

Coordinating utilities infrastructure through local planning

A practical handbook for planners

infrastructure
co^ordination

GREATER
LONDON
AUTHORITY



RTPI
Royal Town Planning Institute

October 2020

Contents

Introduction	1
Section 1: Place leadership	4
Linking utilities with place-making	5
Engaging stakeholders	5
Building an evidence base	7
Working with utility providers	7
Developing a shared vision and objectives for place	9
Translating objectives into action	9
Section 2: Integrated planning	11
Estimating utilities demand	12
Assessing utility capacity and constraint	13
Considering options for reinforcing and replacing infrastructure	14
Technical and commercial feasibility	15
Developing integrated strategies	16
Ongoing governance and delivery	17
Section 3: Coordinated delivery	19
Setting the policy framework	20
Getting the right information from planning applications	20
Early engagement between developers and utility providers	22
Influencing the phasing of development and infrastructure	23
Negotiating developer contributions	24
Monitoring and evaluation	26
Annex: Draft New London Plan policies which support the integrated planning and coordinated delivery of utility infrastructure	28

Introduction

London's infrastructure challenge

London needs around 52,000 new homes every year to meet demand, plus around 1.3 million more jobs by 2041. A huge pipeline of infrastructure is being planned and delivered to accommodate this growth and meet London's wider objectives, which include:

- Achieving good growth which improves health and quality of life, reduces inequalities and makes the city a better place to live, work and visit
- Aiming for 80% of all trips to be made by public transport, walking or cycling by 2041
- Reducing greenhouse gas emissions from transport and buildings to zero by 2050
- Increasing resilience to flooding and overheating
- Achieving ubiquitous gigabit-capable digital connectivity and preparing for the rollout of 5G
- Tackling air pollution and reversing the decline in biodiversity
- Reducing waste and moving to a low-carbon circular economy

The [London Infrastructure Plan](#), updated in 2015, suggested that energy and water infrastructure will require £148 billion and £46 billion of investment respectively over the period to 2050. While much of this is assumed to be funded through utility providers through user charges, an incremental and piecemeal approach to planning and delivery is unlikely to deliver this investment in a timely and cost-effective way, and risks causing

significant disruption to local businesses and communities. A step change is required in the way that infrastructure, and especially utilities, are considered during the planning process.

In 2018, the Mayor of London established a pilot Infrastructure Coordination service to support the integrated planning and coordinated delivery of infrastructure in high growth areas.

The role of infrastructure in local planning

Planning plays a central role in coordinating the delivery of infrastructure to serve both new and existing development and achieve wider place-based objectives. Local authorities take different approaches to infrastructure planning, reflecting variations in development pressures, political priorities and ways of working. However, there are three broad functions of planning which are relevant to infrastructure:

- **Place-leadership**, where planning engages and coordinates activities across sectors and geographical boundaries to align infrastructure with the delivery of a spatial vision
- **Plan-making**, where planning provides a robust evidence base of infrastructure need, creates strategies for delivery, and sets policies which clarify the infrastructure requirements of development
- **Development management**, where planning shapes, regulates and monitors development, and coordinates infrastructure delivery during construction

The 2018 revisions to the National Planning Policy Framework (NPPF) place a greater emphasis on the role of local plans in identifying and coordinating the provision of infrastructure. Reports from the [Royal Town Planning Institute](#), [National Infrastructure Commission](#) and [Institute of Civil Engineers](#) similarly recommend a long-term strategic approach to infrastructure planning.

The treatment of transport and social infrastructure in local planning has improved over time, with relatively clear policies, guidance, standards and funding arrangements. However, approaches to planning for utilities infrastructure are more varied and fragmented. While there is evidence of good practice, this is often limited to high-profile locations where utility constraints presented an obvious barrier to growth. This has yet to translate into a consistent approach to the planning and delivery of utilities infrastructure across London.

In 2019, the Royal Town Planning Institute published [principles for effective local infrastructure planning](#), which emerged from a detailed study of practice in England and Scotland. These principles include:

1. Having a shared vision for place, with clear objectives
2. Identifying specific infrastructure priorities to achieve the vision, aligned to funding sources
3. Carrying out effective and early engagement to align planning and delivery
4. Allocating resources, capacity and skills
5. Continuous learning and dissemination

The purpose and structure of the handbook

This handbook builds on these principles by describing how planning can help to coordinate utility infrastructure in support of sustainable development in London.

It is structured to describe how utilities infrastructure can be considered at different stages in the planning process, covering place-leadership, integrated planning for growth and coordinated delivery through development management.

With clear recommendations, case studies and links to further support, it shows how the current planning system can be leveraged to enable a more integrated and coordinated approach, and the benefits for local authorities, developers, infrastructure providers, business and communities.

While the focus is on energy, water and digital infrastructure, it includes references to transport and green infrastructure where relevant.

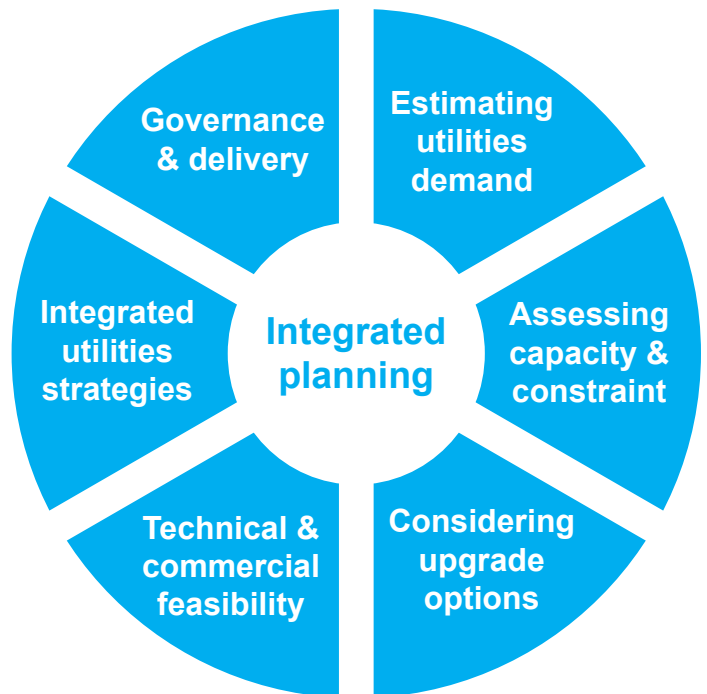
Disclaimer

This handbook was developed as a partnership between the RTPI and GLA Infrastructure Team. It is offered as a guide, and does not take a definite view on how infrastructure planning should be conducted. It has been developed through research and interviews with different stakeholders, and is designed as a starting point for considering approaches which might be suitable in your local area. It should not be taken as a substitute for professional or legal advice.



Section 1 describes how utility providers can be involved in developing a shared vision and objectives for place, derived from common evidence and with a framework for ongoing governance

Section 2 describes how planners and utility companies can work collaboratively to understand the needs of development, and develop integrated clear strategies for delivering the right infrastructure



Section 3 describes how planners can encourage early engagement between developers and utilities, and use planning conditions and obligations to align development with infrastructure



NB: This depicts an iterative rather than sequential process, recognising that planning requires working across multiple hierarchies and stages at the same time.

Section 1: Place leadership

Planning should provide a place-based spatial vision which is clear about where growth and regeneration will occur, and how infrastructure will deliver economic, social and environmental sustainability. By raising the profile of utilities infrastructure within your council and taking a proactive approach to engaging with providers, boroughs can build support for growth, secure better development outcomes and ensure that limited resources are used effectively.



Linking utilities with place-making

Utilities infrastructure delivers a range of critical functions, providing heat, cooling, power, digital connectivity, clean drinking water and waste removal services to people and places across London. This infrastructure is owned and managed as a series of discrete networks, and often hidden out of view.

A sense of invisibility can mean that utilities often rank low on a council's list of priorities: only raised when something goes wrong. This can mean that opportunities to deliver more cost-effective, resilient and sustainable solutions are missed.

By taking an integrated and place-based approach to utility planning, design and delivery, it may be possible to identify packages of solutions which can achieve a wider range of council objectives. Priorities will vary in different locations across the borough, including:

- Incorporating utility upgrades into public-realm strategies, green infrastructure corridors and highway improvement works
- Coordinating infrastructure to unlock development in strategic locations with fragmented land and property ownership
- Coordinating infrastructure to support council-led development programmes on public-sector land
- Facilitating the rollout of electric vehicle charging infrastructure in locations with limited accessibility by public and active transport
- Estate regeneration to improve building fabric energy efficiency and reduce water consumption

- Energy efficiency retrofit within conservation areas
- Providing high-quality digital infrastructure to business districts or high street regeneration

The opportunities, challenges and approaches will be influenced by the nature of the place, and the objectives of the council. To effectively allocate limited resources, consider where additional efforts will be focused on integrated infrastructure planning, the benefits it could achieve, and the opportunity costs involved in the selection process.

Engaging stakeholders

Cross-departmental working groups can help to explore the relationships between utilities infrastructure and council objectives, building partnerships for subsequent coordination initiatives. Departmental structures vary between boroughs, but this might typically include:

- Strategic planning and planning policy
- Development management
- Urban design and place-making
- Energy and sustainability
- Environment
- Neighbourhoods and communities
- Transport and highways
- Business support
- Health and wellbeing
- Data and GIS

By publishing the borough Infrastructure Delivery Plan, policy map and site allocations on a GIS platform, other departments can more easily identify how their objectives relate to initiatives proposed for a given place.

Working groups can be used to establish where collaboration with utility providers will be needed to achieve specific place-based

objectives, and where council assets and investment programmes could impact upon utility networks. This might include examining:

- The potential for public realm, green infrastructure and sustainable drainage strategies to reduce pressure on the sewer system, or provide natural cooling and ventilation during heatwaves to reduce strain on the electricity network
- How higher energy efficiency standards and retrofit strategies for existing buildings can reduce overall energy demand and release capacity on electricity, gas and heat networks
- How traffic removal and public/active transport strategies might influence the scale and location of electric vehicle charging infrastructure
- Where highway maintenance and upgrade programmes can provide opportunities to reinforce utility networks
- Where street furniture can be used to install small cell 5G infrastructure

Stakeholder engagement can also reveal sources of funding which impact upon utilities infrastructure, such as:

- TfL's Liveable Neighbourhoods Fund, which could be used to deliver green infrastructure strategies that reduce demand for sewerage infrastructure, or highway improvement works that provide an opportunity to upgrade underground utilities
- Local Carbon Offset funds, which could reduce energy demand by investing in fabric energy efficiency retrofit, connections to decentralised heat networks and renewable energy technologies

- Lead Local Flood Authority (LLFA) funding to deliver Local Flood Risk Management Strategies

During local plan-making and review processes, use the Duty to Cooperate and consultation processes to engage with neighbouring authorities, local communities, businesses, landowners, developers, property managers and statutory agencies, asking more detailed questions about their utility needs and objectives.

Workshops with developers and their consultants can provide a forum to discuss the challenges and opportunities for integrating utilities infrastructure into masterplans and scheme design.

Support from the GLA: The Infrastructure Mapping Application

Utility infrastructure is often strategic in nature, crossing local authority boundaries. The Infrastructure Mapping Application (IMA) is a GIS-based interactive tool, developed by the GLA, which helps local authorities, developers and utility providers to identify opportunities for joint infrastructure delivery.

The IMA can be used to identify planned utility projects, along with a range of useful context layers including Mayoral policies, air quality, flood zones, social indicators and water catchments. The IMA also includes information on utility asset condition, which gives an indication of where investment may occur even before it is planned. Collectively, these datasets can help when identifying key stakeholders and engaging them in discussions about the relationship between utility infrastructure and place.

For more information visit: maps.london.gov.uk/ima. To request access to the private interface, contact: ima@london.gov.uk

Building an evidence base

Development Plan documents will already contain evidence on the infrastructure needed to support growth and development. This includes studies of demographic change, assessments of available housing and economic land, site allocations and indicative phased programmes of development, and anticipated infrastructure needs and potential funding sources. These are often contained within Infrastructure Delivery Plans (IDPs) and Development Funding Infrastructure Studies (DIFS) and are covered in more detail in Section 2.

Other sources of data and evidence can be combined to investigate where integrated infrastructure planning can deliver wider objectives. This includes:

- The Mayor's Environment Strategy and 1.5C Compatible Climate Action Plan, which set out the energy utility investments and interventions needed to decarbonise building and transport and adapt to future environmental risks
- Air Quality Management Zones, which can help to identify where air pollution levels might be exceeded during construction-related works
- NHS health inequality data, which can help to identify communities which are vulnerable to infrastructure disruption or failure
- The GLA Green Infrastructure Focus map and local surface water flood maps, which can identify where green infrastructure can help to alleviate the pressures from development on the drainage network
- GLA Heat Network Priority Area maps, which can identify where development

proposals may require an option for future connections to district heat networks

- Public complaints data related to disruption from construction, road closures and pollution incidents from utility streetworks
- Estimates of developer contributions that have been renegotiated due to unexpected utility costs which affected scheme viability

Support from the GLA: evidencing the costs of coordination failure

The GLA's Infrastructure Coordination service is gathering evidence of problems which have resulted from poor infrastructure planning. For example, in a survey of property developers over a 24-month period, 79% reported that investments in London had been disrupted due to the delays and unforeseen costs of connecting to utilities networks.

Working with utility providers

Early engagement with utility providers can be used to discuss the borough's vision and objectives for place, high level growth and development projections, and the opportunities and challenges of an integrated approach to infrastructure planning and delivery. Utility providers can in turn share details of their business planning timescales and the regulatory criteria which govern investments, and any barriers they experience when engaging with the planning process.

Meetings should provide clarity about when and how the borough should share more detailed growth projections for specific locations with utility providers, and key opportunities for engagement by providers during the planning process, such as at Regulation 18 consultation.

Understanding London's utility providers

- **Electricity** is supplied by two District Network Operators (DNOs): UK Power Networks (UKPN) and Scottish and Southern Electricity Networks (SSE). Independent Distribution Network Operators (IDNOs) develop, operate and maintain local electricity distribution networks, and accredited Independent Connection Providers (ICNs) are allowed to build electricity networks, which can be adopted by a DNO or IDNO. This sector is regulated by Ofgem.
- **Gas** is supplied by two operators, Cadent Gas in North London and SGN in South London. This sector is regulated by Ofgem.
- **Water** is supplied by four monopoly suppliers – Thames Water, Affinity Water, Essex and Suffolk Water and Sutton & East Surrey Water, with one sewer undertaker, Thames Water. This sector is regulated by Ofwat.
- **Telecoms** are provided by numerous private companies, regulated by Ofcom. Within this model, there is an effective monopoly controlled by BT Openreach.

Through agreement with their respective regulators, Electricity, Gas, Water and Telecom providers update their long-term strategies to invest in network upgrades which accommodate future demand.

However, the regulatory framework requires a high degree of certainty that development will come forward and rarely permits investment to meet 'speculative' future demand. Without proactive interventions from local authorities, utility providers often wait for individual developer connection requests to trigger investment in the necessary upgrades.

In addition, the following infrastructure sectors have an important impact on utility capacity and constraint.

- **Green infrastructure**, which is the responsibility of a variety of public, private and third-sector land management bodies, and which lacks a consistent revenue model for management, maintenance and upgrade
- **Heating and cooling networks**, which are an emerging class of utility infrastructure and may be managed by an established utility provider or bespoke Energy Service Company (ESCO)
- **Flood risk management infrastructure**, which are identified and delivered by the Environment Agency and Lead Local Flood Authorities, using government funding and other sources
- **Waste infrastructure**, which is overseen by the London Waste and Recycling Board and managed by boroughs through sub-regional partnerships

It is helpful to maintain a database of contacts at utility providers, building on any relationships established when preparing and updating the Infrastructure Delivery Plan (IDP). At the same time, make sure that utility providers have access to named points of contact, and that these are updated following staff changes. If possible, assign this responsibility to a dedicated member of staff.

Developing a shared vision and objectives for place

This process of engagement can be used to develop a shared vision and set of objectives to guide the integrated planning and coordinated delivery of utilities infrastructure in specific locations.

This should set out the rationale for enhanced cooperation, and the expected benefits for different stakeholders. These might include:

- Providing a more efficient utilities connection service for new developments, to reduce costs and disruption and accelerate housing delivery
- Reducing overall demand for energy and water infrastructure through the preparation of integrated infrastructure strategies
- Reducing congestion and pollution through improved construction logistics and coordinated streetworks for utilities
- Incorporating streetscape measures which improve accessibility for all users, regardless of age and ability

At the plan-making stage, the Duty to Cooperate can be used to negotiate objectives which cross borough boundaries and involve multiple utility providers. Agreements can be evidenced in the Statement of Common Ground or a Memorandum of Understanding.

When preparing a Development Plan, such as a Local Plan, Opportunity Area Planning Framework (OAPFs) or Area Action Plan (AAP), the consultation process can be used to communicate and refine the vision and objectives through discussion with a wider range of stakeholders, including statutory agencies, landowners, developers and the public.

The agreement of a vision and set of objectives should clarify responsibilities for cooperation between council departments, landowners, developers and infrastructure providers. These can be set out in Development Plans, Supplementary Planning Documents, masterplans and other non-statutory documents as appropriate.

Translating objectives into action

Coordinated planning for utilities infrastructure benefits from good internal governance arrangements and dedicated resources.

A single point of contact for infrastructure planning can help to reduce complexity for internal and external stakeholders. For boroughs without a dedicated individual or team, it helps to consider which existing staff or departments are best placed to assume responsibility for coordinating across departments, and with developers and infrastructure providers.

In higher growth boroughs, it may be possible to secure dedicated funding from additional S106 contributions or the CIL administration fee, or by pooling resources across neighbouring boroughs. Within Opportunity Areas, boroughs can also access strategic planning and design expertise from the GLA and TfL, which can help to identify and deliver the infrastructure needed to support good growth. See page 18 for more information on support from the GLA.

The Infrastructure Delivery Plan (IDP) can be a valuable tool for communicating both the evidence on infrastructure needs and the actions that the borough is taking to support planning and delivery in specific locations. This includes updates on prioritised infrastructure projects, delivery partnerships and funding sources, and links to the Local Development Scheme to show when additional infrastructure studies will be commissioned for key locations.

An effective IDP should be outward facing and designed for a variety of audiences including developers, utility providers, local communities and businesses, and councillors. It should demonstrate how infrastructure funding, coupled with a proactive approach to delivery, are aligned with relevant areas of the council's corporate strategy or business plan, and contribute towards wider economic, social and environmental objectives.

Case study: The Infrastructure Planning Service at the London Borough of Tower Hamlets

Funded by making the best use of S106 and CIL contributions, this team is developing innovative approaches which go beyond the collection of the Community Infrastructure Levy (CIL) and the production of an Infrastructure Delivery Plan, towards the strategic long-term planning of future infrastructure. This includes influencing and enabling delivery of infrastructure and carrying out the direct delivery of on-the-ground solutions.

Supporting this, the team undertakes in-house development viability assessment, one of very few local authorities to do so, maximising affordable housing and infrastructure funding from development.

Case study: Resources to coordinate development and infrastructure in the Croydon Growth Zone

The Croydon Growth Zone is a partnership between Central Government, the London Borough of Croydon (LBC), the Greater London Authority (GLA) and Transport for London (TfL) to finance and deliver a major regeneration programme in central Croydon.

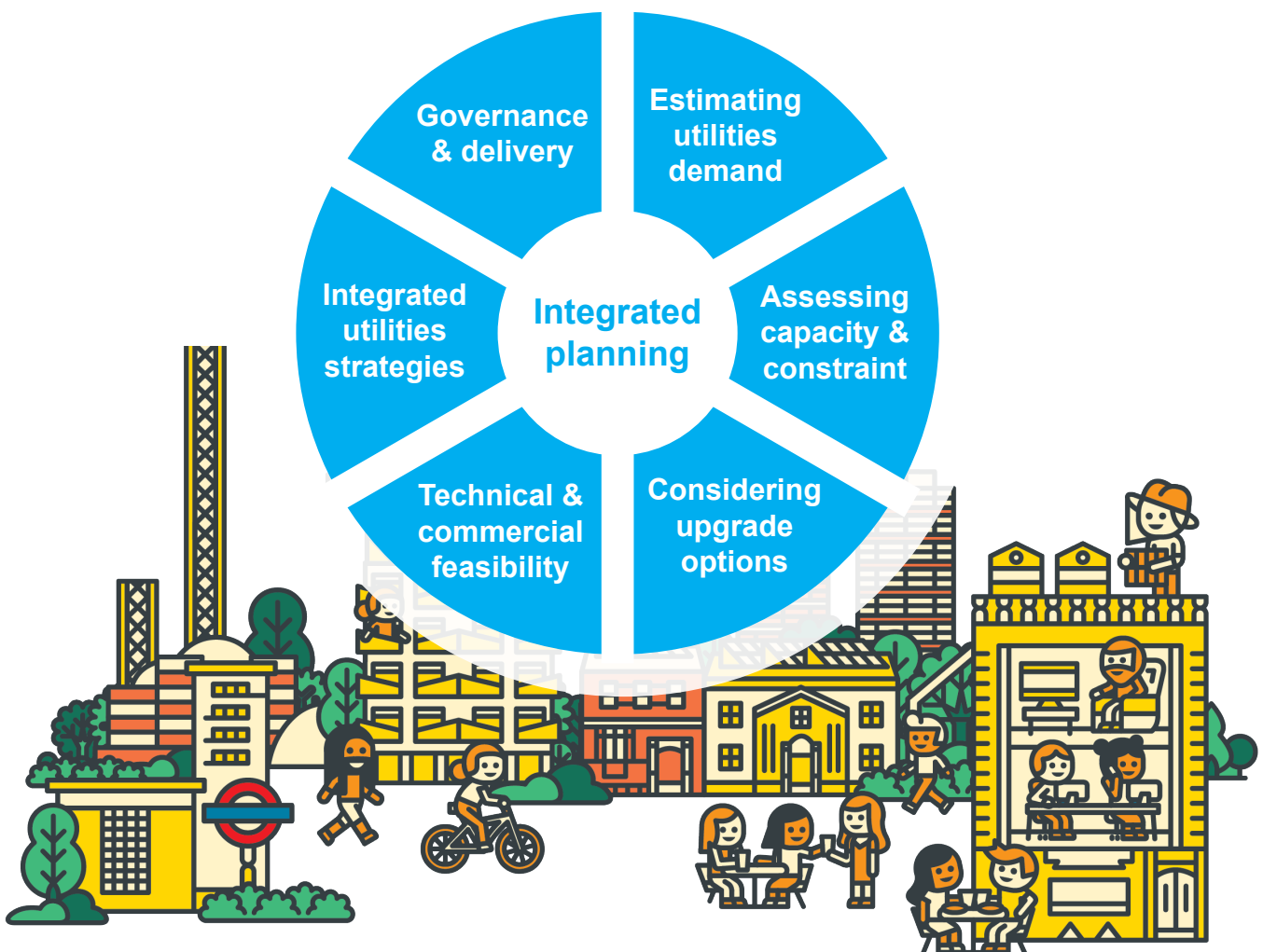
There was an early recognition that an incremental approach to utility connections would cause significant disruption to the highway network, given the anticipated scale of development. To address this problem, LBC have developed several interventions to coordinate growth and infrastructure across the borough. These are detailed throughout this handbook.

These initiatives required dedicated resources and capacity. In 2017, LBC appointed a Principle Impact Assessment Engineer, paid for through Growth Zone funding. With an adaptable role, this provided a single point of contact between LBC departments, developers and infrastructure providers.

Section 2: Integrated planning

The London Plan requires boroughs to assess the capacity of existing and planned physical, environmental and social infrastructure to support required levels of growth, and plan capacity improvements where necessary.

Utility providers tend to invest on a reactive basis as individual connection requests are submitted, under a regulatory framework that restricts speculative investments to protect consumers. While providers do examine Development Plan Documents to understand potential impacts on their networks, these do not always provide sufficient certainty or detail about the timing and nature of development. Local authorities can take a proactive role in helping providers understand the quantum and phasing of likely development, sometimes in advance of applications being submitted. Presenting this information in an open, consistent and detailed format helps to assess impacts on network capacity and consider integrated solutions.



Estimating utilities demand

There are a range of data sources which can be used to estimate the utility demands of planned development, in advance of individual applications being submitted. These include:

- The London Development Database (LDD) and Brownfield Land Register
- Housing and Economic Land Availability Assessments, and other studies of development capacity and absorption rates
- Draft or final site allocation documents
- Infrastructure Delivery Plans, plan-level viability assessments, Housing Delivery Test Action Plans and Annual Monitoring Reviews
- PropTech and consultancy services which provide methodologies for calculating utility demand
- Confidential surveys, questionnaires and pre-application engagement with developers, consultants and landowners to establish a more detailed picture of when sites are likely to come forward

Key data categories include:

- Anticipated project start and completion dates
- Number and area (m²) of residential, commercial, industrial and retail units
- Estimated electricity (VMA), gas (MW), potable water (ltrs/s) and telecom (lines)

This information can be updated and refined as individual applications come forward with more detailed infrastructure assessments.

Support from the GLA: The Infrastructure Mapping Application

The Infrastructure Mapping Application (IMA) includes a range of planning data drawn from Barbour ABI and the London Development Database (LDD). This includes development applications which can be filtered by cost, planning and funding status, and overlaid with data on energy, water and transport infrastructure projects.

The latest version of the Infrastructure Mapping Application (IMA) includes a 'Probability of Development' model for residential planning permissions. This draws on data from the London Development Database (LDD) to show the likelihood that construction will come forward within expected timescales. The model achieves 80% accuracy when predicting historic data.

For more information visit: maps.london.gov.uk/ima. To request access to the private interface, contact: ima@london.gov.uk

Case study: Estimating potential build out rates in Tower Hamlets

With support from the GLA, the London Borough of Tower Hamlets have developed a series of rules, and combined this with knowledge of local markets and developments, to model potential build out rates from 2017/18 to 2041/42. This separates development into 'strategic' 'non-strategic' and 'estate regeneration' schemes, to account for general differences in lead in times and annual build out rates.

Case study: Calculating utility load profiles at Vauxhall Nine Elms Battersea

After a high-level study indicated that utility infrastructure would need upgrading to accommodate the total peak demands of proposed development, consultants sent a letter to all major landowners within the Opportunity Area. This requested utility loads for anticipated developments, along with phasing details and site usage.

The consultants emphasised the need to provide accurate utility calculations and offered support to help respondents and address concerns about commercial confidentiality. A standardised form allowed this data to be aggregated and shared with utility companies.

Assessing utility capacity and constraint

Local authorities can work with consultants and utility providers to develop this information into a load profile timeline for each development area, showing demand for each utility service.

Issues of capacity and constraint vary between infrastructure sectors. Electricity, gas, potable water and foul drainage network are typically subject to upstream network constraints, whereas heat energy, sustainable drainage systems (SuDS) and telecoms are not.

Network capacity and constraint will also be affected by wider issues within and across local authority boundaries, such as strategies which seek to:

- Retrofit existing buildings for improved fabric energy and water efficiency, which could increase capacity on the electricity, gas and water network

- Expand district heat networks, which could increase capacity on gas and electricity networks
- Install air-source heat pumps and other technologies for the electrification of heat, which could increase capacity on the gas network and reduce capacity on the electricity network
- Increase the provision of electric vehicle charging points, which could increase demand on the electricity network
- Reduce surface water flood risk through integrated water management and green infrastructure, which could reduce pressure on the sewerage network

The GLA's Infrastructure Plan 2050, Transport and Environment strategies provide additional evidence on the wider trends affecting London's infrastructure.

GLA support: Sensitive information in the Infrastructure Mapping Application

Where information is commercially sensitive, data sharing agreements - sometimes in the form of Non-Disclosure Agreements (NDAs) - can be used to share information between utilities and developers on a time-limited basis to selected audiences.

The IMA has a public version which is available to all users, and a private version for registered organisations who have signed an IMA-specific non-disclosure agreement. This enables them to view more sensitive future infrastructure investment data and contextual data layers to identify opportunities for collaborative streetworks and plan better for growth.

Case study: Assessing infrastructure capacity in the Croydon Growth Zone

In early 2018, LBC commissioned a study which took planning data from the Development Infrastructure Funding Study (DIFS) and calculated expected utility demand based on the square footage of different use classes in developments that had been granted permission or were at pre-application stage. This allowed for a detailed assessment against current infrastructure capacity and formed the basis for a collaborative partnership with Thames Water and SGN.

Through this partnership, LBC were able to examine their five-year utility investment programmes and identify opportunities for alignment with developments, highway works and other council-led capital investment programmes. This partnership evolved into a Growth Zone Governance Board, where stakeholders can provide updates and contribute to a coordinated schedule for infrastructure delivery.

Considering options for reinforcing and replacing infrastructure

Cross-departmental working groups or consultants can assess different options from utility providers for reinforcing existing infrastructure and installing new capacity. Different combinations should be tested to see how they help to deliver the vision and objectives for place.

Efforts should be focused on identifying synergies which reduce overall infrastructure demand, for example by maximising building energy and water efficiency, designing multi-functional green infrastructure, and prioritising connections to existing utility networks. Discussions with TfL and the local highways

authority can help to identify opportunities for coordination with planned works to the local and strategic road network.

This process could be covered through an Integrated Impact Assessment (IIA), which combines the legal requirement for local authorities to undertake a Strategic Environmental Assessment (SEA), Sustainability Appraisal (SA) and Health Impact Assessment (HIA) and others when preparing new plans.

Utility providers can help to anticipate the lead times for installing and connecting new supply infrastructure, enabling consideration of where this might affect development viability and deliverability. This could include situations where:

- Significant savings could be realised by delivering strategic rather than incremental network reinforcements, and where development phasing and demand is sufficiently certain to allow utility providers to meet these costs
- Land needs to be safeguarded and acquired, for example to accommodate an electricity substation or pumping station
- There is a risk that the costs of network reinforcement will fall on an individual developer and affect delivery of the entire scheme

Options should be presented in outward-facing documents for consultation with local communities, businesses, developers, landowners and relevant statutory bodies.

Case study: Assessing utility upgrade options at Old Oak and Park Royal

The Old Oak and Park Royal Development Corporation (OPDC) has been focused on the early delivery of homes and jobs at Old Oak North. To support this process, OPDC worked with AECOM to engage with UKPN and SSE to understand capacity within the existing electrical power network and their long-term development plans for the area. This process identified sufficient supply until 2021, after which time network reinforcements would be required to serve demand from new energy centres and EV charging infrastructure.

Given the high cost of new DNO connections to individual developers, OPDC worked to secure the upfront network investment required to unlock future development. By working closely with stakeholders in the area, they identified an opportunity to expand the capacity of a new electricity substation that had already been commissioned by HS2 to support the construction of the railway and the operation of Old Oak Common Station. Through many months of collaboration with HS2, UKPN, Ofgem and others, they were able to facilitate an upgrade to the substation which can ensure sufficient capacity in Old Oak North until 2026.

Technical and commercial feasibility

More detailed studies can help to consider the costs and benefits of integrated solutions, looking across infrastructure sectors to identify opportunities to reduce costs, coordinate delivery and achieve wider objectives. These studies should clarify where integrated solutions require upfront investment and delivery, rather than an incremental approach from each utility provider to individual sites.

By working with utility providers and across council departments, identify where existing capital investment programmes and departmental budgets could fund utility infrastructure upgrades and reinforcement in advance of development, and where developer contributions can be used.

Commercial feasibility studies can be used to update any funding gap identified in the Infrastructure Delivery Plan and used to explore further funding and financing options. This many include options for the local authority to assume some of the investment risk.

In addition to CIL and Section 38, 104, 106 and 278 agreements, possible funding sources for infrastructure include:

- The Housing Infrastructure Fund, administered by GLA Housing and Land
- The Mayor's Good Growth Fund, administered by GLA Regeneration
- The Mayor's Liveable Neighbourhoods Fund, administered by Transport for London
- Tax Increment Financing, where funding is raised through borrowing against future income streams from business rates, S106 contributions and the Community Infrastructure Levy
- Revolving Investment Funds
- Investment through a special purpose vehicle, such as an Energy Service Company (ESCO)
- Local capital investment programmes

Support from the GLA: Development Infrastructure Funding Studies

In several of London's Opportunity Areas (OAs), the GLA and TfL have worked with boroughs to procure a Development Infrastructure Funding Study (DIFS). These support the preparation of Opportunity Area Planning Frameworks (OAPFs) by identifying and costing the infrastructure necessary to support development, helping to phase infrastructure with development, and exploring funding sources. However, DIFS can be expensive to prepare and risk becoming outdated. The GLA are now [exploring options to develop a strategic infrastructure evidence base](#).

Case study: A Development Infrastructure Funding Study for the Croydon Growth Zone

In 2018, Peter Brett Associates were commissioned to develop the Croydon Growth Zone delivery plan and programme. This was accompanied by the Croydon Assessment and Sifting Tool (CAST) which was used to prioritise and sequence infrastructure projects against strategic, economic, social and environmental objectives, along with information on the financial, commercial and managerial case. This information was used to inform the Council's Infrastructure Delivery Plan and an accompanying GIS model.

The Croydon Infrastructure Finance Group (IFG) was established to determine how prioritised projects can be funded, drawing on contributions from across the council which include the LBC Capital Programme, Growth Zone funding, S106 agreements and CIL contributions. The IFG consists of Director of Planning, development management officers, legal and finance staff, and the LBC capital delivery hub.

Case study: Electricity network reinforcement in central London

The City of London Corporation, London First and the City & Westminster Property Association, with support from the GLA, developed robust evidence on the projected future energy demands of planned growth in central London. UKPN has since invested in the major reinforcement of electricity substations which serve this area. This includes two for the City of London, which provide capacity for approximately 15 years of growth in the Square Mile.

The presence of major ongoing infrastructure projects in central London enabled UKPN to take a longer-term investment view. This is because the energy requirements of these projects reduced the risk that larger substations would become 'stranded assets' if expected growth did not materialise, which would in turn impact upon existing consumers.

Developing integrated strategies

Prioritised options for meeting utility needs can be combined into cross-sector infrastructure delivery strategies. These should seek to:

- Provide a single schedule, regularly updated, which sets out projects by type, location, timing and funding, ideally published on a GIS platform (for boroughs without in-house GIS capability, the GLA's Infrastructure Mapping Application can be used to support this task)
- Categorise infrastructure projects according to role and function (e.g. critical, desirable, place-shaping)
- Minimise demand for infrastructure by using smart and integrated solutions

- Provide evidence on the sequencing and phasing of infrastructure upgrades by different stakeholders to minimise disruption and maximise efficiency, including opportunities for coordinated works
- Provide evidence for the contributions that individual developments need to make
- Identify where compulsory purchase powers can assist in the timely delivery of infrastructure and development
- Maintain flexibility and resilience to fluctuations in land and property markets, technological and behavioural change, and the infrastructure impacts of cumulative development
- Update Local Validation List to ensure that the necessary information is provided by applicants
- Inform pre-application engagement by development management officers
- Update the GLA Infrastructure Mapping Application with details of planned infrastructure investments, along with in-house GIS platforms and/or 3D models
- Update monitoring and evaluation requirements

In addition to physical infrastructure, strategies should set out the governance arrangements needed to ensure coordinated delivery. These can identify potential funding sources for infrastructure coordination, and set out priorities and responsibilities for key stakeholders including council departments, landowners, developers and infrastructure providers, including:

Ongoing governance and delivery

Integrated strategies can be used to:

- Update the borough's plan-level viability assessment, Infrastructure Delivery Plan, CIL charging schedule and planning policies in order to provide robust evidence for negotiations on developer contributions covering on-site, off-site and in-kind infrastructure provision
- Update other relevant local strategies, such as for flood risk management, green infrastructure, digital connectivity, district heat and electric vehicle charging infrastructure
- Accompany site-specific Development Plan Documents, such as Area Action Plans, and inform more detailed masterplans
- Influence development layout, density, landscaping and other factors
- The terms of reference for participation in dedicated partnerships boards, forums and working groups
- Expected contributing to a live, coordinated timetable of development and infrastructure delivery
- The use of common data sharing and modelling platforms, including mechanisms for sharing commercially sensitive data
- Opportunities for joint procurement and works contracting

Case study: Infrastructure governance at Vauxhall Nine Elms Battersea

The Vauxhall Nine Elms Battersea (VNEB) area was identified as an Opportunity Area in the 2010 London Plan. In 2012, the OAPF identified capacity for approximately 16,000 homes and 20-25,000 jobs, and a need for large-scale infrastructure investment to unlock development. This included the extension of the Northern Line from Kennington to Battersea Power station, as well as transport interchange facilities at Vauxhall, announcements which accelerated development activity. The Thames Tideway Tunnel project also makes use of the riverbank near to Battersea Power Station for tunnelling and logistics transfer, adding further complexity to the delivery of the OA.

In recognition of the scale and complexity of planned development and infrastructure at VNEB, the boroughs, TfL, and the GLA identified the need for a partnership to support the coordination of development and associated activities. This led to the establishment of the Nine Elms Partnership, a joint initiative between Lambeth and Wandsworth councils.

A 2010 DIFS identified significant constraints on electricity supply and drainage capacity. However, the pace of development and relative lack of pre-existing governance arrangements meant that common solutions were not identified sufficiently early in the development process. A detailed utilities study, commissioned in 2013, recommended a stronger collaboration between the Nine Elms Partnership and utility providers, which led to the establishment of a utilities working group.

This group is overseen by a Strategy Board, comprised of the GLA, TfL, Wandsworth, Lambeth, Homes England and key landowners, and supported by communications and community engagement working groups. A dedicated support and delivery team oversees working sub-groups focused on public realm, transport management, employment and business, utilities and wharves, and housing and social infrastructure.

Section 3: Coordinated delivery

Utility works are often organised reactively as individual connection requests are made by developers. Different providers then undertake works in a piecemeal manner, often excavating the same road to access utility infrastructure and make connections. This creates disruption and congestion, accelerates the degradation of infrastructure, and imposes additional costs for developers, local authorities and utility providers.

Multiple benefits can be achieved when a local authority is able to take a more proactive approach to development management, looking beyond the 'red lines' of an individual application to coordinated delivery across a wider area.



Setting the policy framework

Planning can translate local and strategic infrastructure priorities into site-specific development management policies, providing clarity about the utilities information that will be required from applicants, the use of planning conditions to encourage early engagement between developers and utility providers, and where developer contributions will be sought for utilities infrastructure or related works.

Planning policy can also set out where developers will be expected to participate in borough-led coordination initiatives, and what level of involvement is required. It may be appropriate to set a light-touch policy requirement at the Local Plan or Opportunity Area level and reserve more prescriptive planning policies into frameworks which cover high-growth locations, such as Area Action Plans.

A GIS-based policy map, including relevant information from the Infrastructure Delivery Plan and pan-London Infrastructure Mapping Application, can make it easier for applicants to understand the location of specific development management policies and coordination initiatives, and factor in costs and benefits during due diligence and early scheme design.

Case study: Draft City of London planning policy

Development in the City of London takes place in a very dense and congested area, with limited road space and poor air quality. The high rates of churn within multiple-occupancy office buildings generates frequent requests for new utility connections, often to very specific requirements (such as to enable high-frequency trading). This combination of factors means that it is impractical to dig up the road every time a

new utility connection needs to be made.

The draft Local Plan for the City of London, titled City Plan 2036, contains a new Strategic Policy on Smart Infrastructure and Utilities (S7). This is accompanied by three development management policies: Infrastructure Provision and Connection (SI1), Infrastructure Capacity (SI2) and Pipe Subways (SI3). Together, these policies seek to:

- Minimise demand for new infrastructure
- Encourage developers to engage with infrastructure providers at an early stage of design
- Ensure that designs incorporate connections to existing infrastructure
- Ensure that existing underground infrastructure is effectively utilised

For more information visit: [City Plan 2036](#) (pg 82-86)

Support from the GLA: London Plan policy

The 2019 Draft New London Plan contains multiple policies which support the integrated planning and coordinated delivery of utility infrastructure. These are included in Annex 1.

Getting the right information from planning applications

Planning applications contain information on utility need and provision through on-site delivery, off-site delivery and developer contributions. Collectively, this can help boroughs and utility providers to coordinate

the delivery of utilities infrastructure across multiple sites, however this information is often divided across multiple supplementary statements. This includes energy and sustainability, foul water and drainage, travel and construction logistics, and Section 38, 104, 106 and 278 agreements.

Through a review of the Local Validation Checklist, it may be possible to identify where information can be standardised, consolidated, mapped and shared. This applies to both the different statements required for an individual application, and across multiple applications.

Major applications will typically provide a more detailed list of utility connections and specifications, coupled with phasing details. Planning policy and guidance should encourage this to be submitted at the earliest possible opportunity, to help plan for coordinated delivery.

Some relevant information will not be available at the outline or detailed application stage, but rather submitted when planning conditions are discharged. By assigning a geospatial identifier to each planning application, it may be easier to track developments during construction and ensure that updated infrastructure data is recorded in a standardised, open format.

Case study: Infrastructure sufficiency statements in Newham

In Newham, applicants are now required to provide a single statement to describe how their scheme or masterplan will provide a policy-compliant level of infrastructure through on-site delivery, off-site provision and/or financial contributions which address existing deficits and new needs.

For strategic sites, this will be accompanied by an Infrastructure Delivery Statement which looks at the contribution of each

scheme to overall infrastructure needs, and where schemes are likely to exceed network benchmarks or thresholds. This will be supported by a Statement of Common Ground or Memorandum of Understanding between developers and utility providers, setting out engagement processes and responsibilities for delivery.

Support from the GLA: The London Development Database Automation project

The London Development Database (LDD) is a resource maintained by the Mayor that boroughs are required to populate, which monitors certain planning permissions, starts and completions across London, and makes these available in a standardised, open dataset.

The automation project is a collaborative effort between the Mayor and boroughs. It will standardise the way that information is collected from planning applications, ensuring admission portals add new fields which capture the data required for monitoring in a machine-readable form. This will include information already provided by applicants in supplementary documents.

The project will result in a more comprehensive feed of planning application information for London, collected with less burden on boroughs and available in real time to the public.

For more information about the LDD automation project, visit: london.gov.uk/what-we-do/planning/london-plan/london-development-database

Early engagement between developers and utility providers

Planning policy and guidance can emphasise the importance of considering utility infrastructure location, capacity and constraint during the due diligence process, for example through an assessment by the landowner of existing underground assets. This can reduce the risk of unexpected costs emerging during development management and affecting scheme viability.

Boroughs can issue standing advice, development briefs and other types of guidance which encourage applicants to carry out early feasibility studies on development utility connections and make timely requests for connection advice. Local Validation Lists can be used to require evidence of communication and engagement between applicants and utility providers, such as a joint statement of intent.

Pre-application meetings can be used to provide developers with contact details for utility providers and information on borough-led coordination initiatives.

Case study: Construction Logistics Plans in the Croydon Growth Zone

To support alignment between development and utility infrastructure in the Croydon Growth Zone, the London Borough of Croydon (LBC) issues pre-commencement planning conditions which require developers to submit a Construction Logistics Plan (CLP) as part of their planning application. These are supported by Policy 7.68 in the Growth Zone OAPF, which sets out measures to mitigate the impacts of development on traffic.

While the focus of CLPs relates to safety and traffic routing, developers are also

required to submit a list of utility connections and specifications at the earliest possible opportunity when discharging the condition. This allows LBC to identify connections that could impact on the footway or highway, and opportunities for coordinated streetworks. Developers are made aware of the CLP requirements as part of their pre-application advice.

In order to ensure that pre-commencement conditions were consistently and fairly applied by development management officers, LBC developed a Croydon Town Centre Framework CLP and a CLP guidance document. These contained an outline of mandatory and suggested measures, a link to the LBC local validation list, and evidence derived from detailed traffic modelling.

The CLP guidance was designed to be updated, allowing LBC to learn from emerging good practice and strengthen or relax planning conditions as necessary. To demonstrate that this condition was justifiable, they also require a light-touch CLP for developments outside of the Growth Zone.

Support from the GLA: The Developer Infrastructure Coordination Service

The GLA are piloting a new developer infrastructure coordination service, which will be launched in partnership with Westminster, Tower Hamlets and Croydon from April 2020.

Infrastructure coordinators will be based within their respective local authorities, supporting developers with strong local knowledge of infrastructure constraints and opportunities, and facilitating their engagement with local infrastructure asset owners. The service is offered at

pre-planning stage, for scheme definition and design, and post-planning to support coordinated delivery by:

- Providing advice and guidance to developers embarking on the early stages of development planning
- Facilitating engagement with local infrastructure asset owners, enabling coordination with their plans
- Seeking opportunities for enhancement of local infrastructure, preparing it for future development with minimal disruption and triggering incremental improvements
- Supporting programming and organization of coordinated construction works to minimize disruption and protect the quality of public realm.

If successful, the GLA intends to establish this service across London. For more information, contact infrastructurecoordination@london.gov.uk.

Influencing the phasing of development and infrastructure

By engaging with different stakeholders, it can be possible to build a picture of development, place-making, highway and utility works planned in the area, and identify opportunities for coordinated delivery.

By programming and planning works in advance of development, it can be possible to coordinate in a way that reduces both costs and disruption for different stakeholders. The use of existing GIS platforms, such as Street Manager (the Department for Transport's new register of roadworks) and the GLA Infrastructure Mapping Application, can help to

identify and coordinate works.

Programming schedules can be updated with revised information on development phasing, which might be triggered through the confirmation of Section 38, 104, 106 and 278 agreements, the discharge of planning conditions and processing of CIL payments.

Planning conditions can also help to align development phasing with infrastructure delivery. However, these must meet the requirements of national planning policy which states that conditions should be kept to a minimum, and only used where they are demonstrably:

- Necessary
- Relevant to planning
- Relevant to the development
- Enforceable
- Precise
- Reasonable in all other respects

Working within these tests, it may be possible to set planning conditions which:

- Restrict commencement of development until information has been submitted on expected utility connections, and an agreement reached on how updates to development phasing will be shared with the local authority
- Restrict commencement of development until off-site infrastructure works have been completed, or planning obligations submitted and approved
- Restrict occupation until infrastructure has been delivered to a certain standard

Case study: Collaborative partnerships in the Croydon Growth Zone

To align the phasing of development and infrastructure in the Croydon Growth Zone, the London Borough of Croydon (LBC) established a collaborative partnership with Thames Water and SGN. This allows LBC to examine five-year utility investment programmes and identify opportunities for alignment with developments, highway works and other council-led capital investment programmes.

This is supported by improvements in infrastructure data-sharing and mapping. LBC invested in an Esri ArcGIS online platform to support and promote multi-utility collaboration works, which aims to synchronise with the London Infrastructure Mapping Application (IMA).

Relevant high-level data is shared with satellite-navigation apps and via the LBC website, and used to identify opportunities for further coordinated streetworks. This information is also shared with development management officers and developers during pre-application discussions and ongoing project management.

Case study: Coordinating infrastructure in Waltham Forest

At a location near the Blackhorse Lane Tube, four separate developments are under construction on adjacent sites. Each developer is working to a different programme and delivery timescale, while the Council also carried out a road improvement scheme. Existing water, drainage, electricity and gas capacity was insufficient to meet demand, and all required upgrade works while maintaining two-way traffic flows and construction activity.

In order to manage these works efficiently, council officers brought together representatives of all the developers and utilities to agree a collaborative programme. The following items were successfully negotiated and carried out:

- Three utilities - gas, water and electricity - shared a trench crossing the full width of Forest Road, working together to excavate a reinforced concrete road, install infrastructure and reinstate the road while maintaining traffic flow.
- Two developers agreed to install new drainage services simultaneously, with one agreeing to assume the risk for paying for enabling works before receiving planning permission for their site.
- For the drainage works, both developers agreed to employ the same contractor, who was also carrying out the Council's improvement works. This simplified coordination and traffic management for both activities and helped coordinate the additional utility works which took place in the same period.

Officers believe that this saved a minimum of ten weeks additional street works disruption, and the consequential risk of delays.

Negotiating developer contributions

Development management policy may request planning obligations for off-site utility infrastructure or in-kind contributions such as land. These are negotiated through Section 106 Agreements, which enables funding for infrastructure which is:

- Directly related to proposed development
- Reasonable in scale and kind

- Necessary to make the development acceptable in planning terms

Planning obligations in London are prioritised for affordable housing, public transport and health and education infrastructure. This means that clear evidence will be required to justify contributions towards utilities infrastructure, set out in the borough Infrastructure Delivery Plan and any accompanying development plan documents. Interventions could include:

- Reinstatement works that deliver healthy streets or components of a sustainable drainage system
- Upfront installation of electric vehicle charging points
- Construction of utility tunnels, culverts and conduits
- Installation of spare ducts for passive provision
- Installation of asset monitoring sensors

In addition to robust evidence, the negotiation process can be supported through good working relationships between planning policy, infrastructure and development management officers. It may be possible to identify synergies with Section 106 agreements for other types of infrastructure, or with Section 278, 38 and 104 agreements which cover aspects of highway and sewerage works and adoption.

It may also be possible to use developer contributions to fund in-house coordination activities and services.

Case study: Communal Entry Chambers and early installation in the City of London

The City of London faced challenges when considering how best to facilitate the roll out of fibre broadband connections to new office developments. With many of the large office buildings occupied by numerous tenants, and with multiple networks installed for resilience purposes, it was clear that a more coordinated approach was required to avoid consecutive connection requests which would lead to significant disruption from streetworks.

In order to overcome this problem, the City of London has amended its S106 agreements with developers to compel the funding and installation of Communal Entry Chambers. These are brick chambers built into the footway outside new offices that all fibre broadband providers can connect into. This allows for the coordinated installation of whichever service the building occupant requires, without the need for major streetworks and road closures.

The chambers are funded, owned and maintained by the developer under a Section 50 highways licence, and with ongoing access and management by the building owner.

Through pre-application engagement and planning policy requirements, developers are encouraged, where possible, to retain basement entry points during building refurbishment.

The City of London further assisted this process by developing a standardised wayleave toolkit to speed up wayleave agreements and expedite broadband connections, which is now being used across the UK.

Case study: Using planning obligations to fund infrastructure coordination in Tower Hamlets

At Tower Hamlets, the draft Supplementary Planning Document (SPD) for Planning Obligations (currently out for consultation) proposes that all major developments make a financial contribution to an in-house infrastructure coordination service.

Calculated at £100 per residential unit, and £10 per sqm of additional non-residential floorspace, the funding would support a coordinated approach to minimise the impacts of construction and maximise efficiencies, with benefits to developers, contractors, the council and wider communities. Proposed activities, which could be taken at a borough-wide level, include:

- The co-ordination of different construction timeframes, logistics and resources required for sites, along with planned utility and highways works within the wider area
- The assessment of multiple construction management plans to identify opportunities for co-ordination and integration
- The organisation and management of local construction forums with relevant parties, focused on sharing issues, best practice and communicating and scheduling works to minimise possible disruptions to services and local residents
- Community liaison duties, including out-of-hours meetings and forums.
- Monitoring adherence to relevant safety and compliance schemes

The draft SPD notes the need to manage the impacts that result from cumulative nature of construction and development across the borough, and references Local Plan policies which require that development minimise its impact on the local environment and communities. The draft SPD notes that higher contributions may be sought for when construction for a site is particularly complex.

Monitoring and evaluation

The Infrastructure Delivery Plan and Annual Monitoring Report can be used to describe where developer contributions and other funding sources have supported the delivery of integrated infrastructure strategies, and how these have helped to achieve the council's wider economic, social and environmental priorities.

Reporting also provides an opportunity to look beyond the physical infrastructure delivered, and communicate the impact of borough-led coordination initiatives, such as:

- Reducing street work duration and extent
- Improving local perceptions of development
- Fewer air pollution incidents
- Improved safety through construction logistics

Monitoring and evaluation can also gather valuable data to support future infrastructure planning, such as by:

Using pre-occupancy conditions to request information from developers on as-built utility costs, which can be compared to the estimates provided at the application stage. This evidence can assist planning officers, designers and contractors with subsequent schemes.

Using planning obligations and conditions to require Post-Occupancy Evaluation (POE). This can provide valuable information on building and utility performance, along with community attitudes to development and the impact of coordination initiatives.

Support from the GLA: The London Development Database Planning Data Standard

In addition to the automation project, the GLA is expanding the range of planning data which is automatically captured and recorded in the London Development Database (LDD) in order to more effectively monitor the London Plan. This will include a range of datasets which can assist in the monitoring the utility demands of development, including:

- Number of homes and other uses served by full fibre internet
- Number and type of active and passive vehicle charging points proposed
- Number of homes with electrical heating
- Number of homes with passive cooling
- Number of new gas connections required
- Provision of heat pumps
- Provision of solar capacity
- Provision of onsite community owned energy generation
- Greenhouse gas emissions reduced by a level exceeding that specified by Part L of the Building Regulations
- Area of green roof proposed
- Urban Greening Factor score

For more information about the LDD combined planning data standard visit:

london.gov.uk/what-we-do/planning/london-plan/london-development-database

Annex 1: Draft New London Plan policies which support the integrated planning and coordinated delivery of utility infrastructure

The following list highlights policies within the [2019 Draft New London Plan](#) which can be used to support local planning policy and development management for utilities infrastructure.

General

- Policy GG6, which requires those involved with planning and development to take an integrated and smart approach to the delivery of strategic and local infrastructure by ensuring that public, private, community and voluntary sectors plan and work together.
- Policy SD1, which states that the Mayor will assist in delivering specific infrastructure requirements that unlock capacity for new homes and jobs in London's Opportunity Areas
- Policy D1B, which requires boroughs to prepare Development Plans which assess the capacity of existing and planned physical, environmental and social infrastructure to support the required level of growth and, where necessary, improvements to infrastructure capacity should be planned in infrastructure delivery plans or programmes to support growth.
- Policy D2B, which requires boroughs to work with applicants and infrastructure providers to ensure that sufficient infrastructure capacity will exist at the right time to support proposed densities, to phase development accordingly
- Policy D2C, which requires the submission of an infrastructure assessment during the planning application process, which has regard to the local infrastructure delivery plan or programme, and identifies any infrastructure that will be delivered through the development to address capacity issues
- Policy D3, which requires development to make the best use of land by following a design-led approach which considers existing and planned infrastructure capacity

Green

- Policy G1, which requires boroughs to prepare strategies that support the planning, design and management of green infrastructure in an integrated way to achieve multiple benefits

Energy

- Policy SI3A and B, which requires boroughs and developers to engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals, and develop energy masterplans for large-scale development locations which establish the most effective energy supply options, including possible land requirements and the role of the public sector in supporting implementation.
- Policy SI3C, which requires development plans to identify the need for, and suitable sites for,

any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure, and to identify existing heating and cooling networks, proposed locations for future heating and cooling networks and opportunities for expanding and inter-connecting existing networks as well as establishing new networks.

- Policy SI4, which requires development proposals to minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure, and for major development proposals to demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems.
- Policy T6, which requires all operational car parking and car parking in new development to make provision for infrastructure for electric or other Ultra-Low Emission vehicles

Water

- Policy SI5B and C, which requires Development Plans to promote improvements to water supply infrastructure to contribute to security of supply in a timely, efficient and sustainable manner, and for development proposals to minimise the use of mains water.
- Policy SI5F, which requires Development Plans and proposals for strategically or locally defined growth locations with flood risk constraints or insufficient water infrastructure capacity to be informed by Integrated Water Management Strategies at an early stage.
- Policy SI12, which requires development proposals to employ natural flood management methods
- Policy SI13, which requires development proposals to achieve greenfield run-off rates, ensure that surface water run-off is managed as close to its source as possible, and to prioritise green over grey features

Digital

- Policy SI6A, which requires development proposals to ensure that sufficient ducting space for full fibre connectivity infrastructure is provided to all end users within new developments, unless an affordable alternative 1GB/s-capable connection is made available
- Policy SI6B, which requires Development Plans to support the delivery of full-fibre or equivalent digital infrastructure, with focus on areas with gaps in connectivity and barriers to digital access.



To find out more about the GLA's Infrastructure Team and how they work with industry, read the [Team Prospectus](#)

www.london.gov.uk

infrastructure
cōrdination

GREATER
LONDON
AUTHORITY



RTPI
Royal Town Planning Institute