

# MAYOR OF LONDON



## Smarter London Together

The Mayor's roadmap to transform London into the smartest city in the world

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## Mayor's foreword

Our 'Smarter London Together' roadmap sets out how we plan to transform London into the smartest city in the world. It is a response to my challenge to find a bolder approach to the way data innovation and digital technology serve those who live, work and visit our great city.

Many of London's advances in the application of data and smart technologies are globally recognised. Transport for London popularised contactless payments in a model now followed across the world. The Met Police are leading the way with body-worn cameras to gather evidence and ensure accountability. And we are using data in new ways to improve air quality and tackle fuel poverty.

We have taken great steps already, but I want us to do even more to utilise data and smart technology to meet the needs of our citizens. To do this, we need to be bold and to think big. This involves being willing to try new ways of doing things. I see London's future as a global 'test-bed city' for civic innovation, where the best ideas are developed, amplified and scaled.

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. I have appointed London's first ever Chief Digital Officer, together with a new Smart London Board, to lead on this work.

As Mayor, I want to ensure London is ahead of the curve in becoming the smartest city in the world. As part of this, we have drawn up five missions, which you can help us to achieve.

Each mission is key to laying the foundations for future innovation. And, taken together, they form a roadmap that will help ensure data and digital technologies are used to make London a fairer, more prosperous and more equal place for all Londoners.



**Sadiq Khan**  
Mayor of London





### **Mission 1: More user-designed services**

- Leadership in design and common standards to put users at the heart of what we do
- Develop new approaches to digital inclusion to support Londoners' access to public services
- Launch the Civic Innovation Challenge to spur innovation from the tech sector
- Explore new civic platforms to engage citizens and communities better
- Promote more diversity in tech to address inequality

### **Mission 2: Strike a new deal for city data**

- Launch the London Office for Data Analytics (LODA) programme to increase data sharing and collaboration for the benefit of Londoners
- Develop a city-wide cyber security strategy to coordinate responses to cyber-threats to businesses, public services and citizens
- Strengthen data rights and accountability to build trust in how public data is used
- Support an open ecosystem to increase transparency and innovation

### **Mission 3: World-class connectivity and smarter streets**

- Launch a new Connected London programme to coordinate connectivity and 5G projects
- Consider planning powers, like requiring full fibre to the home for all new developments, to enhance connectivity in the future
- Enhance public wifi in streets and public buildings to assist those who live, work and visit London
- Support a new generation of smart infrastructure through major combined procurements
- Promote common standards with smart tech to maximise benefits

### **Mission 4: Enhance digital leadership and skills**

- Enhance digital and data leadership to make public services more open to innovation
- Develop workforce digital capability through the Mayor's Skills for Londoners Strategy
- Support computing skills and the digital talent pipeline from early years onwards
- Recognise the role of cultural institutions engaging citizens in the digital world

### **Mission 5: Improve city-wide collaboration**

- Establish a London Office of Technology & Innovation (LOTI) to support common capabilities and standards for future innovation
- Promote MedTech innovation in the NHS and social care to improve treatment
- Explore new partnerships with the tech sector and business models
- Support better GLA Group digital delivery to improve effectiveness
- Collaborate with other cities in the UK and globally to adopt and share what works

## Introduction by Theo Blackwell, Chief Digital Officer

A smart city is a collaborative, connected and responsive city. It integrates digital technologies and uses city-wide data to respond to our citizens' needs.

'Smarter London Together' sets out Mayor Sadiq Khan's ambition to make London the smartest city in the world. It addresses the Mayor's commitment to better digital services, open data, connectivity, digital inclusion, cyber-security, innovation, and City Hall's plan for the growth of our city to more than 11 million residents by 2050.

Our ambition is to make London a better place to live, work, and visit for everyone. London is a city of nine million inhabitants, 33 local authorities, over 40 National Health Service Trusts and many more public agencies. It is also home to globally renowned universities, cultural institutions and finance and technology sectors.

We want the capital to take the lead in how data innovation serves its citizens. So we asked Londoners how we can develop a more collaborative, responsive and trustworthy approach to using data and digital technology.

We conducted a Listening Tour and attended more than 80 public meetings and events to gather views from the tech sector, universities, councils, London's digital civil society, experts and community groups. Through our partnership with Bloomberg Associates we gained an invaluable international perspective on the next generation of smart city thinking. We also hosted a public campaign, 'Your Commute', to gather citizens' views on the use of their data in the city. We finished with an Unconference at City Hall, to discuss how to make London a smarter city with experts in the field.

Our learning from the Listening Tour helped us to develop our approach for this new roadmap. The result is not a rigid digital masterplan, but a flexible approach that sets out our longer term thinking about the interaction between city government, citizens, data and digital technology.





It focuses on getting the ‘foundations for the future’ right through five missions. These incorporate the work we need around user-centred design, data-sharing, infrastructure, skills and collaboration. It is a new approach that calls on digital leaders in London boroughs, the GLA Group, government and the NHS to put innovations in data and digital technology to the test for the benefit of all Londoners.

We will succeed only through collaboration and partnership. I very much look forward to working with everyone to realise the Mayor’s vision of making London the smartest city in the world.

## The roadmap and Mayoral strategies

The Smarter London Together roadmap is a non-statutory document adopted by the Mayor of London. The roadmap builds on the last [Smart London Plan](#) in 2013 ([updated in 2016](#)) and is a new approach based on collaborative missions. It calls for the city's 33 local authorities and public services to work and collaborate better with data and digital technologies, and helps to realise the seven statutory Mayoral strategies in:

- [transport](#),
- [the environment](#),
- [health inequalities](#) (draft),
- [housing](#),
- [culture](#) (draft),
- [economic development](#) (draft), and
- [the London Plan](#) (draft).

## Smart London - our strengths

London is the tech capital of Europe – by size, level of investment and the presence of more than a third of Europe's billion-dollar 'unicorn' companies. The capital is home to 46,000 tech companies, supporting 240,000 jobs in an ecosystem worth an estimated \$44bn. This has grown at pace – between 2006 and 2016 London's digital sector recorded 77 per cent employment growth and a 90 per cent rise in the number of digital enterprises. And business is booming too – with tech turnover reaching £56bn in 2016, measuring a 106 per cent increase over five years.

London is a hub for CleanTech, GovTech, Digital Health, EdTech, innovations in mobility, as well as the global hub for FinTech, LegalTech and professional services needed to support innovation. The city is also the [European capital of AI](#), with over 750 suppliers in the city – double the number of Paris and Berlin combined – primed to innovate with the city's data. It leads the world in research and development (R&D), having produced companies such as [Deepmind](#) – a world leader in AI, and [Improbable](#) – a world leader in virtual reality technology which raised the largest venture capital investment in UK tech history with a £502m investment led by Softbank.

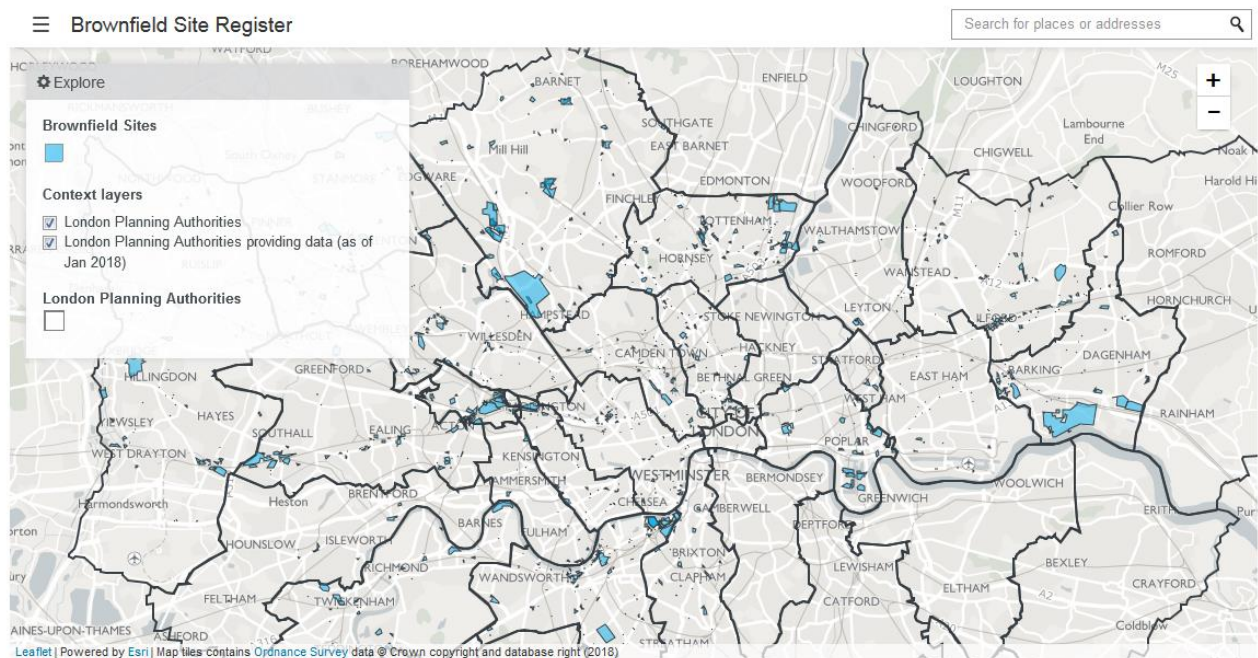
London is also home to many cultural, academic and civil society institutions that are thought-leaders in this field. Examples include the [Open Data Institute](#), [Nesta](#), the [Catapults](#) and London's internationally recognised universities and innovation centres.

Promoters such as [London & Partners](#) – the Mayor’s official promotion agency - [Tech London Advocates](#), [TechUK](#) and [Tech Nation](#) regularly gather London’s founders and funders to network the tech sector in the capital. The capital is also home to Founders for the Future and Europe’s largest tech-for-good community, using digital technologies and data to tackle social challenges.

Data underpins advances in new technologies in AI, cognitive computing and sensors. London is a global leader in the use of data for public service delivery. The potential to collaborate further presents an exciting opportunity.

### City data

The [London Datastore](#) is an internationally recognised open data resource with over 700 datasets that help to address urban challenges and improve public services. City Hall uses data itself to inform policy, services and campaigns. We use housing data to identify sites for small developers, model new school locations and identify brownfield sites. We use demography data to predict population growth in opportunity areas and to model demand for school places. We use air quality data to inform public health campaigns and notify children and people at most risk. Providing open data is only the beginning of the journey. The next step is combining that data in meaningful ways to better understand the way the



 **London\_Brownfield\_Register.csv** (1.11 MB)

[Preview](#) [Download](#)

 **London Brownfield Register ESRI shapefile.zip** (817.83 kB)

[Preview](#) [Download](#)

**The London Datastore stores information to help make decisions in many areas, including up-to-date brownfield sites for housing and planning**

city works. This will help focus public services and interventions on the people that need them most, such as those most affected by air pollution, fuel poverty or overheating. Many public services and regulated utilities are developing their own track record in the use of data analytics to aid service design and infrastructure - either by themselves or in partnership with the technology sector.

### **Data, tech and the environment**

London is a leader in new 'CleanTech' products, such as sensors that create data in new ways to combat the causes and effects of pollution and climate change. For example, London already has access to the largest network of air quality monitors of any city, with world-class modelling and emissions forecasting. The GLA now co-leads the C40 Air Quality Network, which is investing [\\$1m in a challenge](#) to create lower-cost air quality sensing technology to directly measure thousands more locations in London to complement London's 100 air quality monitoring stations.

Through other initiatives, like [FlexLondon](#) and supporting the rollout of smart meters, the [Mayor's Energy for Londoners programme](#) is championing the commercialisation of new digital technologies and the safe and secure management of the city's energy data.

We are also managing and combining environment data to accelerate new solutions. For example, the Mayor is developing a 'focus map' of several environmental and social datasets to help decision-makers identify where and how to prioritise different kinds of green infrastructure investment across the city.

### **Data, tech and transport**

Transport for London's (TfL) track record is a particular strength for London; technology and data underpin everything that TfL does. From controlling the movement of trains to



**Half of all Tube and rail pay as you go journeys are now regularly made using contactless payment cards or mobile devices.**

designing future streets using virtual reality, technology drives all aspects of its business.

Vast amounts of data are generated on the Underground and the city's streets. This data is used to improve services. TfL has an [open data portal](#) and a [Unified API](#) for developers to create services and products. These generate an estimated annual economic benefit and savings of up to £130m a year. Since 2014, TfL has also played a crucial role in [contactless payment](#).

### **Data, tech and safety**

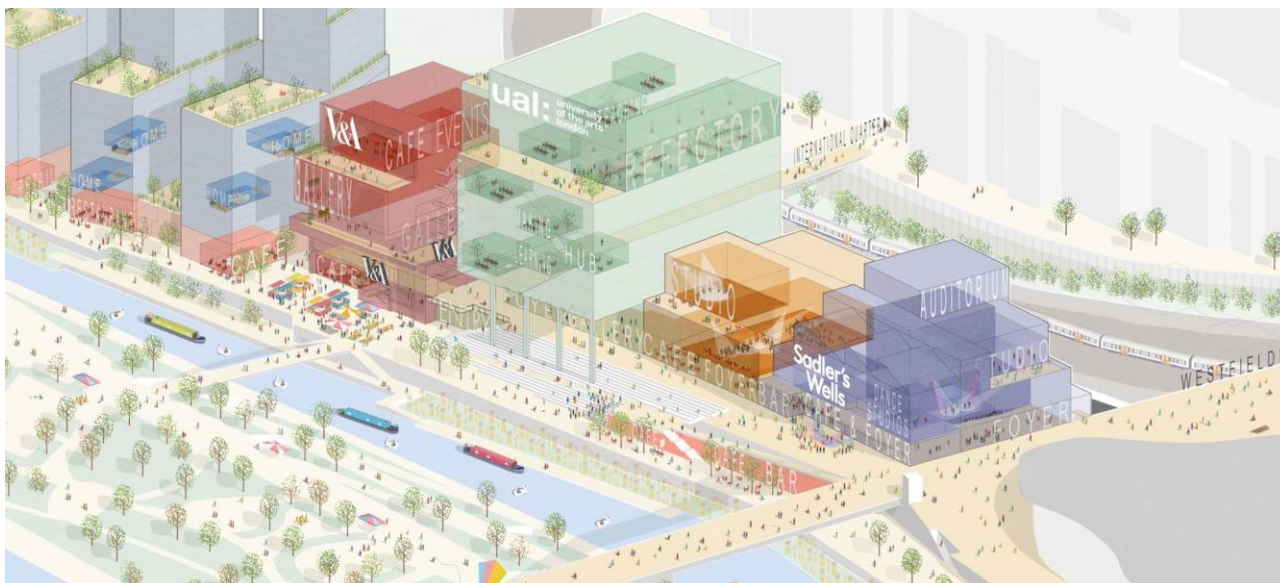
The Met Police are using data and digital technology to provide everyone with the best possible service. They are tackling knife crime by analysing time and location of crimes and adjusting patrol patterns to prevent and discourage further attacks. Public [interactive dashboards](#) are now well established. The Met Police has also completed the largest deployment in the world of 22,000 body-worn cameras to improve evidence-gathering and accountability. They have deployed mobile technology to front line officers and launched a sector-leading digital channel for the public to report non-emergency crime and access information and guidance. Responsible and accessible technology is now essential for policing in London.

### **Data and 'test-beds'**

**Queen Elizabeth Olympic Park** is London's newest, smartest and most sustainable area. The Park's development is managed by the London Legacy Development Corporation (LLDC). Its ambition is to use the Park as a test-bed for new international standards in smart data, sustainability and community-building, sharing its successes across the city and beyond.

A [data platform](#) is being built to publish data on air quality of green spaces and energy from buildings in the Park. More than £100m has been invested in one of the [largest district energy systems in the UK](#). This includes hard, soft and data infrastructure through smart meters that give building residents and tenants control and information on their energy use and spending.

A [consortium led by TRL won £13.4m in Connected and Autonomous Vehicle \(CAV\) funding](#) for a Smart Mobility Living Lab to test the technology and 5G connectivity infrastructure in the Park and Greenwich over the years ahead. This sits at the heart of a growing cluster of clean technology and mobility innovators centred around the Park. These and other projects, from [planning engagement tools](#) to [demonstrating drone technologies](#), support new resource-efficient, low-carbon, connected and future-ready places.



**The Park** invested in digital engagement tools to get Londoners' say on its design of the £1.1bn development of **East Bank** in the Queen Elizabeth Olympic Park includes **UCL**, the **BBC**, the **V&A**, and **Sadler's Wells**.

The LLDC works closely with universities, schools, SMEs and community groups to help realise and test a wide range of outcome-based innovations.

**Digital Greenwich** is developing new standards for smart infrastructure and data with international partners. [The Sharing Cities programme](#) is trialling technology in Greenwich such as energy management systems in social housing blocks, energy-saving lighting and controls, and sensors and digital connectivity in lampposts. Autonomous delivery robots [have been tested](#) and the technology is now being [scaled in other cities abroad](#). [The borough is also trialling](#) a range of air quality sensor and data standards to measure air pollution and gain further insights into the levels and causes of pollution. Together with other initiatives, these projects will help develop business models for the scaling of smart technologies that are proven to work.

### **Pan-London innovation from town halls**

Over the last decade, day-to-day interactions between Londoners and the public sector have gone digital from making online payments to reporting litter and noise to their council. [London Ventures](#) - a programme led by [London Councils](#) and delivered in partnership with EY - is scaling digital solutions to meet public sector challenges in using data to identify vulnerability in [children's services](#), [counter-fraud](#), [automation](#) and [crowdfunding](#). London's councils continue to innovate, building partnerships with the private sector and civil society.

## The challenge - making London smarter

How can we truly mobilise all our strengths to make London the smartest city in the world? London's strong record as a smart city masks the challenges that we face when it comes to growing the best ideas and being greater than the sum of our parts.

London's scale - 33 local authorities, nearly 60 NHS Trusts, large regeneration opportunity areas and major public agencies like TfL and the Met serving a population of nine million citizens - presents a tremendous opportunity to 'test-bed' ideas. London now needs to improve its ability to adapt, scale and amplify the best innovation created by the public or tech sectors across the city.



The Chief Digital Officer's Listening Tour ended at the Mayor's first 'unconference' - [Smart London Camp](#), in April 2018

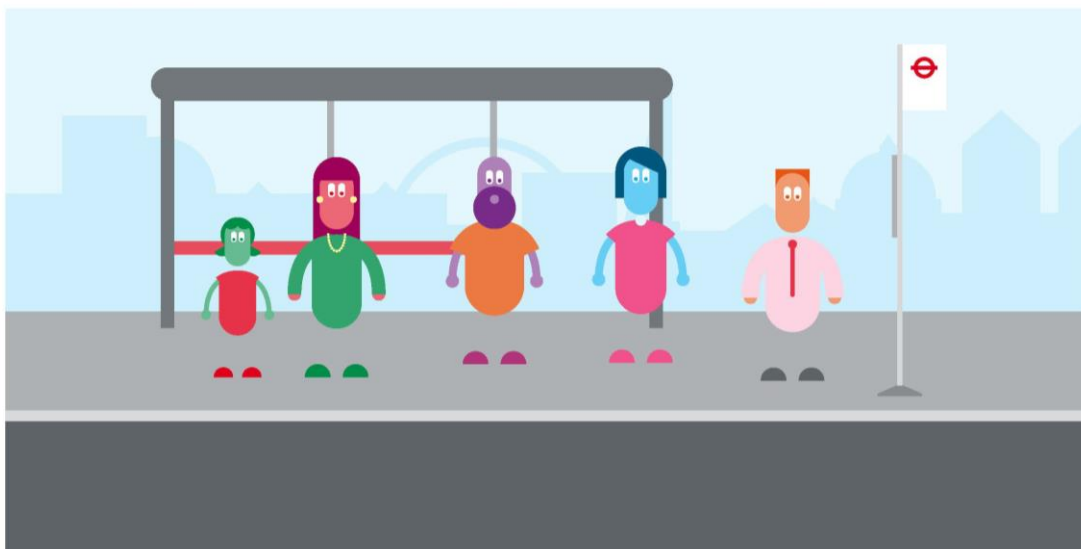
Our Listening Tour told us that we need to:

- **put people first and respect diversity when we design digital services or adopt technology**
- **lead in data innovation but build trust and transparency in how public data is used**
- **be better connected and open to new technologies in the built environment**
- **strengthen digital leadership in public services and enhance the digital skills and understanding of citizens**
- **make city-wide collaboration and tech partnerships better to design and share what works for citizens across public and community services**

We have set out how to achieve the Mayor's vision in five missions, culminating in how we propose to make collaboration work more effectively.



## Mission 1: More user-designed services



Too often, smart city thinking has been driven by a rush towards integrating new digital technologies, without understanding citizens' needs first. London's creative strengths in design can play a major role.

We want to respect the diversity of our great city when we develop new digital services and will work in collaboration with partners to build this into a city-wide approach.

The Mayor is starting with the following initiatives:

- **leadership in design and common standards to put users at the heart of what we do**
- **develop new approaches to digital inclusion to support Londoners' access to public services**
- **launch the Civic Innovation Challenge to spur innovation from the tech sector**
- **explore new civic platforms to engage citizens and communities better**
- **promote more diversity in tech to address inequality**

## Leadership in design and common standards

The Mayor will champion the adoption of **common standards and design principles** in public services to put users at the heart of what we do.

Design is an important and sometimes overlooked part of digital services and technology, but it is vital in making sure the right problems get solved, or are free from bias. This approach means understanding how your users think, how they behave and ultimately what they need, then incorporating that understanding into every aspect of design, backed up with evidential data to enable the right problems to be solved.

Common standards, including the forthcoming Government Service Standard, will help to make this possible. Just as the GLA worked with peers to develop and promote the [Local Government Digital Service Standard](#) in 2016, we believe common standards can help London to scale services across organisational boundaries and increase the pace of delivery by sharing data, processes, components, services and platforms to serve citizens better - for example, better online services will improve access to travel.

## Develop new approaches to digital inclusion

The Mayor will develop new approaches to **digital inclusion** to support citizens who need to go online to access public services.

Lack of access to a computer, good digital connectivity and basic digital skills hold some citizens back from finding work and from accessing public services and financial support. The GLA is evaluating the success of the [MiWifi programme in Lewisham](#) for the over 50s and unemployed where from June 2017 to January 2018 Lewisham residents were able to borrow a tablet for up to four weeks and offered six hours of digital skills training. The next two years will see the implementation of online-only Universal Credit (2018) and smart energy meters (by 2020), both of which will require specific approaches and potential support adopting in London if further exclusion is to be avoided.

While poor digital skills can limit the ability of a citizen to get the most from online services, a lack of digital understanding can expose people to misinformation, 'fake news' or online fraud. This is [defined by Doteveryone](#) as "the ability both to use technology and to comprehend, in real terms, the impact that it has on our lives".

An emphasis on [service design](#) presents an opportunity to look at inclusion afresh, including an understanding of users from every background. For example, we want to ensure that there are no barriers that might prevent anyone who is hard of hearing or has visual, cognitive or motor impairments from accessing a digital service. We will work with city services to encompass this new thinking.

## Civic Innovation Challenge

The Mayor will launch his **Civic Innovation Challenge**. This is a mission-led business support programme which matches startups with leading corporates and public organisations to solve some of London's most pressing problems. In 2018/19, the Challenge is searching for innovative solutions to reduce inequality, prevent climate change and support London's ageing population.

Another way of meeting citizens' needs is to offer innovation prizes to the tech community to help solve public service or urban problems identified by the city or directly by citizens. In other cities these initiatives have successfully co-designed and tested ideas that can be scaled up to meet the needs of the whole city. Examples from the UK and around the world include [Amsterdam's Startup in Residence](#), [New York's NYCx Challenges](#) and [CivTech Scotland](#).

The [Mayor's Civic Innovation Challenge](#) is part-funded through the [London Economic Action Partnership](#) and TfL, and will learn from work already underway with London Councils' established [London Ventures](#) programme. It will be delivered by [Bethnal Green Ventures](#), a tech accelerator with a focus on supporting firms using technology for social impact.

Startups taking part in the challenge will develop and test their solutions with corporates and public organisations, while receiving business support and mentoring from Bethnal Green Ventures. The Challenge provides startups with the valuable opportunity for customer development and validation directly with the end market, including:

- direct access and support from potential customers and partners
- validate and test solutions directly with market leaders
- business support and access to £15,000 for testing

In the future, the public will also be directly involved in deciding the focus of and setting future innovation challenges, which could be in areas such as housing or education.

## Renew civic platforms

**Talk London** - The Mayor will mount digital campaigns to increase levels of participation from more diverse audiences; invest in technical development to optimise user journeys and maximise community growth; and target advertising to build brand awareness, confidence and participation in the work of [Talk London](#) in our target audiences.

**New crowdfunding platform for London** - The Mayor will support [Crowdfund London](#) with £4m to support projects and scale up the platform by 2022. This includes research and development of complementary initiatives to support community-led participation and regeneration.

**New platforms** - The Mayor will explore the changing ways in which Londoners are using civic platforms, rapidly prototyping and testing different models for delivering this innovation in partnership with London's tech community.

Civic and peer-to-peer platforms offer better ways for citizens and communities to interact and co-create - capitalising on trends and changes in technology that have unlocked new opportunities for citizens to play a more active role in the way London is run. Through our open government and city-wide collaboration work proposed below there will be an opportunity to examine how new digital platforms can be adopted in London to increase transparency or boost the sharing economy. For the present the GLA will look at developing two of its platforms - Talk London and Crowdfund London.



The mayor pledged £11,000 on top of the £27,000 raised through the Crowdfund London platform to support the 'Colour in Romford' campaign. Local people proposed ideas for murals, which were created by artists to boost civic pride

The development of compelling, accessible and highly shareable online content has the capacity for huge audience reach, and even media coverage. [‘Your Commute’](#), developed as part of the Listening Tour, increased participation in Talk London - our 42,000-strong online community where Londoners can tell us their opinions on London's big issues through surveys and discussion forums. Initiatives like this to increase the diversity of Talk London will be crucial when we discuss citizen views on the use of their data in public services.

Crowdfund London is our digital platform for citizens to help shape their neighbourhoods. It allows anyone to propose an idea, develop it and coordinate local support, resources and funding through a public campaign. City Hall pledges funds to live campaigns, helping to catalyse success, and support local groups to make ideas a reality. The initiative has been recognised internationally as an exemplar in Government innovation and is one of the most advanced public sector-led programmes to blend digital alternative financing models with public funds to deliver social impact and promote active citizenship.

### **Promote more diversity in tech**

**Digital Talent Programme** - The Mayor is delivering a £7m programme to inspire and train more young women and BAME Londoners to enter digital, technology and creative job roles. This year will see three more initiatives to build on the launch.

**Tech Talent Charter** - The Mayor will sign the Tech Talent Charter and promote it across London public services. We will work to encourage the tech community to adopt the charter in greater numbers.

The tech sector has been criticised for its lack of diversity: the [2018 Tech Nation report](#) found that only 19 per cent of the digital tech workforce is female, compared to 49 per cent across all UK jobs. This has to change - gender equality is the cornerstone of the Mayor's [#BehindEveryGreatCity campaign](#). The city has a responsibility to lead change in 2018, a hundred years after some women first secured the right to vote.

The [Tech Talent Charter](#) is a commitment by organisations to a set of undertakings that aim to deliver greater gender diversity in the tech workforce of the UK, one that better reflects the makeup of the population. This includes organisations across all sectors who have employees in tech, public and private sectors. Signatories of the charter make a number of pledges in relation to their approach to recruitment and retention. As a first step, the GLA Group will commit to the pledges in the charter to demonstrate the great work being done on diversity throughout many organisations.



To support diversity at entry-level jobs for young people, the [Mayor's Digital Talent Programme](#) increases training in digital technology with new industry-approved courses for 16-24 year olds. It focuses on attracting more young women and Londoners from a range of backgrounds to work in the sector. It supports collaboration between training providers, schools, further education colleges, universities and employers to ensure that young people have the skills that employers are looking for.

## Mission 2: Strike a New Deal for City Data



How we treat data is an infrastructure issue for the city, as important as our road, railway and energy networks. We need to develop better policies and build these into public procurement and the design of new services. This is also important for our city's growth. The data sector is estimated to create around £322bn of economic value to the UK by 2020. London already has a world class ecosystem in research, skills and businesses. We want to continue to foster the conditions for this sector to grow and benefit all Londoners.

The next stage is to work in collaboration with partners to build this into a city-wide approach.

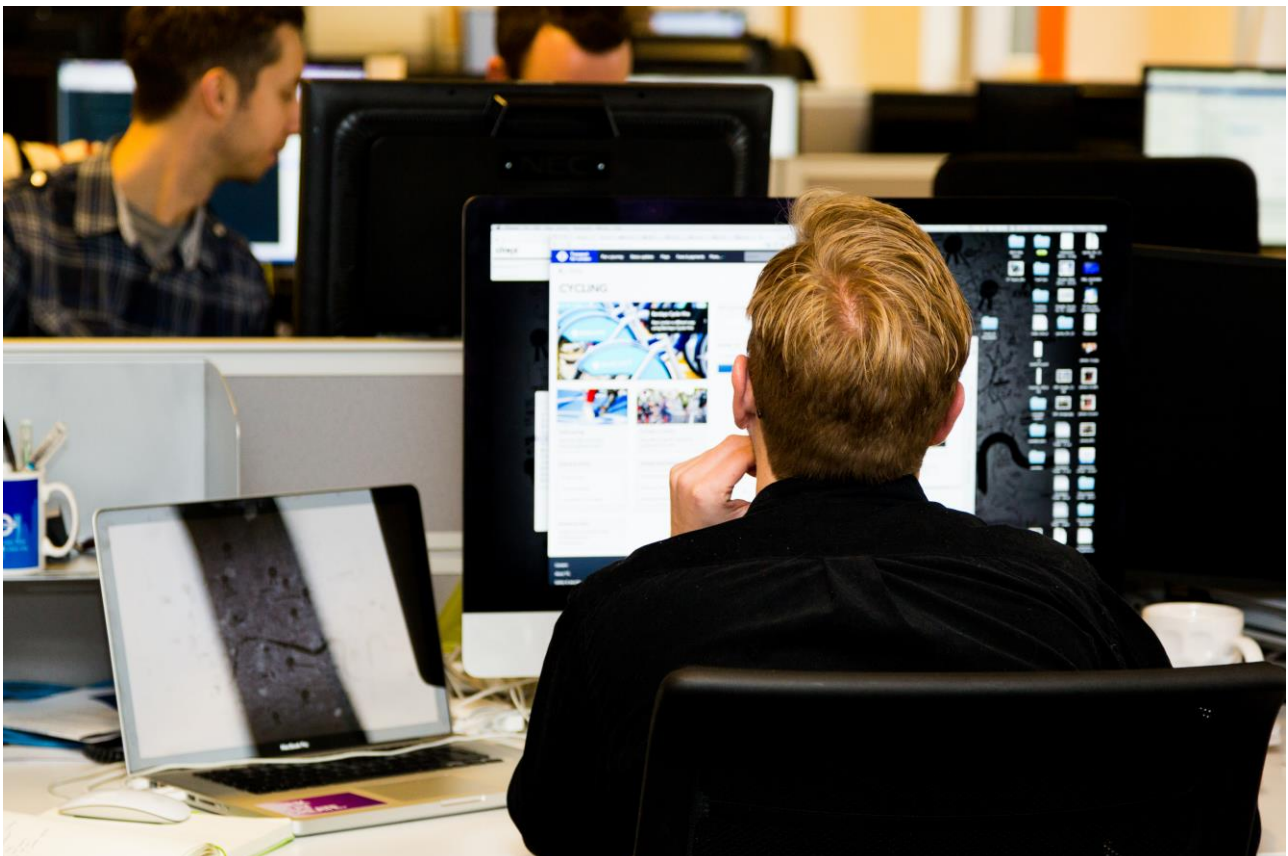
To enable this next stage, the Mayor will:

- **launch the London Office for Data Analytics (LODA) and programme to increase data-sharing and collaboration for the benefit of Londoners**
- **develop a city-wide cyber security strategy to coordinate responses to cyber-threats to businesses, public services and citizens**
- **strengthen data rights and accountability to build trust in how public data is used**
- **support an open ecosystem to increase transparency and innovation**

## Launch the London Office for Data Analytics and programme

The Mayor will establish a **London Office for Data Analytics (LODA)** programme to introduce new data-sharing arrangements at City Hall and across public services. It will invite partnerships with the public and tech sector for new *City Data Sprints* to develop use cases. To aid standard identification, we will define lists of *critical enabling data* of the names and footprints of London's buildings, objects like lampposts and spaces like parks. We will make this data - whether it is held by the public, private or third sectors - as open as possible to save time and confusion agreeing the names and locations of buildings and places. We will continue technical development of borough data officers through a 'City Data Academy' run by the GLA.

The first step in our 'New Deal' will be to address data-sharing and capabilities in the city. The smart city of the future involves real-time metrics, data analytics and services focused on the needs of the citizen. The new LODA will be a hub developing and supporting data collaborations between public services in London. It will develop, commission and implement projects that address public services and urban challenges which are best tackled together. Developed following [a pilot with Nesta](#) and several London boroughs in 2016-17, LODA has now secured £365,000 of investment from City Hall, the [London Fire Brigade](#), the [Centre for Urban Science and Progress London](#), and [Sharing Cities](#), our Horizon 2020 EU-funded project.





LODA will operate across councils, the NHS and other public services. It will build on existing partnerships with universities and the tech sector, such as London Ventures and the London Counter-Fraud Hub. Its [partnership with the Alan Turing Institute](#) will help us better understand air pollution in the capital by collating existing and new data sources and enhancing how they are analysed, using a technique called machine learning. This will complement the existing modelling already undertaken in London, which adopts a bottom-up approach (in the case of the London Atmospheric Emissions Inventory) and relies on more traditional data sources. LODA's initiatives will add to the existing ecosystem of ways for London's boroughs and public services to innovate in data sharing and standards.

### **Develop a city-wide cyber security strategy**

**Cyber-security strategy** - Together with the [Mayor's Office for Policing and Crime \(MOPAC\)](#) and the [London Resilience Group](#), the Mayor will develop a new cyber security strategy to coordinate innovation and resilience across London's business community and public services in order to better protect our citizens.

The more widespread use of networked devices, such as sensors, and the move to the cloud represents a fundamental change in infrastructure, meaning the city and its public services need to be more responsive and collaborative in order to counter new cyber-threats. To take advantage of London's strengths as a cyber security tech sector, the Mayor is committed to developing a new approach for the city.

MOPAC has invested £300,000 in 2017 in the [London Digital Security Centre](#). This is a joint venture between the Mayor of London, the Metropolitan Police Service and the City of London Police, to help provide advice and protection against cyber-crime to small and medium sized enterprises in London. Local councils and other public bodies are supported by the [Information Security for London network](#), set up in 2003 and funded by London Councils.

The next step will be to support collaboration across London's public services, working with [London Councils](#) and the [London Health and Care Strategic Partnership Board](#). The world-first £13.5m [London Cyber Innovation Centre](#), located at [Plexal](#) in Queen Elizabeth Olympic Park, received part of its funding from DCMS in April 2018. It will help secure the UK's position as a global leader in the growing cyber security sector. The centre will offer a tailored programme of support to at least 72 companies over three years.

## Strengthen data rights, accountability and trust

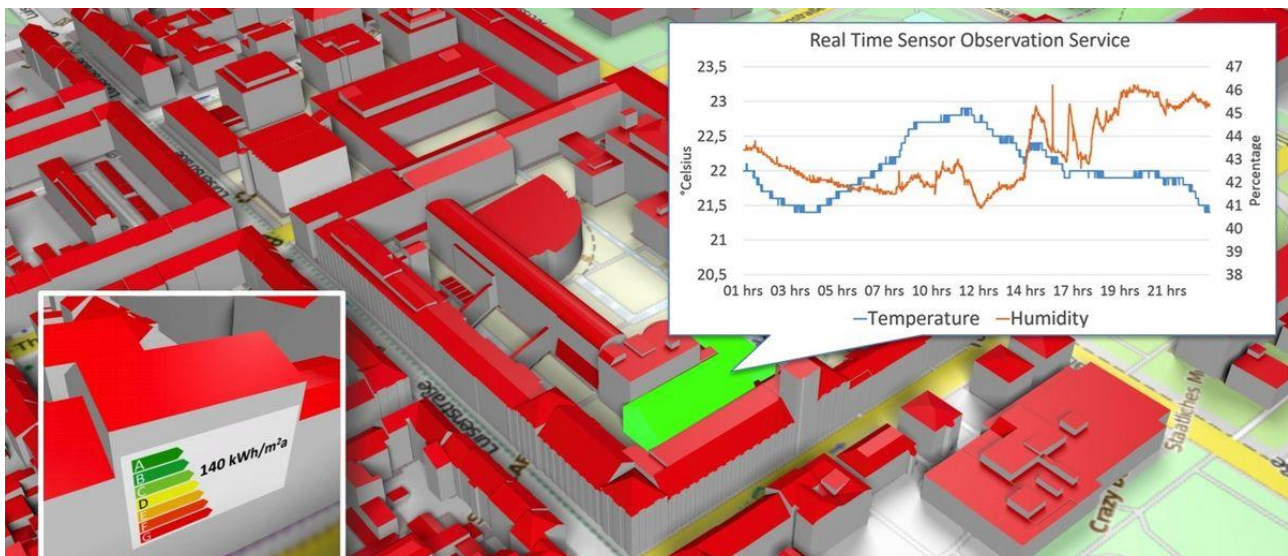
**Digital understanding** - The Mayor will work with civil society, boroughs, government and other organisations to advance the public understanding of civic benefit of data.

**Data ethics** - The Smart London Board will work with the new [UK Centre for Data Ethics and Innovation](#) and will appoint a new member with specific responsibility for data and privacy.

**Algorithmic transparency** - The Smart London Board will discuss the development of a [code of standards on algorithmic decision-making](#).

**Data trusts** - The Smart London Board will study how the Mayor can set a challenge for piloting a data trust for AI.

Citizens need to trust how digital services are designed and how they operate. With new GDPR data laws, data holders must protect ‘privacy by design’, giving individuals new rights to give them greater control over their personal data, such as the right to request data is deleted and for inaccurate data to be rectified. In practice, any Londoner whose data has been shared must be able to know the legitimate reasons why and the benefits to them as individuals, their communities and their city.



In partnership with Technical University Munich, a Smart District Data Infrastructure (SDDI) has been developed as a best practice framework for Queen Elizabeth Olympic Park. With a 3D virtual CityGML model being the primary visual interface for the SDDI it can be connected to a wide range of data feeds to simulate key use cases.

During the Listening Tour we suggested that some citizens are more open to making ‘worthy trade-offs’ - in other words to share their data if it benefits themselves and others in society. Looking to the future, as a leader in the civic application of data science and the development of AI, we will need to develop clear guidelines on the ethics of data use, the appropriate use of sensors in public spaces, how to address the bias in algorithms and transparency.

New mechanisms for earning the trust of citizens in how data is exchanged should be considered. The [UK Industrial Strategy](#) proposes the design of ‘data trusts’ to help the sharing of data between organisations holding data and organisations looking to use data to develop AI. The government will soon consult with industry to ensure data exchange is secure and benefits public services.

### Support an open ecosystem

**Publish an open data charter** - The Mayor will work with stakeholders across London’s public sector to agree a set of standards and principles to be adopted for open data and publish these under a new open data charter for London.

**Open Government partnership** - The Mayor will apply to the 2019 [Open Government Partnership Local programme](#) and join [the Community of Practice on Transparency and Local Open Government](#) as a founding member when it launches in 2018.

The Mayor is committed to opening up the capital’s data to help drive better decision-making throughout London. For this we need to support our work with an ecosystem that works more effectively with the open data and government transparency community. The current open data landscape in London is complicated by multiple public bodies publishing their data across different websites. This means there is little consistency in their approach. The GLA is keen to engage with partners and stakeholders across London to enable the further release and usability of open data.

All of London’s councils have a transparency section on their website where they publish their local government transparency code data. However, only seven have a fully-featured open data portal (a platform that includes metadata, a search feature as well as the ability to download data) with each differing significantly in their structure and content.

## Mission 3: World-class connectivity and smarter streets



The number of connected devices, whether a mobile phone on a person, a smart meter in the home, an air quality sensor on the street or an energy meter in the workplace, is growing at a huge rate. [Ofcom estimates they will increase 12-fold](#) in the UK by 2026. Mobile data use alone is growing at more than 30 per cent a year. The current provision of connectivity across London needs to improve significantly so that the city can continue to grow and prosper as a digital economy, and smart solutions can be tested and adopted.

Our new approach to connectivity will work across London to coordinate investment, mobilise public and private land and assets, lower costs for providers and consumers and increase choice. We want to see more of this and work in collaboration with partners - such as public bodies, private landowners and providers - to build this city-wide.

To enable this next stage, the Mayor will:

- **launch a new Connected London programme to coordinate connectivity and 5G projects**
- **consider planning powers, like requiring full fibre to the home for all new developments, to enhance connectivity in the future**
- **enhance public wifi in streets and public buildings to assist those who live, work and visit London**
- **support a new generation of smart infrastructure through major combined procurements**
- **promote common standards with smart tech to maximise benefit**

## Launch the Connected London programme

**Connected London** - The Mayor will launch a [Connected London](#) programme that will tackle 'notspots' and mobilise public-sector property across London to reduce the costs of full fibre deployment.

**Creative Enterprise Zones** - We will work with teams across the GLA and London's boroughs to ensure access to exemplary affordable fixed and mobile digital connectivity in the new [Creative Enterprise Zones](#), which enable artists and creative businesses to locate together in affordable studios and workspaces.

**5G** - We will ensure the capital's readiness for 5G by creating a pan-London bid for the Urban Connected Communities Fund. We will develop integrated strategies and governance frameworks, including template standardised wayleaves and agreements, to deliver a new 5G standard for London.

The new [Connected London](#) programme sets out the Mayor's ambition to achieve ubiquitous gigabit-capable digital connectivity and to prepare London for the roll out of 5G.



**TfL will secure significant investment in fibre capability in the London Underground**

An important way of achieving a more connected city is through the mobilisation of public land, buildings and smaller assets. In the future, sharing data between infrastructure owners - TfL, utilities, real estate - will help connectivity providers build their networks more cheaply and easily and Londoners will be less disrupted by building and street works. Our new Connectivity Forum and support for boroughs will be an important vehicle for this.

The Mayor, through TfL, has made a start by bringing mobile coverage to London Underground and to use TfL's assets. TfL will also deploy fast digital connectivity along key transport corridors by securing significant investment in fibre capability in the London Underground. City Hall, TfL and London boroughs successfully collaborated in winning an £8.5m Full Fibre Network grant in March 2018. By linking 50 public buildings to the fibre network on the Tube, this will provide extra local connectivity to the surrounding area.

### **Propose planning powers to require full fibre to the home and mobile connectivity**

**London Plan** – Planning policies under consideration in the Mayor's draft London Plan include requiring new development across London to provide **full fibre connectivity to the home** and meet expected demand for **mobile connectivity**. These provisions can support mobile and wireless connectivity, such as rooftop access.<sup>1</sup>

Today only around five per cent of London properties are able to access residential fibre to the property (or 'fttp') services. While higher grade dedicated leased lines are available across much of the capital, most affordable options in London are still limited to copper delivery methods. Mobile and wireless operators need more consistency and certainty across London boroughs when planning and installing infrastructure. Business connectivity, particularly for the tech and creative clusters needs to be improved.

By developing policies and tools with boroughs and providers, and supporting their implementation through guidance and training, we can help the capital resolve digital 'not spots' in under-served places, including the Underground and critical transport corridors. We will also promote greater choice for the citizen or business.

The new London Plan currently under consultation and scheduled for adoption in 2019 provides a major opportunity to enhance personal, residential and business digital connectivity and necessary data infrastructure. Our new approach proposes that the provision of digital infrastructure is as important for the proper functioning of the city as

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<sup>1</sup> The early suggested changes will be submitted to the planning inspectors in advance of the Examination in Public due to start before the end of the year.

energy, water and waste management services. As such, it should be treated with the same importance.

### Enhance public wifi in streets and public buildings

**Public wifi** - The Mayor will support coordination of public wifi services in London.

**GovWifi and Govroam** - The Mayor will explore a London-wide wifi service focused on improving flexible working in the public sector.

The availability of public wifi has become a service expected by citizens and visitors. The city and boroughs have a role in ensuring open access to all citizens on our streets and in our public buildings. It can support access where people gather, from rooftop cinemas to pop-up bars. As many boroughs prepare for a new public wifi concession, the opportunity presents itself for greater collaboration.



**TfL has invested in wifi connectivity in Tube stations**

Public service productivity can be improved for the workforce by ensuring consistent access across the public estate, enabling more flexible and 'on-site' working. [GovWifi](#) is being developed by GDS and Jisc is developing [Govroam](#) as products public sector organisations can use. In both cases, users of these networks can now log on and access the internet securely in hundreds of new public-sector locations around London.

## A new generation of smart city infrastructure

The Mayor will accelerate the take up of **smart infrastructure** through the Sharing Cities programme in order to make the city safer, cleaner and more liveable by enhancing our ability to use data and technology.

Across London we are exploring how we support smart infrastructure when old 'street furniture' (lamp posts, benches and shelters) is renewed. We can start by supporting a new generation of lampposts whose capability goes beyond providing light, but can include air quality sensors, public wifi, cameras, electric vehicle charge points, electricity for filming and festivals, and potential for 5G roll-out.

The GLA leads on the [Horizon 2020-funded Sharing Cities](#) programme. As part of this, Sharing Cities is seeking [European Investment Bank](#) seed funding of between €1-3m to explore the collaborative procurement of smart lampposts for five city regions across Europe including London. This will build on the continuing replacement of thousands of lampposts by TfL and boroughs. Through collaboration we can reduce costs, provide common designs, secure finance and make the technology more easily available to boroughs.



**Guidance on smart infrastructure will improve future buildings, spaces, and streets**



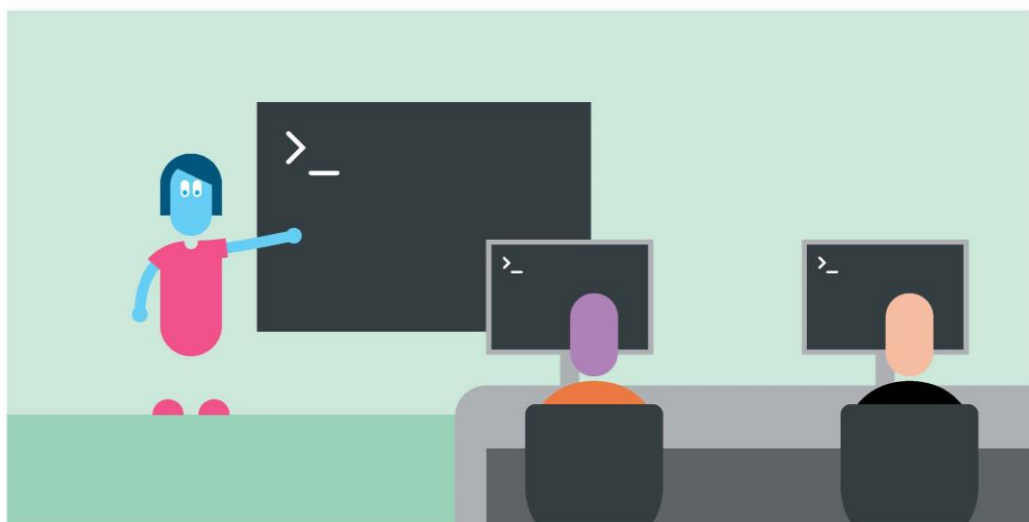
## Common standards for smarter built environment

The Mayor will propose [guidance on common standards for smart infrastructure](#) in new developments in his draft London Plan.

The growth in demand for smarter buildings, infrastructure and workspaces in our public realm creates real potential for testing innovative infrastructure. However, it also creates potential for duplication or waste if smart tech is adopted without properly regarding the needs and security of citizens. The Mayor can support innovation through common standards and initiatives in smart infrastructure procurement, so that the industry can innovate at scale with more confidence.

Adoption of common standards in smart infrastructure across London and sharing of performance data with designers and engineers will improve the design and performance of London's future buildings, spaces and streets. The [Mayor's Design Advocates](#) will advise on how this data should be collected and shared as part of the [Mayor's Good Growth by Design](#) programme.

## Mission 4: Enhance digital leadership and skills



London's economy is becoming increasingly digital and requires a workforce with a new set of skills. Data innovation, AI and the Internet of Things are having an influence on how we work, the demand for skills and the automation of tasks. Alongside upskilling citizens, better digital leadership at all levels of public services will be required in areas such as transformation, cyber-security and data.

To achieve these goals London needs to make the most of the opportunities afforded through the apprenticeship levy alongside collaboration with the [Government Digital Service \(GDS\)](#) and central government departments and agencies, as well as its own initiatives.

The Mayor's new responsibility for skills, set out in the new [Skills for Londoners Strategy](#), proposes significant investment in the skills Londoners need.

The Mayor is starting with the following initiatives:

- **enhance digital and data leadership to make public services more open to innovation**
- **develop workforce digital capability through the Mayor's Skills Strategy**
- **support computing skills and the digital talent pipeline from early years onwards**
- **recognise the role of cultural institutions engaging citizens in the digital world around them**

## Public service digital and data leadership

The Mayor will use his investment in **digital leadership training** to share lessons learnt with the Local Government Association (LGA), GDS and the NHS academy. We hope to extend digital leadership and skills (eg data analytics) across London's workforce and will scope this as part of our proposed LOTI work (see below).

The breadth and pace of digital change means that capacity within organisations to understand, develop and implement new digital approaches is stretched. Addressing this requires leadership across London's public services. This does not mean that leaders must be IT or data experts. But leaders that have a basic understanding will make more informed, effective decisions and make sure that their services are able to respond to how technology is changing Londoners' life chances and expectations.

We have already started with our [own digital leadership programme in City Hall](#) with [Doteveryone](#). At the end of this programme, we will publish open source guidance, content and resources for other organisations to use. We will then share the results to inform future competitive procurement of such services for new cohorts of public sector leaders. The public sector leaders on these programmes will be expected to come together to form a code of practice once there is a critical mass of trained leaders. The next step is to develop a pan-London digital leadership offer in conjunction with the GDS Digital Academy and other central government initiatives.

## Develop digital capability

**Levy** - The Mayor will review how existing digital apprenticeship standards meet the skills needs of the public sector and take the lead in creating new standards as appropriate.

**Basic digital skills** - The Mayor will develop basic digital skills training through the devolved Adult Education Budget and the European Social Fund to support Londoners who are seeking employment or in-work progression.

It is crucial that the opportunities and benefits of technological advancements are felt by all Londoners. Employment in London's digital technology sector is predicted to grow by almost a fifth over the next ten years. It is vital that we give Londoners opportunities in digital education and learning at all stages of life. The Mayor is supporting Londoners attain the skills they need for the growing number of tech jobs through the [Skills for Londoners Strategy](#).

The £800m annual apprenticeship levy spent in London provides the capital with a significant opportunity to upskill its workforce with the digital skills needed in today's economy. Currently, the GLA Group can directly contribute to a digitally-enabled workforce through its own approach to workforce planning and development. For example, Transport for London has taken an active role in developing [digital apprenticeship standards which are now available for use](#). However, in common with other employers, we have been calling for additional flexibilities to meet the ever-evolving needs of both employers and individuals.



As well as creating pathways into work, the levy has the potential to be used as a means to up-skill or re-skill individuals who are seeking a career change or entering the workforce after a break (such as women returners and army veterans). This is especially relevant to the digital and STEM sectors in London, which face major skills and apprenticeship qualifications gaps. By reshaping the apprenticeship levy into a Skills Levy, as called for by the Mayor, London government would have the ability to gear training towards the high-growth sectors of the economy.

Alongside the apprenticeship levy, significant opportunities have been provided through devolution. From 2019 the Adult Education Budget (AEB) in London will be devolved. This allows City Hall to have control over where learning will be prioritised - from 2020, adult Londoners who lack basic digital skills will be entitled to free training. Alongside this entitlement, we are developing wraparound support through the European Social Fund,

such as childcare or transportation costs, to Londoners seeking higher level digital skills training. These programmes will support Londoners who are unemployed or in low-paid jobs.

## Computing from early years and the Talent Pipeline

**Computing initiatives** - The Mayor will continue to invite partners to develop new coding skills among our young people before they are eligible as 16-year olds for the Digital Talent Programme. City Hall will also work with government in the London element of the National Centre for Computing to maximise investment.

**Digital Talent Programme** - The Mayor will develop further links with tech firms to increase the benefit of the £7m investment in digital talent.

The GLA also has a role in brokering partnerships with the many formal and informal digital learning initiatives aimed at young or school-age Londoners, so digital understanding can begin at an early age. We are engaging with primary teachers to introduce coding skills early. In collaboration with LEGO and the Institute of Imagination, more than 3,000 primary students are getting hands-on with the [RE:CODE London](https://www.london.gov.uk/recode-london) coding challenge throughout 2018. The Mayor also champions coding in the capital through his London Curriculum. Central government is spending £100m on a National Centre for Computing to train 8,000 new teachers. We aim to work with providers and the tech sector to develop exciting new initiatives with teacher training in our schools.



Over 3,000 primary students are getting hands-on with the [RE:CODE London](https://www.london.gov.uk/recode-london) coding challenge throughout 2018

The Mayor's vision of a tech talent pipeline continues with the recent launch of the Digital Talent Programme. With six coding bootcamps already underway, three further initiatives to develop the digital skills of young Londoners aged 16-24 will be launched throughout the year. The programme links with tech sector employers across the capital, and aims to lead to meaningful employment.

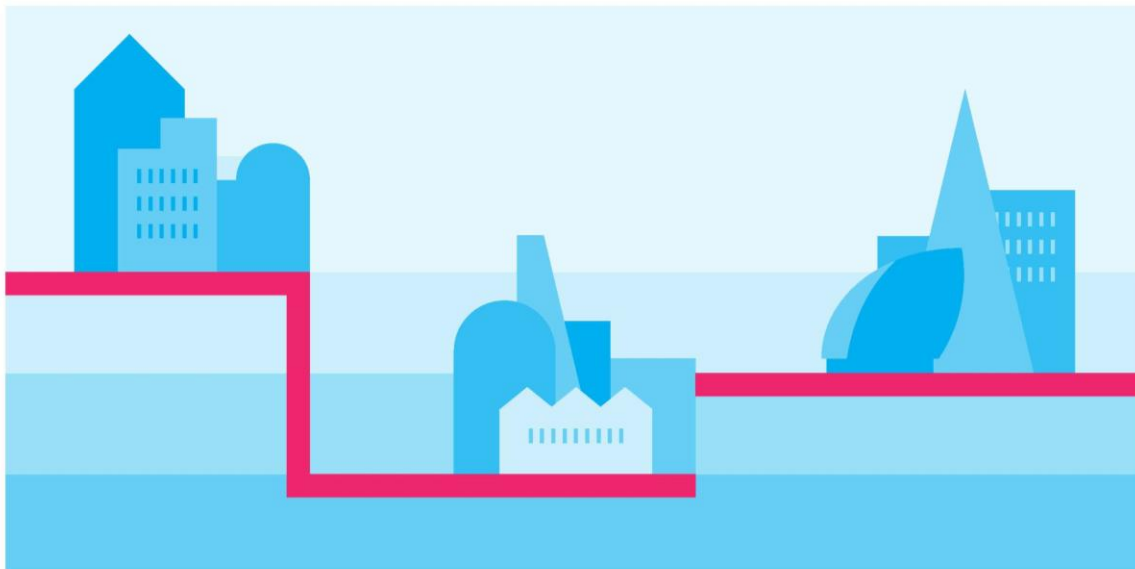
### **Role of cultural institutions engaging citizens**

**Technology and culture** – We will explore how cultural institutions, including the new Museum of London being built [at Smithfield Market](#), can promote greater understanding of Londoners about the smart technologies and data shaping their lives.

Cultural institutions have an important role to play in promoting public discussion and understanding about the role of data and technology in people's lives. Digital technologies shape people's experience and environment but are often 'invisible' to them as they go about their daily lives. The [Barbican's Digital Revolution exhibition](#), the [V&A's Digital Design Weekend](#), and the [City Now City Future season](#) at the Museum of London in 2017/18 are examples of how cultural institutions can play a vital role in promoting greater understanding among citizens of all ages. New ways they can do this range from interactive games to increasing use of AR and VR to tell stories from the past.

The Mayor-funded [London Games Festival](#) showcases the ubiquity of the city's video games industry. Not just as gaming entertainment, but also for crossover technologies which aid learning through the latest VR and immersive tech in science, public art and education.

## Mission 5: Improve city-wide collaboration



The final mission strengthens the city's ability to work together more effectively. All public services need to think about technology preparedness and new business models and services need to be understood, explored and anticipated. We need to be better at 'building once and sharing often', promoting consistency to drive quality of service.

The steps we will take include:

- **establish a London Office of Technology & Innovation (LOTI) to support common capabilities and standards for future innovation**
- **promote MedTech innovation in the NHS and social care to improve treatments**
- **explore new partnerships with the tech sector and business models**
- **support better GLA Group digital delivery to improve effectiveness**
- **collaborate with other cities in the UK and globally to adopt and share what works on big urban challenges**

## Establish a London Office of Technology and Innovation (LOTI)

The Mayor proposes a new function, provisionally called the '**London Office for Technology & Innovation**', to support collaboration on the design, standardisation and scaling of digital services and smart technology in public services.

To improve digital collaboration and sharing between London's 33 local authorities and City Hall, we are examining the case for a 'London Office for Technology & Innovation' (or 'LOTI'). This function will identify and resolve those 'keystone issues' holding back the development of better public services for citizens. Our research with Arup, Futuregov and Stance suggests that these issues could include: lack of awareness about what solutions can solve a shared problem; rigidity of procurement; and innovation cultures getting in the way of meaningful collaboration or the adoption of new technologies.

Often the answer to these challenges will be to provide guidance and support. Through its own internal expertise, as well as contacts with the tech sector and civil society, a LOTI can provide thoughtful guidance around many technology and digital issues that boroughs and other public services struggle with. By employing and encouraging open standards, LOTI can ensure better networks and collaboration.

## Promote healthcare innovation

**Health collaboration** - The Mayor will **work with the NHS and health organisations** in London to ensure that all Londoners can benefit from digital health and social care by linking NHS data and digital transformation with other city-wide initiatives. **Engaging Londoners** in discussions about the appropriate and secure use of patient or personal data to improve the healthcare of citizens and medical research.

There is now a real opportunity for MedTech to help accelerate London towards becoming a smarter city, through work with the NHS and local councils. Wearable technology and [SportTech](#) can help make people more active, enhancing citizen engagement and providing incentives for healthier lives. Data of available exercise and arts therapy can boost social prescribing from health practitioners. At the same time, data analytics and AI can increase understanding of serious or complex conditions.

There is great innovation emerging from London's MedTech scene. The Mayor is supporting businesses through [MedCity](#) and the [MedTech London programme](#). Accelerators like [DigitalHealth.London](#) scale pioneering products and services. Devolving health powers to the Mayor is an opportunity to innovate with health and social care organisations in London and serve citizens better and reduce health inequalities.



Under the leadership of the [Mayor's London Health Board](#), a new London Digital Partnership Board for health and social care has been established. The board is a link to health and social care collaborations in data and digital technologies and will make its own digital strategy to do this. It has already won funding for the One London programme to connect the record systems of different NHS and partner organisations to improve the care and support of people who move between the NHS, council social care and third sector services. With more than 4,500 health and care organisations and already more than 30 different examples of local record sharing, One London will enable better treatment for Londoners with very complex or serious conditions and support those who need it most.

### Explore new tech partnerships and business models

**GovTech engagement** - The Mayor, through his CDO, will work with London & Partners to improve engagement in London. The CDO will develop resources to bring clarity to the London GovTech market and run regular GovTech surgeries in conjunction with London & Partners, the Catapults and others.

**Access to finance** - Services offering clear civic benefits will be connected to venture capital via the Mayor's new [TechInvest](#) programme.

**Open Procurement** - The Mayor, through his CDO, will promote take-up of the Digital Marketplace and G-Cloud, research the viability of the [Open Contracting Data Standard](#) and explore new routes to market.

Tech scale-ups and providers that we engaged through our Listening Tour called on City Hall to provide more clarity around procurement and partnerships with London's public services. Data on procurement needs to be opened up to increase transparency and access to the market by non-traditional providers. Ideas need to be shared between public officials who should be empowered to be bolder and to try new approaches.

More tech startups need to consider how their products might be applied in innovative ways to improve public service infrastructure, administration and front-line services. Public services need to set more mission-led challenges of the type seen in other cities to procure solutions differently and invite new investment in solving the toughest public policy problems. Finally, we need to secure more investment to flow into early-stage companies and the founders who have the product and track record to help transform services.



**The Chief Digital Officer held a fireside chat with GovTech entrepreneurs at London & Partners during his Listening Tour**

### **Improve GLA digital delivery and innovation**

**Benchmarking** - The Mayor will coordinate and share best practice in data and digital services across the GLA Group. The GLA will commission the [LGA](#) to conduct a 'peer challenge' on data and technology to align with best practice across devolved government and combined authorities.

City-wide collaboration and innovation also applies to the GLA Group, which can improve its approach to digital transformation and data sharing. Alongside our LOTI work, the GLA Group should also review its efforts to ensure the most effective use and coordination of resources in data and digital transformation. This will also include a focus on new areas of delivery such as skills and health. We will develop new approaches to innovation so this can be shared and scaled more easily with boroughs and the NHS.

## Collaborate with other cities

**Digital devolution** - The Mayor will work with other UK city mayors to advance 'digital devolution' in data and digital transformation. This will help to identify common asks of government departments including access to innovation funds, digital leadership support and data-sharing.

How to share and amplify successful adoption of technology will be an increasingly important function for city government. London wants to play a leading role collaborating with other UK and global cities on common urban and citizen challenges. In drawing up A Smarter London Together, London has been influenced by the thinking of the [Scottish Digital Office](#) in developing the LOTI proposition and data-sharing by of Manchester with our LODA model.

Through international missions with [Bloomberg Associates](#) and London & Partners, we have linked with chief digital and innovation officers in San Francisco, New York and other US cities to show how urban solutions can be better crafted and inter-agency innovation advanced. And through the [Sharing Cities](#) programme, we are at the heart of the 80-plus [European city 'Lighthouse' collaboration](#) programme, with London in the lead.

# Appendices

## Appendix 1 Report cards

[Actions in the plan are 'live' online](#) so citizens and stakeholders will be able to see progress and a report card will be presented every year at London Tech Week as proof-of-performance. The list below are the projects we expect to see 'live' in years 1 to 3 of Smarter London Together.

### Year 1 – London Tech Week, June 2019

At the end of the first year, we will have started to deliver **more user-designed services** by:

- championing adoption of common standards and design principles in public services
- piloting civic innovation challenges
- supporting Crowdfund London to recommission and scale crowdfunding
- supporting Talk London to increase diversity of its membership
- signing the Tech Talent Charter
- delivering the Digital Talent Programme

At the end of the first year, we will have started to deliver **a new deal for data** by:

- launching the London Office of Data Analytics programme
- developing a cyber-security strategy for the city
- appointing a data ethics board member of the Smart London Board
- researching standards in algorithmic transparency
- joining the Community of Practice on Transparency and Local Open Government

At the end of the first year, we will have started to deliver **world-class connectivity and smart streets** by:

- launching the Connected London programme
- supporting a pan-London bid for the Urban Connected Communities Fund in 5G
- accelerating the take up of smart infrastructure
- proposing planning powers to require full fibre to the home and meet demand for mobile connectivity in the London Plan
- developing guidance on common standards for smart infrastructure

At the end of the first year, we will have started to enhance **digital leadership and skills** by:

- sharing lessons in GLA digital leadership programme
- supporting new coding skills and the National Centre for Computing
- developing more links with tech firms to increase the benefit of Digital Talent Programme

At the end of the first year, we will have started to **deliver collaborations** by:

- supporting the work of the Digital Partnership Board for health and social care
- engaging Londoners on use of health data
- supporting London & Partners on GovTech engagement
- promoting the Digital Marketplace
- using TechInvest to connect public service to venture capital

### **Years 2 and 3 – London Tech Week, 2020 and 2021**

After three years, we will be delivering **more user-designed services** by:

- continuing to champion adoption of common standards and design principles in public services
- developing new approaches to digital inclusion
- growing our civic innovation challenges
- continuing to support Crowdfund London
- continuing to support Talk London to increase diversity of its membership
- prototyping and testing new civic platforms
- continuing to deliver the Digital Talent Programme

After three years, we will be delivering **a new deal for data** by:

- continuing and growing the London Office of Data Analytics and Programme
- developing a programme for the digital understanding of the public
- examining the case for data trusts
- publishing an open data charter for London
- joining the Open Government Partnership Local programme

After three years, we will be delivering **world-class connectivity and smart streets** by:

- continuing to grow the Connected London programme
- continuing to accelerate the take up of smart infrastructure
- requiring full fibre to the home and meet demand for mobile connectivity in the London Plan
- requiring common standards for smart infrastructure using guidance
- delivering a programme to support connectivity in the Creative Enterprise Zones
- exploring a public wifi service

After three years, we will be enhancing **digital leadership and skills** by:

- supporting more digital leadership programmes
- continuing to support new coding skills
- reviewing digital apprenticeship standards
- supporting adult digital skills training

- developing new ways for cultural institutions to promote understanding of data and digital technologies

After three years, we will be delivering **collaborations** by:

- continuing to support the Digital Partnership Board
- continuing to engage Londoners on use of health data
- continuing to support London & Partners on GovTech engagement
- continuing to promote the Digital Marketplace
- establishing a London Office of Technology and Innovation
- researching the viability of the Open Contracting Data Standard
- commissioning a 'peer challenge' on data and technology
- working with the UK metro-mayors to advance digital devolution

## Appendix 2 The Mayor and Smart London

**In these projects, the Mayor is using data and technology to make a difference:**

### Air quality

The Mayor already has access to the largest network of air quality monitors of any city, and has access to world-class modelling and emissions forecasting. Despite this capability, a very small proportion of the city is covered by London's approximately 100 air quality monitoring stations. The GLA co-lead the C40 Air Quality Network, who are investing [\\$1million in a challenge](#) for lower-cost fixed, mobile, portable, remote and wearable air quality sensing technology to directly measure at thousands of more locations in London. We have committed to a [two-year collaboration with the Alan Turing Institute](#) to set data standards and accept more types of air quality monitors in our modelling and analysis work.

### Collaboration

The Mayor, boroughs and NHS trusts are giving tech start-ups a better understanding of their service challenges. However, [recent research shows a more than 400% increase](#) in single-bid tenders in UK public procurement. Alongside London Councils' support of [London Ventures](#), the Mayor and the LEAP have committed to support [Better Futures](#), [CleanTech London](#) and [MedTech London](#) to widen opportunities for London's SMEs. These programmes are trialling new ways to help the Mayor's Old Oak and Park Royal Development Corporation, boroughs, and NHS trusts articulate their demand for innovation in cleantech and health. Start-ups are then able to test products and services at an earlier stage in the development life cycle to better meet demand.

### London Underground

The Mayor, through TfL, is tackling crowding through informing the public of the best modes, routes and times for their journey. This is done using data in real-time so that people can, when possible, avoid the most crowded parts of the network. In 2016 [TfL ran a four week pilot to evaluate wifi connection data](#) to better understand crowding and choice of route at different times of day, and during events and service interruptions. They invested less than £100,000 to collect 500 million points of personalised connection requests from mobile devices at 54 stations. The data revealed the routes that Londoners take in great detail, paths they follow in stations, and how crowds react to events and interruptions. The pilot showed the potential for new analytical tools and services to improve the way TfL runs its network and provides the best information to the public.

### Planning and urban design

In his draft London Plan, the Mayor calls for more 3D virtual reality and other interactive digital models to be used to inform and engage Londoners in the planning process. An example of this in action is in the planning of the £1.1bn development of [East Bank](#) in the Queen Elizabeth Olympic Park includes UCL, the BBC, the V&A, and Sadler's Wells. The Park invested in digital engagement tools to get Londoners' say on its design from



[interactive forums](#) to virtual and augmented reality. City Hall is also seeking to grow its 3D modelling capability so that the public can weigh in more effectively on proposed developments and other changes across London.

### **Planning and infrastructure**

The Mayor, through TfL's lane rental fund, is investing more than £800,000 to further develop two tools: the [London Infrastructure Mapping Application](#), to support better infrastructure planning and coordinated delivery based on London's expected growth; and the [London Development Database](#), to improve the collection, accuracy, and accessibility of data on planning applications and coming development for use by citizens, businesses and public administration. These tools can serve as a foundation for deploying machine learning and AI to understand, forecast and manage the city's growth.

### **Energy**

The Mayor is putting data and technology to work to meet his ambition to be a zero-carbon city with smart, integrated energy systems that use local and renewable energy. Demonstrators, like [Sharing Cities](#), are creating an advanced energy management service to integrate energy assets, optimise performance, increase energy efficiency take-up and allow for citizens to participate in the energy system. Through other initiatives, like [FlexLondon](#) and the [Mayor's Energy for Londoners programme](#), the Mayor supports commercialisation of new digital technologies and the safe and secure management of the city's energy data.

### **Fuel poverty**

In tackling fuel poverty, it is important to identify who is at risk. But there are significant challenges in doing this. For example, whilst there is limited data sharing on benefit claimants taking place between the Department for Work and Pensions and energy suppliers, neither the Mayor nor the boroughs currently have access to this. The Mayor is lobbying government for the provisions of the Digital Economy Act relating to fuel poverty to be extended to local authorities in order that they can target fuel poor households with greater precision. The Mayor will combine data on [Energy Performance Certificate data for London](#) that he has already published with area-level indices of vulnerability such as fuel poverty and disability to identify priority areas. Guidance will also be issued to boroughs on how they can legally and responsibly use data to identify fuel poor households.

### **Culture**

We are currently mapping the city's cultural infrastructure across all boroughs. This data allows us to benchmark cultural venues and the supporting ecosystem for the first time, and supports boroughs in their own cultural planning. This data is broken down by type of facility (right now for [music venues](#) and in future, more venues from museums and galleries to pubs and skateparks). It is an open source map so that any Londoner can add to the datastore. The data is already helping the [Culture Team](#) provide an evidence base to support more pro-cultural planning and the Mayor's investment programmes. The data works alongside the GLA's new Culture at Risk Office which monitors cultural venues and

spaces and intervenes to help support them. It is part of the Mayor's Cultural Infrastructure Plan which we will launch in the autumn 2018.

### **Night-time economy**

The Mayor and his Night Czar, Amy Lamé, have published a [24-hour vision](#) to create a life at night that works for everyone. Our GLA Intelligence Unit is measuring night-time activities, from travel and noise to eating and drinking, to support the vision. TfL has shared travel pattern data from which it might be possible to infer the numbers of people in an area at any one time, as an alternative to sensors, and IU is working with partners to try to address other data gaps to better connect crowd levels at night and spending patterns.

### **Skills**

In his Skills for Londoners Strategy, the Mayor commits to empowering all Londoners to access the education and skills to participate in society and progress in education and in work, including digital skills. We are looking at the costs and investment required for a Knowledge Hub for training providers and learners geared towards filling skills gaps in London. It will bring together a range of information about skills and employment in the city, and will provide sub-regional data where possible.

## Appendix 3 The Smart London Board

The Smart London Board is charged with helping the Mayor shape his vision and strategy for London's smart city agenda and investment in data infrastructure.

Composed of leading figures from the tech sector, entrepreneurs and academics, the Board advises on how London can put digital technology and data at the heart of making the capital an even better place to live, work and visit.

Interim Chair: Theo Blackwell, Chief Digital Officer, Greater London Authority

The members of the board are:

- Julie Alexander, Director of Urban Development and Smart Cities Lead, Siemens
- Dr. Volker Buscher, Director, Arup Digital
- Eddie Copeland, Director of Government Innovation, Nesta
- Jarmo Eskelinen, Chief Innovation & Technology Officer (CITO), Future Cities Catapult
- Jen Hawes-Hewitt, Global Cities Management Consulting Lead Director, Accenture Health and Public Service
- Professor Andrew Hudson-Smith, Director, Centre for Advanced Spatial Analysis (CASA) at University College London
- Sabrina Kavanagh, Researcher, Hansard Society, Associate Content Developer, Toynbee Hall, and Lecturer in Law, University of London
- Ekaterina Lichtenstein, Director of Urban Insights, Project Imagine
- Alwin Magimay, Digital Partner, McKinsey
- Claire Maugham, Communications expert
- Linda O'Halloran, Digital Collaboration Unit Lead, Ministry of Housing, Communities and Local Government
- Professor John Polak, Professor of Transport Demand and Director of the Urban Systems Laboratory, Imperial College London
- Miranda Sharp, Smart Cities Practice Lead, Ordnance Survey
- Omid Shiraji, Chief Information Officer, London Borough of Camden
- Prof. Duncan Wilson, Professor of Connected Environments, Centre for Advanced Spatial Analysis (CASA) at University College London
- Rikesh Shah, Head of Commercial Innovation, Transport for London
- Michael Hurwitz, Director of Transport Innovation, Transport for London
- Jim Wood, Director of IT and Information Services, London Legacy Development Corporation

## Appendix 4 Glossary

4G – The current mobile communications standard that allows mobile phones, computers, and other portable electronic devices to access the internet wirelessly.

5G - A mobile communications standard intended to replace 4G, allowing wireless Internet access at a much higher speed and capacity.

AI - Artificial intelligence is more than the simple automation of existing processes: it involves, to greater or lesser degrees, setting an outcome and letting a computer program find its own way there. It is this creative capacity that gives artificial intelligence its power. But it also challenges some of our assumptions about the role of computers and our relationship to them.

Alan Turing Institute - The UK's national institute for data science and artificial intelligence

Algorithmic transparency - Openness about the purpose, structure and underlying actions of the algorithms used to search for, process and deliver information

API - An application programming interface (API) is a piece of software that lets one program access or control another program. APIs allow applications to share data without requiring developers to share software code.

#BehindEveryGreatCity - The Mayor, in 2018, is marking 100 years since the first women secured the right to vote in the UK by championing the achievements and contributions of women that make cities great.

Big Data - Big data involves very large datasets, such as billions of tweets or terabytes of sensor data.

BIM - Building Information Modelling uses multi-level data rendered in a 3D common language environment. This allows the interdisciplinary parties in the project – architects, structural engineers, mechanical and electrical engineers, designers and manufacturers – to talk about exactly the same thing and, crucially for so many participants, visualise it in 3D.

Bluetooth - A standard for the short-range wireless interconnection of mobile phones, computers, and other electronic devices.

Borough - The 32 London Boroughs and the City of London.

CAV - Connected and autonomous vehicles incorporate a range of different technologies, facilitating the safe, efficient movement of people and goods. Increased connectivity allows vehicles to communicate with their surrounding environment. This provides valuable

information to the driver about road, traffic and weather conditions. Vehicles with increasing levels of automation will use information from on-board sensors and systems to understand their global position and local environment. This enables them to operate with little or no human input (be driverless) for some, or all, of the journey.

CDO - The Chief Digital Officer is tasked with realising the Mayor's ambition to make London the world's smartest city, ensuring that the capital's status as a global tech hub helps transform the way public services are designed and delivered, making them more accessible, efficient and responsive to the needs of Londoners.

CleanTech - refers to technology for low carbon and resource efficient technologies. In the Mayor's Environment Strategy, the term is used to cover technologies that address the causes and effects of climate change.

Cloud Computing/The Cloud - The practice of using a network of remote servers hosted on the internet to store, manage, and process data, rather than a local server or a personal computer.

Coding – Coding, or programming, commonly refers to computer programming, which is the process of writing software, applications and websites, which are all created using a programming language. There are many different programming languages, and programmers often tend to specialise in one or two. Examples include python, ruby, and java.

Cyber-security - Measures taken to protect a computer or computer system (as on the Internet) against unauthorized access or attack

Data trusts - A framework of agreements between government and industry to stimulate the secure and mutually beneficial exchange of data. The [Hall review](#) recommended that the government works with independent institutions, such as the Royal Society and the Open Data Institute, to create arms-length mechanisms to share public and private sector data. These mechanisms could assure data 'donors' - Londoners and businesses - that their data is used for collective good instead of profit or surveillance.

Digital Catapult - One of seven 'Catapults' launched by the UK's Technology Strategy Board as a network of world-leading centres designed to transform the UK's capability for innovation in seven specific areas and help drive future economic growth. The Digital Catapult focusses on accelerating growth through the Digital Economy.

Crowdfunding - The practice of funding a project or venture by raising small amounts of money from a large number of people, typically via the Internet.

Creative Enterprise Zones - Creative Enterprise Zones are a new Mayoral initiative to designate small areas of London where artists and creative businesses can put down roots

and where creative activity is supported. Based on Enterprise Zones they will offer incentives to retain and attract artists and new creative businesses to an area by offering permanent affordable workspace, business and skills support, business rates relief, super-fast broadband and a pro-culture Local Plan.

Crossrail - The new high frequency, high capacity railway for London and the South East. When Crossrail opens in 2018 it will, for the first time, produce a direct connection between all of London's main business centres, linking Heathrow, with Paddington, the West End, the City and Canary Wharf.

DECODE - An EU-funded project, managed by Nesta, that creates tools that put individuals in control of whether they keep their personal data private or share it for the public good.

Devolution - the transfer or delegation of power to a lower level, especially by central government to local or regional administration

Drones - an aircraft without a human pilot aboard, often much smaller than a passenger airplane.

Founders for the Future - Accelerator for entrepreneurs' careers to launch tech businesses. Founders for the Future was launched by Founders Forum, a private network of leading digital and technology entrepreneurs.

Future Cities Catapult – One of seven 'Catapults' launched by the UK's Technology Strategy Board as a network of world-leading centres designed to transform the UK's capability for innovation in seven specific areas and help drive future economic growth. The Future Cities Catapult focuses on Urban Innovation: how cities can take a more joined-up approach to the way they plan and operate. To improve quality of life, strengthen their economy and protect the environment.

GDPR - The General Data Protection Regulation was introduced into UK law on 25 May 2018 and overhauls how businesses process and handle data.

- It will introduce tougher rules on how personal information must be handled and protected, particularly where it relies on the individual's consent.
- The GDPR introduces new rights to give individuals greater control over their personal data, such as the right to request data is deleted and for inaccurate data to be rectified.
- There will be a big increase in the maximum fines the ICO will be able to impose on data controllers who break the law – up to 4% of annual turnover or €20m (whichever is greater) for failing to comply with certain areas of the legislation

GDS - The Government Digital Service is the UK government's centre of excellence in digital, technology and data, collaborating with departments to help them with their own

transformation. We work with them to build platforms, standards, and digital services.

GLA Group - the Greater London Authority (GLA) and the five functional bodies: Transport for London, the Mayor's Office for Policing and Crime, London Fire Commissioner, London Legacy Development Corporation, and the Old Oak and Park Royal Development Corporation

GPS - Global Positioning System, an accurate worldwide navigational and surveying facility based on the reception of signals from an array of orbiting satellite.

GovTech - Companies that invest and build hardware and software tools for governments that are better than existing technologies.

Industrial Strategy - This sets out a long-term plan to boost the productivity and earning power of people throughout the UK. It sets sets Grand Challenges, including artificial intelligence, to put the UK at the forefront of the industries of the future

Jisc - A not-for-profit organisation that develops digital services and solutions for the UK higher, further education and skills sectors. It was formerly called the Joint Information Systems Committee of the Higher Education Funding Councils for England, Scotland and Wales.

LFB – London Fire Brigade is the body responsible for London's fire and rescue service. It is the busiest in the country and one of the largest firefighting and rescue organisations in the world.

LGA - The Local Government Association promotes local government, working with councils to support, promote and improve local government.

LLDC – London Legacy Development Corporation is a Mayoral Development Corporation responsible for the regeneration legacy from the London 2012 Games, created in April 2012. Its role is to promote and deliver physical, social, economic and environmental regeneration of the Olympic Park and its surrounding area, in particular by maximising the legacy of the 2012 Olympic and Paralympic Games, by securing high-quality sustainable development and investment, ensuring the long-term success of the facilities and assets within its direct control, and supporting the aim of convergence.

Living Lab - An approach that tests prototypes 'in the wild' instead of in a controlled environment. This is a good way to test technology readiness, social utility and financial viability in the real world. They are designed to understand how technology affects community, work, health and place, whilst protecting privacy and creating trust in those systems. It also tests stakeholder participation in the delivery of these prototypes.

Local authorities - in London, see 'Boroughs'.

LODA - The London Office of Data Analytics is a planned hub developing and supporting data science collaborations between public services in London

LOTI - The London Office of Technology and Innovation is an organisation being scoped that identify and resolves issues that hold back better digital public services in London's 33 local authorities

London Ambulance Service - the busiest emergency ambulance service in the UK and provide healthcare that is free to patients at the time they receive it. They are also the only London-wide NHS trust.

London Councils - represents London's 32 boroughs and the City of London. They are a cross-party organisation that works on behalf of all member authorities regardless of political persuasion.

London Datastore - Created by the GLA as an innovation towards freeing London's data, the datastore provides free access to a number of data-sets. The GLA is committed to influencing and cajoling other public sector organisations into releasing their data onto the site providing an easily accessible location for multiple data sets.

London Development Database - The London Development Database records selected planning permissions in the Greater London area as part of the process of monitoring the Mayor's London Plan. The LDD is a collaboration between the GLA, which provides the IT infrastructure and co-ordinates the project, and the London boroughs who are responsible for providing the data for schemes in their area.

London Economic Action Partnership - The London Economic Action Partnership (LEAP) is the local enterprise partnership for London. The LEAP brings entrepreneurs and business together with the Mayoralty and London Councils to identify strategic actions to support and lead economic growth and job creation in the capital.

London Ventures - A programme that brings brings innovative private and third sector ideas to the public sector. The products, services and solutions in our Venture portfolio all aim to deliver significant benefits for London residents. They use cutting-edge technology to reduce costs and improve the effectiveness and efficiency of public services. London Ventures is a joint partnership between EY and London Councils - the umbrella body for London local government.

London & Partners (L&P) - London & Partners is the Mayor of London's official promotional agency. They exist to support the Mayor's priorities by promoting London internationally as a leading world city in which to invest, work, study and visit.



MedCity - The Mayor cofunds MedCity - a collaboration between London, Cambridge and Oxford Academic Health Science Centres which aims to promote and grow the life sciences cluster in London and across the wider south-east.

MedTech (including digital health) - The interface between health and technology. This includes both developing medical devices with a digital component (such as apps and software), and also the use of data in healthcare (such as NHS booking and information systems).

MOIIS - The UCL Commission for Mission Oriented Innovation and Industrial Strategy (MOIIS) was established by the Founder and Director of the UCL Institute for Innovation and Public Purpose (IIPP), Professor Mariana Mazzucato, and considers how the four 'Grand Challenges' set out in the UK Government's Industrial Strategy, can be transformed into concrete 'missions', that require different sectors to come together in tangible ways.

MOPAC - The Mayor's Office for Policing And Crime sets the direction and budget for the Metropolitan Police Service on behalf of the Mayor.

Nesta - A charity that backs innovations to grow new ideas that tackle the challenges society faces and change the world for the better. It was founded as the National Endowment for Science, Technology and the Arts.

NHS Digital Partnership Board - Provides oversight and leadership to ensure digital improvements for health can happen as quickly as possible. The Board brings together partners from across the health and care system in London. Their aspiration is to make London the healthiest city in the world and they are committed to working together to improve the health and wellbeing of all Londoners.

London Resilience - Coordinates institutions and communities to prevent, handle, recover and learn from disruption, and adapt to change; on behalf of the Mayor of London, Greater London Authority, Local Authorities and London Fire Brigade to ensure London survives and prospers.

Open Data - Open data is information that is available for anyone to use, for any purpose, at no cost.

ODI - The Open Data Institute was co-founded in 2012 by the inventor of the web Sir Tim Berners-Lee and Artificial Intelligence expert Sir Nigel Shadbolt to advocate for the innovative use of open data to affect positive change across the globe.

Open Government Partnership - a multilateral initiative that aims to secure concrete commitments from governments to promote transparency, empower citizens, fight corruption, and harness new technologies to strengthen governance.

Queen Elizabeth Olympic Park – Queen Elizabeth Olympic Park is the site that hosted the 2012 Olympic Games. The site and its surrounds are now being developed and regenerated by the London Legacy Development Corporation, building on the 2012 Olympic and Paralympic Games legacy.

Roadmap - A design method that creates a timeline and a plan of action to get ideas out into the world.

Service Design - Applying design practice to the service sector – from retail and banking to transportation, health and education. Services represent around 80 per cent of the economy and offer a new frontier for designers seeking to make a difference.

Smart meter - Gas and electricity meters that will digitally send meter readings to your energy supplier and show you exactly how much energy you are using

SME - Small to medium-sized enterprise, a company with no more than 250 employees.

SportTech - technologies driving innovation in physical activity and sport

Sprint (agile management) - Work using agile methods that is managed in weekly or fortnightly 'sprints', with a key chunk of work built and tested after each sprint. At the end of each sprint, an agile team will 'show the thing' that they have prototyped, and reflect on what they need to deliver over the next sprint. 'Agile' is a relatively new method of delivering project work that has been widely adopted in digital and technology industries, and is increasingly being taken up in government.

Talk London - Talk London hosts online discussions, polls, live Q&A events, surveys and focus groups - discussing a wide range of topics from improving standards in the private rented sector to cyclist safety around HGVs (heavy goods vehicles). Through the community, Londoners are taking part in policy conversations to generate new ideas. We can also consult Londoners on our ideas to make sure that policies are responsive, effective and resonate with communities.

Tech City – Also known as Silicon Roundabout. A number of digital and creative small to medium start-up companies have established themselves around the Old Street roundabout and Shoreditch areas. In just three years, the originally small cluster of high-tech firms around the Old Street roundabout has become the capital's leading hub for digital, creative and high-technology companies.

Tech London Advocates - A network of more than 6,000 tech leaders, entrepreneurs and experts in London, across the UK and in over 50 countries worldwide.

Tech Nation - A publicly supported non-profit organisation launched in Shoreditch in 2010 at Tech City UK to support the east London tech cluster. In April 2014, they handed over

promotion of London's tech sector to London & Partners to take on a national role, but still promotes the London tech sector as part of their work to promote the tech sector of the UK.

TechUK - A trade body that represents the more than 950 companies that employ approximately 700,000 people, about half of all tech sector jobs in the UK.

TfL – Transport for London is the local government body responsible for the majority of the transport system in Greater London.

TRL - A global consultancy for innovation in transport and mobility, and formerly known as the Transport Research Laboratory. It was established the UK government in 1933 and privatised in 1996.

Ultrafast Broadband – Broadband service with downloading speeds of at least 100 Mbps and uploading speeds of at least 50Mbps. This is most often delivered by fibre to the premises (FTTP).

Unicorn - A unicorn is a privately held startup company valued at over US\$1 billion.

United Cities and Local Governments (UCLG) - An umbrella organisation for cities, local and regional governments, and municipal associations throughout the world

Wearable technology - a category of technology devices that can be worn by a person and often include tracking information related to health and fitness

Wifi - A facility allowing computers, smartphones, or other devices to connect to the internet or communicate with one another wirelessly within a particular area.

## **Other formats and languages**

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