony Arbour AM: They are sort of Toy Towns compared to London, are they not?

Theo Blackwell (Chief Digital Officer, GLA): Yes, 650,000 people. That is true, but in London we look at things both on a level of 9 million people and on the average borough size of 250,000.

Tony Arbour AM: I would have thought that that is something that we should be looking at, really. I am of a generation that remembers when everybody was given an Acorn computer --

Theo Blackwell (Chief Digital Officer, GLA): I remember them, too.

Tony Arbour AM: -- and I do wonder whether we ought not to have a new generation of things. People would charge for the use of it, but if the piece of hardware equipment was dished out it would be the real thing to popularise all of this. Maybe that is too futureproof.

My third question has already been answered by Councillor Glanz telling us how wonderful Westminster is and you already have. Thank you, Chair.

Tony Devenish AM (Chairman): I thought I should put how wonderful Westminster is as my last question. I am showing my bias here anyway. There are two other things I was going to ask, Theo. One has been touched on by Tony [Arbour AM]. Could you write to us with examples of what other cities are doing that you would like to do ideally in the future?

Theo Blackwell (Chief Digital Officer, GLA): Yes.

Tony Devenish AM (Chairman): The question I always ask because I am often told to by the Scrutiny Team and by my party leadership, actually, is: how do you measure success?

Theo Blackwell (Chief Digital Officer, GLA): The Smart London Together roadmap is published openly. We have published that on an off-the-shelf project management toolkit called Trello. We just have a Trello board and it tells you what we are doing, what success we are measuring on our 20 or so initiatives, when we have pivoted - because sometimes we are doing something, and we realise that the hypothesis is wrong - and why. We have published that openly.

We did that because, when you talk about a smart city, it involves lots and lots of different things coming together, which is very confusing for practitioners and the public. We felt we needed to be clear about our approach. That is fundamentally how we hold ourselves accountable. Each of the measures will have its own success criteria, whether it is the Mayor's Civic Innovation Challenge, the work of the Connected London Team or indeed the metrics around the Mayor's Digital Talent programme.

On a high level, how I measure success is through our ability for our public services to be more responsive to the needs of citizens, how we use data as a city and how we mobilise that for civic benefit. That essentially is the goal and what we are trying to do here.

Tony Devenish AM (Chairman): Thank you. Any final questions from colleagues? No. Can I thank our guests for their attendance and very helpful contributions to the discussion?