London Borough of Hounslow

Strategic Environmental Assessment for the Hounslow Local Implementation Plan III

November 2018

Contents

Non-Technical Summary

A Strategic Environmental Assessment (SEA) has been carried out on the London Borough of Hounslow's third Local Implementation Plan (LIP3) to meet the SEA regulations[1], because it has the potential to produce significant environmental effects.

The London Borough of Hounslow, along with all other London Boroughs, is required to produce a Local Implementation Plan (LIP) under Section 145 of the GLA Act (1999). The LIP is a statutory document which sets out how the Borough proposes to implement the third Mayor's Transport Strategy (MTS)[2] within its geographical area.

The LIP3 covers the same period as the MTS (2019 – 2041) and takes into consideration the draft London Plan, and other relevant local, regional and Mayoral policies. The document sets out the long terms goals and transport objectives for the London Borough of Hounslow for the period of the MTS, and also provides a programme of investment and delivery plan for the next three years starting in 2019/20.

Regulation 13(1) of the SEA Regulations requires that an Environmental Report is prepared to accompany the draft LIP, and that both the draft LIP and Environmental Report be made available for consultation with environmental bodies and the public.

The main purpose of this SEA is to improve the environmental performance of the LIP by assessing whether it is likely to result in any significant environmental effects (positive or negative). Recommendations as to how adverse effects can be avoided, offset or reduced, as well as how improvements can be made, are suggested. A programme to monitor significant effects is also needed in order to check whether the SEA has been accurate in its predictions.

In line with the legislation, this SEA of LIP3 considers the following environmental issues:

- Biodiversity, Fauna and Flora
- Population
- Human Health
- Air Quality

[1] The Strategic Environmental Assessment (SEA) Directive 2001/42/EC was adopted into UK law in July 2004. The purpose of a SEA is to integrate environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment. In England, the Directive has been implemented via the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004 No.1633) (referred to as 'the SEA Regulations').

[2] Published in March 2018.

- Noise Pollution
- Climatic Factors
- Material Assets
- Soil& Water
- Historic Environment and Landscape

Baseline Information

Hounslow is a diverse outer London borough reasonably well served by public transport and with easy access to major roads and motorways linking Central London to the west. The borough, home to 270,000 residents, has plentiful green spaces and also supports a range of commercial and industrial areas including the Great West Corridor which is home to 24,000 employees and is a major media hub for London.

While Hounslow has seen improvements in road safety and has instituted many strategies to protect and rehabilitate land and townscapes, maintaining low levels of air pollution, noise, greenhouse gas emissions and obesity have remained challenging due to population and traffic growth in the borough and an increasing volume of through traffic

Detailed baseline information describing Hounslow's current environmental situation and trends can be found in the main Environmental Report.

Environmental Issues

The first stage of the SA/SEA focused on the identification of the environmental issues in the Borough. The issues identified are:

- Population growth in London is forecast as 20% by 2041 increasing pressure on the physical and social infrastructure.
- Large areas of the borough, particularly in the west, are poorly served by public transport. This can act as a barrier to accessing jobs, services and leisure opportunities
- The borough currently has a 45% private car mode share, which is particularly high in deprived western areas such as Heston and Feltham poorly served by public transport.
- High use of private vehicles and HGVs in the borough is resulting in accidents in which people are killed or seriously injured, although this has steadily been declining in Hounslow. It is in the bottom quartile of boroughs in terms of casualty rates.
- There are high obesity rates within the borough. 40.1% of year 6 pupils in Hounslow are overweight, higher than the London and national averages.

- 34% of the adult population of Hounslow are inactive (defined as less than 30 minutes moderate intensity activity/week) compared to the London average of 24%, making the Borough one of the most inactive in London.
- Across Hounslow, polluted air has been shown to cause 200 premature deaths a year with exceedances in NO_2 still being regularly recorded. Traffic is the main source of air pollution.
- Greenhouse gas emissions in Hounslow are high largely due to the presence of the M4, with the Borough in the upper quartile of London boroughs for CO_2 emissions.
- There are relatively high levels of noise pollution in the Borough, mainly generated from the 300,000 annual flights over the Borough, but improvements have been made over recent years. However, the introduction of Heathrow's 3rd runway may offset these gains.
- There is potential for a negative impact on biodiversity through increased human interaction if routes are not planned sympathetically and the construction process must also be managed to minimise any risk to wildlife.

Draft LIP3 Objectives

Within the LIP3, the council has developed the following vision in line with the MTS:

The transport network and public realm will enable and encourage the development of a prosperous, healthy, accessible and safe environment for all residents and visitors.

The council's objectives, also in line with the MTS, are for a transport network that is:

1. **Healthy, Clean and Green**
   We will achieve this by reducing transport related emissions; improving the quality and accessibility of the public realm and maximising the opportunity for the transport system to improve health outcomes by removing barriers to the uptake of active travel.

2. **Safe**
   We will achieve this by reducing the number of people killed and seriously injured on our roads, contributing to the Mayor's Vision Zero target.

3. **Efficient**
   We will achieve this by ensuring that the transport network facilitates economic growth in Hounslow and unlocks space for new homes and jobs for all users, particularly through a shift from private to public transport.

SEA Objectives

Having considered all the environmental issues in the Borough and following consultation of the SEA Scoping Report, the following objectives have been identified:

1) To conserve and enhance biodiversity, flora and fauna in the Borough.

2) To reduce the number of people injured or killed (KSIs) as a result of a road traffic collision.

3) To increase the number of Hounslow residents participating in active travel (i.e. walking and cycling)

4) To ensure that all residents in Hounslow have access to local services and facilities regardless of location, without a car

5) To reduce the noise disruption caused by road traffic in the borough

6) To reduce CO2 emissions from transport during the life of the plan and support a zero carbon London

7) To adapt to the effects of climate change and to promote measures which enable the borough to accommodate the likely impacts of it

8) To reduce transport related emissions of harmful pollutants: PM2.5, PM10 and NOx in Hounslow

9) To minimise vulnerability of the transport network to flood risk and minimise adverse effects of drainage from the network on soil and the water environment

10) To improve the quality of the streetscape and where possible the local townscape and landscape in the borough, respecting local character and distinctiveness

11) To conserve, and where possible enhance, all cultural and heritage assets and their settings whilst increasing enjoyment of and access to the historic environment

12) To increase the sustainability of our construction and operational processes by minimising waste produced and resources consumed

A full list of assessment criteria for each objective can be found in Section 3.2 of the main report.

A test of compatibility between the Draft SEA and Draft LIP objectives was carried out to establish whether there were any potential conflicts between objectives. it was found that all LIP objectives would be likely to positively impact at least one SEA objective.

Identifying Alternatives

Identifying and comparing appropriate strategic alternatives is a key aspect of SEA. Examining alternatives helps ensure that the plan's likely environmental effects are

addressed during the preparation of the plan. It also assists in explaining to stakeholders why these strategies and measures, and not others, are being put forward.

A number of alternatives were identified within the different programmes, these were assessed alongside the options put forward in the LIP. These are identified in italics in Table NTS 1 below.

Assessment of LIP Environmental Impacts

As part of the SEA process and development of the LIP, it is necessary to assess the extent of the environmental impacts of the LIP, its initiatives and any reasonable alternative options.

The potential impacts of each transport programme in LIP3 have been assessed in terms of the extent of its environmental impacts, its initiatives and any reasonable alternative options. For all cases, a "business as usual" scenario has been included as a comparison against continuing work under the programmes decided in the LIP2.

The impact of each programme's proposed options, alternatives and "business-as-usual" approaches has been qualitatively rated against each SEA objective on a scale from "major positive" to "major negative" as per the key below and has also been assessed on a holistic basis. Any significant effects are highlighted green where positive and red where negative in Table NTS 1.

Impact	Minor Positive	Minor Negative	Neutral	Uncertain	Major Positive	Major Negative
Symbol	+	-	O	?	++	--

The assessment of the LIP3 generally found that the programmes are likely to have overall positive effects across the range of SEA topics, with a number of significant positive effects having been identified. For example, in relation to the LIP3 programme elements aimed at increasing active travel had significant positive effects identified for population and health (SEA objectives 2, 3 and 4), climatic factors (SEA objective 7) and air quality (SEA objective 8).

The only element for which significant adverse effects were identified was Alternative 2 within the Better Streets programme which proposed the removal of cycle lanes to increase green verge area which would have significant negative impacts on active travel participation (SEA objective 3), CO_2 reduction (SEA objective 7) and air quality. (SEA objective 8). As a result of these effects, this alternative will not be taken forward.

In addition to individual programmes, total and cumulative, as well as synergistic and secondary effects, have been assessed for environmental impact. Overall, it has been found that all programmes are at least neutral, with most having positive or

major positive impacts (particularly on population and human health topics). A synergistic effect is also expected between the LIP programmes, particularly around human health and active travel.

The full results of this assessment can be seen in Table NTS 1 below.

Table NTS 1 - Summary of SEA Assessments

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Environmental Assessment of Road Danger Reduction Programme												
20mph zone implementation	O	++	+	+	++	+	O	+	O	+	+	O
Road safety engineering improvements	O	++	+	O	+	?	O	?	O	+	+	O
Alternative 1 – Traffic calming measures e.g. speed humps	O	++	O	O	+	O	O	-	O	O	+	O
No Plan 'Business as Usual' Scenario	O	+	O	+	+	+	O	O	O	O	O	O
Education, Training and Publicity Programme												
Cycle training programme	O	++	++	+	+	+	O	+	O	+	+	O
Road safety education and training including primary school, motorcycle and delivery driver specific projects	O	++	+	+	+	+	O	+	O	+	+	O
Alternative 1 – Divert funding from ETP programme to active travel infrastructure	O	O	++	++	+	+	O	++	O	+	+	O
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	+	+	O
Travel Demand Management Programme												
School Engagement Programme	O	+	++	+	+	++	O	++	O	+	+	O
Business travel planning	O	O	++	+	+	++	O	++	O	+	+	O
Promotional campaigns e.g. walking, anti-idle	O	?	+	+	+	++	O	++	O	++	++	O
Alternative 1 – Target communities with engagement	O	+	+	+	+	+	O	+	O	+	+	O
No Plan 'Business as Usual' Scenario	O	O	+	+	+	+	O	+	O	+	+	O
Better Streets Programme												
Public Realm Improvement Programme including Liveable Neighbourhoods and member fund	+	+	++	++	++	++	+	++	+	++	++	?
On and off-street cycle parking	?	O	++	++	+	+	O	+	O	?	O	-
Alternative 1 – Widening of footways	-	O	+	+	+	+	-	+	-	+	O	-
Alternative 2 – Removal of cycle lanes to increase green verge area	++	O	--	-	-	--	-	--	-	+	+	-
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	+	+	O
Developing a Hounslow active travel network												

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Hounslow Priority Cycle Network	+	+	++	++	+	++	O	+	O	+	+	?
Alternative 1 – Advisory only cycle routes (no segregation)	+	-	+	+	O	+	O	+	O	O	O	O
No Plan 'Business as Usual' Scenario	+	+	+	+	+	+	O	+	O	+	+	O
Bus Reliability and Accessibility Programme												
Parking restrictions and other physical bus priority measures	O	+	+	++	+	+	O	+	O	O	O	O
Bus stop accessibility enhancements	O	O	O	++	O	+	O	+	O	O	O	O
Alternative 1 – Introduce express, limited stop bus services	O	O	+	+	O	+	O	+	O	O	O	O
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	O	O	O
Rail Enhancement Programme												
New rail services and stations serving areas of low connectivity	?	O	+	++	+	++	+	++	O	+	+	?
Step free access at stations	O	O	+	++	+	+	O	+	O	+	+	O
Alternative 1 – Increased frequency on existing lines and more connecting bus services	O	O	+	+	+	+	O	+	O	O	O	-
No Plan 'Business as Usual' Scenario	?	O	+	++	+	++	+	++	O	+	+	O
Encouraging Efficient Car Use												
New controlled parking zones	O	O	+	O	+	O	O	+	O	++	+	O
Traffic restrictions/filtering on residential streets	O	O	+	+	++	+	O	++	O	+	+	O
Electric Vehicle charging infrastructure and council fleet EV upgrades	O	O	O	O	+	++	O	++	O	+	+	-
Workplace Parking Levy Scheme	O	O	+	O	+	++	O	++	O	+	+	O
Alternative 1 – No parking restrictions in residential areas	O	O	O	O	+	?	O	?	O	+	+	?
No Plan 'Business as Usual' Scenario	O	O	O	O	+	+	O	+	O	+	+	O
Asset Maintenance Programme												
Asset Maintenance Programme (PFI Contract)	++	+	+	+	+	+	+	+	+	++	+	++
Overall LIP3 Programme												
Overall LIP3 Programme	O/+	++	++	++	++	+	+	+	O/+	+	+	O

Mitigating Adverse Impacts

The majority of programmes and their sub-elements within the Hounslow LIP are expected to have either positive or neutral impacts, although there are still some likely minor negative impacts meaning some mitigations are necessary. Any

mitigations that are needed will follow the “mitigation hierarchy”, which begins with measures for avoidance/prevention, then reduction, and finally measures aiming to offset impacts. The mitigation measures for the Hounslow LIP3 target unwanted side effects of programme goals.

Monitoring

A monitoring strategy within an SEA should determine what needs to be monitored (any significant effects), identify information gaps and suggest when and what remedial actions are required.

As this SEA found no significant adverse impacts from the LIP programmes (excluding alternatives not being taken forward), there are no areas in specific need of monitoring. However, Hounslow still has in place a management plan, continuing existing monitoring of road accidents, traffic congestion and activity levels, among others, and will institute remedial action should it become necessary.

Next Steps

This draft report will be sent to statutory consultees, The Environment Agency, Natural England and Historic England as part of the LIP3 consultation. The SEA and LIP3 will then be reviewed and amended to incorporate where appropriate, any consultee feedback. Following this, an Environmental Statement will be prepared, and the final LIP adopted in May 2019, following approval from The Mayor of London.

Chapter One: Introduction

1.1 Background to the SEA

The Strategic Environmental Assessment (SEA) Directive 2001/42/EC was adopted into UK law in July 2004. The purpose of a SEA is to integrate environmental considerations into the preparation and adoption of certain plans and programmes which are likely to have significant effects on the environment. In England, the Directive has been implemented via the Environmental Assessment of Plans and Programmes Regulations 2004 (SI 2004 No.1633) (referred to here as 'the SEA Regulations').

The Local Implementation Plan (LIP) is a statutory document required from all London boroughs by the GLA Act (1999) which defines how the borough will implement the Mayor's Transport Strategy (MTS). The formal preparation of the London Borough of Hounslow's third Local Implementation Plan (LIP3) for Transport began in May 2018 in response to the release of the third MTS.

All LIPs must broadly be in compliance with the objectives and targets set by the MTS, however the nature of the projects and programmes proposed will vary by authority, depending on their specific transport challenges and local priorities.

Regulation 13(1) of the SEA Regulations requires that an Environmental Report is prepared to accompany the draft LIP, and that both the draft LIP and Environmental Report be made available for consultation with environmental bodies and the public.

1.2 Aims of the SEA

The purpose of a SEA is to provide a high level of environmental protection by ensuring that the environmental impacts of a proposed plan or programme are taken into account in the early stages of its development with a view to promoting sustainable development. The SEA regulations require a report to be prepared, and made available to the public, which identifies and assesses the likely significant effects on the environment of implementing the plan or programme. In the case of Hounslow's LIP3, the process of developing the SEA has been run in parallel with the LIP policy development in order that environmental considerations are embedded within the process.

The overall aims of this SEA are to:

1. Make the LIP3 as sustainable as possible by ensuring that the consideration of sustainable development is ingrained into the strategy making process, influencing all stages of policy process;

2. Provide a high level of environmental protection and balance environmental, economic and social considerations in the plan's preparation;

3. Consult on the SEA procedure and the LIP to allow the public and stakeholders to have an input into its production;

4. Provide an environmental, economic and social audit at appropriate spatial and temporal levels;

5. Provide transparency about how environmental concerns influence the content of the LIP, and allow the public to be told about how decisions were made:

6. Provide a system for monitoring and testing the potential environmental impact of the Local Implementation Plan.

1.3 Consideration of Habitats Regulations

The Habitats Regulations[3] transpose Council Directive 92/43/EEC and elements of the EU Wild Birds Directive into law in England and Wales. Amendments to the Regulations require an assessment of the effects of plans and programmes on Natura 2000 sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), Sites of Community Importance (SCIs) and Ramsar sites prior to the plan being adopted. The National Planning Policy Framework[4] stipulates that "potential Special Protection Areas and possible Special Areas of Conservation"; "listed or proposed Ramsar" sites; and "sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites" should be given the same level of protection as European sites.

[3] The Conservation of Habitats and Species Regulations 2017 (which consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments)

[4] Ministry of Housing, Communities & Local Government (2018) National Planning Policy Framework – Draft text for consultation, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685289/Draft_revised_National_Planning_Policy_Framework.pdf

The Integrated Impact Assessment prepared for the draft Mayor's Transport Strategy[5] has transposed the pillars of sustainable development into three principles which have assessed the capacity of the London transport system to support:

- A strong, sustainable and competitive economy with new homes and jobs by providing infrastructure for all Londoners.

- Strong, vibrant and healthy communities, by delivering a good public transport experience, safe and pleasant places; and creating a high quality built environment, with accessible local services that reflects the community's needs and support its health, social and cultural well-being for all; and

- The natural environment, contributing to protecting and enhancing our natural, built and historic environment, and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change, including moving to a low carbon economy.

It is noted that these are applied within the MTS via its three primary objectives, and whilst these are also the basis for LIP development, it is recommended that SEA assessments be carried out in detail at a local level on individual projects.
This scoping exercise has identified that there are no Natura 2000 sites within the LIP area, however there is one "Ramsar" site, Kempton Nature Reserve at Hanworth Reservoir (see Appendix 1, Map 2). This forms part of the South West London Waterbodies SPA / Ramsar, which in total covers more than 800ha. The site is home to wintering Anas strepera (gadwall) and Anas clypeata (shoveler), which are bird species occurring at levels of international importance.

The role of London Borough of Hounslow is set out within the Southwest London Waterbodies Site Improvement Plan[6]. Our responsibilities are to create and/or promote alternative amenities that reduce the human impact on the SPA / Ramsar site. The policies and projects defined within this LIP and those of neighbouring boroughs will contribute towards achieving this objective.

The site is potentially sensitive to environmental effects associated with the LIP in terms of possible disturbance to bird feeding and roosting habitat by noise and visual intrusion, and by diffuse air pollution from traffic. However, there are no proposals in the LIP to develop transport infrastructure in or close to this area. It is also unlikely that the implementation of the LIP would lead to significant increases in noise, visual

[5] Jacobs (2017) – Integrated Impact Assessment of the Consultation Draft of the Mayor's Transport Strategy 3, https://tfl.gov.uk/cdn/static/cms/documents/integrated-impact-assessment-report.pdf
[6] Natural England (2015, http://publications.naturalengland.org.uk/file/5135484288237568

impacts or air pollution from traffic that would affect the site. On this basis, a detailed appropriate assessment of the effects on the site will not be undertaken as part of this report.

1.4 Consideration of the Equalities Impact Assessment (EqIA)

The Equality Act 2010 requires public bodies such as the London Borough of Hounslow to carry out an Equalities Impact Assessment when drafting new policies in order to eliminate unlawful discrimination, harassment and victimisation and advance equality between those who share one of nine protected characteristics and those who do not. As a result, an EqIA has been completed for the LIP with the objective of identifying whether or not the LIP has a positive or negative impact on a particular protected group, and to identify mitigation measures for impacts that could lead to an adverse effect.

The EqIA for Hounslow's third LIP concluded that no individual population group was adversely impacted by the proposals set out in the new strategy. The finished EqIA is being consulted on alongside the draft LIP and this Environment Report. The results from this parallel assessment has been used to inform the SEA as appropriate.

1.5 The SEA Process

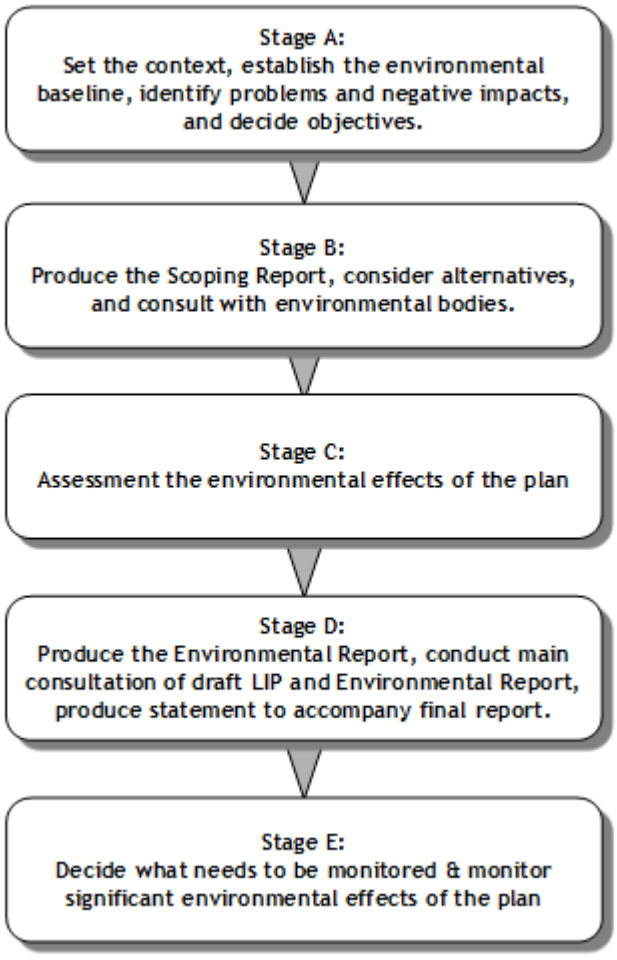
The SEA is an iterative process as the plan (in this case, the LIP) is developed. The process can be broken down into five stages, as shown in figure 1-1.

The Draft SEA Scoping Report (Stage B) was prepared in June 2018 and released for consultation to the three required statutory bodies. The objective of the Scoping Report was to consult on the overall scope and methodology that was to be used for the preparation of the SEA Environment Report.

Appendix 2 provides a summary of the comments received from the main consultees and outlines how the comments were taken into consideration when completing the Environmental Report. Comments were received from Natural England and Historic England.

This document takes the SEA up to Stage D, production of the Environmental Report.

Figure 1.1 SEA Process Diagram



1.6 Scope of the SEA

The geographical scope of this SEA is limited to the London Borough of Hounslow except in the case where an important feature or characteristic e.g. conservation area, straddles the borough boundary. In these cases, a more holistic view is taken and cross border impacts are considered. Whilst the impact of schemes operating London-wide have also been considered where there is an impact or potential impact on Hounslow in the preparation of the LIP, they are not analysed as part of the SEA due to their inclusion in the Integrated Impact Assessment (IIA) for the MTS3. An example of this is the proposed extension of the London Ultra-Low Emission Zone into Chiswick in 2021.

To ensure full coordination with the LIP process and the MTS, this SEA considers the period from 2019 through to 2041, however the primary focus is on the first 3 years, since detailed programmes are to be presented in the LIP for this period.

The SEA guidance recommends that the following issues should be considered when assessing environmental impacts and these are used as a framework for analysis in chapters 2 and 5:

- Flora, Fauna and Biodiversity
- Population
- Human Health
- Soil
- Air
- Water
- Climatic Factors
- Material Assets
- Historic Environment
- Landscape

1.7 The Local Implementation Plan (LIP3)

The third Hounslow Local Implementation Plan describes how Hounslow Council proposes to implement the London Mayor's Transport Strategy locally, within the period 2019 to 2041. The key requirement for the third LIP is to set out transport policies and programmes that will contribute to the overarching aim of the MTS that 80% of trips in London will be on foot, by bike or on public transport by 2041. A detailed programme plan is required for the three-year period to 2022, whilst a set of longer term proposals need to be included to 2041, reflecting the long-term nature of many of the targets.

The MTS sets out a wide range of policies and proposals for transport in London. In preparing the content of LIP3, it has been necessary to take account of the MTS strategic framework of 9 desired outcomes under 3 headings. The LIP is expected to contribute to all 9 outcomes although the degree to which each will be addressed is dependent on the local context and degree of control and responsibility of the borough. The framework is summarised in Table 1.2 below.

The following draft vision and objectives for the development of Hounslow's transport network have been developed for the third LIP. These reflect the objectives of the third MTS, as well as local priorities laid out in our Community Plan, Corporate Plan and other relevant policy documents. Our vision is:

Our transport network and public realm will enable and encourage the development of a prosperous, healthy, accessible and safe environment for all residents and visitors.

The council's objectives are for a transport network that is:

Healthy, Clean and Green
We will achieve this by reducing transport related emissions; improving the quality and accessibility of the public realm and maximising the opportunity for the transport system to improve health outcomes by removing barriers to the uptake of active travel.

Safe
We will achieve this by reducing the number of people killed and seriously injured on our roads, contributing to the Mayor's Vision Zero target.

Efficient
We will achieve this by ensuring that the transport network facilitates economic growth in Hounslow and unlocks space for new homes and jobs for all users, particularly through a shift from private to public transport.

Table 1.2 – Mayor's Transport Strategy outcomes and indicators

Mayor's Transport Strategy									
Strategic Drivers	**Healthy Streets and Healthy People**				**A good public transport experience**			**New homes and jobs**	
Policies	**2**	**3,4**	**5**	**6,7,8,9**	**10,17,18,19**	**11,12,14,20**	**13,15,16**	**21a**	**21b**
Outcomes	1) London's streets will be healthy and more Londoners will travel actively	2) London's streets will be safe and secure	3) London's streets will be used more efficiently and have less traffic on them	4) London's streets will be clean and green	5) The public transport network will meet the needs of a growing London	6) Public transport will be safe, affordable and accessible to all	7) Journeys by public transport will be pleasant, fast and reliable	8) Active, efficient and sustainable travel will be the best option in new developments	9) Transport investment will unlock the delivery of new homes and jobs
	Traffic reduction and changing mode share – policy 1 **80% of all trips in London to be made on foot, by cycle or using public transport by 2041**								
Outcome indicators	All Londoners to do at least 20 minutes' active travel a day by 2041	65% reduction in KSIs by 2022 compared to a 2005–09 baseline	10–15% reduction in volume of traffic by 2041	72% reduction in CO2 emissions from transport (excluding aviation) by 2041	Public transport network can accommodate 14–15 million trips daily by 2041	Reduce travel time difference between total and step-free network by 50% by 2041	5–15% improvement in bus speeds by 2041 London-wide		
	70% of Londoners live within 400m of London -wide strategic cycle network by 2041	70% reduction in KSIs by 2030 compared to a 2010–14 baseline	10% reduction in freight trips in central London by 2026 in morning peak	94% reduction in road transport NOx emissions by 2041					
		Zero deaths and zero serious injuries from road collisions by 2041	250,000 fewer cars owned by 2041	Reduction of 53% in PM2,5 and 45% in PM10 from road transport emissions by 2041					

Chapter Two: Baseline Environmental Information

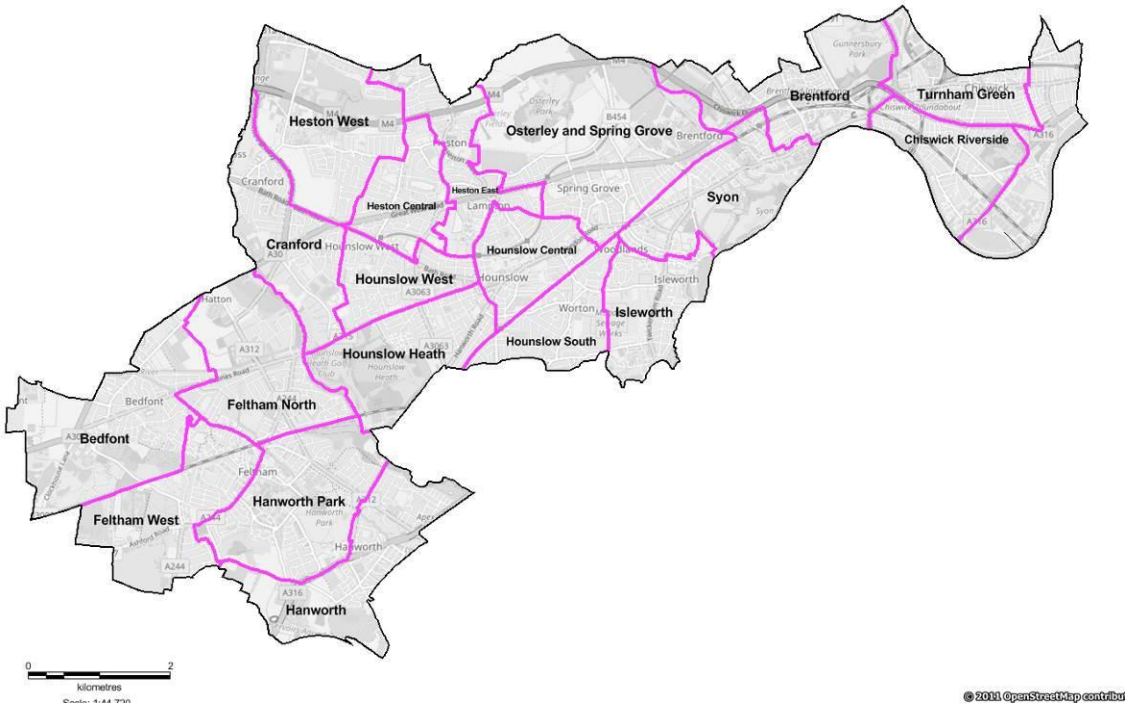
This chapter provides information relating to the current state of the environmental, economic and social baseline for Hounslow, including information sources, and identifies environmental issues that are related to the transport network.

The identification and definition of environmental issues relevant to transport is fundamental to the production of a sustainable plan since it allows the plan to avoid or help solve these problems.

2.1 Background to the London Borough of Hounslow

Located in West London, the London Borough of Hounslow covers an area of approximately 5,600 hectares, stretching from Chiswick in the east, to the eastern boundary of Heathrow Airport in the west. Hounslow borders Ealing, Hammersmith & Fulham, Hillingdon and Richmond-upon-Thames, as well as the county of Surrey. Figure 2.1 shows the relative position of the 20 wards that make up Hounslow.

Figure 2.1 Hounslow Wards



Hounslow has a mix of residential, commercial and industrial land uses as well as several waterways, green spaces and areas of architectural and cultural heritage. The Borough is reasonably well served by public transport and is well located for national transport links, with easy access to major roads and motorways linking

Central London to the South West, Wales and the Midlands via the A4, M25 and M4 network. A map of the transport network can be found in Appendix 1-Map 1.

Green belt in the borough lies exclusively in the west, but Hounslow has several open spaces in the more built-up parts of the borough. Hounslow Heath, Osterley Park, Boston Manor Park, the grounds of Chiswick House, Bedfont Lake's, Hanworth Park, Duke's Meadows, Syon Park and Gunnersbury Park serve the environmental, cultural and recreational needs of the population living within and beyond the Borough's boundaries. In addition to these green spaces, the River Thames and the Grand Union Canal also provide access to blue infrastructure, adding to the quality of the open space and residential areas in Chiswick, Brentford and Isleworth.

Although outside the borough's boundaries, Heathrow Airport continues to have influence on Hounslow's economy with employment in the west dominated by airport related logistics, construction and services such as hospitality and catering. This location also contains almost half of the borough's commercial and industrial estates. Elsewhere, where Heathrow Airport has less of a direct influence, the economy is continuing to be restructured. Traditional industrial estates have been affected by the nationwide decline in manufacturing and are characterised by ageing and/or obsolete commercial floor space. At the same time, there has been a shift towards employment opportunities within the service sector. The development of Chiswick Business Park has also created a popular location for office lettings in outer London.

The borough has four major town centres: Brentford, Chiswick, Hounslow and Feltham. These centres, as well as Chiswick Business Park, the Great West Road and Bedfont Lakes are the Borough's key employment areas. Hounslow town centre has undergone significant redevelopment, with further development currently being carried out in the centre of Feltham. The regeneration of Brentford continues with vacant employment sites on the Great West Road being redeveloped for mixed-use purposes.

Hounslow has one of the most culturally diverse communities in the UK. Approximately 36% of the population are from minority ethnic groups, with over 140 languages spoken. Population density stands at 71.1 persons per hectare, compared to the London average of 52.0 persons per hectare, with 49.8% of Hounslow's population female and 50.2% male.

Across the borough, local areas have distinct characteristics, and therefore have different requirements. Hounslow is not poor in comparison to many other boroughs, however, there are areas of deprivation within the Bedfont, Brentford, Hanworth, Heston West and Syon wards (Appendix 1, Map 8). These areas are characterised by higher levels of unemployment, a larger percentage of lone parent families, lower academic attainment, higher crime rates/drug abuse, a higher amount of local authority housing, and areas of environmental and industrial decline.

2.2 Biodiversity, Flora and Fauna

Despite being densely populated over much of its area, Hounslow contains over 581ha of public open space and 1225ha of urban green space, covering

approximately 30% of the Borough's land surface area, making it one of London's top ten greenest boroughs. Of this, an estimated 954ha is managed either wholly or partly for nature conservation.

2.2.1 Designated Sites Overview

Appendix 1-Map 2 summarises the location of designated sites. Areas with official designation are as follows:

- Kempton Park Reservoirs has been designated as a Ramsar site (Special Protection Area) and a SSSI. The site, categorised as neutral grassland, is home to nationally important populations of gadwall and wintering populations of shoveler. It was last reviewed in 2012 by Natural England and categorised as "Unfavourable - recovering" due to infestation of the invasive plant Crassula helmsii (New Zealand Pygmyweed).

- Syon Park Tide Meadow is situated on the floodplain of the River Thames and is one of the largest remaining areas of floodplain swamp in the Greater London area. It supports an exceptionally rich wetland invertebrate fauna, including several rare species. Reviewed in 2017, its condition is currently favourable, with the habitats being in good condition.

- Ten local nature reserves (LNRs), shown in Table 2.2.

Table 2.2: Local Nature Reserves in Hounslow and their total area (2015)

Local Nature Reserve (LNR)	Area (m2)
Bedfont Lakes	315,852
Chiswick Eyot	8,256
Crane Park Island	26,707
Cranebank Water Meadows	63,753
Duke's Hollow	2,694
Gunnersbury Triangle	23,226
Hounslow Heath	831,312
Isleworth Ait	34,871
Kempton Nature Reserves	228,010
Pevensey Road	99,182

LNRs serve not just as habitats for wildlife but also have a key role in providing community services, in that they are accessible green spaces close to population centres. LNRs not only help in connecting people to nature through formal or informal education, they create space for recreational activities including many related to encouraging active lifestyles.

- There are 47 sites dedicated to the importance of nature conservation (SINC), 11 of which are sites of metropolitan importance. Details of these can be found in Appendix 1-Map 4.

  The majority of the SINCs are accessed by the public for recreational activities such as walking and cycling. Hounslow's parks host a wide variety of habitats of varying biodiversity value whilst playing a vital role in the health and wellbeing of local communities. Routes through these areas also provide pleasant off road active travel routes for commuters. The LIP will seek to encourage the use of these routes by both pedestrians and cyclists and new routes may be introduced through the 'Greenways' programme. There is potential for a negative impact on biodiversity through increased human interaction if routes are not planned sympathetically and the construction process must also be managed to minimise any risk to wildlife.

2.2.2 Hounslow BAP

The latest Hounslow Biodiversity Action Plan (2011-2016) contains a set of objectives and actions for protecting, conserving and enhancing wildlife and habitats in the borough. It considers the positive and negative impacts that transport infrastructure can have on biodiversity, for example, the habitats created by road and rail infrastructure for species such as bats but also the potential negative impact of polluted surface run off from roads on the water table.

2.2.3 The Highway Network

The highway network also plays an important role in biodiversity by providing green space which has incidental nature conservation value e.g. street trees, road verges and hedgerows and which act as wildlife corridors allowing dispersal between habitats. Hounslow has over 10,200 street trees for which it is responsible for as the Highways Authority. These are not evenly spread across the borough but form an important part of the it's character and identity. They are important for urban drainage, help clean polluted air and are crucial to the movement of biodiversity in the Borough from the street scene to parks and open spaces. Similarly, grass verges, hedges, shrubs and planting adjacent to the road network are also a very important part of the built environment as they help to soften the landscape to mitigate the encroachment of developments particularly for residents and contribute to the overall amenity within Hounslow.

2.3 Population

Hounslow has one of the most culturally diverse communities in the UK, with a 2016 population of over 270,000 people (just over 3% of London's total population) projected to grow to 322,000 by 2041 (GLA, housing led forecast). All of this growth is expected to result from a positive balance of inward international migration and new births since the number of domestic arrivals is lower than departures. Over this same period, the working population is expected to grow from 180,000 to 217,000.

The most direct effect of population growth on the transport network is an increase in demand. As with other outer London boroughs, there is limited access to public transport in many areas, resulting in over 45% of trips being made by private vehicle. In the last 10 years, total traffic flow on Hounslow's roads has barely changed although there was a temporary reduction caused by the 2007/8 recession. Traffic volumes on the M4 however have continued to grow and have now exceeded pre-2007 levels.

Large areas of the borough, particularly in the west, are poorly served by public transport. This can act as a barrier to accessing jobs, services and leisure opportunities – particularly when compounded by financial disadvantage or mobility issues. Within the lifetime of this LIP, several major public transport upgrades are expected:

- Piccadilly Line Capacity Improvements (2023-);
- Enhanced bus services in the east of Hounslow, linking the Great West Corridor area with Ealing and the west of Hounslow; and
- A new train service linking Brentford with Crossrail services at Southall.

In the longer term, the Borough is expected to benefit from the introduction of the West London Orbital train line which will connect Brentford to Old Oak Common and north-west London.

2.3.1 Congestion

The fact that so many residents rely on the personal car for commuting and leisure purposes is one factor contributing to the high levels of congestion on major roads and at several junctions in the borough such as the Chiswick roundabout. The presence of major trunk roads such as the A4/M4 and Heathrow Airport on the Borough border also mean that through traffic plays a huge role in Hounslow's congestion issues. The ability of Hounslow to directly address this type of traffic is limited and requires regional and national level intervention.

Evidence collected by TfL indicates that the issue is getting worse. The average vehicle delay experienced on major roads during working weekdays in the am peak in Hounslow has shown a gradual rise over the last 10 years, increasing from 0.83 minutes per kilometre (mpk) in November 2008 to 1.07 mpk in November 2018 (TfL,

Network of interest statistics). Congestion exacts a high economic and social cost, has a detrimental effect on local air quality and limits the employment and residential capacity of some areas in Hounslow such as the 'Golden Mile' section of the A4 in Brentford.

2.4 Human Health

2.4.1 Physical Activity and Obesity

Low levels of physical activity are closely linked to a number of health conditions including Type 2 diabetes, obesity and cardiovascular disease. Active travel (walking, cycling and scooting) is one of the easiest and inexpensive ways of integrating activity into a person's daily routine and it is one of the primary aims of the MTS and Hounslow's LIP to increase the number of residents doing 20 minutes of active travel per day.

The 2017 active people survey from Sport England estimated that approximately 34% of the adult population of Hounslow are inactive (defined as less than 30 minutes moderate intensity activity/week) compared to the London average of 24%, making the Borough one of the most inactive in London. Furthermore, the percentage of residents doing at least 2 x 10 minutes of active travel a day is only 25% compared to an outer London average of 28% and a London-wide average of 33% (TfL, MTS Evidence Base[7]).

Obesity has been highlighted as a priority issue for Hounslow (Hounslow JSNA, 2017[8]) in both adults and children and is prevalent across most wards. Data from the national child measurement programme for 2017 (see Appendix 1-Map 6) showed that one quarter of year 6 pupils were obese and 40.1% of year 6 pupils were overweight (including obese), which is higher than both the London (38.5%) and England (34.2%) averages. Records also indicate that there has been no significant progress in reducing excess weight in reception or year 6 since weight measurement began. In Hounslow, not all children are affected equally, statistics show that more boys than girls are obese and black ethnic groups have higher excess weight than white or Asian groups although levels are consistent with the England average.

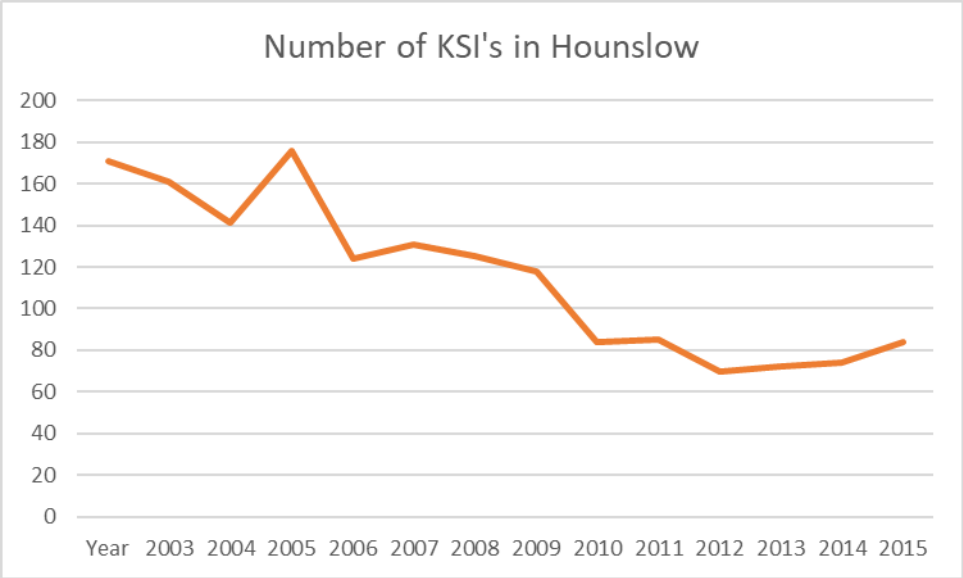
2.4.2 Road Safety

Improving safety on the Hounslow transport network is a core objective of the LIP and it is Hounslow Council's intention to meet the MTS target that no-one will be

[7] Third MTS Evidence Base
[8] Hounslow Joint Strategic Needs Assessment 2017

killed or seriously injured in a road traffic collision in the capital by 2041. Road safety is closely monitored and data for Hounslow shows a steady decline in the number of people killed or seriously injured (KSIs) since 2000 (Figure 2.3). Another key indicator is the 'all casualty rate per million vehicle km', which includes minor injuries, for which Hounslow is in the bottom quartile of the individual London boroughs for its all casualties rate.

Figure 2.3: Change in number of annual KSIs in Hounslow between 2002 and 2015



However, whilst improvements have been made, the numbers remain unacceptable and a recent increase in slight child casualties, and the overall number of people receiving slight injuries remains worse than target.

2.4.3 Unemployment, Social Exclusion and Deprivation

Hounslow has one of the largest economies in London and estimated unemployment is 1% lower than the London average of 5% (July 2015-June 2016, ONS model estimates). There are several large new commercial developments expected during the LIP period including Heathrow expansion, the Golden Mile opportunity area and west of Borough development. These bring new opportunities for employment and economic regeneration however it is important to mitigate against additional risks to health such as poorer air quality and noise.

The transport network plays an important role in providing access to jobs but can also create or aggravate public health problems. Large areas of the Borough, particularly in the west, are poorly served by public transport. Severance caused by major roads is an issue that particularly affects the north of Hounslow due to the presence of the A4/M4 corridor. Multi-lane roads that are difficult to cross, noisy and

heavily polluted create a physical barrier that damages community cohesion and exposes nearby residents to increased health and safety risks.

The overall level of deprivation in the Borough, shown in Appendix 1-Map 8, is close to the England average, with Hounslow ranked 151st out of 326 England Local Authorities in the 2015 Index of Multiple Deprivation. However recent trends indicate that relative deprivation has become slightly worse with 16 areas now becoming classified in the 20% most deprived in the country in 2015, compared to 12 areas in the 2010 classification. There are also significant differences between wards, for example a child born in Hounslow Heath is likely to live 8 years longer than one born in Feltham North. Educational achievement of children, obesity, teenage pregnancy, and substance misuse are correlated to deprivation. Ultimately cardiovascular disease and cancer are the greatest contributors to the premature death rate of residents from the most deprived areas. A correlation also exists between long-term unemployment and poor mental and physical health.

2.5 Air Quality

Road transport is the largest source of air pollutants in Hounslow contributing 65% of NOx and 56% of PM10. Poor air quality is known to have a major impact on human health and in Hounslow causes 200 premature deaths a year (Hounslow JSNA, 2017[9]). The increased traffic caused by the proximity of Heathrow is a major source of these pollutants and consequently the entire Borough has been declared an Air Quality Management Area for NO_2. As can be seen from Appendix 1-Map 7, the highest levels of pollutants are associated with the road network.

Hounslow's extensive network of monitoring stations show that all targets are being met for particulate matter (PM10 and PM2.5) but that exceedances in NO_2 levels are still regularly recorded. In general, these exceedances follow the major road network and are therefore more common in the north east of the Borough around the M4/A4 corridor. Data from automatic monitoring sites show that there has been some decline in concentrations since 2006, however in 2016, readings at 4 sites remained above the UK 40µg/m^3 target.

Poor air quality disproportionately affects the more deprived communities in Hounslow, such as Heston and Cranford, due to their proximity to the strategic road network, although hot spots do exist in more affluent areas. Groups particularly susceptible to the harmful effects of air pollution include the elderly and young children and in 2017 three schools were included in the Mayor's Air Quality audit programme due to their location in areas of NO_2 exceedance. The audits

[9] Joint Strategic Needs Assessment, LB Hounslow, 2017.

recommended a series of actions which included creating green walls between the schools and the road network which are now being investigated by London Borough of Hounslow in partnership with the schools.

A new Hounslow Air Quality Action Plan is due for release in 2018 that sets out a series of objectives and actions for meeting European Union targets for air quality. London Atmospheric Emissions Inventory (LAEI) modelling indicates that there will be a general reduction in pollutant levels across the Borough between 2013 and 2020, with a 20% fall in NOx emissions anticipated but it also predicted that exceedances will remain close to the strategic road network.

In recent years there has not been the expected improvement in air quality as a result of the introduction of cleaner vehicles, in part due to the gap between emissions recorded in laboratory testing and those achieved in real world driving conditions. As already stated, it is also the case that traffic levels are stagnant or increasing on the strategic road network and that much of this is beyond Hounslow's control. Other factors include the increase in reliability of cars leading to reduced need to buy a new, cleaner vehicle and the impact of the recession on new car sales.

2.6 Noise Pollution

Noise pollution reduces the quality of life of Hounslow residents by disturbing sleep patterns and increasing stress levels. The main sources of noise are road traffic, particularly heavy goods vehicles, and aircraft noise from Heathrow (with over 300,000 flights over the Borough per annum). The 2017 JSNA for Hounslow estimated that noise affects 60,000 residents.

The latest draft of the Heathrow Noise Action Plan 2018-2023 reviews progress so far and sets out how the impacts of aircraft noise will be managed. Data collected shows that improvements have been made over the last ten years, with the population living within the 55dB L_{den} contour being 6% lower than in 2006[10]. These improvements are due to a range of measures including new quieter aircraft and revised landing and take-off procedures. In contrast, the improvements to noise at night have not met expected levels and the plan acknowledges that more needs to be done to reduce noise impact at this time. In the future, the introduction of new, even quieter aircraft is expected to improve noise levels further however the possible introduction of a 3rd runway brings additional concerns for the residents of Hounslow, due to the increased number of flights and as yet unannounced changes in flight and holding patterns.

[10] Heathrow Noise Action Plan 2019-2023 Draft for Consultation – May 2018,

2.7 Climatic Factors

A key objective of the LIP is to reduce transport related emissions of all types, including greenhouse gas emissions such as carbon dioxide (CO_2). Hounslow therefore fully supports the Mayor's target to make London's transport network zero emission by 2050.

As with other pollutants, road traffic is a significant contributor to CO_2 emissions. Hounslow's road transport contributes 31% of its total CO_2 emissions across all sectors of which around a third is from cars. Data from the national atmospheric emissions inventory, shown in Table 2.4, shows no meaningful change in road transport emissions in the period 2011-2015. Compared to other London boroughs, Hounslow has the second highest motorway emissions due to the presence of the M4 but average levels on A and minor roads for outer London. Based on 2015 data, Hounslow's total transport related CO_2 emissions rank in the upper quartile for London boroughs making up over 5% of London's total.

Table 2.4: Road Transport CO_2 (kt equiv.) emissions for Hounslow (data from NAEI http://naei.beis.gov.uk)

	A-Roads (kt)	Motorways (kt)	Minor Roads (kt)	Total (kt)
2011	180	74	111	365
2012	181	74	110	365
2013	176	76	107	359
2014	173	77	109	359
2015	176	79	103	358

2.8 Material Assets

Material assets related to transport include highway and street furniture, the materials used in their construction, and highway structures. The street environment can influence public wellbeing, including physical and mental health, and have a significant environmental impact during construction, working life and maintenance phases. Since material assets are the building blocks of public realm, they will be of particular relevance when applying the Healthy Streets approach.

This Hounslow Street Scene Design Guidance (SSDG)[11] is a strategic document which sets objectives for the design and maintenance of streets, proposes design solutions and specifies materials for assets. It aims to ensure that streets become places where people work and live rather than simply transport corridors and that the needs of all groups of people are met including the elderly, those with disabilities and active travel modes.

The impact on the environment is assessed by considering six critical sustainability themes – energy, waste, water, transport, green infrastructure and public space in all street design projects and the application of principle 4 – "Streets must be sustainably built and maintained". Specific policies related to these principles:

- In order that streets are socially inclusive they must be safe, convenient and accessible to all.
- The London Borough of Hounslow's 'Sustainability Checklist' should be used to evaluate environmental impacts associated with the proposed street scene works to identify more sustainable alternatives or working methods.
- All street scene materials and furniture should be of the quality and durability compatible with their function.
- Consider the whole life costing of all specified materials and street furniture to maximise robustness but minimise the maintenance liability.

2.9 Soil & Water

Flood risk in Hounslow is summarised in Appendix 1-Map 3. Large areas in the east of the Borough lie within the flood zones of the River Thames, however smaller flood risk zones also exist around the Duke of Northumberland River in Isleworth and the River Crane which flows from the Heathrow boundary to the southern border of the Borough. The planning system makes provision for development in areas of flood risk by prohibiting basement dwellings in flood risk zone 3 and limiting the area of none permeable paving surfaces in front gardens. The highway network can, if drainage is not considered at design stage, contribute to flood risk in urban areas due to its relatively impermeable nature.

Depending on the proposals being brought forward, the LIP may potentially have direct impacts on geology and soils. For example, new infrastructure may bury important deposits or affect geological strata indirectly by altering the hydrogeology of an area. The presence of new infrastructure particularly may affect the propensity of areas to flood.

[11] Hounslow Street Scene Design Guidance 2012.

2.9.1 Contaminated Land

Hounslow's Contaminated Land Strategy (2008) sets out how land which merits detailed individual inspection will be identified in an ordered, rational and efficient manner, and over what time scale. Hounslow, like many urban areas, has a history of industrial usage. This includes a range of derelict land, as well as former factories, gas works and military land. These former land uses have the potential to leave contamination in the ground, which if not properly dealt with, can affect land quality and pose a significant risk to human health, water supplies, natural habitats and/or property.

- No. of priority sites investigated to date = 144
- No. of priority sites requiring initial investigation = 460 (including 194 sub-stations)
- No. of priority sites requiring detailed investigation = 12
- No. of lower priority sites requiring investigation = 1125
- Total planning sites discharged = 108
- Voluntary remediation sites discharged = 9
- Planning sites in progress of investigation or remediation = 64
- Planning sites in progress of voluntary investigation or remediation = 21

More commonly, providing new infrastructure can lead to the disturbance of contaminated land, and care needs to be exercised in the handling and/or disposal of contaminated materials to prevent migration of pollution and the contamination of groundwater resources.

2.10 Historic Environment and Landscape

The Borough contains 28 designated conservation areas (Appendix 1-Map 9) as well as 23 Grade 1 listed buildings, 557 Grade 2 listed buildings, 214 locally listed buildings, 7 ancient monuments and several zones identified as areas of archaeologically priority (Appendix 1-Map 5).

Hounslow also benefits from three Registered Parks and Gardens within its border:

Park and Garden	Listed Grade
Osterley Park	Grade II*
Syon Park	Grade I
Gunnersbury Park	Grade II*

In addition, the Royal Botanic Gardens at Kew, a site of international importance, lies adjacent to Hounslow's south-eastern border. Kew has a great deal of influence on

planning decisions made in the Brentford area due to the need to consider its setting when planning new development.

Metropolitan greenbelt covers 1225ha of the Borough, just under a quarter of the total area. These areas contribute to many environmental services such as drainage, public well-being and biodiversity and receive a high level of protection from the planning system where development is focused on underdeveloped brownfield sites close to transport amenities. Hounslow's landscape is also defined by a network of mature street trees, particularly in the east of the Borough, and these play an important role in improving air quality, providing shade for pedestrians and have an impact in reducing road noise. They are also valued aesthetically by residents.

2.10.1 Heritage at Risk Register (HAR) and Historic Environment Record (HER)

Historic England's 2017 register of 'Heritage at Risk' (combining listed buildings and conservation areas together with archaeology) includes, for Hounslow, one grade I building, Boston Manor House (owned and managed by LB Hounslow), and four grade II* buildings two of which are within Gunnersbury Park (jointly owned by the London boroughs of Hounslow and Ealing). A further seven Grade II buildings are classed as at risk within the park, alongside another eight across the Borough. Of these five are actual buildings, two are bridges and one is a boundary wall.

The local historic environment record (HER) for Greater London provides detailed information on local archaeological sites, historic buildings, monuments and historic landscapes. It is a more comprehensive data source than the HAR since it includes undesignated sites which could potentially be sensitive to new transport infrastructure projects. When considering the location of new transport infrastructure, reference is made to the HER, to assess if the proposed route/location of such infrastructure will affect both designated, non-designated and intangible heritage assets. The location of such assets influences the position and nature of such infrastructure and is used to inform the finer details of the proposals. Projects which harm assets would only be proposed where there is no other alternative and the cumulative public benefits of the proposal outweigh any harm.

2.10.2 Transport and The Setting of Heritage Assets

Historic England define setting as the surroundings in which a heritage asset is experienced[12]. The way in which a person experiences an asset is influenced by a range of factors and whilst views from or to the asset are an important aspect of setting, other environmental factors such as noise and air pollution and the type of

[12] Good Practice Advice 3 – *The Setting of Heritage Assets*, Historic England, 2015

buildings in close proximity all influence setting. The local transport network around an asset can enhance or diminish its setting in several ways:

- The presence of busy roads can act as a barrier to accessing an asset if convenient crossings are not available.
- A lack of public or active transport options could limit accessibility to those who own a car.
- Road transport is the primary source of air and noise pollution in Hounslow, both of which can contribute to a poor personal experience.
- Views can be interrupted by major transport infrastructure. One example in Hounslow is the elevated section of the M4.

In some cases, the economic viability of an asset can be affected by the transport network if access is too difficult or high levels of pollution makes visiting the site unpleasant. There can often be a tension between providing sufficient transport links and the need to maintain a less busy, more tranquil setting such as in a rural location.

2.10.3 Hounslow's Urban Context and Character Study

The purpose of this study[13] was to understand how the uniqueness and personality of Hounslow's areas can be maintained through innovation and planning. It is important to consider these issues when making changes to transport infrastructure so that the distinctive character of Hounslow's places, streets and buildings are protected.

The report makes a set of area-based recommendations, summarised in Appendix 1- Map 10, which can be used to help determine which areas would be most sensitive to changes that would alter the character of an area. The areas recommended for transformative change include the area around Feltham in the south west of the borough, Heston and Cranford in the north west and the Great West Corridor area which has also been designated as an opportunity area in the draft London Plan. Areas such as Chiswick in the east are more sensitive and care should be taken to protect its character when considering material changes.

[13] Urban Context and Character Study, LB Hounslow, August 2014

2.11 Summary of Key Environmental Issues

The information collected as part of the baseline review indicates that the following key issues should be considered in preparing the Hounslow LIP:

Table 2.3 Transport issues and their potential relevance/impact on SEA topic areas

	SEA Topic								
Transport Issue	Biodiversity, Flora and Fauna	Population	Human Health	Air Quality	Climatic Factors	Material Assets	Soil	Water	Historic Environment and Landscape
Population growth bringing increased demand and traffic volumes	✓	✓	✓	✓	✓		✓	✓	✓
Congestion on the road network		✓	✓	✓	✓				✓
Access to public transport services		✓	✓	✓	✓				✓
Low levels of active travel in the borough and links to obesity			✓	✓	✓	✓			
Road Safety, particularly child casualty rate			✓			✓			✓
High level of air pollutants – NO_2 and particulate matter	✓	✓	✓	✓					✓
Localised flooding on the highway network	✓	✓	✓			✓	✓	✓	✓
Impact of public realm design	✓	✓	✓	✓	✓	✓	✓	✓	✓
Impact of asset maintenance and construction			✓	✓	✓	✓	✓	✓	✓

Noise from aircraft was also identified as an issue by the baseline review but has not been included in the environmental assessment as it is not within the scope of the LIP.

Chapter Three: Policy Review and SEA Objectives

3.1 Policy Review

The Local Implementation Plan (III) and the Strategic Environmental Assessment (SEA) should both be considered in the context of their relationship with a range of other environmental plans, programmes, assessments and objectives established across international, European, national, regional and local levels.

A comprehensive review of environmental plans at each geopolitical level was undertaken as part of the Integrated Impact Assessment (IIA) for the Mayor's Transport Strategy (MTS). This systematic review informed the development of the MTS objectives and proposals. Since the LIP outlines how the London Borough of Hounslow will contribute towards the aims and objectives of the MTS, this SEA does not consider national or European policies as they have already been reviewed in the development of the MTS and IIA.

The review for the MTS can be found in Chapter 4 of the IIA:
https://tfl.gov.uk/cdn/static/cms/documents/integrated-impact-assessment-report.pdf

It should be noted that in addition to this assessment, a number of other policy documents have been issued or updated by the Greater London Authority on behalf of the Mayor of London. These include:

Environment:

- London Environment Strategy (May 2018).

Planning:

- The London Plan: Spatial Development Strategy for Greater London - Draft for Public Consultation (December 2017).
- The Mayor's Economic Development Strategy for London: Draft for Consultation (December 2017).
- London Housing Strategy (May 2018).

Health:

- Better Health for All Londoners: Consultation on the London Health Inequalities Strategy (August 2017).

Art and Culture:

- Culture for All Londoners: Mayor of London's Draft Culture Strategy (March 2018).

Crime & Community Safety:

- The Right Direction: The Mayor's Strategy for Improving Transport Safety, Security and Reliability in London 2015 - 2017 (May 2015).
- All of Us: The Mayor's Strategy for Social Integration (March 2018).

The revisions to policy context at a regional level have also been taken into account in developing the SEA objectives. Given the depth and breadth of this review, and the need to consider the MTS objectives in the development of the LIP, the focus for this SEA has been on the various local and regional plans which were particularly relevant in identifying environmental problems/opportunities and applying local context to the objectives. These include:

Table 3.1 Local Policy Review

Policy Document	***Purpose and Key Policies/Actions relevant to SEA***
The Hounslow Local Plan 2015 - 2030	Sets out the council's proposals for development over the next 15 years. Key policies include the protection of green and blue infrastructure, the reinforcement of local character and context, a comprehensive set of policies to ensure environmental protection and proposals to enhance connectivity with improved transport infrastructure.
Future Borough Strategy 2018 - 2035	The community strategy for Hounslow sets out a vision in three areas: place, people and relationships. The environment is listed as a key challenge, with particular emphasis on air quality and public health.
Air Quality Action Plan (AQAP) 2018 - 2023	A comprehensive set of measures designed to address high levels of the 3 main air pollutants. Road transport and Heathrow airport are named as the primary sources, and both behaviour change and infrastructure measures are proposed to combat the issues. The LIP and AQAP are closely aligned.
Leisure and Culture Strategy 2016 - 2020	Describes how leisure and cultural services need to change to 2020.Key policy area is the objective of enhancing parks and green spaces and make them more accessible. Also a focus on

	getting residents more active by providing safe and welcoming facilities.
Housing Strategy 2014 - 2018	Sets five objectives of which the most relevant is to support communities by creating cleaner, safer and greener living environments. Also promotes health and well-being through increased activity.
Green Belt Review Draft Report, October 2017	This review assesses the state of the green belt and the contribution it makes to the borough. A key recommendation was that areas that served an open space function should continue to be protected.
Regeneration and Economic Development Strategy 2016 - 2020	Includes enhancing the environment and improving connectivity as two of the four key objectives for the regeneration of Hounslow. Both are considered key for successful regeneration in order to attract investment, businesses and workers to an area.
West London Strategic Flood Risk Assessment (SFRA)	Level 1 SFRA with Barnet, Brent, Ealing, Harrow, Hillingdon and Hounslow. Delineates Hounslow into areas of different flood risk and recommends that risk of flooding can be mitigated primarily through a planning solution. Council Policy is also key to managing flood risk and therefore the policies set within the LIP need to take it into account.
Hounslow Street Scene Design Guidance	Sets standards for the maintenance of highways assets and a policy for the protection of numbers of street trees.

From this review, the key opportunities to be taken on board during the development of the LIP and the SEA were as follows:

- The Healthy Streets approach is a common framework for the discussion or analysis of transport objectives in all London strategies published in the last year.

- Connectivity across the borough can be improved through the delivery of sustainable transport improvements.

- Increasing activity levels is a pathway to improved health and well-being. Green space and the local environment have an important role to play in encouraging activity.

- Reducing traffic flow can improve air quality and help realise the associated benefits that this can bring to the environment and health.

- Growth can be accommodated, and its impact mitigated, by improving public transport accessibility through upgrading existing network infrastructure and ensuring suitable planning provision for future projects.

3.2 SEA Objectives and Indicators

SEA objectives are distinct from the LIP objectives and provide a statement of what is intended from an environmental perspective, giving a desired direction of change. The LIP's performance against these can be measured using indicators. Where appropriate these indicators are linked to measurable targets. In addition, the full range of SEA topics, as stated in the Directive, is covered by the objectives.

Based on the issues identified as part of the baseline review, the following SEA objectives have been proposed to identify whether any LIP programmes or projects will have any significant environmental impacts.

A full list of objectives, indicators and data sources can be seen in Table 3.2. Guide questions used for the assessment in chapter 5 of this report are also included. Following consultation, the finalised set of indicators will be developed in to a well-defined and cost-effective monitoring programme.

Table 3.2 SEA objectives, indicators and guide questions

SEA Topic	SEA Objective	Proposed SEA Indicators	Environmental Problems - Questions for assessment
Biodiversity, Flora and Fauna	1. To conserve and enhance biodiversity, flora and fauna in the Borough.	• Total number of street trees in Hounslow (to take into account new trees and replacements) • Number of sites where hedgerows and green open space is lost due to transport scheme Data Source: Hounslow Highways	• Would the LIP, in combination with other plans, result in damage, loss or fragmentation to any existing designated wildlife sites, wildlife corridors and natural and semi natural habitats (e.g. woodlands, tree, watercourses)? • Would the LIP, in combination with other plans, provide opportunities for enhancement of biodiversity or biodiversity gain, for example through green and/or blue infrastructure implementation? • Would the LIP in combination with other plans, protect and enhance the character of green spaces in the Borough or provide opportunities to create new green spaces? • Would the LIP in combination with other plans, contribute to a wider green and blue infrastructure strategy? • Would the LIP in combination with other plans, improve access to green spaces and encourage people to visit and engage with nature?
Population and Human Health	2. To reduce the number of people injured or killed (KSIs) as a result of a road traffic collision.	• KSI and all casualty statistics Data Source: MET Police	• Would the LIP result in reduced speeds in residential areas? • Would the LIP include measures to improve safety in accident hot spots? • Does the LIP include road safety objectives that actively encourage walking and cycling? • Will the LIP result in overall improved safety across all transport routes in the Borough?
	3. To increase the number of Hounslow residents	• Transport mode data for Hounslow	• Would the LIP provide opportunities to promote the benefits of active travel and encourage

	participating in active travel (i.e. walking and cycling).	• Number of residents achieving 2x10 minutes of active travel per day. • Obesity Prevalence in year 6 pupils. Data Source: TfL Transport in London, Sport England Active Lives and DfT National Travel Surveys. Obesity national measurement programme in schools.	behaviour change? • Would the LIP improve infrastructure for cyclists and pedestrians?
	4. To ensure that all residents in Hounslow have access to local services and facilities regardless of location, without a car.	• Number of bus stops meeting accessibility standards. • Successful implementation of new transport infrastructure projects including new rail stations, bus routes and pedestrian/cycle routes. Data Source: Traffic and Transport Data, LB Hounslow	• Would the LIP, in combination with other plans, result in greater provision of public and community transport? • Are the main residential areas and residential growth areas in the Borough linked to key services and facilities via sustainable transport? • Would the LIP, in combination with other plans, result in improved accessibility for all of the Borough's residents? • Would the LIP improve connectivity to key services by promoting active travel modes?
	5. To reduce the noise disruption caused by road traffic in the borough.	• Percentage of residents stating that noise pollution is a slight or serious problem in their local area. • Continued input into the planning process for a 3rd runway at Heathrow. Data Source: Traffic and	• Would the LIP, in combination with other plans, contribute to a reduction in noise pollution associated with transport infrastructure or traffic management? • Will overall road traffic noise levels increase or decrease as a result of LIP implementation?

		Transport Data, LB Hounslow	
Climatic Factors	6. To reduce CO_2 emissions from transport during the life of the plan and support a zero carbon London.	• CO_2 emissions attributable to transport and related functions in Hounslow. Data Source: Transport for London and LAEI	• Would the LIP, in combination with other plans, reduce GHG emissions from transport, through a reduction in traffic or effective traffic management? • Would the LIP, in combination with other plans, promote a shift to low carbon transport modes (such as active modes or electric vehicles) or more efficient travel options (such as working from home) for passenger and/or freight transport? • Would the LIP, in combination with other plans, provide opportunities to invest in green technologies, equipment or infrastructure to reduce GHG emissions?
	7. To adapt to the effects of climate change and to promote measures which enable the borough to accommodate the likely impacts of it.	• Proportion of the network made unavailable in the case of extreme weather event. Data Source: Hounslow Highways	• Would the LIP, in combination with other plans, improve the resilience of the Borough's transport network in the event of extreme weather events such as storms, floods, snow and ice, drought and heatwaves?
Air Quality	8. To reduce transport related emissions of harmful pollutants: $PM_{2.5}$, PM_{10} and NO_x in Hounslow.	• Recorded levels of all 3 pollutants via own monitoring stations and LAEI modelled data • Percentage of HGV traffic on local road network. Data Sources: LB Hounslow air quality monitoring, DfT and TfL traffic surveys	• Would the LIP, in combination with other plans, result in a reduction in NO_x, PM_{10} and $PM_{2.5}$ emissions from road transport? • Would the LIP, in combination with other plans, reduce air pollution in the existing Borough-wide AQMA and in areas of high sensitivity such as Conservation Areas? • Would the LIP, in combination with other plans, result in changes in the composition of traffic (particularly heavy goods vehicles) which would could have an impact on local air quality? • Would the LIP, in combination with other plans, result in effective traffic management that improves traffic flows and reduces congestion hot spots in the Borough?

			• Would the LIP, in combination with other plans, promote increased use of low carbon vehicles with better emissions standards for passenger and/or freight transport?
Water and Soil	9. To minimise vulnerability of the transport network to flood risk and minimise adverse effects of drainage from the network on soil and the water environment.	• The proportion of infrastructure schemes including a sustainable urban drainage (SUDS) component.	• Would the LIP, in combination with other plans, promote transport infrastructure and services that are resilient against flooding? • Would the LIP, in combination with other plans, reduce the risk of severance of key transport routes due to flooding? • Would the LIP, in combination with other plans, result in reduced surface run-off thereby reducing pollution of soils and watercourses? • Would the LIP, in combination with other plans, involve development on previously developed land?
Historic Environment and Landscape	10. To improve the quality of the streetscape and where possible the local townscape and landscape in the borough, respecting local character and distinctiveness.	• Change in the number of conservation areas considered to be at risk or a change in condition of existing areas at risk. • Proportion of positive consultation feedback received on public realm project proposals. Data Sources: HAR register, Traffic and transport consultation responses.	• Would the LIP, in combination with other plans, affect the character of locally distinctive townscapes? • Would the LIP, in combination with other plans, be likely to adversely affect an area of landscape importance? • Would the LIP, in combination with other plans, have the potential to enhance the quality and diversity of the townscape (and landscape) and improve satisfaction with local streetscapes? • Does the LIP include measures to minimise the amount of street 'clutter' ensuring that all street furniture and signage present is necessary? • Does the LIP include measures to improve the public realm?
	11. To conserve, and where possible enhance, all cultural and heritage assets and their settings	• Number of proposals which make improvements to access and conserve the setting of the historic	• Would the LIP provide opportunities to enhance the quality, condition and character of the historic environment and surrounding setting?

	whilst increasing enjoyment of and access to the historic environment.	environment, for example through key view conservation. • Changes in the number or condition of entries in Historic England's heritage at risk surveys Data Sources: HAR register, Traffic and transport consultation responses.	• Would the LIP provide greater access to and enjoyment of the Borough's historic environment and heritage assets? • Would the LIP have an adverse effect on any buildings, structures or areas of national or local heritage significance (e.g. through visual intrusion, congestion and associated noise, vibrations and pollution?
Material assets	12. To increase the sustainability of our construction and operational processes by minimising waste produced and resources consumed.	• Total carbon generated by transport operations. • Percentage of recycled materials used in LIP infrastructure projects. Data Sources: TfL emissions data, Hounslow Highways	• Will the LIP promote the use of recycled, re-used and locally sourced resources over primary resources in transport construction projects? • Will the LIP reduce the environmental impact of infrastructure maintenance services?

3.3 Testing the Compatibility of LIP Objectives against SEA Objectives

The Local Implementation Plan objectives are detailed Section 1.7. Table 3.3 maps these objectives against the SEA objectives to assess any conflict between them and to make certain of consistency as far as possible. No potential conflicts were uncovered, with all objectives positively impacting at least one LIP objective.

Table 3.3: Draft SEA vs Draft LIP objectives

SEA Objectives		LIP Objectives Healthy, Clean and Green	Safe	Efficient
1	To conserve and enhance biodiversity, flora and fauna in the Borough.	+	O	O
2	To reduce the number of people injured or killed as a result of a road traffic collision.	O	+	+
3	To increase the number of Hounslow residents participating in active travel.	+	+	+
4	To ensure that all residents in Hounslow have access to local services and facilities regardless of location, without a car.	+	O	+
5	To reduce the noise disruption caused by road traffic in the borough.	+	O	+
6	To reduce CO_2 emissions from transport during the life of the plan and support a zero carbon London.	+	O	O
7	To adapt to the effects of climate change and to promote measures which enable the borough to accommodate the likely impacts of it.	+	O	+
8	To reduce transport related emissions of harmful pollutants: $PM_{2.5}$, PM_{10} and NO_x in Hounslow.	+	+	+
9	To minimise vulnerability of the transport network to flood risk and minimise adverse effects of drainage from the network on soil and the water environment.	O	O	+
10	To improve the quality of the streetscape and where possible the local townscape and landscape in the borough, respecting local character and distinctiveness.	+	O	+
11	To conserve, and where possible enhance, all cultural and heritage assets and their settings whilst increasing enjoyment of and access to the historic environment.	+	O	O
12	To increase the sustainability of our construction and operational processes by minimising waste produced and resources consumed.	+	O	O

Key: - Conflicts, O No Conflict, + Positive relationship

Chapter Four: Identifying Alternatives

Identifying and comparing appropriate strategic alternatives is a key aspect of SEA. Examining alternatives helps to ensure that the plan's likely environmental effects are addressed during the preparation of the plan. It also assists in explaining to stakeholders why these strategies and measures, and no others, are being put forward.

The SEA Directive (2001/42/EC) states that:

"an Environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated" (Article 5.1)
It also notes that one of the issues that must be covered in the Environmental Report is: "an outline of the reasons for selecting the alternatives dealt with." (Annex 1b)

The SEA Directive and Regulations also emphasise the importance of a reasonable approach to the assessment of alternatives, conducted at the appropriate level, considering resources, time and information available. Hence it is not necessary to consider unrealistic alternatives. It should also be noted that that since the LIP is developed within the context of the MTS policies, the approaches available are limited to those applicable to the objectives and outcomes set out within it. Hounslow therefore has no ability to consider alternative strategies that do not accord with the present MTS.

For these reasons, this Environmental Report considers the environmental impact of a set of reasonable alternatives to the programmes and projects that have been identified during the preparation of the LIP. The range of possible alternatives is severely limited by the requirement that the LIP must adhere to the objectives and policies of the MTS. These restrictions lead to a relatively small set of possible variations in scope than would otherwise be expected of other statutory strategies.

The environmental impacts revealed in this SEA will then inform the final choice of projects in the LIP. In addition, a 'no plan' scenario has been considered, demonstrating the environmental impacts if only existing local and regional measures or strategies were implemented and the third LIP was not carried forward.

Chapter Five: Assessment of LIP Environmental Impacts

5.1 Assessment Methodology

As part of the SEA process and development of the LIP, it is necessary to assess the extent of the environmental impacts of the LIP, its initiatives and any reasonable alternative options.

The potential impacts of each transport programme in the LIP have been assessed using matrix tables, which also consider the alternative options and the "do-nothing, business as usual" (without a LIP) scenario. The matrices are set out to show the significance of impacts of the LIP programmes on the SEA objectives, ranging from major negative effects to major positive effects. Each programme is divided into the major workstreams in order to provide a finer level of detail on the expected impacts.

Table 5.1 Assessment Key

Impact	Minor Positive	Minor Negative	Neutral	Uncertain	Major Positive	Major Negative
Symbol	+	-	O	?	++	--

5.1.1 No Plan 'Business-as-Usual' Scenario vs the New LIP Programme

In interpreting the following assessment, it is important to understand that the 'No Plan' scenario does not translate to an empty work programme. Instead, it represents a scenario under which Hounslow's second LIP (LIP2) continues to operate and so do the projects designed to contribute to the previous MTS objectives. Since there are similarities in the objectives between the current and previous MTS's, there are instances within the analysis where there are only minor differences in environmental impact.

The proposed LIP3 programme differs from the business as usual approach by:

- Putting air quality and hence transport emissions at the heart of the LIP.
- An increased emphasis on increasing the proportion of trips made by active travel by improving the public realm through application of the Healthy Streets approach.
- Further funding to encourage the use of electric vehicles where residents do not have a realistic choice but to use the car.
- A movement away from creating off-road cycle networks and hence reduced pressure on converting green infrastructure, to links which connect people to employment and services.
- Increased emphasis on transport being the key enabler for employment and housing growth.

5.2 Road Danger Reduction Programme

The objective of this programme is to reduce the number of people killed or seriously injured on Hounslow's roads as a result of a collision. This programme covers physical measures only, with behavioural interventions considered in section 5.3.

Table 5.2: *Environmental Assessment of Road Danger Reduction Programme*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
20mph zone implementation	O	++	+	+	++	+	O	+	O	+	+	O
Road safety engineering improvements	O	++	+	O	+	?	O	?	O	+	+	O
Alternative 1 – Traffic calming measures e.g. speed humps	O	++	O	O	+	O	O	-	O	O	+	O
No Plan 'Business as Usual' Scenario	O	+	O	+	+	+	O	O	O	O	O	O

5.2.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Road Danger Reduction Programme will have positive effects overall. In particular, significant positive effects have been identified for SEA Objective 2 'KSI Reduction' through 20mph zone implementation and road safety engineering improvements and for SEA Objective 5 'Noise reduction' through 20mph zone implementation. Minor positive impacts have also been identified for 'Active Travel Participation', 'Accessibility without a car', 'Townscape and streetscape' and 'Heritage conservation' (SEA Objectives 3, 4, 10 and 11).

These positive impacts are expected from:

- A reduced number of road casualties from road safety infrastructure improvements and lower speeds.

- A reduction in transport related emissions including pollutants related to poor air quality. The results of a TfL assessment[14] of the effect of 20mph on vehicle emissions concludes that 20mph zones have no net negative effect on emissions and if benefits from increased levels of walking and cycling are included, there will be a positive impact. Smoother traffic flow is also expected to reduce particulate emissions.
- Improved setting of heritage assets from slower traffic, a safer environment and lower pollution levels. Townscapes in particular are expected to benefit from speed reduction.

Since the nature of the engineering improvements is unknown at this stage and is decided on a per location basis, it is not possible to say for certain what the effect on air quality and carbon emissions will be. Safety focused engineering improvements can have positive or negative impacts depending on their implementation.

One alternative approach was considered for this programme, the use of calming measures such as speed bumps. Whilst they are generally effective at reducing traffic speed, the option was discounted due to the potential for localised increases in vehicle emissions and uncertainty over whether speed bumps have negative impacts on air quality over the whole area of a scheme.

The No Plan 'Business as Usual' Scenario was not found to deliver as many positive effects as the new LIP3 programme, with no significant positive effects being identified. However, it still delivers minor positive impacts for KSI reduction, accessibility without a car, noise reduction and CO_2 reduction.

5.3 Road Safety Education, Training & Publicity (ETP)

The objective of this programme is to use education and training to reduce road traffic collisions and increase the number of people participating in active travel.

[14] Speed, Emissions and Health, TfL, June 2018

Table 5.3: *Environmental Assessment of ETP Programme*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Cycle training programme	O	++	++	+	+	+	O	+	O	+	+	O
Road safety education and training including primary school, motorcycle and delivery driver specific projects	O	++	+	+	+	+	O	+	O	+	+	O
Alternative 1 – Divert funding from ETP programme to active travel infrastructure	O	O	++	++	+	+	O	++	O	+	+	O
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	+	+	O

5.3.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Road Safety Education, Training & Publicity Programme will have positive effects overall. In particular, significant positive effects have been identified for SEA Objective 2 '*KSI Reduction'* through cycle training provision and education and Objective 3 '*Active Travel Participation*'. Minor positive impacts have also been identified for SEA Objectives 4, 5, 6, 8, 10 and 11.

These positive impacts are expected from:

- A reduced number of road casualties due to increased safety awareness and training.
- A higher number of people participating in active travel is at the core of the LIP and impacts most SEA objectives positively, such as air quality, noise reduction and CO2 reduction.
- Townscape, streetscape and heritage conservation would benefit from reduced congestion levels and improved air quality as more people take up active modes.

Although this programme encourages a mode shift to active modes, the resulting decrease in traffic over the LIP period is not expected to produce any measurable reduction the environmental impact of infrastructure maintenance services.

The alternative of reallocating funds to active travel infrastructure, , although significantly positive for SEA Objectives 3 and 4, was discounted primarily due to its lack of impact on road safety.

5.4 Travel Demand Management

The objective of this programme is to increase the number of people travelling by sustainable modes (including public transport) using promotional and engagement techniques. This programme will work with schools, employers and community groups to promote sustainable travel options.

Table 5.4: *Environmental Assessment of Travel Demand Measures*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
School Engagement Programme	O	+	++	+	+	++	O	++	O	+	+	O
Business travel planning	O	O	++	+	+	++	O	++	O	+	+	O
Promotional campaigns e.g. walking, anti-idle	O	?	+	+	+	++	O	++	O	++	++	O
Alternative 1 – Target communities with engagement	O	+	+	+	+	+	O	+	O	+	+	O
No Plan 'Business as Usual' Scenario	O	O	+	+	+	+	O	+	O	+	+	O

5.4.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Travel Demand Measures programme will have positive effects overall. In particular, significant positive effects have been identified across all projects for SEA Objective 3 'Active Travel Participation', Objective 6 'CO_2 Reduction' and Objective 8 'Air Quality'. Minor positive impacts have also been identified for SEA Objectives 4, 5, 10 and 11.

These positive impacts are similar to those expected from the ETP programme.

- The focus on increasing levels of active travel will result in major direct positive impacts on human health due to the increase in physical activity and air quality due to the reduction transport related emissions as people use the private car less.
- Air quality campaigns such as anti-idling promotions are expected to have considerable impact on localised areas such as around schools.

The alternative approach of targeting communities as opposed to workplaces and schools was rejected due to a lower level of expected benefits. This is because it is more difficult to produce targeted, effective campaigns across a broader geographical and demographic audience.

The impact of promotional campaigns on KSI reduction is uncertain since, unlike the school programme, they do not always include a safety element and higher rates of active travel could lead to more accidents. They do not exist in isolation however, and with other safety focused activities, the overall impact should be positive.

5.5 Better, more accessible streets

The objective of this programme is to contribute to the MTS objectives through improvements to the public realm. The implementation of the Healthy Streets Approach will be key to success in this area.

Table 5.5: *Environmental Assessment of Better Streets Programme*	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Public Realm Improvement Programme including Liveable Neighbourhoods and member fund	+	+	++	++	++	++	+	++	+	++	++	?
On and off-street cycle parking	?	O	++	++	+	+	O	+	O	?	O	-
Alternative 1 – Widening of footways	-	O	+	+	+	+	-	+	-	+	O	-
Alternative 2 – Removal of cycle lanes to increase green verge area	++	O	--	-	-	--	-	--	-	+	+	-
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	+	+	O

5.5.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Better Streets Programme will have positive effects overall. The Public Realm Improvement Programme has significant positive effects over 7 of the 12 SEA objectives and the Cycle Parking Programme has significant positive effects on SEA Objective 3 'Active Travel Participation' and Objective 4 'Accessibility without a car'. Minor positive impacts have also been identified for SEA Objectives 1, 2, 5, 6, 8 and 9.

These positive impacts are expected from:

- Public realm improvement is expected to bring significant environmental impacts across most objectives. This is primarily due to its effects on increasing active travel by making it easier and more attractive, subsequently contributing to improved noise levels and air quality.
- A public realm which considers the Healthy Streets Approach will also incorporate SUDS into the design with localised benefits for flood risk.
- Its impact on material asset sustainability is uncertain as improvements are done on a case by case basis and in some cases it could create a public realm which is more resource intensive to maintain.

- There is also potential for major positive impact on Historic Environment and townscape where improvements are made close to heritage assets with the objective of improving their setting and accessibility.
- The lack of cycle parking is known to be a barrier to increasing active travel rates and so its installation is expected to have a major positive impact. Any possible negative impact from the addition of street furniture which could result in street cluttering or may not be considered aesthetically pleasing will be mitigated by choosing locations carefully and using good quality materials in keeping with the surrounding setting.
- The relationship between this programme and biodiversity is complex – whilst there is potential to do harm through the reduction of green habitats, the LIP commits to enhancing the public realm by incorporating new planting and green spaces and improving drainage.

Two alternatives were considered under this programme. Firstly, the simple widening of footways rather than the application of healthy streets was discounted due to its potential to increase flood risk and surface run-off. Secondly, the removal of cycle facilities completely was not included because although there is great potential to create new green areas which could benefit biodiversity, the negative impact on cycle popularity was unacceptable.

5.6 Developing a Hounslow active travel network

The objective of this programme is to improve active travel infrastructure on key, targeted routes which connect popular destinations. The LIP names a set of priority routes to be completed and the programme will include infrastructure improvements for both cyclists and pedestrians. This assessment does not consider each route separately however during the planning stage, the environmental impact of each on the local area will be considered.

Table 5.6: *Environmental Assessment of introducing Hounslow active travel network*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Hounslow Priority Cycle Network	+	+	++	++	+	++	O	++	O	+	+	?
Alternative 1 – Advisory only cycle routes (no segregation)	+	-	+	+	O	+	O	+	O	O	O	O
No Plan 'Business as Usual' Scenario	+	+	+	+	+	+	O	+	O	+	+	O

5.6.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Active Travel Network Programme will have positive effects overall. In particular, significant positive effects have been identified for SEA Objective 3 '*Active Travel Participation*', Objective 4 '*Accessibility without a car',* Objective 6 '*CO_2 Reduction'* and Objective 8 '*Air Quality*'. Minor positive impacts have also been identified for SEA Objectives 1, 2, 5, 10 and 11.

- Since the paucity of safe, convenient routes are a known barrier to increasing active travel, the creation of the Hounslow cycle network is expected to increase active travel mode share significantly. It will provide the opportunity to access to services and the natural environment for those without a car and also have a minor benefit for safety due to the installation of segregated facilities.

The alternative of creating advisory cycle lanes only was discounted due to its possible negative impact on the safety of cyclists, lack of benefit for pedestrians and minimal impact of transport emissions due to not increasing active travel levels meaningfully.

5.7 Bus network improvements

The objective of this programme is to create a reliable and attractive bus network in Hounslow that is accessible to everyone regardless of any physical impairment.

Table 5.7: *Environmental Assessment of Bus Reliability and Accessibility Programme*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Parking restrictions and other physical bus priority measures	O	+	+	++	O	+	O	+	O	O	O	O
Bus stop accessibility enhancements	O	O	O	++	O	+	O	+	O	O	O	O
Alternative 1 – Introduce express, limited stop bus services	O	O	+	+	O	+	O	+	O	O	O	O
No Plan 'Business as Usual' Scenario	O	+	+	+	+	+	O	+	O	O	O	O

5.7.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Bus Reliability and Accessibility Programme will have positive effects overall. This programme is highly targeted and so significant positive effects have been identified in only one SEA Objective 4 '*Accessibility without a car'.* Minor positive impacts have also been identified for SEA Objectives 2, 3, 6, and 8.

These positive impacts are expected from:

- Bus priority measures will enable buses to run more reliably and make quicker journeys, in turn making the services more attractive to existing car users. When combined with the changes currently being made to the London bus fleet (hybridisation and electrification), major air quality benefits and climate change are expected within the LIP lifetime.
- Further accessibility enhancements at bus stops will bring significant mode change opportunities for those with physical impairments.

The impact of making buses more attractive on active travel modes can seem uncertain since there is a question of whether those moving to bus travel will come from active modes or the car. Although there is currently no definitive evidence either way, it is known that those travelling by bus still do more walking than car users, so an overall positive benefit is still expected.

Express bus services, although faster and potentially attractive, serve fewer people due to limited stops, reducing their overall impact on mode change and therefore limiting positive environmental benefits.

5.8 Rail enhancement programme

The objective of this programme is to encourage a modal shift to the rail network by creating new infrastructure where there is potential demand, for example a link from Brentford to the new Crossrail services. It also seeks to improve accessibility at stations to enable access for all.

Table 5.8: *Environmental Assessment of* Rail *Enhancement Programme*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
New rail services and stations serving areas of low connectivity	?	O	+	++	+	++	+	++	O	+	+	?
Step free access at stations	O	O	+	++	+	+	O	+	O	+	+	O
Alternative 1 – Increased frequency on existing lines and more connecting bus services	O	O	+	+	+	+	O	+	O	O	O	-
No Plan 'Business as Usual' Scenario*	?	O	+	++	+	++	+	++	O	+	+	O

*Since this programme is carried over from the previous LIP, the business as usual scenario is identical.

5.8.1 Impact Analysis

This programme is expected to produce the largest positive environmental impacts within the LIP. Significant positive effects have been identified for SEA Objective 4 '*Accessibility without a car',* Objective 6 '*CO_2 Reduction'* and Objective 8 '*Air Quality*'. Minor positive impacts have also been identified for SEA Objectives 3, 5, 7, 10 and 11.

These positive impacts are expected from:

- New rail services will accommodate thousands of journeys per day of which a high proportion are expected to be replacements for car trips. This will bring a substantial reduction in transport emissions and congestion, bringing benefits to local air quality and townscape.
- The impact on biodiversity is uncertain since new infrastructure could destroy existing habitats in certain locations but also create new ones e.g. along rail embankments. The design of the infrastructure will be key to ensuring the balance is a positive one. On mitigation option that will be considered during the design of any rail infrastructure is offsetting the impact by creating alternative habitats elsewhere.

The alternative considered for this programme was to increase provision on existing lines. Whilst this will bring small benefits, it has been discounted due to the fact that the infrastructure will not directly serve the new communities expected to grow in Hounslow and additional bus services would be ineffective on already congested roads.

5.9 Encouraging Efficient Car Use

The objective of this programme is to make better use of the space that is available on the highway network, introducing measures that will contribute to the goals of the MTS whilst recognising that car ownership and use will continue to be prominent for the medium term. Measures include introducing control access systems for vehicles entering residential areas and encouraging Electric Vehicles (EVs) to improve air quality and reduce carbon emissions.

Table 5.9: *Environmental Assessment of Encouraging Efficient Car Use*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
New controlled parking zones	O	O	+	O	+	O	O	O	O	++	+	O
Traffic restrictions/filtering on residential streets	O	O	+	+	++	+	O	++	O	+	+	O
Electric Vehicle charging infrastructure and council fleet EV upgrades	O	O	O	O	+	++	O	++	O	+	+	-
Workplace Parking Levy Scheme	O	O	+	O	+	++	O	++	O	+	+	O
Alternative 1 – Control of EV charging infrastructure with private company	O	O	O	O	+	?	O	?	O	+	+	?
No Plan 'Business as Usual' Scenario	O	O	O	O	+	+	O	+	O	+	+	O

5.9.1 Impact Analysis

In summary, the assessments above demonstrate that implementation of the Efficient Car Use Programme will have positive effects overall. Significant positive effects vary by project but are expected under SEA Objective 5 '*Noise Reduction*', Objective 6 '*CO_2 Reduction*', Objective 8 '*Air Quality*' and Objective 10 'Townscape and Streetscape'. Additional minor positive impacts have also been identified for SEA Objectives 3 and 11.

These positive impacts are expected from:

- Reduced transport emissions due to the accelerated uptake of EVs as a result of increased charging provision. Noise levels will also decrease once adoption is widespread, but this is not likely within the lifetime of the LIP.
- Major localised air quality improvements from traffic restrictions in residential areas.
- Fewer vehicles is expected to provide a positive impact on townscape and the setting of heritage assets. There is however potential for accessibility by car to be negatively affected if visitors do not wish to use public transport.

- Encouraging EVs is not expected to have a negative impact on active travel levels in the short term however their introduction will not in isolation positively impact congestion.

Charging infrastructure could have a minor impact on material asset maintenance due to the burden of servicing the equipment. Alternative 1, the option of allowing private companies full control over the installation of charging infrastructure, produces uncertain impacts due to the lack of certainty over locations and user cost and the impacts on the wider network as a whole.

In the no plan scenario, traffic restrictions would not be implemented in residential streets and there would be fewer EV charging points leading to reduced benefits across most objectives.

5.10 Asset Maintenance

The asset maintenance package is not officially a LIP programme since it is not LIP funded, however it is included here (as it is in the LIP) because it is so closely linked to material assets and their impact on the environment. Several indicators, such as the number of street trees, included in the LIP annual reporting are the responsibility of this programme. Additionally, the LIP contains an objective requiring LB Hounslow to work to enforce the environmental standards set in the highway maintenance contract.

An alternative or 'no plan scenario' is not considered since a long-term agreement with the PFI contractor (Hounslow Highways) responsible for this programme exists and so these scenarios would not be reasonable. The objective of this programme is to ensure that the PFI arrangement delivers on requirements to maintain the street scene to a high standard with highways that are robust, safe and clean.

Table 5.10: *Environmental Assessment of Asset Maintenance Programme*

	1. Biodiversity, Flora and Fauna	2. KSI Reduction	3. Active Travel Participation	4. Accessibility without a car	5. Noise reduction	6. CO_2 Reduction	7. Climate change adaptation	8. Air quality	9. Flood risk and drainage	10. Townscape and streetscape	11. Heritage conservation	12. Material Assets
Asset Maintenance Programme (PFI Contract)	++	+	+	+	+	+	+	+	+	++	+	++

5.10.1 Impact Analysis

It is clear from the analysis matrix that maintenance programme of Hounslow's highway assets has an overall positive environmental impact. In particular, significant positive effects are expected for SEA Objective 1 '*Biodiversity, flora and fauna*', Objective 10 '*Townscape and Streetscape*' and Objective 12 '*Material Assets*'.

These positive impacts are expected from:

- The PFI contract requires as a minimum the replacement of any street trees lost to development or maintenance and so protects urban biodiversity. Additionally, green areas alongside roads such as hedges and verges are maintained by this programme.
- Maintenance of drains will protect water course from surface run off which can contain high levels of pollutants from the road surface.
- Better, well maintained road surfaces are known to reduce transport related emissions.
- The Healthy Streets approach emphasises that the condition of active travel facilities impacts their likelihood of use. Poorly maintained footpaths for example discourage pedestrians.
- Townscape and the setting of heritage assets benefit from a well-maintained public realm.
- By integrating the principles of sustainable development into operations, Hounslow Highways will minimise waste produced and carbon emissions from operations.

5.11 Total, cumulative, synergistic and secondary effects

Annex I of the SEA regulations require that an evaluation of the cumulative effects of the plan be included. Cumulative effects are distinct from the total impact of all the plans programmes combined, in that cumulative effects include external, background trends and 'without the plan' effects. They therefore include the combined impact of the plan and interacting policies from national or regional programmes.

In some cases, the combined effect of the plan on the environment can be much more significant than those of the individual projects or programmes and this is often found in transport projects that include a behaviour change component.

5.11.1 Total and cumulative effects

The following table provides an overview of how the SEA topics are impacted by the whole LIP. The table separates the total impact from cumulative impact as defined above. Since many of the topic areas are cross boundary in nature, the spatial level

of the programmes and their impacts also needs to be considered and this is highlighted as necessary.

Table 5.11: Impacts of LIP3 on SEA Topics

SEA Topic	Total Impact	Comments	Cumulative Impact
Biodiversity, Fauna and Flora	O/+	Across Hounslow, the total impact of LIP3 policies will be a neutral or minor positive effect on biodiversity depending on design choices. Public realm improvements provide an opportunity to enhance or conserve the natural environment and increased active travel networks will increase access to the natural environment so that residents and visitors can interact with and enjoy it. Any programmes that have potential to negatively impact on biodiversity (e.g. rail infrastructure) will seek to mitigate or offset the impacts wherever possible. In particular, PFI contract policies require street tree conservation.	In combination with the planning system (Hounslow Local Plan includes the objective of maintaining or improving biodiversity), green infrastructure and the biodiversity in supports will be protected.
Population & Human Health	++	Likely to see the most significant positive impact of the LIP, expected from: - Reduced number of road casualties from infrastructure improvements and an education and promotional programme. - Reduced levels of obesity, type 2 diabetes and heart disease from increased levels of active travel.	There are a variety of regional and national policies targeting similar health conditions which also encourage active travel. Transport for London in particular, are encouraging active travel through infrastructure improvement and behaviour change programmes.

		- Improved mental health from a reduction in traffic related noise. Programmes from the LIP designed to improve air quality will improve human health from reduced levels of transport related air pollutants.	Population increase in London and associated new development could have a negative impact if people choose to travel by car.
Air Quality	+	The LIP is expected to have a minor positive impact overall through: - Infrastructure schemes to reduce localised traffic in residential areas (rat-running). - Increasing the number of zero tailpipe emission vehicles by installing EV charging infrastructure. LIP programmes targeting mode shift to public transport and active travel as outcomes will also act to improve air quality. The combined effect of the LIP on air quality is not expected to be even across the borough due to the targeted nature of interventions and focus on those areas with the poorest air quality.	There will be significant cumulative effects from regional programmes such as the London ULEZ, TfL's bus improvement programme and nationally the setting of tighter emissions standards. If all regional and national policies are successful, the impact on Hounslow's air quality will be highly positive. Air quality in Hounslow will also be impacted by the actions of neighbouring boroughs, as well as emission levels from other industries which affect background levels of pollutants e.g. energy generation.
Climatic Factors	+	The inclusion of new rail infrastructure and electric vehicle charging facilities will have a minor positive impact on climatic factors although in isolation and at a wider spatial level, these will not have a significant impact on	Cumulatively, combined with regional infrastructure improvements such as the introduction of Crossrail and national climate change policies such as EV promotion,

		national CO_2 emissions. LIP policies focused on increasing active travel levels will also have a positive impact here.	the impact on climatic factors will be much greater.
Material Assets	O	Overall, the LIP (excluding the PFI maintenance contract) is not expected to have any impacts, positive or negative, in this area.	By enforcing the standards set in the highway maintenance contract, there will be a major positive benefit for the SEA objectives under this topic.
Soil and Water	O/+	Whilst the highway network covers a large area and hence has potential for significant positive or negative impact, there are unlikely to be any major additions to the network e.g. new roads, so only a very minimal impact is expected. The priority cycle network will be predominantly built on existing hard surfaces and where routes do cross green space, the design will ensure permeability is maintained or improved. At a local level, some positive impact is expected through limiting increases or reducing extent of non-permeable surfacing, particularly in flood risk areas and seeking to incorporate SuDS (Sustainable Drainage Systems) into new and existing infrastructure. The scale of these improvement limits the impact however.	There are regional initiatives which will have a cumulative impact such as leak improvement programmes run by water supply companies and consideration of flooding in new development design and construction.
Townscape/Landscape	+	The LIP is expected to result	There are also likely to

		in a positive impact from: - Infrastructure schemes designed to make streets feel safer and offering the opportunity for public realm improvements. - Better designed and higher quality public realm that supports active travel.	be cumulative positive impacts on townscape through other schemes that focus on streetscape, for example the PFI contract policy of removing street "clutter" and maintaining assets to a high standard. All complementary programmes that will improve air quality can also be considered cumulative.
Historic Environment	+	LIP3 will have a minor positive impact in both enhancing and protecting heritage assets in the following ways: - An improved setting for heritage assets from safer streets, with fewer vehicles and better public realm. - Improved accessibility by public transport. - All LIP projects will require consultation with conservation officers before the design process begins.	The PFI contract ensures that Highways construction processes respect the potential sensitivity of heritage assets. A cumulative impact is expected from the application of the policies within the Hounslow Local Plan and the Leisure and Culture Strategy.

5.11.2 Synergistic and Secondary effects

In addition to cumulative effects, synergistic and secondary effects should also be considered; definitions of these are as follows[15]:

[15] A Practical Guide to the SEA Directive, ODPM, 2005

Synergistic effects *interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity.*

Secondary or indirect effects *are effects that are not a direct result of the plan but occur away from the original effect or as a result of a complex pathway.*

No negative synergistic or secondary effects are expected as a result of LIP3. The most extensive synergistic effect will be as a result of the regional and national policies directed towards changing travel habits away from the car and increasing activity levels.

By putting human health and active travel at its heart, the LIP aims to create a synergistic effect between all its programmes. It is expected that the successful implementation of the programmes will create a culture of active travel and change people's attitudes on a large scale. Since all boroughs are expected to implement the common aims of the MTS via a LIP, synergies are expected at a regional level to reinforce these goals across London. The cumulative interaction of all of London's boroughs combined with regional interventions sponsored by TfL will be much greater than if boroughs were to produce individual transport strategies.

An additional secondary effect is also expected on the Historic Environment of Hounslow. It is one of the aims of the LIP to increase transport accessibility of some areas by improving public transport and the public realm. If this is done in an area where a heritage asset is present, the number of visitors could reasonably be expected to increase, improving the economic health of the asset.

Chapter Six: Mitigating Adverse Impacts

6.1 Role of Mitigation in SEA

The SEA Directive requires that the Environmental Report should include measures to prevent, reduce or offset adverse impacts on the environment as a result of implementing the plan. Since the MTS has already been subject to assessment and the fact that London boroughs do not carry out large scale infrastructure projects, it is not expected that LIPs have significant adverse effects.

Previous chapters of this report confirm that the Hounslow LIP is not expected to have any significant adverse impacts on the environment. The scope of mitigation is therefore reduced

6.1.1 General Advice on Mitigation Throughout the LIP Programme

SEA guidance recommends that opportunities for mitigation should follow the 'mitigation hierarchy'. This begins with measures for avoidance/prevention, to reduction, and finally measures aiming to offset impacts. Possible suggestions include:

- Changes to the programme, such as adding, deleting or refining projects
- Technical measures required for the implementation stage, e.g. buffer zones
- Application of design principles and/or requirement of sub-contractors to have an Environmental Management System (e.g. maintenance contractors)
- Establish a 'no net loss' principle to compensate/offset construction over sensitive land
- Requirements for project environmental impact assessments for certain projects if appropriate.

6.2 LIP3 Mitigations

A key role of the SEA is to provide recommendations as to how the environmental performance of the LIP can be improved. These recommendations include measures to mitigate potential adverse effects that can be incorporated into policies and proposals as detailed in Table 6.1 below.

Table 6.1: Potential Adverse Environmental Effects

	Impact	Mitigation
Population and Human Health	Rat running to avoid vehicle restrictions in residential areas increases local pollution on other routes.	Consider alternative routes when designing schemes and expand zones if necessary. Target these areas with public transport and active travel infrastructure improvements to bring about mode change.
	Increased levels of active travel lead to more collisions on the road, increasing KSIs	Target cycle training on residents in areas with improved infrastructure. Promote cycle training to groups considered to be at a higher risk. Expand provision of sustainable urban driving courses for HGV drivers.
	Air quality deteriorates as a result of from increased bus numbers	Work with TfL to accelerate the introduction of hybrid bus technology in air quality hotspots and request that drivers are trained to minimise emissions.
Biodiversity, Flora and Fauna	Biodiversity impact of new transport infrastructure and public realm	Ensure consideration of biodiversity is embedded in design processes.
Townscape and Historic Environment	Visual impact of cycle parking, signage and lines for active travel network on townscape and Historic Environment	Use sympathetic materials and design in sensitive areas. A wide array of cycle parking designs are available which will allow a design choice in keeping with the existing setting. Continue to apply street clutter minimisation policy. Ensure consultation with Historic England on case by case basis to ensure heritage assets are taken into account during planning stage.
	Light pollution from public realm or road safety schemes	Reduce lighting to a minimum needed

		for road safety Use lighting design that minimises light pollution or spillage
Material Assets	Increased pressure on asset maintenance leads to lower environmental standards in construction and operations	Develop monitoring procedure to ensure current environmental standards are adhered to Encourage use of stronger, more durable construction materials that require less maintenance

Chapter Seven: Monitoring

A monitoring strategy within a SEA should determine what needs to be monitored; identify what sort of information is required and any gaps in existing sources of information; suggest when remedial action may be required, and which actions could be taken.

7.1.1 What Needs to be Monitored

The monitoring should focus on any significant environmental impacts that give rise to irreversible impacts upon environmental attributes in the area. This SEA found very little evidence of significant negative impacts and only some of the rail and accessible streets schemes were seen as having neutral or uncertain impact. The majority of the LIP schemes resulted in a positive impact on the key issues of air quality and historic environment.

7.1.2 Information Required and Gaps in Existing Sources

The Directive states that performance monitoring must be focussed on the environmental objectives, targets and indicators of the plan. Wherever possible, direct environmental effects (or 'outcomes') should be measured, although it may sometimes be necessary to collect information on indirect factors (such as the progress of implementing a traffic reduction measure, or pressure factors/ input e.g. emission levels). The LIP already has a number of targets to measure transport objectives set for the borough and monitoring of local air pollutants already takes place as part of the assessment work undertaken by the air quality officers at the Council. It is recommended that this is reported in the LIP.

7.1.3 Triggers for Remedial Action and Possible Actions

Possible gaps in the existing information were previously examined following consultation on the Scoping Report, at an earlier stage in the SEA process. As and when further gaps appear, new data will be sought. However, it should be noted that no primary data collection is necessarily appropriate for this level of monitoring and is not required for compliance with the Directive. As and when monitoring reveals that remedial action is required, the appropriate measures need to be enacted. Criteria or thresholds will therefore need to be established as part of the strategy, which can trigger action if they are exceeded.

7.1.4 Management Plan

The management plan should identify the responsible parties who must undertake monitoring activities, the time frame within which they must be carried out, and how to present the results. Table 7-1, has been set out below to show this. This will be fully developed in the Environmental Statement, as the last stage of the SEA process.

Table 7-1: Management Plan - Responsible Parties; Time Frames and Format of Results Presentation

What needs to be monitored?	What sort of information is required?	Where can the information be obtained?	Who is gathering data?	Are there any gaps in existing information?	When should remedial action be considered?	What remedial action could be taken?
Biodiversity	Number of Street Trees Public realm schemes where green space is lost	Hounslow Highways PFI contract monitoring LB Hounslow scheme design records	Hounslow Highways LB Hounslow Traffic and Transport	No	If indicators illustrate significant under performance against targets	Invest more in green space replacement Reduce scope of works
Population & Human Health	KSI Data Levels of activity Levels of obesity in children Public perception of	MET Police Sport England (active people survey), Travel in London report Dept. of Health/National Child Measurement Programme Scheme consultation responses	LB Hounslow Traffic and Transport Sport England, TfL LB Hounslow Public Health Officers LB Hounslow Traffic and	No	If indicators illustrate significant under performance against targets	Refocus funding, review delivery actions Invest more funding in road safety, change delivery approach

What needs to be monitored?	What sort of information is required?	Where can the information be obtained?	Who is gathering data?	Are there any gaps in existing information?	When should remedial action be considered?	What remedial action could be taken?
	noise levels		Transport			
Climate Change	Road transport CO_2 emissions per capita Network unavailability following extreme weather event	Travel in London report Hounslow Highways PFI contract monitoring	TfL Hounslow Highways	No	If indicators illustrate significant under performance against targets	Recommend changes in the next revision of the LIP to secure a reduction in air pollution.
Air Quality	$PM_{2.5}$, PM_{10}, NO_2 (hourly average, annual average)	Air Quality Annual Progress Report	Environmental Strategy Team	No	When National Air Quality Objectives are expected to be breeched	Review the existing Air Quality Action Plan
Water and Soil	Number of new infrastructure schemes incorporating SUDS	LB Hounslow scheme design records	LB Hounslow Traffic and Transport	Yes (this is a new indicator so not recorded prior to 2018)	If indicator illustrates significant under performance against targets	Review design processes and refresh Healthy Streets application.
Historic Environment and Landscape	Change in HAR/HER registrations or change in condition of existing	Historic England / LB Hounslow Conservation	LBH Conservation Team/ LB	No	If indicators illustrate significant under	Review approval processes and ensure

What needs to be monitored?	What sort of information is required?	Where can the information be obtained?	Who is gathering data?	Are there any gaps in existing information?	When should remedial action be considered?	What remedial action could be taken?
	entries. Public response to public realm designs.	Team Public realm consultation responses	Hounslow Traffic and Transport		performance against targets	application of streetscape design guide.
Material Assets in construction	Proportion of road construction materials from recycled sources and number of highways vehicles converted to EV.	PFI contract monitoring	LBH PFI Contract Managers	No (indicator is part of Highways Maintenance PFI and commenced in 2013)	If indicators illustrate significant under performance against targets	Review contract mechanisms and enforce as required.

Chapter Eight: Next Steps

8.1 Consultation

This draft Environmental Report will be subject to a full public consultation and will also be sent to the following organisations for consultation before the final Environmental Report is produced:

- The Environment Agency
- Natural England
- Historic England

This document will also be included as part of the draft LIP consultation. Any responses to the SEA draft Environmental Report arising from the consultation will be assessed in terms of technical validity, relevance and environmental significance.

In order to comply with the Directive, the Authority will publish an Environmental Statement, highlighting any responses made to the Environment Report and summarising how these have been incorporated into the final LIP document. This will be sent to all stakeholders who commented on the Environment Report. It will also set out clearly how the SEA will be monitored.

8.2 Adoption of the Final LIP

It is expected that the final LIP will be adopted in May 2019, following approval by TfL.

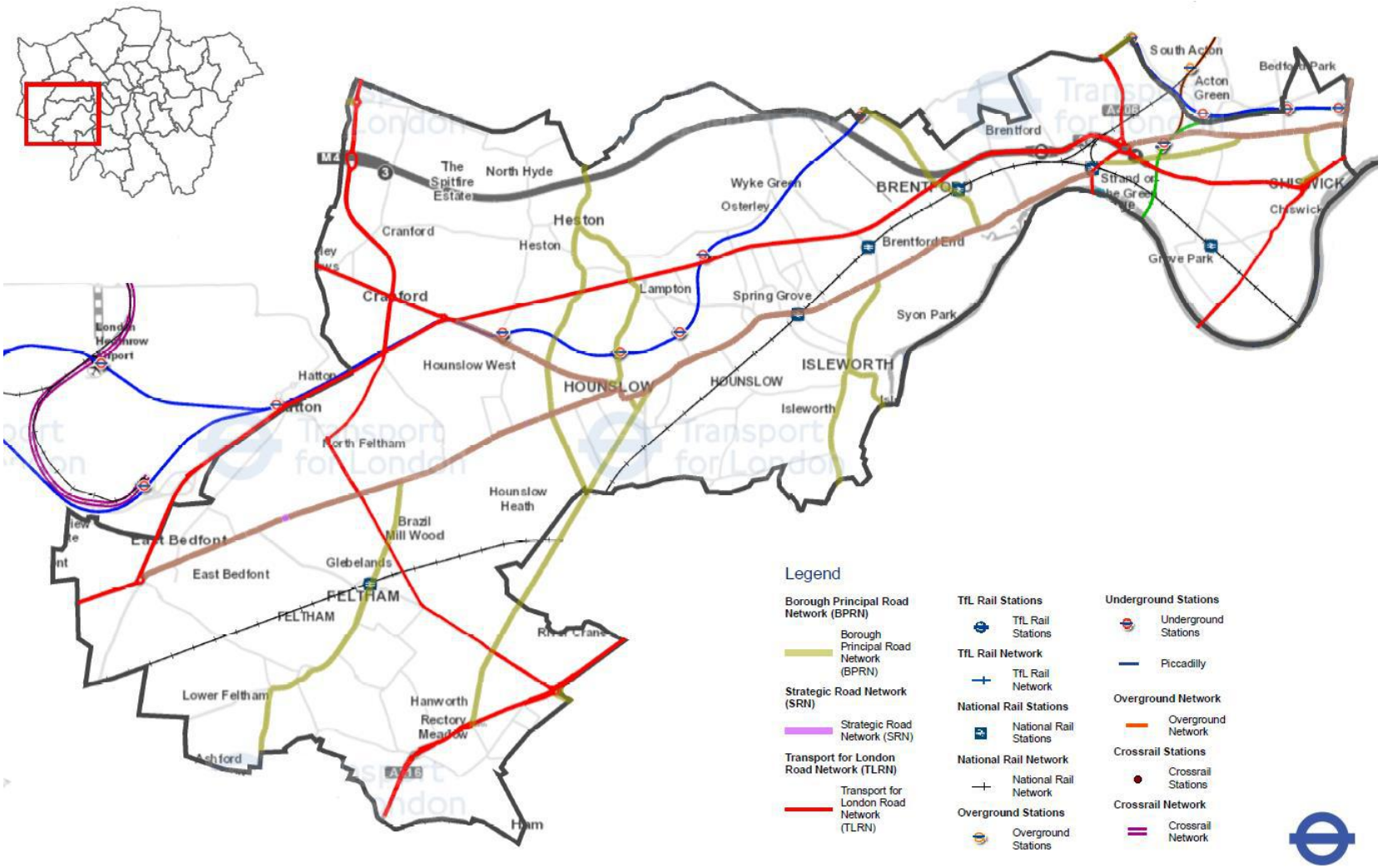
8.3 Contact Information

Any queries or comments about the SEA should be directed to:

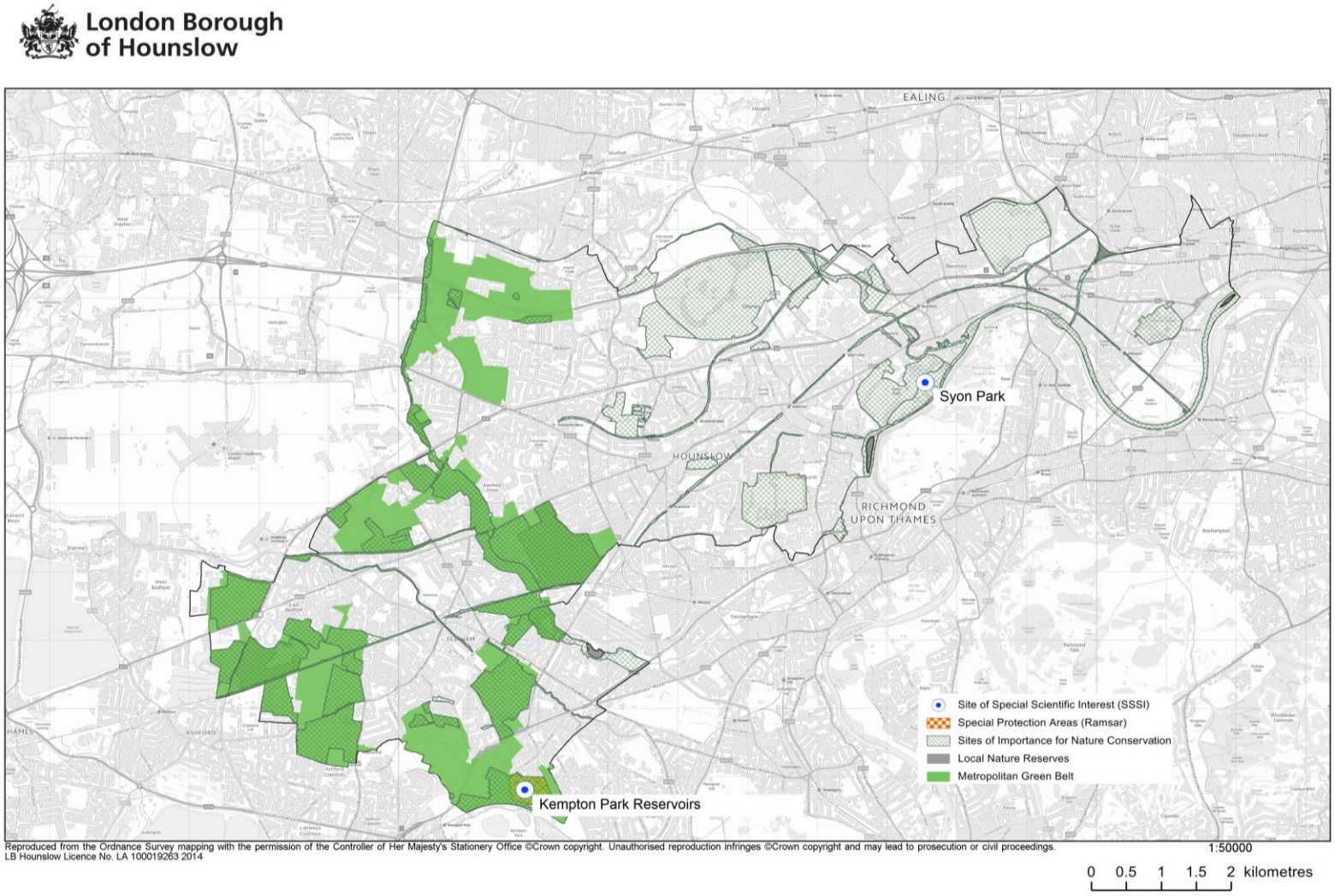
LIP Consultation
Transport Planning and Policy Section, London Borough of Hounslow, Civic Centre, Lampton Road, Hounslow, TW3 4DN.
Email: transportplanning@hounslow.gov.uk

Appendix One: Maps and Diagrams

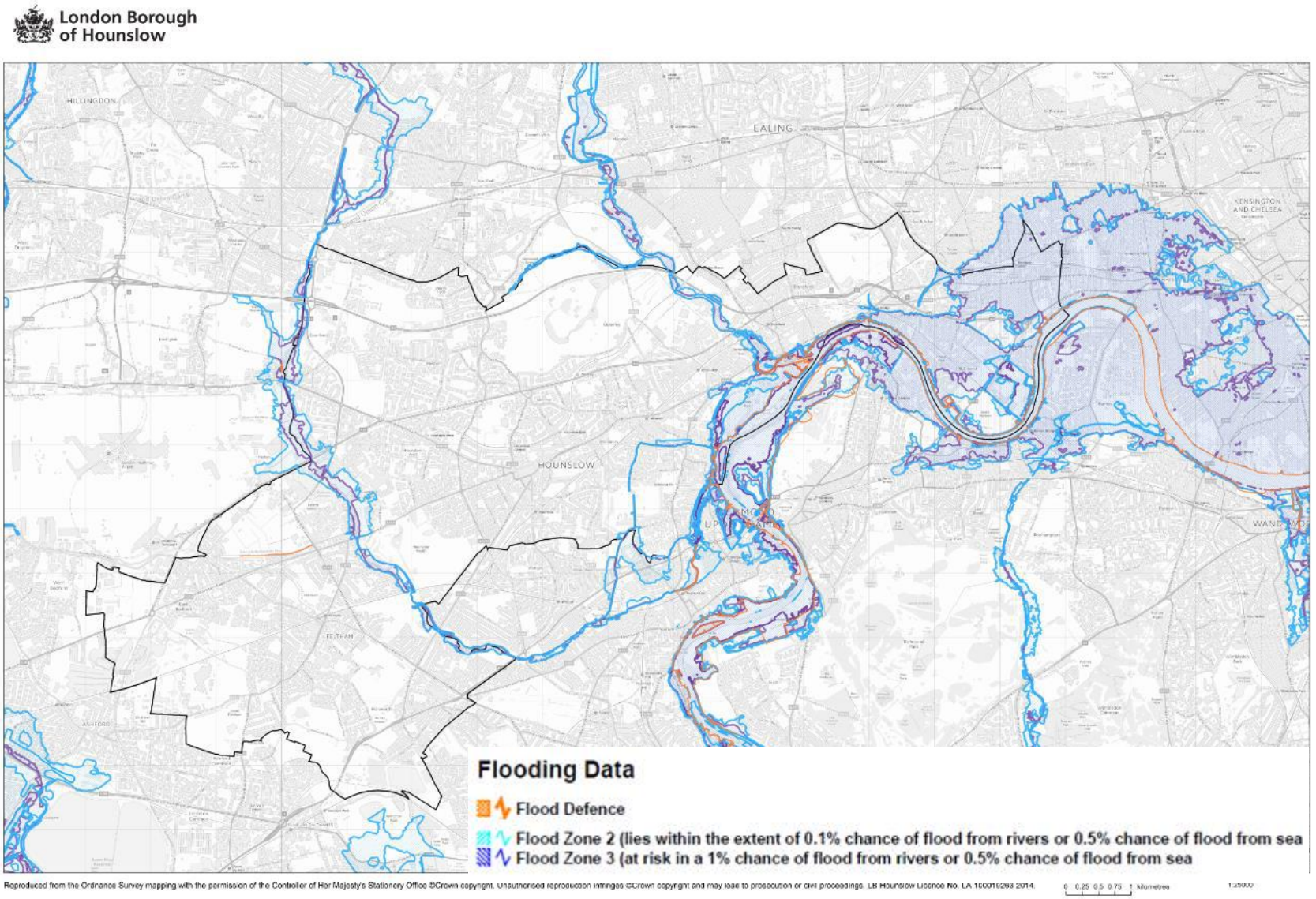
MAP 1 – Hounslow's Transport Network



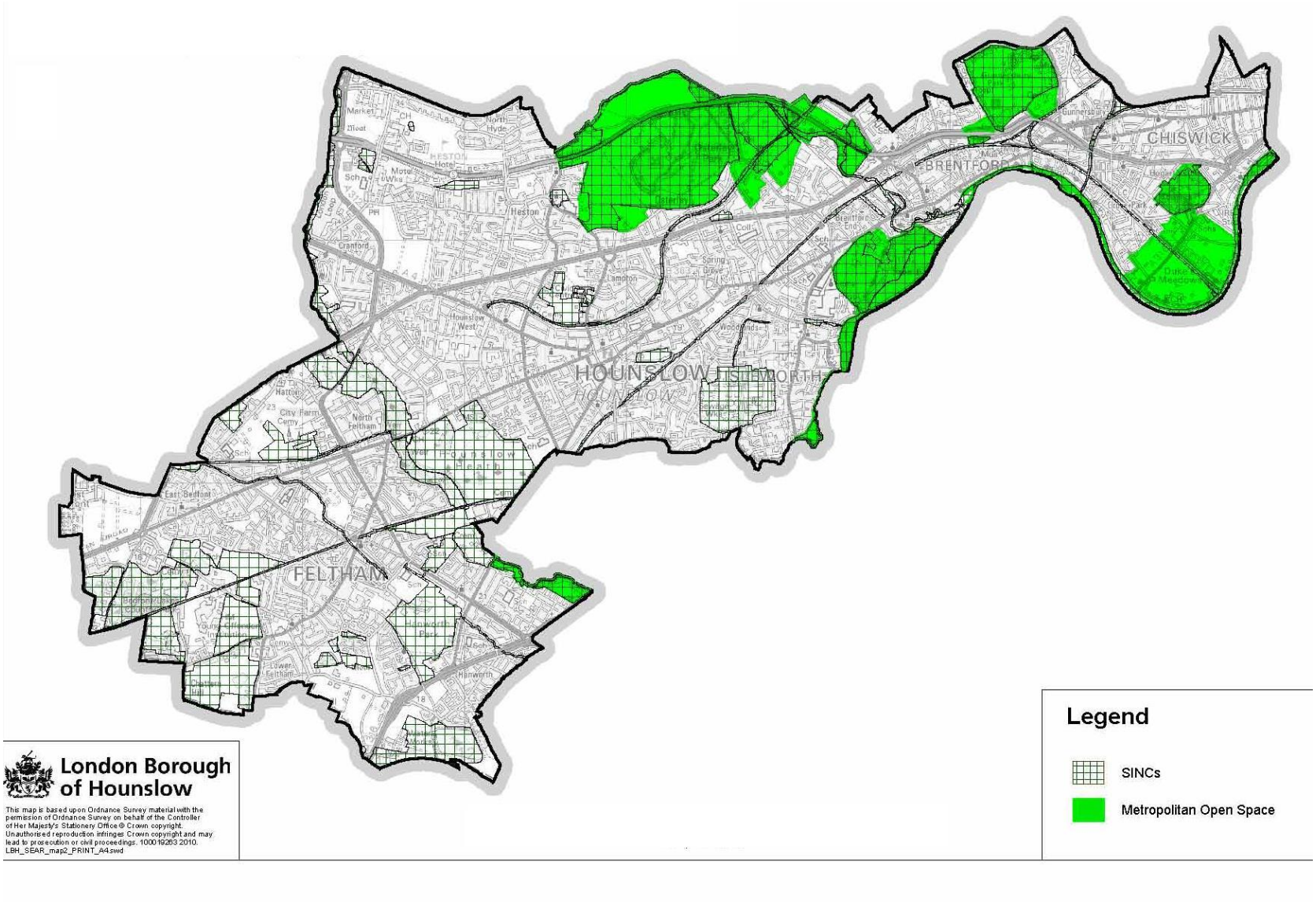
MAP 2 – Nature Conservation Sites



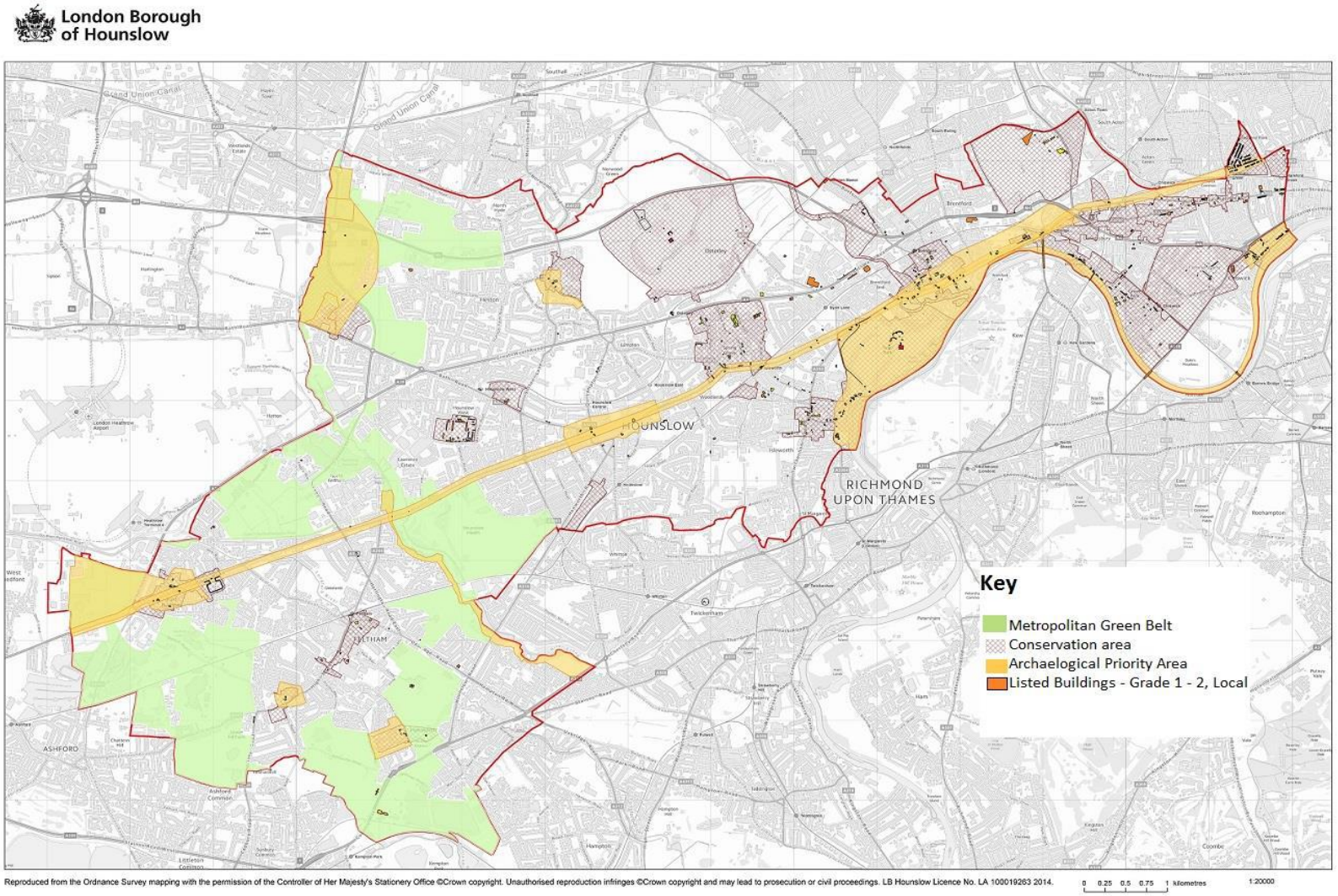
MAP 3 – Flood Risk Areas



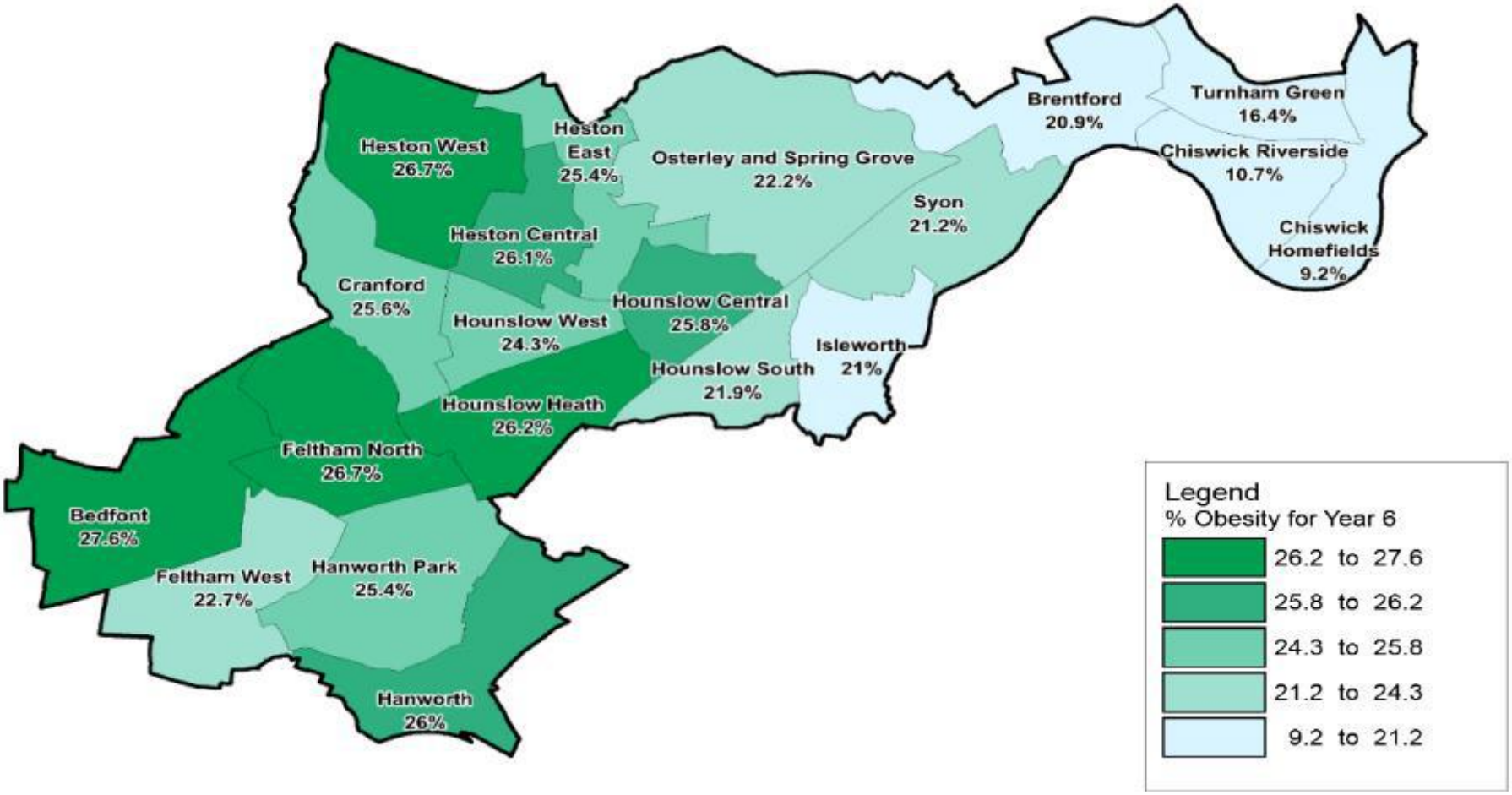
MAP 4 – SINCS and Metropolitan Open Space



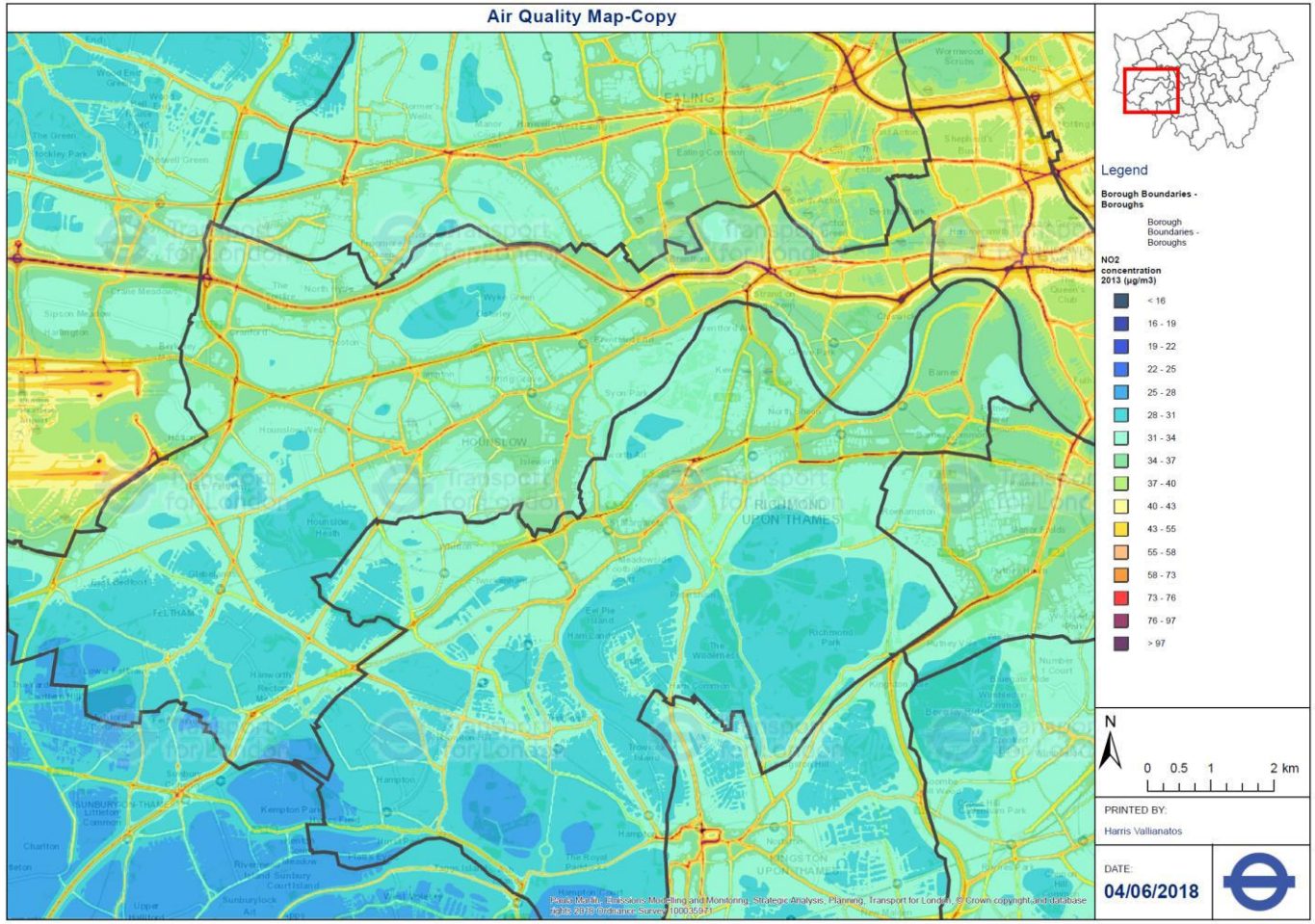
MAP 5 – Green Belt, Listed Buildings and Archaeological Priority Areas



MAP 6 – Prevalence of Obesity in year 6, Hounslow Schools

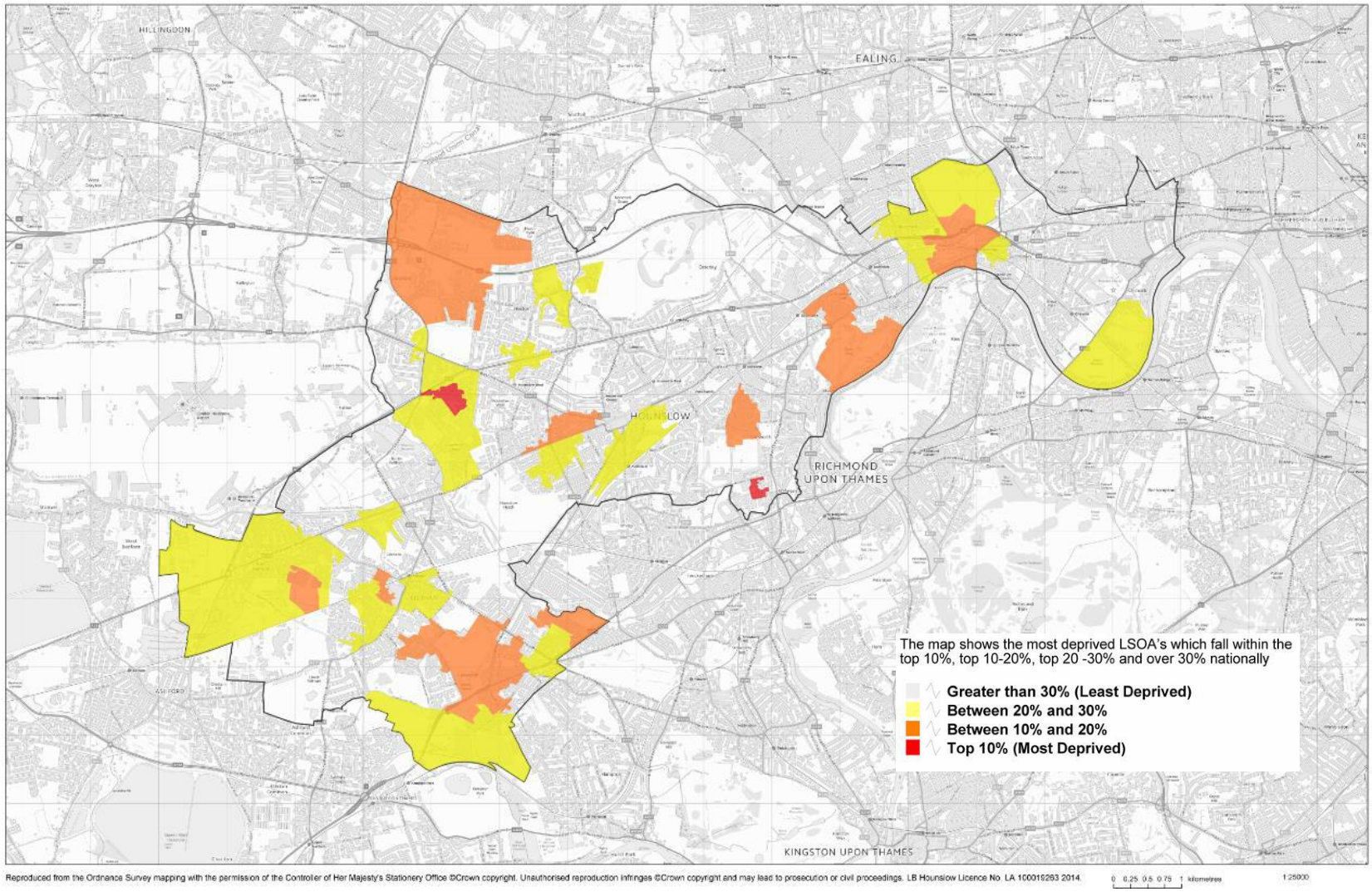


MAP 7 – Air Quality illustrated by NO_2 levels across Hounslow

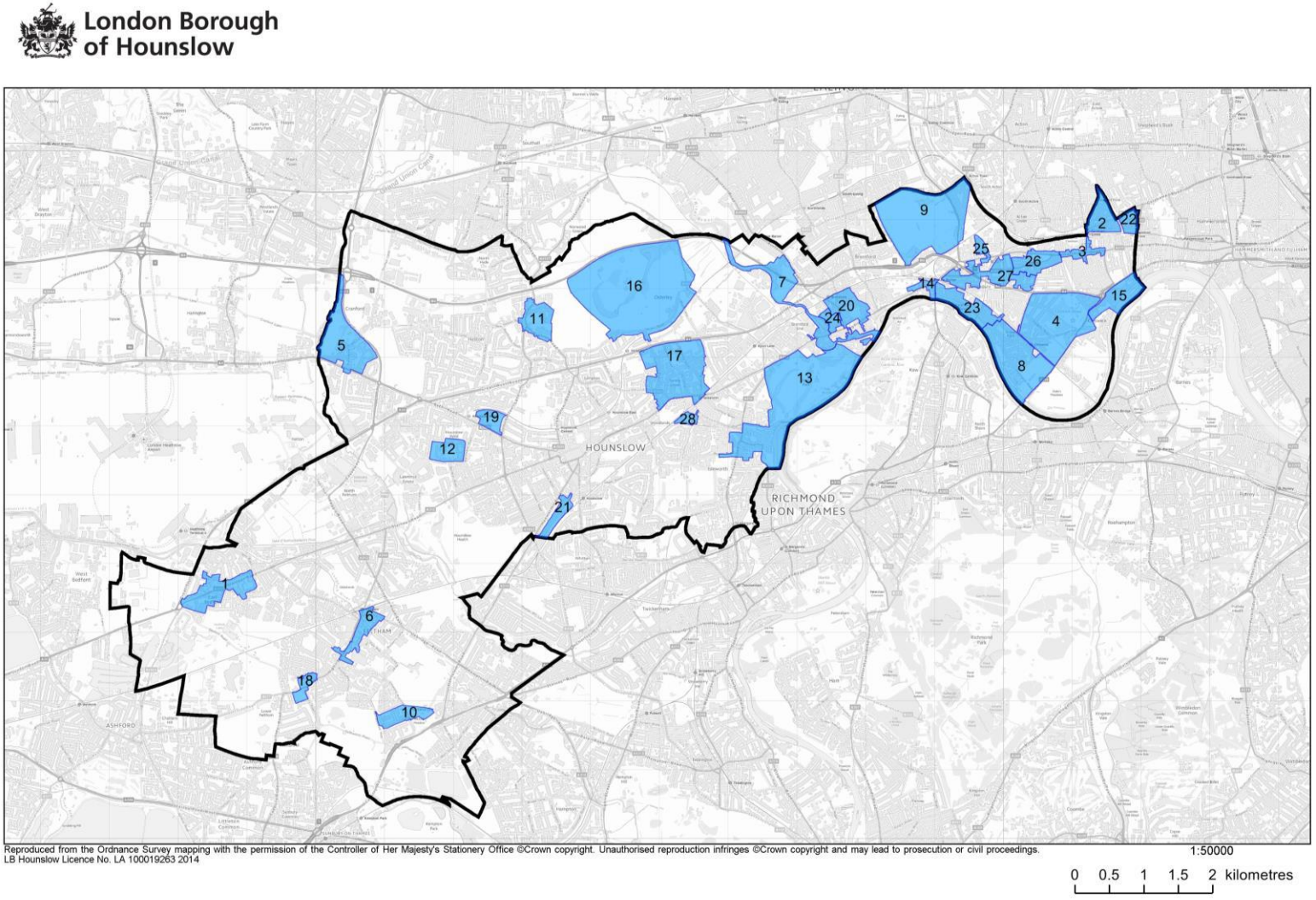


Source: LAEI 2013

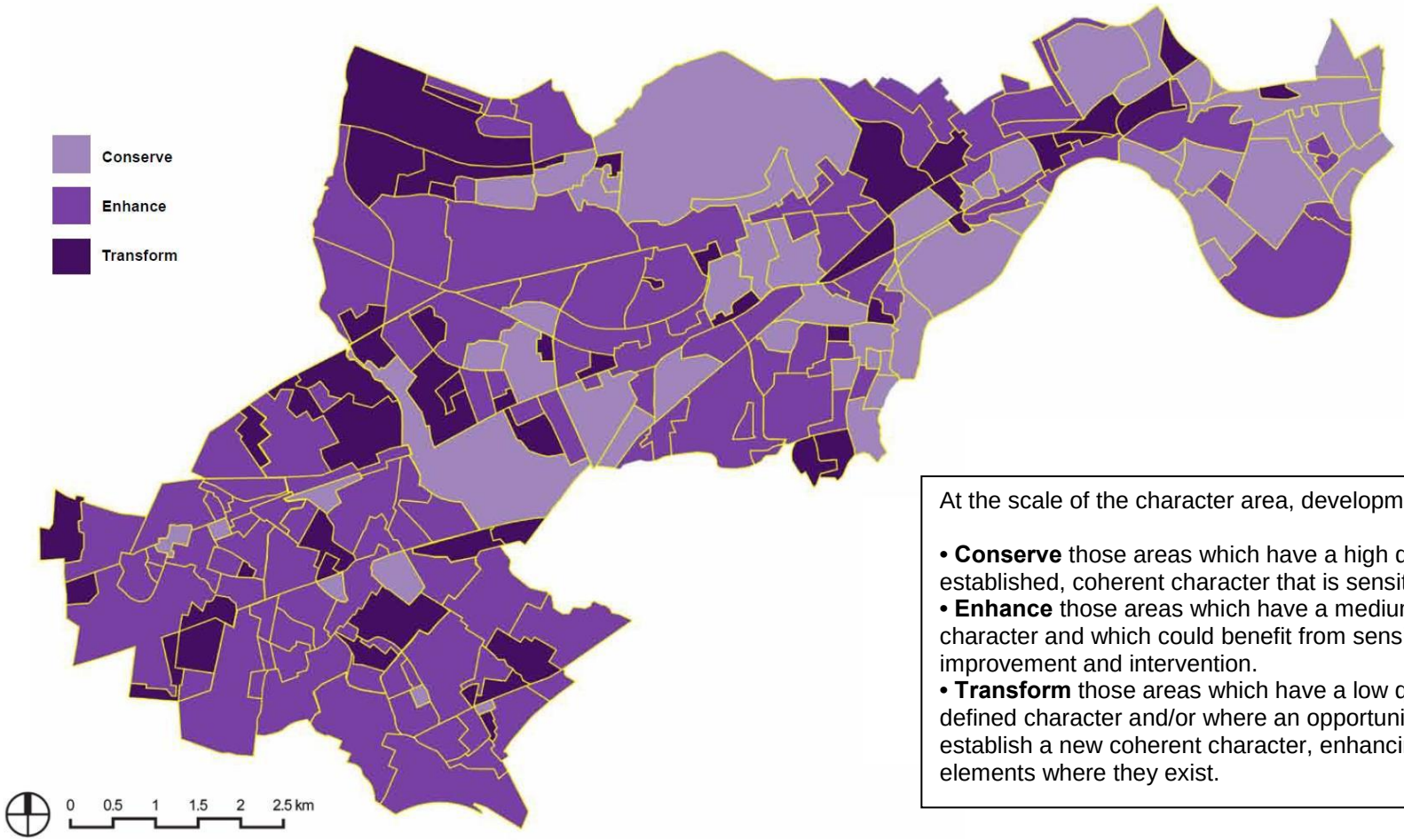
MAP 8 – Areas of Deprivation



MAP 9 – Conservation Areas



MAP 10 – Urban Context and Character Study Character Areas



At the scale of the character area, development should:

- **Conserve** those areas which have a high quality, well-established, coherent character that is sensitive to change
- **Enhance** those areas which have a medium quality, mixed character and which could benefit from sensitive improvement and intervention.
- **Transform** those areas which have a low quality, poorly-defined character and/or where an opportunity exists to establish a new coherent character, enhancing positive elements where they exist.

Appendix Two: Consultation Reponses to the Scoping Report

Table A-1 Comments Received from Historic England

The following comments relate to the scoping report; no comments specific to the SEA environment report were provided during the public consultation of the LIP and SEA which ran from Nov 2018 to Jan 2019. Specific comments were provided on the LIP however and were taken into account during its drafting.

Comment	Response
General Comments	
Historic England has published specific guidance on Strategic Environmental Assessments, which contains details on baseline information, sustainability issues and objectives, indicators and monitoring. This document may be helpful and can be found here: Historic England Advice Note 8: Sustainability Appraisal and Strategic Environmental Assessment.	Noted. This has been taken into account in the development of the SEA.
The supporting information supplied (Scoping Report) with the consultation indicates that within the plan area there is a range of designated historic environment assets. There is also likely to be other features of local historic, architectural or archaeological value, and consideration should also be given to the wider historic landscape. Given the likely significant effects (both positive and negative) upon the historic environment, Historic England hence concurs with the Council's view that a Strategic Environmental Assessment will be required.	Agreed and noted.
Historic England strongly advises that the local authority conservation staff is closely involved throughout the preparation of the LIP and its assessment. They are best placed to advise on; local historic environment issues and priorities, including access to data held in the Historic Environment Record (H ER) , how specific projects or proposals can be tailored to m ini m ise potential adverse impacts on the historic environment; the nature and design of any required mitigation measures; and opportunities for securing wider benefits for the future conservation and management of heritage assets.	Further consultation was carried out with LB Hounslow conservation officer in preparing the environmental report, specifically on the role of the HER and generally on the protection and management of assets.

Baseline Evidence	
Section 8.9 addresses the historic environment. The text lists the numbers and types of some designated heritage assets within the Borough but omits reference to Registered Parks and Gardens (RPAGS) and Locally Listed Buildings. It would also be pertinent to make reference to the World Heritage Site of Royal Botanical Gardens Kew which lies adjacent to the Borough of Hounslow as its setting is likely to be a factor in decision making. We are pleased to see that the national Heritage at Risk Register forms part of the baseline data. However, a simple list of designated heritage assets in unlikely to be helpful in producing robust baseline analysis. We recommend that the local Historic Environment Record (HER) should form part of the baseline evidence with regards to the historic environment. Referring to the HER demonstrates that you have considered sources of evidence which will give an accurate local cross-section of local level conditions with regards to the state of the historic environment. The HER is particularly useful in terms of archaeology as an understanding of potentially sensitive sites i.e. sites where finds have been found and recorded but which are not designated or if there is a locally known but undesignated site for example, can prevent problems arising further in the Transport Local Implementation Plan process with regards to site conditions for specific projects. Ideally local Conservation Area Appraisals and the Hounslow Urban Context and Character Study would be included as part of the baseline evidence.	Registered parks and gardens added, including Kew. Reference to the HER and its scope and role added. Urban Context and Character study reviewed and referenced in preparation of the Environmental Report.
Summary of Key Environmental Issues	
Transport issues such as congestion and high levels of air pollutants are not marked as a relevant environmental issue with regards to the historic environment in table 9.1. These issues can be a considerable factor when experiencing the historic environment or individual heritage assets. The wider context within which the historic environment is experienced is an important aspect of its setting and therefore its significance. Setting goes beyond visual links to include atmospheric factors	In the Environmental Report, a section on setting and experience of heritage assets has been included in the baseline and the table mapping issues to SEA topics updated to include the effects of air quality and congestion.

such as noise, vibration and pollution which can detract from the accessibility to and enjoyment of the historic environment. Equally, the increase in environmental aggressors deriving from emissions that could accelerate the erosion and decline of historic fabric are also an issue. We would encourage you to ensure that these issues are considered within the context of the historic environment as part of the on-going SEA process. We have recently updated out advice note on the concept of setting which may be helpful.	
It is recommended that the wording of Objective 11 is amended to bring the overall objective in line with statutory legislation regarding the historic environment. Harm to heritage assets should be avoided in the first instance before mitigations is explored; therefore, the wording "To minimise adverse effect on, and where possible conserve ... " is a weaker test Objective 11 should be expanded upon to include specific reference to the setting of historic buildings, as well as designated and non-designated heritage assets. We would suggest the following wording as an alternative to Objective 11: "To conserve, and where possible enhance, all cultural and heritage assets and their settings whilst increasing enjoyment of and access to the historic environment".	Noted and agreed. Wording of objective 11 strengthened as suggested
There is concern regarding the feasibility of the second indicator for Objective 10. It will be difficult to measure what are considered to be excessive changes from the conservation officer regarding development proposals. Careful definition would be required to outline what is meant by excessive changes and this is likely to be open to interpretation, both these issues make this an unsuitable monitoring indicator. It	It was agreed that measurement of this indicator would have been too subjective. Objective 10 changed Wording of indicator for objective 11 updated. Agreed on the role of the Urban Character Study and removed as an indicator/benchmark. Key views are protected and monitored as part of the Hounslow planning system and so have not been included as indicator.

would perhaps be more appropriate to monitor the number of conservation areas considered to be at risk or the number of completed proposals where public realm improvements have been implemented. The monitoring indicator for Objective 11 could be more concisely worded and clearer. Alternative wording could be, "conserve and improve access to the historic environment". The Hounslow Urban Context and Character Study is a useful document and should form part of the baseline data as mentioned above. However, its role is as an evaluation document which is aimed at improving understanding of the Borough's historic environment and urban character whilst also making recommendations for future growth. It is not therefore a suitable benchmark of measuring degradation of heritage in isolation of other statutory obligations. Monitoring key views, improvements to identified heritage assets earmarked for further protection or urban character changes within the context of the Urban Context and Character Study may be a more achievable way of monitoring the progress of this objective. Monitoring the numbers of entries onto and off the national Heritage at Risk Register will be a useful way of recording the status of Borough's historic environment.	Additional indicator added of monitoring entries onto HAR register.

Table A-2 Comments Received from Natural England

Comment	Response
General Comments	

Natural England does not consider that this Transport LIP poses any likely risk or opportunity in relation to our statutory purpose, and so does not wish to comment on the consultation.	Noted.

Appendix Three: Glossary of Terms and Acronyms

Table A-3: Terms and Acronyms

Term	Explanation
Concentration	The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant over unit volume of air (e.g. microgram's per cubic metre, _g/m3) or a volume of gaseous pollutant per unit volume of air parts per million, ppm).
Cumulative effects	The effects that results from changes caused by a project plan, programme or policy in association with other past, present r reasonably foreseeable future plans and actions
Emission	The amounts of different pollutants sent out from a vehicle or other source of pollution. Emissions for road vehicles are usually measured by placing a probe in the exhaust pipe of a running engine. Lots of different vehicles are checked in this way and the data collected is put into a database so that we can uses computer modelling to make predictions about the concentrations of pollutants in the air at a certain distance away from the pollution source. Emissions are usually expressed in terms of mass per unit length of road travelled (e.g. g/metre).
Environmental Assessment	A tool for integrating environmental considerations into decision making by assessing the significant effects. In the SEA Directive, an environmental assessment means, "the preparation of an Environmental Report, the carrying out of consultations in decision-making and the provision of information on the decision", in accordance with the Directive's requirements.
Environmental Report	Document required by the SEA Directive as part of an environmental assessment, which identifies, describes and evaluates the likely significant effects on the environment of implementing a plan programme.
Indicator	A means by which change in a system or to an objective can be measured.
Local Development Framework	Act comes into force July 2004. The LDF consists of a number of documents setting out the local authority's policies for meeting the economic, environmental and social aims for the future of their area.
Local Implementation Plan II	Local Implementation Plan (LIP) provides a 20 year integrated transport strategy, devised at local level partnership with the community.
Measure	An individual action to deliver the objectives of the plan. The terms are used in this report to encompass a range of actions including projects, schemes, and policy proposals.

Mitigation	Used in this report to refer to measures to avoid, reduce or offset significant adverse effects on the environment
Monitoring	Activities undertaken to after the decision is made to adopt the plan or programmes to examine its implementation
Performance indicators	Performance measures, for which the council monitors progress
Policies	Fundamental principles that guide the choice of proposals that will be delivered to achieve the strategy's objectives
Private Finance Initiatives	Government funding initiatives using private funding
Programme	A timed and costed delivery plan that brings together all the council's schemes for a ten-year period
Proposal	Actions that the council proposes to take to deliver its objectives and policies
Schemes	Individual transport measures, projects or activities that the council will undertake as part of its delivery programme. Also known as a project
Scoping	The process of deciding the scope and level of detail of the SEA. This also includes defining the environmental effects and alternatives that need to be considered, the assessment methods to be used, the structure and contents of the Environmental Report.
Secondary Effect	Impacts that is attributed to the plan but which may not be obvious or direct. Secondary effects are specifically noted in the SEA Directive in order to emphasise the need for broad and comprehensive information regarding the effects.
Strategic Environmental Assessment (SEA)	A term used internationally to describe environmental assessment as applied to policies, plans and programmes
Targets	Performance measures for which the council has set a date to achieve a specific measurable outcome
Transport for London Road Network (TLRN)	This is described in the Greater London Authority Act 1999, as the Great London Authority Road Network. The Mayor has decided to call this the Transport for London Road Network. It comprises 550KM of London's red routes and other important streets.

AQMA	Air Quality Management Area	LIP	Local Implementation Plan
AMR	Annual Monitoring Area	LNR	Local Nature Reserve
AAP	Area of Archaeological Priority	LSP	Local Strategic Partnership
BAA	British Airports Authority	LAA	Local Area Agreement
BAP	(Hounslow) Biodiversity Action Plan	MTS	Mayor's Transport Strategy
BAAP	Brentford Area Action Plan	NATA	New Approach to Appraisal
BVPI	Best Value Performance Indicator	NI	National Indicator
CA	Conservation Areas	NO2	Nitrogen Dioxide
CO_2	Carbon Dioxide	NOx	Nitrogen Oxides, Nitrogen Oxide and Nitrogen Dioxide referred

			to as NOx
CQC	Countryside Quality Counts	NAQS	National Air Quality Strategy
DDA	Disability Discrimination Act	ONS	Office of National Statistics
Defra	Department for Environment, Farming and Rural Affairs	PCT	Primary Care Trust
DfT	Department for Transport	PPS	Planning Policy Statement
DH	Department of Health	PFI	Private Finance Initiative
DPD	Development Plan Document	PSA	Public Service Agreement
EA	Environment Agency	PTAL	Public Transport Accessibility Levels
EIA	Environmental Impact Assessment	PRoW	Public Rights of Way
EqIA	Equalities Impact Assessment	PM	Particulate Matter
ER	Environment Report	PM10	Particulate Matter <10um
EU	European Union	PPP	Plans, Policies and Programmes
GIS	Geographical Information System	SA	Sustainability Appraisal
GLA	Greater London Authority	SAC	Special Area of Conservation
GIGL	Greenspace Information for Greater London	SEA	Strategic Environmental Assessment
HA	Highways Agency	SPA	Special Protection Areas
HIA	Health Impact Assessment	SSSI	Site of Special Scientific Interest
HRA	Habitat Regulations Assessment	SINC	Site of Importance Nature Conservation
HER	Heritage Environmental Record	TfL	Transport for London
JSNA	Joint Strategic Needs Assessment	UK	United Kingdom
KSI	Killed or Seriously Injured	UN	United Nations
LDF	Local Development Framework	UDP	Unitary Development Plan
LBH	London Borough of Hounslow	VPD	Vehicles per day