

# LONDON INFRASTRUCTURE PLAN 2050 UPDATE

---



**Mayor's Foreword****Executive Summary****A. A LONG-TERM INFRASTRUCTURE INVESTMENT PLAN FOR THE CAPITAL**

- Chapter 1 Introduction
- Chapter 2 Consultation
- Chapter 3 A long-term commitment
- Chapter 4 Our vision for London 2050

**B. PROGRESS**

- Chapter 5 Joint delivery
- Chapter 6 Transport
- Chapter 7 Green infrastructure
- Chapter 8 Digital connectivity
- Chapter 9 Energy
- Chapter 10 A circular economy
- Chapter 11 Water
- Chapter 12 Housing and social infrastructure

**C. FUNDING AND FINANCING**

- Chapter 13 Powers and structural changes
- Chapter 14 The business case
- Chapter 15 Reducing costs and demand

**D. NEXT STEPS**

- Chapter 16 Prioritisation
- Chapter 17 Timescales

## London Infrastructure Plan 2050 – update

Since I published the London Infrastructure Plan 2050 consultation in July 2014, much has happened.

Our draft proposals on how to go about giving London the infrastructure it badly needs have been confirmed, challenged and shaped by this wide and thorough consultation.

New London Survey data confirms that housing and infrastructure are seen as the most pressing matters facing our city.

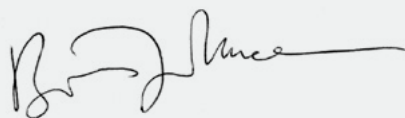
We are tackling these issues head on as London continues to grow.

We have set up a London Infrastructure Delivery Board, which brings together the leaders in the field. This group has the collective will and clout to drive work in this area and come up with creative solutions to how we fund new infrastructure.

This report describes how our thinking has developed and accelerated in recent months. We know that well planned infrastructure and housing are innately linked. People must live in areas with running water, energy supply and flood protection. Beyond such basics, they also need excellent transport and digital links to connect them to the rest of the city and the world, and good quality of life. That means investing in the benefits of green infrastructure and reducing demand on our finite resources.

We must be creative in developing funding and financing solutions. To that end, we are continuing our clarion call for devolved fiscal powers so that London government has more control over its finances.

Of course, this report does not and cannot provide all the answers. What it does do is highlight the impressive progress we have already made so far. It also sets out what next steps we must take to make sure that the London of 2050 is as successful as our capital today.



**Boris Johnson**  
Mayor of London

On 30 July 2014, the Mayor published the London Infrastructure Plan 2050 (LIP 2050), a consultation on the future of the city's growth. The report considered a wide range of infrastructure types - transport, green, digital, energy, water and waste - that we know the city will require over the coming decades. The consultation was met with widespread support and general agreement about the scale of infrastructure investment needed to support future growth.

Since the publication of the consultation report, we have developed many of the ideas it put forward. This document serves to update on progress and to set out next steps.

**Section A** of the report outlines the main issues identified through the consultation process. It focuses on a number of challenges that were presented to us, including the need to better coordinate our plans with the wider South East and to further reduce demand for infrastructure, and explains how we are working to meet these challenges. This Section also articulates our vision for the London of 2050, which will be greener and more productive, at the forefront of technological changes, and environmentally, financially, socially and economically sustainable.

**Section B** considers how we can improve the delivery of all infrastructure projects, to which the newly established London Infrastructure Delivery Board (LIDB) will bring integrated leadership, and confirms our ambition to work effectively with the wider South East and with central government. This Section of the report also sets out the work underway across the different infrastructure types.

**Transport** keeps the city moving, connects all parts of London and helps maintain competitiveness. Chapter 6 looks into various elements of transport infrastructure, including expanding into South East London and better utilising the River Thames.

**Green infrastructure** improves quality of life and reduces the need for traditional 'grey' infrastructure. Chapter 7 explains how the newly established Green Infrastructure Task Force will develop the evidence base to prove the many benefits of green infrastructure and will work to accelerate its delivery.

**Digital connectivity** is essential for many businesses and, increasingly, for all Londoners. With some parts of London still without access to affordable high-speed connectivity, Chapter 8 outlines how we aim to address different connectivity-related problems across the city.

It is our goal to have in place **Energy** infrastructure that delivers secure, reliable and affordable energy, which also produces 80% less carbon by 2050. Chapter 9 sets out how we are working to deliver the right energy infrastructure for the city.

Embedding the **circular economy** (in which materials are reused and recycled rather than thrown away) in our approach to waste management will be of great environmental and economic benefit to the city. Chapter 10 outlines the steps we are taking to move London towards a circular economy.

The **Water** Advisory Group (WAG) is already working to develop integrated water management strategies in specific Opportunity Areas and development sites, which is detailed in Chapter 11.

It is vital that **housing and social infrastructure** are considered, planned and delivered alongside other aspects of infrastructure, which is looked into in Chapter 12.

**Section C** considers how London might pay for its infrastructure needs. It explains that fiscal devolution will be essential for London to make the best infrastructure investments, examines the kinds of creative funding solutions that we think will be necessary in light of the sheer scale of the city's investment needs, and considers how in the short term we can better articulate business cases as we seek Government funding. This Section also examines how we can make better use of existing assets, introduce more efficient and innovative ways of building new infrastructure and reduce peak demand across infrastructure types.

**Section D** sets out the next steps of the LIP 2050 project, which will move us closer to the realisation of our vision for effective infrastructure delivery in London. With the national elections approaching, our short-term focus will be on prioritising London's infrastructure requirements and making a robust case for investment. Beyond that, we will concentrate on programme planning across infrastructure projects and working effectively with all relevant stakeholders.

This document concludes this stage of planning for London's long-term infrastructure requirements. It should not be seen as a final report, nor as an attempt to summarise London's total infrastructure requirements over the next 35 years. In reality it merely marks the beginning of a much longer-term process.

**In this section we explain the rationale for the LIP 2050 and set out our objectives for the project. We provide an overview of the consultation submissions we received, explain our responses to the main points raised and make a long-term commitment to delivering London’s infrastructure requirements in the coming years and decades. We then set out our vision for London in 2050 – a city in which all Londoners will benefit from the unprecedented levels of growth projected for the city, which will be greener, more sustainable and more equitable.**

## **Chapter 1 Introduction**

The LIP 2050 was commissioned by the Mayor to ensure that London has the infrastructure it needs to remain one of the best cities in the world in which to live, work and do business.

The [LIP 2050 consultation presentation, report and supporting analysis](#) were published on 30 July 2014. They set out proposals about London’s strategic infrastructure requirements up to 2050 in transport, green, digital, energy, water and waste, along with the estimated costs associated and potential funding and financing options.

This is the first undertaking of its kind for London, exceptional in its attempt both to consider different types of infrastructure, as well as their total cost and possible methods of funding and financing.

The consultation report set out the significant levels of growth London is projected to experience to 2050. Now home to more people than at any time since 1939, its current 8.6 million residents are likely to grow to over 11 million by 2050. The infrastructure required to safeguard the quality of life for this number of Londoners will be substantial and will require far greater spending than we have seen in recent decades.

It is vital that infrastructure is prioritised and delivered in an inclusive way, with all Londoners benefiting from access to high-quality green space, good transport connections to work and leisure activities, and decent homes sustainably supplied with energy and water – and that all Londoners are included in the digital revolution.

It is also vital that efficiency and innovative thinking are integrated into all elements of infrastructure delivery to ensure that costs are minimised.

This report provides an overview of London's infrastructure requirements and sets out how we will ensure the continued success of the city by making them a reality. It cannot serve as a final report that concludes London's long-term infrastructure planning. Rather, it sets out the programme of infrastructure delivery we believe is necessary for London's future. It marks the beginning of a process to prioritise our needs and surmount the many delivery challenges that the city will face in the coming years and decades.

## Chapter 2 Consultation

Publication of the LIP 2050 consultation report in July 2014 was followed by a three-month consultation period. During this period we spoke to a range of stakeholders through seminars, workshops and meetings with businesses, government, infrastructure providers, as well as, importantly, Londoners. We also received over 270 written consultation responses<sup>1</sup>.

We are grateful to all those who provided written responses and attended events, which, overall, have confirmed much of our thinking, challenged some aspects and given us much more to consider and work on in the future.

In summary, the consultation demonstrates broad support for the LIP 2050's proposals and for its attempt to plan for the long term and to address diverse issues such as regulation and funding<sup>2</sup>.

The following clear themes emerged, many of which are already being addressed through the work of the Mayor.

### **We need to better coordinate London's infrastructure planning with the wider South East**

We are establishing mechanisms to enable much more joint working with the South East, which will also inform the next full review of the London Plan (see Chapter 5).

### **The Mayor's Housing Strategy and Infrastructure Plan need to be better aligned. Infrastructure is essential to unlocking housing growth and to achieving the Mayor's housing targets.**

Infrastructure investment has been a key component of many of the successful bids to the Mayor's [Housing Zones programme](#), a £400 million programme targeting investment in up to 20 areas to accelerate housing delivery (see Chapter 12).

---

<sup>1</sup> A separate report, which summarises consultation responses and lists consultees, has been published alongside this report.

<sup>2</sup> 95% of responses stated that they supported the LIP 2050 and only 5% that they unconditionally opposed it.



**If transport infrastructure can be improved, South London represents a clear opportunity for development, particularly for housing.**

The consultation report makes clear our aim to make significant improvements to the rail network in South London to provide a reliable and frequent metro service (in addition to the proposed Bakerloo line extension from Elephant and Castle through Southwark and into and beyond Lewisham). We will keep under review the need for further infrastructure improvements in this area (see Chapter 6).

**Fiscal devolution and innovative funding methods will be required for London to effectively deliver the infrastructure it needs.**

We will continue to lobby for fiscal devolution, as recommended by the [London Finance Commission](#) and we are considering other innovative methods of funding infrastructure (see Section C).

**The River Thames should be explored as a way of extending the transport offer, particularly for freight.**

Transport for London (TfL) is already making a range of investments in river infrastructure, and the Mayor's [River Concordat Steering Group](#) will consider further investment to increase passenger and freight use of the river (see Chapter 6).

**Demand management should be given more prominence.**

In order to ensure that the overall infrastructure bill to 2050 is affordable we are considering how we can balance building new infrastructure with ways of enabling Londoners to reduce the demands they place on infrastructure (see Chapter 15).

**Social infrastructure must also be planned for over the long term alongside the infrastructure types included in the LIP 2050.**

Housing, schools, hospitals and a whole range of social infrastructure will play a critical role in supporting London's continued growth and sustainability. We will work to ensure they are planned for alongside the infrastructure included in the LIP 2050 in the course of our ongoing work, in particular as we prepare the next version of the London Plan (see Chapter 12).

**Availability of land is already an important issue and will become increasingly so as our population grows.**

We are already considering releasing brownfield and contaminated land for development, and in the future we intend to repurpose existing infrastructure and develop multifunctional infrastructure to maximise the use of space (see Chapter 15).

## Chapter 3 A long-term commitment

The infrastructure planning cycle invariably spans elections. Infrastructure can become subject to political attack, long-term plans are less convincing when they can be rejected by political opponents, and plans can be undermined more easily if they do not achieve consensus. At every stage of our work, the infrastructure industry has emphasised the need for long-term plans with cross-party support if delivery is to be coordinated, accelerated and reduced in cost.

Accordingly, we have sought to achieve broad cross-party consensus for the LIP 2050<sup>3</sup>. London's political leaders are committed to working together to make a success of London's infrastructure planning and delivery, and we will continue to review the extent and effectiveness of political consensus over time.

'London Councils and the London boroughs look forward to working with the Mayor, the London Enterprise Panel and wider stakeholders from business, the regulated industries, experts and representatives from across London's diverse communities, to secure the infrastructure vital to London's continued reputation as a global destination for people wishing to work, live and visit.' 'London Councils and the London boroughs look forward to working with the Mayor, the London Enterprise Panel and wider stakeholders from business, the regulated industries, experts and representatives from across London's diverse communities, to secure the infrastructure vital to London's continued reputation as a global destination for people wishing to work, live and visit.'

### London Councils

While the need to review the Plan and make adjustments is inevitable, our commitment is that alterations will be based on evidence of economic changes, benefits arising from new technology and other relevant factors, including ongoing feedback from all relevant stakeholders.

---

<sup>3</sup> Cross-party representatives of London Councils have agreed to work together through the LIDB, and we have consulted widely with London's political leaders and with national politicians to ensure that all voices have been heard and that all can buy into the case we are making for London's infrastructure.

## Chapter 4 Our vision for London in 2050

London is already one of the greatest big cities in the world. We want to improve it yet further and to ensure that all Londoners benefit from the investments we make.

Through our work, we intend to better explain and communicate the concept of growth, which we understand in the following ways.

### **The London of 2050 will be greener.**

- By 2050, all new built developments will include more green cover, including greenways, pocket parks, roof gardens and green roofs and walls – which will encourage active, healthy lifestyles, reduce the burden on the drainage network and improve living environments.
- Pollution levels will be very low. Ultra low-emission vehicles will be more widely used, an Ultra Low-Emission Zone established by 2020 will reduce air pollutant emissions in Central London by half, and strengthening the existing London Low-Emission Zone will have delivered further benefits across the capital.
- A comprehensive network of greened cycle routes for all types of journeys and cyclists will be in place, including 200 kilometres of Dutch-style cycle highways, at least five major pedestrian, cycle or green bridges, and inter-regional cycle corridors connecting London to towns outside its border.
- Furthermore, London's green spaces will be integrated and managed as a strategic network rather than as isolated sites (see Chapter 7).

## **London will be a sustainable city.**

### **Environmentally sustainable**

- By 2050 London will have moved towards a circular economy, where goods are designed to be reused, repaired or remanufactured. The circular economy will have introduced new employment opportunities, and the city will be home to fewer large-scale waste disposal facilities.
- We will have adapted to the changing climate by ensuring that buildings and infrastructure are resilient to all but the most extreme weather events. Any opportunities afforded by the changing climate will be maximised.
- A secure, sustainable and affordable energy system will be in place. Smarter systems will help manage energy demand, Londoners will better control their energy needs and wasted energy (such as that leaking out of the system) will have been brought to a minimum.
- Water supply too will be secure, sustainable and affordable. Rainwater and wastewater will be regarded as valuable resources and our green and grey infrastructure systems will complement one another.

### **Financially sustainable**

- By 2050, London will be capable of servicing its financing commitments and will be able to raise any additional financial resources it needs to deliver infrastructure and other requirements.
- This financially sustainable London will be more attractive to institutional investors.

### **Economically and socially sustainable**

- London will also be economically and socially sustainable. There will be enough jobs for all Londoners, they will be equipped with the right skills for these jobs, and the skills system will proactively identify and meet future skills requirements, ensuring that the local population is able to compete for local jobs.
- Affordable housing will also ensure that the city has all the workers it needs to function – not just those on high incomes.

### **London will be at the forefront of technology.**

- While it is impossible to predict the extent and influence of technological developments in the coming decades, we envisage the London of 2050 remaining the location of choice for the high-tech industries. The city's physical and digital infrastructure will meet the technological needs of businesses.
- All Londoners will have access to what is now seen as high-speed internet and other technologies at home and on the move, and will have adequate training to use them effectively.
- London authorities and infrastructure providers will be able to usefully monitor all aspects of infrastructure and avert problems – they will, for example, be able to identify and respond to burst water mains, congestion and accidents much more rapidly than they can today.
- London will be the first capital city to roll out 5G, by 2020, which will be instrumental in enabling machine-to-machine communications through the 'Internet of Things'. London will be at the forefront of any other future generation technologies that will inevitably emerge in the coming decades.

**In this section we set out the new, more effective ways in which London’s infrastructure might be delivered, with a focus on the LIDB. We also give an overview of the thematic work streams, partnerships and projects to which the LIP 2050 has given rise, which will continue to evolve and develop beyond the publication of this report.**

## **Chapter 5 Joint delivery**

It has been clear to us from the outset that City Hall does not, cannot, and should not deliver London’s infrastructure alone. All those involved - in planning and design, delivery, funding and financing - will need to come together to ensure maximum efficiency and innovation at all stages.

### **Bringing infrastructure providers together**

‘Within the capital, infrastructure governance is fragmented... many developments or projects share mutual interests, but are viewed as separate entities and any chances of exploiting such interests are lost... Thus, a system must exist in London that brings together all the necessary strands of infrastructure planning and construction’.

#### **Institution of Civil Engineers (ICE)**

At present, infrastructure governance does not support integrated, cost-effective delivery, and governance varies between and sometimes within sectors. A key conclusion of the consultation report was that a clear need exists to bring the capital’s infrastructure providers together with other stakeholders, including local authorities, to coordinate and improve infrastructure delivery, which is supported by the findings of the [Economist Intelligence Unit’s 2015 ‘Urban infrastructure insights’ survey](#)<sup>4</sup>.

As committed to in the consultation report, the Mayor has established the [LIDB](#). Chaired by the Mayor, the Board is made up of senior representatives of London’s main infrastructure providers, which have readily come together to collectively take the lead on improving the delivery of London’s infrastructure. The LIDB’s overarching aim is to achieve more efficient, integrated and innovative infrastructure solutions. It has already committed to a range of projects to actively demonstrate

---

<sup>4</sup> More than half of the respondents to this survey believe that more extensive use of public-private partnerships would be the most effective way in which to improve infrastructure and services in their city; moreover, 82% say that government should work more closely with the private sector to improve urban infrastructure and services.

the benefits of a coordinated approach to infrastructure planning and delivery, as set out below.

### **London Infrastructure Programme Plan**

A Programme Plan is being developed to articulate to Londoners what will be delivered by 2050, including projects that are fully funded, projects to which we have already committed and projects that we know will be required by 2050 but are otherwise currently less certain.

By setting out the pipeline of construction across London over time, infrastructure providers will be able to identify and source the skilled workers and supply chains they require. City planners will be able to identify potential opportunities and constraints from projects being delivered simultaneously, and could, for example, highlight to one another similar funding sources or labour requirements.

The Programme Plan is not a one-off exercise; it will be updated as necessary to reflect the multiple economic, environmental, technical and other factors that will influence infrastructure provision, and as more information becomes available.

### **Integrated approaches in London's Opportunity Areas**

[Opportunity Areas](#) are parts of London that can accommodate large-scale development. Each is at a different stage of readiness for development, though over the next 10-15 years they all represent opportunities for collaboration and improved delivery.

Already, issues that have arisen at Vauxhall Nine Elms Battersea (VNEB) around planning for infrastructure, including drainage, electricity distribution and heat networks, have taught us the importance of effective master planning and coordination of all infrastructure providers concerned, from the outset.

Initially the LIDB will take an active role in Old Oak Common, the Upper Lee Valley and North Bexley – its three case study areas. It will appraise the benefits of coordinated delivery and learn lessons for further improvements.



### **Better understanding of the fiscal rules governing infrastructure investment**

We have started to analyse the fiscal rules around infrastructure set by the Chancellor, their inter-relationship with the classifications of government expenditure as determined by Eurostat and the extent to which they enable or inhibit investment in productive infrastructure. We will assess the potential for reform to enable greater borrowing for infrastructure investment.

### **An enabling regulatory system**

The regulatory system has been a key theme throughout the LIP 2050 process, and we will work to challenge regulations that restrict optimal infrastructure investment. The main regulators – Ofgem, Ofwat and Ofcom – are now a part of the LIDB, so will hear at first hand the challenges faced by infrastructure providers.

### **Supporting efficient infrastructure investment: skills, innovation and circular economy principles**

In order to understand the skills required to deliver the LIP 2050, the [London Enterprise Panel](#) (LEP) will work closely with the LIDB and relevant private and public-sector stakeholders to identify solutions to skills shortages for infrastructure projects and develop a tangible plan of action. A Construction Skills Advisory Group led by the LEP will develop and take forward the action plan, and will consider mapping the skills pipeline against the LIDB's Programme Plan.

To take full advantage of the latest technological expertise, we will work with infrastructure providers and digital technologists to develop new solutions to common challenges (see Chapter 15).

And in order to make the most out of the existing system, we will work to ensure that London's infrastructure is developed in line with the principles of the circular economy (see Chapter 10).

### **Success measures**

The success of the LIDB will be measured against tangible outcomes - and ultimately by the more efficient delivery of London's many infrastructure requirements.

The LIDB has set itself the following measures of success. Short-term measures, to have been achieved by 2017, are as follows:

- Feedback from infrastructure providers, developers and constructors confirming that joint working has become standard working practice;
- Infrastructure providers being assured that there is cross-party commitment to delivering London's infrastructure programme;
- Innovative solutions being in place to address common challenges;
- Skills gaps being identified and plans being in place to train Londoners in time to deliver planned infrastructure;
- Regulatory and policy barriers being surmounted.

### **Longer-term measures to have been achieved by 2025 include:**

- User experience across infrastructure types being improved, for example through shorter journey times, world-class access to the internet and smart solutions to reduce energy and water usage;
- Environmental and community impact of construction and infrastructure maintenance being minimised;
- Housing potential being unlocked across London;
- Costs being reduced;
- Training and supply chains being in place to provide timely and efficient delivery;
- London being regarded as an exemplar of infrastructure delivery;
- London's infrastructure enhancing the capital's position as the best city in which to live, work, study, visit and do business.

## **Working with the wider South East**

Our remit in producing the LIP 2050 has necessarily been to consider London's infrastructure requirements. It is not the place of the Mayor of London to assess the infrastructure requirements of areas outside the capital – yet we are aware that a great deal of the infrastructure that serves London does not stop at our boundary. London also shares many of the same challenges and opportunities as its neighbours.

The Mayor is currently working with the East of England Local Government Association and South East England Councils to develop arrangements for more effective coordination of strategic policy and infrastructure planning across the wider South East. Only on the basis of robust bottom-up cooperation can the long-term distribution of growth be considered effectively.

## **Working with national government**

It will also be essential for London infrastructure planning to be aligned with national infrastructure planning. Infrastructure UK is represented on the LIDB, which will help ensure consistency with national activities, and we will seek further ways to collaborate.

## **Planning together with a common understanding of London's projected growth**

The LIP 2050 and the [Further Alterations to the London Plan \(FALP\)](#) place great emphasis on strengthening infrastructure planning in London. This is not only in line with the National Planning Policy Framework, which promotes infrastructure provision as a key priority, but was also clearly supported by almost all stakeholders throughout the FALP's preparation and at its Examination in Public.

The GLA's projections of long-term growth in the capital, set out in the LIP 2050 consultation report, show higher growth than previously forecast. Having brought London's main infrastructure providers together through the LIDB to improve infrastructure delivery, it is important that we are all working to the same understanding of London's growth by consulting with stakeholders on an ongoing basis.

To enable even greater levels of coordination, we want to see planning undertaken by bodies such as the regulators and utility companies to be more joined up with London's infrastructure planning – and progress has been made. Through projects such as the London Energy Plan (see Chapter 9) we are already working to translate growth projections into practical energy demand projections for utilities to consider, and the spatial planning data from the [London Development Database](#) has been made available to UK Power Networks to inform their electricity demand forecasting modelling. These data sets will now be made available on a regular basis and there is scope for other utility providers to have access as well. In return we would expect utility companies to make their data publicly available to inform and help coordinate infrastructure planning.

In time we would expect utility companies and regulators to then have due regard to the growth projections and infrastructure commitments in the London Plan.

### City data

A number of recent initiatives such as the [London Datastore](#)<sup>5</sup> and the [London Schools Atlas](#)<sup>6</sup> have shown the potential benefits of openly available data (see Chapter 15). The importance of data will become ever greater, especially as planning tools such as Building Information Modelling (BIM)<sup>7</sup> develop and are integrated into infrastructure planning, design and maintenance. To enable effective data sharing and coordinated planning, common underlying assumptions and common data platforms will be needed.

---

<sup>5</sup> *The London Datastore uses data to visualise the 'pulse' of the capital. It displays data as varied as crime rates, Tube delays and recycling volumes. It brings together data feeds on the city's essential infrastructure and services in an accessible user interface. It can help monitor key services, gain insight into citizen's priorities, and enable international benchmarking.*

<sup>6</sup> *The London Schools Atlas is an interactive online map that offers a uniquely detailed and comprehensive picture of London schools, current patterns of attendance and potential future demand for school places. For parents and children it offers the most vivid insight yet into the educational options for their family, in their locality and wherever else they may consider living in London.*

<sup>7</sup> *BIM can be defined as the purposeful management of information through the whole life cycle of an infrastructure asset. It is a managed approach to the collection and exploitation of information. At its heart are computer-generated models connecting all graphical and tabular information about the design, construction and operation of the asset.*

## Chapter 6 Transport

[TfL's annual business plan](#) sets out detailed plans to develop London's transport system over the next ten years. As with other areas of the LIP 2050, it would neither be possible nor desirable to attempt to define a detailed plan for London's longer-term needs beyond the next decade. Rather, the LIP 2050 aims to identify a set of strategic requirements for the longer term, balancing the need for flexibility whilst also ensuring a pipeline of projects is in place.

### Ensuring the foundations for London's continued global success

There is strong evidence that the very high employment densities in Central London are a result of powerful agglomeration economies. This agglomeration effect depends on the 'hyper connectivity' Central London enjoys at the heart of the rail system and in its access to a leading international hub airport.

Some responses to the consultation suggested that a multi-polar<sup>8</sup> employment model would be preferable to the current system. Yet in our view, the two models are not mutually exclusive; we expect Outer London town centres and London's other employment areas to continue to play a vital role in London's economy, alongside Central London, and transport investment will continue to facilitate employment growth in all of the following locations:

- Established employment areas in Central London;
- Previously peripheral areas of Central London, such as VNEB and King's Cross;
- New clusters of high density employment such as Old Oak Common and Stratford;
- Employment growth areas across London in sectors that are less dependent on the agglomeration economies found in Central London.

---

<sup>8</sup> Multi-polar refers to a situation where town centres and other sites outside Central London are developed for employment with supporting transport infrastructure.

The value to London and the surrounding regions of maintaining a leading global hub airport was recognised in particular by local authorities in the broader region surrounding London. These stakeholders identified investment in airports as their second highest priority (after rail).

London's international links remain vitally important to its economy, which is highly dependent on its openness to the global economy. The Mayor firmly believes London needs a new hub airport with sufficient capacity to serve long term growth and is opposed to expansion at Heathrow. Meanwhile, transport connections to and from existing airports need upgrading, which is why four tracking the West Anglia lines to Stansted and improving capacity on the Brighton line to Gatwick are strategic requirements for the capital and the surrounding region.

The consultation report set out an ambitious programme of radial rail capacity investment. In addition to completing the tube upgrade programme, the first new scheme we need to bring forward is Crossrail 2. We are also considering proposals for the Bakerloo Line extension beyond its upgrade. Key to these schemes is the development potential they will unlock in helping to house London's growth. Development work is well underway on these schemes and new ways of maximising the potential of the rail network through different operating models are being explored.

Recent consultations have demonstrated overwhelming support for new river crossings to help regeneration in major growth areas in East London. TfL is actively progressing three new river crossings in East London. By the end of 2015 we hope to submit an application for powers to build and operate Silvertown Tunnel, and a further consultation will be held in Autumn 2015, following more work to develop crossings at Gallions Reach and Belvedere.

TfL is also investigating the affordability and feasibility of new road tunnels, including a scheme to replace the inner ring road, as well as 'fly unders' and 'decking over' sections of road to unlock surface space, improve safety and manage congestion. More than 70 locations have been reviewed, initial feasibility studies are now underway for five locations, and two options for a Central London tunnel are being assessed.

## Supporting a better, not just bigger, London

The Mayor's ambition is to make London one of the best cities in the world for walking and cycling. A good start has been made in delivering his £913 million [ten-year cycling vision](#), which will include the construction of four new segregated Cycle Superhighways and upgrades to the four existing Cycle Superhighway routes.

The LIP 2050 consultation also set out ambitious multi-billion pound plans to enable at least two thirds of public transport journeys to be made on step-free routes. While some responses called for a 100% step free network, it is our view that this is not an economically realistic ambition for the Tube given the combination of very high costs associated with remedial work on historic infrastructure. As such, we will continue to invest in the bus network, which is 100% step free, make a far higher proportion of surface rail stations step free and focus on key Underground stations.

River passenger services are not yet reaching their full potential and action is required to bring about transformational change. Through the River Action Plan, TfL is making a range of investments in river infrastructure, including extending existing and building new piers, with the aim of boosting passenger numbers to 12 million a year by 2020, and planning new passenger piers at Battersea Power Station, Rotherhithe, Convoys Wharf and Enderby Wharf. In the longer term, we envisage continuing expansion of river services, particularly to serve population growth east of Canary Wharf where fewer constraints exist.

In 2013 over five million tonnes of freight were transported on the Thames, taking 265,000 lorry movements off London's roads. Freight infrastructure is, however, relatively more developed in the East than the West. Developing freight capacity could significantly reduce road freight traffic volumes and enhance local employment opportunities.

As such, the Mayor's [River Concordat Steering Group](#), a group of stakeholders brought together to address strategic issues on the river, will consider this matter<sup>9</sup>.

---

<sup>9</sup> *The River Concordat Steering Group will consider matters including: combining use of the river for containerised goods with last mile by electric; significant additional capital investment, for example to ensure long-term access to wharves, sufficient space and equipment for loading, and good road access; and a new boat yard to support the boats operating on the Thames.*

## Chapter 7 Green infrastructure

As set out in the consultation report, we want green infrastructure to be regarded as a type of infrastructure in its own right. We also want the full range of benefits it provides – including shade, drainage, biodiversity, pedestrian and cycle routes – to be quantified and included in business cases. We have established a Green Infrastructure Task Force to work on a more strategic and long-term approach to green infrastructure investment and delivery.

<sup>10</sup> *The Natural Capital Committee advises Government on how the natural capital (the value of the goods and services provided by the natural environment and urban green spaces) can be managed efficiently and sustainably to promote economic growth and well-being.*

<sup>11</sup> *In its third report (The State of Natural Capital), the Natural Capital Committee identifies 'improving and expanding urban green infrastructure' as an investment priority and provides an evidence base for this investment, but also recognises that the 'costs and benefits are highly spatially dependent and further work is needed to quantify them'.*

<sup>12</sup> *Natural capital accounting is a framework that has been developed to capture the true value of ecosystem services (such as flood management and health improvement) that are usually considered as externalities with no financial impact and are therefore not factored into decisions about investment in and management of land.*

<sup>13</sup> *I-Tree Eco is a methodology developed by the United States Forest Service. It has been used by over 50 US cities to provide a compelling economic justification for managing and expanding a city's canopy cover.*

### Developing the evidence base

The work of the Task Force will align with that of the national [Natural Capital Committee](#)<sup>10</sup>, in the first instance by contributing to its work to quantify the spatially dependent costs and benefits of green infrastructure and to better target interventions<sup>11</sup>. Guided by the Task Force, the GLA and its partners are undertaking the following studies.

#### – Natural capital accounting pilot

A natural capital accounting pilot<sup>12</sup>, to be published in Spring 2015, is being undertaken for Beam Parklands in Dagenham. It will not only capture the full value of ecosystem services to inform investment decisions, but will also help test and demonstrate the applicability of the model to an urban green space.

#### – London Sustainable Drainage (SuDS) modelling

By Summer 2015 we are working to quantify the opportunity and potential for surface water management by wide-scale delivery of SuDS across London and in one strategically important drainage catchment.

#### – The London i-Tree Eco assessment

London i-Tree Eco<sup>13</sup> assessment, to be published in Summer 2015, will evaluate the benefits provided by trees and tree canopy cover in order to identify the economic value of London's 'urban forest' and monetise some of the services it provides.



## Accelerating delivery

The concept of green infrastructure is increasingly informing the planning and delivery of GLA Group projects amongst others in London. The following serve as examples.

### – Major regeneration sites

A suite of policies has been included in the Opportunity Area Planning Framework (based on lessons learned from the [Olympic Quarter](#) and [Barking Riverside](#)) to ensure green infrastructure informs the design and development of [Old Oak Common](#).

### – Changes to London's road and streets

TfL and the London boroughs are working to ensure that more of London's street space is made greener, safer and more user friendly (for example in the [Aldgate Gyratory](#) and the [Quietways](#) programme) in line with recommendations of the Mayor's [Roads Task Force](#).

### – Big Green Fund, Pocket Parks and Drain London

The Mayor is targeting funding at projects that illustrate the joined-up thinking and integrated delivery which characterise the best green infrastructure projects in London - such as the strategic intervention at [Walthamstow Wetlands](#) and the smaller scale [Derbyshire Street Pocket](#) Park.

## Chapter 8

### Digital connectivity

Digital connectivity is rightly considered the fourth utility. Vital for many businesses, access is also becoming essential for all citizens to take part in modern society.

London benefits from an extremely broad range of digital connectivity infrastructure suppliers, with over 500 offering a variety of fixed and wireless services across the capital. 89% of the city now has access to fast connections, and local authorities frequently work with diverse providers to deliver connectivity in areas where larger suppliers are unable to roll out.

However, at present some parts of the city are still without access. In order to ensure that every resident and business in London is able to access affordable high-speed internet connectivity and that connectivity infrastructure can be more easily upgraded in future, a number of immediate problems must be addressed.

As set out in the consultation report, the Mayor established the [Connectivity Advisory Group](#) (CAG) in 2014 to address the root causes of connectivity problems in the capital. The Group has developed a wide-ranging action plan, which includes the following.

- The Mayor's Connectivity Rating Scheme, to be launched in Summer 2015, will rate and promote the connectivity levels of different buildings to assist consumers to find appropriate premises, and encourage developers and property owners to improve the connectivity of their properties.
- A connectivity toolkit for London boroughs, providers and other stakeholders will also be made available this year. It will enable stakeholders to learn from best practice and access useful data; it will include a detailed London-wide connectivity map to highlight existing levels of high-speed connectivity as well as 'not-spots'; and it will provide information about locations on GLA Group property that could be suitable for wireless infrastructure

This will give London the tools it needs to solve its connectivity problems. By the summer, the Mayor will set new ambitious targets to provide London's businesses and residents the connectivity they need wherever they are located in the city.

In a broader sense, the Mayor is running a number of other projects that will help to stimulate demand in the long term, including the Digital Skills Programme and the [Digital Inclusion Strategy](#).

## Chapter 9 Energy

London's energy infrastructure must supply energy securely and reliably, provide affordable and cost-competitive energy, and deliver an 80% reduction in carbon dioxide emissions by 2050, in line with Mayoral and national government policy. New and existing energy infrastructure must also be made resilient to climate risks.

To support these objectives we are working on a number of projects, as set out below. For more information, see our [energy supply pages](#).

### Ensuring investment ahead of need in electricity infrastructure

One of the key issues identified in the consultation report was an inability for investors to finance electricity infrastructure ahead of demand, which can have an impact on the cost and delivery times of developments in Central London. We have been working with Ofgem, No. 10 and the Department of Energy and Climate Change to look into how these barriers to investment could be removed, and the potential solutions we have generated will now be considered by Ofgem<sup>14</sup>.

### Efficient production of energy that is local to demand

The Decentralised Energy Project Delivery Unit (DEPDU) supports London boroughs (and other public and private partners) to develop decentralised energy projects, and offers technical, financial and commercial advice for larger energy projects. The majority of projects rely on combined heat and power (CHP) energy generation and sources of waste heat. DEPDU currently supports 17 projects in advanced stages of development, and the GLA intends to extend programme support even further through an Energy for London successor programme, which will seek to develop and deliver a further £350 million-worth of decentralised energy projects to market by 2020.

---

<sup>14</sup> Since the publication of the consultation report, discussions have been taking place between the GLA, UK Power Networks (UKPN), the Department of Energy & Climate Change (DECC), No.10 and others to find a solution to the inflexibility of the current system. Ofgem is now formally considering a number of options, including those developed by the GLA and partners, which is likely to give rise to a formal consultation.

The GLA has become the first authority in the country to apply for Licence Lite, a form of junior electricity supply licence. This enables it to buy from smaller-scale electricity generators and supply their outputs to selected electricity customers. This system offers the generators better prospects of obtaining higher prices for their power, more in line with the large-scale wholesale market for electricity. To initiate the operation of our Licence Lite, we are currently inviting companies that generate electricity to bid to provide the electricity.

### **The London Energy Plan**

Based on findings presented in the consultation report, we are now developing the London Energy Plan, London's first spatial attempt to map energy demand, supply and infrastructure in the years up to 2050. The Plan will include:

- A spatial map of London's energy supply and demand to 2050, alongside options for the infrastructure that could support it;
- Projections of heat and electricity infrastructure;
- Consideration of how demand could be shifted away from peak times through further retrofitting of the built environment, increased use of electrically powered transport and 'smart' energy solutions<sup>15</sup>.

We expect to launch and open public dialogue on the London Energy Plan in Autumn 2015.

---

<sup>15</sup> Our [RE:NEW](#) and [RE:FIT](#) projects are also reducing energy demand in homes and public buildings across London. RE:NEW has already delivered improvements to over 100,000 homes and will retrofit a further 175,000 homes by 2017. Through RE:FIT, 408 buildings have been retrofitted or are in the process of being retrofitted across London. These programmes will continue to run over coming years, further reducing demand.

## Chapter 10

### A circular economy

The consultation report set out our ambition to significantly reduce the amount of waste being disposed of, by helping London move towards a circular economy, where materials are reused, remanufactured or recycled rather than thrown away.

This kind of shift could result in significant environmental and economic benefits. But in order to realise this ambition, it will be essential to ensure the correct incentives and facilities are in place.

As such, the GLA and the [London Water and Recycling Board](#) (LWARB) will develop a route map for London's transition to a circular economy. A primary materials scoping study, which will recommend metrics and make recommendations for the route map, is currently underway, and the [London Sustainable Development Commission](#) (LSDC) has commissioned a study on the value of London's secondary materials. Both will inform the development of the route map

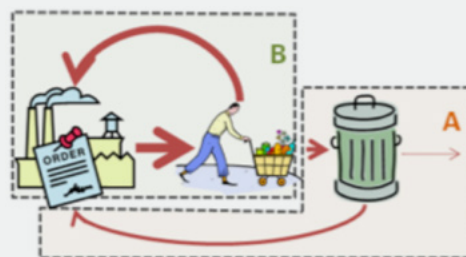


FIGURE 1 SHOWS HOW THE LSDC (A) AND GLA (B) STUDIES WORK TOGETHER TO GENERATE A ROBUST PICTURE OF CIRCULAR ECONOMY OPPORTUNITIES IN LONDON

The LIDB has committed to ensuring circular economy principles are embedded across all areas of infrastructure delivery in London, and a Circular Economy Sub-Group of the LIDB is being set up to deliver this commitment.

The LEP will develop opportunities for SMEs to benefit from an accelerated transition to the circular economy, and the GLA Group procurement service has identified next steps for public procurement to support the transition. The first step will be a mapping exercise of priority materials and services, which will be taken forward following the completion of the two scoping studies in Spring 2015.

## Chapter 11 Water

The challenges of sustainably managing water security, quality, drainage, wastewater and flood risk are considerable. They are amplified by ageing infrastructure, population growth and the changing climate. To ensure we take a proactive, integrated, far-sighted and risk-based approach to managing these challenges and realising any opportunities, the Mayor has convened the WAG to bring together key representatives from the water sector.

### Developing and delivering actions

The consultation report proposed a number of actions relating to water, many of which were shown to have wider support through the consultation process, including the following:

- Promoting the need for a national policy statement on water resources;
- Encouraging and supporting water companies to invest in new technologies and approaches to use water more wisely;
- Taking a resilience-based approach to long-term water resource options;
- Publishing a sustainable drainage action plan for London, in parallel to working with Thames Water on a long-term wider drainage plan;
- Seeking opportunities to generate energy from water and wastewater;
- Developing a 25-year flood risk management and investment plan;
- Encouraging a risk-based share of the national flood budget whilst, in parallel, securing match funding (where appropriate) from certain beneficiaries of flood protection;
- Raising political and public awareness of flood risk.

### **Opportunity Areas and wider development**

The WAG will work with [Old Oak Common and Park Royal Mayoral Development Corporation](#), relevant boroughs and other stakeholder groups to develop an Integrated Water Management Strategy for each of the three priority Opportunity Areas. These will optimise the planning and delivery of water infrastructure, provide transferable best practice and identify synergies with the implementation of other infrastructure.

The Mayor will also work with the water companies to identify and resolve strategic-level ‘pinch points’ in the capacity of water supply, drainage and sewerage infrastructure to address the cumulative impact of wider incremental growth.

Through the LIDB, the Mayor will seek to influence Ofwat and the Treasury to enable investment ahead of need in a way that also manages the risk of stranded assets or water companies being unable to recover their advance investments.



## Chapter 12

### Housing and social infrastructure

Housing, schools, hospitals and a whole range of social infrastructure will play a critical role in supporting London's continued growth and sustainability. They need to be planned alongside other aspects of infrastructure, both to ensure that communities are liveable and that a comprehensive approach is taken when considering the funding and financing of the city's infrastructure.

#### Housing

The potential for infrastructure, particularly transport, to unlock housing growth across London has underpinned much of the thinking behind the LIP 2050. Some areas of the capital are already evolving into vibrant new communities that are home to many Londoners, and with additional investment, major housing development could be accommodated in lots of other areas. It is imperative that we maximise the potential of reservoirs of land within the city and plan infrastructure and housing together, based in part on the precedent being set through the extension of the Gospel Oak to Barking line, which will allow for the development of 11,500 new homes.

There was strong support in the consultation responses for our plans to unlock further housing development in London's Opportunity Areas through transport investments such as Crossrail 2 and the Bakerloo Line Extension.

There was also very strong support for improving transport provision in certain other areas, in particular South London, which many respondents feel is unable to meet its full potential because of relatively underdeveloped transport networks. TfL and the Mayor are developing plans to address this matter (see Chapter 6).

The Mayor's [Housing Zones prospectus](#), published in June 2014, invited bids to a £400m programme to target investment in 20 areas to accelerate housing delivery. The response was extremely positive, with 25 borough-led bids received from across London. In February 2015, the Mayor announced the first nine designated Housing Zones<sup>16</sup>:

- Abbey Wood, Plumstead and Thamesmead
- Abbey Wood and South Thamesmead
- Barking Town Centre
- Clapham Junction to Battersea Riverside
- Heart of Harrow
- Hounslow Town Centre
- New Bermondsey
- Southall
- Tottenham

Infrastructure investment has been a key component of many Housing Zone bids. The first set of Zones designated includes:

- Five station upgrades
- Five estate regeneration schemes
- Five new schools
- Four new bridges built over water, rail and road to unlock development
- Three new libraries
- Three new health facilities
- Two new civic centres
- A new church
- A new park
- A 3G football pitch

---

<sup>16</sup> So far £260 million of funding has been allocated to these Zones, which will help attract around £9.4 billion of investment from other sources and accelerate the development of 28,000 new homes (of which 9,000 will be affordable), as well as creating over 56,000 construction jobs.

## Healthcare

The [London Health Commission](#), an independent inquiry established by the Mayor and chaired by Lord Darzi, examined how London's health and healthcare can be improved. In October 2014, the Commission published its [Better Health for London](#) report to the Mayor, which included a proposal to invest £1 billion of public capital over the next five years to ensure that every Londoner is treated in a modern purpose-built or purpose-designed facility. We will work with the NHS to ensure these investments are well planned in relation to London's overall growth.

## Education

Over 600 new schools and colleges will be needed in the years up to 2050, and the significant projected increase in London's population will place pressure on local authorities to increase the number of places available. This growth in provision will either have to be funded from increased central-government contributions or from additional locally raised sources (see Chapter 13, in which we consider the growing need for fiscal devolution to London), and it will be vital to integrate education infrastructure within wider infrastructure planning.

**In this section we consider how London might pay for its infrastructure requirements. We argue for structural changes that would facilitate delivery, with a focus on fiscal devolution, and explore how we can develop better business cases through more intelligent approaches to long-term strategic planning, funding and decision making. In recognition of the need for a radical change in approach to the funding and financing of London’s infrastructure if the bill is to be met, we investigate ways of reducing costs and expanding the funding sources available to us.**

## **Chapter 13 Powers and structural changes**

### **Devolution**

Devolution will continue to be high on London’s agenda. Central government maintains a high degree of control of London’s tax base, which places unreasonable restrictions on the city’s ability to make integrated long-term investments in its infrastructure. The current balance of fiscal powers limits London government to a series of negotiated fiscal schemes (such as the Tax Increment Financing (TIF) set up to fund the Northern Line Extension), which are time consuming and limited currently to a single tax revenue stream, business rates. It also restricts the ability of London’s government to incentivise growth across the capital – for example through improved delivery of public services, efficiency savings and the discipline of servicing borrowing.

In order to improve infrastructure delivery, at the very least we will need more TIF schemes across London. The mechanism set up for the Northern Line Extension will enable the GLA to borrow up to £1 billion to begin construction in 2015; but London should be able to use a broader range of taxes to support infrastructure investment, including Stamp Duty Land Tax. We are also considering how other local financing tools might help London come closer to fulfilling its infrastructure needs. California, for example, has introduced the concept of Enhanced Infrastructure Financing Districts, geographical areas where a percentage of property tax revenues is ringfenced to pay for infrastructure; it is possible that a similar measure may work well in London.

However, new fiscal powers for London will be required. We are calling for the devolution of the full range of property taxes to London, in line with the recommendations of the [London Finance Commission](#), and we are also considering other fiscal levers that could be employed in future. This may include introducing additional local taxes, such as an infrastructure tax levied to pay for large projects in the South East, or the assignment of existing tax revenues streams; for example, our calculations shows that if even a small portion of income tax revenues in London were assigned for infrastructure, it could fund projects equal in cost to another two Crossrails.

As well as devolving taxes to London, we are also exploring bottom-up approaches to funding infrastructure that eschew traditional forms of taxation altogether – including asking people and communities to nominate infrastructure for which they would be willing to pay extra fees, and crowd funding, where people would be able to invest their own money in the infrastructure they want to use and pay for (which would also afford them a return). These kinds of approaches would render infrastructure spending more transparent and would also forge a more direct relationship between those who invest, use and pay for infrastructure.

## Chapter 14

### The business case

It will also be vital that the business cases we make for infrastructure are comprehensive and compelling, and in particular that they reflect the full range of benefits associated with unlocking economic potential..

'Clearly those projects which are likely to generate the greatest value for money will need to be prioritised. However, we believe that the way business cases are currently prepared is much too narrow. This is particularly true for the very large strategic schemes, such as Crossrail 2'.

#### Atkins

The current centralised decision-making system for funding was developed in an era in which only modest national budgets were available for managing what was felt to be the inevitable decline of cities. This is no longer fit for purpose in today's more expansionary city-focused climate, and the appraisal system currently used by the Government stands out as particularly ill suited to the kinds of large projects that will fundamentally transform the way the economy functions. It is clear that a new approach to long-term strategic planning and funding with more integrated, devolved decision making is needed if we are to unlock the economic growth, jobs and housing London needs.

The major investment decisions of the future will need to be shaped by a more holistic view of cities' needs. Significant savings could be made by taking into account programmes rather than focusing exclusively on projects, and a fresh approach to investment decisions could introduce a better strategic focus on how investment is paid back.

It is vital to build these different dimensions into the project evaluation criteria so that as each project progresses, opportunities that alter the final proposition and deliver greater social benefits can be pursued.

## Chapter 15

### Reducing costs and demand

In the consultation report published in July we set out our best cost estimates to meet all our infrastructure needs, which implied a need to almost double expenditure as a proportion of London's economy. After looking at the funding sources available, we concluded that this level of investment cannot be sustained if approached in the traditional way<sup>17</sup>.

Building on the conceptual framework we set out in the consultation report, we outline below a number of innovative measures that could drive efficiencies, bring down costs or reduce our need for infrastructure. We believe innovation goes far beyond technology and digital solutions, and must be embedded in all new approaches we adopt.

#### Better use of existing assets

We are considering how multifunctional infrastructure (infrastructure that has more than one purpose) could work in London. The following serve as examples of how infrastructure projects could be integrated to perform more tasks than they were originally intended for, which would ultimately release land or allow it to be used more intensively:

- Road tunnels that can also act as floodways or to carry TMT cabling;
- Roads with a green lane to provide drainage;
- Green roofs on schools that could form part of a sustainable drainage system as well as providing spaces for informal play or science-based education.

We are also looking into the possibility of re-purposing redundant or underutilised infrastructure – for example how tunnels, rail tracks and stations could be used to accommodate future needs in a faster, cheaper and more efficient way.

---

<sup>17</sup> For more information, please see [The cost of London's long-term infrastructure](#) by Arup and the [London Infrastructure Plan 2050 consultation document](#)

## Technological solutions

Technological solutions are likely to play a role in reducing the delivery cost of infrastructure in future.

We are working with [HyperCatCity](#)<sup>18</sup> to investigate solutions that could reduce TfL operating costs, as well as to consider how we could create a fully integrated digital representation of London's above-ground and underground assets. This would both improve how existing assets are efficiently managed and renewed and how new assets are delivered, and would serve as a valuable platform for:

- Digital modelling and simulation testing the feasibility of adding new infrastructure developments in growth areas;
- Incentivising greater coordination and sharing of costs around potential works;
- Investigating the potential of non-invasive technologies for fixing underground problems (such as leakages).

Given the significant costs involved, we hope to begin with a pilot at a restricted scale, in Old Oak Common, to demonstrate the benefits of a wider intervention, to be led by the HyperCat Consortium<sup>19</sup>.

---

<sup>18</sup> [HyperCatCity](#) is a consortium of technology and service companies brought together through a government-backed programme. Working to accelerate the market development of interoperable, open and secure smart solutions to address city infrastructure growth challenges, it aims to explore innovative smart technology ecosystems to improve efficiency; demonstrate infrastructure cost savings, both capex and opex; stimulate economic growth; develop new revenue models; promote citizen satisfaction; and promote standards that remove barriers to entry for smaller innovative players.

<sup>19</sup> The Hyper/CatCity Consortium will collaborate with the GLA to establish best practice and conduct research and development into policy for smart city infrastructure.

We are also working closely with infrastructure providers to investigate the potential for innovation in infrastructure delivery. Leveraging the expertise of the [SMART London Board](#) and through the Smart London Innovation Network, we plan to inform technology specialists and innovators of the concrete challenges faced by infrastructure providers, with the best ideas then being piloted by industry.

## Demand management

As well as reducing the costs of infrastructure delivery, we are also investigating ways of reducing the overall demand for it, in line with the findings of a recent [Economist Intelligence Unit \(2015\) survey](#), which suggests that 'the public may be willing to adapt their use of infrastructure if they have the right tools and information to understand their usage.' The [DEMAND Centre](#) will analyse our estimated infrastructure needs and suggest different options for reducing demand for infrastructure, but the following are examples of demand management tools we have looked into.



The [London Datastore](#) already enables innovators to create useful apps from GLA data, and plans are in place to make available more data about the city's infrastructure consumption and performance. Adopting a 'digital first' approach, we intend to further the use of digital infrastructure and citizen co-design to move to a system in which infrastructure is only built where a genuine need exists.

Smart meters are empowering consumers to monitor and reduce their utility bills, and through the Growing Places Fund (GPF), the GLA is supporting new entrants to the energy market, such as TEMPUS Energy, to roll out and improve these technologies to enable consumers to reduce their peak-load energy usage. Ultimately, shifting use away from peak periods will reduce the need for new infrastructure developments, as well as decreasing CO2 emissions and energy bills. Thames Water has committed to meter every property in London by the 2030s.

Smart parking will also help to better manage and reduce demand, as is currently being explored by the City of Westminster. Building on this pilot, in time we hope to develop and introduce demand-based smart parking across London, which could be of financial, economic and environmental benefit to both local authorities and Londoners<sup>20</sup>.

Road user charging systems, in which prices change depending on demand, time of day and location, may promote sustainability in some parts of the city, and more flexible patterns of vehicle ownership, such as fleet-to-peer vehicle rental, could also reduce demand.

---

<sup>20</sup> A report conducted by UCL students analysed the implementation of demand-based smart parking to more than 158,000 parking spaces in London's 13 inner boroughs and the City of London. The analysis showed the following three key benefits that smart parking could bring to London: (1) £166 million in increased parking revenue, (2) £259 million in annual economic benefit from parking time savings alone, and (3) a reduction of 112,000 tonnes per year in CO2 emissions.

### **Extracting more value out of data**

Approximately 90% of all world data have been created in the last two years<sup>21</sup>. In order to ensure that data work in our favour, the GLA is working with Nesta and the Open Data Institute (ODI) to develop a series of city data challenges for London to generate solutions to better manage demand and reduce costs.

<sup>21</sup> *Big Data, for better or worse: 90% of world's data generated over last two years!*. [ScienceDaily](#). [ScienceDaily, 22 May 2013](#)

## Voluntary standards

In line with the thinking of the Government's Construction 2025 strategy and the ICE's 2012 report [Specifying Successful Standards](#)<sup>22</sup>, we believe that voluntary standards, through incentivising different parties to meet set outcomes, can help drive innovation. Working with the British Standards Institute (BSI), we are investigating the potential of using standards to drive forward our policy recommendations, such as accelerating the transition to a circular economy. The example below illustrates how standards can be used to drive down costs.

### Benefits of standards in High Speed 2

HS2 Ltd established 19 work streams to identify how significant cost savings could be made, one of which focused on the efficient application of standards. As part of this work, the BSI conducted research into the standards landscape; it identified specific gaps within the existing standards portfolio, as well as inconsistencies in the interpretation of existing standards and unnecessarily complicated procurement strategies. The work also estimated that capital cost savings of up to 5% could be made if compliance needs were clarified and simplified and new material specifications standardised. As a result of this exercise, HS2 will specify procurement standards in future.

### Innovative planning in all projects

Old Oak Common represents the biggest single regeneration opportunity in London. To ensure that innovation and digital technology are embedded in the planning and delivery of the redevelopment project, the GLA, the SMART London Board and the Old Oak & Park Royal Development Corporation (OPDC) will work with developers and utility providers to deliver a number of innovative strategies in support of the OPDC Local Plan.

BIM, through which digital representations of physical and functional characteristics are generated, is becoming an increasingly powerful tool for planning and managing places and is employed at various locations across London. As it is not yet possible to integrate these separate systems (which reduces the potential for future synergies and scenario testing), we hope to incentivise an interoperable BIM system through our work.

<sup>22</sup> The Government's Construction 2025 strategy aims to reduce costs by 30% and increase the speed of project delivery by 50%. The ICE's *Specifying Successful Standards* report concluded that the interpretation and application of standards create inefficiencies and increase costs, and recommended that outcomes rather than inputs should be defined and that the industry should be empowered to challenge and innovate.

The Crossrail Innovation Portal provided an online platform that allowed people to submit their ideas to Crossrail's Innovation Team for consideration. In return, Crossrail provided those with the best ideas access to the social and financial resources required to implement their ideas. We will work to ensure that Innovation Portals become a fundamental feature of projects in future, facilitating the identification, development and implementation of original ideas.

To ensure innovative ideas developed in past projects are not lost, a library of best practice will be developed on the GLA website, to be applied to future projects, and the LIDB will foster better coordination and collaboration across infrastructure providers to help encourage innovation.

Ultimately, these kinds of fundamental approaches should be embedded in all new projects.

**The responses to the LIP 2050 consultation broadly suggest that our appraisal of London’s strategic infrastructure requirements to 2050 is realistic. However, constraints relating to funding and availability of land are very real, and the need for a robust plan setting out how to reduce costs and rank infrastructure requirements is clear. In this section we set out how we will prioritise infrastructure – and the next steps we will take to realise our vision for London in 2050.**

## **Chapter 16 Prioritisation**

As set out in the consultation report, London’s infrastructure requirements to 2050 are significant, and include among others:

- 1.5 million new homes;
- A 50% increase in public transport capacity, through Tube upgrades and extensions, Crossrail 2, road tunnels and river crossings, and a comprehensive rail network across London with substantial improvements to services in South London;
- Over 600 schools and colleges;
- 9,000 additional hectares of accessible green space;
- A new ‘strategic’ water resource;
- A sustainable drainage network to complement the current drains and sewers;
- High-speed digital connectivity;
- Around 40 facilities for reuse, remanufacturing, recycling and waste management.

While our ongoing analysis and feedback from the consultation suggest this remains a reasonably accurate estimate of London’s long-term needs, we know that further work is required to prioritise programmes and projects.

'For maximum credibility, the plan and its future iterations will need to set out the process by which projects will be developed and assessed against each other. It should also set out the pipeline of future projects for which funding is available, as well as those which would come forward should additional funding headroom emerge'.

### **London First**

We are developing a Programme Plan across key sites and major pan-London projects to look at each Opportunity Area and identify sets of projects that can be delivered jointly, and to bring them together in an overall long-term overview of potential infrastructure delivery across London.

Maps and visualisations will be made available in Summer 2015 and will set out our latest understanding of planned and speculative infrastructure build and development across the city. It will be possible to view them at London level, local area level and by individual projects.

The Programme Plan will serve to:

- Communicate to Londoners in an accessible and interactive way;
- Help London's planners and infrastructure providers identify pinch points and opportunities, such that works can be effectively coordinated, planned and prioritised;
- Help infrastructure providers plan for the longer term, providing a clear view of infrastructure commitments and plans.

This is the first time we have attempted to programme plan over the long term across sectors and across the city. It will be an evolving tool, which will be modified and restructured as more data become available, as our knowledge grows and as plans inevitably change. Over the coming months we will further refine these outputs to increase their usefulness and we will use them to identify opportunities for consolidation, as well as challenges that mean we have to delay or alter projects, and we will update them to reflect these changes.

We will also develop a robust prioritisation framework that will allow us to assess different projects against each other, as well as against the Mayor's vision for London; our key performance indicator (KPI) framework will relate to London's economy, housing provision, quality of life and well-being, and sustaining London's environment.

## Chapter 17 Timescales

This report and accompanying outputs represent our current thinking, but our work to prioritise and refine London's infrastructure requirements will be ongoing. Work will continue across the infrastructure types included in the report and the remit of the LIDB will develop as appropriate. However, the priorities below set out indicative timescales in 2015 and beyond.

### Key priorities for 2015

#### – Representing London's needs to the new Government

As the national elections are fast approaching and will be followed by a Comprehensive Spending Review, our intention is to have in place a prioritised programme of infrastructure requirements, supported by a strong case for investment, to form the basis of our discussions with Government and to ensure London gets the funding commitments it requires.

#### – Full review of the London Plan

The Mayor has committed to begin a full statutory review of the London Plan in 2015. This exercise will consider further improvements to infrastructure policies, building on the outputs and evidence produced through the various LIP 2050 work streams. The illustrative scenarios we have developed about how London's growing population could be accommodated in the longer term (within London and beyond its boundaries) will serve as a starting point for the London Plan's further consideration of growth distribution in and around the city.

### Beyond 2015

Beyond 2015, our focus is likely to remain on refining London's priorities, improving infrastructure delivery in the Opportunities Areas, and pressing for the fiscal and regulatory changes necessary for effective delivery. We do not currently plan to publish a refreshed LIP 2050. Rather, we will keep the relevant documents and outputs [online](#) to ensure the latest information on London infrastructure planning is available to all.

**MAYOR OF LONDON**