Haringey Council

A Review of Sustainable Transport Measures to Achieve 40:20

September 2011

Final Report

TRANSPORT
TRAFFIC
DEVELOPMENT
PLANNING
URBAN DESIGN
ECONOMICS
MARKET RESEARCH

colinbuchanan.com

A Review of Sustainable Transport Measures to Achieve 40:20

Final Report

Project No: 19959-01-1
July 2011

20 Eastbourne Terrace,
London,
W2 6LG
Telephone: 020 7053 1300
Fax: 020 7053 1301
Email : London@cbuchanan.co.uk

Prepared by:	Approved by:
Chris Hanley	Atholl Noon

Status: Final Issue no: 1 Date: 21st September 2011

Contents

Tables

Figures

Executive Summary

Overview

In order to launch the London Borough of Haringey's (LBH) carbon reduction action plan, which aims to achieve a 40% reduction in emissions across the borough by 2020, Haringey Council has commissioned a study to understand its transport carbon footprint currently and how emissions can be reduced long-term.

The study uses the North London Highway Assignment Model developed by Transport for London and considers four questions:

- What is Haringey's current level of emissions (2008 base year)?
- What will emissions be in 2020 if LBH take advantage of vehicle efficiency improvements and infrastructure upgrades, but our population also increases (business as normal)?
- What added benefit will there be if the measures outlined in the LBH Local Implementation Plan and Smarter Travel Programme are implemented?
- What other measures may help to optimise emissions reductions by 2020?

Current situation

The graphics below show ground-based emissions by mode in Haringey, along with the proportion of internal trips that end or pass through adjacent London boroughs. There are a very high number of trips that transcend the Haringey borough boundary (88%). It is also worth noting that only 12% of all carbon emissions from are from internal to internal trips (those that start and end within the Borough); many of the smarter choices measures in the LIP will only affect these trips, hence why the carbon reduction potential is greatly reduced.

Figure S 1: Annual CO_2 emissions by mode

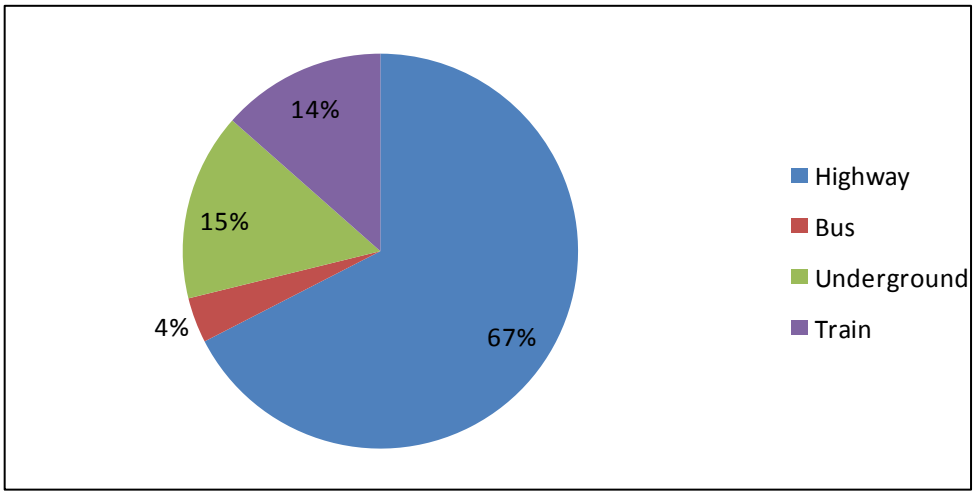
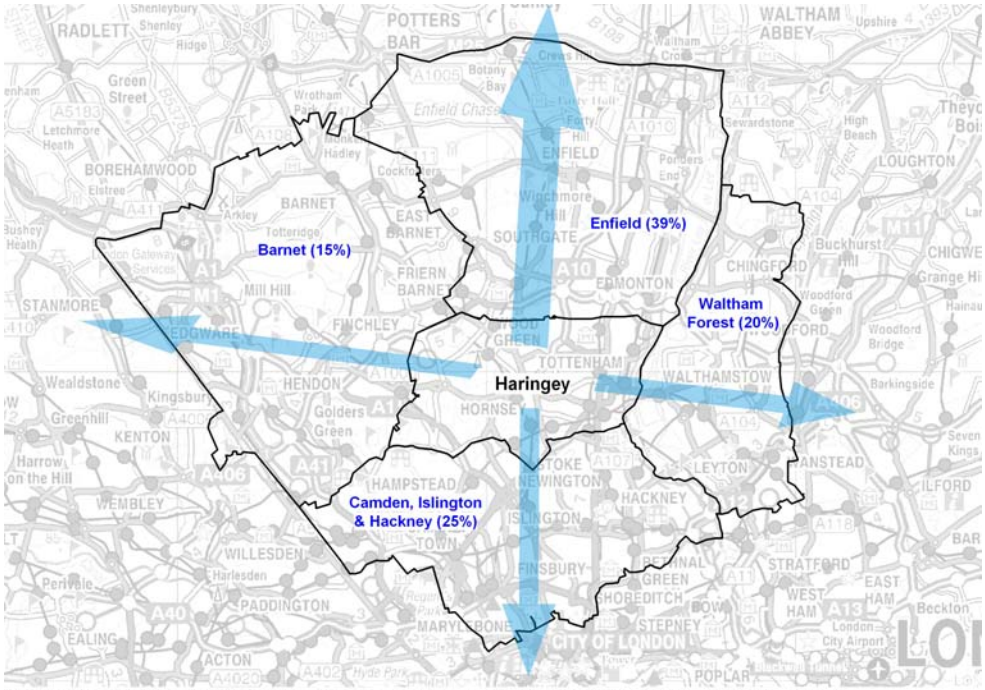


Figure S 2: Internal to external trip flows



Volume of trips (%) from Haringey to the surrounding boroughs and beyond

Future scenarios

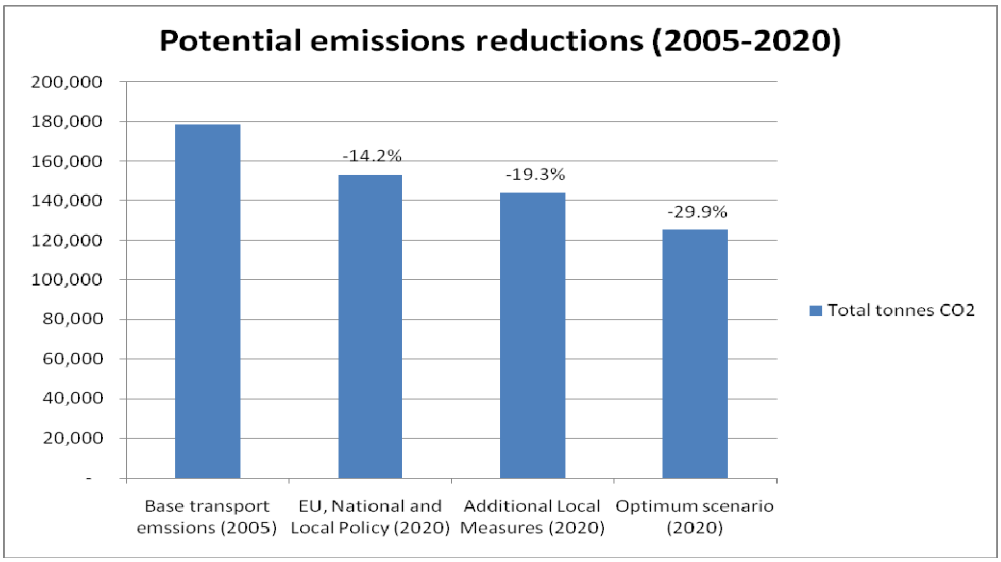
Measures that may help to reduce future emissions were then evaluated for their impact on **speed** and **demand**. Demand reduction is key to effective carbon management; measures that impact on speed will generally only have a limited impact as the average vehicle speed in the borough is 24kph.

The table and figure below summarise the headline results in terms of overall carbon emissions from transport that can be reduced by 2020. Promisingly there are significant reductions than can be achieved, although the reductions are not as great as in other sectors, such as energy and waste, where up to 40% may be achieved.

Table S 1: Potential reductions in emissions from 2008-2020

Scale	Key Measures Included	Scenario	Potential Reduction In Emissions In 2020 (From 2005 Levels)
EU, National and sub-regional level	- EU carbon standards for the production of new vehicles by 2020 - Population changes Infrastructure improvements (e.g. cycle superhighways)	2020 BAU	-14.2%
London Borough of Haringey	- Travel demand management - Parking restrictions - Electric vehicle charging points - DIY Streets - Road safety schemes - Behavioural change marketing	2020 BAU + Costed LIP Package	-5.1%

Figure S 3: Overall potential emissions reductions by scenario



So the total reduction in transport related emissions to 2020 are **-19.3%.** CB also analysed the impact of other measures that would offer additional savings of around **10%** although there would potentially be at least an additional £750,000 needing to be spent per year. These additional measures include Personalised Travel Planning for the whole borough, Low Carbon Bus Corridors and Driver Training.

Conclusions

Approximately, two thirds of all ground-based transport carbon emissions achievable by 2020 are from EU, national and committed TfL infrastructure with one third attributed to schemes outlined in the LIP and smarter travel packages.

Four schemes evaluated show a reduction greater than 3% for 2020 carbon emissions when compared to the base year. They would be particularly effective as measures as they directly reduce travel demand or improve vehicle operating efficiency across a range of trip types across all times of day (AM Peak, PM Peak and Inter Peak). The schemes included:

- CPZs
- Personalised Travel Planning
- Driver Training
- Low Carbon Bus Corridors

Low carbon bus corridors are currently not contained within Haringey's 2nd Local Implementation Plan but could be developed in conjunction with TfL as a key measure. Workplace travel planning, EV infrastructure and car clubs also showed good value for money when cost per tonne of CO_2 abated was considered.

Schemes in which the carbon and value for money benefits scored poorly tend to focus on internal to internal trips (only 12% of all emissions). These typically targeting a small proportion of all highway trips ('car other' in the inter-peak for example[1]).

The carbon benefits of road safety and DIY Streets programmes are particularly uncertain due to sub-optimum speed reductions and limited impact on car travel demand.

For the purpose of the borough-wide 40:20 carbon reduction action plan, a ground-based emissions reduction target of 19-20% should be set for 2020 based on 2005 levels. Re-directing some funds from school travel planning and more generalised marketing into personalised travel plan may produce additional carbon reduction benefits of over 3%, meaning a 22% reduction target could be achievable.

[1] 'Car other' typically includes leisure trips such as shopping, going to the gym and visiting friends.

1 Introduction

1.1 Overview

1.1.1 Colin Buchanan (CB) has been commissioned by Haringey Council to independently review carbon emissions savings from sustainable travel measures defined in the 2nd Local Implementation Plan (LIP) 2011-2031.

1.1.2 Furthermore, CB has been asked to recommend key transport measures that should be prioritised for the London Borough of Haringey (LBH) to meet an overall 40% carbon reduction target across the borough by 2020 (against a 2005 baseline). The project has been named Haringey 40:20 and is supported by the Department of Energy and Climate Change (DECC), through the Local Carbon Framework pilot (LCF).

1.1.3 The LCF pilot focuses on developing a detailed, costed and measurable carbon action plan across the transport, housing and energy sectors. DECC will in particular want an understanding of what issues are limiting local action on climate change and where resources should be focused to reduce carbon emissions from each of these sectors.

1.2 The 40:20 project

1.2.1 The target for a 40% reduction in annual emissions (against a 2005 baseline) was adopted in 2009 by LBH following a 'Get serious about CO_2' campaign led by local residents. In addition, LBH aim to reduce emissions from their own buildings by 40% by 2015, five years ahead of the borough-wide targets.

1.2.2 The 40:20 project aims to bring together residents, business, local enterprises, charities and community groups across the borough to create a better future of all those who live and work in the borough.

1.2.3 Two key actions are being undertaken to help understand what measures can be taken within the local transport sector 1) establishing a Transport Commission to identify the key challenges and 2) developing an informed action plan. The action plan is due in autumn 2011 and will cover a ten year period (2011-2021).

1.2.4 CB's report undertakes a carbon emissions appraisal of the transport measures proposed as part of the action plan to deliver the 2020 carbon savings target.

1.3 The Haringey Transport Commission 2010

1.3.1 In 2010 LBH established a Transport Commission to identify the key challenges facing the borough and to make recommendations on how the borough should address a number of objectives including:

- Traffic congestion
- CO_2 reduction
- Increasing mobility

1.3.2 The Commission's report determined that a number of priority measures that the Council should consider implementing in order to reduce carbon emissions and smooth traffic flow within the borough. These included:

- Borough-wide roll out of controlled parking zones
- Wider roll out of 20mph limits in residential areas

- Reducing on street parking and other measures to improve priority and comfort for pedestrians

1.3.3 The findings of CB's study will help to inform the Council whether in reality these schemes will help to reduce carbon emissions, balanced with other key socio-economic benefits.

1.4 Study aims

1.4.1 The overall aim of this project is to support the development of the Haringey 40:20 carbon reduction action plan and undertake a cost benefit analysis exercise for selected measures to determine which LIP measures deliver the best value for money for LBH in terms of carbon reduction.

1.4.2 The following outputs have been agreed with Haringey Council and form the basis of this report:

- An analysis of the impact of national, regional and EU transport policies on carbon reduction in Haringey by 2020.
- An evaluation of the impact of Haringey's draft LIP and Smarter Travel Programme on CO_2 in Haringey to 2020.
- A more detailed cost benefit analysis of the impact of 1) wide scale roll out of CPZs 2) wide scale roll out of 20 mph speed limits in residential areas and 3) creation of biking hubs in town centres 4) school travel plans and 5) personalised travel planning across the borough.
- Recommendations on what should be priority CO_2 reduction measures for the borough, including measures for the current LIP to 2014 and measures beyond 2014.
- Conclusions on how these measures should be implemented giving consideration for cross-borough delivery and additional sources of funding (beyond the Mayoral LIP funding allocation).

1.4.3 In order to meet these objectives, the remainder of the report is divided as follows:

- Chapter 2 outlines the key EU, national and regional transport policy priorities that influence measures being funded at the local level in Haringey;
- Chapter 3 reviews the measures specifically outlined in the LIP and Haringey's Smarter Travel Programme;
- Chapter 4 contains the scenario modelling results for the baseline ground-based transport emissions in Haringey;
- Chapter 5 contains the scenario modelling for Haringey LIP schemes and other sustainable measures not currently funded;
- Chapter 6 provides an economic appraisal of selected transport schemes; and
- Chapter 7 provides a summary of the key findings, funding opportunities and recommendations.

2 Review of regional, national and EU policies

2.1 Overview

2.1.1 The necessity to mitigate and adapt to climate change is increasingly becoming higher on social, economic and political agendas at all spatial scales. The following sections highlight the key policies, particularly focusing on the Greater London Authority's (GLA) Mayor's Transport Strategy, published in 2010, that will have a specific influence on carbon emissions in Haringey.

2.1.2 The sections also provide the context for which a Business as Usual 2020 scenario could be modelled (i.e. taking into account EU, national and regional policy influences but not adding the carbon benefits of the LIP measures at this stage).

2.2 Regional policies and measures

2.2.1 The main regional policy in terms of reducing carbon emissions is set through the Mayor's Transport Strategy (MTS) (GLA, 2010). The MTS is a statutory document, developed alongside the London Plan and Economic Development Strategy. It sets out the Mayor's transport vision and describes how Transport for London (TfL) and its partners, including London boroughs, will deliver that vision.

2.2.2 The Mayor, in accordance with the (1997) Kyoto Protocol to the United Nations Framework Convention on Climate Change, the 1998 Aarhus Convention on access to information, public participation in decision making and access to justice in environmental matters, and the 2009 Copenhagen Accord on Climate Change, has included policies and proposals on climate change and environmental matters he considers would meet the requirements of these treaties.

2.2.3 Six goals set out how the overarching vision should be implemented through the boroughs' Local Implementation Plans. The transport strategy should:

1. Support economic development and population growth
2. Enhance the quality of life for all Londoners
3. Improve the safety and security of all Londoners
4. Improve transport opportunities for all Londoners
5. Reduce transport's contribution to climate change and improve its resilience
6. Support delivery of the London 2012 Olympic and Paralympic Games and its legacy.

2.2.4 Two of the goals mentioned above are relevant to this particular project.

2 – Enhance the quality of life for all Londoners includes the need to improve air quality with the outcome being reducing air pollutant emissions from ground-based transport, contributing to EU air quality targets. Policies that seek to improve air quality often have co-benefits in reducing carbon emissions (such as the introduction of Low Emission Zones).

5 – Reducing transport contribution to climate change and improves its resilience seeks to reduce overall CO_2 emissions and adapt to climate change. The outcomes are stated to be reducing CO_2 emissions from ground-based transport, contributing to a London-wide 60 percent reduction by 2025. Another outcome is stated to be maintaining the reliability of transport networks.

MTS emissions targets

2.2.5 The Mayor has set a target to reduce CO_2 emissions by 60 per cent by 2025, compared to 1990 levels. Road vehicles currently account for around 72 per cent of transport related CO_2 emissions in London (Haringey also has 72%, according to the North London Highway Assessment Model (NoLHAM)-based analysis for 2008).

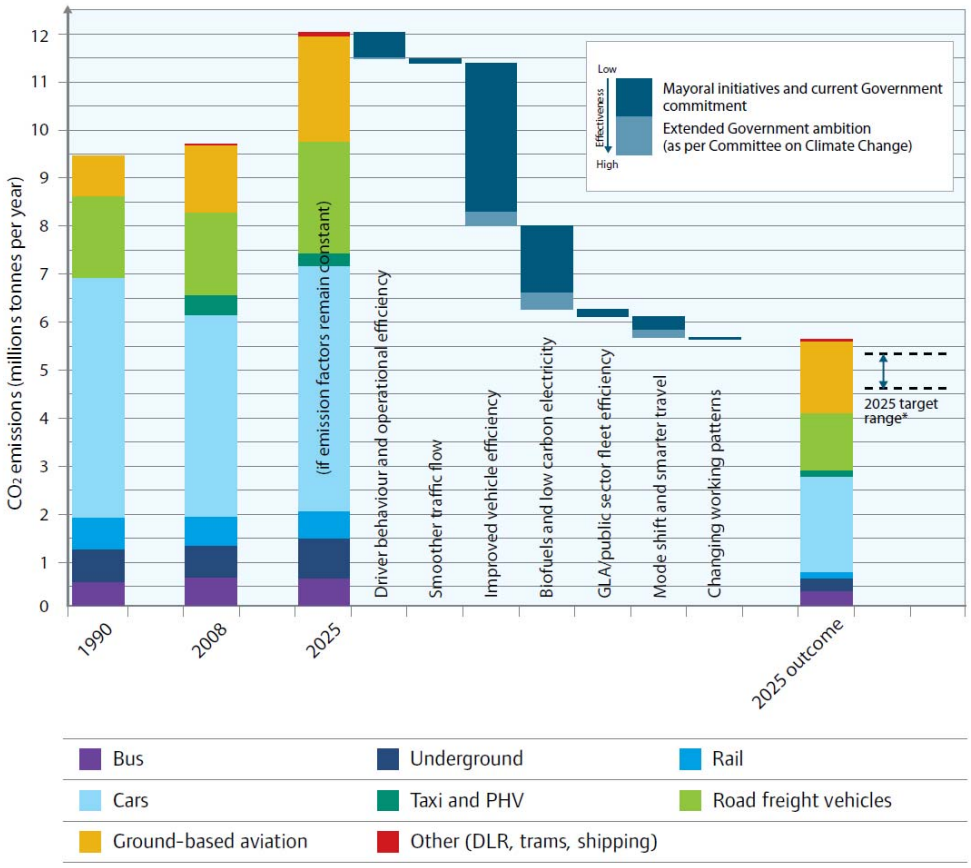
The Mayor proposes to structure his approach to reducing CO_2 emissions from ground-based transport around three core themes:

1. **Improved operational efficiency** – to minimise unnecessary CO_2 emissions
2. Supporting and enabling the development and **use of low carbon vehicles, technology and energy** – this will require close joint working with stakeholders and appropriate incentivisation.
3. **Carbon efficient mode choice** – massive investment is underway in London to improve the attractiveness of low carbon modes such as walking, cycling and public transport and to enable the movement of freight by water and rail.

2.2.6 Meeting the Mayor's target will require strong commitment from TfL, the boroughs, Government, the EU and others to catalyse the introduction and use of low carbon road vehicles. This also includes the provision of charging points for electric vehicles (EV's) and a package of incentives to ensure price competitiveness of low carbon vehicles and, if required to introduce further demand management measures.

2.2.7 Figure 2.1 shows what impact the Mayor's strategy should have on carbon reduction until 2025. Most of the reductions come from improved vehicle efficiency, the use of alternative fuels and electrification of transport infrastructure, while comparatively little contribution will come from smarter travel measures.

Figure 2.1: Impacts of the Mayor's Transport Strategy (2010) on CO_2



* The contribution required from the transport sector to meet the Mayor's CO_2 emissions target for 2025 is linked to the CO_2 emissions reductions from other sectors. It is anticipated that transport sector CO_2 emissions, in the range indicated on the chart, will be required to meet the Mayor's target of a 60 per cent reduction in London's CO_2 emissions by 2025 compared to 1990

Key MTS policy proposals

2.2.8 Table 2.1 shows the key proposals that the Mayor of London has set out to achieve a low carbon transport network that would have a direct impact on transport related carbon emissions in Haringey.

Table 2.1: MTS Key Policy Measures

Core Theme	Policy	MTS Proposal Reference
Improve operational efficiency	▪ Eco-driving ▪ Fleet management ▪ Reduce stationary idling ▪ Automatic energy control on the tube network ▪ Smoothing traffic flow through better signal control ▪ Use of tree street-planting with 10,000 new street trees by 2012	91 91 91 100 102 113
Use of low carbon vehicle technology and energy	▪ Cleaner buses and trains ▪ Electrification of passenger transport ▪ Changes to parking regulations ▪ Supporting the uptake of electric vehicles ▪ Tighter Low Emission Zone standards (Jan 2012) ▪ Planning conditions within Delivery servicing plans for emissions ▪ Promote use of sustainable bio-fuels ▪ Set up procurement framework for low carbon vehicles	92, 108 92, 107 93, 130 93, 103, 105 94 99 104 108
Carbon efficient mode choice	▪ Promote non-car modes ▪ Promotion of car clubs ▪ Annual review of road user charging	91, 96, 97 98 109, 130

Key infrastructure proposals

2.2.9 Alongside the policy goals that LBH have included within their LIP, there are several committed wider public transport infrastructure projects that would help to increase rail use and reduce CO_2 emissions in the borough. These include TfL upgrades of Victoria, Piccadilly and Northern lines and will provide between 19% - 25% increased capacity by 2015. The key changes planned are described below.

- **Northern line** (Highgate station) – frequency improvements
- **Great Northern** rail line to Liverpool station (Bowes Park, Alexandra Palace, Hornsey and Harringay) – frequency improvements
- **West Anglia** line via Stratford Station (White Hart Lane, Bruce Grove, Seven Sisters, Northumberland Park and Tottenham Hale) –new trains and increased capacity
- **Thameslink** – improved connectivity with central London
- **London Overground –** improvements stated but not in this borough.

2.2.10 Two Cycle Superhighways will also be completed that pass through Haringey: Route 1 – Tottenham Court to Liverpool Street (to be completed 2014/15) and Route 12 – East Finchley to Angel (to be completed October 2012).

2.2.11 TfL also aims to have 25,000 EV charging points across London by 2015 as part of the Source London initiative. Haringey's plans to meet their proportion of the EV point targets are outlined in the next chapter.

Commentary on the carbon reduction assumptions associated with the Mayor's Transport Strategy

2.2.12 Analysis of the impacts of the MTS on carbon emissions indicates that approximately 30 per cent of CO_2 reductions will be delivered by improved vehicle efficiency and a further circa 14 per cent saving from biofuels and low carbon electricity. Few quantifiable details are available as to exactly how these savings will be delivered within the MTS. Read in conjunction with '*Delivering London's energy future: The Mayor's draft Climate Change Mitigation and Energy Strategy for public consultation, Chapter 8 - Moving towards zero emission transport in London'* which provides details on specific actions which outline how these percentage reductions can be achieved, there is no inclusion of numerical values determining exactly how the percentage savings have been calculated.

2.2.13 The MTS vehicle efficiency, biofuel and low carbon electricity targets are considered ambitious when considering other organisations estimations of the potential benefits improved vehicle efficiency and biofuels and low carbon electricity can bring. The Stockholm Institute (2008) indicates that fuel technology can only deliver a carbon reduction of 14% - this value is approximately half that indicated in the MTS relating to vehicle efficiency. The International Transport Forum report "Reducing transport GHG emissions – Opportunities and costs" indicates that *"Improving traditional internal combustion engine vehicle fuel economy is a key low-cost transport GHG reduction strategy - there is a clear opportunity to improve* ***new car*** *fuel economy 30% or more by 2020 and 50% by 2030 at low costs taking into account lifetime fuel savings"*. This therefore applies to **new** ICE vehicles only and does not apply to London's entire transport fleet.

2.2.14 The International Transport Forum (2009) also outlines that *"the CO_2 reduction potential for vehicle-related technology measures is large but it will not be fully realised unless policies account for key factors such as consumer and manufacturer aversion to risk, the gap between "official" and "real" fuel economy figures, manufacturers' production cycles, and regional differences"*.

2.2.15 Given the evidence presented here, projected impacts of the MTS on CO_2 may require further consideration with targets reflecting a more conservative approach

2.3 EU and National policies and measures

Implications for Haringey 40:20

2.3.2 At the national level carbon emissions from transport represent 21% of total UK domestic emissions (DfT Low Carbon Transport, 2010). As in London with the GLA's MTS, most policy measures that target transport emissions are derived from improvements in vehicle efficiency and the electrification of transport infrastructure.

2.3.3 The key policy drivers that will influence the Business as Usual 2020 scenario are defined below:

EU policies

- The EU's New Car CO_2 Regulation establishes a clear, long-term framework for action by industry to develop lower emitting vehicles. Targets of 130gCO_2/ km from 2012, with full compliance by 2015, and 95gCO_2/ km by 2020 have been set to provide a clear and accelerating trajectory for the deployment of new low carbon technologies and vehicles.

- Regulation and promotion of alternative fuels to lower emissions from freight and promotion of sustainable biofuels through the Renewable Transport Fuel Obligation in the UK and the EU Renewable Energy and Fuel Quality Directives which puts the onus on fuel suppliers to invest in alternative low carbon fuels other then petrol and diesel.
- Promoting the use of trading schemes for both aviation and shipping, such as the EU Emission Trading Scheme (ETS) for aviation.

National policies

- The Climate Change Act 2008 introduced a binding long-term framework to reduce greenhouse gas emissions, towards a target of at least an 80 per cent reduction below 1990 levels by 2050.
- A DfT grant of £30 million has been established in the past two years to encourage the uptake of low emission bus technology.
- Support for the electrification of the rail network and decarbonising of the National Grid to support low carbon vehicles is defined and supported in the UK Carbon Budget policy.
- Marketing campaigns such as ACT ON CO_2.
- Powers in the Local Transport Act and Government Regulation to control price rises in rail and bus fares.

Planning policy powers

2.3.4 There are also a range of **national** planning, environment and transport powers that help local authorities to implement specific schemes to reduce transport emissions. These are defined in the following tables.

Table 2.2: Planning and Environment Powers

Act or Policy	Key incentives that can be targeted
Section 106 (1990) And Community Infrastructure Levy (CIL) (2008)	▪ Developer contributions for sustainable infrastructure, e.g. communal EV charging points
Environment Act (1995)	▪ Air Quality Management Areas (air quality and CO_2 co-benefits)
Local Government Act (2000)	▪ S2 Wellbeing – wide power to promote economic, social and environmental well-being
Localism Bill (2010)	▪ Encouraging sustainable social enterprises, e.g. (U)LCV car pool ▪ Business Rate discounts
PPS 1 – Planning and Climate Change (2007)	▪ Create and secure clear opportunities for sustainable transport
PPG 13 (2011 update)	▪ Recharging infrastructure especially in areas of poor air quality ▪ Priority parking for (U)LCVs
Creating Growth, Cutting Carbon (2011)	▪ Pump-priming of (U)LCVs ▪ Provision of EV infrastructure ▪ Low Emission Zones (LEZs)

Table 2.3: Transport Powers

Act or Policy	Key incentives that can be targeted
Road Traffic Management Act (1984)	▪ LEZs implemented through TROs ▪ Emissions-based parking charges ▪ Used To Implement AQMAs
Road Vehicle Regulations (1986)	▪ Fixed Penalty Notices for stationary idling
Transport Act (2000)	▪ Congestion charging and WPLs

2.4 Summary of policy measures

2.4.1 In order to translate the policy measures and committed infrastructure identified at the EU, National and MTS levels, Table 2.4 sets out what measures have been included in the carbon modelling analysis.

2.4.2 The modelling accounts for these impacts by developing a 2020 'Business as Usual' (BAU) scenario, i.e. determining what reduction would there be in transport related carbon emissions with no additional investment through the LIP.

Table 2.4: Summary of policies modelled under BAU

Scale	Main Policy Measures Included In BAU
EU Level	▪ New Car CO2 Regulation ▪ EU Renewable Energy and Fuel Quality Directives ▪ Air Quality Management Areas Legislation ▪ Environment Act (1995)
National Level	▪ Renewable Transport Fuel Obligation ▪ ACT ON CO2 campaign ▪ Planning Policy Statement 1 & PPG13 ▪ Road Traffic Management Act (1984) ▪ Transport Act (2000) ▪ Community Infrastructure Levy (2008) ▪ Low Emissions Bus Grants
London Level	▪ Infrastructure upgrades to Northern, Victoria and Piccadilly lines ▪ Low Emissions Zone extension ▪ New EV charging infrastructure ▪ Cycle Superhighways (Routes 1 & 12) ▪ Population increases

Are there any factors specific to Haringey that make London and EU policy targets more challenging?

2.4.3 A number of LB Haringey specific factors will increase the risk of policy targets not being met. These factors should therefore be taken into account when determining realistic targets and the approach to climate change mitigation. Population increase within the Borough automatically puts pressure on targets. Currently, projections estimate LBH's population will rise by 14.8% by 2026. Combining population increases, along with ambitious carbon emission reduction targets, means that per capita emission reductions must be set at a higher threshold.

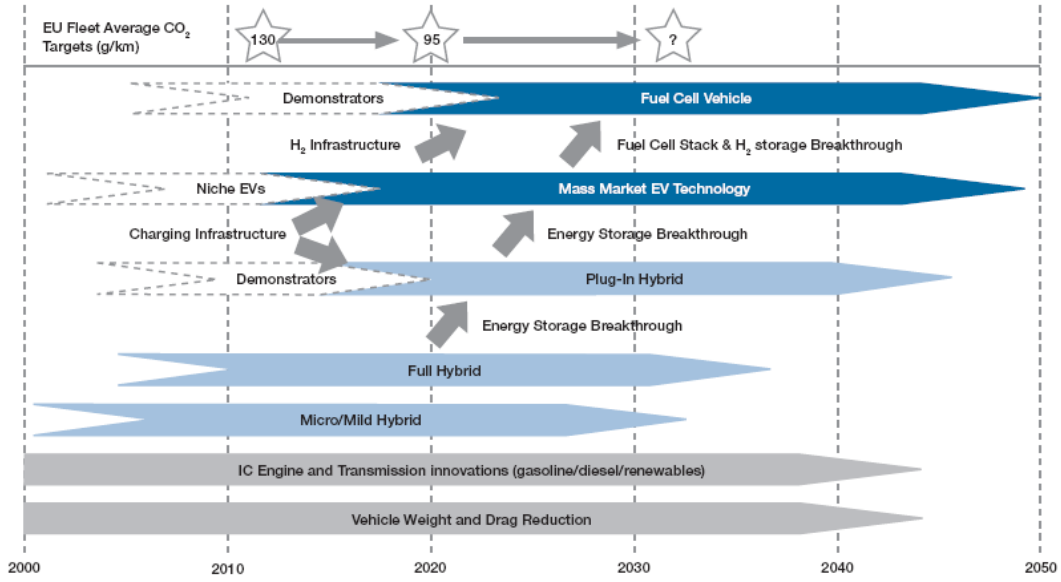
2.4.4 The socio-economic make up of Haringey shows that the Borough has high levels of deprivation. Emerging, low carbon technology, i.e. EV's have high initial purchasing costs. These costs are likely to prohibit many borough residents investing in expensive technologies over the next few years. Typically, early adopters are more wealthy and live in places where the desire to be an early adopter is a status symbol. Based on this assumption, the early adoption of new technology is less likely in Haringey.

2.4.5 Owing to the location of the borough, and also evidence through the modelling work in subsequent chapters, there is a high proportion of through traffic. The Borough also has a number of radial routes passing through connecting outer London to central London. Through traffic emissions count towards borough-wide emissions and are difficult to control. Area-wide driver behaviour change campaign in conjunction with the adjoining

Boroughs could help reduce the impact of this. This would need to apply to private and commercial vehicles.

2.4.6 The low carbon vehicle road map (see figure below) outlines the projected delivery and mass uptake dates for emerging technology. Currently this road map projects that commercial mass uptake of low carbon transport will occur too late for the impacts to benefit the 40:20 programme, i.e. early adoption will take place pre 2020, with mass adoption post 2020.

Figure 2.2: Low Carbon Vehicle Roadmap



Ultra low carbon vehicles in the UK (DfT, 2009)

3 LIP2 and Smarter Travel Programme Review

3.1 Overview

3.1.1 This chapter reviews the proposed measures in the LBH LIP2, 2011 – 2031 in order to inform the modelling of a 2020 transport emissions scenario that considers both the impacts of EU, national and regional policy alongside the costed LIP measures. The results of this modelling are summarised in the next chapter.

3.1.2 Where possible, for each measure CB has reviewed (and quantified) the potential impact on:

- Travel demand (in terms of shift from highway trips to public transport, walking and cycling).
- Speed impact (in terms of a measure that alters the average speed of travel for a particular trip type).
- Scope of measure, in terms of the number of people that are targeted; and
- Trip type impact (in terms of whether the measure affects internal trips only, external trips or both).

3.1.3 This analysis helps to inform the assumptions that are used to model the change in key variables for each measure (demand and speed) which help to calculate future carbon emissions impact (the full list of assumptions are defined in Appendix 1).

3.1.4 The LIP2 measures analysed for the purpose of the carbon modelling are as follows:

- DIY Streets and 20mph zones
- Haringey Biking Borough (and additional cycling projects)
- CPZ implementation
- Electric Vehicle (EV) charging infrastructure
- Car clubs
- Low carbon Council fleets
- Tree planting
- School Travel Plans
- Workplace travel plans
- Travel awareness campaigns (including initiatives with Health partners)
- Low carbon zones
- Neighbourhood and Corridor schemes

3.2 DIY Streets and 20mph zones

3.2.1 DIY Streets and 20mph zones are planned for three areas within Haringey:

- Langham Road/Turnpike Lane area
- Hornsey area
- Noel Park estate

3.2.2 The zones will have traffic calming and “home zone” measures implemented in order to reduce speeds, alongside potential 20mph restrictions.

3.2.3 The Transport Commission identified improvements in road safety and the introduction of 20mph zones as a key measure. However, the carbon benefits of such schemes are less clear. The impact on volume of car trips removed from the network is uncertain for DIY streets and assumed as insignificant for 20mph zones (based on studies such as the DfT’s evaluation on 20mph zones in Portsmouth, 2010). But there is better evidence for a reduction in average speeds by 3 to 4mph where 20mph zones have been introduced in

areas where the old speed limit was 30mph (DfT 2010). However this assumes a baseline average speed of 24-25mph. The 2008 baseline model (NoLHAM) showed average speeds in Haringey to be as follows for highway trips:

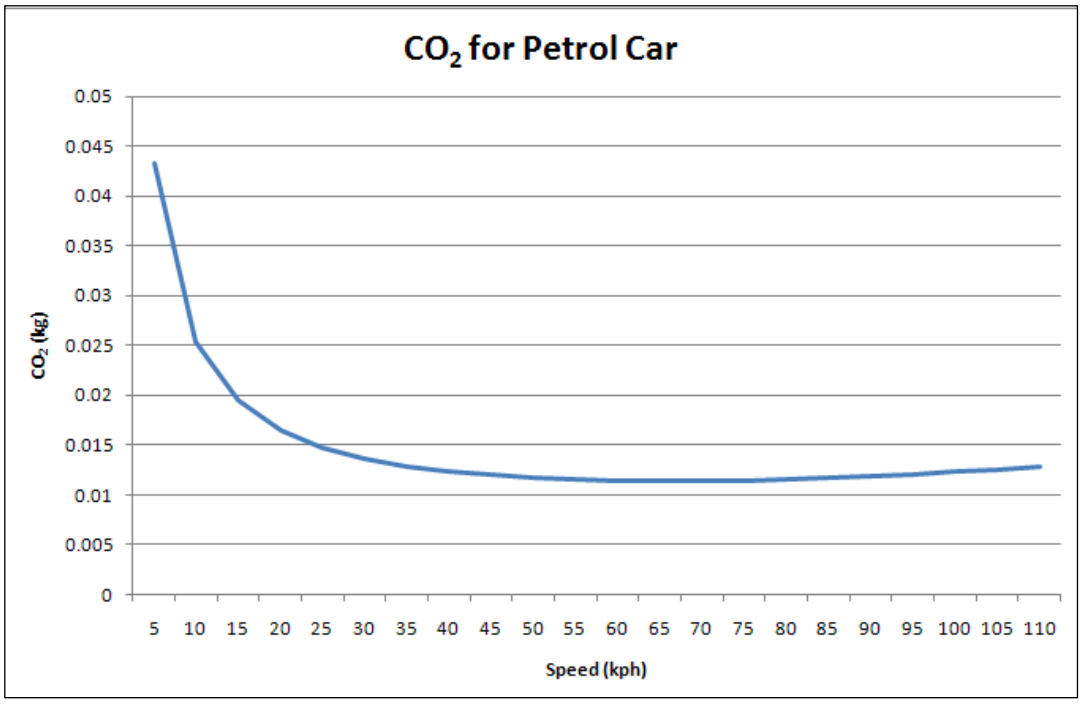
Table 3.1: Average speeds in Haringey

Period	Av. Speed (Kph)	Av. Speed (Mph)
AM peak	23.9	14.9
Inter-peak (IP)	25.1	15.7
PM peak	24.3	15.2

3.2.4 The average highway vehicle speed in Haringey is only around 15mph (over the course of the day). The variance in speeds ranges from 6.3 mph to 19.4 mph across all wards and time periods. As current average speeds are below 20mph, as a best case, speeds would not change and the carbon impact would be zero.

3.2.5 However, in a worse case if traffic flow trips were in fact made slower (more stop start, accelerating and breaking due to traffic calming measures), it may be the case that emissions would actually increase, given the relationship between speed and emissions below. (Note: CB would also envisage that 20mph zones would only play a significant role on impacting internal to internal trips and not internal to external or external to internal trips travelling mainly on the strategic road network; thereby lessening the overall increase in carbon emissions in this worst case scenario).

Figure 3.1: The relationship between Speed and Carbon Emissions



3.2.6 Any speed reductions will also have an impact on the economic case for 20mph zones due to the journey time disbenefits, although this will be offset by a reduction in road casualties (see Chapter 5).

3.3 Haringey Biking Borough

3.3.1 The LIP2 proposals set out a comprehensive programme for encouraging cycling across the borough, including making Haringey a Biking Borough. The Biking Borough strategy includes four main themes:

- Cycle hubs – the first of which is planned for Wood Green, with four other potential locations earmarked (Tottenham High Road, Seven Sisters, Muswell Hill, Crouch End);
- Borough-wide infrastructure measures, including cycle network development, traffic management, increasing permeability for cyclists and increased cycle parking, including at transport interchanges;
- Marketing and promotional measures;
- Integrating cycling provision with wider Council policy, particularly the development control process and Section 106 conditions.

3.3.2 In addition, and complementary to the Biking Borough, are a number of cycling projects which will build upon existing Haringey cycling initiatives:

- Potential Barclaycard Cycle hire scheme extension into the borough;
- Trial on-street residential cycle parking (for units with no storage);
- London Cycle Network and Greenways development;
- Increased cycle parking across the borough;
- Marketing and promotion – particularly targeted at certain groups (including women and particular ethnic minorities);
- Cycle training and cycle maintenance.

3.3.3 The LIP2 sets out targets for increasing cycling mode share across the Borough, which are shown in Table 3.2. The target is for increasing the mode share of cycle trips originating in Haringey:

Table 3.2: LIP2 cycling targets

	Baseline (average 2007-09)	2011	2012	2013	2014	2016
Cycling	1.7%	1.8%	2.0%	2.5%	3.0%	5.0%

3.3.4 CB have reviewed the effect of intensive cycle promotion in other areas across London and the UK and from this believe that with the implementation of the borough-wide initiatives proposed this target can be achieved.

3.3.5 For example, in the six Cycling Demonstration Towns, where intensive infrastructure and marketing initiatives were implemented, the average increase in cycling across all six towns was 27% between 2005 and 2009. This was against a backdrop of a general decline across the UK (with the exception of London).

3.3.6 Applying a 27% increase over 4 years to the Haringey base rate would result in a 2.5% target mode share in 2014. Setting Haringey's cycling mode share target higher at 3% seems achievable as London as a whole is experiencing a general increase in cycling mode share. CB in fact believe that more could possibly be achieved if cycling

promotions and infrastructure are targeted at specific groups with a higher propensity to change, but the existing targets were applied to the modelling stage for robustness.

3.3.7 In order to reduce carbon emissions through the increase in cycling mode share it will be important for the programme to keep focussed on:

- **Existing car users**:
  - "Dissatisfied Drivers" and "Environmentally Aware" groups, as identified by MOSAIC analysis.
  - Particularly for journeys between 5km and 8km (higher impact of emission reduction but still a cyclable distance. 22% of Haringey cyclists cycle 5-8km in comparison to a London average of 13%; 16% cycle over 8km compared to 8% of London residents). This could link in with the opening of the Cycle Superhighways for journeys to central London.
  - Integrating cycle trips with rail and underground to replace longer car journeys.
- Travellers normally taking **congested underground and train lines** (to free up capacity and increase attractiveness of these public transport options to car drivers).
- **New residents.** The borough is expected to see a population increase of 15% by 2026. Targeting new residents before they form travel habits is the best time to instigate a sustained change in travel behaviour.
- **Leisure trips.** The Haringey and Enfield Smarter Travel Strategy travel analysis showed that shopping, leisure and entertainment account for approximately 50% of car trips in the borough.
- **Schools, particularly independent schools**. School run traffic is a major contributor to peak hour congestion, which in turn reduces fuel efficiency. As independent schools in Haringey still have a 36% car mode share, and travel to school distances tend to be longer, there is significant propensity to reduce carbon emissions by encouraging a switch to cycling, or a combination of cycling and other modes. The school travel programme is covered in more detail in Section 3.9.

3.3.8 In addition to the above, a general increase in the volumes cycling will help progress towards achieving a critical mass of cyclists, which will improve safety and the perception of the safety of cycling, as well as demonstrating that cycling is a "normal" way to travel, all of which will help further increase the attractiveness of cycling to non-cyclists.

3.4 Controlled Parking Zones (CPZs)

3.4.1 Local parking policy is an important demand management tool when considering how to tackle parking, congestion and mode shift issues. Controlled Parking Zones (CPZ) are one of many parking controls available to the Council, and prioritise parking spaces for residents and local business.

3.4.2 LBH has 16 CPZs (2010 data) to manage the competing pressures for limited parking availability particularly where demand is high, for example, in the vicinity of rail / underground stations.

3.4.3 The Mayor's Transport Strategy supports the expansion of CPZs in London, and LBH plan to continue to expand or introduce CPZs where necessary in order to manage high demand. By 2013/2014, the Council intends to introduce two new CPZs in Hornsey and Alexandra Palace and extend the Finsbury Park CPZ. These extensions and additional CPZs have the aim of reducing car parking demand, consequently driving down local congestion and increasing the level of patronage on public transport.

3.4.4 The carbon agenda is further supported by the Council's 2007 review of CPZ parking permit policy as the Council introduced a CO_2 emission based parking permit charging structure – lower emitting vehicles will be charged at a lower rate for their parking permit. This policy contributes to the Council's objective to reduce transport based CO_2 emissions, by encouraging residents to purchase more environmentally friendly cars.

3.4.5 Research in Edinburgh[2] helps to ratify the benefits of introducing a CPZ with the aim of controlling the use of cars and reducing vehicle emissions in Haringey. This research aimed to determine the likely mode shift resulting from a CPZ expansion, affectively creating a wider area of control for the Council. The research considered the impact of increasing the town centre CPZ by 0.5, 1 and 1.5 miles with the results showing a percentage reduction of those driving and seeking a free on-street parking space by 26.5, 69.4 and 75.5% respectively.

3.4.6 Comparing the mode share for the current CPZ boundary and the expansion of the boundary by 1.5 miles, the results of the study shows a likely reduction in the number of people commuting by private car by 21%. This equates to a reduction in the main mode share of commuters travelling by private car by 7.9%, and an increase in walking by 1.5%, bus by 3.2% and 0.4% increase in rail travel.

3.4.7 For the purpose of the modelling exercise, CB modelled a 7.9% reduction in mode share for internal to internal and external to internal car trips. CB also assumed there would be some smoothing of traffic flow in areas where CPZs were in place and applied an average 3mph speed increase.

3.5 Electric vehicle charging infrastructure

3.5.1 Haringey Council is committed to promoting the uptake of electric vehicles (EVs) and is implementing an installation programme of charging infrastructure in off street, public car parks and on street locations in or near town centres, transport hubs and employment areas.

3.5.2 By June 2010, LBH had installed 13 EV charging points within the borough, and a further 8 charging points are planned for the 2010/2011 financial year.

3.5.3 By the end of 2013/2014, LBH intend for a total of 45 public charging points to be installed. 31 of this total will be publicly accessible charging points in car parks, with a further 14 points being available on street.

3.5.4 LBH signed the London Plug-in-Places (PiP) agreement in November 2010 which allows the Council to claim 50% of the purchase and installation costs for new charging point installations from PiP funds. The remaining 50% of funding for each charging point will be covered by the Councils LIP funding, which is secured through the neighbourhood and corridors programme for 2011/12-2013/14.

3.5.5 LBH plans to secure further charging points through planning obligations for new developments via Section 106 agreements. The EV charging infrastructure will be incorporated into the pan-London membership scheme, Source London, to facilitate drivers to enable a seamless integration of all charging points across the capital.

3.5.6 CB has modelled two scenarios for EV uptake in Hounslow based on the uncertainty around consumer uptake to 2020. This is based on 1% and 5% of conventional Internal

[2] Rye, T., Cowan, T., and Ison, S. (2006) 'Expansion of a controlled parking zone (CPZ) and its influence on Modal Split: The Case of Edinburgh' *Transportation planning and Technology,* **29**, 1, 75-89.

Combustion Engine (ICE) cars being replaced by EVs across all time periods and trip types.

3.6 Car clubs

3.6.1 The car club strategy outlined in the LIP2 is set out in two Phases:

- Phase 1 will focus on the south-west of the borough, an area identified through MOSAIC modelling to include a large number of residents who are drivers that can be classified as Environmentally Aware. Through the implementation of an additional 150 bays by 2012 and targeting promotions at the Environmentally Aware sector (19.2% of population, approx 44,000 people), it is anticipated that 3,500 new members could be generated. Streetcar estimated that 1,469 cars (cars, not trips) will be removed from the network as people give up their private vehicles. Moreover, the average annual miles driven by these 3,500 new members is 51% of the average licence holder.
- Phase 2 will commence after Phase 1 has achieved sufficient momentum and will continue to support the further roll out of car clubs, although the target market is unclear at this stage. For modelling purposes, CB have used Car Plus (2008) survey analysis and the projection of car club growth data in Haringey up to 2020 and converted this into a 4.4% demand reduction for car business, other and taxi trips.

3.7 Fleet Vehicles

3.7.1 The borough's internal vehicle fleet is already Low Emission Zone (LEZ) compliant, i.e. all vehicles have engines meeting EURO III or higher standards. The Council also requires contracted vehicles to meet the same standards. The reduction of carbon emissions achieved as a result of these new standards have been modelled under BAU 2020 as they are an existing policy.

3.7.2 More significant reductions in emissions from fleet vehicles could be achieved via a shift in operating technology, with the Council using hybrid and electric vehicles which return much lower or zero tailpipe emissions per km driven compared to ICE vehicles. The potential impact of such vehicles on any fleet carbon reductions would be dependent on the proportion of conventional ICE vehicle kms replaced by hybrid or EVs. There are currently no plans for the replacement of fleet vehicles to hybrid or fully electric technology, hence they have not been modelled in any future emissions scenario for 2020, although four hybrid/electric vehicles are currently available to staff (the impact of four vehicles is however negligible on overall borough emissions and therefore has not been modelled for the purpose of this study).

3.8 Tree Planting

3.8.1 Haringey Council is keen to support the introduction of street tree planting in line with the priorities of the Mayor.

3.8.2 Planting trees is known to bring benefits to a local area, by absorbing CO_2, filtering out particulate matter and other vehicle emissions, and acting as a barrier to noise pollution. An additional number of trees also helps to improve the aesthetics of an area and help to improve the local biodiversity.

3.8.3 Haringey Council has been actively planting trees on borough streets in 2008/9 and 2009/10 where 250 and 144 trees were planted respectively. Looking to the future, the

Council will consider the scope for the appropriate planting of street trees as part of all infrastructure improvements.

3.8.4 Planting trees may contribute to tackling climate change, as trees sequester carbon through growth. Research estimates that a broadleaf tree abates 1 tonne of CO_2 over its life (estimated to be 100 years). One tree therefore equates to an annual saving of 10kg CO_2 per tree, per year.

3.8.5 This rate of carbon abatement also assumes that a tree absorbs a set amount of CO_2 per year throughout its lifecycle, however, in reality, a young tree is expected to abate a lower volume of CO_2 than a more mature tree.

3.8.6 Furthermore, to deliver the savings outlined above, all trees planted must be broadleaf trees, although other species of tree will deliver a saving, but have not been quantified here. Additionally, the removal of any trees within the borough will be working against this process and will offset any tree planted under the scheme.

3.8.7 It is estimated that if the rate of tree planting continues at the same rate for the next ten years (144-250 trees per year) this will deliver a very small contribution to the LBH 40:20 targets. Table 3.3 sets out some CO_2 abatement estimations.

Table 3.3: CO_2 savings from tree (broadleaf) planting

Number of trees planted per annum	CO_2 Savings (Tonnes per annum)
144	1.44
250	2.50
197 (median value)	1.97

3.8.8 For comparison, tree planting on this scale will only reduce carbon emissions by less than 0.005% of all transport related emissions in Haringey. In summary, tree planning will help contribute to localised benefits, such as the public realm, wildlife, noise pollution and vehicle particulates but will play a negligible role in mitigating against carbon emissions.

3.9 School Travel Plans

3.9.1 There are 99 schools in Haringey (school pupils comprise 19.1% of the population) therefore their travel makes a significant proportion of peak hour trips. There are approximately 35,000 pupils attending local authority-run schools.

3.9.2 Haringey has run a successful school travel programme since 2004, working with schools to reduce travelling to school by car and encouraging travel by the most healthy and environmentally-sustainable modes, walking and cycling. By 2010, 100% of Haringey schools had a travel plan and travel to school data showed that 78% of children were travelling to school by sustainable modes (walking, cycling and public transport).

3.9.3 The LIP2 provides information of the mode shift that was achieved between 2004 and 2010; this is shown in Table 3.4. The average baseline across schools in Haringey is assumed to be 21% (iTRACE, 2010 results for Outer London) although baselines for the mode shift achievements of the different types of schools (primary, secondary, independent) are not available.

Table 3.4: Mode shift in school travel, 2004 - 2010

School Type	Decrease in car travel, 2004-2010
All schools	-5.4%
Primary	-6.25%
Secondary	-2.53%
Independent	-14.24%

3.9.4 In future, the Haringey travel to school programme will continue to be available to all schools, but will target those in the East of the borough and independents in order to tackle the schools with the highest potential for reducing car use. Targeting harder to reach schools, such as independents, means a harder audience to convert but more potential gains in terms of mode shift (the LIP2 states that independents have a car mode share of 35.9%, making them responsible for the largest number of school car trips in the borough).

3.9.5 For the modelling exercise, CB has assumed a mode shift of 1% per year away from car use given that the 5.4% reduction was delivered over a 6 year period. No impact on speed reduction has been modelled (if it was this would increase carbon emissions) as speed impacts will generally be picked up by 20mph and DIY Streets initiatives.

3.10 Workplace Travel Plans

3.10.1 Businesses in the borough have been supported in developing workplace travel plans by the Council and also the North Central Travel Network.

3.10.2 The LIP2 commits to continuing this support for workplaces and the LIP2 will contribute funding towards a Sustainable Travel Advisor post, shared with two neighbouring boroughs, to advise workplaces on developing travel plans required through the planning process.

3.10.3 In addition, the Sustainable Travel Advisor will work with businesses to support them in the implementation of site-specific actions to increase sustainable travel. Businesses implementing and monitoring travel plans will be able to take advantage of the TfL workplace travel planning reward scheme TAPAS, which awards credits to spend on workplace travel measures. The Mayor also offers a free cycle parking scheme, 'Take a Stand', which funds the provision of Sheffield stands (with installation costs covered by the business).

3.10.4 The Council's own travel plan will be used to show organisations that the Council is committed to reducing travel impact and leading by example. The Council travel plan has reduced SOV trips by 5% and increased cycling to work by 2.5%.

3.10.5 For modelling purposes, CB has used the 9.8% mode shift results away from single occupancy car commuting from iTRACE across outer London for those businesses that have registered their travel plan with TfL.

3.11 Travel Awareness

3.11.1 An integrated marketing campaign across the borough will be carried out in conjunction with smarter choices measures such as workplace and school travel plans. This will cover a new website, local marketing campaigns, neighbourhood champions, road shows and festivals.

3.11.2 Integrated town programmes such as Smarter Travel Sutton and Richmond have achieved positive results. Smarter Travel Sutton recorded overall mode shift of 2% away from car although the level of investment was significant (over £1 million on marketing alone). Accordingly for the purpose of this study there was a low and high scenario modelled at 1% or 2% mode shift to account for variations in results of different campaigns.

3.12 Low Carbon Zones

Muswell Hill

3.12.1 In September 2009, the Mayor of London declared Muswell Hill one of ten low carbon zones in London. The scheme was launched in April 2010, and will be operational until March 2012.

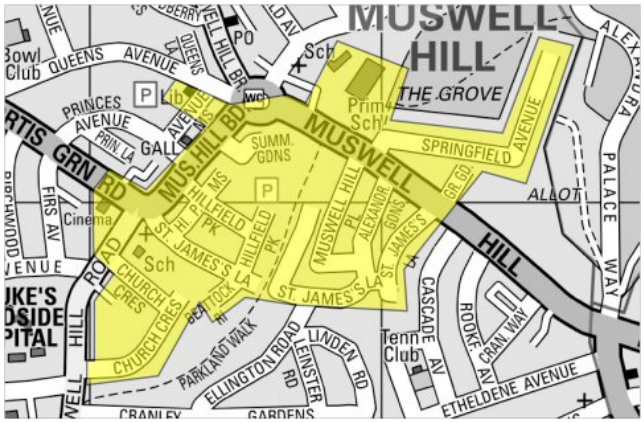
3.12.2 The scheme is expected to deliver a 10.06% reduction in CO_2 per annum over the duration of the project. The **expected carbon savings** from the Muswell Hill Low Carbon Zone project are:

- 14% from energy efficiency in homes
- 3.5% from behaviour change
- 1% from sustainable transport measures
- 1% from community buildings
- 1% from domestic micro renewable energy
- 0.5% from energy efficiency in businesses

3.12.3 This community-led initiative aims to test different measures to reduce carbon emissions to both residents, schools and businesses. The project will affect a small area to the south of the Muswell Hill area (Figure 3.2), covering approximately 1,000 buildings, and a number of streets on the southern side of Muswell Hill.

3.12.4 A simple mapping exercise has indicated that the Low Carbon Zone is approximately 24 hectares, while the Muswell Hill ward measures 165 hectares. The Low Carbon Zone therefore comprises approximately 14.5% of the total ward area. This was taken into account when considering the total proportion of carbon emissions that can be reduced through the pilot.

Figure 3.2: Muswell Hill Low Carbon Zone area



Haringey

3.12.5 The Haringey Low Carbon Zone is also piloting a number of carbon reduction approaches, with the aim of reducing the annual volume of emissions produced by the area. Those relating to transport include:

- A Personal Carbon Trading Scheme officering financial incentives for carbon savings achieved by residents,
- Cyclehoops for cycle parking,
- A joint school travel plan for the schools in the local area
- Promotion of sustainable transport measures.

3.12.6 The estimated carbon abatement resulting from the measures to be deployed is summarised in Table 3.5 for the period up to 2012. A succession plan for the future emissions savings will be developed in late 2011.

Table 3.5: Estimated CO_2 savings from the Haringey Low Carbon Zone

Measure	Take up of Measure (No of people)	CO_2 savings (Tonnes PA)
Switch to electric car	20	26.49
Switch to street car	20	24
Switch to cycling / walking and public transport	5	5
School travel plans	5	5
Learning eco driving	25	7.5
Total	67 tonnes per annum (1% of target saving for area)	

Data taken from Table 2.4 in LBH LIP (Page 64)

3.12.7 Although the carbon emissions savings from Haringey outlined in the table above will only contribute to 0.03% reduction, CB has modelled a 1% reduction in emissions using the results of the Muswell Hill pilot. This has been applied to one tenth of the total population of Haringey as more low carbon pilots will come on line between now and 2020.

3.13 Neighbourhoods and Corridors

3.13.1 The Neighbourhoods and Corridors Programme consists of developing a holistic approach to addressing a number of issues including smoothing traffic flow, increasing cycling and walking, supporting the development of smarter travel measures to complement physical measures such as the Biking Borough Strategy. Examples of this include the development of travel plans for schools and businesses.

3.13.2 The smarter travel programme will focus on community work and some personalised travel planning, and will promote the use of sustainable and carbon efficient private car use.

3.13.3 The corridor aspect of the programme targets areas of the A road network which are likely to present the greatest problems in terms of congestion and traffic flow, while the neighbourhood aspect of the programme focuses on B roads within the borough.

3.13.4 For the period 2011-2014, the Council has identified the following areas as priorities for the Neighbourhoods and Corridors Programme.

- Wood Green High Road, Green Lanes corridor and the adjoining residential neighbourhoods of Hornsey Park and St Ann's.
- Tottenham Hale and Tottenham Green neighbourhoods as part of the Tottenham Hale Gyratory system complementary measures.
- Seven Sisters and North Tottenham neighbourhood and corridors.

3.13.5 Many of the measures which will be implemented via the Neighbourhood and Corridors programme have already been covered in the chapters above. As a result, the Neighbourhoods and Corridors Programme has been excluded from this analysis to avoid double counting of carbon emission abatement, for example, the impact of 20mph zones has already been assessed as a stand alone measure. This is particularly true of the Wood Green Town Centre Scheme which consists of a combination of measures to help improve the attractiveness of the area and reduce traffic congestion.

4 Baseline scenario modelling

4.1 Introduction

4.1.1 The study used the carbon emission reduction estimations identified in Chapters 3 and 4 and combined these with baseline data from the NoLHAM and London Underground and National Rail data for public transport to consider 4 emissions scenarios:

- What is LBH's current level of ground-based transport emissions (2008 base year)?
- What will the emissions be in 2020 if LBH take advantage of vehicle efficiency improvements and infrastructure upgrades, but population also increases (business as usual (BAU) 2020)?
- What added benefit will there be if the measures outlined in the LIP and Smarter Travel Programme are implemented (BAU + costed LIP 2020 scenario)?
- What other measures may help to optimise emissions reductions by 2020 (BAU + optimal package 2020 scenario)?

4.2 Data assumptions

4.2.1 Appendix 1 outlines the detailed methodology for the modelling, with the key inputs and results summarised in the following sections. The model runs all contain the following assumptions:

1. The AM peak, PM peak and Inter-Peak (IP) highway flow data has been annualised to calculate total transport carbon emissions for each scenario over a 24 hour period, 365 days per year.

2. All calculations are based only on travel within Haringey and therefore trip lengths are partial (i.e. trip lengths for the purpose of emissions reporting in Haringey start and end at the borough boundary).

3. The future year NoLHAM BAU 2020 scenario accounts for population changes, vehicle efficiency changes and committed TfL infrastructure defined in Chapter 2.

4. Emissions from public transport are assumed to remain the same over the time period 2008-2020 under BAU as major rail electrification and a reduction in bus fleet emissions should be offset by any population rises and hence an increase in the number of services.

5. The spreadsheet model does not model the effects of the measures in terms of them being coded into the highway model. Instead it assumes that a definite response to a particular scheme occurs in terms of **network speeds or demand** and then calculates the associated impact of this scheme on CO_2 emissions.

6. To calculate total emissions for the Haringey area, by sector, the individual car emissions for a particular sector to sector trip were multiplied by the total demand for that movement. The sectoring arrangement for the Haringey area is shown in Figure 4.1 overleaf.

7. The vehicle types within the highway model are split into 6 different categories. The different types, alongside their description, are shown in Table 4.1.

Figure 4.1: NoLHAM modelling sectors

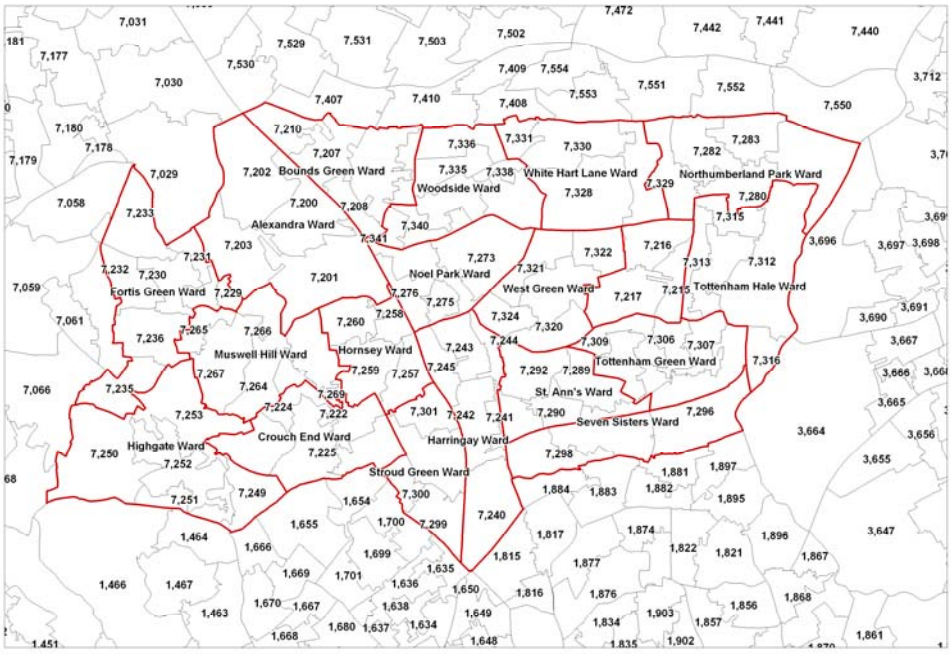


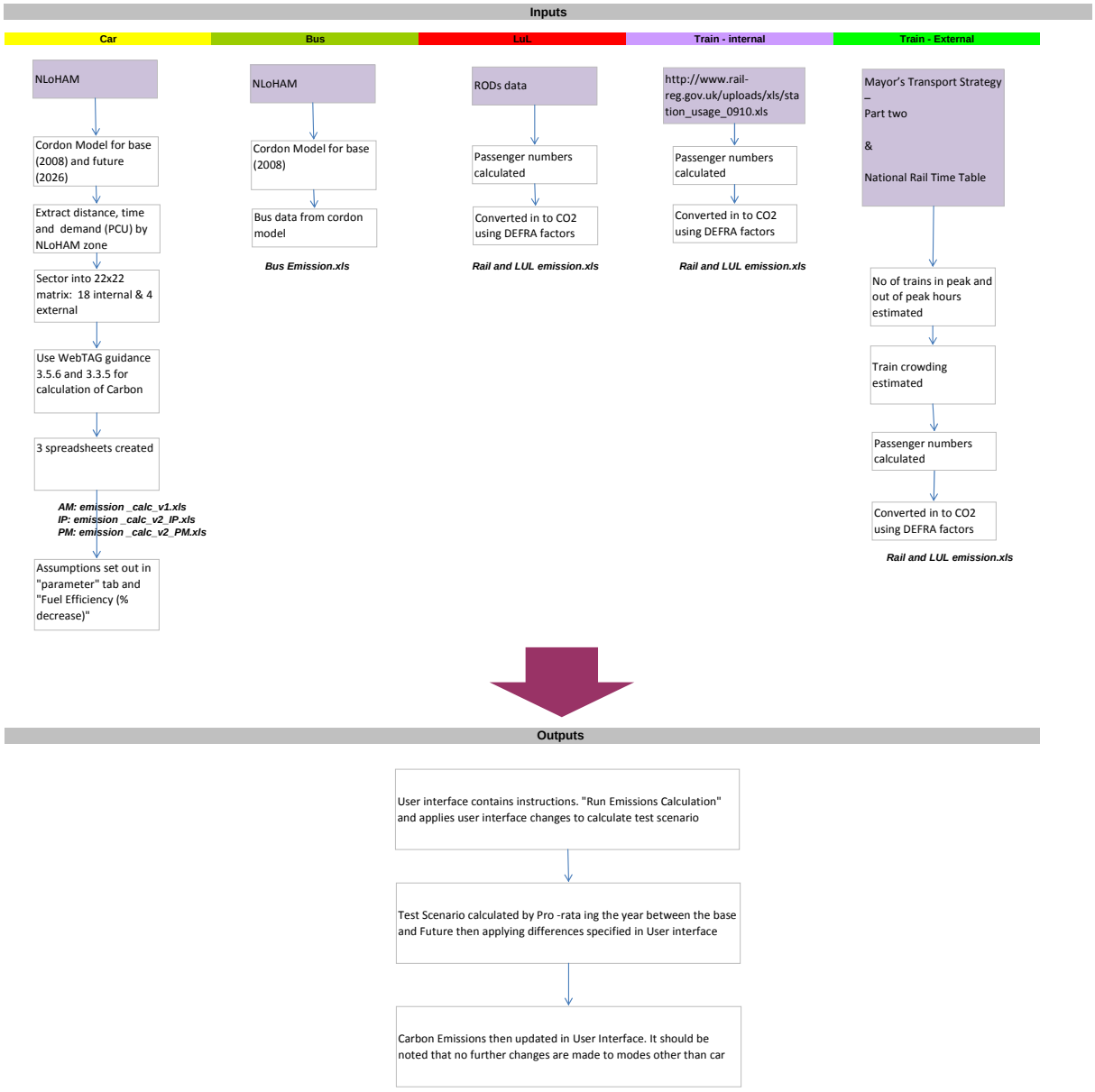
Table 4.1: Highway Vehicle Types

Highway Type	Description
Car Business	Car - in work time (Business)
Car Commute	Car - commuting
Car Other	Car - out of work time not commuting (Other)
LGV	LGV
OGV	OGV
Taxi	Taxi

4.3 Methodology

4.3.1 Figure 4.2 shows an overview of the calculation process for the procedure used to assess CO_2 emissions. Separate calculation processes have been developed for each mode below in order to use the available data to develop a spreadsheet based model which has the ability to predict base and future year CO_2 emissions as well as assessing the impacts of softer demand and speed related infrastructure and smarter choices measures.

Figure 4.2: Model inputs and outputs

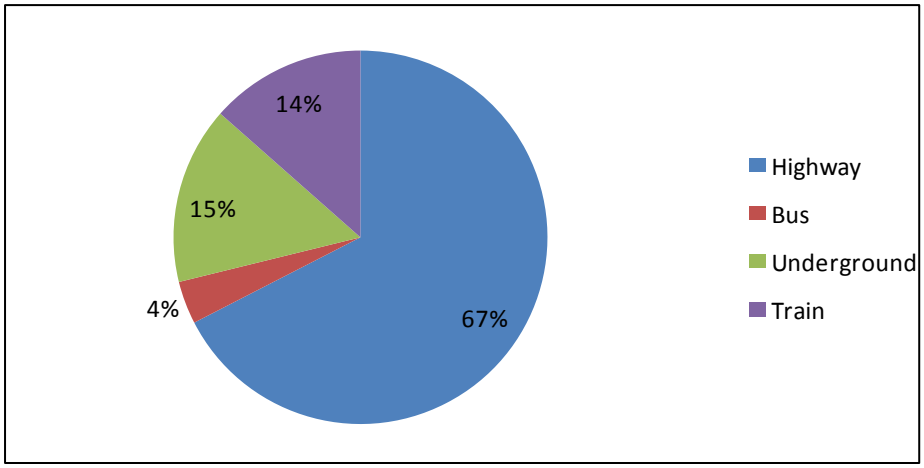


4.4 Base Year

Modal Split

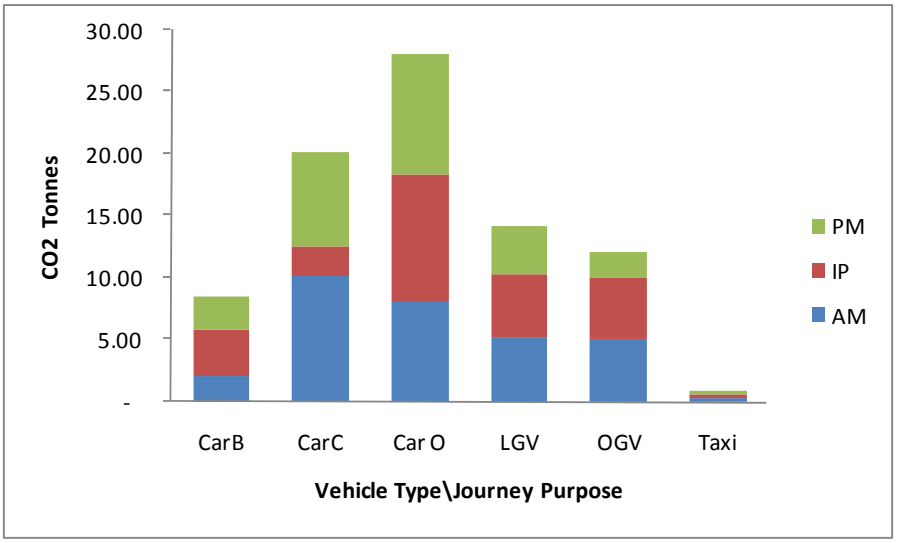
4.4.1 Figure 4.3, which shows base year (2008) carbon emissions illustrates that annually the majority of the carbon emissions are produced from highway vehicles.

Figure 4.3: Annual CO_2 Emissions by Mode



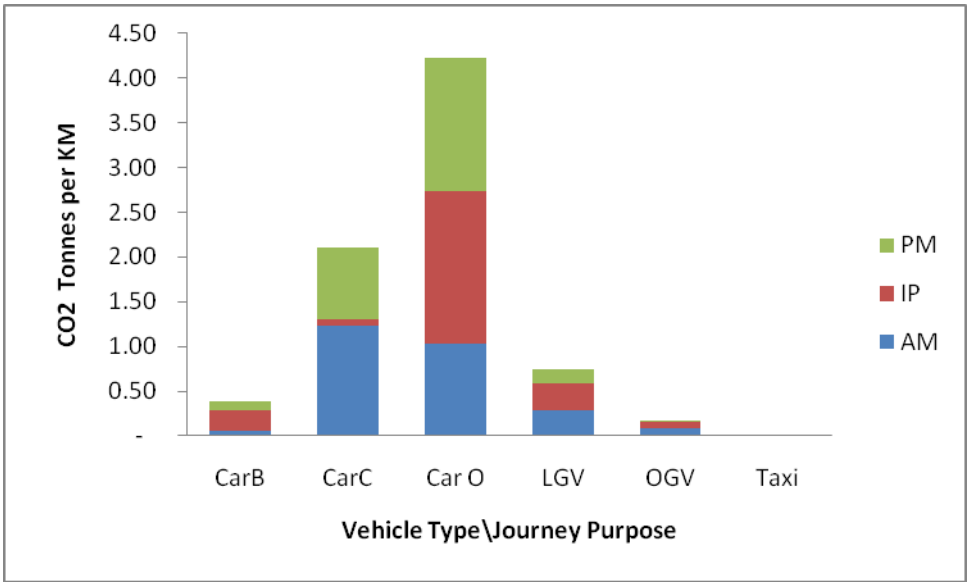
4.4.2 For AM, PM and IP time periods on the Highway Network, the graph below highlights that when looking at the time periods combined together the '**car other purpose'** is the highest contributor to CO_2 emissions for highway vehicles. This includes leisure, retail and personal trips visiting friends. For both the IP and PM peaks, the largest majority of CO_2 emissions are from also car other purpose. During the AM peak the highest majority of CO_2 emissions are from commuter cars (this is also high during the PM peak).

Figure 4.4: Highway Vehicle Type/Purpose Emissions by time



4.4.3 For comparison, the same graph has been produced but instead of using CO2 tonnes on the y-axis, CO2 tonnes/km has been used. 'Car other purposes' is still the highest contributor but the results are accentuated due to the high number of relatively short trips, especially in the PM and IP periods.

Figure 4.5: Highway Vehicle Type/Purpose CO_2/km Emissions by time



4.4.4 For all of the time periods combined, the CO_2 emissions have been calculated by the distance travelled and by the highway vehicle type/purpose. This distance is the distance travelled only within the Haringey cordon. These are shown below in Figure 4.6.

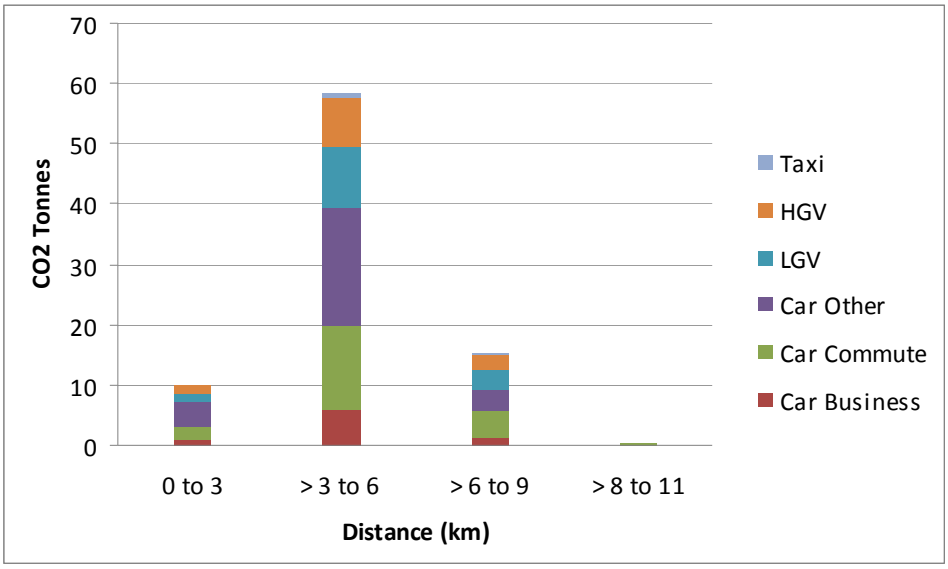


Figure 4.6: AM + IP + PM CO_2 Emissions by Distance in LB Haringey

4.4.5 For the distances within the cordon, the highest CO_2 emissions occur between 3 – 6km. This is due to the highest number of trips also occurring within these distances.

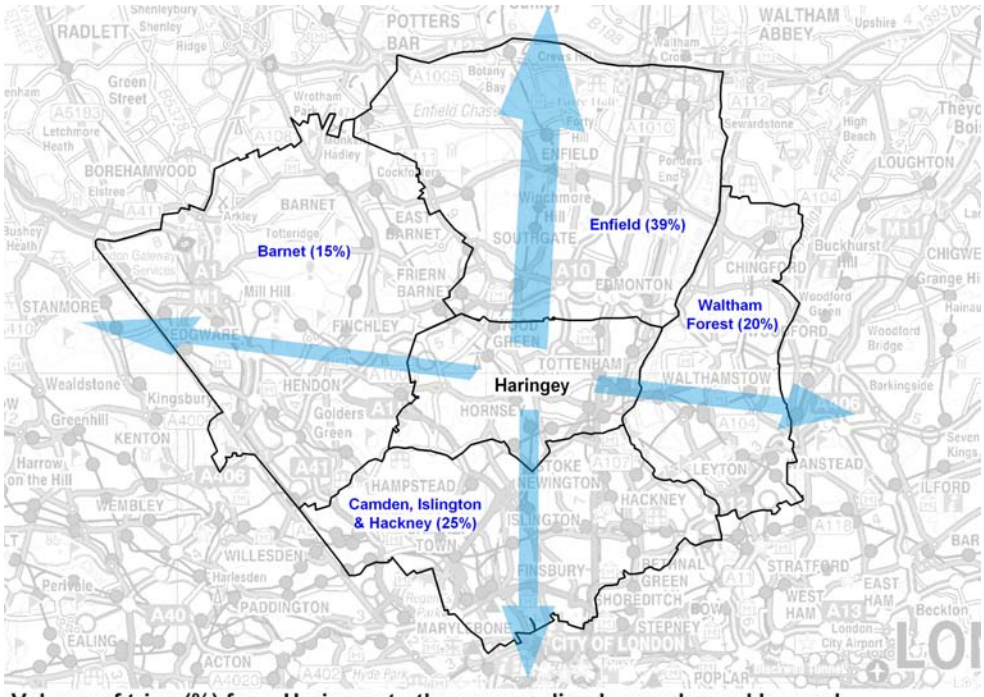
4.5 Highway External and Internal Movements

4.5.1 The calculated carbon emissions are shown numerically in Table 4.2 and graphically in Figure 4.6 for the external and internal highway movements within Haringey. There are a very high number of trips that transcend the Haringey borough boundary (88%) and 39% of internal to external trips are linked with Enfield. It is also worth noting that only 12% of all trips are internal to internal; many of the smarter choices measures in the LIP will only affect these trips, hence why the carbon reduction potential is greatly reduced (see Section 4.4).

Table 4.2: External and Internal Movements (tonnes CO_2)

Trip type	Destination	AM	IP	PM	Total	Total %
Internal	Internal	2925	8267	2542	13734	12%
Internal	External	9637	15979	8021	33637	29%
External	Internal	8521	16331	6765	31617	27%
External	External	10121	19472	9249	38842	33%
Total	Total	31203	60048	26578	117829	100%

Figure 4.7: Internal to external trip flows



Volume of trips (%) from Haringey to the surrounding boroughs and beyond

5 Future Year (2020) Scenarios

5.1 Overview

5.1.1 For the future years, an increase in highway demand has been modelled within NoLHAM. This has seen some network deterioration (increased congestion), leading to decreased speeds. All public transport demand is assumed to stay the same for future years.

5.1.2 Even though an increase in highway demand is observed when modelling the future year, savings are observed from vehicle emissions, taken from the DfT's WebTAG guidance. These savings are from improvements in vehicle efficiency and changes in the cost of fuel. There are also savings from committed infrastructure upgrades within London.

5.1.3 The reduction in CO_2 tonnes is shown in Table 4.3.

Table 5.1: CO_2 Annual Emissions (Tonnes) in 2008 and to 2020

Mode	Base (2008)	2020
Car	117,829	96,300
Bus	6,492	6,492
Underground	26,838	26,838
Train	23,557	23,557
Total	**174,715**	**153,187**

5.1.4 There is decrease of 12.4% predicted between the NoLHAM base year (2008) and 2020 carbon emissions. This scenario can be defined as 2020 Business as Usual and takes into account the impact of EU, national and regional policy.

5.2 LIP and Smarter Travel scheme Assessment

5.2.1 In order to model the impact of different measures identified in the LIP and Smarter Travel programme for LBH the methodology outlined below was adopted.

5.2.2 The scope of each measure was defined in terms of how much of the borough was being targeted by the measure, e.g. can it be applied across all wards or are only certain areas being targeted? (For example, the Low Carbon Zones are only applied over a certain area)

5.2.3 Impact analysis was then based on evidence from Haringey of scheme benefits, for example, for school travel plans, mode shift results to date were used, or where local data was not available, other London or national data was used.

5.2.4 Impacts were predicted based on the following:

- Speed impact (average speed reductions induced from the current level, typically these will be very small as the current average is around 24 kph)
- Demand impact based on predicted trip reduction from the highway network and mode shift from highway and / or public transport to other modes.
- Trip impact (what trips are affected under I-I, E-I and I-E and at what times of day, AM, PM, IP)
- To which wards or segments of the population the reductions can be applied.

5.2.5 The model assumes that the measures identified in the LIP and the Smarter Travel Programme will realise benefits beyond 2014 (in fact some of the emissions benefits may not even start by 2014).

5.2.6 As mentioned in Chapter 3, to avoid double-counting some measures have been combined, for example, cycling is considered as a basket of measures.

5.2.7 The full list of scheme assumptions that were modelled are listed in Appendix 1 (Modelling technical note). Six additional schemes were also modelled as part of identifying additional measures that may help LBH to meet its carbon reduction targets. These were:

- Community hubs
- Driver training
- Personalised travel planning
- Low carbon bus corridors
- Electric taxis
- Freight quality partnerships

5.2.8 The modelling assumptions used for these additional measures are outlined in Appendix 1 and are shown in green in the following tables.

Modelling results - % change resulting from LIP measures

5.2.9 For each measure, the % change from 2020 BAU emissions is shown below in Table 4.4.

Table 5.2: % change from 2020 emissions by LIP measure

Measure	% Change From 2020 Emissions
Low carbon bus corridors	-4.2%
CPZs	-3.7%
Personalised Travel Planning	-3.6%
Driver training	-3.4%
Electric Vehicle Charging Infrastructure - 5% reduction in Car Emissions	-1.3%
Cycling - all initiatives incl. Cyclehubs & Cycle Parking	-0.8%
Electric taxis	-0.8%
DIY Streets	-0.7%
Workplace Travel Planning	-0.6%
Car Clubs - Phases 1 & 2	-0.5%
Integrated Marketing Campaign - 2% reduction	-0.5%
Town Centre and Retail Areas Travel Planning	-0.3%
Electric Vehicle Charging Infrastructure - 1% reduction in Emissions	-0.3%
Integrated Marketing Campaign - 1% reduction	-0.3%
Freight quality partnerships	-0.2%
DIY Streets Low Scenario	-0.1%
School Travel Plans	-0.1%
Rewards for walking for leisure trips	-0.1%
Community Hubs	0%
Low Carbon Zones - Muswell Hill	0.1%
Road Safety Measures including Schools	0.9%

5.2.10 The Low Carbon Bus Corridors and CPZs in 2020 produced the lowest carbon emissions of all of the measures tested. This was a decrease of 4.2% from the base year emissions. The Road Safety Measures including schools produced the highest CO_2 emissions with an increase of 0.9% from the base year emissions (mainly reflective of the impact of lowering vehicle speeds).

5.2.11 Four schemes show a reduction greater than 3% for 2020 carbon emissions when compared to the base year. These are CPZs, Personalised Travel Planning, Driver Training and Low Carbon Bus Corridors.

5.2.12 The same measures were then modelled again, this time excluding those trips which originate externally to Haringey and finish externally to Haringey (E-E). For each measure, the new % changes from 2020 are listed below.

Table 5.3: % change from 2020 emissions by LIP measure (excl. E-E)

Measure	% Change From 2020
Low carbon bus corridors	-5.4%
CPZs	-4.7%
Personalised Travel Planning	-4.5%
Driver training	-4.4%
Electric Vehicle Charging Infrastructure - 5% reduction in Car Emissions	-1.7%
Cycling - all initiatives incl. Cyclehubs & Cycle Parking	-1.0%
DIY Streets	-0.9%
Workplace Travel Planning	-0.8%
Car Clubs - Phases 1 & 2	-0.7%
Integrated Marketing Campaign - 2% reduction	-0.6%
Electric taxis	-0.5%
Town Centre and Retail Areas Travel Planning	-0.4%
Electric Vehicle Charging Infrastructure - 1% reduction in Emissions	-0.3%
Integrated Marketing Campaign - 1% reduction	-0.3%
Freight quality partnerships	-0.2%
DIY Streets Low Scenario	-0.2%
School Travel Plans	-0.1%
Rewards for walking for leisure trips	-0.1%
Community Hubs	-0.1%
Low Carbon Zones - Muswell Hill	0.1%
Road Safety Measures including Schools	1.1%

5.2.13 As shown with the inclusion of external – external trips, the Low Carbon Bus Corridors and CPZs in 2020 produced the lowest carbon emissions of all of the measures tested. This was a decrease of 5.4% from the 2020 year emissions, which is more of a decrease than if external – external trips are included. Again, the Road Safety Measures including School produced the highest CO_2 emissions (less of an increase than with the external – external trips) of 1. 1% from the base year.

5.2.14 All measures performed better with the external – external trips removed, with only the Low Carbon Zones – Muswell Hill, Road Safety Measures including School and Community Hubs producing increases of CO_2 emissions from the base year.

5.3 Value for money

5.3.1 The ratio of the saving to cost for each measure has been calculated by looking at the cost of each scheme against the emissions savings. Costs have been estimated from the LIP budget and are also included within the assumption Table within Appendix 1. These figures are shown below in Table 4.6, and indicate that the electric vehicle charging

infrastructure measure gives the best value for money. These results include the external – external trips.

Table 5.4: Ratio of Savings to Costs for LIP Measures 2020

Measure	Cost (£) Per Tonne CO_2 Abated
Electric Vehicle Charging Infrastructure - 5% reduction in Car Emissions	10.0
Electric taxis	12.4
Driver training	18.9
Low carbon bus corridors	21.6
Workplace Travel Planning	25.2
Electric Vehicle Charging Infrastructure - 1% reduction in Emissions	50.4
Car Clubs - Phases 1 & 2	61.5
CPZs	69.7
Freight quality partnerships	69.8
Personalised Travel Planning	73.5
Town Centre and Retail Areas Travel Planning	97.2
DIY Streets	145.2
Cycling - all initiatives incl. Cyclehubs & Cycle Parking	159.8
Integrated Marketing Campaign - 2% reduction	181.4
Rewards for walking for leisure trips	293.2
School Travel Plans	327.2
Integrated Marketing Campaign - 1% reduction	362.8
Community Hubs	598.0
DIY Streets Low Scenario	870.9
Low Carbon Zones - Muswell Hill	-24.9
Road Safety Measures including Schools	-143.9

5.4 Package Analysis

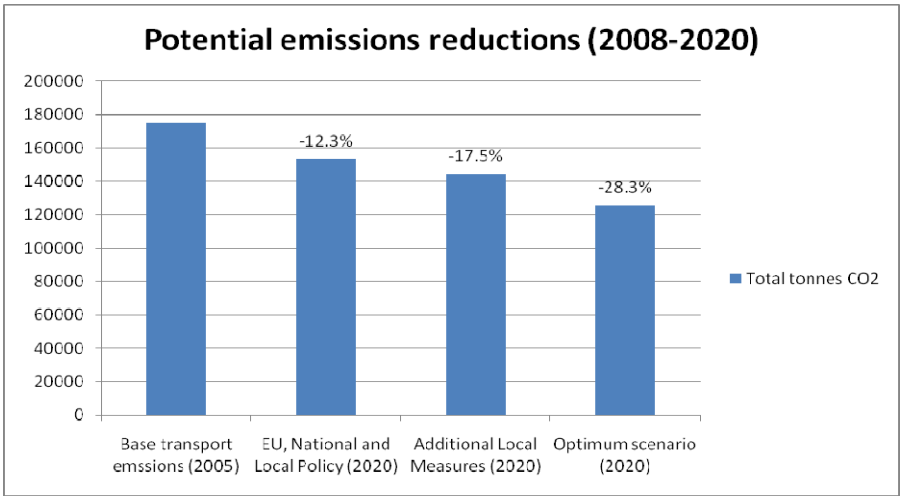
Overall effect

5.4.1 The table and figure below summarises the headline results in terms of overall carbon emissions from transport that can be reduced by 2020. Promisingly there are significant reductions than can be achieved, although the reductions are not as great as in other sectors, such as energy and waste, where up to 40% may be achieved.

Table 5.5: Comparison of emissions reductions scenarios

Scale	Key measures included	Scenario	Potential Reduction In Emissions In 2020 (From 2008 Levels)
EU, National and sub-regional level	- EU carbon standards for the production of new vehicles by 2020 - Population changes - Infrastructure improvements (e.g. cycle superhighways)	2020 BAU	-12.3%
London Borough of Haringey	- Travel demand management - Parking restrictions - Electric vehicle charging points - DIY Streets - Road safety schemes - Behavioural change marketing	2020 BAU + Costed LIP Package	-5.2%

Figure 5.1: Overall potential emissions reductions by scenario



5.4.2 So the total reduction in transport related emissions to 2020 is calculated to be **-17.5%.** CB also analysed the impact of other measures that would offer additional savings of around **-10.8%** although there would potentially be at least an additional £750,000 that would need to be spent annually. These additional measures include Personalised Travel Planning for the whole borough, Low Carbon Bus Corridors and Driver Training.

5.4.3 Trips that travel through Haringey may be difficult for Haringey Council to influence. Again, for reporting purposes we have removed external to external trips, because although a change in these trips could significantly affect carbon reduction under the optimal scenario, they will be little impacted on the costed LIP package as most of the measures affected internally focused trips only.

Table 5.6: Carbon reductions by package

	2008	2020 BAU	2020 Costed LIP Package*	2020 Optimal Package*	2020 (Excluding E-E)	2020 Costed LIP Package (Excluding E-E)	2020 Optimal Package (Excluding E-E)
CO_2 Emissions	174,715	153,187	144,090	125,313	121,025	111,928	93,709
% Change from Base	0.00%	-12.32%	-17.53%	-28.28%	-10.93%	-17.62%	-31.03%

* Based on optimistic EV, DIY Streets and integrated marketing scenario

5.5 Approximating a 2005 baseline

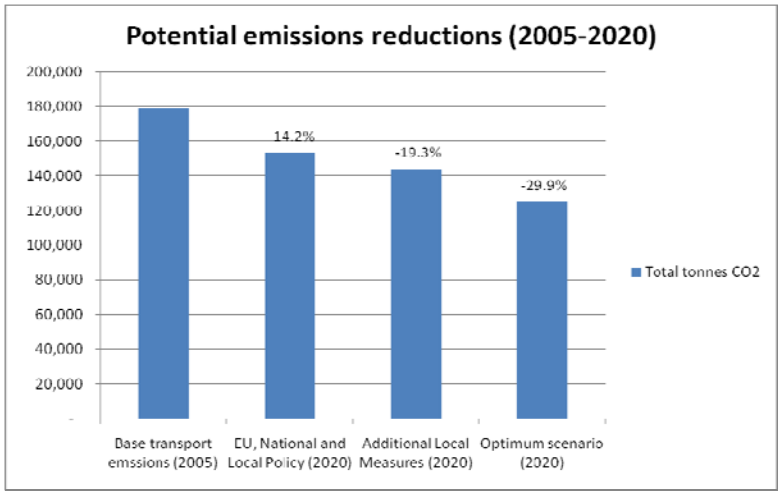
5.5.1 This study uses a base reference year of 2008 to match the reference data that is available from NoLHAM for all sectors within Haringey.

5.5.2 However, it is important for the purpose of reporting back to DECC that an estimate is given to the total savings potential from a 2005 baseline (for consistency of reporting across the transport and energy sectors). In order to do this, CB backdated the fuel efficiency savings between 2005 to 2008. This produced the following results.

Table 5.7: Total emissions (2008 to 2005)

Year	Total Emissions (tones CO_2)
2008	174,715
2007	176,006
2006	177,310
2005	178,629

Figure 5.2: Overall potential emissions reductions by scenario



5.5.3 The results show that approximately there is a 1.6-1.9% additional benefit in emissions across each of the scenarios compared to using the 2008 baseline results, with the total

benefit of the LIP package being a 19.3% CO_2 reduction. Potential emissions abated under the optimum package also rise to around 30%.

6 Cost benefit analysis

6.1 Overview

6.1.1 An economic appraisal has been undertaken of the following five schemes, in line with TfL and DfT appraisal guidance:

- Cycling measures
- School travel plans
- Controlled Parking Zones
- 20mph zones
- Personalised travel planning

6.1.2 Each scheme has been assessed in isolation, and assumes that the other schemes do not take place.

6.1.3 The appraisal considers costs, revenues and wider benefits in the following way:

- Costs / revenues are calculated for the duration of schemes between 2008-2020 and divided into:
  - Capital, operating and maintenance
  - Change in cash revenues for each year the project benefits are realised
- Wider benefits are monetarised and divided into:
  - User benefits (journey time savings, bus fare savings, fuel vehicle operating cost savings and non-fuel operating cost savings)
  - Social benefits (road decongestion, ambience, public health, ambience, carbon).

6.1.4 The outputs of the transport/carbon model have been used to quantify the magnitude of modal shift that each of the schemes provide, with the following exceptions:

- Cycling measures – the economic assessment only includes the cost of specific improvements at the Wood Green cycle hub and new cycle stands at five stations, whereas the transport/carbon model includes a wide range of measures across the borough. The numbers from the transport/carbon model have been scaled down in the appraisal to account for this discrepancy.
- 20mph zones – without understanding the characteristics of the areas where the 20mph zones are to be introduced, in particular the average speed and volumes of traffic, it is not possible to quantify the impacts of the scheme fully. Therefore a qualitative assessment has been made for the purposes of this report.

6.2 Results

6.2.1 This section presents the results of each of the five economic appraisals in turn.

Cycling measures

6.2.2 A bottom-up approach has been used to estimate the number of users and the number of trips that would be generated by the Wood Green hub and additional stands at five stations. Table 5.1 summarises the economic appraisal:

Table 6.1: Cycling measures economic appraisal

Description	Present Value (£000s, Discounted To 2011)
Capital expenditure	570
Operating expenditure	456
Change in revenues	(453)
User benefits	669
Social benefits	2,598
Net Present Value	**1,779**
BCR	**2.2**

6.2.3 The cycle measures have a good Benefit Cost Ratio (BCR) driven by the high levels of social benefits – mainly improved public health and reduced absenteeism benefits from new cyclists.

6.2.4 It is assumed that the new cycle trips have been abstracted equally from bus and car trips. The scheme starts in 2011, and is fully operational by 2015.

School travel plans

6.2.5 School travel plans will primarily result in a shift from car travel to cycle and walking trips. It is assumed that the mode shift will be split equally between cycle and walking. The scheme starts in 2011, and is fully operational by 2015. Table 5.2 below summarises the economic appraisal:

Table 6.2: School travel plans economic appraisal

Description	Present Value (£000s, Discounted To 2011)
Capital expenditure	143
Operating expenditure	114
Change in revenues	-
User benefits	(4,965)
Social benefits	4,060
Net Present Value	**(1,161)**
BCR	**-3.5**

6.2.6 The school travel plans are shown to be poor value for money, driven by the negative user benefits. These include a valuation of the additional time taken to complete the journey by cycle or walking compared to by car. These are offset to some extent by the social benefits – including road decongestion, public health and carbon – however not sufficient to achieve a positive Net Present Value.

6.2.7 Even a doubling of modal shift from car to walk/cycle does not improve the appraisal, due to the negative user benefits also being doubled. This results in a BCR of -8.3. Underlying weightings within the DfT appraisal guidance on valuing journey time savings are a key reason for school travel plans having such a poor BCR.

Controlled Parking Zones (CPZ)

6.2.8 The introduction of CPZ is forecast to result in mode shift from car with 50% of trips switching to bus, 25% of trips shifting to cycle and 25% of trips shifting to walking. The CPZ will also provide a revenue stream for the Council, assumed to be equivalent to the operating cost of enforcing the scheme, once fully operational. The scheme starts in

2011, and is fully operational by 2016. Table 5.3 below summarises the economic appraisal:

Table 6.3: Controlled Parking Zones economic appraisal

Description	Present Value (£000s, Discounted To 2011)
Capital expenditure	361
Operating expenditure	588
Change in revenues	479
User benefits	(17,915)
Social benefits	25,879
Net Present Value	**7,493**
BCR	**16.9**

6.2.9 The CPZs are assumed to take nearly 6 million vehicle km from the roads, leading to road decongestion benefits. Public health and absenteeism benefits are high resulting from the cycle mode shift. This results in a very high BCR value. It is worth noting though that CPZs often incur substantial design and consultation costs and these are not often recovered through the project (any CPZ expansion in Haringey would need to draw on these costs which are not currently in the LIP).

6.2.10 Although the BCR for CPZ is very high, the schemes themselves can be very contentious as often residents incur additional charges for the purchasing of parking permits, while in Haringey there is opposition from businesses that CPZs can damage trade. In order to minimise any perceptions to the loss of trade, good scheme design is crucial, either incorporating the use of flexible commuter bays or encouraging low carbon vehicles by reducing the costs of permits.

6.2.11 There are also a number of recent studies (such as CB's report for Enfield Council (2009) on the relationship between parking charges and town centre vitality) that show that most shoppers with the highest spending power use non-car modes and that the retailing offering of an area is far more of a critical factor than the cost of parking for customers. The wider benefits of CPZs should also be emphasised:

6.2.12 The benefits of controlled parking include:

- making it easier for residents to park near their homes
- improved safety, with better visibility at junctions
- easier access for emergency services, delivery and removal vans
- reduced traffic and pollution
- reduced visual impact of cars on the street environment.

20mph zones

6.2.13 As explained previously, it is not possible to undertake an economic appraisal of the scheme without detail on the speed and traffic volumes of the specific roads affected by the 20mph restrictions. We have therefore provided a qualitative assessment.

6.2.14 There is significant evidence that lowering vehicle speeds leads to a reduction in the number of accidents and the number of people killed or seriously injured. The Royal Society for the Prevention of Accidents (ROSPA), quoting a review of road casualties in London between 1986 and 2006 published in the British Medical Journal, claims that a 20mph zone can reduce the number of road casualties by 41.9% and that fatal or serious injuries to children could be reduced by half (50.2%).

6.2.15 On the other side of the appraisal would be the journey time disbenefits to vehicles as well as the marginal carbon disbenefit from driving at a lower, less efficient speed.

6.2.16 The Institute of Transport Studies (ITS) has looked at a number of case studies[3] with actual data after introducing 20mph zones which shows three out of four areas had a positive Net Present Value, so it demonstrates that 20mph zones can be value for money. However, wider user and social benefits were not considered.

Personalised travel plans

6.2.17 Personalised travel planning across Haringey assumes that the vehicle trips removed from the road are distributed equally between walking and cycling, in the same manner as the school travel plans. The scheme starts in 2011, and is fully operational by 2016. Figure 5.4 below summarises the economic appraisal.

Table 6.4: Personalised travel plans economic appraisal

Description	Present Value (£000s, Discounted To 2011)
Capital expenditure	367
Operating expenditure	294
Change in revenues	-
User benefits	(20,515)
Social benefits	22,444
Net Present Value	**1,268**
BCR	**2.9**

6.2.18 The personalised travel plans are assumed to remove 3.4 million vehicle km from the roads onto cycling and walking, resulting in some significant time disbenefits (user disbenefits) but offset by public health, absenteeism, road decongestion and carbon benefits (social benefits). This leads to a BCR showing good value for money.

6.3 Assumptions

6.3.1 This section highlights the key assumptions used in the economic appraisal of the schemes.

[3] http://www.its.leeds.ac.uk/aoss/01/cases.html

Table 6.5: Appraisal assumptions

Assumption	Value	Description
Appraisal period	10 years	CB assumption
Discount rate	3.5%	As per WebTAG[4]
Value of time, VoT	Various, by mode	Taken from BCDM[5]
VoT growth	1.56% per annum	From WebTAG (2012-2021)
Value of carbon	Various, by year	From DECC report / WebTAG
Fuel costs	Various, by year	From WebTAG
Non-fuel vehicle costs	Various parameters	From WebTAG
Average bus fare	£2.10	Per trip, from BCDM
Average bus distance (within Haringey)	4km	From transport model
Average car distance (within Haringey)	3.7km	From transport model
Induced traffic – reduction in car km removed	50%	CB assumption
Average vehicle occupancy	1.48	From WebTAG
Average car speed (general)	24 km/h	From transport model
Average car speed (near schools)	18 km/h	CB assumption
Average cycling speed	14 km/h	From BCDM
Average bus speed	14 km/h	From BCDM
Average bus waiting time	5 mins	CB assumption
Weighting for bus waiting time	2.5	From BCDM
Average walking speed	4.8 km/h	From BCDM
Absenteeism benefit per day	£8.30	From WebTAG (2002 prices)
Working days per year	227	CB assumption
Ambience benefit – increase in cycle stand provision	8p per trip	From BCDM
Ambience benefit – introduction of CCTV at cycle parking area	8p per trip	From BCDM
Value of preventing a fatality	£1.7m	From BCDM
Road decongestion benefit	33.3p per km	WebTAG, 'other roads' in 'conurbations'

[4] Department for Transport appraisal guidance
[5] Transport for London Business Case Development Manual

7 Conclusions and recommendations

7.1 Key findings

7.1.1 The carbon emissions modelling and economic BCR analysis produced the following headline results:

Total carbon emissions reduction

- Approximately, two thirds of all ground-based transport carbon emissions achievable by 2020 are from EU, national and committed TfL infrastructure with one third attributed to schemes outlined in the LIP and smarter travel packages.
- A 19.3% emissions reduction under the BAU + LIP costed 2020 package would equate to removing around 28.3% trips from the Highway network.
- A 29.9% would potentially be achievable with additional measures include borough-wide Personalised Travel Planning, Low Carbon Bus Corridors and Driver Training but LIP costs would rise by £750,000. A 29.9% reduction would equate to a 43.9% reduction in trips from the Highway network.
- 88% of all carbon emissions are currently linked with travel origins or destinations, or both, beyond Haringey.
- 39% of all highway trips that flow internally to externally from the borough finish in Enfield.

LIP scheme carbon emissions benefits

- Four schemes evaluated show a reduction greater than 3% for 2020 carbon emissions when compared to the base year. They would be particularly effective as measures as they directly reduce travel demand or improve vehicle operating efficiency across a range of trip types (particularly I-E, E-I) across all times of day (AM, PM, IP). These schemes were:
  - Low Carbon Bus Corridors.
  - CPZs
  - Personalised Travel Planning
  - Driver Training
- Workplace travel planning, EV infrastructure and car clubs also showed good value for money when cost per tonne of CO_2 abated was considered.
- Schemes where the carbon and value for money benefits scored poorly focused on those that only affected internal to internal trips (only 12% of all trips) and targeted a small proportion of all highway trips ('car other' in the interpeak for example).
- The carbon benefits of road safety and DIY Streets programmes are particularly uncertain due to sub-optimum speed reductions and limited impact on car travel demand.

Wider economic impacts

- The wider economic benefits of road safety schemes and school travel plans are low based on the journey time disbenefits. This is partly due to DfT's WebTAG weighting of journey time savings offset against road safety benefits being almost equal.
- More positively, the other three schemes that underwent the economic evaluations had very good BCRs all over 2 and included CPZs, cycling hubs and personalised travel planning.

7.2 Recommendations

For Haringey

7.2.1 For the purpose of the borough-wide 40:20 carbon reduction action plan, a ground-based emissions reduction target of 19-20% should be set for 2020 based on 2005 levels.

7.2.2 There are also some steps that Haringey Council could take to increase carbon reduction from ground-based transport emissions, further to those schemes currently identified in the LIP:

- Re-directing some funds from school travel planning and more generalised marketing into personalised travel plan may produce additional carbon reduction benefits of over 3%, meaning a 22% reduction target could be achievable.
- Widespread driver training schemes and low carbon bus corridors should also be supported but external funding may be needed. Driver training should perhaps be carried out in conjunction with private sector partners, such as vehicle manufacturers.
- Measures should focus on demand reduction rather than speed to optimise carbon reductions in Haringey as there is more of a linear relationship on reducing the number of highway trips and total emissions reduced. The relationship between speed and emissions is more complex but at low speeds; under 25kmph, carbon emissions will rise as further speed reductions are induced.
- Low carbon bus corridors will be expensive to fund if no additional funding is given from TfL. Hybrid buses currently cost approximately £100,000 more than a conventional bus so any additional funding may have to come jointly from the Boroughs, the DfT or from Europe (see section below).
- More effective links could be made between policies that produce both air quality and carbon emissions co-benefits. LB Haringey is defined as an Air Quality Management Area whereby actions must be taken to reduce the amount of nitrogen dioxide (NO_2) and PM_{10} (respirable dust) predominantly from road transport. Such schemes could build on the Clean Air Fund[6] offered by TfL's Business Engagement Team in central London. A particular focus should be given to vehicle procurement and Delivery and Servicing Plans for businesses. The table below shows one example of how Camden has prioritised vehicle procurement based on a joint air quality and carbon emissions policy.

Figure 7.1: Vehicle hierarchy of combined air quality and CO_2 reduction

Decreasing Emissions ↑

Electric
Biomethane
Hybrid
LPG (liquefied petroleum gas)
CNG/LNG (Compressed/liquefied natural gas)
Retrofit hybrid assist
Biodiesel/bioethanol
Petrol/diesel fitted with particle trap

[6] The Clean Air Fund provides a package of incentives to major businesses within specific air quality management corridors.

- Personalised travel planning can be resource intensive and expensive to sustain, although as shown in Chapter 6, a positive BCR is possible if delivered well. Two possibilities of providing a better PTP package in Haringey would be to:

  1) Attract investment from the private sector in either funding the programme or sponsoring the production of marketing materials. Potential sponsors could include developers, transport operators, health clubs and cycle shops.

  2) There are economies of scale to be made from joining up any PTP programme with other energy, water and waste conservation schemes run by the local community. **Living Smart** is on such approach from Perth, Western Australia that has used the concept of eco-coaching[7]. This has helped to reduce energy consumption and car travel by 5-10% amongst the community when compared to control samples.

- 39% of all trips that originate in Haringey either end in Enfield or beyond. Furthermore both Boroughs have similar journey purpose profiles. Procurement of sustainable transport solutions should therefore pan across both Boroughs but there is the question whether the scope of any investment should also include other Boroughs such as Barnet and Waltham Forest. Suitable procurement projects at this level may include an EV vehicle purchasing framework and driver training contracts.

- Economic growth is particular important for Haringey but given the high population growth forecasts over the next few years, developers and house builders have their part to play in mitigating against additional car trips in the Borough. Haringey Council should investigate the potential to use the Community Infrastructure Levy mechanism to levy a charge against particular development in relation to the net additional car trips generated onto the highway network by that development, particularly during peak hours. The charge would be applied after consideration of the mitigation effects of a Travel Plan. Based on DfT WebTAG guidance there is a benefit or cost of 13.1p per car kilometre removed or added to the road network.[8]

- Pricing of parking both in terms of off street parking and CPZs (including residential and business permits) should be dependent on vehicle emissions. This should also extend to the promotion of workplace emissions based parking charges.

- More radical solutions would include restricting access of all vehicles apart from low and ultra-low carbon vehicles (ULCVs[9]) within certain areas of Haringey (i.e. where air quality and congestion is particularly high), offering Council Tax rebates for individuals and businesses who replace vehicles with emissions under 100gCO_2/km and investigating the potential for low carbon vehicle lanes within the Borough.

[7] Eco-coaching uses a combination of telephone, face-to-face and group facilitation in combination with consumer incentives and marketing materials to deliver changes across a range of environmental issues. The work builds on the concept that people who are more likely to change their travel behaviour will also change environmental behaviour in relation to other environmental issues, such as energy, water and waste.
[8] In 2002 prices and values; these have risen about 10% since then. See http://www.dft.gov.uk/webtag/documents/expert/unit3.9.5.php#081
[9] The DfT defines low carbon vehicles as those emitting less than 100g/CO_2 km whereas ultra low carbon vehicles are those emitting less than 75g/CO_2 km.

Beyond Haringey

7.2.3 In order to maximise the reduction in transport-related carbon emissions within the Borough, a number of wider regional and national policy measures could be promoted. These would include:

- Development of legislation to include air quality and carbon emissions co-benefits. but any movement towards adapting legislation to deal with both aspects is as yet at an early stage. The Cleaner Road Transport Vehicles Regulations 2011 constitute a new piece of legislation that offers the opportunity to both tackle air quality objectives and reduce vehicle carbon emissions. The only other expression of this type of joined-up policy as yet is through bodies such as the Low Emissions Strategies Partnership with their work in Camden and Greenwich.
- Creation of a regional and national fund that tackles carbon emissions from transport jointly between areas and target middle and long distance trips, especially from commuting, freight and leisure travel.
- More measures should focus on integrated travel. One measure that works particularly well in urban areas in the US that could be adopted in London is buses for bikes, whereby a bike rack is attached to the front or back of a bus. Similarly, station travel plans may help to improve integrated travel between rail and cycling.
- EU legislation for vehicle manufacturers to provide more informed driver telemetrics that provide real-time data on efficient driving.
- Extension of TfL's Clean Air Fund in London to incorporate areas outside of Central London.
- National campaigns and eco-coaching that focus on a range of environmental issues. These could be incentivised through a national Living Smart fund.
- More aggressive differentials in the pricing of road tax based on emissions, i.e. for the highest polluting vehicles emitting over 255 g CO_2 / km, the annual tax should be 8-10 times higher than the current charge of £460. Alternatively road tax could be based on a road pricing model that takes into account vehicle emissions, length of travel and time of day (i.e. peak and off-peak travel).
- Commitment from all bus operators and taxi companies to move towards low and ultra-low carbon vehicle fleets, incentives through bus operator grants and revisions to the Local Transport Act (2007).

7.3 Funding opportunities

7.3.1 Beyond funding from Transport for London, there are several European options for potential sources of income in relation to sustainable transport measures in Haringey:

- **INTERREG IVB** – http://www.nweurope.eu/. This programme releases calls every 6 months. There is one call due in October, the next one in April 2012. This programme is all about joint working and trans-national cooperation in the North West European Region. This is reflected in the key priorities relating to connectivity and sustainable development. There is a focus on reducing the need to travel and

using ICT to enable this. Co-financing[10] is 50%, projects typically last 3 years, 5-8 partners. Budget could be anything from €200,000-€500,000 per partner.

- **Intelligent Energy Europe** - http://ec.europa.eu/energy/intelligent/. This focuses on environment and energy efficiency with a specific call on transport called STEER. Calls for funding are only once year usually due in May/June (opens in February). Last year actions for calls related to urban freight, leisure travel, Sustainable Urban Mobility Plans, and green car initiative. Typical consortiums are 5-8 partners and projects last up to 3 years. Focuses on promotion and dissemination activities, staff time etc. It won't fund infrastructure, research… Looking at budgets of €150,000-€300,000 per partner. Co-financing is 75% and they have a flat rate reimbursement of overheads of 60% on eligible staff costs, which is very handy.

- **LIFE+** - http://ec.europa.eu/environment/life/funding/lifeplus.htm. This is quite heavily focused on ecology and biodiversity but there is a sub-programme called Environment Policy & Governance which has the potential to fund transport projects. It will support demonstration projects including design and implementation. LIFE+ only has calls once year; the next one will be due in July 2012. If a bid was submitted and was successful it would not start until June 2013. Co-financing is 50%-75% depending on the element of work. Projects typically last 2-5 years. There is no obligation to submit a bid with other partners. Typical budgets are in excess of €1million.

- **European Investment Bank -** http://www.eib.org/products/technical_assistance/elena/index.htm. To facilitate the mobilisation of funds for investments in sustainable energy at local level, the European Commission and the European Investment Bank have established the ELENA technical assistance facility (European Local ENergy Assistance), financed through the Intelligent Energy-Europe programme. ELENA support covers a share of the cost for technical support that is necessary to prepare, implement and finance the investment programme, such as feasibility and market studies, structuring of programmes, business plans, energy audits, preparation for tendering procedures - in short, everything necessary to make cities' and regions' sustainable energy projects ready for EIB funding.

7.3.2 Haringey Council should discuss these funding options with the London European Transport Partnership to maximise their chances of submitting a successful bid.

7.4 Further work

7.4.1 More research is needed on the long-term carbon reductions possible through public transport in Haringey in terms of the potential impact of increasing or reducing overall patronage numbers on average or marginal carbon benefits (e.g. how many more train passengers does it take for a new train service to be commissioned and what is the associated impact on carbon?).

7.4.2 There needs to be better monitoring of the carbon and wider impacts on DIY Streets and 20mph zones to inform more accurate modelling analysis.

7.4.3 Further analysis should be conducted on the economic benefits of school travel plans to capture additional user and social benefits.

[10] 1.1.1 Co-financing: As a hypothetical example; Haringey was a partner in a project with 75% co-financing from the European Commission and a budget of €300,000 over 3 years, or €100,000 per annum. The match funding they would have to provide over the 3 years would be €75,000 (25%).

7.4.4 Any expansion of CPZs should be considered against the wider community perceptions of such schemes, alongside a consultation study to try and address any concerns.

7.4.5 A personalised travel planning scoping study should be conducted to ensure good value for money, identify suitable funding partners and identify integration opportunities with wider eco-coaching community programmes.