

London Environment Strategy Integrated Impact Assessment: Non-Technical Summary

Introduction

An Integrated Impact Assessment (IIA) has been carried out on the draft London Environment Strategy for consultation (the 'LES') by Jacobs, in association with Temple Group Ltd. The purpose of IIA is to promote sustainable development by ensuring that environmental, social and economic issues are considered during the preparation of the LES and consulted upon. Figure 1 illustrates the main stages of the IIA process.

The IIA incorporates the following types of assessment, which are described in Table 1:

- Strategic Environmental Assessment
- Equality Impact Assessment
- Health Impact Assessment
- Assessment of Economic Impacts
- Community Safety Impact Assessment

This Non-Technical Summary reports the IIA of the draft LES for consultation. It provides a summary of the information contained within the IIA Report and, together with the IIA Report, is being consulted upon alongside the draft LES.

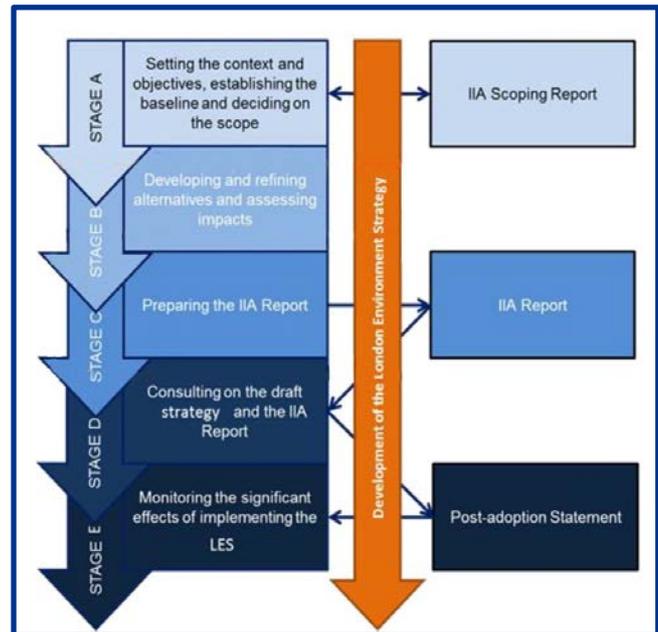


Figure 1: Main Stages of the IIA Process

Table 1 Assessments included in the IIA of the LES

• Assessment type	• Description
Strategic environmental assessment (SEA)	SEA is a statutory requirement for new or revised plans and programmes ¹ . It assesses the likely significant effects on the environment of implementing the LES. SEA considers: biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, landscape and the interrelationship between these issues. A non-technical summary of the assessment is required to be made available to the public.
Equality Impact Assessment (EqIA)	EqIA is undertaken to help fulfil the Mayor's duty under the Equality Act 2010 to work to eliminate discrimination and promote equality in all activities. The EqIA assesses how the strategy would affect groups of people with protected characteristics under the Equality Act 2010: age, disability, gender reassignment, pregnancy and maternity, race, gender, religion or belief, sexual orientation and marriage/civil partnership status. It also considers effects on Londoners on low incomes.

¹ European Directive 2001/42/EC (the SEA Directive) transposed into English law via the Environmental Assessment of Plans and Programmes Regulations 2004 ("the SEA Regulations" SI2004/1633)

<p>Health Impact Assessment (HIA)</p>	<p>When preparing or revising a strategy, the Mayor is required to consider policies and proposals best considered to promote improvements in health of persons in Greater London.² The purpose of HIA is to assist decision-makers in understanding the health impacts of a plan. It seeks to highlight practical ways to:</p> <ul style="list-style-type: none"> • Enhance the positive health, health equality and well-being effects of a plan; and • Avoid or reduce the negative health, health inequality and well-being effects.
<p>Assessment of Economic Impacts (AEI)</p>	<p>The Mayor has a duty to promote economic development and wealth creation in Greater London³. While there is no statutory guidance on undertaking an AEI, the AEI has been undertaken to identify likely significant effects on society and the economy through assessing issues such as: climate change; crime and security; connectivity; economic competitiveness; employment; energy use and generation.</p>
<p>Community Safety Impact Assessment (CSIA)</p>	<p>There is no specific statutory requirement for a CSIA to be carried out. However it has been included to support the Mayor in his duty to do all that reasonably can be done, when carrying out his activities, to prevent crime and disorder⁴.</p>

² Section 41(4) of the Greater London Authority Act 1999

³ Section 30 of the Greater London Authority Act 1999

⁴ Section 17 of the Crime and Disorder Act 1998

The Draft LES for Consultation

Objectives and Content of the LES

The Mayor is required to prepare a London Environment Strategy, which must cover biodiversity; air quality; ambient noise; climate change mitigation and energy; climate change adaptation, and municipal waste.

In addition to these aspects, the Mayor considers that London's environmental issues are wider, and so has covered further issues of green infrastructure, commercial waste, and water supply and demand within the draft LES.

The draft LES, which has been prepared by the Greater London Authority (GLA), sets out the Mayor's strategy for a city which is:

- Greener;
- Cleaner; and
- Ready for the future

The LES has been shaped by the consideration of three interrelated factors:

- Population growth
- Climate change
- Fairness and social integration

The draft LES is set out according to seven Policy Areas, each with its own objectives:

Policy Area for Green Infrastructure

Objectives

- Make more than half of London's area green by 2050
 - Conserving and enhancing wildlife and natural habitats
 - Value London's natural capital as an economic asset and support greater investment in green infrastructure
-

Policy Area for Air Quality

Objectives

- Support London and its communities, particularly the most vulnerable and those in

priority locations, to help empower people to reduce their exposure to poor air quality

- Achieve legal compliance with UK and EU limits as soon as possible, including by mobilising action by the London boroughs, Government and other partners
 - Establish and achieve new, tighter air quality targets for a cleaner London by transitioning to a zero emission London by 2050, meeting World Health Organisation guidelines for air quality
-

Policy Area for Ambient Noise

Objectives

- Reducing the adverse impacts of noise by targeting locations with the highest noise pollution from transport
 - Protect and improve the acoustic environment of London
-

Policy Area for Adapting to Climate Change

Objectives

- Understand and manage the risks and impacts of severe weather and future climate change in London on critical infrastructure, public services, buildings and people
 - Reduce risks and impacts of flooding in London on people and property and improve water quality in London's rivers and waterways
 - Ensuring efficient, secure, resilient and affordable water supplies for Londoners
 - London's people, infrastructure and public services are better prepared for and more resilient to extreme heat events
-

Policy Area for Waste

Objectives

- Drive resource efficiency to significantly reduce waste, focusing on food waste and single use packaging
- Maximise recycling rates.
- Reduce the environmental impact of waste activities

- Maximise local waste sites and ensure London has sufficient infrastructure to manage all the waste it produces

Policy Area for Climate Change Mitigation and Energy

Objectives

- Reduce emissions of London's homes and workplaces while protecting the most vulnerable by tackling fuel poverty
- Develop clean and smart, integrated energy systems utilising local and renewable energy resources
- A zero carbon transport network by 2050

Policy Area for Transition to a Low Carbon Circular Economy

Objective

- Enabling the transition to a low carbon circular economy

This IIA report assesses an additional Policy Area – 'Water'. Just prior to the publication of the draft LES for consultation this Policy Area was incorporated into the 'Adapting to Climate Change' Policy Area. In this process none of the policies or proposals were changed and as such the standalone assessment of this policy area remains unchanged. The IIA assesses eight Policy Areas but due to amalgamation of 'Water' and 'Adapting to Climate Change' Policy areas into one, seven Policy Areas in total were taken forward in the draft LES for consultation document.

Under each of the objectives within the Policy Areas, the LES sets out a series of proposals setting out how the Mayor intends to work towards meeting the objectives.

One of the Mayor's most important roles is leadership. As a consequence, the delivery of much of the vision set out in the draft LES will depend upon the indirect influence of the Mayor in this leadership capacity, through his ability to bring together stakeholders to deliver initiatives and programmes identified in the LES that would benefit Londoners' and London's environment.

Relationship with other Mayoral Strategies

The LES is one of a number of strategies that the Mayor is required to produce. These strategies are closely interlinked and there is a need for consistency between the LES and these other strategies. For example, the Mayor's spatial development strategy the 'London Plan', sets out an integrated economic, transport and social framework for the development of London over the next 20–25 years, while the consultation draft Mayor's Transport Strategy (MTS) sets out the Mayor's vision for London's transport up until the year 2040 and aims to address the transport requirements for London's predicted population growth.

Alternative Options

Alternative strategic approaches to the proposed Policy Areas were put forward by the GLA in the initial stages of the LES's development. These were considered in relation to the IIA objectives and recommendations were fed back to the GLA on which options were considered to offer the most potential in term of achieving sustainable development objectives.

Alternative Options for the Air Quality Policy Area

The four options put forward for the Air Quality Policy Area were:

- Option 1: Impose restrictions on the quantity / type / timing of emissions allowed from buildings and or transport e.g. The Ultra-Low Emissions Zone.
- Option 2: Introduce standards that Londoners' / manufacturers / companies should be encouraged to meet e.g. Euro emissions standards for vehicles.
- Option 3: Invest in or promote the use of technologies that either improve air quality or have a reduced impact e.g. Ultra-Low Emission Vehicles (ULEVs).
- Option 4: Encourage Londoners' to change their behaviour to mitigate the impacts of poor air quality e.g. through promoting active travel or school education programmes.

The IIA team judged that the options could be complementary rather than alternative approaches and recommended that the LES sought to involve a combination of the approaches. It also recommended that the most vulnerable to harmful emissions (such as school children and cyclists) should be protected. The GLA agreed to consider aspects from all four

options in terms of policy approach and recognised this as the most effective approach for addressing human health impacts. The GLA agreed that it would look to include specific interventions to improve air quality around schools, hospitals and care homes.

Alternative Options for the Green Infrastructure Policy Area

The GLA put forward two alternative approaches:

- Option 1: Develop policies and proposals that promote the protection and enhancement of London's green spaces and natural habitats. An approach that focuses on the conservation of nature and improving access to and appreciation of the natural environment.
- Option 2: Develop policies and proposals that promote the concept of green infrastructure and the greening of the urban environment, alongside protection of the natural environment. An approach that focuses on optimising ecosystem services to provide a range of socio-economic benefits as well as environmental outcomes.

The IIA team advised that option 2 could be strengthened through a broad-based use of ecosystem services approaches (i.e. recognising the services that the natural environment and processes provide to people) across London authorities. The GLA considered that the use of an ecosystems services approach was fundamental to the LES and would be reflected within it.

Alternative Options for the Adapting to Climate Change Policy Area

The GLA put forward two options:

- Option 1: Reactive approach to managing climate risks and impacts (involving a focus on emergency responses, provision of information during heatwaves and water restriction measures in times of drought).
- Option 2: Proactive approach to managing climate risks and impacts (involving creating an action plan to retrofit adaptation measures, ensuring appropriate design to guard against heat risk and working with water companies to identify new sources of water supply).

Again the IIA team considered that aspects from both approaches could be used but recommended that in both options there would be a need to target at risk

groups with interventions. The GLA confirmed that the LES would include targeted interventions for 'at risk' groups.

Alternative Options for the Climate Change Mitigation and Energy Policy Area

The GLA put forward two options:

- Option 1: Low demand, centralised supply scenario to achieve net zero carbon emissions in London by 2050. This scenario reflects a similar energy system to the one we have today in 2050 which primarily relies on national supply however it assumes that there has been significant interventions to reduce building demand. These are likely to have been driven by regulatory requirements. It includes a significant uptake in electrification of heat and transport.
- Option 2: Low demand, decentralised supply scenario to achieve net zero carbon emissions in London by 2050. This scenario demonstrates significant change to London's energy infrastructure from how it is today. It considers more local energy generation and use of energy, this includes high uptake of heat networks using secondary heat sources and renewables. This option may also allow a wider choice of fuels for example hydrogen used for heating buildings.

The IIA identified that both options focused on lowering building energy demand but not demand for high energy transport. It recommended that there should also be a focus on transport and active travel.

The GLA confirmed that both options assumed electrification of transport, but Option 1 relies on centralised decarbonisation of the grid.

Alternative Options for the Ambient Noise Policy Area

Two options were put forward:

- Option 1: Reduction in impact from or levels of noise and vibrations caused by road, rail, aircraft and water transport.
- Option 2: Improvement of London's soundscape through mechanisms such as public realm design, green infrastructure and improving biodiversity.

The IIA team recommended that a combination of both approaches would provide the greater amount of sustainability benefits. The GLA agreed to this combined approach.

Alternative Options for the Waste Policy Area

The GLA put forward two options:

- Option 1: Improvements in traditional waste management via the linear (take, make, dispose) economy.
- Option 2: Taking a resource efficiency approach through a shift to a circular economy.

Again the IIA team recommended that both approaches could be delivered together. It suggested that traditional approaches should focus on areas where recycling effectiveness is high, building on existing success, while non-traditional approaches could be used to build up the circular economy within London. The GLA agreed to consider both options in the LES.

Iterative Development of the LES

In addition to the above-identified options, the LES has been through three main iterations, which have been reviewed by the IIA team. This has allowed further recommendations to be put forward and taken into account in the draft LES for consultation.

Relevant Environmental Conditions and Problems

Since the LES covers Greater London, the geographical area of the environment likely to be significantly affected is also considered to be Greater London (Figure 2). The IIA has considered London's current environmental conditions and how these conditions are predicted to develop in the absence of the LES up until the year 2050. The IIA has also considered the key issues of relevance for the LES, which informed the definition of objectives against which the strategy has been assessed.



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Figure 2 Greater London and its Sub Regions (source: GLA)

Air Quality

There are high levels of air pollutants from road transport and London is failing to achieve legal limits for nitrogen dioxide. Furthermore, pollution in the form of particulate matter is not predicted to reduce between now and 2030 without further policy intervention. Other non-road air pollutant sources include domestic and commercial gas, river transport, aviation, non-road mobile machinery.

A large population is exposed to polluted air which exceeds legal limits⁵. There are hotspots of pollution around the city, including around schools, (Walton et al. 2015) exposing children to dangerously polluted air.

This is a critical issue for London and there is a need to introduce a range of measures to tackle all the main sources of air pollution as well as address the inequality in exposure across the population.

Climate Change Adaptation

The predicted impacts of climate change include an increasing frequency of extreme weather events such as flood risk, drought and heat risk.

The impacts of climate change will not be equal or fair and are likely to increase existing inequalities. For example, since some people will be more vulnerable to the health effects from extreme heat (for example children, pregnant women, those with underlying health conditions, and the elderly), whilst those on lower incomes will be less able to protect and / or adapt their properties.

Climate change resilience will require protecting the health and livelihoods of Londoners, as well as London's infrastructure including transport, homes, public buildings and businesses, from the effects of these events.

Climate Change Mitigation

Greenhouse gas emissions peaked in London in 2000 and have been decreasing ever since despite population growth. Furthermore, London's per capita emissions are the lowest of any region in the UK⁶.

5 Howard, R., Beevers, S., Dajnak, D. (2105) Up in the air – How to Solve London's Air Quality Crisis: Part 2 [online]. Available from: <https://policyexchange.org.uk/wp-content/uploads/2016/09/up-in-the-air-part-2.pdf>.

6 Greater London Authority. 2014. Interim London Energy and Greenhouse Gas Inventory (LEGGI) 2014 [online]. Available from: <https://data.london.gov.uk/dataset/interim-london-energy-and-greenhouse-gas-inventory--leggi--2014>

The buildings and transport sectors are responsible for the greatest share of greenhouse gas emissions in London (from workplaces, homes and transport).

Energy Use and Supply

Energy demand in London will continue to rise with population growth and as heating and transport becomes increasingly electrified⁷. The current relatively high use of fossil fuels coupled with the ineffective use of energy, contributes towards London's greenhouse gas emissions.

There is a relatively high number of people in fuel poverty. There is opportunity to reduce fuel poverty by improving insulation and energy efficiency. There are also opportunities to reduce greenhouse gas emissions and air pollution through the generation and supply of clean energy.

Flood Risk

London always has had and will continue to have a degree of flood risk. However it is an issue and the probability of flooding is increasing with climate change.

The sources of flood risk include river, surface water, tidal, sewer, groundwater and reservoirs. Flood risk affects people and property, and affects poorer communities to a greater extent. Some of London's most critical future flood defences involve development of land outside of the Greater London Authority's boundary.

Geology and Soils

Greater London has a range of distinctive natural landscapes shaped by geological processes, such as undulating chalk downlands in south London, and the river terraces of north London⁸.

Soils play an important role in urban areas in supporting food production, improving drainage and can help shape the quality of London's green spaces. Pressure on soils is likely to increase in the future with expected population growth.

Some soils in London have high levels of contamination from substances that are a legacy of former industry and the incorporation of rubble and waste into soils as a consequence of redevelopment.

Materials and Waste

There is increasing pressure on London's waste sites and infrastructure, including wharves, to meet demand. Landfilling is expensive and many landfill sites receiving London's waste are expected to close by 2025 and not be replaced. Recycling rates in London are lowest in England and the recycling performance in flats is particularly low (estimated to be around 10%⁹). There is therefore a need to address the wasteful economy and improve performance on recycling.

Noise and Vibration

Many people live in areas where noise levels exceed the guidelines set by the World Health Organisation (WHO). Available research shows that locations which are most likely to exceed WHO guidelines are those near urban roads and transport interchanges. A key issue is the increasing noise levels from the night time economy, freight traffic and deliveries associated with mixed use development. There is also a lack of quiet and tranquil places for relaxation and enjoyment.

Noise disturbance can be associated with health impacts such as sleep disturbance, stress, anxiety, high blood pressure, poor mental health in adults and school performance and cognitive impairment in children.

Water Resources and Quality

Water is supplied to customers in London by four water companies – Thames Water (the largest supplier), Affinity Water, Essex & Suffolk Water, and Sutton & East Surrey Water. Around 80% of London's water is drawn from rivers, principally the Thames and the River Lee. Most of the remaining water comes from abstracting groundwater.

Water resources are already under pressure in London. There is a risk of drought if there are two consecutive dry winters. This pressure is exacerbated by some of the highest rates of water use in the country, combined with some of the highest rates of leakage from the water supply distribution network.

Only two of the 64 waterbodies in London have a rating of 'good' in terms of water quality. The

⁷ Defra. 2016. Local authority collected waste from households from January 2010 to March 2016 – England data [Online] [Accessed 08 August 2017]. Available at: <https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables>

⁸ Capita (2012) London's Geodiversity Action Plan 2009-2013 (2012 update) [online. Available from: www.londongeopartnership.org.uk/downloads/LondonGAP_Feb%202012%20update.pdf.

⁹ Defra. 2016. Local authority collected waste from households from January 2010 to March 2016 – England data [Online] [Accessed 08 August 2017]. Available at: <https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables>

remainder are 'moderate' or 'poor'¹⁰, so there is a need to improve water quality in the waterbodies in London. The causes of poor water quality are varied but there is significant concern about incorrectly connected sewers that allow wastewater to discharge into rivers and the other concern is the general build-up of pollutants from road surfaces (fuel and oils, together with tyre rubber and bits of metal) and other dust, debris and litter from the urban environment, getting washed into the water environment.

Natural Capital and the Natural Environment

This topic covers biodiversity (the variety of habitats and species of wildlife); semi-natural areas; parks and amenity green spaces, as well as engineered green space such as green roofs.

Natural capital refers to the elements of the natural environment that directly or indirectly produce value to people, including ecosystems, species, freshwater, land minerals, air, as well as natural process and functions (such as nutrient cycling)¹¹.

Green infrastructure refers to the natural capital assets (parks, gardens, street trees, green roofs, etc) that can be planned, designed and managed to provide a range of benefits including healthy living, mitigating flooding, cooling the urban environment and improving air and water quality.

Key issues are a loss of biodiversity and reduced ecological resilience as a result of increased pressure from development. There is also increasing recreational pressure on existing habitats and green spaces. The impact of climate change and threat of new pests and diseases further puts pressure on the natural environment and green spaces.

Historic Environment

London's heritage includes nationally and locally listed buildings, registered historic parks and gardens, and other natural historic landscapes, conservation areas, World Heritage Sites, registered battlefields, scheduled monuments, archaeological remains and memorials.

Historical characteristics and the preservation and enhancement of these, is particularly important to

people's sense of place. Heritage assets are at risk from inappropriate development and air pollution.

Equality and Inclusion

Inclusion means removing barriers and taking steps to create equality, harness diversity and produce safe, welcoming communities and cultures that encourage innovative and fresh ways of thinking and allow people to speak up, especially to suggest where things could be done better.

Equality refers to advancing equality of opportunity and avoiding discrimination. Environmental impacts will be experienced differently among London's diverse population. For example, children are particularly vulnerable to air pollution, in part from their immature immune defences and higher breathing rates than adults.

Social Integration

London is one of the most diverse cities in the world but in a 2015 survey only half of Londoners agreed that there are good relations between older and younger people, and between ethnic and religious communities in their local area¹².

Social integration is about how we all live together. It is about building strong communities where all Londoners can lead interconnected lives and play an active part in their city and the decisions that affect them. This can only be achieved by working to prevent, identify and remove inequalities and barriers that prevent people from engaging in their communities and wider society, whilst recognising the important role interaction and participation play in overcoming these.

Health and Health Inequalities

Life expectancy in London is higher than the national average¹³ and trends in the leading causes of premature death – cancer, cardiovascular and respiratory diseases, are all going down¹⁴. However the increases in the amount of time that people can expect to live without suffering ill-health are not keeping pace with increases in overall life expectancy.

Health can be influenced by a range of factors, and the quality and accessibility of healthcare services

10 Defra (2015) Water for life and livelihoods – Part 1: Thames river basin district. River basin management plan [online]. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/500548/Thames_RBD_Part_1_river_basin_management_plan.pdf.

11 NCC (2013) The State of Natural Capital: Towards a framework for measurement and valuation [online]. Available from: <http://nebula.wsimg.com/66000b802a5cab1425b1e05d9a716835?AccessKeyId=68F83A8E994328D64D3D&disposition=0&alloworigin=1>

12 GLA (2015) Annual London Survey. GLA: London.

13 Greater London Authority. Economics Evidence Base for London 2016. Chapter 8 – London's people [online]. Available from: <https://www.london.gov.uk/sites/default/files/chapter8-economic-evidence-base-2016.pdf>

14 Public Health England. n.d. Health Profiles [online]. Available at: <https://fingertips.phe.org.uk/profile/health-profiles/data#page/0>

only accounts for a minority of the overall variation in health. Wider factors such as socio-economic status, the environments in which people live, and the influence these factors have on Londoners' lifestyles and behaviour, play an important part in determining the health and wellbeing outcomes of Londoners. There are big differences in life expectancy and healthy life expectancy between and within different boroughs and demographic groups. People in the most deprived areas have the shortest life expectancy.

Key issues include increasing health inequalities across London, due to, for example, differences in exposure and susceptibility to air pollution. Other issues include health inequalities related to heat risk, noise, and access to green space. Green space can play an important part in improving quality of life, health and wellbeing.

Londoners are not doing enough physical activity each day, which affects overall health.

Accessibility

Inequalities in access to healthy environments have a strong influence on health outcomes.

Accessibility with respect to the environment is considered in sections on air quality, climate change adaptation, climate change mitigation, energy use and supply, flood risk and natural capital and the natural environment.

There are parts of the city where local people lack access to green space and the natural environment. These areas tend to be where development is densest, or in areas of deprivation.

People living in almost half of London do not have sufficient access to district or local parks.

Housing Supply, Quality, Choice and Affordability

There is an undersupply of homes in London which meet the needs of Londoners in terms of size, type and tenure. There is also a lack of affordable housing and the increase in house prices is greater than increases in wages. Fuel poverty remains a key issue (refer to section on energy use and supply). There are opportunities to design new build housing to environmental building standards to improve energy efficiency.

Crime, Safety and Security

London is a relatively safe city compared to other global cities and the likelihood of being a victim of

crime is low. However, as a global city it is at higher risk of terrorist attacks than other cities in the UK.

Fear of crime can be a barrier to walking or using public transport and deter Londoners from using sustainable forms of transport. Fear of antisocial behaviour can be stressful and can limit people's access to activities, contributing to social isolation.

The design of the built environment can help to minimise the risk of criminal behaviour through passive surveillance. Sometimes there is a balance between designing a place to make it feel safe and secure and allowing places to be permeable and attractive which can aid walking and movement.

Design

The social, cultural, environmental and economic relationships between people and their communities are reinforced by the physical character of a place.

Some parts of London have a poor quality public realm. The design of streets is an important element in improving people's perception of the public realm. Attractive streets can encourage more walking and cycling as well as social interaction and play. Therefore there are benefits in terms of physical and mental health, as well as social integration.

Economic Competitiveness, Employment, Education and Skills

The environment is a fundamental part of London's economy. Maintaining high environmental standards and ensuring infrastructure meets the needs of London's economic for the future is essential to ensure London's continued competitiveness.

There are incentives and opportunities for London to specialise and develop in areas that could help to mitigate against some of the climate risks that London faces. For example there has been growth on London's low carbon finance sector; low carbon and environmental goods and services; and development in activities relating to the circular economy.

Connectivity

Connectivity relates to the ease of reaching employment, education, shop, recreation, friends, family and health and social services by different modes of transport.

Transport issues will be principally addressed through the draft Mayor's Transport Strategy. Key issues for the LES relate to addressing existing

difficulties in access to open space; poor connectivity to green infrastructure for all; poor air quality as a result of overcrowding and congestion on services and roads, and poor connectivity and access to essential services during climate related air quality episodes.

Infrastructure

The scale and growth expected in London has significant implications for its infrastructure. Key issues related to infrastructure are the level of green infrastructure; impacts of climate change on existing infrastructure; the capacity of waste infrastructure, and the infrastructure requirements of a low carbon circular economy. These issues are covered in the preceding information.

Culture

London's culture sector and the creative industries deliver both economic and social benefits for the capital. As well as one of London's fastest growing sectors, culture plays a role in bringing people together and generating civic pride.

The culture sector can also promote the environmental agenda, for example through improving sustainability in its venues.

Sustainable Land Use

Due to the scale of growth expected in London and the limited supply of land, there is an inherent tension between the need to provide more housing and the need for other land uses such as employment. The way London accommodates this growth in demand

on available land will be fundamental to the spatial policies of the new London Plan.

Developments which increase road traffic can cause damage and loss to nearby habitats, directly through land-take and indirectly through changes in air and water quality. However, good design and creation of green transport corridors can help offset such impacts, and even enhance biodiversity at a local level.

Likely Significant Environmental Effects

Objectives-led Assessment

The IIA has taken an objectives-led approach. This means that a series of IIA objectives have been developed against which to judge if the content of the draft LES is beneficial in contributing to each objective or adverse in being counterproductive to the delivery of each objective.

Spatial and Temporal Scope of Assessment

The assessment has considered effects on the environment and communities in Greater London (Figure 2) since this reflects the geographical scope of the LES.

The draft LES covers the period to 2050 and therefore the IIA has considered effects over the same timeframe. Where possible, significant effects identified were categorised as short term (0-5 years), medium term (6-15 years) and long term (16-25 years).

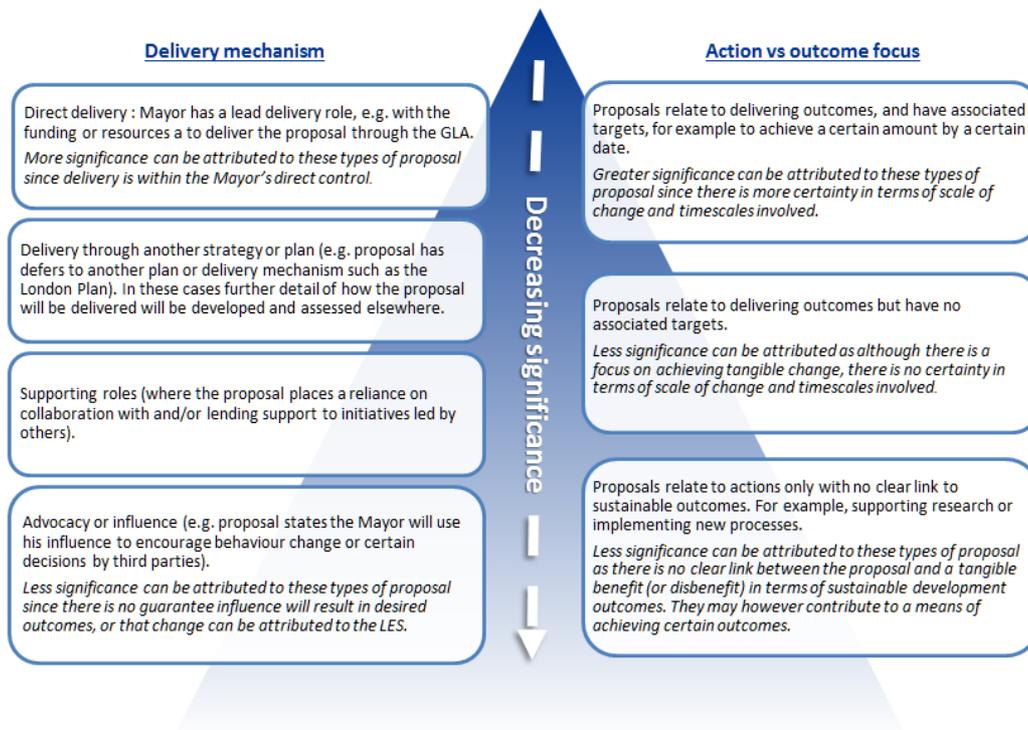


Figure 3 Factors Considered in Assessing Significance

Consideration of Significance

The IIA used the criteria set out in Table 2 to assign the level of significance in the assessment. All effects which have been judged to be greater than neutral or uncertain are considered potentially significant and should be taken into account in decision-making on the LES.

In deciding what level of significance to apply to proposals within the draft LES, the assessors have considered whether the proposals assessed relate to a direct action from the Mayor or depend upon third party actions to result in impacts on London's environment or communities. They have also considered whether the proposal relates to delivering an actual outcome or an action towards delivering an outcome. Figure 3 illustrates the considerations applied in the assessment process. The significance criteria applied to the assessment are set out in Table 2.

The assessors recorded their assessments and the evidence to support the assessment. The draft LES was assessed by Policy Area and then the results were considered in combination to consider the strategy-wide implications of the draft LES on the IIA objectives.

The IIA Report presents the results of the assessment for each Policy Area. The strategy-wide results are presented below in this non-technical summary.

Table 2 Significance Ratings

Scale of effect		Definition
++	Major positive effect	Contributes greatly towards achieving the IIA objective/Significant Effect
+	Minor positive effect	Contributes to achieving the IIA objective
0	Neutral or no effect	Does not impact upon the achievement of the IIA objective
-	Minor negative effect	Conflicts with the IIA objective
--	Major negative effect	Greatly hinders or prevents the achievement of the IIA objective/Significant Effect
?	Uncertain	Can have positive or negative effects but the information available does not allow a clear judgement

Strategy-Wide Assessment (Table 3)

Each of the Policy Areas was assessed against the IIA objectives. Following this the effect of the whole strategy on each of the IIA objectives was assessed to identify which sustainability objectives are strongly supported through the draft LES for Consultation and which ones are more weakly supported.

Table 3 presents a summary of the results of the assessment for each IIA objective.

The IIA did not record any overall negative effects against the IIA objectives. The draft LES performed most strongly against the IIA objectives for:

- Air quality (IIA objective 1)
- Climate change mitigation (IIA objective 3)
- Flood risk (IIA objective 5)
- Materials and waste (IIA objective 7)
- Natural capital and natural environment (IIA objective 10)
- Infrastructure (IIA objective 22)

These significant effects are described below.

Overall Effect on Air Quality

The strategy was identified as having positive impacts on air quality through its inclusion of measures to tackle both sources of air pollution and exposure to air pollution. The sources of air pollution covered by the strategy include emissions from road transport, aviation, river transport, buildings and non-road mobile machinery (for example, construction plant, generators, industrial trucks). The strategy identifies funding for London boroughs to use to improve air quality and reduce exposure, especially around schools. To support this, the GLA will implement a programme to identify measures to reduce exposure which can be implemented by London boroughs. The strategy recognises protecting children from exposure as a priority due to their greater vulnerability to adverse health impacts of air pollution. Most Policy Areas contributed in some way to air quality improvements. Overall, the breadth of measures, and priorities for action, were considered to support major beneficial effects on air quality. These effects would be realised in the medium to long term.

Overall Effect on Climate Change Mitigation

The positive impacts of the strategy against this objective relate to a range of different policies and proposals across Policy Areas (addressing air quality through implementation of low carbon vehicles and green infrastructure, targets to reduce waste and

push materials up the waste hierarchy, retrofitting of measures to reduce energy demand), which would all support a shift to a low carbon circular economy. Due to the number of positive impacts identified, a major positive overall assessment was made. It was considered that the effects would likely occur in the medium to long term.

Overall Effect on Flood Risk

The draft LES supports the objective to manage the risk of flooding, with positive impacts assessed across over half of the Policy areas, and no negative effects identified. The Adapting to Climate Change Policy Area contains objectives and proposals specifically focused on climate resilience and minimising the impact of flooding. These are enhanced by the associated benefits of improved green infrastructure proposals set out in the Green Infrastructure Policy Areas. As the measures within the Adapting to Climate Change Policy Area are varied and include both specific and outcome-orientated proposals, and other Policy Areas either support this or do not negatively impact, the overall assessment is considered to be major positive. It was considered that the effects would likely occur in the medium to long term.

Overall Effect on Materials and Waste

The Waste Policy Area directly addresses the effective management of waste and resources. The range of measures directly addressing the objective, including a number of outcome-oriented proposals, has resulted in major positive effects being assessed as would be expected. The Policy Areas relating to air quality, noise, green infrastructure, climate change mitigation, and adaptation would not be expected to directly address the objective. As no negative impacts have been assessed in these areas, a major positive is assessed overall for the short, medium and long term.

Overall Effect on Natural Capital and Natural Environment

The draft LES supports the achievement of IIA objective 10 with positive effects identified across all Policy Areas except the Waste Policy Area, which would not be expected to contribute directly to this objective, and the water supply policies in the Adapting to Climate Change Policy Area, where some uncertainty of the effect of future (potential) reservoirs was identified. The draft LES includes a Policy Area focused on the increase and improvement of green infrastructure and natural capital and would therefore be expected to contribute positively to this objective. A major positive effect

was assessed in the SEA as a result of the outcomes-orientated measures and specific targets in place to increase green infrastructure. Given the range of measures, an overall major positive effect has been identified. The overall effect is considered likely to be noticeable in the medium to long term as new green infrastructure becomes identified and established.

Overall Effect on Infrastructure

The LES has a positive effect on IIA objective 22, including major positive effects in relation to Policy Areas for Waste, Climate Change Mitigation and Energy, and Water. This largely relates to proposals within these Policy Areas which promote the optimised use of existing infrastructure as well as specific proposals for additional infrastructure to meet an identified need. This would help to ensure the best use of infrastructure and growth in infrastructure to support economic growth through sustainable development. Minor positive impacts are also assessed in relation to enhanced green infrastructure and energy infrastructure. It was considered that the effects would likely occur in the medium to long term.

Assessment of Cumulative Effects

The SEA Directive requires that the assessment of effects include secondary and cumulative effects where practicable. Cumulative effects are the effects from multiple activities which may combine to cause a significant effect on a particular environmental aspect. Often, effects may result from the accumulation of multiple small and often indirect effects rather than few large obvious ones.

The IIA has considered the potential for cumulative effects from the LES in combination with the current adopted London Plan (March 2016), and the draft Mayor's Transport Strategy.

There are expected to be positive cumulative effects from wider strategic delivery on air quality across strategies with the draft Mayor's Transport Strategy including policies to support cleaner vehicle fleets and modal shift, and the draft LES including specific proposals to tackle in the short-term hotspots of pollution near to locations such as schools, which are likely to be used by 'at risk' groups and therefore offer greater sustainability benefits for human health and inequalities.

There are likely to be positive effects from wider strategic delivery on reduction of greenhouse gas emissions, enhancing natural environment through achieving a net biodiversity gain, promotion of the renewable energy sources and the delivery of the affordable housing in London.

• Table 3 Summary of Strategy-Wide Assessment Results

IIA Objectives		Strategy Assessment
1	Air quality: To reduce emissions and concentrations of harmful atmospheric pollutants, particularly in areas of poorest air quality and reduce exposure.	++
2	Climate change adaptation: To ensure London adapts and becomes more resilient to the impacts of climate change and extreme weather events such as flood, drought and heat risks.	+
3	Climate change mitigation: To help tackle climate change through reducing greenhouse gas emissions and moving towards a zero carbon London by 2050.	++
4	Energy use and supply: To manage and reduce demand for energy, achieve greater energy efficiency, utilise new and existing energy sources effectively, and ensure a resilient smart and affordable energy system.	+
5	Flood risk: To manage the risk of flooding from all sources and improve the resilience of people, property and infrastructure to flooding.	++
6	Geology and soils: To conserve London's geodiversity and protect soils from development and over intensive use.	0
7	Materials and waste: To keep materials at their highest value and use for as long as possible. To significantly reduce waste generated and achieve high reuse and recycling rates.	++
8	Noise and vibration: To minimise noise and vibration levels and disruption to people and communities across London and reduce inequalities in exposure.	+
9	Water resources and quality: To protect and enhance London's waterbodies by ensuring that London has a sustainable water supply, drainage and sewerage system.	+
10	Natural capital and natural environment: To protect, connect and enhance London's natural capital (including important habitats, species and landscapes) and the services and benefits it provides, delivering a net positive outcome for biodiversity.	++
11	Historic environment: To conserve and enhance the existing historic environment, including sites, features, landscapes and areas of historical, architectural, archaeological and cultural value in relation to their significance and their settings.	+
12	Equality and inclusion: To make London a fair and inclusive city where every person is able to participate, reducing inequality and disadvantage and addressing the diverse needs of the population.	+
13	Social integration: To ensure London has socially integrated communities which are strong, resilient and free of prejudice.	+
14	Health and health inequalities: To improve the mental and physical health and wellbeing of Londoners and to reduce health inequalities across the city and between communities.	+
15	Accessibility: To maximise accessibility for all in and around London.	+
16	Housing supply, quality, choice and affordability: To provide a quantum, type, quality and tenure of housing (including specialist and affordable provision) to better meet demographic change and household demand.	+
17	Crime, safety and security: To contribute to safety and security and the perceptions of safety.	+
18	Design: To create attractive, mixed use neighbourhoods, ensuring new buildings and spaces are appropriately designed that promote and enhance a sense of place and distinctiveness, reducing the need to travel by motorised transport.	+
19	Economic competitiveness and employment: To maintain and strengthen London's position as a leading, connected, knowledge based global city and to support a strong, diverse and resilient economic economy structure providing opportunities for all.	+
20	Education and skills: To ensure the education and skills provision meets the needs of London's existing and future labour market and improves life chances for all.	0
21	Connectivity: To enhance and improve connectivity for all to and from and within and around London and increase the proportion of journeys made by sustainable and active transport modes.	+
22	Infrastructure: To ensure that provision of environmental, social and physical infrastructure is managed and delivered to meet population and demographic change in line with sustainable development and to support	++

IIA Objectives		Strategy Assessment
	economic competitiveness.	
23	Culture: To safeguard and enhance the Capital’s rich cultural offer, infrastructure, heritage, natural environment and talent to benefit all Londoners while delivering new activities that strengthen London’s global position.	0
24	Sustainable land use: To make the best and most efficient use of land so as to support sustainable patterns and forms of development.	+

Mitigation and Enhancement Recommendations for the LES

The IIA has not identified any significant adverse effects from the LES. However, the IIA process has recommended some possible enhancement opportunities that the GLA may consider during the consultation process of the draft LES.

Policy Area on Transition to Low Carbon Circular Economy

Recommendation 1

The Mayor should work with industry bodies to identify opportunities for disadvantaged and underrepresented groups to develop skills and gain practical experience which will enable them to participate and benefit from the new types of employment opportunities which will arise in the low carbon circular economy.

Policy Area on Climate Change Mitigation and Energy

Recommendation 2

It is recommended that the final LES is strengthened with specific proposals and policies relating to developing the required skills and creating job opportunities in a low carbon circular economy or an acknowledgment that this will be addressed in the draft Mayor’s Economic Development Strategy. There is potential to include specific targets for apprenticeships (or to link low carbon technology providers to FE/HE establishments to develop internships/placement opportunities).

Policy Area on Water

Recommendation 3

The final LES could more specifically address how the Mayor will support innovations and development and uptake of new technologies which will improve sustainability in the water

sector. For example, linking to possible funding/investment routes, supporting business case development, working with water companies to undertake resource efficiency assessments of key water users, review the success of water efficiency measures in the domestic sector (beyond behaviours).

Recommended Monitoring Measures

Monitoring must be undertaken on the likely significant environmental effects of the implementation of plans and programmes.

The draft LES for consultation includes several proposals for monitoring to better understand existing trends and to inform more targeted interventions. It also includes proposals to improve existing monitoring (for example in relation to biodiversity).

The GLA and TfL already undertake extensive monitoring. Therefore a framework for monitoring will be developed in agreement with the GLA and set out in the forthcoming Post Adoption IIA Statement. This will involve a review of the monitoring already undertaken, and that which has been proposed in the consultation draft LES, so that any monitoring indicators which would be useful for informing the understanding of the likely significant environmental effects of the LES can be included and any monitoring gaps identified.

Assumptions and Uncertainties in the IIA

IIA is a strategic level assessment by nature and is based on broad assumptions and judgements; therefore some uncertainty over the assessment may exist. Qualitative rather than quantitative assessments need to be made and there will be some degree of subjectivity which is typical of the IIA process. The assessment has been undertaken by independent consultants with specialist knowledge across a range of sustainability topics. A monitoring framework will assist in providing more clarity for the duration of the LES and will

address any uncertainties identified in the IIA report.

The IIA has generally made reference to a collective set of measures (policies and proposals) within a Policy Area, rather than specific details of individual schemes. As a result, an assumption about the predicted effects has been made based on the nature of the collective measures. The assessment has assumed that all proposals listed in the draft LES under each Policy Area will be implemented. However, the IIA has noted that in many cases, achievement of the objectives and policies within the Policy Areas will be dependent upon third parties and other plans and programmes.

Conclusions

The draft LES for consultation, as a whole, is anticipated to have likely significant effects in relation to the objectives for Air Quality; Climate Change Mitigation; Flood Risk; Materials and Waste; Natural Capital and the Natural Environment, and Infrastructure.

All these effects are assessed as positive.

Next Steps

This IIA Non-Technical Summary and the IIA Report are open for a consultation period of twelve weeks alongside the draft LES for consultation. Upon completion of this period, the consultation responses will be considered. The findings will be used where appropriate in the finalisation of the LES.

The way in which consultation responses have been addressed in finalising the LES will be set out in a document known as the IIA Post Adoption Statement. The purpose of the IIA Post Adoption Statement is to record how the IIA was carried out and how the IIA process has informed the development of the LES.

Comments and Feedback

Any comments relating to the findings of the IIA presented in this report, or the draft LES for consultation, would be welcomed.

Any comments relating to the findings of the IIA presented in this report please email to environment@london.gov.uk or send written comments to:

Draft London Environment Strategy
City Hall
The Queen's Walk
London
SE1 2AA

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