

Smarter London Together Roadmap 2018–21: Report Back to Mayor of London

Executive summary

In summer 2018 the Mayor of London launched [Smarter London Together](#), a three-year Roadmap to make London “the smartest city in the world.” This 2021 report back outlines progress towards the objectives of better digital services, data sharing, connectivity, smart pilots, digital skills and city-wide collaboration:

- Across its work on digital, data, technology and smart programmes, the GLA now adopts a **common design approach** based on understanding and meeting user needs when developing new digital services. City Hall developed leading examples of online citizen engagement in policymaking (Talk London) and citizen participation through crowdfunding platforms (Make London, Pay-it-Forward).
- There are now stronger foundations for **joining-up data** across London’s public services to support both core public services and the Recovery Programme, and work is well advanced on a new city data platform and governance. The GLA produced nationally recognised data services: Infrastructure Mapping Application (private data sharing to ‘dig once’); the Planning Datahub (live feed of all planning applications in city); High Streets Data Service (detailed local economic data using spend and footfall from private sources) and the Cultural Infrastructure Map (open data on cultural assets).
- Connected London is a ground-breaking mobilisation of TfL and other public assets to **improve digital infrastructure** for Londoners and an opportunity to expand gigabit

capable internet speeds across London and prepare the way for 5G and emerging technologies. In addition, the London Plan set the most comprehensive planning policies in the UK on fibre and mobile connectivity in future developments.

- London played a major role in the success of the EU Sharing Cities programme by piloting smart technologies in the Royal Borough of Greenwich, building expertise in deploying and financing **smart technologies to support the green transition** and working with other European cities, as well as establishing a track record of mobility and green initiatives.
- Opportunities for Londoners to access **basic and advanced digital skills** are now in place, the Mayor's Digital Talent Programme is an example of innovation in skills delivery.
- New institutions now enable **collaboration at scale** via the London Office for Technology and Innovation (LOTI) and TfL's Innovation team. The GLA and TfL's developing expertise in open call approaches fosters both valuable innovation and partnerships with scale-ups and the tech sector. The new Smart Mobility Living Lab, supported by TfL and QEOP, positions London as the place to trial new mobility services technology in a real-world setting.

- **Recommendations for future focus**

Although *smart cities* are variously defined, London now ranks very highly globally according to several independent studies. In the coming years, London government needs to consider both the **impact/opportunity of advanced digital technologies for Londoners** as well as continuing to **fix-the-plumbing** to build better foundations for the delivery of common approaches across public services, covering:

- **Digital Access for All** to enable Londoners to get the skills, connections, device or other support they need to be online
- **Better city data sharing** to support London's public sector organisations to better use their collective data legally, ethically and securely for the benefit of all Londoners. This includes a new city data platform by the end of 2022, governance model, support for data sharing across the city and data innovation
- **Public trust in emerging technologies** through a new Emerging Tech Charter for London to guide and inform how new technologies are trialled and deployed in our city
- **Scaling Green Tech** to ensure that green innovation happens at scale by strengthening design, governance and commissioning of projects across the city and by its partners
- **Grand Open Calls** through high value and status competitions to solve a large and clearly defined city objective, for example around the Green New Deal or Mobility
- **Common digital platforms** to serve Londoners better by investing in the necessary in-house digital and data capability to make, share, reuse or buy products and services.

Introduction

The Mayor launched his [Smarter London Together \(SLT\) Roadmap](#) in 2018 with an ambition to make London “*the smartest city in the world*” by “*a bolder approach to the way data innovation and digital technology serve those who live, work and visit our great city.*” The Roadmap represents the work programme of the first Chief Digital Officer for London (CDO), appointed in September 2017. This report to the Mayor summarises its progress over the last three years and makes recommendations on next steps.

Role of Chief Digital Officer for London

London’s Chief Digital Officer will:

- *Provide strategic leadership on the digital transformation agenda for London’s public services, across the GLA group and the wider public sector.*
- *Convene on behalf of the Mayor, across London local government, to build support for and take-up of innovative, technology and data-led approaches to service delivery and public engagement.*
- *Develop and promote partnership between the public, private and community sectors to enable and support the development of new public service-oriented technology and innovation.*

Development

The Smarter London Together Roadmap pivots from previous Smart London plans through a focus on digital transformation and collective capacity-building. The Roadmap was developed following extensive public engagement through the 2018 Listening Tour, including over 80 events, an Unconference hosted by City Hall generating 300 ideas, a survey of nearly 2,000 Londoners and through the Your Commute tool reached almost 90,000 people. It was drafted through the Mayor’s Smart London Board and supported by the Smart London team and the City Intelligence Unit at the GLA. Progress was charted through a publicly-accessible [Trello Board](#) and 77 [Smart London Medium posts](#).

The Roadmap was supported by Bloomberg Associates, who provided invaluable strategic advice, access to international networks and support for the creation of the London Office of Technology & Innovation and work by Public Digital to develop the new data services approach.

Approach

The Roadmap piloted the [‘missions-based innovation approach’ developed by UCL](#), later adopted for London’s Recovery Programme. Mission-based innovation relies heavily on external collaboration and shared purpose, reflected in the Mayor’s foreword to the Roadmap: *“If we are to use data and smart technology to help solve the biggest problems our great city faces, it is crucial that we take a more collaborative approach. We need our public services, major universities and the technology community to mobilise their resources in new ways and to partner with us.”*

There are two guiding principles behind Roadmap both derived from the Listening Tour. First, to *‘put people first’* when using technology and data – in practice this means championing and applying design principles in what we do. Second, and related to this, is a heavy emphasis on *‘fixing-the-plumbing’*: this means identifying and removing friction which prevents London working at appropriate scale whether on infrastructure, data or innovation.

Delivering the Roadmap

1. More user-designed services

An inclusive and modern digital transformation approach requires that we design digital services and technology around the needs of our users and develop them in an agile way.

Common principles and standards

City Hall was one of the co-founders of the MHCLG [Local Digital Declaration](#), a shared ambition for the future of local public services. Internally, we introduced the first pan-GLA approach to all future digital projects by testing GLA digital services against the gold standard set by the Government Digital Service [Service Standard](#) so we can create a coherent, effective and mutually understood way of developing digital services. This provides the basis for future GLA digital capability-building proposals which aim to transform City Hall's ability to make and commission digital services.

Citizen participation: policy

While critical work to strengthen City Hall internal digital capabilities is ongoing in Term 2, the most significant example of this new approach in practice is the re-design of Talk London, [City Hall's online community and citizen engagement platform](#). The new site aims to provide an inclusive space for all Londoners to take part in our work. Extensive user research and testing with communities who were previously underrepresented in the community ensured the new design and functionalities were based on user needs. In collaboration with young Londoners, the GLA developed and introduced a digital safeguarding policy and lowered the registration age to 16 to make sure that more young Londoners can participate. Talk London now supports more engagement with Londoners on the development of programmes and policies than any previous Mayor. It includes building a community of over 60,000 Londoners (45,000 new members since May 2016) contributing to the development of new Mayoral strategies. The platform proved critical during lockdowns when 11,000 Londoners shared with us the impact Covid-19 and lockdown was having on their lives, helping City Hall shape our response and recovery plan. Talk London is now delivering engagement for the functional bodies to use, and in the future will have [added functionality](#) and all online engagement will be directed towards it.

Citizen participation: crowdfunding

City Hall also grew its capabilities with citizen participation through crowdfunding: 20,000 Londoners donated over £1.5 million to help local businesses survive lockdown through

the Mayor's [Pay it Forward](#) campaign. Make London (previously [Crowdfund London](#)) has grown to be a major service enabling Londoners to identify neighbourhood projects where community fundraising can be match-funded by the GLA. Since 2018, Crowdfund London has pledged over £2m to 102 campaigns backed by over 17,000 Londoners, leveraging over £3.5m of match funding from the crowd – with demonstrated improvements in community cohesion, empowerment and skill development.

Business support

The GLA is also supporting small businesses, with the launch of the [London Business Hub](#) and [Technology Adoption Service](#) (TAS), a tool developed with user-centric principles to help businesses more easily access and adopt technologies to improve their operations. The TAS platform enables businesses to search for, discover and compare technology solutions to make improvements and efficiencies in the day to day running of their business. Delivered in collaboration with Greater Manchester Combined Authority, the service will help small businesses across key sectors hit hardest by Covid-19, such as retail and hospitality, to increase their digital skills and improve productivity. The platform supports more inclusive digital transformation by meeting the different needs of users.

2. City data

How we treat data is an infrastructure issue for the city, as important as our road, railway and energy networks. The next stage identified by the Roadmap was to work in collaboration with partners to build this into a city-wide approach, encompassing better data-sharing, security, governance and ethics.

Joining up data

The London Datastore, the city's original data platform established in 2010, has grown in functionality from its inception as an open data publishing platform to one which can link 'non-open' and private data sets which can be shared for important data services to support the city's core business and recovery. Delivery of a new city data platform forms part of the 2021 Mayoral Manifesto and work is already underway. In November 2020, the Recovery Board agreed the [first city-wide principles to join up data](#) using the London Datastore as central registry of London data, establishing London's approach as one where data is shared for specific purposes in a federated, rather than a centralised, system which respects the sovereignty of data owners.

New city data services

The Roadmap saw the creation of several important new data services to support the GLA's work around infrastructure, planning and growth. City Hall also supported cultural venues through the [Cultural Infrastructure Map](#) that plots the location of venues such as theatres, museums and recording studios and is a vital resource for those looking to protect, grow and make use of our cultural facilities. The [Infrastructure Mapping Application](#) allows utilities and public authorities to share private data on street works and better target investment and minimise disruption by coordinating street-works. The new [Planning Datahub](#) for the first time delivers a live data feed of development proposals in London from boroughs and applicants, and is the most advanced planning data in the country. In June the GLA launched the innovative [High Streets Data Service](#) which is used by London boroughs and the GLA to understand how spending and movement patterns have been impacted by the pandemic and the lockdown. The GLA also launched a new city-wide procurement platform, [Thirty3](#), bringing together all the disparate contracting opportunities across London into one, easy to use location. The platform also helps start-ups and SMEs to upskill to meet the requirements necessary to succeed in public sector procurement.

Data ethics

As London's data economy develops so too do questions around ethics and governance. The GLA was involved in the Open Data Institute's pilot on data trusts, using sensor data from the Sharing Cities programme in Greenwich. The Chief Digital Officer for London supported NHS OneLondon [Citizens' Summit](#) on joining up health and social care data (March 2020) and liaised with TfL on privacy development emerging from their work to use [aggregated mobile data collected by the WiFi network on the London Underground](#). Important ethical recommendations also arise from the development of [Live Facial Recognition Technology](#) (MPS), guidance for [Connected Autonomous Vehicles](#) and E-Scooter trials (TfL). Together these learnings have shaped the development of the privacy and data aspects of the GLA's [Public London Charter](#) on the management of open space in the city and the [Emerging Tech Charter for London](#), which establishes London's first general principles to guide the trialling and deployment of new technologies in our city.

Cyber security

Work to enhance London's cyber security and resilience is undertaken by the Chief Digital Officer, who commissioned a discovery in 2019, and liaises with the National Cyber Security Centre (NCSC) and relevant national bodies through the Local Government Association. The CDO has also supported LOTI's work in this area on [smart city guidance](#) and a discovery into the viability of creating a shared *Cyber Security Operations Centre for London*.

3. World class connectivity & smarter streets

This mission set out to improve full fibre provision and mobile coverage to support London grow and prosper as a digital economy and create a better environment where smart city and emerging 5G technology can be tested and adopted.

Fibre infrastructure

The [Connected London](#) Programme by the GLA/TfL is a major intervention to ensure London has affordable full fibre connections that are available to all homes and businesses. TfL's roll-out of underground 4G mobile services has seen hundreds of kilometres of fibre laid in tunnels, creating a new fibre backbone for London using public sector-owned surface assets, like buildings and ducting, to support last mile connectivity by private providers to underserved areas.

The 20-year [BAI partnership with TfL was announced in June](#), with the Connected London team securing an additional £30m+ in grant funding, including £10m dedicated by the Mayor of London, to deliver new or improved digital services at public sector buildings across London. These projects provide new opportunities to bring digital inclusion projects to the places it will help most and will also support 'last mile' connectivity to less commercially viable areas and not spots.

The GLA's Connected London team is supplemented by new and dedicated resource been established in London's five sub-regions to identify areas of need and problem-solve the sometimes complex legal or administrative barriers identified by boroughs and industry – making London more investable for telecoms providers.

Planning powers

The adoption of the [new London Plan](#) in March 2021 now makes full fibre connectivity and considerations for mobile infrastructure mandatory during the planning process for all new builds and, for the first time, supports the use of environmental sensors to enable the collection, analysis and sharing of data. This creates a benchmark for London's future connectivity and a more permissive environment for industry to deploy their networks (as developers need their support and guidance to comply with the policy). This policy future-proofs London's connectivity requirements for years to come and ensures that no new build is a not-spot, and will support smart technologies that will enable more real time data on and better performance of the built and natural environment. These measures represent the most comprehensive planning approach to digital connectivity and smart infrastructure in the country.

Smart platforms

London's 'smart history' owes a great deal to the work of Transport for London: the Congestion Charge, Oyster Card and Contactless payment are all everyday smart city technologies which are embedded in London's (and Londoners') way of life. TfL has continued to innovate, working with the GLA and boroughs on a series of major projects and deployments. Chief of these is the [Ultra-Low Emission Zone \(ULEZ\)](#), but there have also been notable advances in mobility: in particular TfL's support for the [Smart Mobility Living Lab](#) (SMLL). Launched in Greenwich in September 2020, the SMLL now provides a real-world connected environment for testing and development of transport and mobility services. TfL is also testing the future of e-mobility, with E-scooter trials starting in 13 London boroughs, an important step forward in collaboration and real world testing. There have also been [pilots of demand-responsive buses](#) on the TfL network.

Smart pilots

City Hall's EU-funded Sharing Cities programme on piloting smart technologies in the RB of Greenwich is recognised as a leading part of the programme that [triggered EU250m in private investment](#) in smart infrastructure projects (e-mobility, building retrofit, smart street lighting, energy sensors) along with Lisbon, Milan, Bordeaux, Burgas and Warsaw. We have published London's first series of [playbooks](#) on the scaling of smart cities infrastructure to support, for example, the use of technology in the Green New Deal. Overall *Sharing Cities* has achieved a 45% increase in the number of smart units deployed and a 70% increase on CO2 reduction, against programme targets.

The Olympic Park continues to provide a fertile test-bed for [cleantech and other sustainability-focused smart technologies](#): these solutions can provide [living examples](#) to be replicated city-wide or in other districts. The South London Partnership (SLP) is currently piloting use-cases for Internet of Things (IoT) applications in the fields of environment and social care, and [working closely with LOTI](#) to develop learnings into principles which can be used by other boroughs and agencies.

Air Quality

Led by the GLA's Environment team, the city [expanded the Breathe London](#) network of air quality monitoring sensors, with over 190 new sensors installed at hospitals, schools and other priority locations across London. City Hall also partnered with the Alan Turing Institute to build the city's [first air quality model](#) based on machine learning techniques. By utilising city-wide air quality sensors this project is developing machine learning algorithms and data science platforms to understand and improve air quality over London. A prototype model is now ready and being tested, with visualisations being developed by the GLA City Intelligence Unit.

4. Enhance digital skills

This mission focused on developing the talent needed for the future, this means preparing London's workforce for an increasingly digital world. We found a strong demand from both London's elected representatives and general public on digital skills development during the Listening Tour to ensure that Londoners are not left behind and that equity and jobs are a core part of the offer.

Entry level skills

Under this mission we have delivered the [Mayor's Digital Talent Programme](#) (DTP), which has trained more than 1,200 young Londoners in industry-endorsed learning in digital, entrepreneurial and employability skills. Over 870 school and Further Education teachers have been upskilled in industry-relevant digital skills and qualifications and we have supported more than 360 learners into digital work placements. The DTP aimed to increase the diversity and inclusion of the tech workforce with a focus on females, BAME groups, and created a ripple effect as our alumni continue to be changemakers in the organisations and start-ups they are now working in. The innovation the DTP delivered involved different training models to address different learner needs, with best practices embedded across other funding mechanisms. It also supported numerous employer partnerships and demonstrated the key role that employers can and should play in the co-design and co-delivery of digital training to future-proof their talent pipeline. This learning has flowed through to the design of the London Recovery Board's Good Work Mission and its focus on advanced digital skills.

Basic skills

From September 2020 the Essential Digital Skills Entitlement has been introduced as a new statutory skills entitlement for Londoners. The entitlement enables Londoners over the age of 19 years with no to low digital skills to access fully funded entry and Level 1 digital skills courses. Entry level skills are suitable for adults with no or little prior experience of using digital devices or the internet and Level 1 is for adults with some experience of using digital devices and the internet but lacking [basic digital skills](#).

This entitlement is delivered by adult education providers, including colleges and local authority adult learning services. It is essential that these providers work in partnership with community organisations and other local partners to ensure that London's digital skills offer reaches into neighbourhoods and helps reduce digital exclusion.

Londoners are already taking these digital skills courses, but as we develop the Digital Access Mission in the Recovery Programme we expect to support more Londoners to access these resources. This will be through the use of better local data and

understanding of user needs; better signposting of support when people come into contact with borough or voluntary sector services; and new opportunities for community-based learning for digitally excluded Londoners.

Diversity

To address inequality in the UK tech sector and drive inclusion, the GLA Group signed up the [Tech Talent Charter](#) in 2017 and certified every year since then. City Hall continues its active approach through the Digital Talent Programme (above) and the Workforce Integration Network (WIN) project, which improves the employment outcomes of young Black men in the technology and construction sectors and is currently working towards galvanising real change in leading technology companies by supporting them to become more inclusive organisations through the expansion of WIN's successful Design Lab initiative to the technology sector.

Improve collaboration

Under the final mission we looked to strengthen the city's ability to work together more effectively, which is a consistent theme in achieving the other Roadmap missions. This is vital for the city given the unusually fragmented nature of UK local government, which creates additional complexity when joining up data, delivering consistent city-wide methods or services and establishing a front door for innovators.

Collaborating across 32 boroughs

The chief achievement is founding London's first collective public service innovation body, the [London Office of Technology and Innovation](#), bringing together 19 London boroughs, London Councils and the GLA to work together to bring the best of digital, data and innovation to improve public services for Londoners. LOTI's focus over its first two years has been on building solid foundations for ongoing collective work as well as supporting boroughs to respond to the fast evolving needs of the Covid pandemic. Projects have included: developing standard [information governance tools and approaches](#) to support more efficient data sharing across the 32 boroughs; [recruiting 100 digital apprentices](#) for local government teams; establishing three peer support networks for borough data professionals, including running an [intensive data science bootcamp with the Office for National Statistics](#); helping boroughs find appropriate technology to run the vulnerability centres at the start of the Covid pandemic; using [data to map digital exclusion](#) across the capital; helping boroughs [develop preventative measures to stop residents from reaching crisis](#); and working with the GLA and London Councils to standardise the way data about [electric vehicle charging points is shared across London](#).

LOTI's work also enables innovation programmes developed by or with City Hall to have a delivery partner directly connected with borough digital leadership. In practice this has seen collaboration around data infrastructure and governance and commissioning LOTI on the [Digital Inclusion Innovation Programme](#) as part of the London Recovery Programmes Digital Access Mission. In Year 3 its continued focus on developing capabilities will involve exploring how it can boost boroughs' access to data talent, improve their procurement and strengthen their cyber security. This will be accompanied by strengthening the understanding on the shape of the post-Covid office space. A second theme is service innovation, with an emphasis on embedding data ethics into practice, exploring new service models to support prevention and designing measures to help the digitally excluded. Finally, LOTI's Smarter London effort is aimed at helping boroughs to choose the best solutions for their residents while ensuring there is some co-ordination and common approaches. This will take in principles and standards along with work on digital districts, under a thematic focus of meeting environmental targets.

Open innovation

To improve engagement with London's tech sector, City Hall developed an open call programme, first with the Mayor's Civic Innovation Challenge and then, as part of Recovery, @ChallengeLDN. Open calls allow the city to work in collaboration with the innovation community to co-design solutions to pressing challenges. Across 20 challenges delivered over the past 3 years, over £600k in funding has been awarded to date to support the prototyping and testing of impactful innovations, working with partners such as Microsoft, Social Tech Trust, Design Council, Transport for London, National Grid, and the NHS. Notable examples from the Civic Innovation Challenge include [Go Jauntly](#): an app working with TfL to promote active travel; [iReportIT](#), a national anti-terrorism app developed with the Metropolitan Police Service and Raven Science to counter extremism online; and [Connected Kerb](#), a first of a kind EV charging bay deployed in partnership with Lambeth council.

In 2019 TfL launched the [London RoadLab programme](#), the first time the organisation has used an innovation partnership and sought new technologies that could help make London's roads safer and smarter during roadwork. Working with Plexal at the Olympic Park on the challenge, four products were taken through to the contract negotiation stage, including Immense Simulations, which provides an automated method of modelling impact of roadworks, and SAM, which uses AI to monitor social media to identify incidents. Since then, TfL have launched several other transport-focused innovation challenges, including the *Bus Safety Innovation* challenge, *FreightLab* and *Bus Driver Fatigue & Wellbeing* challenge. TfL has also been trialling new co-innovation processes with Bosch and Daimler to develop innovative solutions to solve London's challenges in areas such as road safety and air quality.

International networks

We have also collaborated internationally with CDOs in Europe and North America. In 2019 London signed partnership agreements with Helsinki and Amsterdam, leading to bi-laterals on data sharing and data ethics. London also joined the [Cities Coalition for Digital Rights](#), led by Barcelona, Amsterdam and New York, to collaborate on a range of common city challenges, from digital skills to AI ethics.

In March 2021, the Mayor announced a joint initiative between London, Berlin, New York and Paris to bring forward innovation that will speed up the revival of central London and bolster the resilience of businesses impacted by COVID. Under the moniker the *Global Innovation Collaborative*, the four cities, alongside partners including Bloomberg Associates, Microsoft, UCL Bartlett and many others, will be working together over the summer to share data and ideas. An open call was launched in June 2021 for the first challenge of the collaboration – the *Creative Cities Challenge*, inviting innovators and entrepreneurs to come forward with new ideas that can help one of the sectors hardest hit – the arts and culture - to adapt and thrive post-lockdown.

London joined other global cities to look at the use of AI and Big Data in the public sector transformation and service delivery. We are part of a new EU funded project - *Digital Transformation for Regions*. Working with 14 private and public partners the project aims to develop a challenge-based innovation platform that enables AI and big data solutions for the public sector and public services. It will also facilitate knowledge sharing and capacity building amongst partners in the use of Big Data and AI. In addition, we have joined the Barcelona-led *Urban AI Observatory*, which is a joint research project on the ethics of AI and the implications for its use by cities. The project aims to help cities develop and adopt basic guidelines for the use of AI and facilitate knowledge sharing.

Conclusion

London's international standing as a smart city

Although *smart cities* are variously defined, London now ranks very highly globally according to several independent studies. For the second consecutive year, the [IESE Cities in Motion Index 2020](#) ranks London number one in its smart city index - the index uses 101 indicators across 9 dimensions to gauge economic and social development towards the creation of a 'global city.' The [Eden Strategy Institute's study](#) on the role of city governments in driving smart city development places London in the top 3 of global cities, scoring high both in terms of technologies adopted and our efforts to bring Londoners along the digitalisation journey. London was also amongst the top 15 in the [IMD's 2020 Smart City Index](#), which focuses on how technology is playing a role across five key areas: health and safety, mobility, activities, opportunities and governance.

While much of this recognition is due to the work of Transport for London (Congestion Charge/ULEZ, ticketless travel, smart infrastructure, open data and data innovation using AI); the Roadmap's pivot towards a design-led approach (design standards in digital services, open calls), the establishment of LOTI (city collaboration) and high-profile data services also factor.

Looking forward, the London Recovery Board's emphasis on the Green New Deal – the growth in green finance and economy – now presents an opportunity to anchor the city's already strong reputation in green and mobility technologies as part of our core smart technology objective.

Emerging technologies over the next decade

In 2020, the Digital Catapult was commissioned by the Mayor of London to project forward, inform and advise on technology research and innovation trends over the next 15 years. [London: A Global leader in Advanced Digital Technologies](#) covers the full spectrum of R&D, innovation, start-up and scaleup ecosystems, creativity, design and sector leadership, it explores the evolution of the advanced digital technology stack that is taking us from our current fingers on screens and browser-based applications, to an immersive and interactive physical internet with rich layers of data.

This stack will be formed in two areas:

- **Advanced digital infrastructure:** 5G & future networks, artificial intelligence, the internet of things and in the future potentially quantum computing

- **Advanced digital technology service layers:** Immersive and extended reality, robotics and autonomous machines, blockchain and distributed ledger technologies and haptics.

The combination of advanced digital technologies into this new stack, will drive a market worth hundreds of billions of pounds. Competition will be felt at local, regional, national and international level, transforming businesses, economies and society. This will span everything from localised and personalised manufacturing facilities, smart cities, next-generation services, innovative healthcare, immersive entertainment venues, new methods of content distribution and beyond.

London government therefore needs to consider both the impact and opportunity of advanced digital technologies on Londoners, as well as continuing to fix-the-plumbing and build better foundations for common approaches across the city's public services.

Next steps

We have identified six priorities for the next three years, based on the Recovery programme and Mayor's 2021 Manifesto:

Digital Access: With the speed of technological change: how do we avoid the digital divide becoming the next entrenched inequality? This is a question London and other cities across the world are seeking to answer as the experience of successive lockdowns and restrictions has placed the spotlight on those who struggled to get online. The Digital Access London Recovery mission involves linking, for the first time, major programmes on infrastructure, basic skills and innovation. Through Connected London full fibre networks will be extended across London to underserved areas, enabling gigabit connectivity to homes and businesses and preparing the way for 5G. The mission will extend the basic digital skills offer to those in need and through our innovation work with LOTI we aim to establish a 'digital access package' to enable Londoners to get the device, connection, skills or other support they need to get online.

Better City Data to support recovery: The pandemic highlighted the importance of joining-up data across the city to improve insight, decision-making and create useful new products and services. As smart technology, AI and internet of things networks advance, more data feeds will be available from sensors embedded in the public realm enabling deeper insights into footfall, air quality, mobility and energy consumption. Working with LOTI, we are starting to enable London's public sector organisations to better use their collective data legally, ethically and securely for the benefit of all Londoners. This includes a new city data platform by the end of 2022, governance model and support for data sharing across the city.

In addition to transforming how data is joined up to support the city, London should also continue to innovate with data to help plan for the future, using advanced analytical methods and pioneering new approaches that combine different techniques such as the creation of digital representations of the city in various ways (from 3D digital models of the built environment to dynamic models of the city as an urban system - and many more) that can be used as testbeds for new policies, investment and other decisions. Ultimately the ability to make a difference with data and data services will depend both on stronger public service data teams (capability) and partnership with London's boroughs and GLA Group (formal collaboration) and the private sector through London First's *London Data Commission*.

Public trust in emerging technologies: New data-enabled technologies must be grounded in public trust if they are to be sustainable. Later this year, the Mayor will launch

the *Emerging Tech Charter for London*. The Charter represents the next step in City Hall's thinking about innovation, and the new digital infrastructure enabled by 5G and artificial intelligence. It covers what's now being called 'Urban AI' and includes the trialling and deployment of data-gathering technologies and services like sensors, cameras, drones, robotics, mobility services, augmented & virtual reality, through to automated and algorithmic decision-making. The Charter provides three principles for implementing technology in London – working in the open, respecting diversity and trustworthiness with data - which are brought to life by a series of measures and living examples. These measures will be added-to over time where we see good practice. We also want to create the UK's first city registry of Data Protection Impact Assessments for emerging technologies deployed in the public realm, to ensure that there's proper public transparency and visibility for policy-makers. Following the launch of the Charter, we will design effective ways for makers, buyers and the public to engage with the principles so they become standard.

Scaling Green Tech: Whether energy saving systems and building retrofit, environment sensors, smart mobility and delivery, or citizen-facing apps and services, the Green New Deal and Manifesto commitments on the environment and transport are heavily reliant on data and smart technology. For the city to scale smart solutions requires far greater coordination with London's boroughs and public bodies than at present, to: understand needs, aggregate demand and identify new investment opportunities in a demand pipeline. Based on our experience of LOTI and the Connected London team, ambitions around green finance and developing new financial models for investment across London should not under-estimate this coordination challenge and the Smart London team is currently scoping a service for better design, commissioning, governance of new financial instruments to support objectives on growing the green economy and mobility. Whether the service sits in the GLA or with another body, e.g. LOTI, a central capability here would provide boroughs with visibility on new opportunities and the capacity to deliver.

Grand Open Calls: Expertise in open calls enables challenges to be set by the city to the tech sector and anchor institutions, allowing for design-thinking, fast prototyping and innovation in delivery beyond the current capabilities of the public sector. So far open call approaches developed by the GLA focus on start-ups and scale-ups, with larger tech firms adding support or sponsoring programmes. The next step for open innovation should be to consider *Grand Open Calls* - high value and status competitions to solve a large and clearly defined city objective. For illustration: the city of Helsinki set a [global one-million-euro challenge competition](#) to answer the question: *How can we decarbonise the heating of Helsinki, using as little biomass as possible?*

Transport for London's expertise in this area over the past few years is considered leading-edge in the public sector with the way they have shaped key city problem statements and worked with market innovators from start-ups, academia, corporates, accelerators and venture capitalists to solve challenges, from proof of concepts, trials and

scaling solutions. Mobility also is an important priority for the GLA Group and boroughs as part of the Green New Deal, so with Transport for London the next grand open call should focus on mobility, looking at one of the key themes from the Mayor’s Transport Strategy.

Common digital platforms to serve Londoners better: Our future relationship with London’s boroughs will increasingly be based around data, digital services and technology as well as existing structures and powers. Across core services and Recovery missions one of the critical blockers to effective delivery is in-house capacity within London’s public sector to scope and develop modern digital, data and technology solutions which can be made (or commissioned), shared and re-used at lower cost to the taxpayer than at present. Investment is currently so low in in-house teams across the city that relatively small investments have an oversized high impact - as demonstrated by achievements of LOTI with a small group of dedicated staff.

City Hall is uniquely placed to create valuable tools and resources for London’s public services, for example: Talk London for public engagement; a city data platform; or specific data services like the Planning Datahub or High Streets Data Service. The foundations for collaboration built by LOTI present an opportunity to deliver common digital services that directly benefit Londoners and easily answer questions for Londoners wherever they are in the city - “*Where can I charge my electric vehicle?*” “*Where can I report fly-tipping?*” - or promote behaviour change (recycling, energy saving, healthy living).

Investment in core capability here at City Hall and councils is critical so London’s city leadership needs to consider – *now as a civic question* - the appropriate ‘technology mix’ supporting city services. Today this is overwhelmingly supplied by big technology firms at significant cost, fragmentation and legacy. In line with the ambitions of the Local Digital Declaration, we should aim to break this unhealthy dependence on inflexible and expensive technology and consultants that absorb time and money on short-term projects, but do not contribute to solving London’s bigger strategic challenges in a sustainable way. To do this, we need to improve digital leadership across the board, insist on modular building blocks for the technology we rely on and open standards to give a common structure to the data we create so we can be more flexible and responsive to Londoners.

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