London Borough of Waltham Forest

Local Implementation Plan 3
2019/20 - 2021/22

20th March 2019

1. Introduction[1]

Statutory requirements[2]

The London Borough of Waltham Forest's Local Implementation Plan (LIP) is a statutory document prepared under Section 145 of the Greater London Authority Act 1999 and sets out how the borough proposes to deliver the London Mayor's Transport Investment Strategy (MTS) in its area, as well as contributing to other local and sub-regional goals. It has been developed in accordance with Transport for London's Revised Guidance for Borough Officers on Developing the Third Local Implementation Plan.

This document is the third LIP for Waltham Forest. It covers the same period as the MTS, published in March 2018, and it also takes account of the transport elements of the draft London Plan, other relevant Mayoral and local policies in the Council's New Local Plan and Transport Investment Strategy. In summary, the document sets out:

- long terms goals and transport objectives for the next 20 years
- a three-year programme of investment starting in 2019/20
- delivery proposals for the period 2019/20 - 2021/22
- targets and outcomes the borough is seeking to achieve

A more detailed delivery plan is also provided for the financial year 2019/20.

The LIP identifies how Waltham Forest will work towards achieving the MTS goals of 'healthy streets and healthy people', 'a good public transport experience' and 'new homes and jobs'. Waltham Forest Council supports the overarching aim of the MTS to ensure that at least 80% of all trips in London are made on foot, by cycle or using public transport by 2041, compared to the figure of 63% today (recognising that there are different targets set for central, inner and outer London). The LIP outlines how the Council will set local priorities and targets in order to assist with achieving the overarching aim.

This document also outlines how we will work with TfL to assist with delivering the outcomes, polices and proposals of the MTS.

Local approval process[3]

In March 2018, the Council's Cabinet adopted a new Transport Investment Strategy "Waltham Forest's Transport Infrastructure: Growth and Investment Strategy". This sets out the Council's ambitious plans for sustainable regeneration and growth. It details how we will

[1] Requirement R1: No response required in LIP submission. It is a requirement for the borough to provide a response to every Mandatory Requirement.

[2] Requirement R2: Boroughs are required to include in their LIP an explanation of the statutory background of the LIP process.

[3] Requirement R3: The boroughs are required to outline the democratic processes taken to approve the submission of the LIP at a borough level.

improve the life chances and quality of life for our residents, support local economic growth and position the borough as one of the most desirable places to live, visit, work and do business in London. Elected Members of the Council and in particular the Deputy Leader and Cabinet Member for Environment, provided guidance to borough officers during the development of the Transport Investment Strategy and this process will continue throughout the preparation of the LIP.

Following receipt of TfL's response on the adequacy of the LIP by 7th December and other statutory requirements, the Council amended the LIP in response to the consultation, including TfL's recommendations. The LIP was approved through the Portfolio Lead Meeting process by Cllr Clyde Loakes, Deputy Leader of the Council and Cabinet Member for Environment on 5th of March 2019.

Statutory consultation[4]

The GLA Act 1999 places a duty on boroughs, when preparing a LIP, to consult with the following organisations:

- The relevant Commissioner or Commissioners of Police for the City of London and the Metropolis
- TfL
- Such organisations representing disabled people as the borough considers appropriate
- Other London boroughs whose area is, in the opinion of the council preparing the LIP, likely to be affected by the plan
- Any other body or person required to be consulted by the direction of the Mayor

The Council will undertake a public consultation exercise between 1st and 26th December 2018. The consultation was shared with the following consultees. A summary of responses are provided within the attached Appendix 1.

Statutory consultee	Number to be consulted
TfL	1
Police	1
Disability groups and the Council's Mobility Forum	5
Local authorities	9

[4] Requirement R3: The boroughs are required to outline the democratic processes taken to approve the submission of the LIP at a borough level.

Statutory duties[5]

The borough has taken into account all the statutory duties and processes as set out in the requirements in the GLA Act in the preparation of this LIP.

The borough has met its statutory duty by conducting a Strategic Environmental Assessment (SEA) and, as recommended, an Equality Impact Assessment (EQIA) on the proposals contained in its LIP. The LIP Outcomes and programmes will be assessed for both purposes. The SEA is included as Appendix 2 of this document.

[5] Requirement R5: There is a requirement to undertake a Strategic Environmental Assessment and it is recommended that an Equalities Impact Assessment is also done (which addresses the borough's Public Sector Equality Duty). The boroughs are required to consider whether it is appropriate for the LIP to be assessed against other matters, for example crime and disorder, health, economic and business issues, air quality and climate change.

2. Borough Transport Objectives

Introduction

This chapter sets out the local policy context for the third round of LIPs. It covers the borough's detailed interpretation at a spatial level and the local policies and proposals which will help deliver the MTS. The chapter also considers the link between the LIP and other key frameworks against which the borough plans and delivers local services.

The LIP firmly demonstrates that it is informed by evidence and analysis of local needs and issues and that it is shaped by the wider context of the MTS vision, the MTS Healthy Streets Approach and the MTS policies, proposals and outcomes.

Local context[6]

Geography

Waltham Forest is an outer London borough, located on the edge of Inner London, between the Queen Elizabeth Olympic Park and Lower Lea Valley at the south, and Epping Forest and Essex at the north. The Borough's neighbours are the London Boroughs of Enfield and Haringey in the west; Hackney to the south and west; Newham to the south and Redbridge to the east. It also borders land managed by the statutory bodies of the London Legacy Development Corporation and Lee Valley Regional Park Authority.

The land area of Waltham Forest is relatively small. The character of the Borough and its architecture is broadly suburban in the north, whilst the south is more dense and urban. The Borough's natural boundaries are defined by the River Lea, Metropolitan Open Land in the Lee Valley, Walthamstow Wetlands and reservoirs to the west; and in the north by Epping Forest and the Metropolitan Green Belt. Metropolitan Open Land and Metropolitan Green Belt account for 27% of the Borough.

The Borough has a network of separate town centres, including the Major Town Centre at Walthamstow, and seven District Centres at Wood Street, Bakers Arms, Leytonstone, Leyton, Highams Park, Chingford Mount and Chingford. These town centres account for 22% of borough-wide employment and accommodate 18% of the borough's businesses, as well as provide essential services, cultural and leisure offers for residents.

The Borough has a strong relationship with the East and South East of England. We are an active member of the London-Stansted-Cambridge Corridor and have played a part in the Mayor's Outer London Commission.

[6] Requirement No R7: Boroughs are required to set out the local context including the geographical, demographic and other characteristics of their boroughs, cross-referencing existing policy and context documents as appropriate. Alternatively, please provide web-link(s) to a borough document that contains this information and reference the section and page numbers where this information can be found.

Transport geography

There are two London Underground lines in Waltham Forest. The Victoria line has two stations, Walthamstow Central and Blackhorse Road, connecting towards the West End, and a further two stations on the Central line connect the south east of the borough to Stratford and the City of London, at Leyton and Leytonstone. In recent years, the Victoria line has benefited from a signalling upgrade and rolling stock replacement, now operating at up to 36 trains per hour in each direction. The Central line has been identified as the next Underground line to receive an upgrade although the programme for this is not known.

Waltham Forest is served by two rail lines on the London Overground network. The Chingford to Liverpool Street line is the main radial commuter route with five stations in the Borough connecting towards the City of London. The Barking to Gospel Oak line is an outer London orbital route with four stations in the Borough. Both lines are soon to benefit from the introduction of brand new rolling stock. In the case of the Barking to Gospel Oak line, the existing two-car diesel units will be replaced by four car electric trains providing a 130% increase in passenger capacity.

In 2016, the Council successfully reopened Lea Bridge station on the national rail Lea Valley line. The new station is a core element of plans to regenerate the Leyton and Lea Bridge area, and currently supports 572,400 passenger journeys per year (a 29% increase since opening). It is expected that this number will increase once the service increases from two to four trains per hour in 2019. Looking forward, we are also investigating the feasibility of opening another station at Ruckholt Road at the south of the Leyton and Lea Bridge area.

The Borough is not served by stations on the Crossrail 1 (Elizabeth Line) or Crossrail 2 alignments; however stations in close proximity to the Borough include Maryland and Stratford on Crossrail 1, and Tottenham Hale, Northumberland Park, and Angel Road on Crossrail 2. It is a priority of the Borough to improve connections to these stations once the service is in operation.

In 2014, Waltham Forest became one of three Mini Holland outer London boroughs, securing £27 million of funding to radically transform local cycling and walking facilities. The programme was renamed ‘Enjoy Waltham Forest’ and seeks to make the borough safer for cycling and walking, encourage far more people to cycle and walk (thereby reducing congestion on the roads) and improve the health and fitness of residents through active travel. On completion of the scheme next year, the Council seeks to continue encouraging active travel by implementing Liveable Neighbourhoods schemes.

Waltham Forest has 34 scheduled bus routes and 5 night bus routes, with varying levels of service across the Borough. The bus network is a vital mode of public transport in a borough where residents in over 40% of households do not have access to a car. This network is critical to support the Borough’s regeneration agenda, but it is also to address issues relating to access to employment, essential services and leisure opportunities.

The strategic highway network in Waltham Forest consists of the A12 and the A406 North Circular Road. Both roads have full grade-separation and consequently have a limited number of access points for borough residents. Although they provide strategic access, they also contribute to the challenges facing Waltham Forest residents due to severance by

dividing local neighbourhoods and acting as a barrier for cycle and pedestrian movement. Traffic congestion on these routes has increased and severely affects borough's carbon emissions, resulting in adverse impacts on air quality and quality of life for residents.

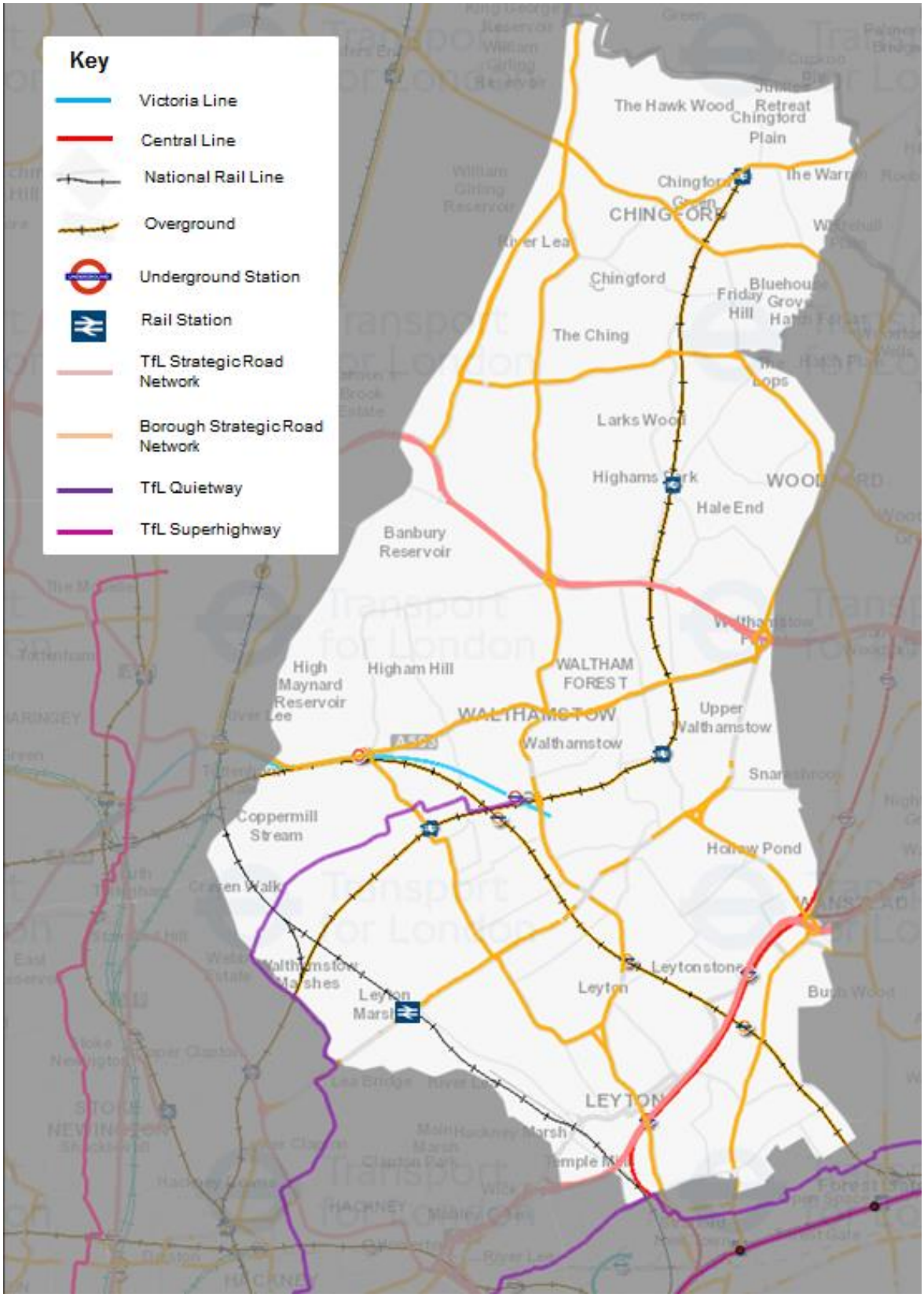

Figure 1: Transport geography of Waltham Forest (to be updated for final draft)

Population and Growth

Waltham Forest is a borough of 278,000 residents and home to over 8,500 businesses. It has experienced some of the most rapid population growth in London in recent years – 13% between 2006 and 2016 – and this is due to grow by a further 24% by 2033.

The Mayor's Draft London Plan has set a housing target of delivering 1,800 homes new per year in Waltham Forest, doubling its current housing targets. This builds on the boroughs impressive track record of delivery towards the Council's own target of building and having in the pipeline 12,000 new homes between 2015 and 2020 and projected demand for continued growth. Opportunity areas for development are currently being identified through a borough wide growth capacity study, and details on growth areas will be presented in the forthcoming Local Plan.

The Borough forms part of the Mayor's vision for East London and have an important role in the Mayor's major strategies: City in the East and Upper Lee Valley Opportunity Area. Each of these sets out ambitious plans for growth, with development currently forthcoming at Blackhorse Lane, and Lea Valley Eastside. Figure 2 below shows key opportunity areas in the borough, illustrated in the new Local Plan Direction of Travel.

Economic Growth

The Borough has benefitted significantly from the economic growth taking place across London. Over the past 5 years, Waltham Forest has seen the greatest increase in jobs of any London borough, alongside a 40% increase in the number of resident-owned businesses. It has a unique identity founded in its cultural heritage, with a burgeoning arts scene and creative industries; Waltham Forest will be London Borough of Culture in 2019.

These targets will be reflected in the Council's new Local Plan, which will also set out the plans for economic growth and the creation of new communities, including that already identified and planned for in the established Blackhorse Lane, Lea Bridge and Leyton, Walthamstow and Wood Street growth areas.

Age Profile

Waltham Forest has a younger than average population, with 22% of residents being aged 0 to 15 compared to 19% nationally. Similar to the London average, Waltham Forest also has a high proportion of young working-age adults aged 25 to 49 (43% compared to 34% nationally). There are proportionately fewer people aged over 50 living in Waltham Forest (25%) compared to the UK average (36%).

It is estimated that 10% of residents were aged 65 and over in 2015 (27,900). Although slightly less than the 12% average across London, based on GLA projections, this number is expected to reach 12% by 2021 (31,700), and 16% by 2041 (a 73% increase in residents aged over 65 within this timeframe).

With this growth in older and younger residents within the Borough, it is expected that additional facilities will be required to support people to travel spontaneously and independently on the public transport network. This will include facilities to support people

with mobility impairments, but also to support parents with young families to make every day journeys with buggies and young children.

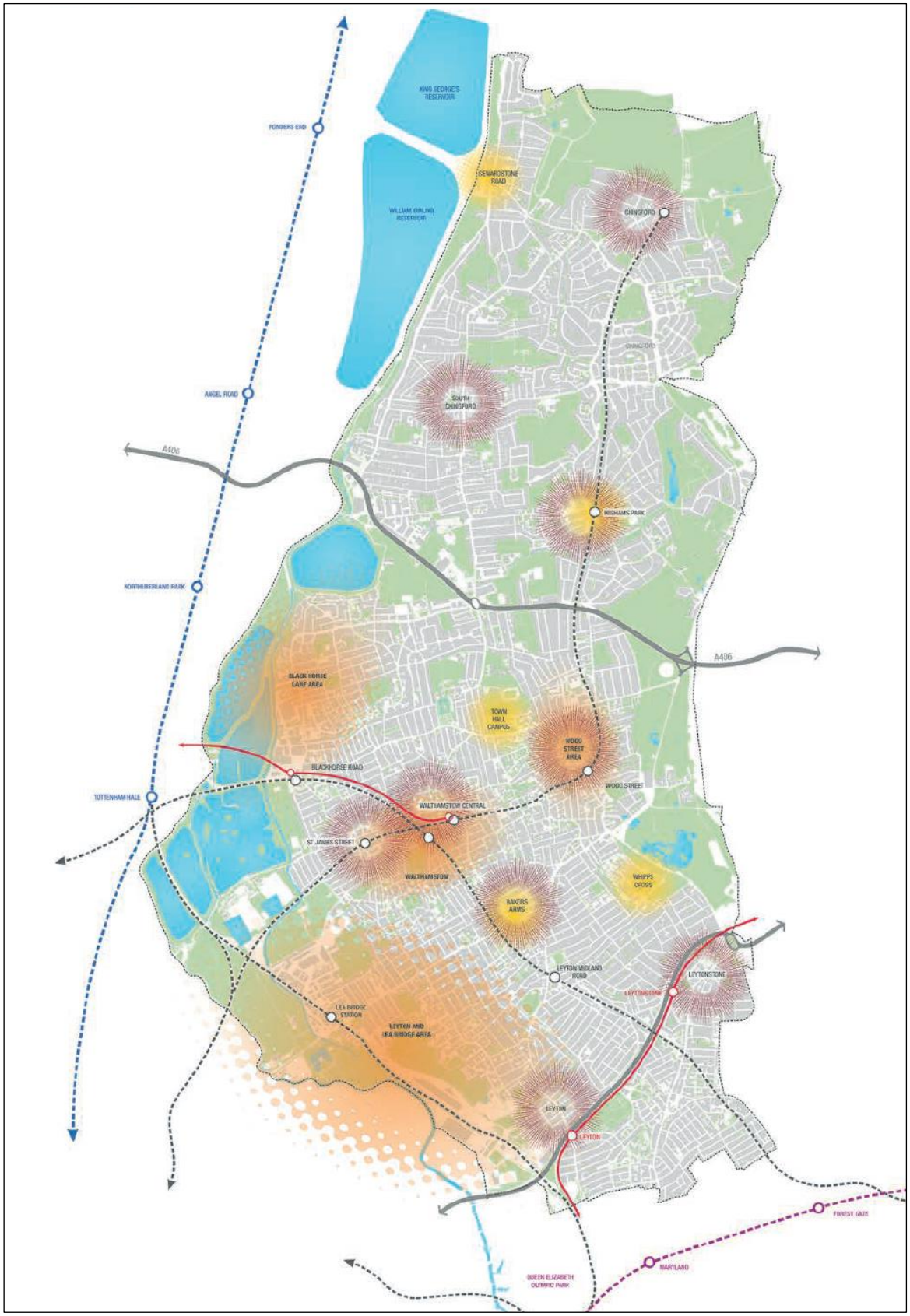

Figure 2: Growth considered in Waltham Forest included with Local Plan Direction of Travel

Deprivation

Waltham Forest is just outside the bottom 10% of England's most deprived local authorities, ranking 35th out of 326 in England, according to the overall measure of multiple deprivation (IMD 2015). Its position has improved from 2010 when the borough ranked 15th most deprived in the country. Out of 33 London boroughs, Waltham Forest currently ranks 7th most deprived.

Furthermore, according to an estimate by the Campaign to End Child Poverty, 23% of children (before housing costs are factored in) and 35% (after housing costs) were living in poverty as of late 2013, which is higher than the UK average of 16% (BHC) and 25% (AHC). Poverty is defined according to HMRC, which measures child poverty as the proportion of children living in families in receipt of out of work benefits or in receipt of tax credits where their reported income is less than 60% of median income.[7]

As detailed below, deprivation has a strong link to life expectancy and challenges around health, within the Borough, and many areas of the Borough with high levels of deprivation suffer from poor air quality and transport connectivity.

Health

Estimated life expectancy for those born between 2010 and 2014 in Waltham Forest for men was 79.4 years and 83.8 years for women, similar to the England average. However, there is significant inequality among wards. In Grove Green, average male life expectancy was 83.4 years compared to 75.7 years in Lea Bridge. Likewise, in Endlebury, average female life expectancy was 89.4 years compared to 80.7 years in Lea Bridge (ONS).

The borough faces a number of challenges around health that are linked to physical activity. This includes obesity among children, recorded diabetes, mental health issues and cardiovascular disease (Waltham Forest Health Profile 2014).The Council is committed to addressing each of these, through prevention, reduction of inequalities and tackling the wider determinants of health, as outlined in the Joint Health and Wellbeing Strategy.

Cardiovascular disease is the biggest killer in the London Borough of Waltham Forest, which causes 24% of premature deaths (75 years and under) and is the main contributor for health inequalities between Waltham Forest and England. It is estimated by Public Health England that 11.1% of people within the borough have diagnosed hypertension, and 90.9% of patients aged over 45 have a record of high blood pressure.[8] This places the borough as amongst the highest in London.

Key findings from the National Childhood Measurement Programme (NCMP) 2015/16, suggests that Waltham Forest is 9th worst of the London boroughs in terms of prevalence of

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[7] https://walthamforest.gov.uk/content/statistics-about-borough

[8] https://fingertips.phe.org.uk/profile/cardiovascular/data#page/6/gid/1938133106/pat/46/par/E39000018/ati/153/are/E38000192/iid/219/age/1/sex/4 Heart disease, https://fingertips.phe.org.uk/profile/cardiovascular/data#page/13

excess weight amongst children in Reception, and 8th worst in London in terms of prevalence of excess weight in children in Year 6 (out of 32 London borough excluding the City). [9]

According to Public Health England estimates, the borough has a slightly higher level of diabetes amongst adults that the London average, with 6.7% of people over the age of 17 being diagnosed with diabetes. This has increased by 0.7% over the last 5 years. The Borough has a comparatively low level of respiratory diseases amongst adults. However, levels of asthma for young people in the borough are higher than the London average.

Public Health England also estimates that prevalence of Mental Health disorders amongst the Borough's population is lower than averages across England and other London boroughs. However, it is estimated that 15.5% of the people aged over 16 suffer from common mental health disorders[10], and 6.2% of people over 18 registered with GPs are recorded to have experience depression.

Levels of Physical Activity

As stated in the Mayor's 'Healthy Streets for London' report, increasing physical exercise amongst the boroughs residents presents an important tool to tackling many of the borough's health challenges, including heart disease, adult and child obesity, diabetes, and mental health problems.

While levels of physical activity are higher than average in London, a significant amount of people who live in the borough do not undertake recommended amounts of activity a day. For example, 2016/17 Active Lives data published by Sport England shows 66% of adults within the borough meet the Chief Medical Officer recommendations of physical activity (150+ moderate intensity equivalent minutes per week). This is higher than the London average of 64.6%, and places the borough as the 15th highest in London.

Further, 2014/15 data produced by Sport England also shows that 10.6% of 15 year olds within the borough are physically active for at least one hour a day per seven days a week. This is below the London average of 11.8%, and 8th lowest across all London boroughs.

There is also a disparity in levels of activity between social groups within the borough, and groups shown to undertake lower than average levels of physical activity include those with a working status of inactive of unemployed, people with disabilities, people within the six most deprived deciles within the borough, people aged over 55, and people from Asian and Black ethnic groups. There is also a slight in balance within the borough between male a female levels of activity (68% of males and 64% of females).[11]

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[9] https://www.gov.uk/government/statistics/child-obesity-and-excess-weight-small-area-level-data https://search3.openobjects.com/mediamanager/walthamforest/fsd/files/hwc_with_title_page_and_exec_summary_and_references_2.pdfb

[10] https://fingertips.phe.org.uk/profile-group/mental-health

[11] https://fingertips.phe.org.uk/profile/physical-activity/data#page/4/gid/1938132899/pat/6/par/E12000007/ati/102/are/E09000031

North – South Characteristics

There are number of differences in local character, demographics, and public transport accessibility across wards within the borough, with each presenting different challenges to meeting the Council's transport objectives the MTS outcomes.

In the north of the borough, public transport options are less prevalent with only two stations located north of the A406 North Circular Road and less frequent and connected bus services than wards in the south and central parts of the Borough. Wards in the north of the Borough are also typically more affluent, with a higher than average population of residents aged over 65, as well as having a much lower density of housing. This is reflected in higher than average levels of car ownership in these areas, shown in Figures 3 and 4 below, but also lower propensity to walk and cycle, as shown in Outcome 1.

In the south and central parts of the Borough, while public transport accessibility levels are generally greater, wards in this area have higher density of housing, and in many locations are experiencing significant levels of development and population growth. This contributes to increased pressure on the public transport network, and overcrowding on bus, rail and Underground routes.

Demographics in the south of the Borough also lead to a higher potential for car-free lifestyles, with lower levels of car ownership and a younger population, but also higher levels of deprivation. While this demographic make-up in the south of the borough may result in less private car travel, where there gaps in the public transport network, this can lead to low levels of access to opportunities and services. For example, the wards of Cathall and Cann Hall have the lowest levels of car ownership in the borough, but also low PTAL levels in many residential areas. Improvements to the public transport and active travel networks are key to improving accessibility in these areas of the borough.

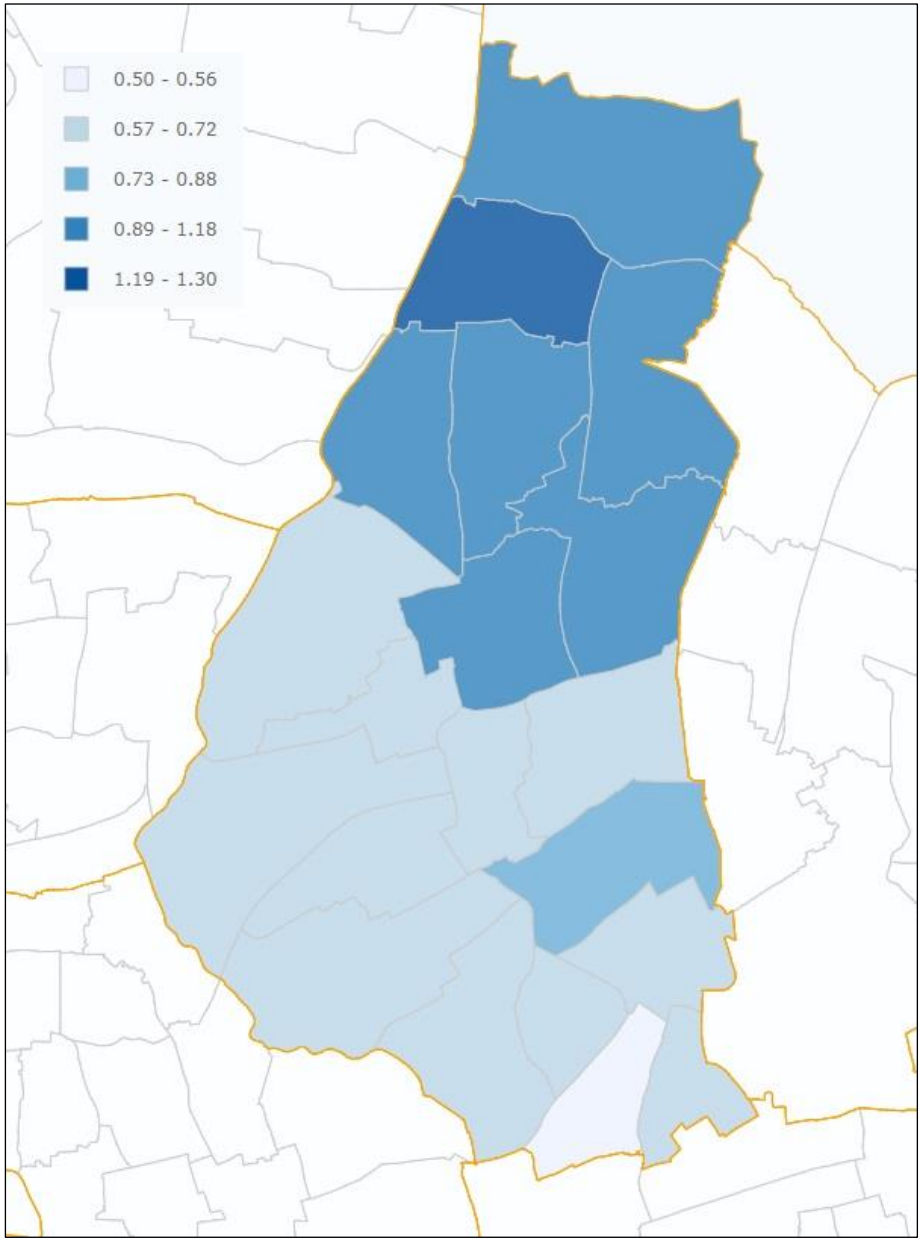

Figure 3 - Levels of car ownership per household by ward (2011 Census)

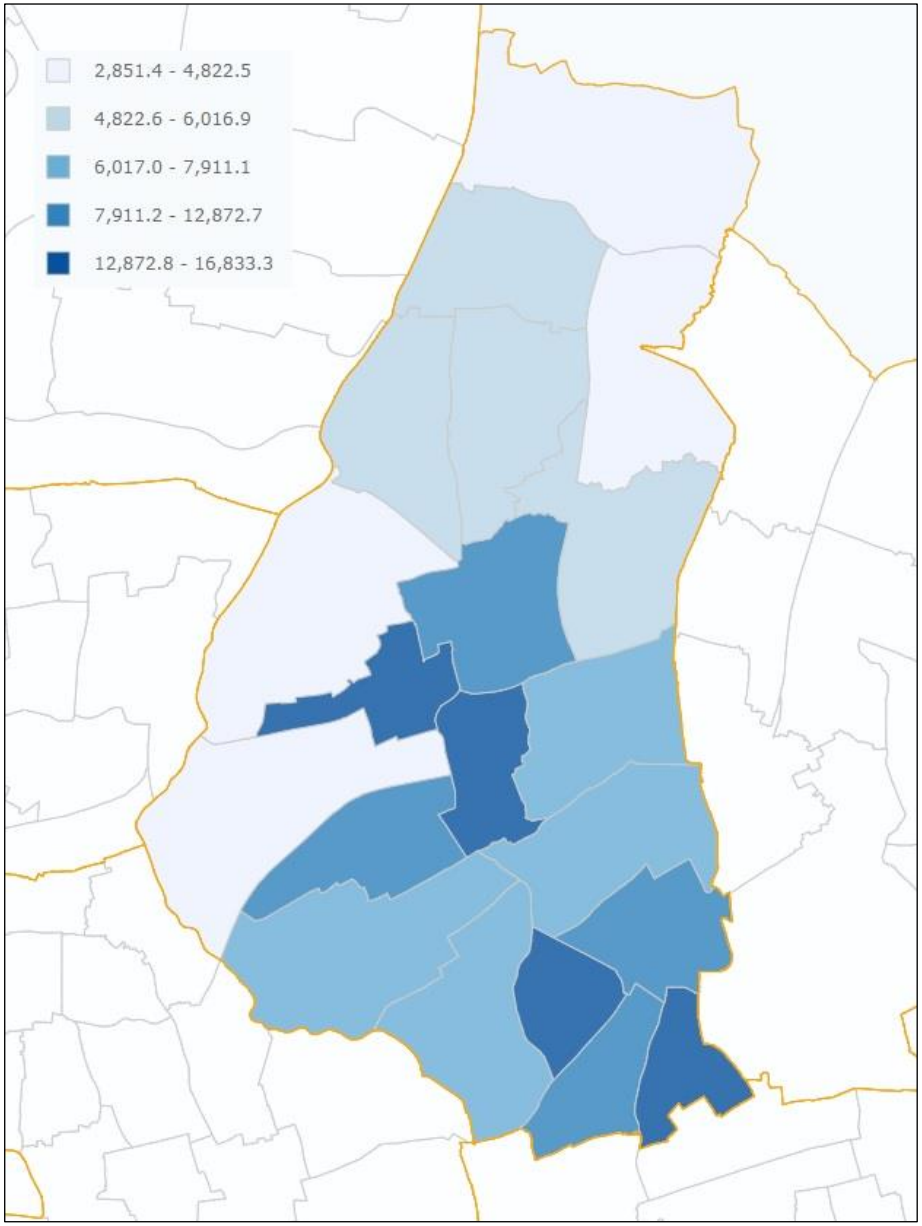

Figure 4 - Population density per km (2014 GLA)

Local Authority Policies

The following provides an overview of the relevant local authority and GLA policies relating to the Local Implementation Plan.

Document	Relevant Policies and Commitments
Waltham Forest Local Plan: Core Strategy (2012)	**Strategic Objective 1:** Strategic Management of Growth Policy CS1 sets the Council's approach in seeking to achieve an appropriate balance between physical, social and economic development and environmental protection. **Strategic Objective 5** - Enhancing Green Infrastructure and Biodiversity Policy CS5 details the Borough's commitment to develop a network of multi-functional green infrastructure to benefit people and wildlife. **Strategic Objective 7:** Developing Sustainable Transport Policy CS7 sets the Council's approach to developing an attractive and sustainable transport network within the Borough. This includes: • Coordination of Land Use and Transport • Sustainable Transport Network • Managing Private Motorised Transport • Freight **Strategic Objective 13:** Promoting Health and Well-Being Policy CS13 sets out the Council's objective to improve the health and well-being of residents to enable residents to make healthier choices.
Waltham Forest Development Management Policies DPD (2013)	The Development Management Policies set out the policy basis for delivering the long-term spatial vision and strategic place-shaping objectives in Waltham Forest which are set out in the Core Strategy.
Shaping the Borough: New Local Plan Direction of Travel (2017)	The Local Plan Direction of Travel set the strategic direction for development of the new Waltham Forest Local Plan, expected for completion in 2019. The document sets out the local context, challenges and opportunities of growth, and a vision for growth in the Borough.
Waltham Forest's Transport Infrastructure: Growth & Investment Strategy	The LBWF Transport Infrastructure Strategy sets out the key projects and programmes that are needed to facilitate continued economic growth and regeneration in the borough. Interventions detailed in the strategy include: • Walthamstow Central: Transport Interchange for a Major

Document	Relevant Policies and Commitments
	Centre in London • Redeveloping Leyton Underground Station: Meeting Growing Demand • A new Ruckholt Road Station: Unlocking the Leyton Growth Area • Station Gateways: Investment in Place-Making and Access for All – • Planning a Smarter, Greener Bus Network • Making Liveable Neighbourhoods for Everyone • Culture Change: Shift to Sustainable Travel and Green Vehicles
2020 Vision: Cycling in the borough of Waltham Forest 2015 -2020 (2015)	The 2020 Vision document details the Boroughs plans for cycling up until 2020, as well as our targets and objectives that will be used to monitor the success of the implementation of the Mini-Holland Programme.
Air Quality Action Plan (2018)	The LBWF Air Quality Action Plan sets out air quality issues within Waltham Forest, and a plan of action to tackle these between 2018 and 2023.
Waltham Forest Health and Wellbeing Strategy	The Health and Wellbeing strategy guides Council decisions and priorities around improving the health and wellbeing of the population. Outcome 2s states the boroughs commitment to placing sustainability at the heart of activities, and transport services are accessible.
Joint Strategic Needs Assessment	The LBWF JSNA examines the health needs of local people. It highlights issues important for improving the health and wellbeing of the local population and for reducing inequalities.

Table 1 - Local Authority Policies

Changing the transport mix

The Mayors Transport Strategy sets an overall mode share aim of 80% of all trips in London to be made on foot, by cycle or using public transport by 2041, increasing numbers of daily trips by active, sustainable modes from 26.7 million trips in 2015 to 33 million trips in 2041.

The following section sets out challenges and opportunities in meeting this target in the London Borough of Waltham Forest, and borough objectives that will contribute to meeting this overall aim.

Challenges and opportunities[12]

Current Trends in Sustainable Travel

The London Travel Demand Survey projects that the borough has an overall sustainable transport mode share of 63%, averaged over the 3 years between 2014/15 to 2016/17. This comprises of 29% mode share of public transport, 32.5% walking and 1.69% cycling. This places the borough as the third highest in outer London and 17th highest across London, and is the only outer London borough where combined levels of walking and cycling match car use (Travel in London 9 and 10).

To meet the MTS target of 80% of trips to be made by active, efficient and sustainable modes by 2041, a 24% increase levels of walking, cycling and public transport amongst the boroughs population is needed during this period, with a 5% increase before 2021.

Vehicle Ownership

As demonstrated in the GLA's Health Impacts of Cars in London (2015) and the TfL Healthy Streets for London Report (2017), car ownership is the greatest factor that influences how often people in London walk and cycle.[13] Indicatively of the 7.3 million car trips made by London residents, it is expected that 1.6 million could be walked, and 2.7 million cycled.

The DfT estimates that there are 82,998 vehicles licensed within Waltham Forest, the 7th lowest of all outer London Boroughs. This number has grown over the past 10 years, increasing by 3% between 2008 and 2017. Levels of ownership increased by 5% between 2014 and 2016, however this decreased by 1% between 2016 and 2017. Correlating with this growth in vehicle ownership, estimated vehicle kilometres driven on roads in Waltham Forest (including the North Circular and A12) has increased by 6% since 2008; the 5th highest increase in outer London. However, since 2014, Waltham Forest has seen the 5th highest decrease in vehicle kilometres driven across all London boroughs, reducing by 2%.

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[12] Requirement R8: Boroughs are required to identify key opportunities for shifting trips and journey stages to walking, cycling and public transport to contribute to achieving the overarching aim for 80 per cent of trips to be made by active, efficient and sustainable modes by 2041.

[13] http://content.tfl.gov.uk/healthy-streets-for-london.pdf, https://www.london.gov.uk/sites/default/files/health_impact_of_cars_in_london-sept_2015_final.pdf

Further work is needed to understand the causes of this growth, but it is expected that this is associated with significant housing development and population in the borough, changing demographics, and improvements in enforcement of unlicensed vehicles.

LBWF Core Strategy Policy CS7, Transport Infrastructure: Growth & Investment Strategy, and 2020 Vision for Cycling recognise the negative impacts of the increase in private car travel on local transport networks, public health, economic viability and quality of the environment. Each outlines the Council's commitment to managing demand in private car use by delivering attractive alternatives and well-placed development.

Public transport accessibility and capacity

Many areas of the borough experience poor public transport services, including low levels of connectivity, accessibility, regularity and reliability. As shown in the Public Transport Accessibility (PTAL) map, shown in Figure 5, significant areas are below PTAL 3, limiting access to employment and leisure, and capacity for public transport to compete with private car use.

In addition to poor connectivity, the boroughs existing public transport network is under severe pressure. As outlined the Transport Infrastructure: Growth & Investment Strategy, several key Underground and Overground stations and bus routes are at, or nearing, capacity, contributing to poor user experience. This includes gateways to central London at Underground stations where overcrowding results in closure of entrances when stations reach passenger capacities, trains skipping stations due to platform crowding, and uncomfortable interchanges, but also along key bus routes where congestion causes slow speeds, and long waits between buses.

Moreover, the overall majority of Underground and Overground stations within the Borough are not fully accessible, with only four stations of 14 stations having full and easy to use step-free access. Combined with wider barriers to accessibility, this limits the ability for many residents and visitors in the Borough to travel on the local transport network.

As detailed in the following sections, there are major opportunities to improve the connectivity and user experience on the borough's bus, rail and Underground network through better planning of services, and upgrades facilities.

Switchable Trips

TfL MOSAIC analysis shows there are significant opportunities for residents to switch car journeys to cycling, walking and public transport, as well as high levels of residential areas with the spatial and demographic characteristics that increase willingness to reduce car use. As shown in the Figures 6 and 7 below, areas with both high potential for switchable trips and a high willingness to reduce car use are limited to locations in the south of the borough, including Leyton, Cathall, Chapel End and Leytonstone.

In the north of the borough, while there is a high proportion of journeys that could be made by public transport, existing car ownership, current levels of public transport accessibility, and demographic factors limit the current potential for mode-shift. Significant improvements

to the public transport network and facilities for walking and cycling facilities are required to lock mode-shift in this part of the borough.

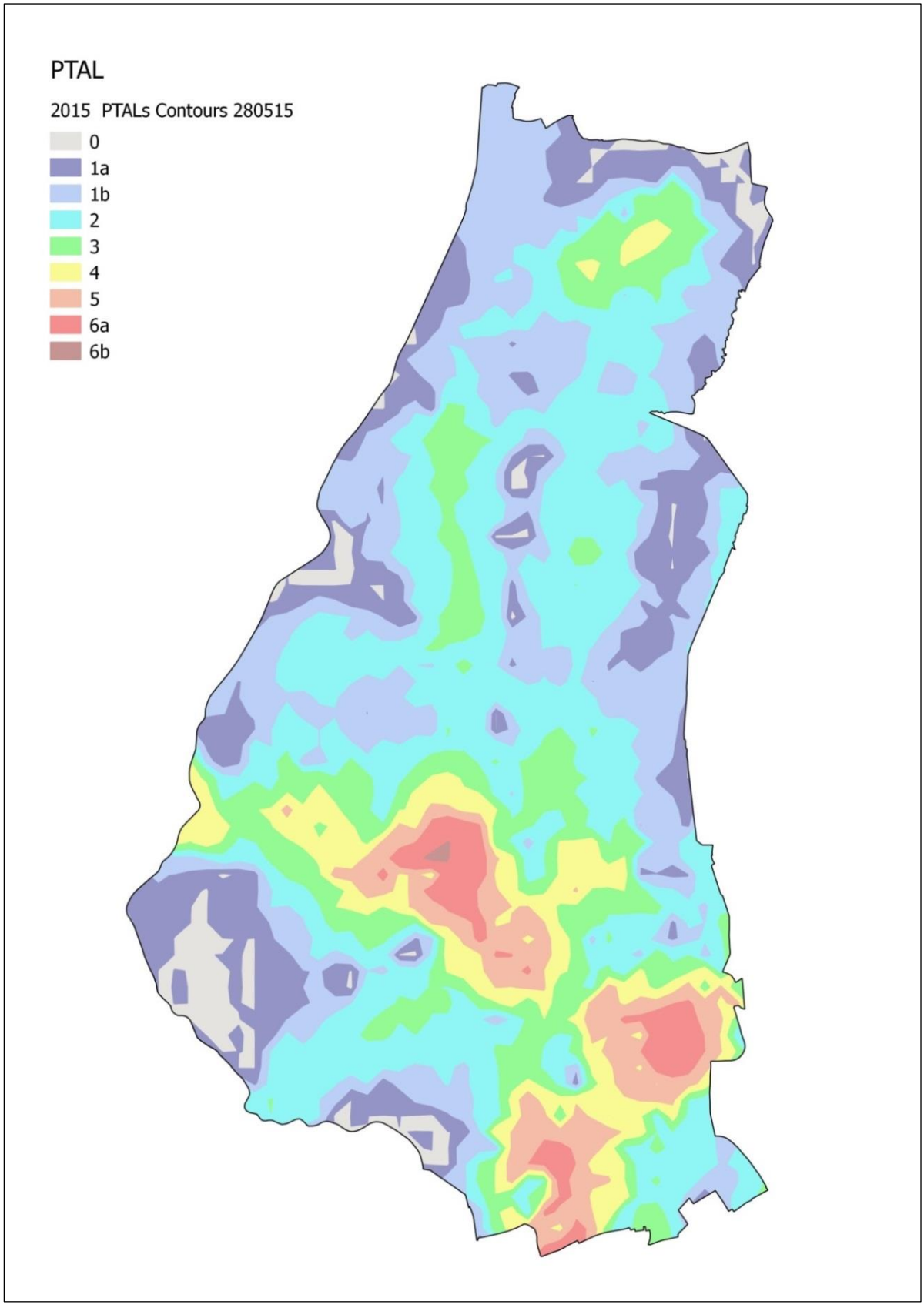


Figure 5 - PTAL map of Waltham Forest

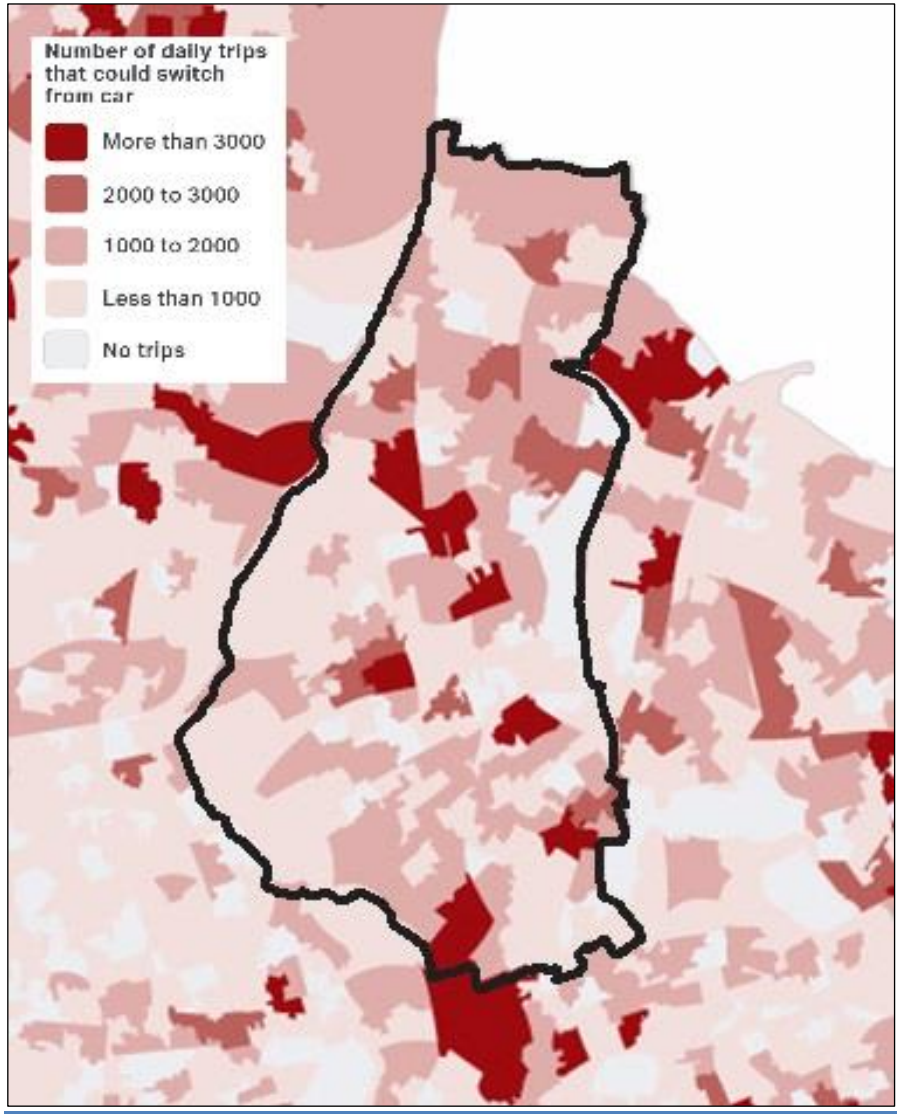


Figure 6: Volume of car trips that could be made by walking, cycling and public transport

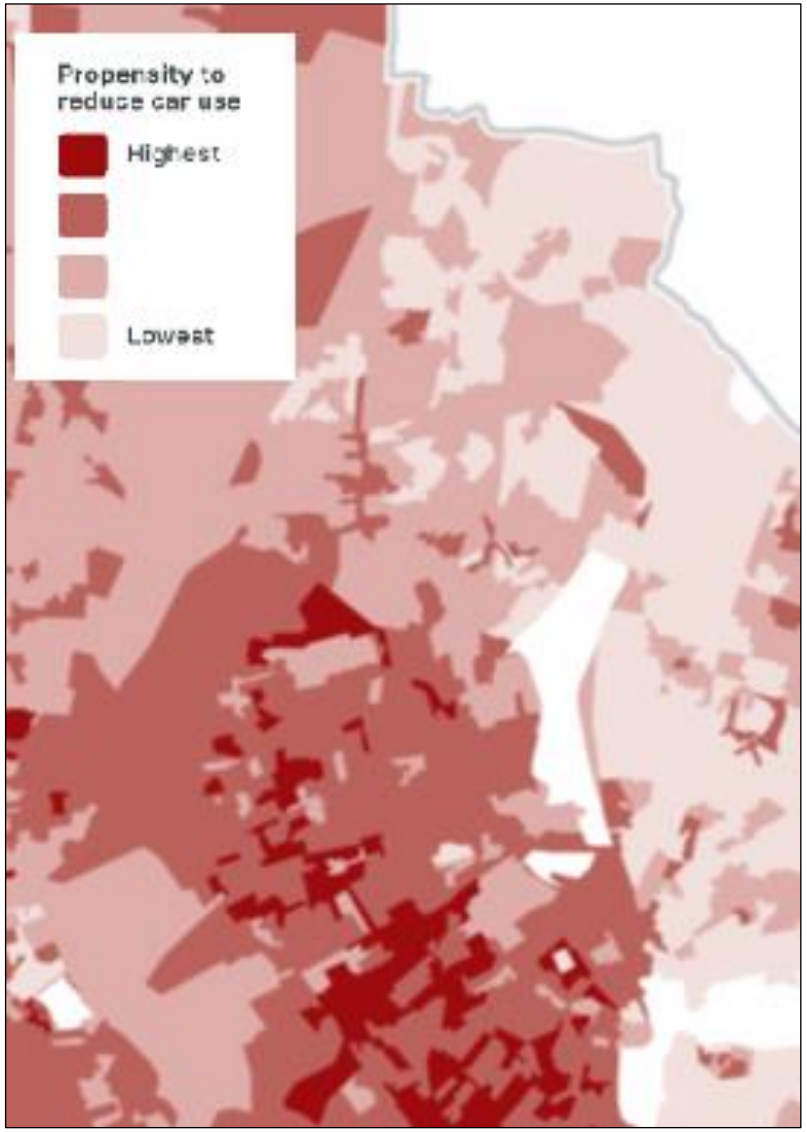


Figure 7: London resident's willingness to reduce their car use

Walking and Cycling Network

The borough has a long term commitment to building and implementing a high quality cycling and walking network across the borough. In 2012 the Borough developed and adopted a Cycling Action Plan which set out a range of improvements to make walking and cycling across the borough safer, easier and more convenient. Building on the Action Plan, in 2013 the borough successfully won £28m funding from the TfL Mini Holland programme, allowing the borough to develop and deliver substantive and transformative street improvements as part of “Enjoy Waltham Forest”.

With an overall aim of increasing numbers of people travelling by foot or by bike, the key objectives of Enjoy Waltham Forest include delivery of a connected network of high quality cycle routes, safer streets for people cycling and walking, better balance between movement and place, and better places for everyone. To achieve this, the Council has delivered a comprehensive set of improvements to streets in the borough, including delivery of segregated cycle routes, low traffic neighbourhoods, safety improvements to major junctions and public realm improvements on local high streets. This is shown in Figure 8 below.

Early monitoring of the Enjoy Waltham Forest shows delivery of outcomes that are central to delivery of the MTS, including increased active travel, reduced through traffic, improvement of air quality, and better public transport connectivity. More information is provided in Outcomes 1, 2, 3, 4 and 6 below.

Growth

As detailed in the borough’s New Local Plan Direction of Travel, provision of excellent public transport, walking and cycling options is essential to delivering good growth. Challenges to managing growth include upgrading station infrastructure to meet capacity and accessibility needs of future growth, ensuring growth areas are well served by bus and rail, and providing a comprehensive transport network that enables a shift to active, sustainable travel. This will include ensuring streets connecting new and existing homes to destinations and public transport network prioritise active use of streets, and reduce dominance of motor vehicles.

Beyond travel habits of residents and visitors, as the Boroughs housing targets are increased, a growth in demand for construction traffic, freight, servicing and deliveries is expected. To ensure an increase in demand does not impact safety of vulnerable road users, congestion, and attractiveness of the Borough’s streets, it is essential goods and services are moved using efficient, low-carbon methods.

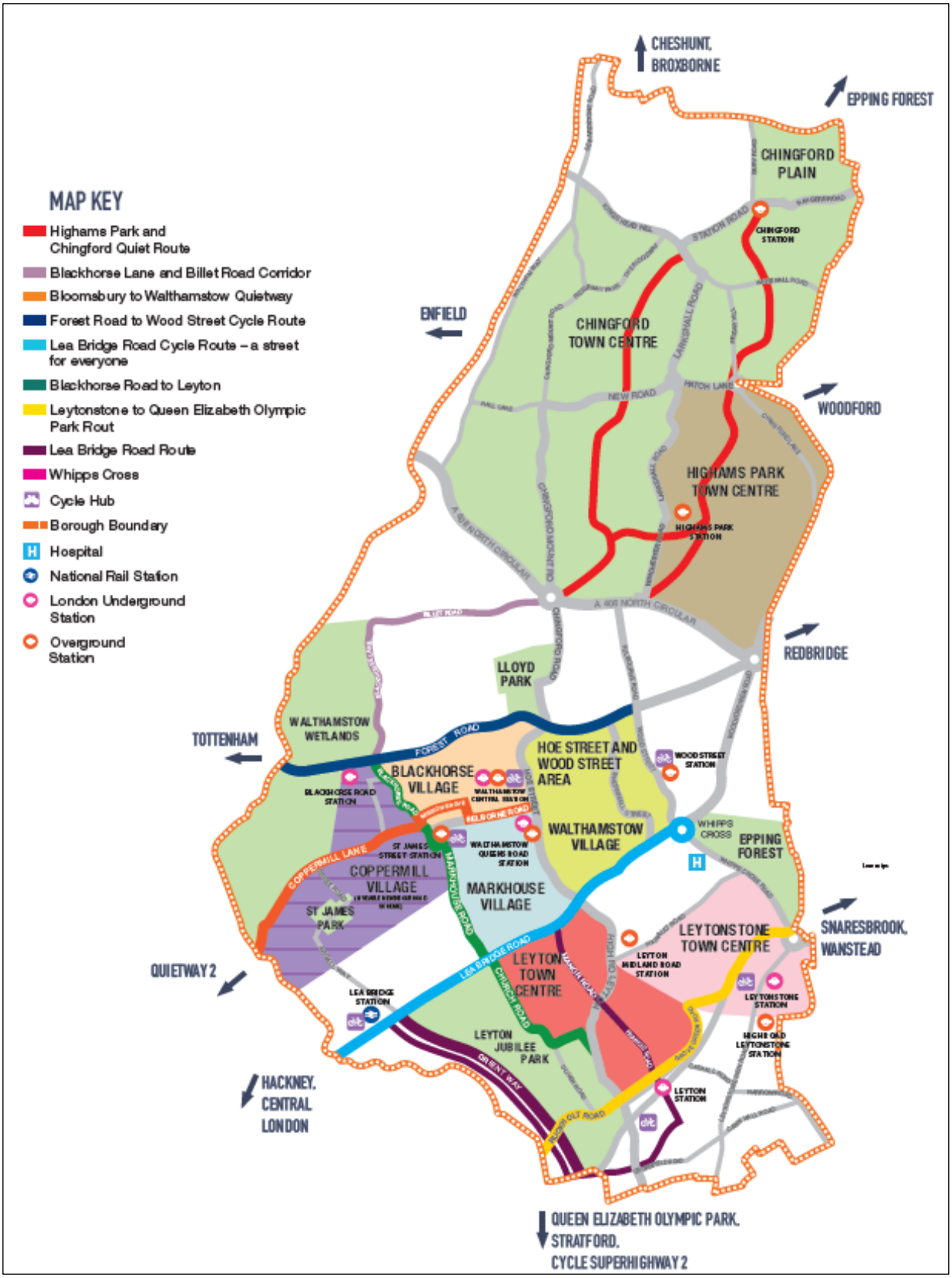


Figure 8 – Enjoy Waltham Forest route map

Borough objectives[14]

LBWF Overall Objective 1: Shift to culture of sustainable travel: In line with the MTS, Waltham Forest is committed to managing and reducing levels of private car ownership and vehicle journeys, and enabling an increase in levels of active, sustainable travel in the borough.

The Council will seek to achieve this through delivery high quality cycling, walking and public transport networks that offer attractive alternatives to private car, as well as more efficient methods to deliver freight and goods in the borough. Infrastructure will be supported by wider initiatives to promote, incentivise and enable modal shift with residents, schools and businesses.

LBWF Overall Objective 2: Liveable neighbourhoods for everyone: Building on success of Enjoy Waltham Forest, the Council will seek to deliver a programme of street improvements in line with TfL's Healthy Street approach within all neighbourhoods across the borough. Key objectives of this programme will include:

- Increasing the number of trips made by walking, cycling and public transport, and improving local connections to these modes
- Reducing motor dominance and increase the active use of streets and public spaces
- Creating safer neighbourhood environments, including reducing road danger and improving personal security
- Improving air quality to create more attractive neighbourhoods for residents and visitors
- Improving quality and resilience of the public realm
- Ensuring neighbourhoods have good connections to public transport.

Priority areas will be based upon scale of local challenges, including connectivity to public transport and services, air quality, severance for walking and cycling, health, and opportunities to reduce car use, as detailed in further sections.

LBWF Overall Objective 3: Place-making and Access for all at stations: Working with TfL and Network Rail, the borough aims to deliver a fully accessible network of stations, which offer a positive user experience and attractive gateways to the borough.

Key to this will be delivery of Step Free Access at all Overground and Underground stations, as well as improved station facilities that enable easy interchange modes, and provide high quality links to employment, residential areas, and town centres.

LBWF Overall Objective 4: Planning a Smarter, Greener Bus Network: The borough is committed to supporting delivery of a bus network that effectively connects residents to town centres, wider transport links, and opportunities for employment, health and education.

[14] Requirement R10: Boroughs are required to set objectives that explicitly assist with meeting the Mayor's Transport Strategy aim of increasing the sustainable travel mode share.

Realisation will require an increase in coverage and frequency of buses, improved connections to Crossrail 1 and Crossrail 2 corridors, and new links to growth areas. Maximising opportunities to improve speed and efficiency of the network, attain funding from development, and trial new forms of bus service will be essential to meeting this objective.

LBWF Overall Objective 5: Delivering a public transport network to meet future demand: Focusing on infrastructure that unlocks development, the Council will work with stakeholders to deliver improvements to the public transport network that will support target levels of growth.

Key projects will include essential upgrades to Walthamstow Central and Leyton Underground Stations to accommodate step-free access and increased capacity a new station at Ruckholt Road, as well as wider improvements to Overground and bus services.

Mayor's Transport Investment Strategy outcomes[15] [16]

The following section provides details of the nine outcomes of the Mayors Transport Strategy, and sets out challenges and opportunities in meeting these within in the London Borough of Waltham Forest, and borough objectives that will contribute to meeting this overall aim.

Outcome 1: London's streets will be healthy and more Londoners will travel actively

MTS Objectives

Seek to make London a city where people choose to walk and cycle more often by improving street environments, making it easier for everyone to get around on foot and by cycle, and promoting the benefits of active travel. The Mayor's aim is that, by 2041, all Londoners do at least the 20 minutes of active travel they need to stay healthy each day.

Challenges and opportunities

Levels of Active Travel

The Travel in London Report 10 (2017) observed that over the two year period of 2014/15 to 2016/17 an average of 32% of residents within the borough undertook at least two x10 minutes of active travel a day. While this is a small decrease of 2% from the 2013/14 to 2015/15 period it places the borough as fourth highest in Outer London and 16th across London. Figure 9 shows the geographic location of residents undertaking these levels of activity.

The borough has an established high mode-share of walking, with the highest outer London walk mode share of 36%, higher than use of private car (32%), and the joint ninth highest cycling share in outer London in 2016/17. This places the borough as the third highest for walking and cycling in outer London, and the 14th highest in (38%).[17] As detailed below, it is expected that these levels will increase following delivery of the Enjoy Waltham Forest programme.

While the borough has relatively high levels of active travel, increasing these levels holds the potential to increase levels of sustainable travel in Waltham Forest, and to help avoid health risks associated with inactivity. As demonstrated in outcomes of initial monitoring from Enjoy Waltham Forest intentions increasing levels of people cycling and walking presents an

[15] Requirement R9: Boroughs are required to set out local issues, challenges and opportunities within the context of contributing towards the achievement of the nine Mayor's Transport Strategy outcomes and the relevant polices and proposals.

[16] Requirement R11: Boroughs are required to identify a set of locally specific LIP objectives that contribute to achieving the nine outcomes of the Mayor's Transport Strategy, and the relevant policies and proposals.

[17] LTDS 2016/17

opportunity to contribute to tackling key health problems within the borough, including mental wellbeing and a reduced risk of chronic illnesses such as Type 2 diabetes and cardiovascular disease.

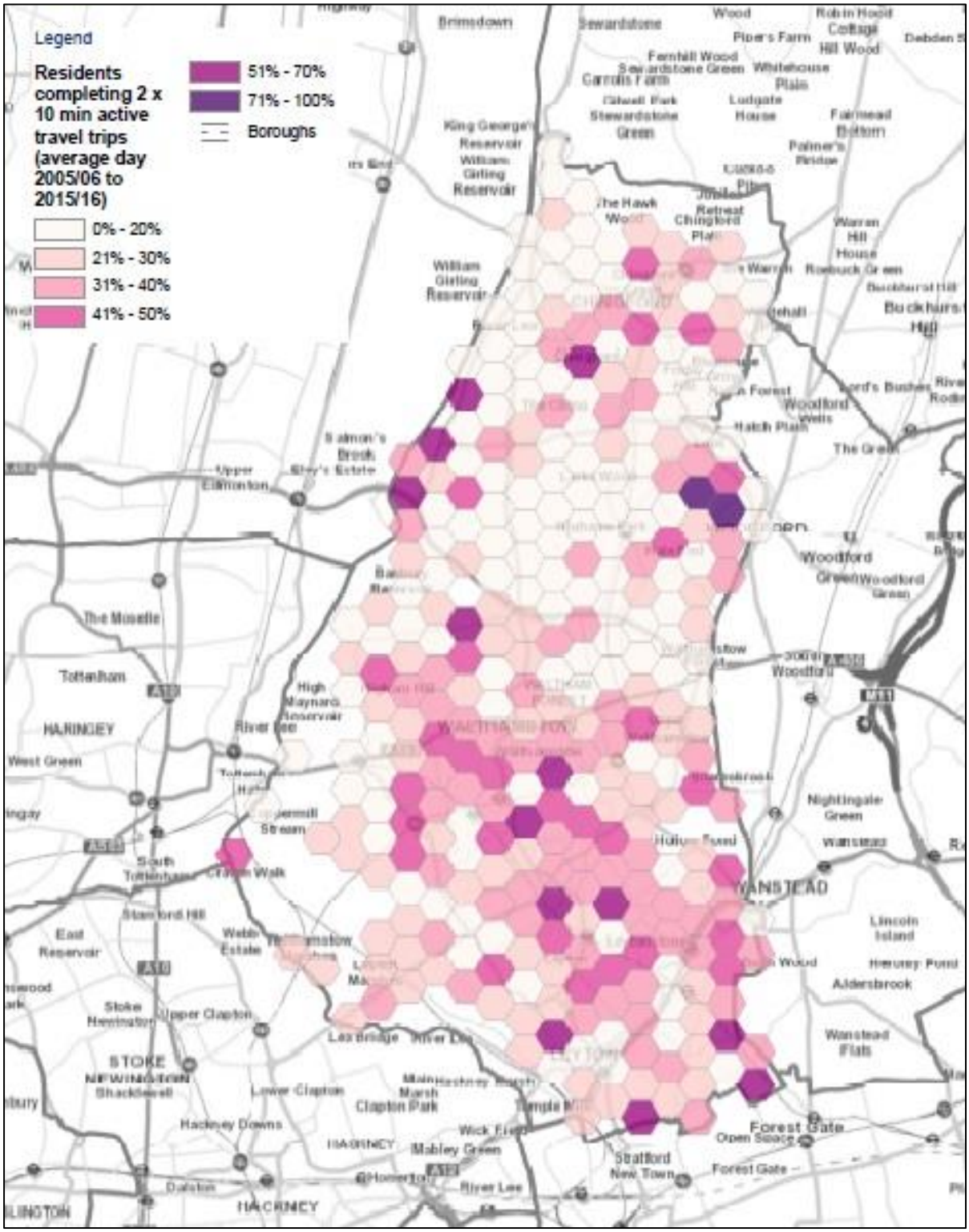


Figure 9 - Percentage of residents completing 2x10 minutes of active travel per day

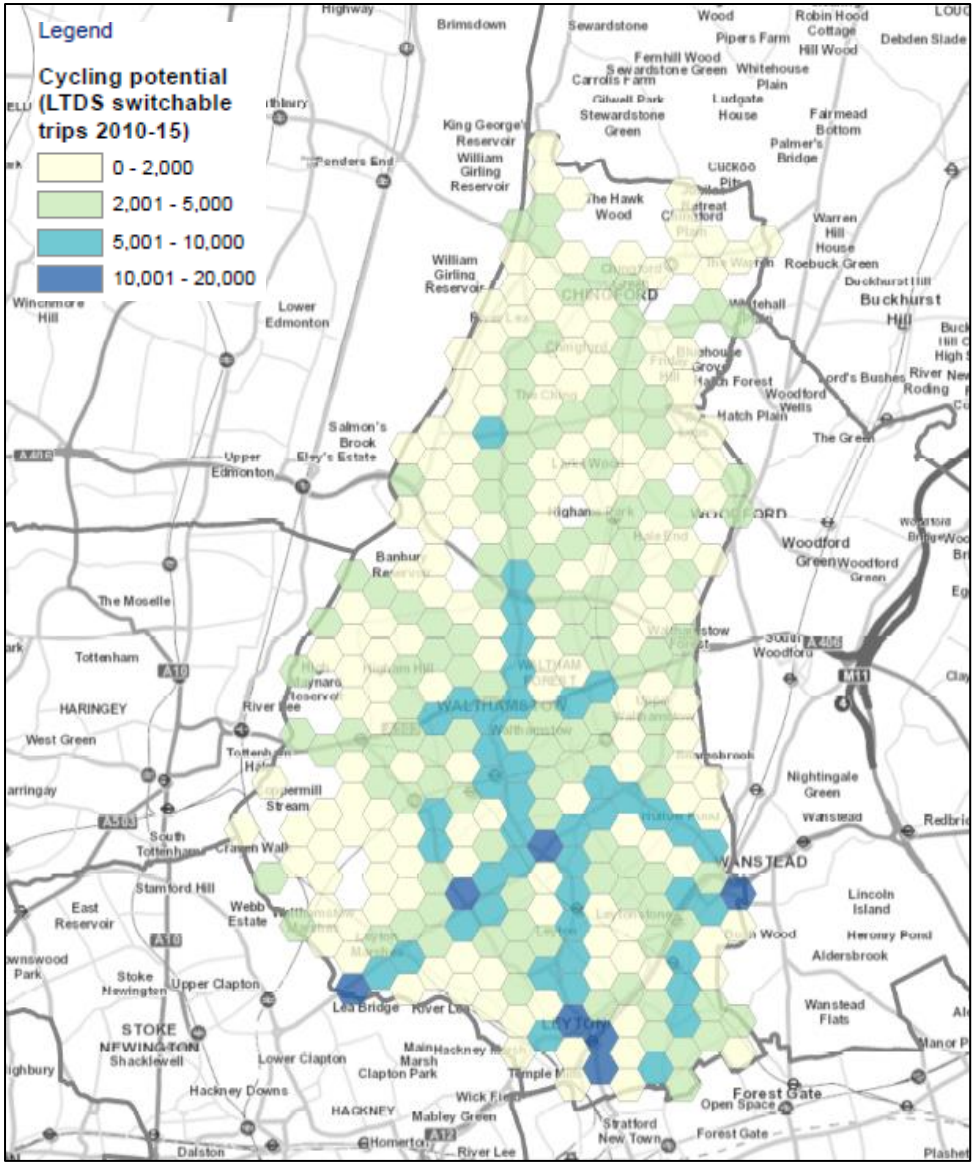


Figure 10 - Potential switchable daily trips to cycling

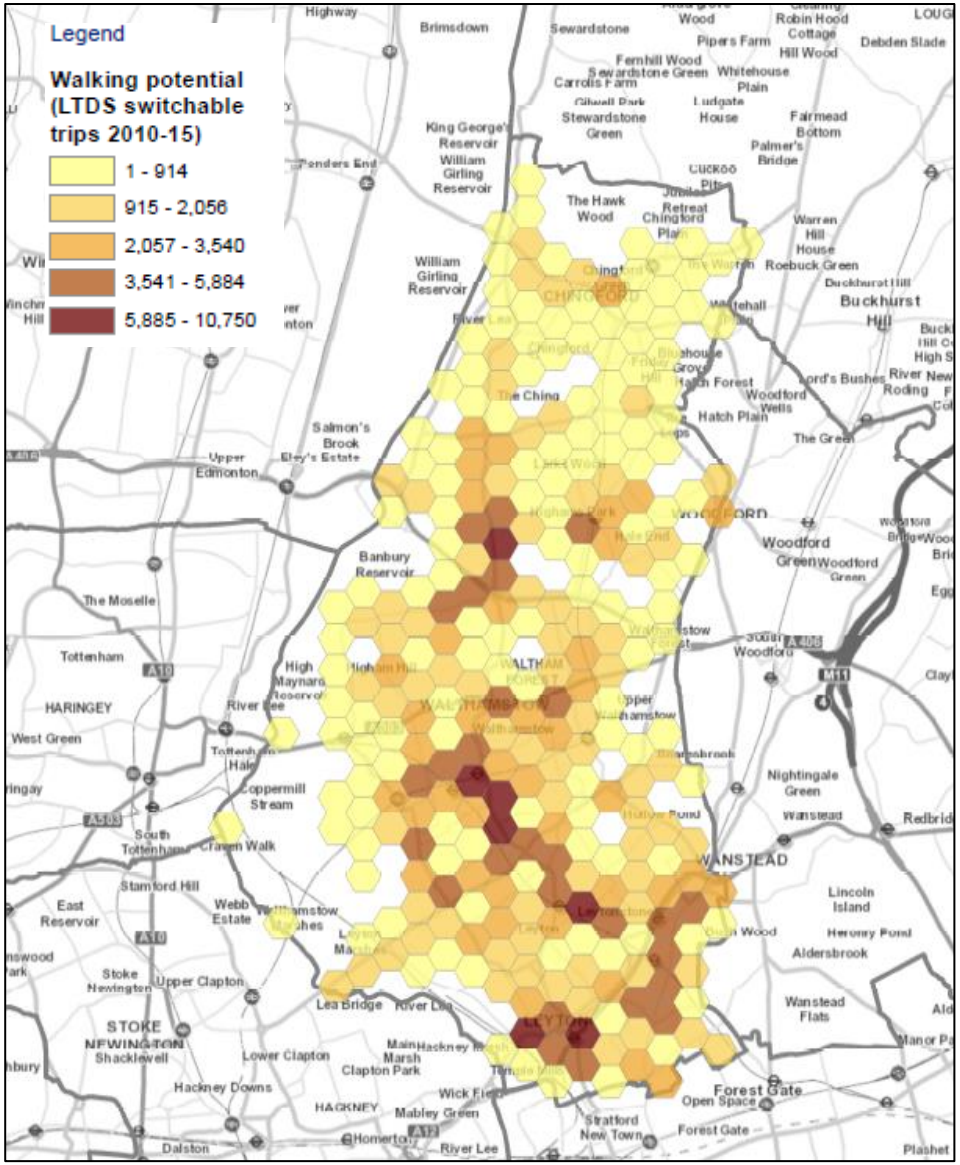


Figure 11 - Potential switchable daily trips to walking

Potential for Cycling and Walking

The LBWF Core Strategy, Transport Investment Strategy and 2020 Vision for Cycling each outline the need to minimise private vehicles journeys, with the 2020 Vision setting a target to reduce short car trips mode share to 35% by 2020.

TfL Analysis of Walking Potential also shows significant potential to grow levels of walking within the borough. It is estimated that an additional 73,400 additional trips could be made by foot each day with in the borough, building on the 205,600 walking daily trips estimated to be made in 2013/14. Many of these journeys are focused on trips to town centres, and it is estimated that 17,100 a trips a day could be made to Walthamstow, either entirely on foot or as walking as part of a journey stage.[18]

Similarly, TfL Analysis of Cycling Potential estimates that 240,700 trips could be cycled every day in the borough, building on 8,700 recorded in 2015. As detailed above in Figures 10 and 11, wards in the centre and the south of the borough, hold the most potential for cycling. Transport for London Mosaic analysis shows that many of these wards demonstrate a high 'propensity to cycle' meaning the type of people living in the area, their commutes and life circumstances mean they could easily adopt cycling into their daily lives.

The LTDS (2014) estimates that over 180,000 private vehicle trips could be cycled every day, and half of the 73,400 potentially walkable trips made in the borough, are currently made by car. Indicatively, in 2012 it was estimated that short car journeys made up 40% of mode share within the borough.

Enjoy Waltham Forest

The Enjoy Waltham Forest Programme is an integrated group of projects, programmes and initiatives that aim to create a step change in travel behaviour away from private car use towards sustainable and active travel modes. In accordance with the original bid requirements the programme is focused around the boroughs town centres in order to make them safer, more accessible and better connected on foot or by bike. The programme is currently in year four of five and is split into four main project areas as detailed below.

- A network of excellent, high quality cycle routes, including Lea bridge Road – A Street for Everyone
- Walthamstow Villages – A series of traffic reduction schemes in the residential areas surrounding Walthamstow Town Centre, based on Healthy Streets principles
- Town Centres – Improvements within the boroughs Town centre areas to them safer and more accessible for walking and cycling short trips
- Complimentary measures – A range of supporting projects and initiatives to promote and support behaviour change through increased cycle parking infrastructure and enhanced education, training and publicity programmes.

[18] http://content.tfl.gov.uk/analysis-of-walking-potential-2016.pdf

To date, the Borough has delivered 22km of segregated cycle lanes, 43 road filters to motor vehicles and two part-time road closures to create four low traffic neighbourhoods, the construction of, 104 improved pedestrian crossings, 30 new pocket parks and the planting of more than 660 new trees. Map of routes is provided on page 21, Figure 6.

Early monitoring of Enjoy Waltham Forest shows where high quality cycling and walking infrastructure is delivered, people travel more actively. Cycle counts at Lea Bridge Road show that on the busiest day in 2016/17, 2,074 people on bikes were recorded making west-bound trips, making up 14% of all westbound traffic on the road. Qualitative feedback received as part of the Walthamstow Village Scheme Review indicated that residents' walking trips in the area had increased by 28% and cycling trips by 19% following introduction of the scheme.

Independent research into changes in travel behaviour within Waltham Forest, and two other Mini Holland boroughs (Enfield and Kingston), has also shown significant shifts towards walking and cycling, and associated health benefits for residents following delivery. 2017 Westminster University research show that people living within "high dose" Mini-Holland areas spend an extra 32 minutes per week walking, or 9 minutes a cycling, compared with other outer London boroughs. Research undertaken by Kings College London suggests if current growth of mode shift is sustained to 2020 in Waltham Forest, it is estimated that this will increase life expectancy of each resident of the borough by seven to nine months[19]

However, despite success, the level of investment available as part of the Enjoy Waltham Forest programme has not been sufficient to cover the entire borough, with gaps between the A503 (Forest Road) and A406 (North Circular), and south of the A12. The Enjoy Waltham Forest programme is significant platform to build upon, but to ensure benefits are shared by all residents a wider programme of investment is needed to deliver improvements across all neighbourhoods.

Liveable Neighbourhoods

The principle of Liveable Neighbourhoods is already firmly embedded into the Borough's approach to increasing active travel amongst residents. The Liveable Neighbourhoods approach has been at the forefront of the boroughs Enjoy Waltham Forest "Village" schemes in Walthamstow, making these areas safer and more accessible places to walk and cycle and generally improving quality of life for residents in these areas. Based on success to date, the borough was subsequently successful in securing Liveable Neighbourhoods funding for the Coppermill area as part of the first round of submissions in 2017/18.

The scheme is currently in the feasibility development stage but ultimately seeks to expand the approach adopted as part of the Enjoy Waltham Forest programme through area wide improvements and enhanced walking and cycling connections between Walthamstow Town Centre, the Lower Lea Valley/Walthamstow Wetlands and onwards into Hackney. The

[19] https://walthamforest.gov.uk/content/increased-levels-walking-and-cycling-extend-life-expectancy-waltham-forest-residents-least

borough is also currently working in partnership with London Borough of Newham on a potential future joint Liveable Neighbourhoods bid that would intrinsically link Stratford and Forest Gate with Leyton and Leytonstone, providing significant improvements to safety and connectivity in one of London's highest growth areas

Delivering a borough wide cycle network

Figure 12 shows the current cycle network in Waltham Forest, and future routes planned for delivery. When complete, these will provide a strategic network of routes that aligns with the TfL Prioritised Strategic Cycling Connections, meets the MTS aim for 70% of residents to live within 400 metres of the London-wide cycle network, and enables and encourages residents to build cycling into their everyday lives.

Complete and planned routes are aligned along a mixture of quieter roads and spaces through primarily low traffic neighbourhoods and along main roads with high quality separated space for cycling. While the streets type will differ, each will deliver high quality cycling facilities that meet or exceed TfL Healthy Streets criteria and London Cycle Design Standards. Completed routes include those delivered as part of Enjoy Waltham Forest, TfL Quietways programme, and London Cycle Network, each providing links to London-wide routes including Cycle Superhighway 1, National Cycle Network 1, and Quietways 2 and 6.

Alongside the strategic network there are a number of local routes in predominantly residential areas, contributing to the aim of liveable neighbourhoods for all. These are essential to providing local permeability and connectivity between homes, town centres, growth areas, employment and activity generators and the strategic cycle network. Delivery of this dense network of main road and quieter residential cycle routes provides ultimate route choice for residents, accommodating both short local journeys and longer trips, and those who prefer to travel on the main road network or lower traffic environments.

Delivery of routes on main roads is essential to delivery of the borough strategic cycle network, and priority roads include Forest Road, Woodford New Road, High Road Leyton, Hoe Street and High Road Leytonstone. While improvements to residential streets can often be delivered through cost-effective measures, the traffic composition of main roads requires fully segregated facilities to provide appropriate provision for cycling, and significant investment is required for delivery. The Borough aims to support delivery of these schemes through LIP contributions, but also other Council and external funding sources.

Improving the Walking Network across the Borough

Consistent with the aims of the TfL Walking Action Plan, the borough is committed to delivering improvements to its streets that will encourage an increase in walking amongst residents. Central to achieving this aim is the removal of key barriers that deter people from walking, including concerns around road danger and personal safety, high traffic volumes and speeds, a lack of infrastructure that prioritises and supports pedestrian journeys, and poor accessibility for people with disabilities. [20]

[20] http://content.tfl.gov.uk/mts-walking-action-plan.pdf

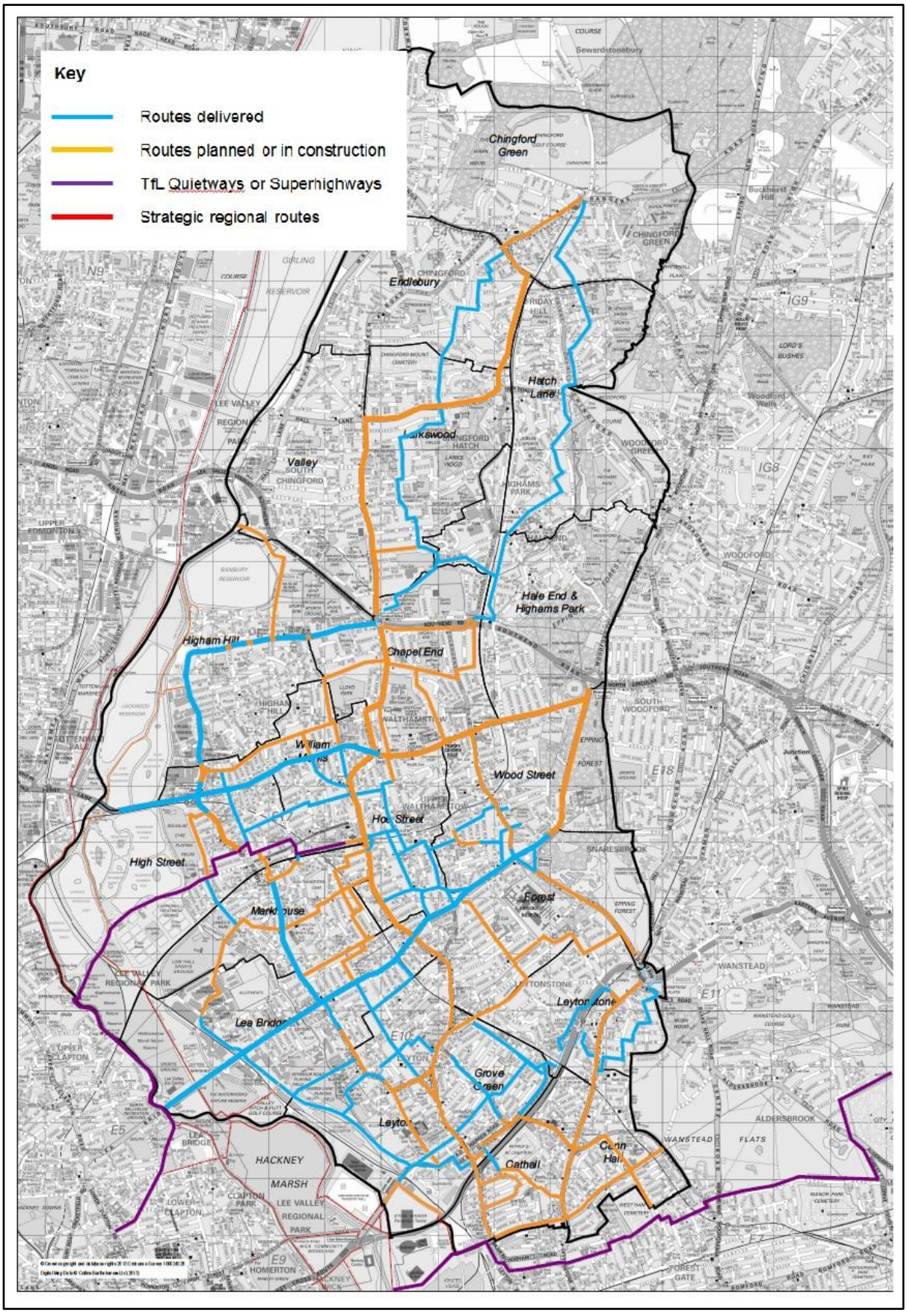


Figure 12 - Current and Future Cycle Network in Waltham Forest

Delivering benefits for people who walk is a key design requirement for all new infrastructure schemes on borough streets. For example, major improvements to the walking environment have been achieved through the Enjoy Waltham Forest programme, including the delivery of new low-traffic neighbourhoods, reduction of traffic speeds on residential streets, decluttering and widening of footways, provision of new or re-timed crossing points on busy roads and major junctions, and enhanced public space at local destinations. Combined with new cycling infrastructure, improvements have resulted in more active and well-used streets, as demonstrated in the increase in walking where new schemes have been delivered.

The Council's is continuing this approach to improving the pedestrian environment and delivering more active streets across the borough, through the Liveable Neighbourhood project in Coppermill lane, as well as neighbourhood improvements as part of the LIP programme and other major transport projects in the borough. These will seek to improve walking access to town centres and public transport hubs, improving the quality and resilience of the public realm, creating safer neighbourhood environments and reducing motor dominance on local streets.

Challenges to Delivery Cycling and Walking Infrastructure

Experience from projects delivered to date has shown there continues to be a wide spectrum of views on the overall need for behaviour change, the mechanisms by which this can potentially be achieved, and the perceived impacts of the interventions delivered, both positive and negative. Obtaining community support and buy-in for interventions remains a challenge in some areas and proactive, interactive and meaningful engagement is essential if the borough is to continue delivering high quality walking and cycling infrastructure in order to provide better active travel options and reduce car dependency.

Technical design constraints and competition for highway space also represent a key challenge to delivery of borough-wide active, and sustainable travel infrastructure. Many key walking and cycling corridors are aligned along the primary and secondary road network where there are a multitude of competing requirements that must be accommodated within a finite amount of space. Balancing the needs and aspirations of all sustainable transport modes, while also considering other local needs and priorities, remains a significant challenge in many cases, often requiring compromise solutions that do not meet all stakeholder and community requirements.

The mixed geography of the borough also represents a challenge in the delivery of schemes. With a less dense urban fabric, journeys in the north of the borough require longer journeys to local amenities, resulting in higher levels of car dependency, and a lower propensity to walk and cycle.

Cycle Parking

A lack of secure and convenient cycle parking is a key barrier preventing people making trips by bike, whether this being for commuting or local leisure and shopping trips. The borough has invested significantly in a range of cycle parking infrastructure over the last 4 years using funding from the Enjoy Waltham Forest Programme, Borough Cycling Partnership, LIP, and Council capital. To date the borough has introduced:

- Seven secure cycle hubs at major rail and underground stations with space for over 550 bikes
- Over 250 residential cycle hangars providing secure cycle parking at home for over 1500 residents.
- Over 400 on-street cycle stands for business, retail and recreational use.

Despite this investment demand for further infrastructure remains significant. A number of stations in the borough do not have any secure cycle parking facilities to facilitate multi-modal trips and the borough currently has over 3000 residents waiting for a space in a residential hangar.

Complementary Measures

Alongside infrastructure improvements the Borough has delivered a wide range of complimentary measures and behaviour change initiatives. The borough has delivered cycle training to over 2000 adults and children each year over the past 3 years, has increased the number of schools with accredited STP's from single figures to nearly 40 (approximately half the schools in the borough, and has delivered a range of publicity and promotion events including the Tour de Waltham Forest cycle ride which was attended by over 700 people in 2018.

Borough Objectives

LBWF Objective 1.1 – To increase levels of active travel amongst people who live and work in the borough: Following the aim within the 2020 Vision for Cycling, the borough aims to continue to grow the overall mode share people travelling actively within the borough.

Consistent with the MTS target of 70% of Londoners undertaking 20 minutes of active travel, the Council has a set mode share target of cycling and walking in the borough of 10% by 2020, with significant steps to reach this target already made.

LBWF Objective 1.2 – Reduce motor traffic dominance and increase the active use of streets: Increasing the number of people using streets actively in the borough, while reducing the levels of vehicle travel forms a key objective of the aim to deliver liveable neighbourhoods in Waltham Forest.

The borough aims to continue the successful approach of the Enjoy Waltham Forest programme to change how streets are used and enjoyed across the borough. Central to delivery of this is continued investment in highway improvements, as well as promoting activities that reallocate road space to people who walk or cycle and for place functions, including new public places, play streets, and school streets.

LBWF Objective 1.3 - To continue to deliver a core cycle network for all residents: The borough seeks to deliver a comprehensive, high quality cycle network, which makes all areas in the borough accessible for residents and visitors, and connects to the pan-London network.

Using the core strategic cycle network provided in the Strategic Cycling Analysis as a guide, the borough will work towards delivery of a core cycle network which delivers the MTS target

for 70% of residents to live within 400 metres of the Strategic Cycle Network. Complementing this, the borough will continue to deliver area based traffic reduction schemes to link into these routes.

LBWF Objective 1.4 – Every resident will be supported to make healthy travel choices: In addition to delivery of infrastructure, the borough aims to support all people who live, work or visit the borough to make healthy lifestyle and travel choices that support good health and sustainability.

Central to this aim will be raising awareness of journeys that can be easily walkable and cycleable, as well as soft measures such as launch of free to hire bikes, supporting personal travel planning, and engagement with pupils and parents at schools.

Objective 1.5 – Continuing to consider pedestrians as a priority mode in all scheme design: Placing pedestrians as priority users in design of highway works, the borough will continue to deliver enhancements to the walking environment through all street improvement and transport projects in Waltham Forest.

This will continue the approach taken through the Enjoy Waltham Forest programme, and aim to deliver improvements to the quality and journey times of pedestrian journeys, reduction in traffic volume and speeds on local and major roads, and improve the perception of safety on borough streets.

LBWF Objective 1.6 - Every resident and visitor will has somewhere to keep their cycle: To complement the borough-wide cycle network, the Council seeks to deliver fit for purpose, accessible and secure cycle parking for all people who live and work in the borough, located at all destinations across the borough, including residential streets, stations, town centres and shopping areas, and new developments.

Cycle parking is should to meets needs of all users, and appropriate levels will be delivered to accommodate disabled cyclists using trikes and tandems, as well as and cargo bike users.

Outcome 2: London's streets will be safe and secure

MTS Objectives

Adopt Vision Zero for road danger in London. The Mayor's aim is for no one to be killed in or by a London bus by 2030, and for all deaths and serious injuries from road collisions to be eliminated from London's streets by 2041.

Ensure that crime and the fear of crime remain low on London's streets and transport system through designing secure environments and by providing dedicated specialist and integrated policing for London's transport system.

Borough Collision Statistics

Table 2 shows the collision and casualty trends in the borough between 2014 and 2017. The Borough experienced a peak in overall collisions (758) and casualties (952) in 2014 before dropping 15% in 2015 (642 and 805 respectively). Overall, collision and casualty levels remained relatively consistent since 2015 with only small increases year on year in 2016 and 2017.

Serious and fatal casualties fluctuated between 2014 and 2016 with a low of 48 in 2015 and a high of 61 in 2014. A noticeable spike in serious collisions and casualties took place in 2017. It is the boroughs understanding that this increase can be largely attributed to changes in classification of severity in 2017, meaning certain injuries sustained prior to 2017 classified as 'slight' are now classified as 'serious'. This is supported by the overall number of collisions and casualties, which remained consistent between 2016 and 2017. Until more annual casualty data is provided, evaluation of recent trends and performance is difficult.

	Borough-wide Casualty Data					**Borough-wide Collision Data**				
Year	**2014**	**2015**	**2016**	**2017**	**Total**	**2014**	**2015**	**2016**	**2017**	**Total**
Slight	891	757	761	751	3160	702	596	612	595	2505
Serious	59	47	56	89	251	54	45	56	82	237
Fatal	2	1	4	4	11	2	1	4	4	11
Total	**952**	**805**	**821**	**844**	**3422**	**758**	**642**	**672**	**681**	**2753**

Table 2 - Borough wide collision and casualty levels

Based on data from TfL, an annual average of 64 serious and fatal collisions resulting in serious or fatal injuries occurred within the borough between 2010 and 2014. To meet the TfL Vision Zero goal, it is estimated that this will need to reduce to 32 by 2022 (the end of the LIP investment period), and 19 by 2030[21]. While it is positive that collision and casualty

[21] It is unclear whether the changes to injury severity classification has been taken into consideration and new trajectories will be set to achieve Vision Zero outcomes and target reductions.

levels have remained broadly consistent over the last years, a major increase in investment is required in targeted collision reduction interventions alongside more general active and sustainable transport improvements in order to achieve the MTS Vision Zero outcomes.

Vulnerable Road Users

As shown in Table 3, vulnerable road users (pedestrians, pedal cyclists and powered two-wheeler drivers) accounted for over 70% of all serious and fatal casualties on the boroughs road network between 2014 and 2017.

Casualties by type*	**2014**		**2015**		**2016**		**2017**		**Total**	**%**
	Fatal	Serious	Fatal	Serious	Fatal	Serious	Fatal	Serious	KSI	KSI
Car Driver	1	13	0	5	0	5	0	14	38	14.50
Pedestrian	0	22	1	19	0	12	4	40	98	37.40
Pedal Cyclist	0	7	0	12	0	10	0	12	41	15.65
Car Passenger	0	4	0	2	0	4	0	10	20	7.63
PTW Rider	0	9	0	7	4	19	0	11	50	19.08
PSV Passenger	0	1	0	1	0	5	0	1	8	3.05
Goods Driver	0	0	0	1	0	1	0	0	2	0.76
Hack / PRI Driver	0	0	0	0	0	0	0	0	0	0.00
Hack / PRI Passenger	0	0	0	0	0	0	0	0	0	0.00
PSV Driver	0	1	0	0	0	0	0	0	1	0.38
Pillion Passenger	0	1	0	0	0	0	0	0	1	0.38
Goods Passenger	0	0	0	0	0	0	0	0	0	0.00
Others / Unknown	1	1	0	0	0	0	0	1	3	1.15
Total	**2**	**59**	**1**	**47**	**4**	**56**	**4**	**89**	**262**	**100**

Table 3 - Fatal and serious casualties by mode of travel for the period 2014-2017

Pedestrians accounted for almost 40% of all serious and fatal casualties in the borough, and over half of vulnerable road user casualties. Pedestrian causalities remained consistent in 2014 and 2015 before dropping in 2016, with no fatalities recorded. A significant increase was seen in 2017, including 4 fatalities. While some of this increase can be attributed to changes in injury classification, figures clearly show that much more investment is needed across the borough on walking and pedestrian safety improvements. This will include targeted interventions, speed reduction measures, reduction of traffic volumes and wider programmes to create liveable neighbourhoods.

After a slight rise between 2014 and 2015, the number of overall and serious pedal cycle casualties has remained at around 10-12 per year since 2015, and no fatal incidents have occurred in the last four years.

Monitoring of cycling levels in the borough suggest that the number and frequency of people cycling has been increasing during this time period with no increase on causalities. While this shows the positive impact of investment to date further work is clearly required to continue expanding the boroughs active travel network in-line with Vison Zero targets. This will include continued delivery of a high quality cycle network, low traffic neighbourhoods and safety improvements to facilitate and support cycling growth while reducing road danger.

Powered two-wheeler (P2W) drivers accounted for almost 20% of all serious and fatal casualties in the borough over the four year period. P2W casualties were highest in 2016, including four fatalities, twice that of any other year during the period. Fatal and serious casualty numbers in 2017 returned to 2014 and 2015 levels, suggesting that 2016 was an isolated spike rather than the start of a significant change in P2W casualty trends. Further work is required to identify key locations and common behavioural or environmental characteristics associated with serious and fatal P2W collision so these can be targeted as part of infrastructure or education, training and awareness programmes.

Geographic analysis of collisions

Geographic analysis of all collisions involving pedestrians and cycles over the period 2013-2017 (shown in Figure 13 and 14) show that the majority of collisions occurred on the boroughs primary and secondary road network. This is largely to be expected given the higher volumes of traffic that use these roads, greater vehicle speeds, and higher level of interaction between users. However, a significant number of the serious collisions involving pedestrians and cycles also occurred away from the primary and secondary road network, on what are traditionally considered to be lower volume and speed residential roads.

There are likely to be a number of factors leading to this including propensity for people to choose to walk and cycle on streets perceived to be quiet residential roads, an absence of formal controlled crossings and dedicated infrastructure for cycles, and drivers perceiving roads to be a low interaction low risk environment. These patterns highlight the need for both integrated corridor improvements on the primary and secondary road network along with neighbourhood based treatments to reduce the amount and speed of traffic using residential areas in the borough.

Many of the primary and secondary roads identified in Figures 13 and 14 have seen investment in the last three years as part of the Enjoy Waltham Forest Programme. Until the impact of these improvements can be robustly assessed, further safety-led investment will be focused on corridors and junctions that have not formed part of the Enjoy Waltham Forest programme or other investment programmes in the last 3-5 years. Similarly, residential areas in and surrounding Walthamstow Central, Leyton and Leytonstone have received area based treatments focusing on traffic reduction and improving the walking and cycling environment. Further safety-led area based investment will be focused on other residential areas to ensure that all communities in the borough benefit.

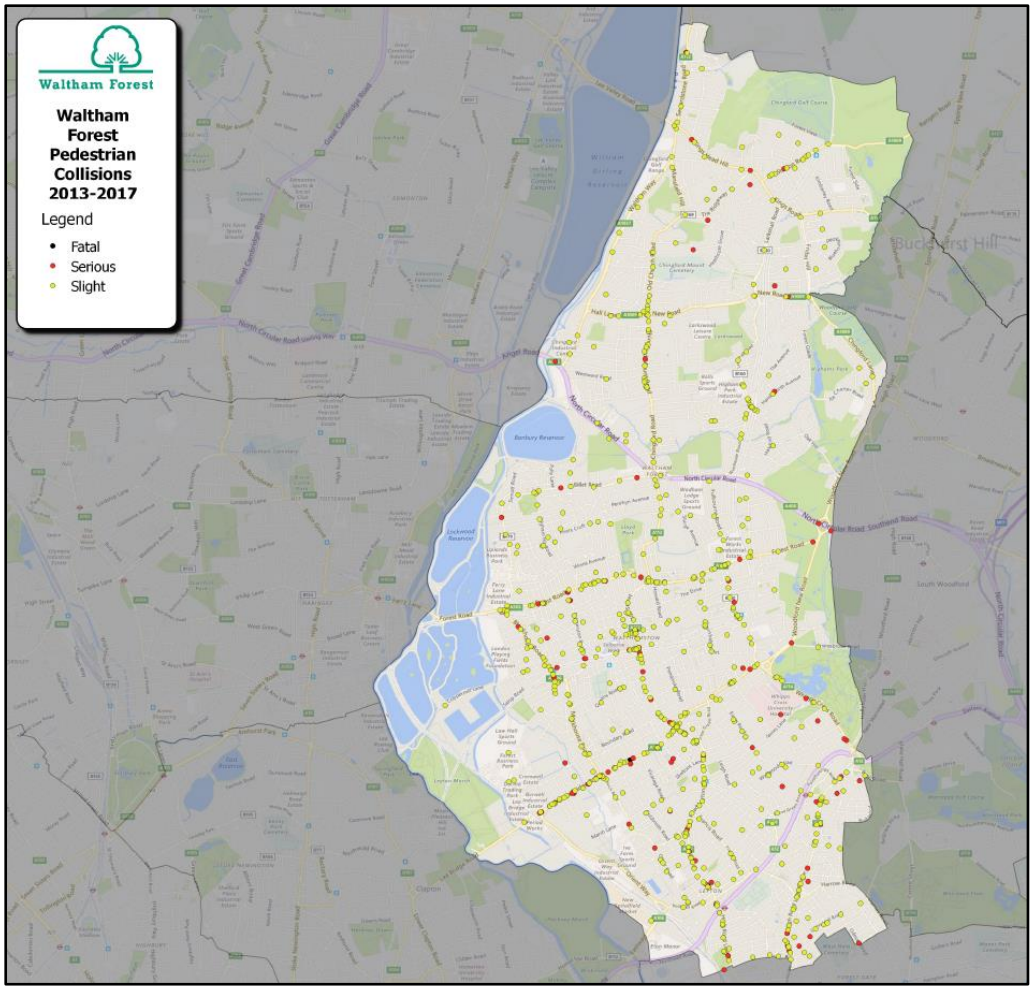


Figure 13 - Collisions involving pedestrians by severity, 2013-2017

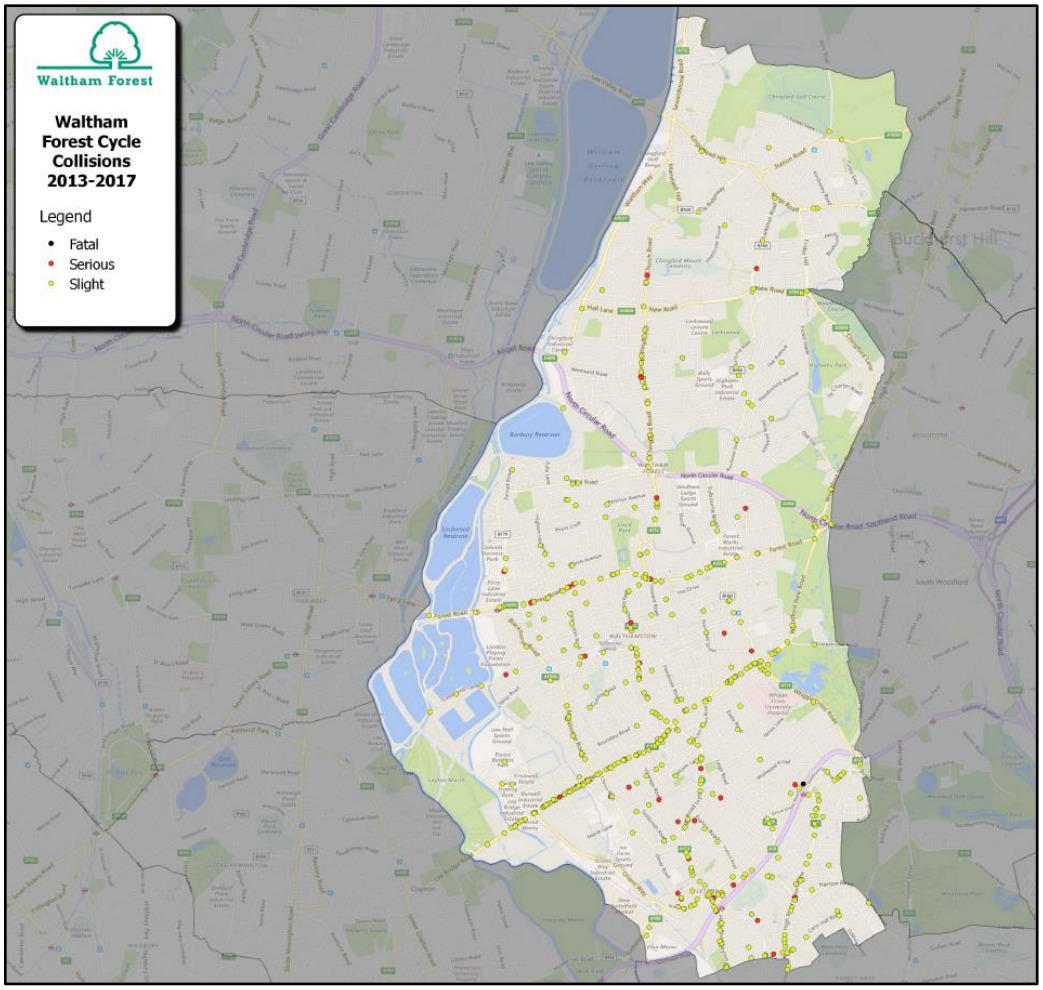


Figure 14 - collisions involving cycles by severity, 2013 -2017

20 mph

In 2012 the borough committed to making all residential roads 20mph as part of the adopted Cycle Action Plan, generally through the use of physical calming measures, where required. The borough has been progressively lowering the speed limit on residential roads through the introduction of 20mph zones over the past 6 years and at present around 85% of the borough's residential network is subject to a 20mph limit. North Chingford is the only remaining area where the speed limit on residential roads is yet to be reduced and this area is a high priority for the borough over the next 3 year period

As part of the Enjoy Waltham Forest programme the speed limit are also being reduced on a number of the key main road corridors where investment in walking and cycling infrastructure is taking place. By the end of 2019/20 all main roads south of the A406 (north circular) will be subject to a 20mph speed limit with the exception of Woodford New Road and Whipps Cross Road, where the speed limit is being reduced from 40mph to 30mph. By 2021 the borough wants to extend the current programme so that all roads are subject to a 20mph limit.

Road Safety Plan

The borough is currently developing a Road Safety Plan which is scheduled for completion in November 2018. The Road Safety Plan will contain detailed collision and casualty analysis over the 5 year period between 2013 and 2017 to identify key geographic, modal and demographic trends and patterns. This analysis will be used to develop a prioritised programme of highway infrastructure and Education, Training and Publicity programmes over the next 3-5 years, taking into consideration locations and work streams of investment to date

The borough has also recently been successful in securing 3 year funding from the Road Safety Council to undertake an interactive study into the perception of road danger in the borough. In July 2018 the Council launched an online map based platform allowing members of the public to highlight areas and locations in the borough they perceive to be unsafe. The platform will be open to the public for the entire 3 year period and will provide valuable insight into user perception of road danger. This information will be used alongside conventional statistical data to help prioritise future projects and develop specific proposals to reduce actual and perceived road danger

Stakeholder Support for Measures

Most road users support the principle of improving safety and reducing road danger but there are often challenges obtaining stakeholder buy-in and support for the specific interventions proposed to achieve this. For example, in areas of higher car use and dependency the level of support for proposals to reduce the speed limit and introduce physical speed reduction measures is often lower than areas where the use of sustainable and active travel modes is higher. Ensuring stakeholders are engaged throughout the process so that the benefits and impacts can be clearly communicated is key.

Enforcement of Speeding

Appropriate and effective enforcement of speed limits is a long standing issue for the borough and its residents. Speeding has long been known to be one of the fundamental causes of road traffic collisions on the public highway and significant evidence exists to demonstrate safety benefits of lower vehicle speeds, both in terms of actual safety (number and severity of collisions) and subjective safety (users perception of road safety and the removal of psychological barriers to more active and sustainable modes of transport).

The borough have continued to implement in road safety improvements over the past 5 years using TfL and borough capital funding, and work closely with the Metropolitan Police on speed reduction programmes such as the Community Roadwatch. However, the tools currently at the disposal of the Council to address this issue are limited to encouraging compliance and highway interventions, often with significant constraints and limited impact. This does not provide the ability to effectively and robustly tackle this problem as we would like to, and ultimately limits the ability to achieve Vision Zero.

An effective, locally managed and delivered enforcement mechanism for speeding is needed. Currently, powers for speeding in London sit with the Metropolitan Police, and while the borough values the service they provide, it is well known that resources for the enforcement of traffic related matters are limited. In response, the borough has continually campaigned to for the Mayor of London requesting investigation into devolving Police powers for speeding enforcement to local authorities. It is recognised that this is a complex and a long term aspiration, and greater resource must be provided to the Police to allow rigorous enforcement in the interim.

Transport mix

As the number of people undertaking trips by sustainable modes, particularly walking and cycling, increases the number of vulnerable road users exposed to potential road danger increases as well. The borough has and will continue to invest significantly in highway infrastructure improvements to reduce the volume, speed and impact of motor traffic and provide safe space for walking and cycling in order to reduce road danger, however, even in the long term it is not possible to remove all interaction between users on all roads.

There is an inherent risk therefore, particularly in the short term before wider investment can take place, that as the number of people walking and cycling increases exposure to potential road danger increases proportionately and the number of collisions may not go down in line with the target trajectory.

HGV’s

HGV’s make up a very small proportion of road traffic in London but account for over half of cycle fatalities and almost a quarter of pedestrian fatalities. Between 2013 and 2015, 116 pedestrians and cyclists were killed or seriously injured in collisions with Goods vehicles (TfL Direct Vision Standards TEC report). Highway Infrastructure interventions to separate vulnerable road users from HGV traffic will inevitably reduce road danger but removing all interaction will never be possible as set out above.

A broader range of measures to improve HGV safety, such as improved in-vehicle visibility and technology are required to help achieve the boroughs road danger objectives, many of which sit outside of the boroughs direct control

Actual and Perception of Crime

Crime rates in Waltham Forest have continually fallen, and since the year 2013-2014 crime rates have remained below the London average. From April 2015 to March 2016, a total of 21,740 crimes were recorded by the Metropolitan Police in Waltham Forest, an increase of 4.6% on the year before. This rise follow national trends as Police in England and Wales recorded an annual rise of 9%.

While crime rates are below the London average, public perception of crime is higher than this. The Metropolitan Police Service Public Attitude Survey was carried out in December 2015; this identified that 35% of residents were 'worried' or 'very worried' about crime in the area. This is slightly higher than the London average of 33%. Similarly, concerns over crime, security and anti-social behaviour have featured highly in many of the perception and early engagement surveys completed by the borough as part of the Enjoy Waltham Forest programme.

The LBWF Local Plan (2012) and Direction of Travel (2017) highlight the role of the built environment and high quality public realm in reducing crime, and improving public perception of safety.[22] The borough is committed to using the principle of designing out crime, and this is reflected in its transport schemes. For example, through Enjoy Waltham Forest programme, the Council have introduced new lighting and CCTV schemes across the borough to improve actual and perceived safety of users, as well as measures to increase footfall in isolated areas of the borough to increase passive surveillance.

Borough Objectives

LBWF Objective 2.1 – To support delivery of Vision Zero by 2041: The borough is supportive of the Mayors aim to eliminate deaths and serious injuries from London's road network, and will work towards delivery of Vision Zero by reducing likelihood of people being injured on the borough's roads..

Significant investment is needed to delivery of the overall vision, and specific targets will be included in the forthcoming Borough Road Safety strategy, accompanied by an action plan of measures to be implemented in the short, medium and long term.

LBWF Objective 2.2 – Create safer neighbourhoods: Reducing road danger and improving personal security form a key aim of the Council's objective to deliver liveable neighbourhoods across the Waltham Forest. This aim is already embedded in delivery of the Enjoy Waltham programme and the Coppermill Lane Liveable Neighbourhoods project, and

[22] https://walthamforest.gov.uk/sites/default/files/C0093_WFScopingReport_V3_130717.pdf

the borough seeks to continue to invest in neighbourhoods not included in these programmes.

LBWF Objective 2.3 – Implement and enforce 20mph speed limit on all borough roads: In line with the 2012 Cycling Action Plan, the borough aims to deliver 20mph speed limits across all residential roads in Waltham Forest by 2020, and all roads by 2021.

Effective enforcement of 20mph speed limits is essential, and the Council will work with the Metropolitan Police and TfL to better manage adherence to speed limits. This could include targeted enforcement, use of technology (such as intelligent speed management), or devolution of powers of enforcement.

LBWF Objective 2.4 – Making freight, servicing, and deliveries safe and sustainable: The borough is committed to reducing the road safety danger presented by the operation of freight in Waltham Forest, including better management of freight, deliveries, and construction traffic.

Key actions to reducing this impact include managing construction traffic through the planning process, retiming deliveries outside peak hours, implementing Fleet Operator Recognition Scheme (FORS) Gold Standard for Council fleet, and reducing overall vehicles on the road through the Zero Emission Delivery (ZED) network.

LBWF Objective 2.5 – Implement borough Road Safety Plan: The borough is currently developing a road safety strategy and action plan, for implementation in 2019. This will detail key road safety issues within the borough, as well as actions to improve road safety for all users. Actions to improve road safety are expected to include prioritised infrastructure and publicity, training and education for drivers – prioritising over-represented groups and vulnerable road users.

LBWF Objective 2.6 - Ensuring Safety and Security through Design: The Council are committed to working with the Metropolitan Police on all schemes that make significant changes to the public realm or deliver new transport infrastructure, to deliver safe environments that reduce crime and improve actual and perception of personal safety.

The Council will apply the principles of designing out crime within all schemes that it delivers, and where significant changes are proposed the Council will engage with the relevant Designing Out Crime Officer, Transport Management Unit Officer and Counter Terrorism Security Adviser during the design and implementation stages of scheme development.

Outcome 3: London's streets will be used more efficiently and have less traffic on them

MTS Objectives

Prioritise space-efficient modes of transport to tackle congestion and improve the efficiency of streets for the movement of people and goods, with the aim of reducing overall traffic levels by 10-15% by 2041.

Use the Healthy Streets Approach to deliver co-ordinated improvements to public transport and streets to provide an attractive whole journey experience that will facilitate mode shift away from the car.

Challenges and opportunities

Traffic Volumes and Ownership

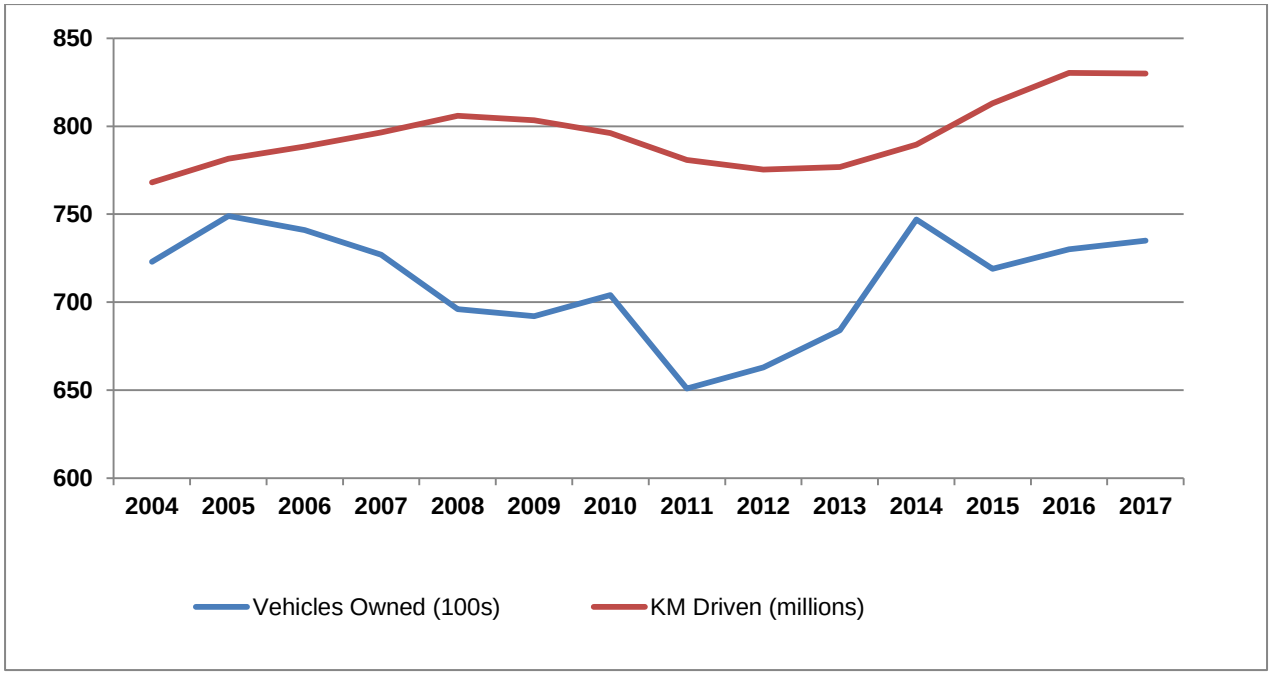
The DfT estimates that 735 million kilometres were driven on Waltham Forest roads in 2017. It is estimated that this comprised 563 million kilometres driven by cars, and 172 million by other motorised vehicles, including freight, buses, vans, and powered two wheelers.

A 10 year peak in kilometres driven was observed in 2014, where it is estimated that 747 million kilometres were driven in the borough. Since this peak, distance driven by vehicles on borough roads has decreased by 12 million km (a 2% decrease), during which the number of car kilometres driven dropped by 30 million km. However distance of non-car journeys continued to grow, with an additional 17 million km made by these modes in this period.

In 2017 there were 82,998 private cars and light goods vehicles registered to addresses within the borough, including 75,776 cars, and 7,232 light and goods vehicles. This represents an increase of 4,034 licensed vehicles in the borough since 2014 (5% growth), including 3,903 additional cars (including taxis and private hire) and 131 light and heavy goods vehicles (5% growth in car ownership, and 2% growth in light goods vehicles ownership). Levels of car ownership dropped for the first time in six years in 2017, reducing by 200 cars on 2016 levels.

Further research is needed to understand the causes of this increase in vehicle ownership, with factors such as population growth, and change in demographics of the population likely to be key factors.

Graph 1 below shows the long term relationship between vehicle ownership in Waltham Forest and distances driven on borough roads. To meet the borough MTS trajectories to reduce current levels of household car ownership by 12% and overall volume of traffic by 10% by 2041, a shift in the link between car ownership and population growth is required. Central to this will be provision of new residents with attractive and convenient alternatives to car use, as well as reducing levels of car ownership amongst the current population.



Graph 1: Number of cars or light goods vehicles licensed in Waltham Forest vs. vehicle km driven

Freight, Deliveries and Servicing

As outlined in the LBWF Transport Investment Strategy, an increase in freight, construction traffic, and deliveries associated with growth has had a significant impact on congestion, air pollution and road safety in town centres and residential streets. DfT counts at 47 locations on a roads in the borough between 2013 and 2016 has shown an increase of 23% in Light Goods Vehicles and HGVs, which make up 20% on traffic on these roads.

Waltham Forest is committed to delivering solutions to improve the efficiency and volume of freight and deliveries across the borough. For example, as part of the Enjoy Waltham Forest programme the Council have implemented a Zero Emission Delivery (ZED) scheme, using electric assist cargo bikes, available for use by all businesses and residents across the borough. From September 2017, the service has delivered 7,335 packages within the borough, travelled over 4,263 miles, and saved an estimated 2076 CO2 equivalent emissions.

The LBWF Air Quality Action Plan details a number of wider opportunities being developed by the borough to improve efficiency of freight and deliveries. These include introduction of virtual loading bays in town centres, managing the local authority procurement policies for waste and deliveries, and working with businesses to improve last mile delivery services and redeveloping industrial estates with better technology. Further work with TfL, neighbouring local authorities, and local industrial, retail, service and logistics sectors is needed to develop and implement plans that mitigate impacts, and support growth in the borough.

Construction logistics plans (CLP) are also a key tool in managing freight and deliveries to construction sites, and the borough is actively requesting developers apply emerging TfL CLP guidance within planning applications. If used correctly, this will enable reduction of volume and impact of construction freight, consolidate vehicle movements, retime delivers, and shift road based deliveries towards other modes such as rail and water based modes.

Car-Free Developments

As stated in the LBWF Core Strategy, the availability of parking spaces is a key determinant of mode choice and car usage, and effective management of residential car parking provides a key opportunity to reduce links between population growth and increase in car ownership.

The Council is actively securing car-free development across the borough, as well as seeking to implement a dedicated car-free policy. Since 2016, 48 car-free developments have been secured through Section 106, delivering an average parking ratio of 0.1 spaces per unit across 3,043 new homes, including disabled parking. However, while this approach has been successfully applied in growth areas and locations with high PTAL, cross-borough implementation is currently limited by poor public transport connectivity, a limited definition of connectivity within London-wide policy, and low level of parking controls, especially in the north of the borough.

To successfully deliver a car-free approach across the borough, further support and investment in public transport is needed from TfL and the GLA. Of particular importance is a broadened measure of connectivity beyond PTAL, recognising wider factors that define the need for car ownership. These include proximity to strategic cycling and walking networks, local services and amenities (schools, GPs, shops, leisure centres), alternatives to car ownership (car clubs), and travel time key employment zones and town centres. Continued research into the link between car ownership and car use is also needed to support emerging Council policy, and to provide further evidence to during the planning process.

Controlled Parking Zones

To support implementation of car-free, and to manage levels of car ownership and parking stress, the Council is continuing to deliver Controlled Parking Zones (CPZ) across the borough (shown in Figure 15). The Council's current Controlled Parking Zone policy is demand led with area wide parking control schemes considered and prioritised on a responsive basis to address reported parking pressure and stress. As shown in the map below, by the end of 2018/19 the entire borough south of the A406 (North Circular Road) will be included within established Controlled Parking Zones, subject to the outcome of localised consultation on the boroughs current 2018/19 CPZ programme.

In areas in the north of the borough, where levels of car ownership are typically higher and public transport options more limited, delivery of a CPZ network has been challenging. The borough has a demand led approach to delivering CPZs and will continue to develop proposals for car parking management, especially around new development.

Alternatives to Car Use and Ownership

The LBWF Core Strategy, Transport Investment Strategy, and 2020 Cycling Vision outline the Council's commitment to providing viable and attractive alternatives to private car use. As detailed in Outcome 1, providing high quality cycling, walking and public transport connections are essential to unlocking mode shift, however the Council also recognizes the role of other transport services to support car-free lifestyles. For example, the ZED cargo deliveries scheme offers residents the opportunity to transport goods from town centres to home, providing an attractive alternative to car travel.

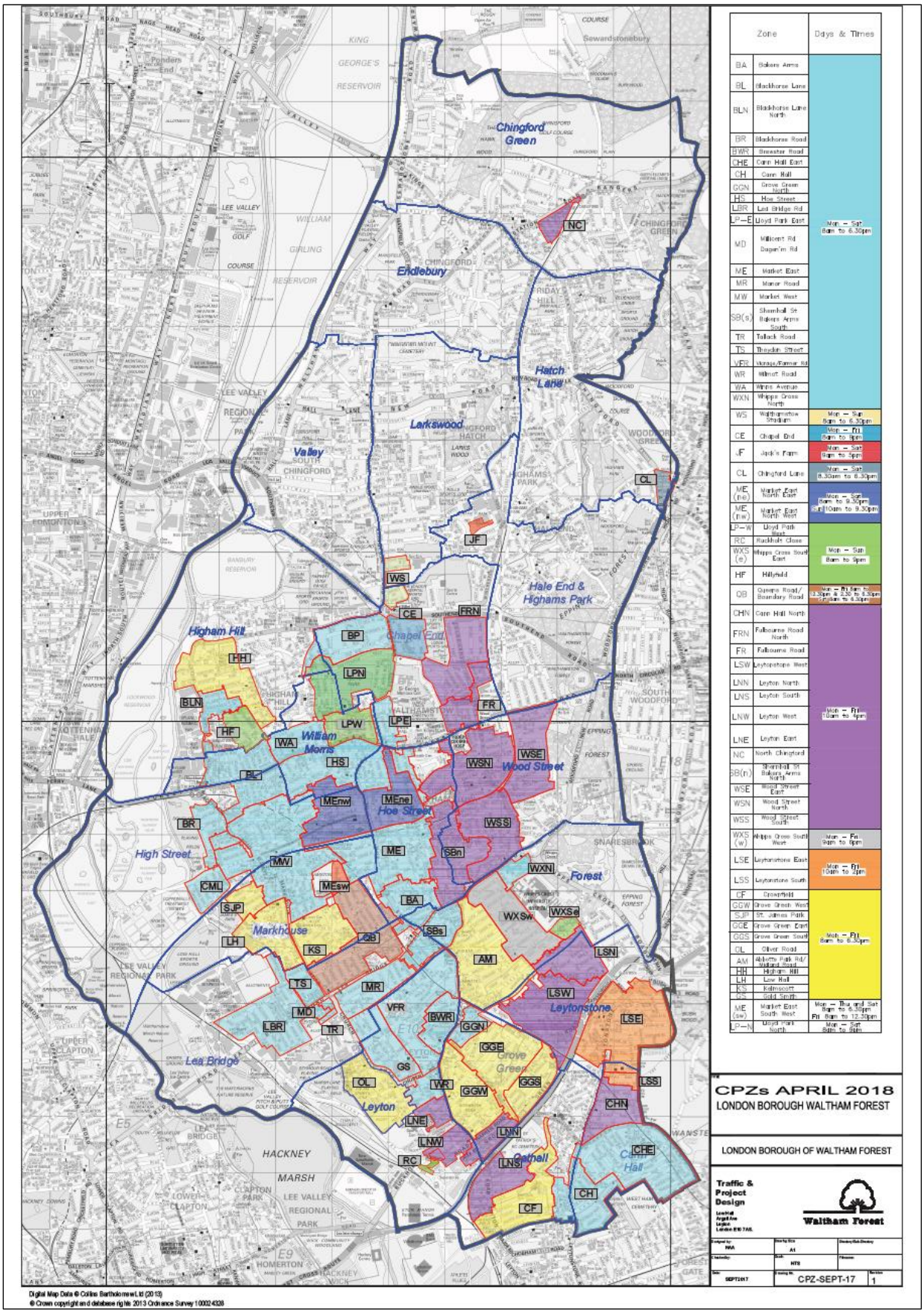


Figure 85: Waltham Forest CPZ Map

Car clubs also provide an important role in supporting people to transition away from car ownership, especially when paired wider incentives, such as management of residential parking, improvements in public transport, and new cycling and walking facilities. It is shown by CarPlus, which car club members are more likely to walk, cycle or take public transport, and that 28% of car club members based in London have reduced the number of vehicles owned by their household since joining a car club.[23]

There are currently 9,000 car club members within the borough (approximately 8% of the population who drive a car) who have access to 180 vehicles operated on a fixed and floating model. However, quality of the car club offer varies across Waltham Forest, with a much higher proportion of vehicles located at the south of the borough, and the area of floating car clubs limited to the south of the A406.

In addition to residential car clubs, the Council has introduced a set of fleet electric car club vehicles that offer an alternative to using personal vehicles to make essential business trips, enabling staff to travel by sustainable modes. Providing access for residents outside business hours, the borough is currently planning to expand this provision to support wider travel plan activities to reduce single occupancy journeys to work.

Future approaches to traffic reduction

While the Council is supportive of delivering improvements to the public transport system and improving road conditions to favour cycling and walking, further incentives are required to achieve a reduction of traffic that meets the MTS objectives. The borough sees implementation of MTS Proposal 21, road pricing, and MTS Proposal 22, workplace parking levies, as opportunities to deliver significant change in London's transport mix, and provide associated health, economic and social benefits.

Key challenges to delivery of these schemes will include co-ordination across borough boundaries, political support for delivery, and establishment of appropriate and fair mechanisms for charging. In terms of workplace parking levies, further investigation is needed to understand impact on businesses and large employers in the borough (such as the NHS and Council), viability and potential income generated, and cross-border agreements with neighbouring boroughs.

Borough Objectives

LBWF Objective 3.1 – Reduce the number of vehicles on borough roads: The borough is committed to reducing the overall number of vehicular trips made on borough roads, with particular focus on reducing walkable or cycleable trips currently made by car.

Key to delivery will be the removal of non-local traffic from residential areas, and providing residents, businesses and visitors with alternatives to vehicle use through high quality attractive active and sustainable travel networks. To support impact of infrastructure, the

[23] https://como.org.uk/wp-content/uploads/2018/06/Carplus-Infographics-2017-London-AW.pdf

borough will work with TfL and the GLA to support development of appropriate vehicle charging mechanisms across London, including road pricing and workplace parking levies.

LBWF Objective 3.2 – Making freight, servicing, and deliveries safe and sustainable: Engaging with TfL, freight operators and businesses, the borough will work towards reducing the impact freight, servicing, and deliveries on traffic volumes, air quality, and the local environment.

The Council is working to introduce new ways of moving goods in the borough, and will continue this by growing the ZED delivery service, implementing a Construction Consolidation scheme, trialling Virtual Loading Bays, and engaging with businesses to understand opportunities to consolidate and retime deliveries.

LBWF Objective 3.3 –Securing car-free and car-lite at new developments: The Council is committed to seeking to reduce levels of car ownership in the borough by implementing car-free and car-capped approaches at new development across the borough.

Working with TfL, the borough will seek to improve public transport connections in the borough to support car-free lifestyles, and to develop a robust approach to measuring accessibility of new developments.

LBWF Objective 3.4 –To deliver a deliver a car club network that supports reduction of car ownership: To support initiatives to reduce levels of car ownership and use, such as parking restrictions, cycle and walking schemes, and public transport improvements, the Council will work with car clubs and developers to expand its car club network in less well-connected areas of the borough. This will include supporting new operations north of the North Circular, and increasing density of provision in areas with lower levels of PTAL.

LBWF Objective 3.5 – Continue to deliver CPZ programme across the borough: Using a demand led approach, the borough will continue to expand CPZ coverage across neighbourhoods. Focus will be placed on locations in close proximity to new developments, to avoid problems associated with uncontrolled parking and overspill parking in adjacent neighbourhoods, and to support delivery of car-free developments, as well as areas with high amounts of parking stress.

Outcome 4: London's streets will be clean and green

MTS Objectives

Make London's transport network zero emission by 2050, contributing towards the creation of a zero carbon city, and also to deliver further improvements in air quality to help meet tighter air quality standards, including achieving a health-based target of 10µg/m3 for PM2.5 by 2030. London's streets and transport infrastructure will be transformed to enable zero emission operation, and the switch to ultra-low and zero emission technologies will be supported and accelerated.

Challenges and opportunities

Air quality in Waltham Forest

The LBWF Core Strategy, Health and Wellbeing Strategy, and Joint Strategic Needs Assessment, each acknowledge the negative impacts on human health of vehicle emissions and air pollution in the borough, and commit the borough to reducing emissions. Central to delivery of each of these strategies is influencing a modal shift away from private vehicle use to more sustainable forms of travel which reduce emissions

The Borough is meeting all of the national AQS objectives other than for the gas Nitrogen Dioxide (NO2), where we fail to meet the EU annual and hourly mean average limit values for this pollutant at roadside and kerbside locations. However, while the borough meets EU objectives for PM10 and PM 2.5, these pollutants are damaging to health at any level, and remain a pollutant of concern for the Council. Indicatively, levels exceed the World Health Organisation air quality guideline for these pollutants as no safe level has been identified.

In 2016 the borough had the 6th lowest levels of CO^2 emissions of Outer London boroughs (15th lowest in London), 8th lowest levels of NOx in Outer London (15th in London). In response to these challenges, the Council have established an Air quality Management Area across the borough, with 13 Focus Areas with high levels of pollution and human exposure. These are:

1. Sewardstone Road & Kings Head Hill
2. Billet Roundabout, Chingford Road, Billet Road
3. Hall Lane & North Circular Road
4. Southend Road, Woodford New Road
5. Forest Road, Blackhorse Road, Blackhorse Lane
6. Forest Road & Wood Street
7. Lea Bridge Road
8. Whipps Cross Road & Lea Bridge Road
9. Lea Bridge Road & Markhouse Road
10. Hoe Street
11. Hoe Street & Selborne Road
12. Green Man Roundabout, Leytonstone High Road, Gainsborough Road
13. Leyton High Road, Warren Road, Ruckholt Road

The figures 16, 17 and 18 provide an overview of the pollutants across the borough.

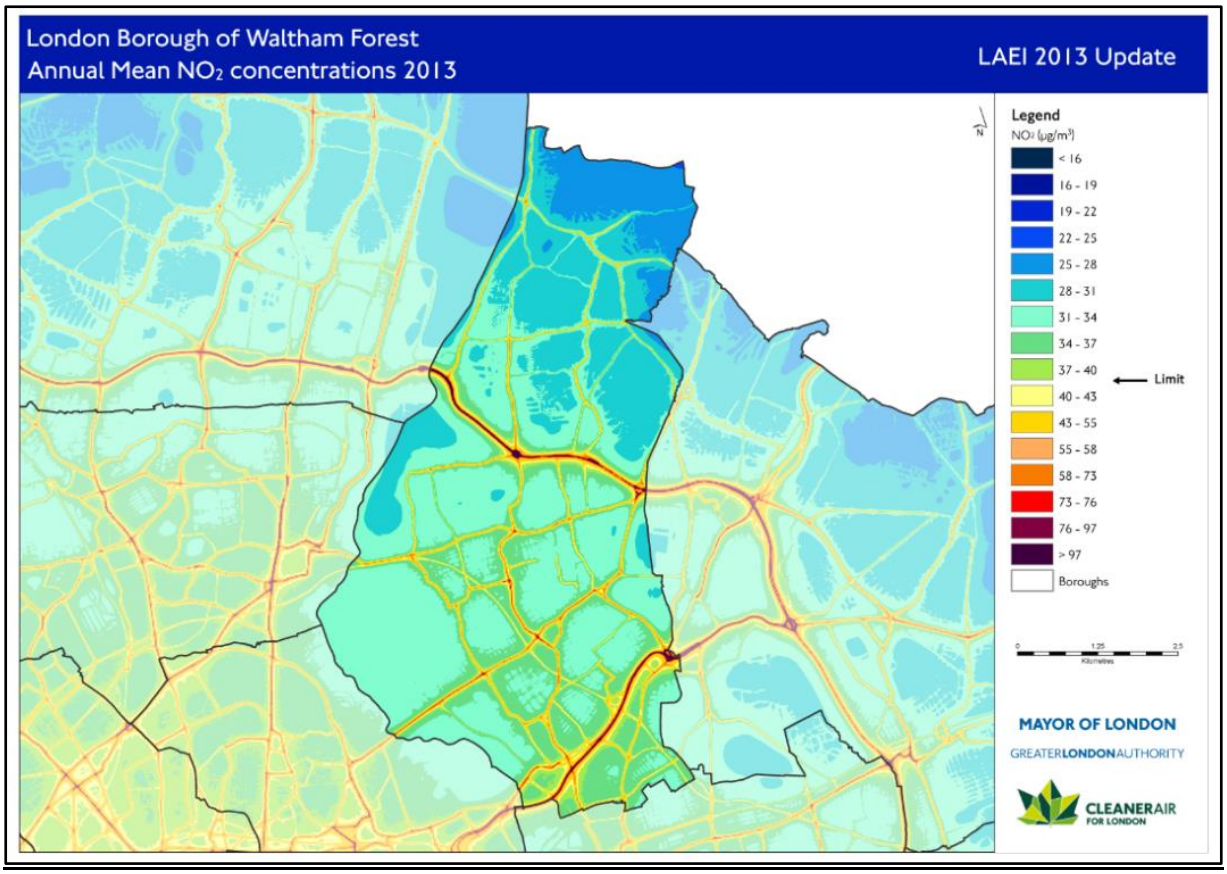


Figure 16 - Annual mean NO2 concentrations 2013

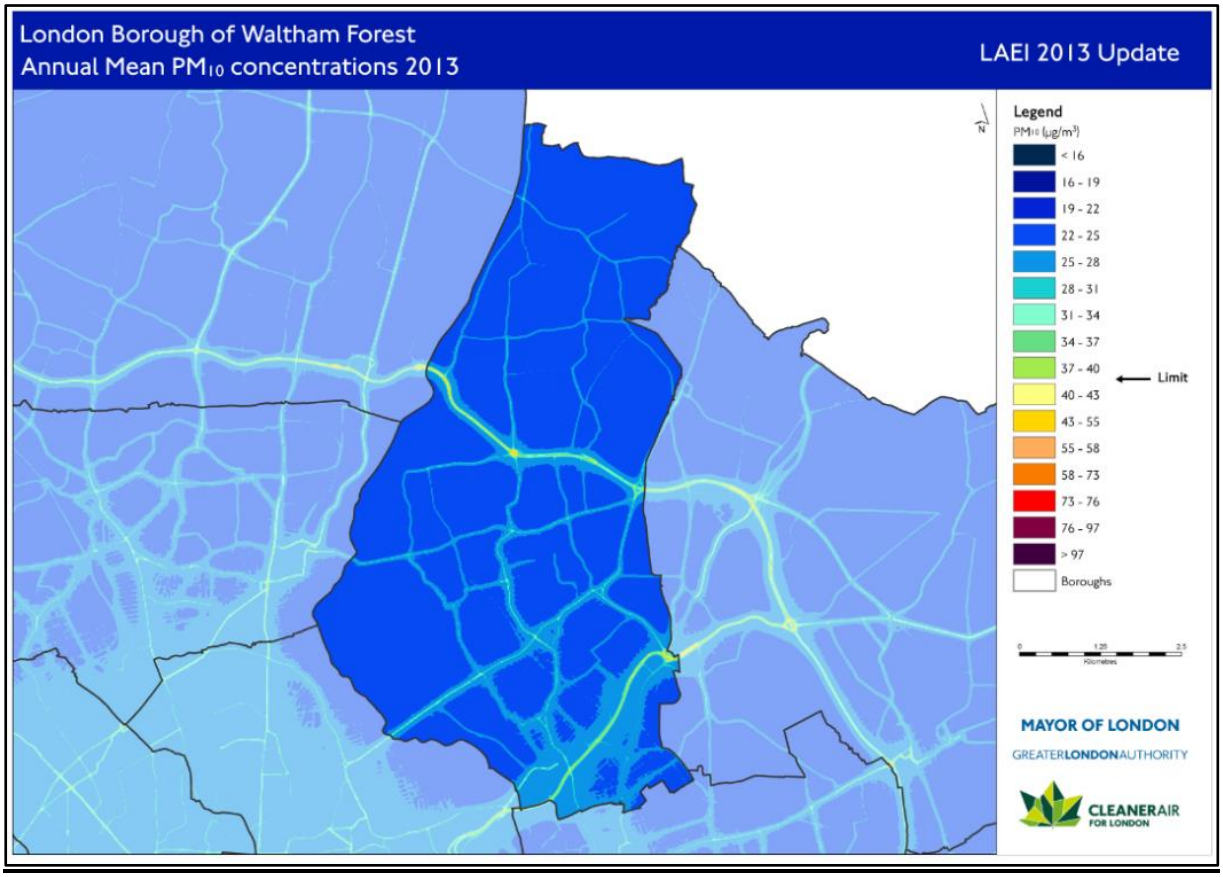


Figure 97 - Annual mean PM10 concentrations 2013

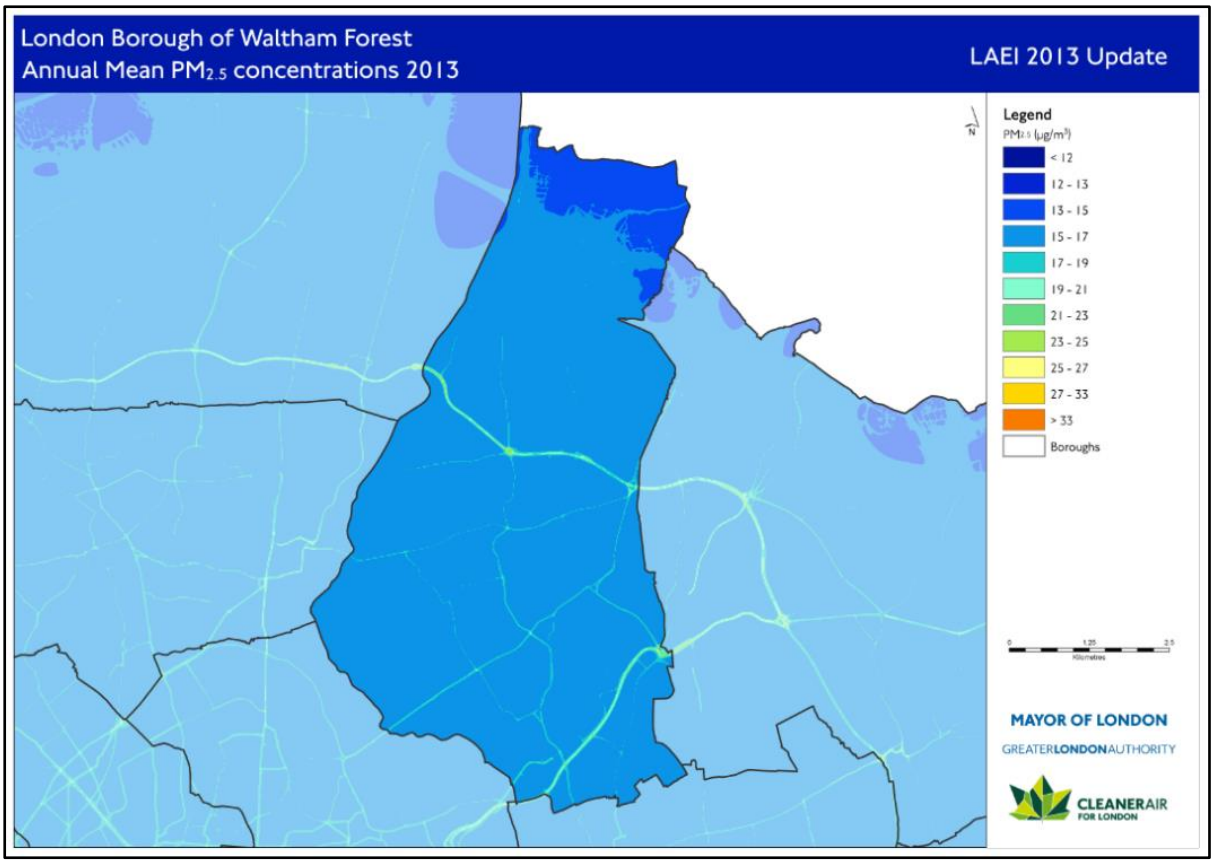


Figure 108 - Annual mean PM2.5 concentrations 2013

Air Quality & Vehicle Traffic

Vehicle emissions continue to be the primary pollution source in Waltham Forest, and shown in figures above, pollution levels are highest on the main roads in the Borough. Waltham Forest's highest pollution concentrations are seen on the two Transport for London Strategic Road Network roads that cut through the Borough, the North Circular and A12, and the Council has limited powers to effect change on these roads. However, pollution remains high on a number of borough roads, particularly in the central and south parts of the Borough.

Many these locations form key road connections in the Borough, holding higher levels of private car journeys, freight and servicing vehicles, and represent major bus corridors. While primarily concentrated on these roads, pollution continues to impact on residential streets, town centres and locations of services such as schools surrounding these hotspots. The Council is committed to reducing this impact in line with MTS objectives, seeking to deliver change through its Enjoy Waltham Forest and Liveable Neighbourhoods programmes, as well as activities to accelerate uptake of cleaner vehicles.

ULEZ

The Transport for London Ultra Low Emission Zone is scheduled for introduction across the borough for coaches and lorries by 2020, and south of the North Circular Road for cars and vans by 2021. The borough is committed to maximising this opportunity to remove highly polluting vehicles from its roads, and will support businesses and residents to replace

vehicles charged under the scheme with low emissions or zero emission vehicles, or to move to car-free or car-lite lifestyles.

While the borough recognises the opportunity of the ULEZ, the exemption of the north of the borough and the North Circular Road represents a key challenge to the Borough. By exempting these areas, the zone fails to include the most highly polluting road in Waltham Forest, as well as creating the potential for increased levels of pollution in the north of the Borough, generated from highly polluting vehicles avoiding the ULEZ fee. Further challenges to delivery include practicalities of scrappage, financial inequalities amongst residents, and communications around of the schemes impact.

There is currently minimal data and understanding on the impacts on air quality from the ULEZ expansion to the north circular and surrounding areas.

Freight, Construction and Servicing

Freight, construction and servicing vehicles represent a significant proportion of vehicles on borough roads, and have a disproportionate effect on air quality due to use of more polluting engines, and higher emissions of PM10 and PM2.5. Following our approach to Objective 3, the borough is committed to lessening this impact by reducing journeys made by freight and servicing vehicles, as well as supporting introduction of low emission vehicles.

As part of the LBWF Air Quality Action Plan, the borough has implemented new low emissions standards for Council waste operators, utilised low emissions vehicles in distribution activities, and introduced new consolidation activities (as detailed above). Work has also begun to understand opportunities to implement construction management conditions at the planning stage, to mitigate impact of construction of new developments in the borough.

While progress has been made towards reducing the impact of freight, further work with the local logistics, light industry and construction sectors, surrounding local authorities, and TfL is needed to deliver a sustainable and efficient distribution network across the borough.

Electric Vehicle Infrastructure

Uptake of electric vehicles will also play a necessary role to delivering air quality improvements to achieving the MTS target for a zero-emission transport network by 2041, and an accessible network of accessible network of electric vehicle charging points is vital to facilitating this shift. Over the next eight years it is expected that ownership of EVs will increase to 2,457 by 2020, representing significant growth from current levels (177 registered at Q1 2018).

The Council have been actively working to install charge points across the borough, and its current network comprises of 20 free standing EV charging points on the public highway, 4 on Council owned property, and 34 in private car parks. To coordinate delivery of a charging network that enables residents to shift to zero-emission vehicles, the Council is in the process of finalising its Electric Vehicle Infrastructure Strategy, which has an overall aim of providing full coverage of the borough by 2022.

The Delivery Plan aims to set out the prospective funding streams and mechanisms to support target, as well as overcome key challenges such as delivering a cost-neutral network, meeting the needs of residents, businesses and visitors, managing change in technology, and mitigating impact on road users such as pedestrians and cyclists. Delivery of the network will require co-ordination between Council teams, neighbouring local authorities, providers of charging infrastructure, energy providers, and TfL, who are currently working with the borough to introduce six new rapid chargers.

Reducing Vehicle Journeys

While Waltham Forest recognises the role of zero emission vehicles in meeting NO2 and CO2 targets, reducing exposure to PM10 and PM2.5, emitted through brake wear and tyre dust, to safe levels will require an overall reduction in vehicle journeys made in the borough. As detailed in Outcomes 1 and 3, delivering liveable neighbourhoods that reduce levels of through traffic in residential areas, providing attractive alternatives to car use and implementation of wider initiatives to reduce vehicle travel are essential to achieving this.

Monitoring impacts of the Enjoy Waltham Forest programme demonstrates the significant potential of this approach to reducing the health and wellbeing impact of emissions on the boroughs residents. [24] Modelling by Kings College indicates that introduction of traffic reduction measures such as road closures, traffic calming, and segregated cycle lanes, could result in a reduction in exposure by 15-25% for NOx, and 6-13% for PM2.5 for residents. Notably, a 7% reduction in NOx, PM10 and PM2.5 from 8-9 am was recorded as a result in a shift to walking and cycling from car use as part of the school run.[25]

Monitoring emissions

The council is currently expanding its air monitoring network by deploying further diffusion tubes in areas around the north circular and the north of the borough. The data from these additional sites will help in assessing air quality impacts from the ULEZ expansion, assessing air quality and mitigation requirements for new developments and facilitate strategic implementation of infrastructure projects.

While there is a robust method of monitoring and understanding impacts and emissions of NOx and CO^2 across London, monitoring of PM2.5 and PM10 is a recent practice, with more researched needed on levels of exposure and drop-off to assess locations that are impacted by PM emission (proximity of residences to roads, width of footway etc.). Further work is needed by TfL and the GLA to develop a referenced method of assessing the impact of PM10 and PM2.5, which meets quality assured standards.

[24] https://drive.google.com/file/d/1MGyThE5H9lgrzhCkjQlKKg7vhuW6pGMR/view
[25] https://drive.google.com/file/d/1MGyThE5H9lgrzhCkjQlKKg7vhuW6pGMR/view

Urban Forest

As detailed in the LBWF Tree Strategy, Core Strategy and Air Quality Action Plan, the borough recognises the role that green space plays in climate change adaptation, sustainable urban drainage, reducing the urban heat island effect, biodiversity and quality of life. This reflected in the boroughs track record in incorporating greening elements into infrastructure projects, and commitment to expanding its Urban Forest.

Incorporating new trees, planting and habitats as part of transport projects is an essential tool to improve access to greenspace, canopy cover, and biodiversity in the borough, as well as a key component of meeting TfL's Healthy Streets objectives. Through the Enjoy Waltham Forest programme, the Council has introduced over 600 trees and created over 30 pocket parks, rain gardens and public spaces with a range of planting and biodiversity. In addition to the Enjoy Waltham Forest programme, the borough is actively increasing biodiversity, and has delivered a net gain of 2,000 trees in the last five years.

Borough Objectives

LBWF Objective 4.1 – Improve air quality to create more attractive neighbourhoods for residents and visitors: As part of the borough's objective to delivery liveable neighbourhoods for all, the Council aims to deliver significant reductions in causes of air pollution in places where people live, work and go to school in Waltham Forest.

In addition to delivery of physical infrastructure and behaviour change activities to reduce emissions and pollutants, the borough will continue to review and expand the boroughs air quality monitoring infrastructure, and update this when new technology is available.

LBWF Objective 4.2 – Reduce the number of vehicles on borough roads: As detailed in Objectives 1 and 3, the borough is committed to reducing the overall levels of vehicles on its roads. This is essential to delivering improvements in air quality, and delivering overall health benefits to residents and visitors to the borough.

LBWF Objective 4.3 – Support switch to ultra-low emission vehicles across the borough: In addition to reducing overall levels of vehicle journeys, the borough aims to reduce the air quality impacts of essential journeys that are made by residents and businesses.

To support the switch to ultra-low emission vehicles, the borough will continue expansion of residential and rapid electric vehicle charge points across the borough (based on targets in the forthcoming Electric Vehicle strategy), and increasing the number of hydrogen, electric, hybrid, biomethane and cleaner vehicles in the boroughs' fleet, as well as accelerating uptake of new Euro VI vehicles

LBWF Objective 4.4 – Making freight, servicing, and deliveries safe and sustainable: To reduce sources of air pollution freight and deliveries, the borough is working to reduce the overall journeys made in the borough, as well as the types of vehicles used. To achieve this, the Council will continue to grow the ZED delivery network, in addition to implementing consolidation and retiming deliveries, as outlined in Outcome 3.

LBWF Objective 4.5 – Raise awareness of air quality issues to residents, schools and businesses: As well as improving infrastructure, raising awareness of air quality issues amongst people who live and visit the borough, local business, and communities is essential to supporting reductions in emissions.

The borough will continue to deliver its programme of engagement activities around air quality, including anti-idling campaigns, roll-out of the ZED programme, school projects, annual car-free days, and promoting the TfL Sustainable Travel: Active Responsible Safe Travel (STARS) programme, as well as develop future projects. Future plans include trailing school street closures, promoting the, and promoting School Air Quality Ambassadors initiative alongside national Clean Air Day.

LBWF Objective 4.6 – Continue to enhance biodiversity through transport infrastructure schemes: Improving the bio-diversity, canopy cover and greening forms a key design objective of the Enjoy Waltham Forest programme. The borough will continue to deliver this through its wider transport schemes, but utilising all opportunities to incorporate greening into schemes, and to deliver Sustainable Urban Drainage where appropriate.

Outcome 5: The public transport network will meet the needs of a growing London

MTS Objectives

The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to make the public transport network easier and more pleasant to use, enabling customers to enjoy comfortable, confident, safe and secure, informed and stress-free travel.

Challenges and opportunities

Public Transport Use

The London Travel Demand Survey estimates that between 2014/15 and 2016/17 an average of 164,000 trips on public transport originated each day by Waltham Forest. Public transport modes make up 28% of mode share within the borough, giving the borough the 18th highest mode share for public transport use in London, and 7th highest amongst outer London boroughs.

LTDS estimates suggest that there has been a slight reduction (3%) in the public transport trips originated within the borough from the 2013/14 to 2015/16 three year average. However, it is expected that was a result of the closure of the Barking to Gospel Oak Overground Line from June 2016 to February 2017, and not a general trend within the borough.

To meet the MTS objective for 14 and 15 million trips will be made by public transport every day by 2041, it is expected that the number of trips originating within the borough will need to increase to 191,000 by 2021 (17% increase), and 255,000 by 2041 (55% increase). The borough is committed to working in partnership with TfL and other key stakeholders to deliver necessary improvements to accommodate and enable this shift.

Growing Demand at Underground, Overground and Rail Stations

The borough has seen a significant rise in journeys to and from its four London Underground Stations, which now support an estimated 56 million journeys a year. Between 2013 and 2016, there has been a 39% rise on exits and entries at the two Victoria Line stations (Walthamstow Central and Blackhorse Road), and an 11% increase on Central Line stations (Leyton and Leytonstone).

Similarly, between 2012/13 and 2015/16 the borough saw a 56% increase in passenger journeys through its 10 London Overground and National Rail Stations, providing for 14.9m entries and exits[26]. The borough's new station at Lea Bridge Station has seen a 29% increase in daily journeys since it was opened in 2016, and now has an estimated 532,000 passengers a year. This is significantly more than estimates the business case, which predicted the station would support 352,000 journeys a year.

[26] While on stations on the Gospel Oak to Barking Overground Line saw a reduction in use in 16/17 due to line closures, all other stations saw continued growth.

It is expected passenger numbers on these lines will continue to grow due to increased demand, and planned improvements to the service. These include a 130% increase in capacity on trains serving the overcrowded Gospel Oak to Barking lines, new trains on the Liverpool Street to Chingford line, and increase of service from two trains per hour to four trains per hour at Lea Bridge as part of the STAR rail scheme.

While the borough welcomes this growth, demand has led to increased pressure on infrastructure at these stations, impacting passenger comfort and quality of experience. As described below, key challenges include significant capacity issues at Walthamstow Central and Leyton Underground stations, as well as poor public realm and interchange facilities across all stations.

Station	2016	2015	2014	2013	2013-16 % change
Blackhorse Road	8.453	8.360	8.633	7.304	16%
Leyton	14.331	14.407	14.067	12.856	11%
Leytonstone	11.301	11.245	11.055	10.103	12%
Walthamstow Central	22.766	18.334	18.053	15.089	51%
Overall	56.851	52.345	51.808	45.352	25%

Table 4: Underground Station Entries and Exits 2013-2017

Station Name	2016-17	2015-16	2014-15	2013-14	2012-13	12-13 - 16/17 Change	12-13 - 15/16 Change
Blackhorse Road	**774,220***	2,013,700	1,101,636	813,532	828,002	-6%	143%
Chingford	2,063,184	1,918,148	1,766,848	1,649,170	1,492,560	38%	29%
Highams Park	2,358,214	2,116,016	1,998,106	1,822,878	1,664,538	42%	27%
Lea Bridge	532,000						
Leyton Midland Road	**286,620***	1,340,438	1,355,070	1,182,122	951,730	-70%	41%
Leytonstone High Road	**210,496***	977,634	1,001,820	858,864	733,060	-71%	33%
St.James' Street	1,159,376	1,016,152	970,494	869,154	801,458	45%	27%
Walthamstow Central	4,020,830	3,432,074	3,196,686	2,867,570	2,778,362	45%	24%
Walthamstow Queens Road	**218,732***	945,750	541,314	458,732	405,656	-46%	133%
Wood Street	1,317,360	1,140,006	972,166	861,962	786,050	68%	45%
Overall	**12,409,030**	**14,899,918**	**12,904,140**	**11,383,984**	**10,441,416**	**5%**	**56%**

*Closure of line during electrification between June 2016 to February 2017.

Table 5: Overground and Rail Entries and Exits 2012/13 to 2016/17

Walthamstow Central Interchange

The most significant growth has been seen at Walthamstow Central, where a 51% increase in passenger journeys has been recorded between 2013 and 2016. The Interchange represents the most heavily used transport gateway to Waltham Forest, supporting 22.7 million journeys a year, the 32nd highest across all of London's 270 Underground Stations. TfL estimates that this number will grow a further 35% by 2031. Increasing this pressure, the adjoining bus station holds 16 bus routes, and 6,000 passengers board or alight from services in the busiest AM peak hour, making it the third busiest in London.

Combined with growth in passenger numbers, layout of the interchange results in a number of issues, including overcrowding, poor public realm and connectivity between the town centre and stations, no wheelchair accessibility, and peak time closures. Delivery of capacity and access improvements at the interchange is a borough priority, and essential to meeting needs generated by growth and development in Walthamstow, as well as delivering a good public transport experience for people accessing opportunities across London.

Working with in partnership with TfL and local stakeholders, the Council is progressing opportunities to deliver comprehensive upgrades to Walthamstow Central. To date, significant investment has been committed to delivery, including £15m through TfL's Growth Fund, and a £1.5m Section 106 contribution from the adjoining Mall Development.

Leyton Underground Station

Leyton Station has also seen a significant increase in passengers in since 2013, and now serves over 14 million journeys a year, making it the second busiest station in the borough. The station sits next to the Lea Valley Eastside regeneration area, which includes delivery of a new neighbourhood to the west of Leyton Town Centre, with an allocation of over 2,500 new homes. Similar to Walthamstow Central, the station is also located on a busy bus corridor, linking Walthamstow to Stratford.

With a constrained entrance located on a road bridge, passengers entering and exiting the station experience severe peak hour overcrowding that spills onto a narrow footway, poor connections to highly used bus stops, and no step-free access. TfL modelling shows the station will reach capacity by early 2020s, and there is an urgent need to deliver improvements to mitigate this, provide an attractive environment for users accessing the Central Line, and to enable growth in the Lea Valley East Side.

Delivery of upgrades to Leyton Station is a key priority for the borough and TfL, and progress is currently being made on feasibility work. Funding opportunities currently being explored include use of TfL Step Free Access, TfL Growth Fund and Community Infrastructure Levy generated from local developments.

Public Realm at Stations and Transport Hubs

Ensuring high quality access to transport hubs is essential to delivering an easy to use and stress free public transport network. The borough is committed to improving interchange facilities between active and sustainable modes at its major transport hubs, including Underground, Overground and Rail stations, but also highly used bus stops (as shown in figure 19 below).

For example, the borough is currently delivering a major walking, cycling and public transport improvement scheme at Walthamstow Central, to support the significant growth in use and access around the station. This has delivered significant bus journey time and reliability benefits, as well improvements to the walking and cycling environment.

The current scheme has been developed to accommodate planned delivery of large scale housing and commercial developments in and around Walthamstow Central, which are at planning or development phases. Once this development has been completed, the borough is committed to delivering further improvements to the walking and cycling accessibility and connectivity in and around Walthamstow Central, and the current scheme enables these changes.

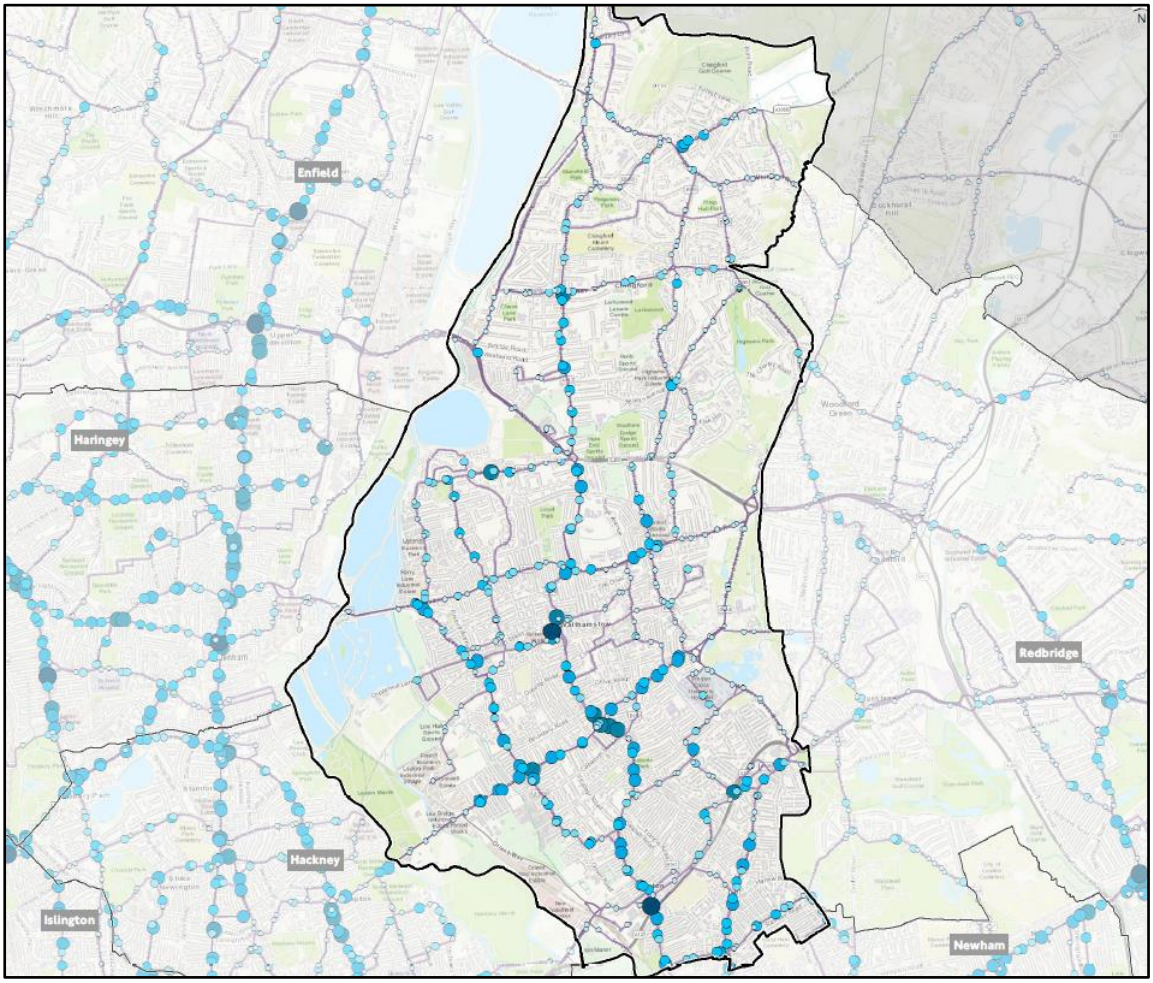


Figure 19 - Major bus interchanges in the borough

Currently, passengers' using many of the boroughs transport interchanges experience a range of physical barriers that reduce quality of journeys and public transport experience. Typical challenges for users at these locations include:

- Poor legibility between transport types
- Poor quality public realm, including waiting space and seating
- Overcrowding on constrained public spaces at entrances
- Accessibility, including step free access

Working in partnership with TfL, the borough is developing a programme of improvement works to its interchanges, with projects planned or funded at Walthamstow Central, Leyton, and Blackhorse Road Underground Stations, as well as Markhouse Corner bus interchange.

Further work is required to identify issues across the wider network, and the borough is actively seeking opportunities funding from development to enable improvements. While challenges are location specific, changes required include improvement of the public realm against Healthy Streets indicators, visible real-time information, and wayfinding to onward modes and destinations.

Forthcoming development at a number of these stations provides the opportunity to improve accessibility, connectivity and public realm. For example, at Highams Park, St James Street, and Lea Bridge, development currently at the feasibility or pre-planning stage hold potential to deliver new or improved accesses to each of these stations. The borough is currently engaging with Network Rail around maximising land around Leyton Midland Road and Leytonstone High Road. Further information is available in table 7 on page 57.

Links to Transport Hubs

The borough also recognises the importance of providing high quality walking and cycling links to public transport and this forms a key element of the borough's objective to deliver liveable neighbourhoods across the borough, and Town Centre improvement strategies. Recent improvements delivered by the borough a new traffic-free link to Walthamstow Queens Road Station, and works scheduled in 2018 and 2019 will deliver upgraded walking and cycling routes at Walthamstow Central as part of Walthamstow Gyratory works, and Blackhorse Road Station, both as part of the Enjoy Waltham Forest programme.

As detailed in Outcome 1, further improvements to enable and encourage people to access public transport by foot are required across Waltham Forest, and the borough are developing a range of opportunities to deliver these. These include incorporating new links within new development within the borough, as well as delivery of important links to St. James Street station as part of the TfL funded Copper Mill Liveable Neighbourhoods project.

Station Cycle Hubs

Cycle parking at interchanges is vital to enabling last mile journeys to be made by bike, and the borough has an established network of Station Cycle Hubs, delivered through the Enjoy Waltham Forest programme. The borough currently has hubs located at seven Underground and Overground stations, providing 474 secure and enclosed cycle parking spaces for over 1,000 members.

The Borough is committed to delivering cycle hubs at each station in the Borough. Key challenges to delivery include lack of suitable locations at smaller stations, and competition with space allocated for operational or revenue making activities, such as staff and visitor car parking and access. The borough is working to overcome challenges through engagement with TfL and Network Rail, and utilising development opportunities, as seen in the new Blackhorse Lane cycle hub, which will provide 50 spaces on the ground floor a new residential development from May 2020.

To unlock further journeys by sustainable and active travel, further work is needed to enable passengers to carry bikes on trains at peak times on trains in London. If this is achieved, this has to the potential to enable quicker journeys by public transport and cycle, open new connections for users, and increase levels of active travel. While opportunities to deliver this in the near future may be limited, space for cycles should be incorporated into the design and roll-out of new rolling stock in the future.

Borough Objectives

LBWF Objective 5.1 – Upgrade major transport interchanges to meet current and growing demand: The borough aims ensure key transport interchanges in Waltham are able to support growing levels of public transport, as well as future population growth, to provide a comfortable, secure and stress-free experience for residents and visitors.

To achieve this, the borough will work with TfL and the GLA to continue to develop capacity and improvement projects at Walthamstow Central and Leyton Underground stations, and to identify opportunities to deliver improvements on the wider network.

LBWF Objective 5.2 – Enhance gateways and interchange facilities across the public transport network: In addition to delivery capacity upgrades, the borough aims to deliver improvements to users experience through changes to the public realm and interchange facilities along its Underground, Overground and key bus network.

To unlock potential at these sites, the will continue to work with TfL, Network Rail and local stakeholders to fund and implement changes, including delivery of urban realm improvements, wayfinding, and providing bespoke cycle parking at station hubs.

LBWF Objective 5.3 – Delivering cycle hubs at all stations: The borough recognises the need for convenient and comfortable interchanges between active and sustainable travel modes, and is committed to delivering cycle hub facilities at all stations in the borough. In addition to delivering new hubs, opportunities to expand facilities at the busiest stations will be maximised, ensuring capacity meets growing demand.

LBWF Objective 5.4 – Deliver high quality, attractive connections to public transport from all neighbourhoods and centres: Delivery of attractive and comfortable walking and cycling connections between residential neighbourhoods and public transport is a key aim of the Council's aspiration to provide liveable neighbourhoods across the borough.

Using successful approaches established during the Enjoy Waltham Forest programme, this will include wider walking and cycling connections to major public transport hubs, but also connections and improvements to local bus stops and Overground stations.

Outcome 6: Public transport will be safe, affordable and accessible to all

MTS Objectives

The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to enhance London's streets and public transport network to enable disabled and older people to more easily travel spontaneously and independently, making the transport system navigable and accessible to all and reducing the additional journey time that disabled and older users can experience.

Challenges and opportunities

Growing population with reduced transport mobility

A high number of people within the borough experience disabilities or mobility impairments that impact their ability to travel independently. This includes people with reduced mobility, long-term health conditions, mental health problems and visual or hearing impairments, with each experiencing different barriers to accessing the public transport network.

37,600 residents stated in the 2011 census that their day-to-day activities are limited because of health. This is made up of 7% of population who said their activities were limited a lot (17,900) and 8% whose activities were limited a little (19,700). The GLA 'Londoners with Reduced Mobility Report' (2010) estimates that in 2018 2,666 (1.2%) residents would use wheelchairs, while 11,902 (8%) will have difficulties walking or other disabilities.

It is expected that the number of people with reduced mobility will increase as the Borough's population and percentage of people aged over 65 continues to grow (as detailed in the borough context). The GLA projects that the number of residents with reduced transport mobility will increase by 15% between 2018 and 2031, including a 20% increase in wheelchair users, and a 19% increase in people with walking difficulties.[27]

The public transport system will also need to support the Boroughs high population of families and young people. This will include facilities to support access of buggies on public transport, as well as walking with small children as part of journey stages.

Step Free Access

TfL estimates that there is a 15 minute difference between the average journey time using the full public transport network in the borough (78 minutes), and average journey time using the step-free network (93 minutes). This is 4th longest time difference of London boroughs.

Of the 14 Overground and Underground stations within the Borough, only four are truly wheel chair accessible. This presents a significant barrier to enabling disabled and older people, as well as those travelling with children in buggies, to accessing the London-wide public transport network.

[27] https://data.london.gov.uk/dataset/londoners-reduced-mobility

While significant investment will be required to meet the MTS target to reduce the average travel time difference between the full public transport network and the free network by 50% by 2041, growth and development around stations represent opportunities to fund Step Free Access (SFA).

To date, the Council and TfL have progressed opportunities to deliver SFA at Walthamstow Central, as part of the Mall development, and Leyton Underground Stations to meet current and expected levels of demand, with funding for delivery already allocated from TfL Growth Fund, and developer contributions.

Table 7 and Figure 20 below outlines the SFA status of all stations within the Borough, as well as proposals for upgrades and funding sources. The borough is committed to delivering a comprehensive step-free public transport network across the borough, and further work is needed by the Council and TfL to identify future sources of funding to deliver SFA in the south east of the borough, at Leytonstone and Leytonstone High Road, and the centre of the borough at Wood Street and Highams Park.

Station	Current Step Free Provision	Proposals	Funding Sources	Indicative Delivery Programme
Underground Central Line (Surface Level)				
Leyton	None	Scheme for capacity improvement and lifts at design stage	TfL Growth Fund TfL SFA Programme LBWF CIL	May 2021
Leytonstone	None	None at present	Future TfL SFA Programme Future LBWF CIL	Mid 2020s
Underground Victoria Line (Deep Tube)				
Walthamstow Central	None	Study work for second entrance and SFA commissioned	TfL Growth Fund Developer led funding	Mid 2020s
Blackhorse Road	None	None at present	Potential over-station development	Long-term 2030s
Overground Barking to Gospel Oak Line (Surface Level)				
Blackhorse Road	Full SFA - Lifts to platforms	-	-	-
Walthamstow Queens Road	Full SFA - Ramps to platforms	-	-	-
Leyton Midland Road	None	None at present	Developer LBWF CIL	Mid 2020s
Leytonstone High Road	None	Working in partnership with developers of nearby sites	Developer LBWF CIL	Mid 2020s

Station	Current Step Free Provision	Proposals	Funding Sources	Indicative Delivery Programme
Overground Chingford to Liverpool Street Line (Surface level)				
Chingford	Full SFA	-	-	-
Highams Park	SFA to platforms - but 400 metres distance between entrances	Future partnership to improve footbridge and install lifts	None identified	Late 2020s
Wood Street	None	Future partnership with developers of nearby sites	Developer LBWF CIL	Late 2020s
Walthamstow Central	SFA to platforms - but 150 metres distance between entrances	-	-	-
St. James Street	None (but passive provision in place for lifts)	Reasonably inexpensive to install lifts - but no proposals at present	Developer LBWF CIL	Mid 2020s
National Rail Lea Valley Line (Surface Level)				
Lea Bridge	Full SFA - Lifts to platforms	-	-	-

Table 6 - Step Free Access at Waltham Forest Stations

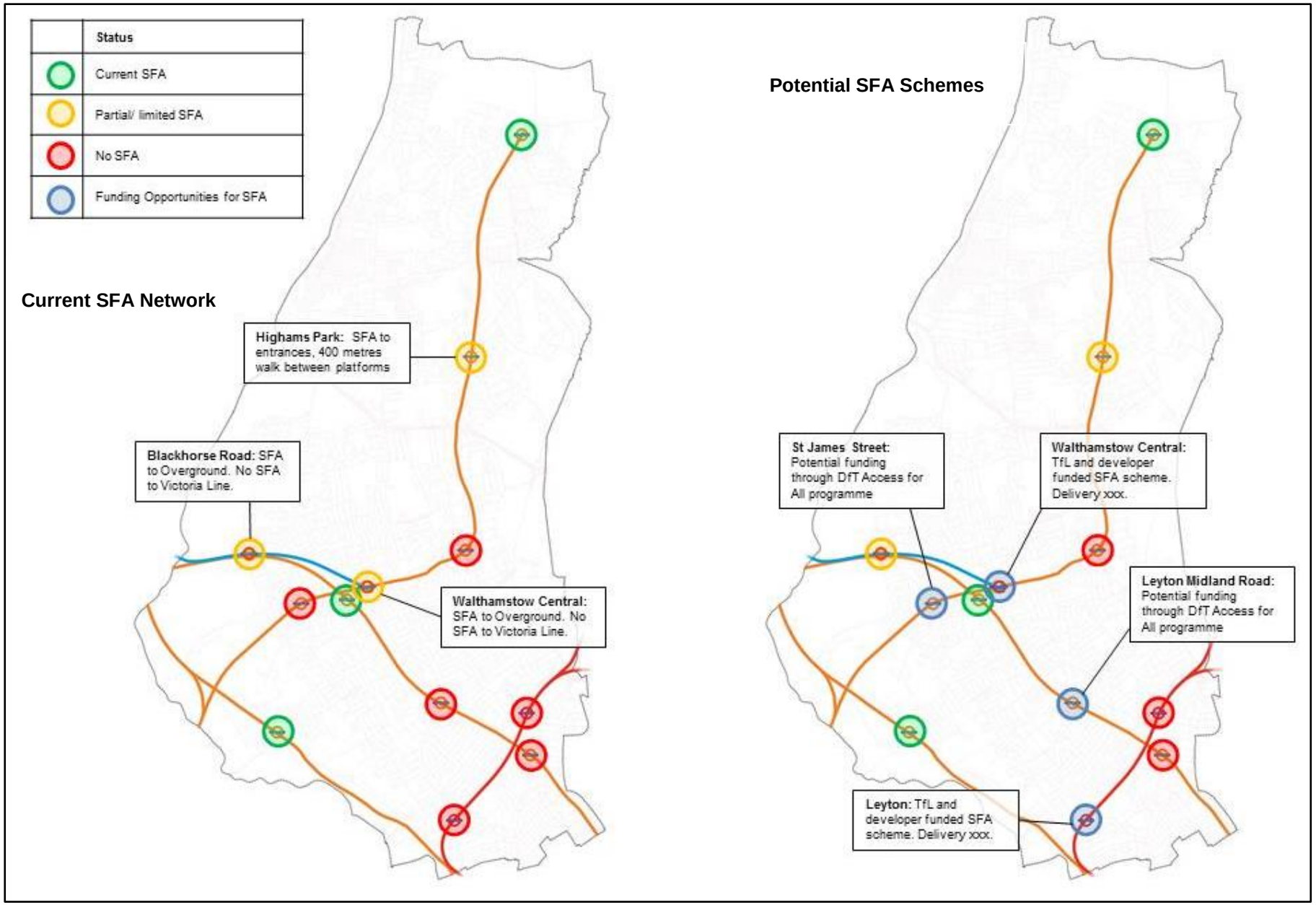


Figure 20 – Location of current and proposed Step Free Access in Waltham Forest

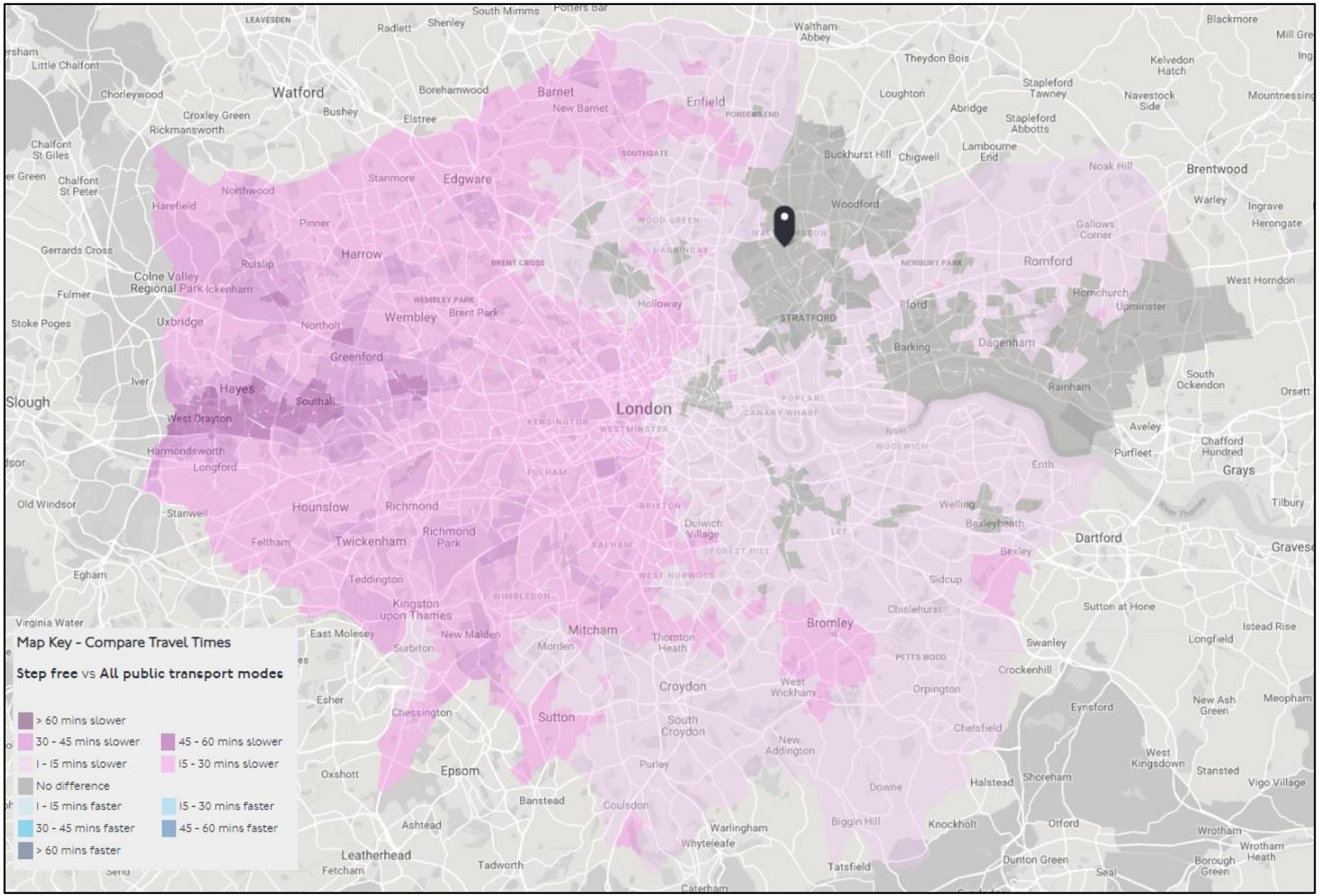


Figure 21 - Step Free travel time vs all public transport modes from Walthamstow Central

Inclusive access at key public transport destinations

Poor physical accessibility at public transport interchanges significantly impacts the ability for residents with mobility impairments to travel spontaneously and independently. Typical barriers to mobility include overcrowding of footways, street clutter, low levels of information on accessibility for onward journeys, and lack of places to sit. These issues are especially challenging at highly used destinations and public transport hubs, such as bus, Overground, Rail and Underground stations, hospitals and town centres.

The Council seeks to provide facilities that improve accessibility for people with reduced mobility within all urban realm, public transport, and active travel schemes it delivers. For example, through ongoing works to improve the highway and public space at Walthamstow Gyratory, the scheme will provide new formal and informal seating between Underground, Overground and bus interchanges, enlarged bus stops, formalised pedestrian crossings over cycle tracks, and larger public space to reduce crowding. Challenges to delivery of improvements across the borough include restricted highway space on borough roads, and local concerns around seating exacerbating anti-social behaviour, as well as reliance on TfL to implement facilities at key transport locations.

Projects with scope to improve accessibility and inclusivity are currently in proposed at a number of these locations. These include development within the Lea Valley Eastside Opportunity Area, upgrades to Walthamstow Central interchange associated with the Mall, redevelopment of Whipps Cross Hospital, and delivery of the Enjoy Waltham Forest programme and Liveable Neighbourhoods project at Copper Mill Lane. However, further assessment is required to understand barriers and improvements at all of these sites.

Accessible bus stops

Statistics from TfL show that 98% of the borough's 510 bus stops meet TfL standards for accessibility, with 10 failing due to either a lack of a Timeplate, Clearway, or Kerb that is over 100mm.

Two bus routes in the borough (W15 and 379) use Hail and Ride stops, which operate in Higham Hill and Chingford. These sections present barriers to accessing buses for people with reduced mobility, including wheelchair users and people with sight impairments, and it is a long held ambition of the borough to deliver permanent bus stops at these locations.

Additionally, while a majority of the boroughs bus stops meet TfL criteria for accessibility, further physical barriers impact access at a number of local bus stops. This includes overcrowding at locations such as schools and health centres, narrow waiting areas, and lack of seating. A further audit of stops is required to identify issues and prioritise locations.

Stop Name	Site (Road) Name	Routes List	Timeplate in place?	Kerb >100mm	Clearway in place?	Access free of impediment
Lloyd Park	Forest Road	123 N73	Yes	N	Y	Y
Colchester Road	High Road Leyton	69 97 W16 N26	Yes	N	Y	Y
St. Saviour's Church	Markhouse Road	58 158	Yes	N	Y	Y
Manor Road	Lea Bridge Road	48 55 56 N38 N55	Yes	N	N	Y
Shortlands Road	Lea Bridge Road	48 55 56 N38 N55	No	Y	N	Y
Shortlands Road	Lea Bridge Road	48 55 56 N38 N55	Yes	Y	N	Y
St Helens School	Shernhall Street	W16 W12	Yes	N	Y	Y
Addison Road	Shernhall Street	W12 W16	Yes	N	Y	Y
Yardley Lane Estate	Sewardstone Road	215	No	N	Y	Y
Century Road	Forest Road	123 N73	Yes	N	Y	Y

Table 7 - Bus stops that do not meet TfL standards for accessibility

Accessible connections to public transport

In delivery of interventions to enable a step change in levels of sustainable travel, the borough recognises the need for roads and public spaces to be as inclusive as possible for a diverse range of users with a multitude of needs and requirements. While reducing the dominance, impact and road danger associated with motorised traffic is at the centre of the boroughs approach to creating sustainable and inclusive public spaces, the design and detail of how our public spaces are used is equally important. For example, we recognise that shared space treatments can create issues for people who are visually impaired due to the lack of delineation and other guides. It is therefore vital to ensure that any shared space treatments are only introduced in the right locations and are considered on a case by case basis.

As detailed in Outcomes 1 and 5, accessible walking and cycling links to public transport are essential to enabling sustainable journeys. Providing accessible links to public transport represents a key objective of the borough's Coppermill Area Liveable Neighbourhoods project scheduled for delivery between 2019/20 and 2021/22, as well as the wider aim to deliver Liveable Neighbourhood's across the borough. Planned and proposed development represents additional opportunities to deliver improvements to access and permeability to public transport hubs within the borough.

Borough Objectives

LBWF Objective 6.1 – Deliver step free access for all stations: Working with TfL and Network Rail, the borough aims to deliver step-free access at all stations within the borough, eliminating journey differences between the step-free and full Underground, Overground and National Rail network.

Upgrades will be prioritised around demand, ease of implementation and funding, with Leyton (May 2021) and Walthamstow Central (mid 2020s) as the first to be delivered. To enable delivery, the borough will maximise opportunities for development to fund and enable SFA at all stations, as well as contribution from CIL and other funding opportunities.

LBWF Objective 6.2 – Improving inclusive access at public transport interchanges: Linking with planned development and projects, the borough will seek to implement works to improve accessibility for all residents at public transport destinations and interchanges. Where appropriate, improvements would include places to sit between interchanges, removal of street clutter, and improving connectivity between transport hubs and onwards connections.

Inclusive access forms a key objective at projects currently in development at Walthamstow Central and Leytonstone Underground station, and the borough is working with TfL to unlock future funding at St. James Street and Leyton Midland Road. To deliver a comprehensive network of SFA in Waltham Forest, the Council will work with TfL to secure funding where there are significant gaps in the network, such as the south east of the borough.

LBWF Objective 6.3 – All bus stops in the borough will be accessible: The Borough will work towards delivering a fully accessible bus stop network within the time frames set by the MTS.

LBWF Objective 6.4 – Ensuring accessible connections to public transport: As a key aim of the aspiration to deliver liveable neighbourhoods across the borough, the Council will work towards ensuring all residents will have safe, attractive and inviting walking and cycling connections to public transport, including those with mobility impairments.

Improvements to accessibility will be delivered through liveable neighbourhoods work streams currently in implementation, as well a working with developers to ensure that new developments provide high quality, inclusive public realm and connections to public transport.

Outcome 7: Journeys by public transport will be pleasant, fast and reliable

MTS Objectives

The Mayor, through TfL and the boroughs, and working with stakeholders, will transform the quality of bus services so that they offer faster, more reliable, accessible, comfortable and convenient travel by public transport, while being integrated with, and complementing, the rail and Tube networks.

Challenges and opportunities

Current bus network

The borough has an extensive bus network with a total of 33 routes which predominantly serve the main town and local centres, transport hubs and connect to locations outside the borough, such as Stratford and central London.

The majority of the southern wards of the borough are well served by buses, with frequent services connecting to major destinations and transport interchanges in Hackney, Central London, Stratford, Tottenham Hale, and East London.

In contrast, the bus networks in the north of the borough, and Cann Hall, in the south are characterised by poor east-west connectivity, requirements to change buses to reach major destinations, and less frequent services. Combined with limited rail connections, this contributes to low PTAL in these areas of the borough, presenting a less attractive option to private car use.

Reducing frequency and usage of bus services

TfL bus data shows that annual usage of bus routes that travel within the borough dropped by 7% between 2013/14 and 2016/17. This drop is consistent with the trend of reducing public transport use in the Borough (4% over the same time period), but also reduction in bus frequency, reliability and speeds. However, bus usage subsequently increased by 1% from 2016/17 to 2017/18.

The Borough has seen a regular reduction in the frequency of buses over the last three years, with hourly frequency reduced on 5 bus routes over the last 12 months. These include the 48 to London Bridge (the 8th highest use in the borough), 230 to Wood Green (12th highest), and 58 to East Ham (14th highest).

15 routes have seen a reduction in annual km operated over the last three years (13 in 2015/16), with this correlating with a reduction in passenger use across the whole route. For example, the W11 has seen a 10% reduction in km operated over the past three years, with a reduction of 13% in use over the same time period.

Reduction in bus speeds

TfL bus performance data[28] suggests there has been a 5% drop in bus speeds in the borough between 2014/15 and 2017/18 (2% drop across London in the same time period), with a slight increase in speeds between 2016/17 and 2017/18. The average bus speed in the borough in 2017/18 was 9mph, below the London average of 9.3mph.

Figure 22 below shows the average speed of buses during Monday to Friday AM peak along each of the boroughs roads during 2016/17. Locations where bus speeds drop 5mph include:

- Walthamstow Central Bus Station
- Higham Hill/ Forest Road Junction
- Blackhorse Road
- Markhouse Road/ Lea Bridge Road Junction
- Chingford Mount Road
- Forest Road

Other locations where speeds drop between 5-10mph include Whipps Cross roundabout, Walthamstow Town Centre, and North Chingford. Each of these locations is a major junction within the borough with high levels of traffic travelling along them.

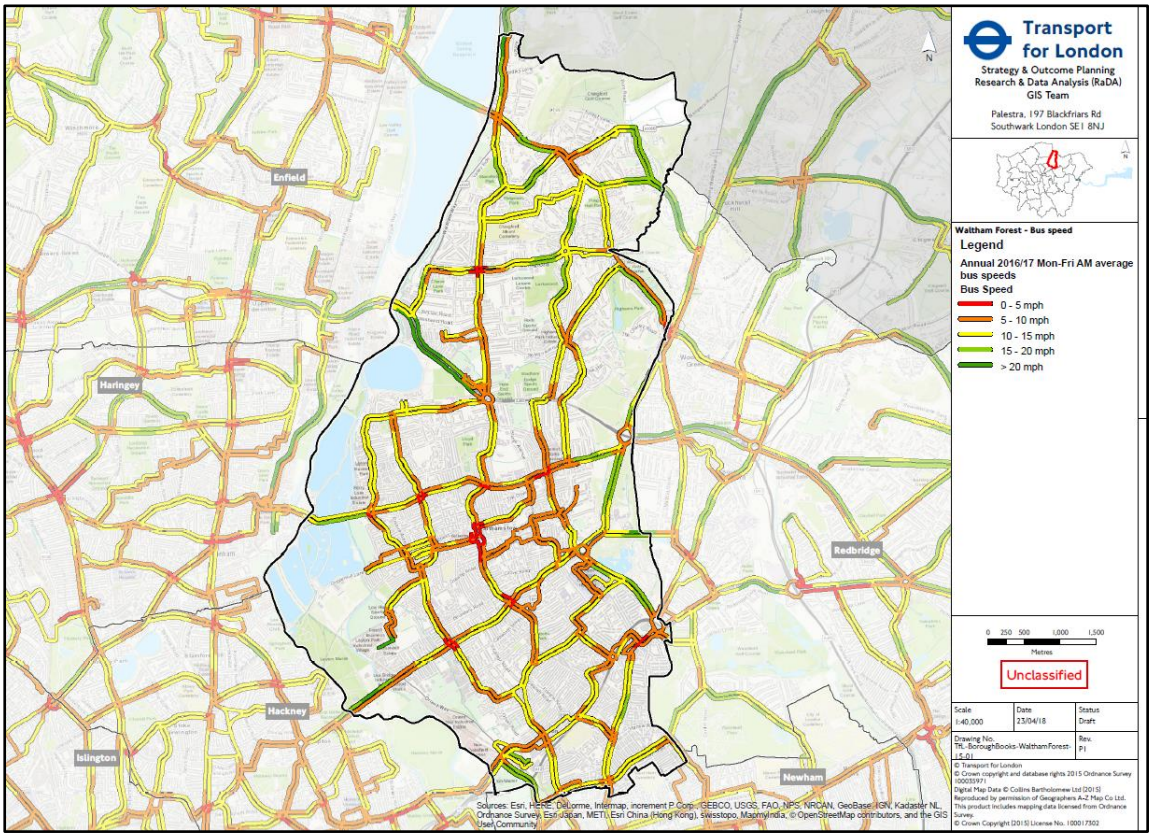


Figure 22 - Bus speeds across Waltham Forest

[28] https://tfl.gov.uk/corporate/publications-and-reports/buses-performance-data

Increase in congestion on borough roads

Data from TfL and DfT show a strong correlation with the long term increase in kilometres driven on borough roads and the decline in bus speeds. For example, between 2013 and 2016, the DfT recorded a 7% increase in the volume of vehicle km driven (51 million km), corresponding with a 7% decrease in bus speeds. This has contributed to an increase in congestion on borough roads, with particular impact on where bus speeds are slow.

Significant road works have also been undertaken within the Borough during this period, including Enjoy Waltham Forest works at Walthamstow Gyratory and Lea Bridge Road, which are expected to have impacted bus times during construction. The majority of these works are now completed, with remaining schemes due for completion in 2018/19.

Potential for bus improvement works

While constrained road space limits opportunities to expand the Borough's bus priority provision, there are a number of opportunities to improve bus speeds within the Borough, either through highways works or management of existing provision.

Bus improvement works are currently being undertaken as part of Enjoy Waltham Forest programme at Walthamstow Gyratory and Whipps Cross roundabout, with both expected to improve reliability, speeds and passenger comfort on key bus corridors, when completed. At Walthamstow Gyratory, relocation of stops for the 97 and 357 to Hoe Street from the central bus station are estimated to deliver a 7 minute journey time saving, with junction works expected to result in a 2 minute saving for the 12 buses entering the station. Significant improvements to pedestrian environment, including new pedestrian crossings, public space, and bus stops, will significantly improve user experience, while reducing overcrowding issues at the interchange.

At Whipps Cross, works will deliver significant improvements to bus reliability through simplification of the junction, as well as new bus facilities. Integral to the new road layout, the new bus facilities will increase the number of bus stops from two to six, as well as providing three new bus stands, improve bus reliability, protect journey times and provide opportunity for future growth of services in the area. The new interchange provides a significantly enhanced customer experience through the creation of improved stopping and waiting areas, new green spaces, and improved accessibility to and from the interchange for people walking and cycling in the area

Further bus improvement works planned in the borough include delivery of junction improvements and introduction of a new eastbound bus stop as part of the Blackhorse Road junction Major Scheme, and introduction of modernised, SCOOT UTC, signals along the Lea Bridge Corridor to improve relatability and traffic flows. To continue this track record, the borough will continue to work with TfL bus in development of major highways schemes to maximise opportunities to improve the bus network in Waltham Forest.

Enforcement and management

The borough has an excellent track history of working with TfL to identify pinch-points and reliability issues on the network and developing measures to address these wherever possible.

In addition to the major projects detailed above, the borough is working with TfL buses to improve journey time reliability on the Hoe Street and Selbourne Road corridors with funding via the Bus Priority programme. The borough is committed to delivering further improvements through the LIP3, including a review of Bus Lane infrastructure, to ensure timings are fit for purpose for a modern bus service and reviewing waiting controls, parking and loading bays along main bus corridors to protect journey times and reliability.

The borough will continue to work closely with TfL Buses in response to any specific reliability issues and concerns that are identified and will continue to work collaboratively on any bus route reviews and extensions to ensure network provision meets current demand.

Re-shaping bus services within the borough

Development within the Borough provides a key opportunity to improve the bus services through allocation of Section 106. In the Lea Valley Eastside Opportunity Area, £475,000 bus sponsorship has been committed to extend and improve frequency of the W19 bus, and the borough is actively looking for additional funding opportunities in this area, as well as at the Blackhorse Lane growth area and other forthcoming sites.

In addition to extending of lengthening existing routes, the MTS highlights the potential to deliver types of bus services across Waltham Forest, including new orbital express corridors and Demand Responsive Services. Each of these services provide opportunities to improve public transport connections in areas in the borough with low PTAL, as well as support shift away from car dependency in the north of the borough.

Borough Objectives

LBWF Objective 7.1 – Reducing the number of vehicles on borough roads: To reduce the impact on congestion on bus speeds, the borough will seek to deliver an overall reduction of vehicles on its roads.

The borough will seek to achieve this through the actions listed in objectives 1-4, including delivering infrastructure that promotes an increase in mode-share of active, sustainable travel, and improving efficiency of freight and delivery vehicles.

LBWF Objective 7.2 – Deliver improvements to cycle, walking and public transport facilities at busy junctions: The borough will continue to deliver Healthy Streets improvements at busy and heavily trafficked junctions, with an aim of improving bus speeds, and the pedestrian and cycling environment.

Improvements at Walthamstow Central, Whipps Cross, and Blackhorse Lane will be prioritised, with further assessment required to identify opportunities at other junctions.

LBWF Objective 7.3 – Review current bus priority facilities to maximise bus speeds: Working with TfL bus teams and Road Space Management, the borough will review and implement changes to maximise current bus priority facilities.

Improvement works to be explored include re-timing, of bus lanes, introduction of priority signals, and enforcement of bus priority facilities.

LBWF Objective 7.4 – Unlock funding from development to support growth of bus network: Building on work in Lea Valley East Side, the borough will continue to seek Section 106 investment to support of growth of the bus network within the borough. This will aim to meet improve existing services within the borough through the extension or increased frequency of routes to support growth in public transport mode share, as well as cater for future growth.

LBWF Objective 7.5 – Work with TfL and developers to introduce new bus services: Working with TfL, the borough seeks to introduce new bus routes or bus services to increase public transport connectivity across the borough. In addition to new services to support development, the borough is keen to trial implementation of new types of bus services, including demand responsive services, and to work with TfL to implement these.

Outcome 8: Active, efficient and sustainable travel will be the best option in new developments

MTS Objectives

The Mayor, through TfL and the boroughs, and working with stakeholders, will ensure that new homes and jobs in London are delivered in line with the transport principles of Good Growth for current and future Londoners by using transport to:

a) Create high density, mixed use places
b) Unlock growth potential in underdeveloped parts of the city

The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to transform London's rail-based services to provide safer, modern, reliable, integrated, accessible and user-friendly services, with improved journey times and an increase in capacity of at least 80% by 2041 to tackle crowding and facilitate mode shift to rail.

Challenges and opportunities

Growth in the borough

As detailed in the borough context, Waltham Forest is currently experiencing significant growth in terms of population and new housing. Between 2015 and 2020 the Borough has committed to delivering 12,000 new homes, 3,192 of these have been constructed, and 3,809 units are under construction. A further 2,333 units have planning permissions in place and 4,384 units are at the stage of planning and development.

Combined with current trends, it is expected that the population will increase by 24% 2033. To meet the needs of this growing population detailed in the Borough Strategic Housing Market Assessment, and to meet London Plan targets it is expected that an additional 1,800 units a year will need to be delivered.

Delivering good growth

The LBWF Core Strategy (2012) and Local Plan Direction of Travel (2017) detail the borough's approach to good growth, including the location, scale, design and connectivity of new developments. Each document highlights the importance of delivering growth that encourages and enables residents to make journeys by active and sustainable modes, and supports a shift away from private car use.

The Core Strategy recognises that the location, type, mix, and intensity of use, strongly influences the travel patterns of the people living, working, or visiting a development, and in turn determines how many trips a development attracts and by what mode. Consistent with the Mayor's Transport Strategy, the Borough is committed to promoting mixed use developments that reduce the need to travel, and to encourage developments at locations that are highly connected to jobs, local amenities, and wider opportunities by cycling, walking and public transport.

The approach is reflected in the co-ordinated development within the boroughs growth areas in Blackhorse Lane and Lea Valley East Side, as well recently completed and planned dense

developments around town centres such as Walthamstow and St. James Street. As stated in the Direction of Travel, connectivity, use and density forms a key consideration of growth, and will be continued to be applied when developing the new Local Plan.

Enabling cycling and walking in new developments

The LBWF Core Strategy (2012), Local Plan Direction of Travel (2017), Vision 2020: Cycling in the London Borough of Waltham Forest (2014) and Transport Investment Strategy (2018) each highlight the role of new development in enabling residents to walk and cycle. This includes delivery of facilities to support active travel on site, as well as interactions with connecting to wider networks.

As detailed in the Development Management Policies (2013), provision of dedicated, secure and easy to access cycle parking that meets the needs of all residents is a key requirement of new developments within the borough. While the borough has previously developed cycle parking standards, new developments are expected to meet levels of cycle parking set out in the new Draft London Plan (2017) which exceeds borough levels, as well as quality standards set out within the London Cycle Design Standards (2015).

Where possible, developments are also expected to maximise permeability between new homes and businesses, and deliver a high quality built environment that meets TfL Healthy Streets objectives. This includes delivery of pedestrian and cycle priority on new streets, closures for road traffic, and maximum permeability for those travelling actively through or from developments. An example of this has been the establishment of a new pedestrian and cycle link through development that has been safeguarded through constructed or planned developments within the Blackhorse Lane Opportunity Area. When completed, this link will overcome high levels of severance between existing residential communities and Blackhorse Road station in this area.

Car parking in new developments

The LBWF Core Strategy recognises the negative social, economic and environmental impacts of increasing private car use, and states the borough's commitment to reducing car ownership and car use within new developments. As outlined in Outcome 3, to reduce the link between an increasing population and car ownership with the borough is actively securing car-free and car capped developments across Waltham Forest where locations are connected to public transport, cycling and walking networks, and local amenities.

Further investment and support is required in Waltham Forest to deliver a borough-wide approach to car free developments. Improving public transport connections through Underground, rail or by bus networks is central to unlocking new car-free developments, as well as stronger policy from the GLA and TfL. As stated in Outcome 3, a wider definition of connectivity is needed to acknowledge the role of active travel in allowing residents to access services and employment, as well as proximity of local amenities to developments.

Servicing and Deliveries

When unmanaged, the movement of goods and servicing vehicles to and from developments can create significant impacts on local environments; including high levels of HGV, LGV and white van traffic, increased levels of air pollution, a reduction in road safety

for vulnerable users, and experience of streets for those travelling actively. The borough is committed to working with developers and TfL to reduce the impact of servicing and deliveries by reducing delivery trips (especially during peak periods), and ensuring use of safe and legal loading facilities.

Examples of measures to reduce the impact of servicing and deliveries agreed at the planning application stage include reducing, consolidating and retiming deliveries, promotion of ZED deliveries to business, and installation of delivery lockers on sites, and form key elements of travel plans (more detail below). The Council is also exploring opportunities to reduce servicing for waste collection on new large scale developments, including underground waste management systems, expected to reduce collection journeys to sites.

Travel Plans

Travel plans are an effective took for enabling long term shift towards sustainable and active travel at new residential and commercial development. Following LWBF Local Plan policy CS7, the Council requests travel plans from all new developments that are expected to generate high trip levels, that demonstrate how development will maximise opportunities to enable a high mode-share of active, sustainable travel, and minimise levels of servicing and private car use. Expected to

Travel Plan targets and actions to meet these are expected to cover all trip generation to developments, including resident, employee, servicing and delivery journeys, and align targets across all modes with the overall aim of the MTS to deliver an 80% mode share for active, sustainable travel. Activities currently promoted by the Council currently include use of ZED scheme, behaviour change activities, and car club memberships (where suitable). New TfL travel plan guidance is expected in 2019, and the borough will seek to work with TfL to apply this for upcoming sites.

Borough Objectives

LBWF Objective 8.1 – New developments will enhance and support strategic and local cycle, walking and public transport networks: To ensure the location and design of developments enables new residents to make all journeys by sustainable and active moves, developments should deliver improvements to these networks.

Key to delivery of this objective will be increase permeability through sites by foot and by bike, as well as enhancements to the local sustainable transport network through highways improvements against the Healthy Streets criteria, and funding contributions.

LBWF Objective 8.2 – New development will be designed to prioritise cycling, walking and using public transport: Following the LBWF Core Strategy, new developments should ensure that cycling, walking and public transport are the easiest and most convenient options for travel. This will require delivery of dense and mixed use developments, but also connections to external networks on pedestrian and cycle desire lines, and high quality cycle facilities that meet needs of all users.

LBWF Objective 8.3 – Implement car-free approach at new developments: As detailed in Outcome 3, the Council is committed to delivering car-free development across the borough, and is developing a dedicated policy to support this approach at planning. As

growth continues in the borough, delivering improved connectivity by public transport and active travel is essential to supporting this approach, as well as improved definitions of connectivity.

LBWF Objective 8.4 – New development will be sited in well-connected locations: Siting development in suitable locations is essential to delivering good growth in the borough, and supporting objectives 8.1, 8.2 and 8.3. As stated in the Core Strategy, development should be located in dense areas, well connected by public transport and with good access to local services. The approach will be applied in development of the borough's new Local Plan.

LBWF Objective 8.5 – New development will be designed and managed to reduce impact of serving and freight: The borough will work with TfL and developers to introduce robust measures to reduce levels of servicing and goods vehicles travelling to and from new development. Measures are expected to include physical facilities to reduce levels servicing at developments, forming a key consideration in the design of schemes, as well as measures set out in Travel Plans.

Outcome 9: Transport investment will unlock the delivery of new homes and jobs'

MTS Objectives

The Mayor, through TfL and the boroughs, and working with stakeholders, will ensure that new homes and jobs in London are delivered in line with the transport principles of Good Growth for current and future Londoners by using transport to:

c) Create high density, mixed use places
d) Unlock growth potential in underdeveloped parts of the city

The Mayor, through TfL and the boroughs, and working with stakeholders, will seek to transform London's rail-based services to provide safer, modern, reliable, integrated, accessible and user-friendly services, with improved journey times and an increase in capacity of at least 80% by 2041 to tackle crowding and facilitate mode shift to rail.

Challenges and opportunities

Supporting Growth

Access to a comprehensive, accessible and future-proofed transport network is a key component to unlocking growth opportunities in Waltham Forest, and to improve the life chances and quality of life for residents. To support the Council's ambitious plans for sustainable regeneration and growth, the LBWF Transport Investment Strategy has identified five priority projects that are required to unlock significant development opportunities across the borough through public transport improvements.

Priority measures include increasing capacity and accessibility of existing public transport infrastructure, as well as enhancing the current transport network through delivery of new interchanges and connections. Key challenges to delivering these major projects include funding assembly, co-ordination of stakeholders, long-term planning of improvement works, and overcoming complex structural challenges.

It is also essential that the public transport network meets the needs of a changing population, placing emphasis on expanding the step-free network across Waltham Forest, as well as delivering streets and public places that encourage active and sustainable travel.

Walthamstow Central Underground Station

As detailed in Outcome 5, Walthamstow Central Interchange has experienced a significant increase in demand in recent years, with usage of the Underground station increasing by 51% between 2013 and 2016. Continuing this growth, Walthamstow is a Major Town Centre undergoing an unprecedented period of investment and development as a key growth area in the borough. In the next ten years, it is expected that Walthamstow will see:

- A minimum of 2,000 new homes
- 8,000sqm extension to The Mall shopping centre immediately adjacent to the interchange,

- A new civic quarter around the historic Town Hall and growth in the cultural and leisure economy, focused on the refurbishment of the EMD Granada Cinema.

Following TfL modelling, it is expected that Walthamstow Central will reach capacity by 2031, and significant investment is needed in to accommodate this potential growth within the Walthamstow area, without impacting the interchange. This need is recognised by TfL, and the borough is currently working with the developer of the Mall site, Capital and Regional, and TfL teams to develop capacity improvements at the Underground and bus stations.

Leyton Underground Station

Capacity increases are also required at Leyton Station to support planned regeneration and growth in the Lea Valley Eastside Opportunity Area. Plans within the catchment of Leyton Station include delivery of a significant new neighbourhood to the west of Leyton Town Centre, comprising of a minimum of 2,500 new homes, in addition to significant investment in sport and leisure facilities, new retail, commercial development, community facilities and improved links to Queen Elizabeth Olympic Park and Lee Valley Regional Park.

Based on current levels of demand, it is anticipated that the station will reach capacity by the early 2020s, and the Council and TfL are working together to introduce a scheme to transform the station to a modern design. This is expected to cater for predicted growth up to 2041 and introduce Step Free Access from street to platform level, as well as improvements to the public realm which form the gateway to Leyton Town Centre and Growth Area.

Ruckholt Road Station: Unlocking the Leyton Growth Area

In addition to improvement at Leyton Underground Station, further public transport capacity is required to support regeneration at Lea Valley East Side, and there is a strong case for the provision of a new station in the east of the opportunity area. This station would provide public transport access midway between Stratford and the new Lea Bridge Station, providing onward service access to the Central and Victoria Lines, Stansted Express, and directly connecting with the Elizabeth Line and, in future, Crossrail 2.

While the station would provide additional transport capacity needed support growth within Lea Valley Eastside, the station would also unlock further opportunities to the east of opportunity area. This includes potential to facilitate development on the nearby Transport for London bus depot and New Spitalfields Market sites, also providing connectivity and access to the north of Queen Elizabeth Olympic Park, where new neighbourhoods are being delivered, and Lee Valley Regional Park leisure facilities at Eton Manor

The new station is a critical piece of infrastructure as it would relieve both local bus routes and the Central Line Corridor by providing quick and direct access to Stratford where there are multiple routes to interchange, including Crossrail from 2019, as well as Tottenham Hale. Even with TfL's current improvement programme looking to increase capacity on the Central Line by 25% by 2030, the line remains under pressure at peak times and alternative routes.

Early discussions with Network Rail and TfL have secured their 'in principle' support. The Council's feasibility study estimates that the new station at Ruckholt Road will cost between £20-25m to deliver.

Planning a Smarter Bus Network

The bus network in Waltham Forest is a key mover of residents accessing the borough's centres, the transport network and wider opportunities for employment and education. Consequently, it is critical to unlocking development potential in the identified growth areas across the borough.

Key growth areas in which improvement of the bus network can support significant housing and business growth include the Blackhorse Lane area (2,500 homes) and the Lea Valley Eastside (2,500 homes), all of which are currently underserved by public transport. Proposals to improve the bus network in these areas include:

- North-south provision through the Blackhorse Lane area
- Improved connectivity in the north of the borough, particularly connecting Chingford Mount and neighbourhoods without Overground services to a range of higher capacity and frequency routes;
- Introduction of north-south services through the Lea Valley Eastside including a potential extension to the W19 service;
- Connections to Crossrail 2 services on the western side of the Lea Valley;
- Use of technological advances to improve information on bus availability, capacity and frequency, as well as to assist with communicating service changes.

The Borough also acknowledges the benefits that new types of bus services, such as demand-responsive services, could bring to reducing car dependency in less well-connected areas of the borough, and their capacity to support denser development. The Council is actively seeking to work with TfL to trial demand-responsive buses to understand how these services can improve connectivity in areas currently underserved by public transport.

The Council is aware of the major financial challenges TfL faces with the withdrawal of its bus subsidy by 2018 and the risk this poses to the development of the network. In response the borough is seeking to work in partnership with TfL to improve bus services, and is securing Section.106 funding from new developments to stimulate enhancements to bus services and support for new routes.

Chingford to Stratford Rail Service

Delivery of a new rail connection between Chingford and Walthamstow and the Metropolitan Centre of Stratford through re-instatement of the Hall Farm Curve is a long-term objective for Waltham Forest. Linking the Chingford-St James Street section of the Overground network to the Lea Valley Line to Stratford would significantly reduce journey times for residents in the north of the borough accessing jobs and opportunities at Stratford, as well as improving access to the Elizabeth Line.

The Council has previously undertaken feasibility into delivery of the link, estimated to cost £30-£40 million, and has engaged with TfL and Network Rail to build support for delivery. Key challenges to the completion of the scheme include platform capacity at Stratford, which

would potentially require new platforms, lack of funding allocation, and buy-in from key stakeholders. The borough has committed to a review of the feasibility studies, with a view to submit a revised business case to TfL and Network Rail.

Borough Objectives

Objective 9.1 – Expanding the boroughs Underground and Rail Network to unlocks growth: To deliver a public transport network that supports growth in the borough, the Council is committed to delivering the following major capacity and improvement projects:

- Walthamstow Central: Transport Interchange for a Major Centre in London
- Redeveloping Leyton Underground Station: Meeting Growing Demand
- Ruckholt Road Station: Unlocking the Leyton Growth Area
- Hall Farm Curve: Improving connectivity in the north of the borough

Objective 9.2 – Delivering high quality places and access for all at Station Gateways: To support capacity improvements, improved accessibility and customer experience is needed Underground and Rail stations is needed to support growth, and to create attractive public transport options. Key improvements to stations in the borough include public realm improvements, new interchange facilities and delivery of a step free access at all borough stations.

Objective 9.3 – Planning a Smarter, Greener Bus Network: The bus network is critical to unlocking development potential in the identified growth areas, which in some cases, such as between Lea Bridge and Leyton, are currently underserved by public transport. The borough is working with TfL and developers to unlock funding for bus services, in addition to supporting new methods of bus travel that hold the potential to support wider growth in the borough.

Objective 9.4 – Supporting growth through liveable neighbourhoods: In addition to improving public transport networks to new developments, improvements to cycling and walking networks, and urban realm in residential neighbourhoods are needed to capture modeshift to active and sustainable travel. Delivery of the borough aim of liveable neighbourhoods for everyone will be key to meeting this aim, and is reflected in the boroughs plans for delivery detailed in Objectives 1 – 7.

Other Mayoral Strategies[29]

The LIP refers to, and supports the following Mayoral Strategies

Mayoral Strategy	Significance within LIP
Walking action plan	The borough's overall Liveable Neighbourhoods is consistent with the TfL Walking Action plan objective in outer London to: - Identifying opportunities for new walking trips - Improving walking access to town centres and transport interchanges, including rail and Underground - Reducing the impact of traffic and making local streets better places to walk and spend time - Targeting trips to school, with a focus on reducing car use and increasing walking
Vision Zero action plan	The borough is committed to supporting TfL to meet Vision Zero, as detailed in Outcome 2 of this LIP.
Improving the Health of Londoners	Increasing levels of active travel and improving air quality is a key outcome for the borough in both its approach to increasing levels of sustainable travel, and improving the health and wellbeing of residents. The approach to improving health through transport schemes is detailed in Outcomes 1, 3 and 4.
London Environment Strategy	Outcomes 1, 3 and 4 each detail the Council's approach to improving the environment through transport schemes. These include: - Improving air quality - Reducing carbon emissions - Improving levels of biodiversity, sustainable urban drainage, and green infrastructure across the borough
Health Inequalities Strategy	Increasing levels of active travel and improving air quality is a key outcome for the borough in both its approach to increasing levels of sustainable travel, and improving the health and wellbeing of residents. As detailed in Outcomes 1, 3 and 4, tacking inequalities in forms key criteria in developing transport projects.

[29] Requirement R12: Other Mayoral strategies are also relevant to LIPs, and boroughs should have regard to these as they are published.

3. The Delivery Plan

Introduction

This chapter sets out our Delivery Plan for achieving the objectives of this LIP. It includes:

- Linkages to Mayor's Transport Investment Strategy priorities
- A list of potential funding sources for the period 2019/20 to 2021/22;
- Long-term interventions
- Three year indicative Programme of Investment for period 2019/20 to 2021/22
- A detailed annual programme for 2019/20

Linkages to the Mayor's Transport Investment Strategy priorities[30]

The Delivery Plan was developed to align the borough's projects and programmes with the policy framework of the Mayor's Transport Investment Strategy, the overarching mode share aim, each of the nine outcomes, and the relevant policies and proposals.

[30] Requirement R13: Boroughs are required to outline projects and programmes that contribute to the delivery of the Mayor's Transport Investment Strategy – including the overarching mode share aim, each of the nine outcomes and the relevant policies and proposals – in preparing a Delivery Plan.

	Project / Programme	MTS outcomes								
		Improving active, efficient and sustainable mode share	No I:-Active	No 2:- Safe	No 3:-Efficient	No 4:- Clean & Green	No 5:- Connected	No 6:- Accessible	No 7:- Quality	Nos 8 & 9 Sustainable Growth/Unlocking
	Corridors, Neighbourhoods and Smarter Travel	✓	✓	✓	✓	✓	✓	✓	✓	✓
1	Enjoy Waltham Forest Town Centres and Village Connectivity (Markhouse area)	✓	✓	✓	✓	✓	✓	✓		✓
2	Lea Bridge Road - A street for everyone	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	Leyton - Lea Bridge Cycle Route	✓	✓	✓	✓	✓	□	□		✓
4	Forest Road Corridor - Bell Junction Improvements	✓	✓	✓	✓	✓	✓	✓	✓	✓
5	Winns/Lloyd Park Area based scheme	✓	✓	✓	✓	✓	✓	✓		✓
6	Sewardstone Road - Mansfield Hill Corridor Safety Scheme	✓	✓	✓	✓		□	✓		
7	Hoe Street/Wood Street area improvement scheme	✓	✓	✓	✓	✓	✓	✓		✓
8	South Leytonstone Liveable Neighbourhoods support	✓	✓	✓	✓	✓	✓	✓	✓	✓
9	Leyton and Leytonstone Town Centre Scheme Phase 2	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	Residential 20mph Zones - Chingford	✓	✓	✓			□	□		
11	20mph principal Road network	✓	✓	✓			□	□		
12	Green Man - Gainsborough Road cycling corridor	✓	✓	✓	✓	✓	□	□		✓

Project / Programme		MTS outcomes								
		Improving active, efficient and sustainable mode share	No I:-Active	No 2:- Safe	No 3:-Efficient	No 4:- Clean & Green	No 5:- Connected	No 6:- Accessible	No 7:- Quality	Nos 8 & 9 Sustainable Growth/Unlocking
13	Chingford Road Corridor Safety scheme	✓	✓	✓	✓		□	□		
14	Billet Road corridor scheme - Walking, Cycling and Safety corridor Improvements	✓	✓	✓	✓		□	□		
15	Larkshall Road corridor scheme - Walking, Cycling and Safety Improvements	✓	✓	✓	✓		□	✓		
16	Forest Road Cycle route - Bell junction to Wood Street	✓	✓	✓	✓	✓	□	□		✓
17	Whipps Cross Road Pedestrian and Cycle Corridor	✓	✓	✓	✓	✓	□	□		✓
18	Chingford Road to Fulbourne Road cycle routes and permeability	✓	✓	✓	✓	✓	□	□		✓
19	Woodford New Road - Lea Bridge Road extension	✓	✓	✓	✓	✓	□	□		✓
20	Cycle Training	✓	✓	✓	✓	✓	□	□		
21	Cycle Parking	✓	✓	□	✓	✓	✓	✓		✓
22	Sustainable Transport Complimentary Measures and Behaviour Change	✓	✓	✓	✓	✓	✓	✓		✓
23	Safer Routes to School	✓	✓	✓	✓	✓	□	□		
24	Scootability	✓	✓	□			□	□		

	Project / Programme	MTS outcomes								
		Improving active, efficient and sustainable mode share	No I:-Active	No 2:- Safe	No 3:-Efficient	No 4:- Clean & Green	No 5:- Connected	No 6:- Accessible	No 7:- Quality	Nos 8 & 9 Sustainable Growth/Unlocking
25	Electric Vehicle and Car Club Expansion	□	□	□	✓	✓	□	□		
26	Hoe Street Walking Cycling and Bus Transport Improvements	✓	✓	✓	✓		✓	✓	✓	✓
27	Virtual Loading trial	□	□	□	✓	✓	□	□		
28	Wayfinding	✓	✓	□	✓	✓	✓	□		✓
29	Post Scheme Studies	✓	✓	✓			□	□		
30	Bus Priority and reliability review - Bus lane timings, waiting and loading and pinch points	✓	□	✓	✓	✓	✓	✓	✓	✓
31	Local transport Funding - Improving conditions for cycling as set out in the Councils 10 point action plan	✓	✓	✓	✓		□	□		
	Major Scheme/Liveable Neighbourhoods	✓	✓	✓	✓	✓	✓	✓	✓	✓
1	Coppermill Village	✓	✓	✓	✓	✓	✓	✓		✓
2	South Leyton/Leytonstone	✓	✓	✓	✓	✓	✓	✓		✓
3	Blackhorse Junction	✓	✓	✓	✓	✓	✓	✓		✓

TfL Business Plan[31]

In developing and preparing the borough's programme of works (as outlined in the Delivery Plan), the borough has considered the Mayor's aspiration to deliver the major projects in TfL's Business Plan and the milestones associated with these projects – including major infrastructure associated with Growth Areas and Opportunity Areas.

The following TfL projects have implications for the borough.

Project	Implications for borough	Complementary works to be carried out by the borough
Ultra-Low Emission Zone	Implementation south of the North Circular.	- Continued delivery of EV charging facilities - Engagement with business and residents to support shift to low emission vehicles - Supporting residents and businesses to reduce levels of vehicle use, and car ownership.
Step Free Access Programme	Leyton Underground Station Step Free Access	- Completion of current walking, cycling and bus priority major scheme at Walthamstow Central. - Potential future enhancement works to improve public realm, cycling and walking at Walthamstow Gyratory and Leyton stations - Allocation of match-funding where appropriate.
TfL Growth Funding	Walthamstow Central Leyton	
Crossrail	Connectivity to the south of the borough	- Delivery of South Leytonstone/ North Stratford Liveable Neighbourhoods scheme to the south of the borough (subject to bid). - Delivery of Leyton to Chingford Mini Holland cycle route.

[31] Requirement R14: When preparing their LIPs, boroughs are required to take into account the major projects and investment in all modes of transport, as well as the investment in the road network that may impact on their borough, as set out in the TfL Business Plan.

Project	Implications for borough	Complementary works to be carried out by the borough
		- Continued support to grow bus services that will connect to stations.
Cross Rail 2	Connectivity to the west of the borough	- Continued support to grow bus services that will connect to stations. - Working in partnership with London Borough of Hackney to deliver priority future cycle route between Lea Bridge Road and Dalston.
Mini Holland	Continued delivery of Enjoy Waltham Forest Programme	- Completion of Mini Holland funded programme in 2019//20, - The borough will continue to deliver improvements to the local cycling and walking network to complement and improve works undertaken through Mini Holland funding.
Liveable Neighbourhoods programme	Coppermill Liveable Neighbourhoods South Leytonstone/ North Stratford Liveable Neighbourhoods	- Delivery of Coppermill Liveable Neighbourhoods using committed funding - Delivery of South Leytonstone/ North Stratford Liveable Neighbourhoods subject to funding allocation. - The borough will continue to deliver improvements to the local cycling and walking network to complement and improve works undertaken through Liveable Neighbourhoods funding.

Sources of funding

Table ST02 below identifies potential funding sources for implementation of our LIP, including LIP funding allocation from TfL, contributions from the borough's own funds, and funding from other sources.

The key source of funding is the borough's LIP allocation. Figures provide by TfL indicate that the borough will receive £5,775,000 between 2019/20 and 2021/22

In addition to the above, the borough will receive £4,633,000 from TfL between 2019/20 and 2021/22 in response to the following successful bids:

a. *Blackhorse Junction Major Scheme*
b. *Coppermill Village Liveable Neighbourhood Scheme*

The borough also uses its own resources and resources from developers to pursue local objectives and ensure that the road network remains in a safe and serviceable condition.

The sums available from developers via section 106 agreements between 2019/20 and 2021/22 is approximately £2,900,000, with the majority being aligned with the Lea Bridge Road, Blackhorse Junction and Coppermill Village Liveable Neighbourhoods projects.

ST02 - Potential funding for LIP delivery				
Funding source	2019/20 £k	2020/21 £k	2021/22 £k	Total £k
TfL/GLA funding				
LIP Formula funding –Corridors & Supporting Measures	1925	1925	1925	5775
Discretionary funding (See 3 Year Programme) inc. MH	3908	1875	50	5833
Discretionary funding (Prospective LN bid)		200	1500	1700
Strategic funding				
GLA funding		395		395
GLA funding (prospective MAQF3)	65	388	247	700
Sub-total	5898	4783	3722	14403
Borough funding				
Capital funding				
Revenue funding	200	200	200	600
Parking revenue	395	395	395	1185
Workplace parking levy				
Sub-total	595	595	595	1785
Other sources of funding				
S106 (anticipated)	1800	800	300	2900
CIL				
European funding				
Sub-total	1800	800	300	2900
Total	8293	6178	4617	19088

Long-Term interventions to 2041

In the medium to long-term the borough believes that a number of significant, but currently unfunded, investments will be required to ensure the economic and social vitality of the borough. These are shown in Table ST03 below with indicative funding and indicative but uncommitted timescales.

ST03 - Long-term interventions up to 2041				
Project	**Approx. date**	**Indicative cost**	**Likely funding source**	**Comments**
Walthamstow Central Interchange	2020-2025	>£20m	TfL Growth Fund, Developer Contributions	The borough is currently working with TfL and Capital and Regional to progress delivery of Step Free Access and a new entrance to the Victoria Line as part of the Mall Development. The Council is exploring funding options to support delivery of this scheme.
Leyton Underground Station	2020-2025	>£18m	TfL Growth Fund, Developer Contributions, TfL Step Free programme	The borough is currently working with TfL Step Free Access and necessary capacity upgrades at Leyton station. The Council is exploring funding options to support delivery of this scheme.
Ruckholt Road Station	2030	>£25m	TfL Growth Fund, Developer Contributions	Delivery of a new station at Ruckholt Road is essential to unlocking large scale development plans at Lea Valley Eastside. The Council is working with TfL and Network Rail to understand feasibility and funding options.

ST03 - Long-term interventions up to 2041				
Project	**Approx. date**	**Indicative cost**	**Likely funding source**	**Comments**
St. James Street SFA	2019-2024	£3m	DfT Access for All programme, Developer Contributions	The Council has an aspiration to deliver Step Free Access at all stations in the borough by 2041. St. James Street has been recognised as a priority station on the London Overground Network, and the Council is supportive of funding bids to the DfT.
Leyton Midland Road SFA	2019-2024	>£5m	DfT Access for All programme, Developer Contributions	The Council has an aspiration to deliver Step Free Access at all stations in the borough by 2041. Leyton Midland Road has been recognised as a priority station on the London Overground Network, and the Council is supportive of funding bids to the DfT.
Complete borough SFA	2020-2041	Dependent on site	TfL Step Free programme, DfT Access for All programme, Developer Contributions	The Council has an aspiration to deliver Step Free Access at all stations in the borough by 2041. It is committed to working with TfL to unlocking funding opportunities from TfL/ DfT funding streams, as well as developer contributions around stations, and across the borough.
Lea Bridge Station Improvements	2021	>£6m	Developer Contributions	Significant growth is planned around Lea Bridge Station, and upgrades are needed to

ST03 - Long-term interventions up to 2041				
Project	**Approx. date**	**Indicative cost**	**Likely funding source**	**Comments**
				support these levels of growth. Improvement works at Lea Bridge station are planned as part of growth, with costs expected to be met through development schemes.
Station Public Realm and Interchange Improvements	2020-2041	>£25m	Developer Contributions	The Council is committed to improving public realm and interchange facilities at all stations in the borough. This includes future works at Walthamstow Central and Overground stations to improve conditions for walking and cycling. Multiple funding streams will be required to deliver works, which will be explored as schemes are developed.
Hall Farm Curve	2030 – 2041	>£40m	TBC	The Hall Farm Curve is a long term intervention to provide an additional rail connection directly from Chingford to Stratford. Although funding sources are not allocated to delivery, the borough is continuing to engage with TfL and Network Rail to build support for the scheme,
Primary Road Cycle Network	2019-2025	>£50m	TfL Funding, Developer Contributions	Aspiration is to deliver high quality, segregated cycle facilities across a number of

ST03 - Long-term interventions up to 2041				
Project	**Approx. date**	**Indicative cost**	**Likely funding source**	**Comments**
				main roads in the borough to expand the Enjoy Waltham Forest Network, deliver the boroughs aspirational network, and meet mesh density requirement of the MTS. The borough will look to fund this through LIP funding and development led contributions, however, given the high cost associated with the delivery of main road infrastructure, further major funding streams are likely to be required.
Borough-wide Liveable Neighbourhoods programme	2019-2041	>£50m	TfL Liveable Neighbourhood funding	The borough is committed to delivering neighbourhood level improvements across the borough to support Healthy Streets and MTS objectives. The borough will look to fund this through LIP funding, and development led contributions, however, given the geographic scale of the areas in question, further major funding streams are likely to be required.
Leyton Green	2020 - 2030	>£7m	TfL Liveable Neighbourhoods	The borough has a long held aspiration to deliver changes at Leyton Green to improve the public realm, cycling and walking infrastructure, and bus reliability and journey

ST03 - Long-term interventions up to 2041				
Project	**Approx. date**	**Indicative cost**	**Likely funding source**	**Comments**
				times. Further funding opportunities will be explored to allow further development of the scheme.
Leytonstone Gyratory	2020 - 2030	>£10m	LEN bid via Mayors Air Quality fund, TfL Liveable Neighbourhoods	The borough is progressing funding opportunities to deliver initial changes to Leytonstone gyratory through the GLA Low Emissions Neighbourhood fund. Further funding opportunities will be explored following development of the initial scheme for more substantive long term changes

Three-year indicative Programme of Investment

The Three Year indicative Programme of Investment has been completed in the table ST04 below. The table summarises, at a programme level, the borough's proposals for the use of confirmed TfL borough funding in the period 2019/20 – 2021/22.

ST04 - Three-year indicative programme of investment for the period 2019/20 to 2021/22			
London Borough of Waltham Forest TfL BOROUGH FUNDING 2019/20 TO 2021/22	Programme budget		
	Allocated 2019/20	Indicative 2020/21	Indicative 2021/22
Local transport initiatives			
CORRIDOR, NEIGHBOURHOODS & SUPPORTING MEASURES	**1925**	**1925**	**1925**
Neighbourhood Improvements	450	325	325
Cycle routes	410	310	500
Collision reduction and corridor improvements	430	640	450
Behaviour change and supporting measures	475	380	380
Smarter, greener and more efficient travel	60	170	170
Local transport funding	100	100	100
Sub-total	1925	1925	1925
DISCRETIONARY FUNDING	**3908**	**1875**	**50**
Liveable Neighbourhoods	1282	1875	50
Major Schemes	1426		
Principal road renewal			
Bridge strengthening			
Mini Holland Traffic signal modernisation	1200		
Sub-total	3908	1875	50
STRATEGIC FUNDING	**£k**	**£k**	**£k**
Bus Priority			
Borough cycling programme			
London cycle grid			
Crossrail complementary works			
Mayor's Air Quality Fund			
Low Emission Neighbourhoods			
Sub-total	0	0	0
All TfL borough funding	**5833**	**3800**	**1975**

Supporting commentary for the three-year programme[32]

The Boroughs three year programme of Investment has been identified and prioritised based on the following key areas and objectives

Supporting delivery of the Boroughs Enjoy Waltham Forest (Mini Holland) programme:

The Enjoy Waltham Forest (Mini Holland) programme commenced in 2014/15 and comprises an integrated group of approximately 30 projects and initiatives that aim to create a step change in travel behaviour away from private car use towards sustainable and active travel modes. The programme is currently in year four of five. As projects and initiatives have been developed and delivered new barriers and gaps in the Enjoy Waltham Forest project areas have emerged and new connections and priorities that previously did not exist have been identified. Monitoring of completed schemes has also demonstrated the need to review and hone certain interventions to ensure they deliver the required outcomes and meet stakeholder needs. A number of the projects set out in the three year delivery programme aim to support the final year of Mini Holland investment in 2019/20 by complementing ongoing funded projects, addressing key gaps and barriers that have arisen, delivering new connections and greater connectivity, and enhancing previously completed projects in response to monitoring and stakeholder feedback

Building on the Enjoy Waltham Forest programme – Neighbourhoods and Routes:

Despite success, the level of investment available as part of the Enjoy Waltham Forest programme has not been sufficient to cover the entire borough, with gaps between the A503 (Forest Road) and A406 (North Circular), and south of the A12. The Enjoy Waltham Forest programme is significant platform to build upon but to ensure benefits are shared by all residents, and a wider programme of investment is needed to deliver improvements across all neighbourhoods.

The Boroughs 2020 Vision, prepared in 2014, set out a range of projects and programmes to be delivered in the period post Mini Holland (originally 2017-2020) in order to deliver further neighbourhood and active and sustainable transport improvements across the borough. The Borough has reviewed the post Mini Holland investment programme set out in the 2020 Vision and re-prioritised based on the interventions delivered over the past 4 years, customer and stakeholder sentiment in different parts of the borough, the boroughs strategic investment priorities, and up to date transport demand analysis including the SCA. A number of the projects set out in the three year investment programme have been prioritised based

[32] Requirement R18: Boroughs are required to provide supporting commentary on: a. How the three-year Programme of Investment has been derived, including how potential interventions have been identified and prioritised, and practical considerations relating to timescales, capacity and consultation b. The role of revenue-based investment, policy decisions, and third-party actions (including commitments outlined in TfL's Business Plan and investment programme) in delivering the borough's LIP objectives c. How the delivery of the Mayor's priorities will be supported at a local level.

on the above and aim to expand investment in neighbourhood improvements and walking and cycling infrastructure into priority areas across the borough

Vision Zero

The borough is committed to supporting TfL deliver Vision Zero for London. A number of projects within the proposed three year investment programme have been identified and prioritised based on recent collision data, with specific focus around links and nodes with higher numbers of vulnerable road use casualties that have not seen investment in the last three to five years. A holistic approach will be adopted to ensure that improvements to all active and sustainable transport modes are investigated and considered but with emphasis on collision and casualty reduction.

Behaviour Change

As the amount and quality of walking and cycling and public transport infrastructure in the borough increases the need to encourage and promote active and sustainable transport options and break down non-infrastructure barriers to these modes becomes imperative to ensure behaviour change is being realised. The borough has invested significantly in behaviour change measures and initiatives during the Mini Holland programme from cycle parking and training through to publicity, events and stakeholder/customer travel planning. A number of projects within the three year investment programme have been prioritised to continue the work delivered to date by the borough and expand into new areas and initiatives.

Smarter, greener and more efficient transport

The borough recognises that road based transport plays a role in supporting a vibrant and economically viable borough and that some residents and businesses are reliant on access to a motorised vehicle for a variety of reasons. Where access and use of a motorised vehicle is essential we want to ensure this is managed as efficiently and sustainably as possible, and the boroughs communities are given options other than individual car ownership. A number of projects and initiatives included in the three year investment programme aim to support and promote alternatives to car ownership, increase the proportion of low or zero emission vehicles on the boroughs roads, and deliver more effective and efficient ways for road based transport, particularly freight, to use the boroughs road network in order to reduce congestion and improve air quality.

Public Transport accessibility, connectivity and reliability

Public transport has a fundamental role to play in achieving both the borough's and Mayor of London's mode share objectives. Many journeys cannot realistically be walked or cycled for a wide range of reasons and where this is the case public transport should be the first choice for the boroughs communities. Many of projects identified in the three year investment programme intrinsically aim to improve accessibility and connectivity to public transport infrastructure and services, in addition to achieving other core aims and objectives such as a casualty reduction, enabling active travel and enhancing the built environment.

A number of specific projects have been identified with a primary focus on road based public transport reliability and resilience. This includes a borough-wide bus operation review (including bus lane timings, waiting, pinch points and loading facilities), and improvements to bus facilities on Hoe Street and the Whipps Cross road corridor. Beyond specific public transport works, public realm, cycling and walking schemes proposed as part of the LIP aim to improve the journey from bus and rail interchanges to homes and destination in the borough, enhancing the overall public transport experience for people travelling to or from Waltham Forest.

Risks to the delivery of the three-year programme[33]

Table ST05 below shows the principal risks associated with delivery of the LIP together with possible mitigation actions for the three-year programme. The risk register summarises the strategic risks identified that could impact on the three-year programme of schemes/initiatives.

Risk	Likelihood			Potential mitigation measures	Impact if not mitigated
	H	M	L		
Financial					
Reduction in proposed funding from TfL or other internal/external sources		X		Additional funding to be identified from alternative funding sources (external grants, Council capital/revenue/S106/CIL) to bridge gap.	Interventions will need to be de-scoped and/or prioritised for delivery which may result in failure to deliver some objectives and meet targets. Internal resourcing is also likely to be affected presenting further challenges to project delivery
Statutory / Legal					
Failure to obtain necessary approvals or consents (either completely or within required timescales) required as part of the legislative and regulatory frameworks relevant to the delivery of Local Authority Highway projects			X	Ensure potential approvals and consents are identified as early as possible and where possible designed out to mitigate need. If not possible early identification will maximise available time to secure necessary consents and approvals.	Interventions may not be deliverable if consents and approvals are not received which may result in failure to deliver some objectives and meet targets.

[33] Requirement R19: Boroughs are required to include a concise section on risk assessment and mitigation in preparing and considering options for their Delivery Plan.

Risk	Likelihood			Potential mitigation measures	Impact if not mitigated
	H	M	L		
Objections from statutory consultees			X	Ensure Statutory consultees are engaged at an early stage to ensure buy-in and support for interventions being considered	Interventions may not be deliverable if Statutory consultees object which may result in failure to deliver some objectives and meet targets
Failure to secure appropriate 3rd party contractual arrangements required to support delivery of projects			x	Identify all contractual arrangements required to support delivery of projects and ensure appropriate contractual arrangements are in place as needed	Interventions may not be deliverable if relevant contractual arrangements are not in place with which may result in failure to deliver some objectives and meet targets
Third Party					
Statutory Undertakers Equipment costs prohibitive			x	Identify statutory undertakers equipment that may influence and affect project development design at an early stage in order to design out risk. If not possible identify potential cost impact at an early stage so that it can be factored into scheme cost forecasting	Interventions may not be deliverable if Statutory Undertakers costs are prohibitive and cannot be designed out
Failure to secure appropriate 3rd party contractual arrangements required to support delivery of projects			x	Identify all contractual arrangements required to support delivery of projects and ensure appropriate contractual arrangements are in place as needed	Interventions may not be deliverable if consents and approvals are not received which may result in failure to deliver some objectives and meet targets
Public / Political					

Risk	Likelihood			Potential mitigation measures	Impact if not mitigated
	H	M	L		
Public/community do not support proposed interventions		x		Undertake early and ongoing public engagement to obtain buy-in and support and ensure proposals are as community led as possible	Interventions may not be supported by the local community may need to be de-scoped or withdrawn. This may result in a failure to deliver some objectives and meet targets
Lack of political support			x	Ensure high level political support for all proposed interventions and deliverables at the outset of the programme	Interventions not supported politically will need to be de-scoped or withdrawn. This may result in a failure to deliver some objectives and meet targets
Programme & Delivery					
Insufficient internal borough resource to deliver programme			x	Ensure programme resource requirements have been identified and costed at the outset to ensure the programme is deliverable within financial and resource constraints	Insufficient resource will mean interventions may need to be de-scoped and/or prioritised for delivery which may result in failure to deliver some objectives and meet targets. Internal resourcing is also likely to be affected presenting further challenges to project delivery

Annual programme of schemes and initiatives[34]

The annual programme of schemes has been completed and submitted to TfL via the Borough Portal. The programme of schemes will be updated annually.

Risk assessment for the annual programme[35]

Table ST06 below shows the principal risks associated with delivery of the LIP together with possible mitigation actions for the annual programme. The risk register summarises the strategic risks identified that could impact on the annual programme of schemes / initiatives.

[34] Requirement R20: Boroughs are required to provide a detailed and costed programme of schemes and initiatives for the first year of the plan, with the programme to be updated in subsequent years. Boroughs should submit their Programme of Investment using Proforma A (as shown at Part three – Appendix F). Proformas will need to be uploaded to the Borough Portal.

[35] Requirement R22: Boroughs are required to identify any projects that have significant potential of risk within the planned programme of works and identify any mitigation measures for these high-risk projects.

Risk	Likelihood			Potential mitigation measures	Impact if not mitigated
	H	M	L		
Financial					
Reduction in proposed funding from TfL or other internal/external sources		X		Additional funding to be identified from alternative funding sources (external grants, Council capital/revenue/S106/CIL) to bridge gap.	Interventions will need to be de-scoped and/or prioritised for delivery which may result in failure to deliver some objectives and meet targets. Internal resourcing is also likely to be affected presenting further challenges to project delivery
Statutory / Legal					
Failure to obtain necessary approvals or consents (either completely or within required timescales) required as part of the legislative and regulatory frameworks relevant to the delivery of Local Authority Highway projects			X	Ensure potential approvals and consents are identified as early as possible and where possible designed out to mitigate need. If not possible early identification will maximise available time to secure necessary consents and approvals	Interventions may not be deliverable if consents and approvals are not received which may result in failure to deliver some objectives and meet targets
Objections from statutory consultees			X	Ensure Statutory consultees are engaged at an early stage to ensure buy-in and support for interventions being considered	Interventions may not be deliverable if Statutory consultees object which may result in failure to deliver some objectives and meet targets
Failure to secure appropriate 3rd party contractual arrangements required to support delivery of projects			x	Identify all contractual arrangements required to support delivery of projects and ensure appropriate contractual arrangements are in place as needed	Interventions may not be deliverable if relevant contractual arrangements are not in place with which may result in failure to deliver some objectives and meet targets

Risk	Likelihood			Potential mitigation measures	Impact if not mitigated
Third Party					
Statutory Undertakers Equipment costs prohibitive			x	Identify statutory undertakers equipment that may influence and affect project development design at an early stage in order to design out risk. If not possible identify potential cost impact at an early stage so that it can be factored into scheme cost forecasting	Interventions may not be deliverable if Statutory Undertakers costs are prohibitive and cannot be designed out
Failure to secure appropriate 3rd party contractual arrangements required to support delivery of projects			x	Identify all contractual arrangements required to support delivery of projects and ensure appropriate contractual arrangements are in place as needed	Interventions may not be deliverable if consents and approvals are not received which may result in failure to deliver some objectives and meet targets
Public / Political					
Public/community do not support proposed interventions		x		Undertake early and ongoing public engagement to obtain buy-in and support and ensure proposals are as community led as possible	Interventions may not be supported by the local community may need to be de-scoped or withdrawn. This may result in a failure to deliver some objectives and meet targets
Lack of political support			x	Ensure high level political support for all proposed interventions and deliverables at the outset of the programme	Interventions not supported politically will need to be de-scoped or withdrawn. This may result in a failure to deliver some objectives and meet targets
Programme & Delivery					
Insufficient internal borough resource to deliver programme			x	Ensure programme resource requirements have been identified and costed at the outset to ensure the programme is deliverable within financial and resource constraints	Insufficient resource will mean interventions may need to be de-scoped and/or prioritised for delivery which may result in failure to deliver some objectives and meet targets. Internal resourcing is also likely to be affected presenting further challenges to project delivery

Monitoring the delivery of the outcomes of the Mayor's Transport Investment Strategy

Overarching mode-share aim and outcome Indicators[36]

Borough targets set by TfL for the overarching mode-share aim and outcomes is provided in ST07 below.

Delivery indicators [37]

The borough will monitor and record the delivery indicators and report to TfL once a year in June using Proforma C.

[36] Requirement R23: Boroughs are required to set targets against the overarching mode share aim and the nine outcomes using their respective outcome indicators.

[37] Requirement R24: Boroughs are required to collect this information and submit it to TfL using Proforma C on at least an annual basis.

ST07 - Borough outcome indicator targets				
Objective	**Metric**	**Borough target**	**Target year**	**Additional commentary**
Overarching mode share aim – changing the transport mix				
Londoners' trips to be on foot, by cycle or by public transport	Active, efficient and sustainable (walking, cycling and public transport) mode share (by borough resident) based on average daily trips. Base period 2013/14 - 2015/16.	66%	2021	The Council is supportive of the overall mode-share target of the MTS. However, while it supports delivery of improvements to the public transport and cycling and walking networks, further incentives to reduce car-travel are needed. Delivery of significant shifts in mode-share is dependent on progress in GLA and TfL led proposals for road pricing, and workplace parking levies, which if introduced correctly will reduce levels of car-use within and through the borough.
		78%	2041	

Objective	Metric	Borough target	Target year	Additional commentary
Healthy Streets and healthy people				
Outcome 1: London's streets will be healthy and more Londoners will travel actively				
Londoners to do at least the 20 minutes of active travel they need to stay healthy each day	Proportion of London residents doing at least 2x10 minutes of active travel a day (or a single block of 20 minutes or more).	40%	2021	
		70%	2041	
Londoners have access to a safe and pleasant cycle network	Proportion of Londoners living within 400m of the London-wide strategic cycle network.	54%	2021	Significant investment is needed to expand the borough's cycling network to meet standards set within the LCDS. While the borough will seek developer funding and LIP allocation to complete the network, achievement of the 75% target is dependent on continued investment by TfL in cycling infrastructure.
		75%	2041	

Objective	Metric	Borough target	Target year	Additional commentary
Outcome 2: London's streets will be safe and secure				
Deaths and serious injuries from all road collisions to be eliminated from our streets	Deaths and serious injuries (KSIs) on borough roads per year	50	2022	The borough is currently developing a Road Safety Strategy that will provide borough specific targets. Depending on targets set within this strategy, further objectives may be set, and the LIP updated. Meeting Vision Zero will require robust enforcement of speed limits, significant investment in segregated main road infrastructure, and wider strategies to reduce levels of vehicle traffic and safer HGV and freight vehicles.
		29	2030	
		0	2041	

Objective	Metric	Borough target	Target year	Additional commentary
Outcome 3: London's streets will be used more efficiently and have less traffic on them				
Reduce the volume of traffic in London.	Vehicle kilometres in given year. Base year 2015. Reduce overall traffic levels by 10-15%.	719 million (-2%)	2021	The Council is supportive of the targets to reduce vehicle volumes and ownership. While it supports improvements to the public transport, cycling and walking networks, further incentives to reduce traffic are needed. Delivery of significant shifts in mode-share is dependent on progress in GLA and TfL led proposals for road pricing, and workplace parking levies, which if introduced correctly will reduce levels of car-use within and through the borough. Further support from the GLA and TFL to progress and expand the car-free approach to new development in Waltham Forest.
		683 million (-10%)	2041	
Reduce the number of freight trips in the central London morning peak.	10% reduction in number of freight vehicles crossing into central London in the morning peak period (07:00am - 10:00am) by 2026.	N/A	N/A	
Reduce car ownership in London.	Total cars owned and car ownership per household, borough residents. Quarter of a million fewer cars owned in London. Base period 2013/14 - 2015/16.	79,400 (-4%)	2021	
		72,900 (-12%)	2041	

Objective	Metric	Borough target	Target year	Additional commentary
Outcome 4: London's streets will be clean and green				
Reduced CO_2 emissions.	CO_2 emissions (in tonnes) from road transport within the borough. Base year 2015/16.	153,000 (- 13%)	2021	The borough is supportive of targets to reduce vehicle emissions, and is committed to reducing overall levels of traffic in the borough, working to implement the ULEZ, and enabling transition to low emission vehicles. Further policy drivers are needed to accelerate wider change in the vehicle industry to shift towards zero-emission vehicles. Further work is needed to develop a referenced method of assessing impact of PM10 and PM2.5. This should include an levels of PM emissions through exhaust fumes, brake wear, road dust, and tire wear.
		42,800 (- 75%)	2041	
Reduced NO_X emissions.	NO_X emissions (in tonnes) from road transport within the borough. Base year 2013.	240 (-61%)	2021	
		30 (-95%)	2041	
Reduced particulate emissions.	$PM_{10\ 5}$ emissions (in tonnes) from road transport within borough. Base year 2013.	-49 (-- 29%)	2021	
		33 (-46%)	2041	

Objective	Metric	Borough target	Target year	Additional commentary
Reduced particulate emissions	PM $_{2\,5}$ emissions (in tonnes) from road transport within borough. Base year 2013	24 (-31%)	2021	
		16 (-54%)	2041	
A good public transport experience				
Outcome 5: The public transport network will meet the needs of a growing London				
More trips by public transport - 14-15 million trips made by public transport every day by 2041.	Trips per day by trip origin. Reported as 3yr moving average. Base year 2013/14 - 2015/16.	191,000 (+17%)	2021	The borough is committed to increasing levels of public transport use, and is working with TfL to deliver and fund large scale improvements to its key transport interchanges.
		255,000 (+ 55%)	2041	Significant infrastructure improvements and further investment is needed to delivery improvements required to support this level of growth.

Objective	Metric	Borough target	Target year	Additional commentary
Outcome 6: Public transport will be safe, affordable and accessible to all				
Everyone will be able to travel spontaneously and independently.	Reduce the difference between total public transport network journey time and total step-free public transport network	50% reduction (7.5 minutes difference)	2041	TfL targets state that journey time between the SFA network and full network should be reduced by 50% to 8 minutes. The borough will continue to seek to reduce the gap completely before 2041.
Outcome 7: Journeys by public transport will be pleasant, fast and reliable				
Bus journeys will be quick and reliable, an attractive alternative to the car	Annualised average bus speeds, base year 2015/16	9.3 mph (+5%)	2021	The borough understands that TfL are making significant changes to the operation of the bus network in London. As a result evaluation and metrics should be based on re-shaped bus network, expected to be in place by 2041.
		9.7 mph (+5%)	2041	

Objective	Metric	Borough target	Target year	Additional commentary
New homes and jobs				
Outcome 8: Active, efficient and sustainable travel will be the best options in new developments **Outcome 9: Transport investment will unlock the delivery of new homes and jobs**				
No targets set by TfL				The borough is currently developing a new local plan, and further targets and requirements are likely to be set.