Air Quality Action Plan – May 2004

Prepared by:
Environmental Protection Team
Environmental Health
Community Safety and Environment Services
Harrow Council
P O Box 18, Civic Centre
Station Road
Harrow, HA1 2UT

Please send comments to:
Paul Hargreaves
Scientific Officer
at the above address or
Telephone: 020-8736-6239
Email: paul.hargreaves@harrow.gov.uk

www.harrow.gov.uk

Executive Summary

Harrow Council declared its whole borough an air quality management area (AQMA) in January 2002. This was required after a review and assessment of air quality within the borough predicted that two pollutants, PM_{1O}s (very fine particles) and nitrogen dioxide (NO_2) were likely to exceed nationally set objectives. Under section 84(2) of the Environment Act 1995, such a declaration requires Harrow to undertake a further review and assessment of air quality (termed 'stage 4') within the AQMA, to refine the outcomes of the earlier review and assessment, and to produce an action plan setting out what they intend to do to meet the objectives.

This action plan contains new policies to improve air quality in Harrow. These policies are inextricably linked to policies detailed in Harrow's Interim Local Implementation Plan and Unitary Development Plan and take into account the Mayor's Air Quality Strategy and statutory guidance.

The policies and proposals within this Action Plan have been grouped into the following sections:

- Reducing emissions from vehicles;
- Reducing road traffic – discouraging non-essential journeys by road;
- Promoting alternative modes of transport to the private car;
- Encouraging walking as a means of travel;
- Encouraging cycling as a means of travel;
- Encouraging development that does not impact upon air quality;
- Public information and education.

The results of the stage 4 report (10) confirm the findings of previous review and assessments in that the busiest roads in the borough are predicted to exceed Air Quality Strategy Objectives. The Council was therefore justified in its decision to declare the whole borough an Air Quality Management Area.

The modelling employed demonstrates that the main contribution to nitrogen dioxide concentrations within the borough is road traffic, whilst the majority of PM_{10} concentrations can be attributed to background sources. However, those locations which experience the highest PM_{10} concentrations are also those most influenced by the contribution from road transport.

As road traffic is the main source of nitrogen dioxide and a major source of fine particle emissions within the borough it is natural that most of the measures relate to attempting to reduce emissions from this source.

The new policy included in this action plan are intended to cement and further enhance existing Council policies and as such, enable Harrow to meet National Air Quality Objectives

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Section 1
An introduction to air pollution control and the reasons for improving air quality.

1.1 Introduction

Air pollution is not a new problem for London. As early as 1273, the use of coal in London was prohibited because of its impact upon health. Historical legislation has numerous references to the use of coal.

The Industrial Revolution was based on the use of coal as an energy source. As industrialisation occurred in London, emissions of sulphur dioxide and smoke increased and air quality was dramatically effected.

Early control was provided for by the Alkali Act's. The first Act to be laid before parliament was the Alkali Act 1863, which made no attempt to control smoke, but required 95% of the offensive emissions to be arrested. The early Alkali Acts were consolidated into the Alkali etc Works Regulation Act 1906. This Act covered "noxious and offensive gases" from a number of highly polluting industrial sources.

The 'pea souper' smogs that occurred in the 1950's were a result of heavy industry and power stations, plus domestic coal burning, at a time when coal fires were still the main heating source for homes.

The Clean Air Act 1956 brought about a great improvement in air quality. This Act constituted the operative legislation against pollution by smoke, grit and dust from processes not covered by the Alkali Acts. The Act also prohibited the emission of "dark" smoke from any chimney.

While this, and subsequent Acts brought about improvements in emissions from domestic heating and industry, a new air pollution mix was developing as a result of increased traffic emissions.

These pollutants associated with vehicle emissions, such as nitrogen dioxide and particulate matter, can also impact upon health and the environment in which we live. Certain groups in society are particularly susceptible to elevated air pollution levels, such as those with lung disease and heart conditions and those individuals who suffer from asthma.

In the early 1990's, elevated pollution episodes in urban areas brought about an increased awareness of the inadequacies in the existing legislation. The Government realised that there was need for a change in the way pollution emissions were controlled. Part IV of the Environment Act 1995 required the Secretary of State for the Environment to develop a National Air Quality Strategy, which was produced in 1997.

The National Air Quality Strategy required Local Authorities to undertake a detailed review and assessment of air quality within their areas. This review and assessment enables a comparison to be made with objectives set for seven main air pollutants.

If this process indicates that the objectives were unlikely to be met, then local authorities were required to designate Air Quality Management Areas (AQMAs) and to draw up action plans to determine how the objectives will be met. This action plan is the outcome of such a process for Harrow.

1.2. The Legal Framework

1.2.1 The EU Air Quality Framework Directive

The European Union's (EU) air quality policy sets the scene for UK policy. The air quality 'framework' Directive on Ambient Air Quality Assessment and Management came into force in September 1996. This policy sets the framework for air quality management in the EU, through the development of European wide air quality limit values. These legally binding air quality limits are produced in a series of daughter directives, superseding and extending existing European Legislation.

The Air Quality Framework Directive and first daughter directive were transposed into national legislation through the Air Quality Limit Values Regulations 2001. These Regulations require the Secretary of State for the Environment to achieve the air quality limits within the time frame set. This complements the existing National Air Quality Strategy which is discussed below.

1.2.2 The National Air Quality Strategy

The Environment Act 1995 required the Secretary of State for the Environment to produce a National Air Quality Strategy, setting air quality standards and objectives for specified pollutants.

The National Air Quality Strategy was published in 1997, with a revision being made in 2000 and an addendum in 2003. The strategy required Local Authorities to review and assess air quality in their areas with regard to objectives set for seven pollutants.

The objectives set for the seven pollutants were based on the levels at which no significant risk to health was posed. The health-based standards were developed by the Expert Panel on Air Quality Standards (EPAQS) from medical and scientific evidence.

The most recent version of the National Air Quality Strategy was published in 2000 with an addendum being published in 2003. The following table, Table 1 shows the current objectives levels set.

Table 1. Air Quality Strategy 2000 objectives and the objectives in the 2003 Addendum prescribed in regulations for the purpose of local air quality management (for England).

Pollutant	Objective	Concentration measured as	Date to be achieved by
Benzene	16.25 μg/m^3 (5 ppb)	Running annual mean	31 December 2003
Benzene	5 μg/m^3 (1.54 ppb)	Annual average	31 December 2010
1,3-butadiene	2.25 μg/m^3 (1 ppb)	Running annual mean	31 December 2003
Carbon monoxide	10 μg/m^3 (8.6 ppb)∗	Maximum daily running 8-hour mean	31 December 2003
Lead	0.5 μg/m^3 0.25 μg/m^3	Annual mean Annual mean	31 December 2004 31 December 2008
Nitrogen dioxide	200 μg/m^3 (105 ppb) not to be exceeded more than 18 times a year 40 μg/m^3 (21 ppb)	1-hour mean Annual mean	31 December 2005 31 December 2005
Sulphur dioxide	350 μg/m^3 (132 ppb) not to be exceeded more than 24 times a year 125 μg/m^3 (47 ppb) not to be exceeded more than 3 times a year 226 μg/m^3 (100 ppb) not to be exceeded more than 35 times a year	1-hour mean 24-hour mean 15-minute mean	31 December 2004 31 December 2004 31 December 2005
Particles (PM10)	50 μg/m^3 not to be exceeded more than 35 times a year 40 μg/m^3 (21 ppb)	24-hour mean Annual mean	31 December 2004 31 December 2004
∗ More stringent objective	Set in addendum 2003		

In setting air quality standards and objectives, the Government has taken account of economic efficiency, practicability, technical feasibility and timescale on a National level.

It should be noted that the PM_{10} objective adopted in the Air Quality Strategy Regulations 2000 is less stringent than the original health based regulation set in the Air Quality Strategy Regulations 1997. This is because the original objective was seen as being too demanding. More stringent objectives have been proposed in the 2003 Addendum of the National Air Quality Strategy, but the objectives will not be formalised until after the EU Daughter Directive for particulates has been reviewed. The review is due this year.

The National Air Quality Strategy provided 9 pollutant objectives. While 7 of these pollutants, as shown in table 1, are intended to be delivered by a combination of EU,

national and local measures, the objectives set for ozone and polyaromatic hydrocarbons are to be managed through national and international measures, as they can not be controlled by local measures.

1.2.3 The Role of the GLA

Under the Greater London Authority Act 1999, the Mayor for London is required to produce a State of the Environment Report, which must include information on air quality and emissions to air, particularly from road traffic, in London. This document is due to be published this year.

The Mayor is also required to produce 8 statutory strategies:

- Air Quality
- Spatial Development
- Transport
- Economic Development
- Culture
- Biodiversity
- Ambient Noise
- Municipal Waste Management

These strategies are aimed to provide a consistent decision making framework for the four functional bodies under the Mayor's control:-

- Transport for London (TfL)
- The London Development Agency
- The London Fire and Emergency Planning Authority
- Metropolitan Police Authority

and by London's 33 local authorities.

The strategies must have regard to: -

- the principle purpose of the GLA
- the effect of the strategy on the health of people in Greater London and on the achievement of sustainable development in the UK
- the need to ensure each Strategy is consistent with national policies, with those international obligations as notified by the Secretary of State and the Mayor's other strategies
- the resources available for implementing each strategy
- the desirability of promoting and encouraging the safe use of the River Thames
- the principle that there should be equality of opportunity for all people

All of the strategies must be taken into account in the development of Harrow's Air Quality Action Plan. It is however, beyond the scope of this document to detail the features of all 8 strategies. The main features of the two most relevant strategies, the Air quality and the Transport Strategy, are discussed below.

1.2.4 The GLA Air Quality Strategy for London

The Mayor issued his Air Quality Strategy in September 2002 following a consultation draft which was produced in September 2001. The objectives of the Mayor's Air Quality Strategy are to:

> *"minimise the adverse effects of air pollution on human health and to improve air quality to a level that everyone can enjoy, making London a more pleasant place in which to live, work and to visit"*

The strategy adopts the National Air Quality Standards and Objectives set by the Government and includes all measures proposed by the Mayor to improve air quality in London. The primary cause of air pollution in London is road traffic. For this reason the strategy concentrates on reducing emissions from this source. The Mayor therefore, identifies the need to look at reducing the volume of traffic on the roads. It is however foreseen that a reduction in traffic will not, in most cases, provide a complete answer to meeting National Air Quality Strategy Targets.

The strategies recognises the need to bring about an improvement and expansion of the public transport, walking and cycling networks in London alongside other traffic reduction measures, to encourage more people to switch from car travel to less polluting modes.

The strategy includes policies, which identify the need for cleaner road vehicles alongside traffic reductions, and highlights the need to address vehicle maintenance and driving styles. The Mayor also recognises the need to aid a smooth flow of traffic on roads and intends to undertake measures to improve flow on the Transport for London road network.

Alongside the measures associated with road traffic emissions the strategy also identifies:

- the need to implement measures to reduce air quality emissions from air travel, airports and associated functions within London
- Industrial activity as a source of air pollution
- emissions associated with construction, non-road vehicle transport, fires
- emissions relating to energy and heating

London's Air Quality strategy sets out 16 policies and 68 proposals to improve London's air. Local Authorities must take account of the policies and proposals of the strategy in their Action Plans. The GLA must be consulted on all Borough Action Plans.

1.2.5 The GLA Transport Strategy for London

The Mayor published his Transport Strategy in July 2001. The strategy is developed around five objectives:

- making London a prosperous city
- making London a city for people
- making London an accessible city

- making London a fair city
- making London a green city

The objectives have been developed within the Mayor's Transport Strategy to reflect the Mayor's key priorities:

- Reducing traffic congestion;

- Overcoming the backlog of investment on the Underground so as to safely increase capacity, reduce overcrowding, and increase both reliability and frequency of services;

- Making radical improvements to bus services across London, including increased the bus system's capacity, improving reliability and increasing the frequency of services;

- Better integration of the National Rail System with London's other transport systems to facilitate commuting, reduce overcrowding, increased safety and move towards a London-wide, high frequency "turn-up-and-go" metro service;

- Increasing the overall capacity of London's transport systems by promoting: major new cross-London rail links including improving access to international transport facilities; improving orbital rail links in inner London; and new Thames river crossings in east London;

- Improving journey time reliability for car users, which will particularly benefit outer London where car use dominates, whilst reducing car dependency by increasing travel choice;

- Supporting local transport initiatives, including improved access to town centres and regeneration areas, walking and cycling schemes, Safer Routes to School, road safety improvements, better maintenance of roads and bridges, and improved co-ordination of street works;

- Making the distribution of goods and services in London more reliable and efficient, whilst minimising environmental impacts;

- Improving the accessibility of London's transport system so that everyone, regardless of disability, can enjoy the benefits of living in, working in and visiting the Capital, thus improving social inclusion;

- Bringing forward new integration initiatives to: provide integrated, simple and affordable public transport fares; improve key interchanges; enhance safety and security across all means of travel; ensure that taxis and private hire vehicles are improved and fully incorporated into London's transport system; and provide much better information and waiting environments.

1.2.6 Local Air Quality Management - The Review and Assessment Process for Harrow

The National Air Quality Strategy (NAQS), which was published in 1997, introduced a new statutory framework for dealing with air pollution. The new strategy, which included Local Air Quality Management (LAQM), requires local authorities to periodically review and assessment air quality within their areas. This review and assessment of air quality was undertaken in a number of stages, with each stage in the process adding increased complexity.

The initial stage of assessment, stage 1, involved a screening of existing and proposed potential significant pollution sources within the borough. This first stage showed that national action would mean that NAQS air quality objects would be achieved on time for benzene, 1-3-butadiene and lead. It was highlighted that further investigation would be required for the NAQS objectives for carbon monoxide, nitrogen dioxide, PM_{10}, and sulphur dioxide. The objectives and standards set for the different pollutants can be seen in Table 1, section 1.2.2.

Stage 2 involved a further investigation of the pollutants established in stage 1. In this stage some initial modelling of monitoring data and source data was undertaken to determine whether there was likely to be exceedences in the target years. This stage found that Harrow was not likely to exceed the objective set for carbon monoxide, however, further assessment would be required for nitrogen dioxide, PM_{10}, and sulphur dioxide. A third stage of review and assessment was therefore undertaken.

Stage 3 involved a detailed assessment of current and future air quality in relation to nitrogen dioxide, PM_{10}, and sulphur dioxide. The assessment involved the use of monitoring data and mathematical modelling. The analysis provided an understanding of the location of the exceedence areas for both nitrogen dioxide and PM_{10}. The results of the analysis showed that Harrow were likely to experience exceedences of the objectives set for nitrogen dioxide and for PM_{10} along the major roads in the borough. The roads affected included Uxbridge Road (A410), Greenford Road (A4127), Burnt Oak Broadway/High Street (A5), Northolt Road (A312), and Station Road/ Sheepcote Road (A409).

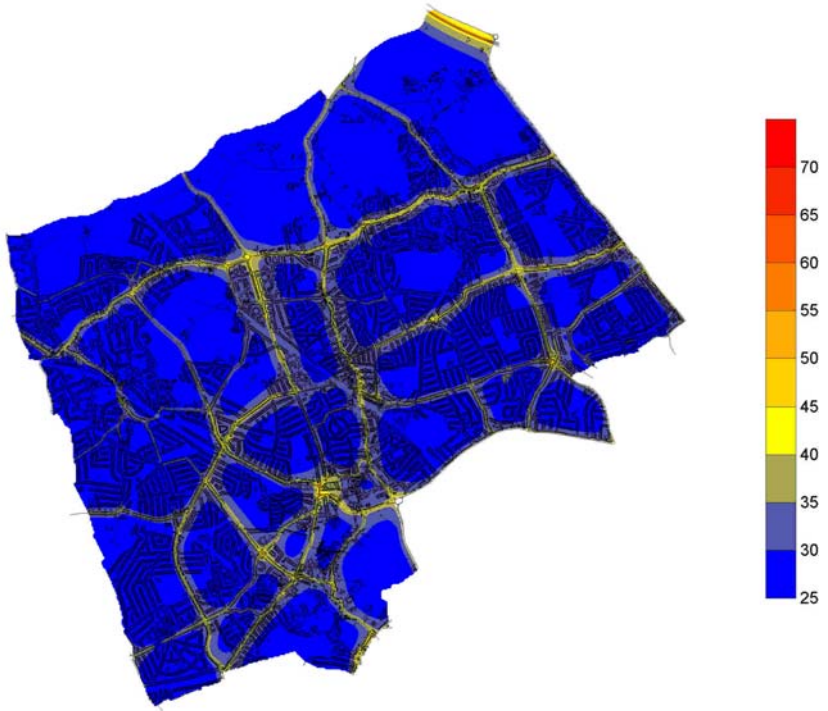
The National Air Quality Strategy requires authorities that have identified potential exceedences of objectives to declare Air Quality Management Areas (AQMAs). For this reason the Council designated the borough an Air Quality Management Area (AQMA), for nitrogen dioxide and PM10s, on the 14th of January 2002.

Following the declaration of an AQMA, the Council was required to undertake a further review and assessment of air quality in parallel with the development of this air quality action plan. This is now termed the “stage 4” assessment and it allows the Council to confirm the original assessment of air quality and also ensure that the designation of an AQMA was the correct option in the first place. The other important aspect of the stage 4 review and assessment is a detailed look at pollution source apportionment. This allows a greater understanding of the specific sources of pollution and provided information on the areas in which to focus action plan attention.

The stage 4 modelling predictions confirm the stage 3 findings, that the National Air Quality Strategy (NAQS) Objectives for NO_2 and PM_{10} will be exceeded within the

London borough of Harrow AQMA. The area where the 24-hour PM_{10} objective is predicted to exceed however is smaller than the area where the annual mean NO_2 objective is predicted to exceed. These exceedence areas are adjacent to major roads within the borough, and while for most locations this presents no exposure to NAQS exceedences at the façades of residential premises, exposure to NAQS exceedences are predicted for some residential properties. The number of residential properties predicted to exceed the annual mean NO_2 objective is greater than that predicted to exceed the PM_{10} daily mean objective. The following two maps (Map 1 and 2) show the exact areas of exceedence within Harrow.

Map 1. London Borough of Harrow - Annual Mean Nitrogen Dioxide (microgrammes per cubic metre, µg/m3) for 2005 based on 1999 meteorology (from 10)



Map 2. London Borough of Harrow - Number of days with daily mean PM10 exceeding 50 microgrammes per cubic metre (µg/m^3) for 2004 based on 1996 meteorology (from 10)

A series of locations were chosen across the borough to help understand the source contribution of oxides of nitrogen (NO_x) and PM_{10}. These locations were selected because they represented main arterial routes through the borough where air quality is predicted to be at its lowest. The assessment was undertaken for NO_x rather than nitrogen dioxide because the latter is mostly a secondary pollutant formed as a result of complicated atmospheric chemistry from the oxides of nitrogen. The source apportionment investigation identified that approximately 48% of the total NO_x contribution is derived from background sources and 52% from local road transport. It is important to note that NO_x background sources also include vehicle emissions from outside the borough. The source apportionment work indicates that on average, over 50% of background related NO_x is from road traffic sources outside the borough.

The source apportionment investigations for PM_{10} included an investigation into primary, secondary and coarse components, which contribute to the total concentrations. Source apportionment was undertaken for the same locations as NO_2, described above. The source apportionment investigation indicated that approximately 46% of the total PM_{10} contribution is derived from road traffic. It is important to note that background sources also include PM_{10} from outside the borough.

A number of traffic related scenarios were also tested as part of the stage 4 review and assessment. These scenarios were intended to provide further information regarding measures required in this Action Plan.

The first scenario (Scenario 1) considered a borough wide reduction in the predicted traffic growth between 1999 and 2005. Traffic growth for roads in Harrow is predicted to be 5% between 1999 and 2005. The scenario modelled a 2.5% increase in traffic flow across the same period. This scenario was modelled to indicate a realistic target for traffic reduction by the relevant objective years. Scenario 1 was predicted to reduce average NO_2 concentrations by less than 1% and average PM_{10} exceedence days by less than 1%. Modelling work based on source apportionment locations indicated that the 4 locations predicted to exceed the NO_2 NAQS objective under 'business as usual' conditions are still predicted to exceed the NAQS objectives under Scenario 1 conditions. Only one location utilised for source apportionment was predicted to exceed the PM_{10} 24 hour mean NAQS objective under 'business as usual conditions'. Scenario 1 was predicted to reduce the number of days exceeding the objective from 39.4 days to 39.1 days, the objective being not more than 35 days exceeding the standard.

Scenario 2 investigated the borough wide effect of a zero growth rate in traffic between 1999 and 2005 within Harrow town centre incorporating Greenhill Way, Sheepcote Road, Kenton Road, Lowlands Road, Junction Road, College Road, Station Road, Headstone Road, Lyon Road and Gayton Road. This scenario was modelled as an indication of borough wide improvements by focusing attention on the area where air pollution is at its highest. The approach reflects the Mayor of London's aim of reducing traffic growth in outer London town centres to zero by 2011, but looks at an early date of achieving this aim to reflect NAQS objective years. Scenario 2 was predicted to reduce average NO_2 concentrations by 1.3% and average PM_{10} exceedence days by 1%. Modelling work based on source apportionment locations indicated that the 4 locations predicted to exceed the NO_2 NAQS objective

under ‘business as usual’ conditions are still predicted to exceed the NAQS objectives under Scenario 2 conditions. Scenario 2 was predicted to reduce the number of days exceeding the PM_{10} NAQS objective from 39.4 days to 38.3 days, the objective being not more than 35 days exceeding the standard.

Scenario 3 investigated the effect of a 10% reduction in traffic flow between 1999 and 2005, borough wide. This scenario was modelled in an attempt to determine the amount of traffic reduction which would be necessary to meet all NAQS objectives.

1.3 Action to improve air quality

1.3.1 National Policies to Improve Air Quality

EU policy on environmental issues is the major driving force behind environmental legislation in the UK. National policies cover a number of areas in which air pollution can be impacted upon. National policies are discussed in more detail in Section 2.

1.3.2 GLA Policies to Improve Air Quality in London.

The Mayor's Air Quality Strategy contains 16 policies and 68 proposals to improve London's air. The policies and proposals are discussed in Section 2.

1.3.3 The London Alliance (WLA) Air Quality Strategic Plan (2002-2005)

The West London Alliance is a grouping of London Boroughs with common aims including working together on a number of environmental matters. In 2001 the WLA issued its environment strategy within which was a commitment to work together on the issue of local air quality. This plan follows on from that commitment and provides a strategic overview of actions the WLA will take as a group to act positively, in a measurable way to achieve improvements in air quality across the region.

Air pollution does not respect borough boundaries and London Boroughs by their nature are small in area therefore the effective options related to individual Borough activity are relatively limited. Consideration must also be given to the effect of individual borough's policies on their neighbours, as pollution emitted in one borough effectively becomes the background concentration for those which adjoin. Many of the actions to improve air quality relate to the transport functions, many of which work on a cross borough basis exemplified by the West London Transport Strategy therefore, the most logical strategic approach to West London's air pollution problems is to work on a cross Borough partnership.

Air Quality in West London – The Challenge

Air pollution levels across West London are dominated by emissions from the level of traffic in the area along with Heathrow Airport therefore, the problem can only be solved by change, be it in the way journeys are made, or by the types of vehicles they use.

Of particular concern are the levels of nitrogen dioxide and fine particles (PM_{10}). This partnership is focused on reducing the levels of these pollutants.

Aims of the Joint Strategic Plan

All Boroughs within the West London Alliance are obliged to develop air quality action plans. The joint strategic plan is designed to provide a framework for Boroughs own action plans highlighting synergies and resolving potential conflicts as the plan reaches the implementation phase.

In addition the Strategic Air Quality Plan will:

- Interface directly with the boroughs own work on air quality action planning;
- Link directly with LLIP / BSP transport objectives particularly on a West London basis;
- Be used to inform / integrate with UDPs, sustainable regeneration policies, Mayors spatial development, transport and air quality strategies;
- Help attract funding for joint West London Alliance Projects, for example a travel web site (see below);
- Foster links with community (LA21) and boroughs community plans;
- Link to health strategies and key health indicators;
- Integrate with boroughs climate change / greenhouse gas protocols;
- Help individual boroughs progress towards their environmental management systems such as ISO 14001;
- Help in building relationships with the other stakeholders whose aim is also the improvement in air quality, such as business groupings, the Greater London Authority and the Department of Environment, Food and Rural Affairs.

Methodology

These actions have been developed via a joint meeting between the boroughs transport policy officers and air quality officers. The initial output was the seven key areas, these have now been turned into a set actions designed to be:

Positive, and "SMART";

Specific – clear, relevant to the individual and based on behaviour;

Measurable – use quantitative data, e.g. time, cost, number, frequency;

Achievable – within the individual's control, stretching but attainable;

Realistic – are relevant and within resource constraints;

Timely – have a date for achievement.

1.3.4 The West London Alliance: New solutions to shared pollution and a joint action plan to improve West London's air quality.

TRL was commissioned by the West London Alliance to develop a strategic action plan aimed at improving air quality for locally identified air pollution hotspots. The emission sources under investigation were all road-traffic related and have been examined under three main headings:

1. Measures to reduce emissions from transport in air pollution hotspots
2. Encouraging the use of cleaner vehicles
3. Identification of public transport hubs and links

Instrumental to the study was the close collaboration with the seven London Boroughs who collectively provided the data necessary to compile a spatial database. This enabled the development of a methodology to prioritise air quality hotspots for the development of mitigation strategies.

The study will be completed in May/June 2004.

1.3.5 Sub regional Supplementary Planning Guidance on Air Quality Management and Planning

The West London Alliance, have approached the Air Quality Management Resource Centre, University of the West of England, to undertake a piece of work involving the preparation of Supplementary Planning Guidance (SPG).

This guidance intends to provide assistance with the requirement of local authorities to address air quality considerations in strategic, local and development control planning processes. The need to develop guidance on air quality and planning has arisen mainly from the following:

- A need for a consistent approach across the West London authorities in addressing planning applications with respect to their potential impact on air quality in the West London area;
- the need to identify 'significant' developments in terms of their local air quality impacts, and
- a need to develop a coherent and comprehensive planning protocol with respect to developments and air quality for all six local authorities.

The guidance will seek to address the potential impact of development *per se* on locations both within and external to any designated air quality management areas within the West London area. Attention will be focused on how to address air quality concerns in relation to large and significant developments such as Heathrow Airport and the development of Wembley arena. However, a focus of the guidance will also be smaller developments that may in practice lead to cumulative air quality impacts within a given area.

This work will be completed in 2004.

New Policy 1: The Council will continue to work in partnership with other West London Boroughs to seek joint solutions to air pollution problems.

1.3.6 West London Integrated Transport Strategy (WLTS)

The West London Integrated Transport Strategy (WLTS) has been developed over the past 4 years to improve transport across West London. The strategy has been developed by WELL (West London Leadership) and the West London Alliance, a joint public-private sector alliance including the six boroughs of Brent, Ealing, Hammersmith and Fulham, Harrow, Hillingdon and Hounslow.

It has been the subject of a wide-ranging consultation with representatives from both the public and private sectors. The strategy provides a framework for the improvement in accessibility, tackling sustainability, reducing the dependence on the private car and providing viable alternatives, particularly for orbital journeys, supporting economic growth, and developing consistent planning policies.

Key actions include:

- the establishment of quality orbital bus corridors to better balance the present dominant radial provision and improve area accessibility (e.g. the 140 bus route);

- improvement of key transport interchanges to provide a convenient, flexible, accessible and comprehensive public transport network;

- supporting the development and design of major infrastructure schemes, such as West London Transit, Crossrail and Airtrack to secure benefits for those living or working within West London;

- road space reallocation proposals, including complementary measures for West London relating to the road user charging scheme for Central London;

- reducing the need to travel through co-ordinated land-use policies, travel awareness and Travel Plans;

- promoting walking, cycling and green areas;

- developing a Freight Quality Partnership with local businesses and the freight industry.

1.3.7 Local Policies - Transport and Air Quality

The Council has been involved in the production of the Harrow Local Transport Strategy (HLTS) since 1999. Following a review of the Local Transport Strategy in light of the Mayor's strategy, the HLTS will be incorporated fully into the Local Implementation Plan (LIP), becoming Harrow's local interpretation of the Mayor's policies and proposals.

The transport policies represented in the LIP will reflect the Council's aims, those of the WLTS and Central Government, to reduce dependency on the car and encourage the use of public transport, walking and cycling.

The key elements of the Local Transport Strategy are:

- to improve personal accessibility to places, goods and services by improving sustainable forms of travel, particularly the reliability, frequency and quality of public transport;

- to make sustainable means of travel more attractive in terms of time, cost and quality relative to the car;

- to reduce traffic congestion in the long term and make essential car journeys easier;
- to reduce the need to travel, particularly by car;
- to ensure people are aware of the implications of their travel choices;
- to improve the distribution of goods and services;
- to encourage walking and cycling as part of health education;
- to ensure a better balance on the streets in residential areas and local centres between social activities and motorised traffic;
- to reduce air pollution and noise from all forms of transport including cars, buses, vans and heavy lorries;
- to ensure that new development is less dependant on non-sustainable forms of transport and contributes positively to supporting sustainable forms of travel;
- to avoid any increase in road capacity for general use;
- to improve the safety and security of all travel modes;
- to ensure that all forms of transport recognise the particular needs of those with mobility problems;
- to ensure the effective enforcement of all regulations and measures identified as necessary to deliver the strategy.

1.3.8 Planning Policy and Air Quality

1.3.8.1 **The Policy Context**

DETR is responsible for setting the National Framework for Development, to make sure that particular development principles are consistently applied.

There are a number of means used for this and some of the principal measures are the Planning Policy Guidance Notes (PPGs). There are guidance notes that specifically relate to environmental and air quality issues. PPG 1 “General Policy and Principles 1997” states that sustainable development aims to deliver economic development which will secure higher living standards while protecting and enhancing the environment (in 12).

Objectives for obtaining this ‘sustainable development’ includes concentrating development for uses which generate a large number of journeys, in places well served by public transport, especially town centres, rather than out of centre locations. This fits alongside PPG 13, which looks at transport issues and the location of public transport close to new developments. In this way alternatives are available to the

private car for travel to and from these new developments. PPG 13 also requires the submission of travel plans alongside planning applications, for those developments that are likely to have significant transport implications. An example of such a development would include developments that would generate significant amounts of travel in/near to air quality management areas (all developments within Harrow that are likely to generate significant amounts of travel) (in 12).

PPG 12 also states that development plans must incorporate principles of sustainability. The consideration of impacts on air quality is part of this. PPG 23 states that air pollution should be a material consideration in determining planning applications and therefore planning permission can be refused on air pollution grounds. This follows the DETR guidance 1997 'Air Quality and Land Use Planning' which states that any air quality consideration, which relates to the use and development of land is capable of being a material consideration. There is therefore a need to ensure that development does not cause unnecessary harm to the environment and this includes air quality (in 12).

Replacement Harrow Unitary Development Plan (12).

The Proposed Modifications to the Revised Deposit Draft Harrow Unitary Development Plan were placed on deposit in January – March 2004. It is also hoped that adoption of the final Plan will take place in spring 2004. The UDP provides the framework for future development in the Borough, and sets out a wide range of land use policies and proposals. The policies and proposals set out in the UDP identify the need to focus on the potential air quality consequences that can result from inappropriate development. The planning policies identified in this action plan include those contained in the initial deposit draft 2001. Future reviews of this action plan will incorporate additional adopted policies.

Other policies and initiatives that impact upon air quality.

A detailed explanation of present and proposed policies affecting air quality is provided in section 2.

1.4. The Health Effects of Air Pollution

Poor air quality impacts upon human health. It is for this reason that both historic and modern legislation has sought ways to reduce air pollution emissions from many day to day activities.

Dark smogs, which effected London in the 1950's and 1960's, have been replaced with a new type of smog. While industrialisation caused smog associated with smoke and sulphur dioxide, modern smogs, 'photochemical smogs' are produced mainly as a result of road traffic emissions. The emissions from vehicles produce a complicated chemical mix, which, under certain meteorological conditions, can produce a photochemical smog episode.

It was as a result of photochemical smogs in the early 1990's that the Government laid down the requirements of the National Air Quality Strategy (part IV of the Environment Act 1995). The National Air Quality Strategy identified a number of health threatening pollutants for which health related standards were set.

1.4.1 Benzene

Benzene is a minor component of petrol (≈ 2% by volume). It occurs naturally in crude oil and forms during the upgrading of fuel oil. The main source of benzene in the atmosphere is from vehicle emissions. Benzene is not present in diesel.

Benzene is a class 1 carcinogen, with proven causal association with acute non-lymphocyte leukaemia in humans[1].

It is at present impossible to determine a concentration at which there is no risk detectable. The objective set in the National Air Quality Strategy (NAQS) therefore adopts a level where the risk to health is seen as being small.

1.4.2 1,3 Butadiene

1,3 Butadiene is emitted mainly from the combustion process in petrol and diesel vehicles. 1,3 Butadiene is formed from olefins in fuel during the combustion process. 1,3 Butadiene is also emitted from certain specific industries. Harrow has no such industry.
1,3 Butadiene is an accepted genotoxic carcinogen. No safe level can therefore be set. The NAQS sets an objective at which the risk to health is seen to be small.

1.4.3 Carbon monoxide

Carbon monoxide is produced during the incomplete combustion of fuels such as wood, coal and oil. Its main source in the UK is road transport. It is also a pollutant that can be emitted in high concentrations from domestic heating systems if they are not functioning correctly.

Carbon monoxide exerts its toxic effect on humans by binding very tightly with haemoglobin in the blood. Haemoglobin is the oxygen-carrying medium in the blood. Increased levels of carboxyhaemoglobin (carbon monoxide bonded to haemoglobin) in the blood reduces its oxygen carrying capacity. In very high doses this is fatal. In lower doses it may effect cerebral function, heart function and exercise capacity.

1.4.4 Lead

In the past the main source of atmospheric lead was the combustion of lead petrol in road vehicles. Lead has been phased out of petrol as a result of the EURO standards scheme (discussed in Section 2.3.4) and air borne lead levels have dramatically declined. Lead is also emitted from metal processing and waste incineration.

[1] substances known to be carcinogenic to humans. There is sufficient epidemiological evidence to establish a causal association between human exposure and the development of cancer.

Exposure to high lead concentrations may result in toxic biochemical effects in humans, that in turn cause problems in the synthesis of haemoglobin, effects on the kidneys, gastrointestinal tract, joints, reproductive system and acute or chronic damage to the nervous system. There is also some evidence that exposure can affect brain growth in children.

1.4.5 Sulphur dioxide

Sulphur dioxide arises mainly as a result of the burning of sulphur-containing fuels.

Sulphur dioxide is a potent bronchiole constrictor in high concentrations. People who suffer from asthma are particularly susceptible to an adverse response to high air concentrations. Sulphur dioxide has a combined effect with particulate matter and it is difficult to establish independent health effects.

1.4.6 Particulate matter

The stage 4 review and assessment for Harrow confirmed that the NAQS objective for PM_{10} (particulate matter with a diameter of 10μm or less) was likely to be exceeded. PM_{10}'s are the small sized particles that can not be removed by the lungs and therefore penetrate deep within the lungs were irritation can occur.

Particulate matter is made up of organic and inorganic particles. The main source of PM_{10}'s are their release during the combustion of fossil fuels. In Harrow elevated air concentrations result from the combustion of fuel in road vehicles.

The health effects of particulate matter depends on the substances chemical composition and the size of the particle. Airborne particles may contain recondensed organic and metallic vapours making them particularly toxic. For example, diesel engines emit oily fine black particles, which may be impregnated with complex organic compounds such as polycyclic aromatic hydrocarbons (PAHs) which have been shown to have a carcinogenic effect (3).

Small particles (PM_{10}) present a toxicological effect in the lungs because they penetrate very deeply. Even at relatively low concentrations PM_{10}'s have been shown to cause changes in lung function. People with asthma are particular susceptible. Long term exposure can lead to cardiovascular and respiratory diseases.

1.4.7 Nitrogen dioxide

The stage 4 review and assessment undertaken in 2003 confirmed that Harrow is likely to exceed the objective set for nitrogen dioxide along major roads.

Nitrogen oxides, such as nitrogen dioxide, are generated during combustion. High temperatures that occur during combustion cause naturally occurring oxygen and nitrogen in the air to combine.

The main source of nitrogen oxides is from vehicle emissions. While the greater proportion of nitrogen oxides emitted is nitrous oxide, oxidation, which occurs in the atmosphere, increases nitrogen dioxide concentrations.

Exposure to high concentrations of nitrogen dioxide can effect lung function. Nitrogen dioxide is an oxidising agent that can cause lung irritation, coughs and sore throats, as a result of acute exposure. Elevated air concentrations can particularly effect those who suffer from asthma.

Chronic (long-term) exposure to elevated nitrogen dioxide concentrations has also been seen to affect lung function, although the evidence suggests that acute exposure causes the greatest adverse reaction.

Two objectives, both an acute objective and a chronic objective, have been set by the NAQS (see table 1, section 1.2.2).

Section 2
Policies aimed at improving air quality
Action Plan Development

2.1 An introduction to policy

The review and assessment process for the London Borough of Harrow (discussed in 1.2.6) has identified that to achieve the National Air Quality Strategy Objectives for nitrogen dioxide and particulate matter, action needs to be taken to reduce emissions from road vehicles.

The measures set out in this plan are split up into European, National, Regional and local measures aimed at improving air quality and are categorised into the following sections:

- Reducing emissions from vehicles
- Reducing road traffic-discouraging non-essential journeys by road
- Promoting alternative modes of transport to the private car
- Encouraging walking as a means of travel
- Encouraging cycling as a means of travel
- Encouraging development that does not adversely effect air quality
- Public information and education

There are a number of policies at European, National, regional and local level that are already in place to improve air quality. This action plan includes new policies as a direct result of the National Air Quality Strategy (NAQS) process, Mayoral strategies and statutory guidance.

Most of the policies presented in this action plan relate to road traffic, the major cause of predicted NAQS exceedences within the borough. This action plan is therefore inextricably linked with Harrow's Interim Local Implementation Plan and Unitary Development Plan and a number of policies from each of these plans are discussed in the relevant sections.

There are a number of measures discussed in this action plan and taken individually, their impact on air quality within Harrow could be considered small or medium. Collectively however, the measures will complement each other, and existing policy, to make a significant contribution to reducing air pollution levels to enable the borough to meet the objectives required by the National Air Quality Strategy.

Note: New Policy 1: The Council will continue to work in partnership with other West London Boroughs to seek joint solutions to air pollution problems. Please refer to page 18, Section 1.3.5.

2.2 Consultation

As part of its statutory obligations, the Council has consulted on all stages of the review and assessment process. The Draft Air Quality Action Plan, which resulted from the first round of review and assessment, went out for consultation in July 2003.

The Draft Action Plan was made available to statutory consultees, businesses and residents within the borough and this finalised Action Plan is the result of the consideration of all comments received.

2.3 Policies to reduce emissions from vehicles

2.3.1 Vehicle emissions.

In outer London Boroughs the private car dominates road traffic. Of the total number of vehicles on the road, around 85% are cars (5). Within West London, two thirds of employees commute to work by car, while the percentage is much lower for London as a whole (40%) (4). Only one fifth of employees commencing their journeys in West London use public transport. This compares to one third in London as a whole (4).

On an individual basis however, emissions from HGV's and buses are many times greater than for cars. Although car travel dominates in Greater London, over 20% of particulate matter emissions within outer London boroughs, was produced by M&HGV's in 1999 (5). Buses and HGV's therefore contribute a disproportionate amount of emissions compared to their numbers. A similar picture has been predicted for 2005

Additionally, in 1999 over 25% of NOx emissions in Greater London, was produced by petrol cars, with M&HGV's contributing just over 20% (5). However, the contribution from M&HGV's is predicted to increase to 35% in 2005 and petrol cars are predicted to contribute a similar percentage of emissions (source: TRL report 431, A low Emissions Zone for London).

2.3.2. Vehicle technology

Vehicle technology is constantly improving. Technology has been developed that provides a reduction in emissions greater than that achieved by using cleaner diesel and petrol for road vehicles. This includes diesel vehicles with exhaust treatments, the use of Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG) or electricity where available.

LPG vehicles are manufactured at a reasonable cost and the conversion of petrol engines to LPG is also economically viable. CNG is more suitable for HGV's but due to the lack of public re-fuelling stations it is necessary for fleet operators to install their own refuelling stations.

Electric vehicle development is progressing rapidly and the availability of improved engine design and the smaller city cars, which are powered by electric engines, is increasing. The fuel cell is at an early stage of development. This technology allows on board electricity generation and therefore avoids the need for large batteries. Other forms of environmentally friendly vehicles are also being developed in increasing numbers and vehicle performance is constantly being improved.

2.3.3 European/National policies to encourage the use of cleaner vehicles: Grant Aid

Department of Transport (DfT) grants are available through the Energy Savings Trust's TransportEnergy programme towards the cost of purchasing alternative fuelled vehicles, converting to cleaner fuels or retrofitting diesel vehicles. The grants are available through two schemes:

PowerShift focuses on alternative fuels that are available within the UK today. It proposes to create a sustainable market for clean fuel vehicles through the provision of grants to offset the additional costs of purchasing or converting to cleaner vehicles. Between 30 and 75% of the additional cost may be met depending on the amount of emission reductions achieved.

CleanUp concentrates on air pollution hot spot areas by providing grants towards the cost of fitting diesel vehicles with emissions reduction equipment, re-engining with cleaner engines or converting them to run on alternative fuels. CleanUp grants cover 50-75% of the capital and fitting cost. At present it is available for vehicles over 3.5 tonnes and black cabs only.

2.3.4 European/National policies: improved vehicle specification (EURO Standards)

Improved emission standards are continually being set through the European Auto Oil Programme. Emission standards have improved with increasing technological improvements to engines. The improvement in emission standards was significantly progressed by Stage 1 (EURO 1) in 1993, when all new cars were required to be fitted with catalytic converters. In 1997 stage 2 (EURO 2) was implemented. This required a further 30% reduction in carbon monoxide and 56% reduction of hydrocarbons and nitrogen oxides from petrol engined vehicle emissions. The third stage of emissions reduction (EURO 3) was implemented in 2000. This required a further 55% reduction in carbon monoxide emissions and an 80% reduction in hydrocarbon's and nitrous oxides. A fourth stage to be implemented in 2005 has also been set by the European Parliament (7).

These improvements in emissions are predicted to reduce fine particulate matter emissions by 41% in 2005 from the emission levels in 1996. NOx emissions are expected to be reduced by 52%. By 2005 it is predicted that 48% of petrol cars will be of emissions class EURO 3 and 31% will meet EURO 2 compared to 11% of petrol cars in 1996. 54% of diesel cars are also expected to be of emission standard EURO 3 by 2005 (7). The full details of emission reduction targets are given in Table 2.

Table 2 European Union emission standards for passenger cars (7).

Type	Date	Emissions in g/km CO	g/km HC	g/km NOx	g/km HC and NOx	g/km Particulate Matter
Stage 1	1992	2.72			0.97	0.14
Stage 2	1996	2.20			0.50	
		1.00			0.70	0.08
Stage 3	2000	2.30	0.20	0.15		
		0.64		0.50	0.56	0.05
Stage 4	2005	1.00	0.10	0.08		
		0.50		0.25	0.30	0.03

Those figures that are red and underlined are for diesel cars

2.3.5 European/National policies: cleaner fuelling

Alongside the improvements in vehicle technology, vehicle emissions are being reduced by the introduction of cleaner 'conventional' fuels (petrol and diesel). Improvements in fuel have been brought about as a result of EU legislation and the introduction of fuel duty incentives to accelerate their take-up.

Since 1989 The Government has used fiscal incentives to encourage the use of cleaner fuels commencing with the tax differential for unleaded petrol. The 1998 Budget also continued to change the structure of road fuel duties over time, in order to treat petrol and diesel more fairly when calculated on energy or carbon basis and encourage the shift from diesel to Ultra Low Sulphur Diesel (ULSD). Since 1999 ULSD has had the same duty rate as unleaded petrol. In the March 1999 Budget, duty on road fuel gas was reduced by 29%. Since 1998, the cost of converting company cars to gas is no longer to be part of tax calculations of employee's benefits.

In January 1999 a Vehicle Excise Duty concession of up to £500 was introduced for buses and lorries that are fitted with catalysts or run on gas, and therefore meet greater emissions standards for particulate matter. In March 1999 this was increased to a £1,000 maximum and a cut of £55 on Vehicle Excise Duty (VED) was introduced for vehicles up to 1100cc.

The March 2001 Budget introduced a lower rate of VED to cover cars in Private and Light Goods taxation class with an engine size of 1549cc or less. From March 2001, a system of graduated VED has been in operation for new cars based primarily on their level of CO_2 emissions. This has encouraged the use of cars running on less polluting fuels and reformed company taxation basing it on value of the vehicle and its emission rate, rather than on mileage, which in the past has encouraged unnecessary driving. From April 2002, company car tax has been based on the CO_2 emissions of vehicles provided to an employee for private use.

The reduction in the maximum allowable sulphur concentration of diesel from 1000ppm in 1994 to just 50ppm 1998 (ULSD) and the introduction of Ultra Low Sulphur Petrol (ULSP) has brought about improvement in sulphur emissions from road traffic.

It can therefore be assumed that more stringent vehicle emissions standards could provide an ongoing amount of air quality improvements. However, it is likely that improvements in emissions will not bring about the required reduction in pollutants to meet government objective levels for 2004 and 2005. This is because of the anticipated growth in the vehicle fleet.

2.3.6 GLA policies to reduce vehicle emissions

The Mayor in his Air Quality Strategy emphasises the need to improve vehicle emissions. This includes the need to promote cleaner vehicles and raise the awareness of their environmental and cost benefits.

The Mayor through the proposals set out in the Air Quality Strategy identifies a number of areas through which emissions from road vehicles could be improved. The strategy focuses on the need to inform and educate in regard to the benefits of cleaner technology. This includes providing information on the technology available and facilitating meetings between vehicle operators and clean fuel and vehicle providers.

The Air Quality Strategy emphasis that an important area in which air quality can be improved in London is to focus on the reduction in emissions from vehicles utilising London roads. The strategy highlights that the greatest gains will be made from targeting the most polluting vehicles, mainly the heavier diesel vehicles such as buses, coaches, goods vehicles, waste vehicles and taxis.

The Mayor includes proposals aimed at improving emissions from certain polluting sectors. This includes proposals aimed at improving the emissions from vehicles in the TfL London buses fleet and the private taxis fleet. The Mayor also emphasis's the need to introduce alternative technologies such as water-diesel emulsion and proposes to trial new technologies within functional fleets.

The Strategy doesn't only focus on the most polluting vehicles. While certain vehicle types provide a disproportionate amount of air pollution, on many roads, the majority of pollution is produced by the large number of private cars. The strategy emphasises the need to work towards the introduction of 'zero emission' forms of transport for all vehicle types.

The Mayor has proposed to urge the Government to extend the grants available under the PowerShift and CleanUp initiatives beyond 2004 and to extend the retrofit grants in some areas. The Mayor has included an exemption from the central London congestion charging for the 'very cleanest vehicles'.

2.3.7 The London Low Emission Zone Study

In July 2003 a final report of the London Low Emission Zone Feasibility Study was published. This study follows a detailed analysis of the implications of implementing a Low Emission Zone(s) in London. The Steering Group responsible for the report contained representatives of the Greater London Authority (GLA), The Association of London Government (ALG), London Boroughs, Transport for London (TfL), the Department for Transport (DfT), and the Department for Environment, Food and Rural Affairs (DEFRA).

The Steering Group concluded that the preferred scheme would be a London-wide scheme incorporating the Greater London area. This is because a large area would be required in order to achieve significant air quality benefits. It was also concluded that a smaller scheme isolated to Central London may divert traffic through Boroughs outside the central zone.

It was also agreed that the zone should not apply to the private car. This is because a scheme including the private car would impact upon low income households disproportionately. A low emissions zone for private cars, presents the least cost effective solution to improving air quality in London. Heavy Goods Vehicles (HGV), coaches and buses contribute a disproportional amount of air pollution to London and it was concluded that these vehicles should therefore form the basic compliance vehicles for a Low Emissions Zone. Implementing a Low Emissions Zone for these vehicles provides the greatest cost benefit.

The feasibility study also identifies that vans may be included at a later date subject to a socio-economic investigation. It is proposed that Taxis (black cabs) should meet the standard through the licensing process.

The feasibility study concluded that the preferred scheme could not be realistically implemented before late 2006 or early 2007. This is after the first National Air Quality objective dates of 2004 and 2005, but prior to the second set of objectives for 2010.

The preferred scheme places a requirement on vehicles entering Greater London (HGVs, Coaches and Buses) to be at least EURO 2 plus a Reduced Pollution Certificate. The EURO 2 standard represents those vehicles manufactured after 1995 (HGVs). A reduced pollution certificate acknowledges additional retrofitting of vehicles to improve the standard of particulate matter emissions. This preliminary standard is to be extended to EURO 3 plus a Reduced Pollution Certificate in 2010.

2.3.7.1 Air quality benefits

While the majority of London will meet National Air Quality Objectives, there are likely to be significant areas of London where pollution concentrations are higher than the objective levels set. The National Air Quality Objectives are discussed in section 1.2.2 and exceedences areas predicted for the London Borough of Harrow are discussed in 1.2.6.

An analysis of the improvements in air quality as a result of the implementation of the preferred LEZ has indicated that only ‘modest’ air quality improvements will be achieved London-wide. The predicted benefits are less than were previously anticipated. The preferred Low Emissions Zone will have the greatest impact on Central London and the predicted improvements in air quality within Harrow are limited.

At a London-wide level, the recommended option would lead to a 1.5% reduction in NO_2 emissions and 9% reduction in PM_{10} emissions in 2007. Emission reductions, however, are not the aim of a Low Emissions Zone. The aim is to reduce the number of times the air quality targets are exceeded and to reduce the area experiencing high air pollution concentrations. The following table (Table 3.) details the NO_2 and PM_{10} National Air Quality objectives, the predicted exceedences of these objectives in London and the estimated effect of the suggested LEZ.

Table 3 The effect of the suggested LEZ on National Air Quality Strategy exceedence areas.

National Air Quality Objective	**Base line (no LEZ)**	**With suggested LEZ implemented (not including vans and taxis)**
NO_2 one hour mean to be achieved by end 2005	Objective to be achieved	Objective to be achieved
NO_2 annual mean to be achieved by end 2005	Exceedence areas in large parts of central London and along the major road network throughout London	4.7% reduction in the total area exceeding the objective London-wide. Exceedences still predicted for large parts of central London and along the major road network throughout London
NO_2 annual mean to be achieved by end 2010 (the same objective as above)	Exceedence areas are mostly limited to areas close to the road network and a very small amount of background areas in central London	12% reduction in the total area
PM10 24 hour mean to be achieved by end 2004	Met at most locations in London except the busiest roads	Objective to be achieved
PM10 annual mean to be achieved by end 2004	Objective to be achieved	Objective to be achieved
PM10 24 hour mean to be achieved by end 2010 (a more stringent objective)	Met at most locations except central London roadside locations	Objective to be achieved
PM10 annual mean to be achieved by end 2010 (a more stringent objective)	To be met almost everywhere in London except the direct vicinity of major roads.	32.6% reduction in the total area exceeding the objective London-wide. This produces very limited areas of exceedence.

2.3.7.2 Improvement in the health of Londoners

It has been estimated that road traffic pollution in London is responsible for an extra 200 deaths, 1,000 severe health events (hospitalisation) and 500,000 to a million more minor health events a year. The suggested LEZ will not effect the number of death, or hospital admissions in London, but would impact upon less severe air pollution, 'very significantly' reducing the number of minor health events by tens of thousand each year. The cost reduction to the National Health Service is predicted to be £100 million in total as a result of the LEZ Scheme.

2.3.7.3 Cost of implementing an LEZ

The enforcement of the suggested Greater London LEZ will be undertaken using number plate recognition technology. In Central London the enforcement cameras will be based on the congestion charging infrastructure and a small number of fixed and mobile cameras will be used outside this area.

The costs associated with the Scheme will be £6-10 million set up costs and £5-7 million a year running costs. Fines associated with non-compliance is predicted to generate £1-4 million a year.

Additionally, the cost to industry for upgrading/renewing vehicles will be in the region of £64 to £135 million in total.

2.3.7.4 Cost v Benefits

The cost of setting up and maintaining the suggested LEZ and the extra cost to industry of complying with the scheme is predicted to be approximately equal to the savings made to the National Health Service by improved air quality.

2.3.7.5 Harrow Council's opinion of the preferred London-wide Low Emissions Zone.

Harrow Council supports the principles of a LEZ for London in principle.

However, the feasibility study identifies a number of issues that need further analysis before a successful scheme can be implemented. These issues will need to be resolved before the Council is able to make a further commitment to the scheme. In particular, the issue of funding must be resolved.

The feasibility study identifies that vehicle operators will make up the bulk of the costs and as such it is important to identify how these cost will be met. A commitment is needed from central Government to increase and continue the grant scheme administered by the Energy Savings Trust, to help businesses improve emissions from their vehicle fleets. Rebates on vehicle excise duty for vehicles that have been retrofitted with clean emissions technology would also help to offset the costs to industry.

It is important for the socio-economic impacts of an LEZ on small companies and owner-drivers to be determined. To gain continued support for an LEZ scheme, it is important that no particular part of London's business sector is seen to be under an unfair burden.

Subject to a suitable resolution of a number of key issues raised above and other issues identified in the feasibility report, Harrow Council would support a London-wide consultation to establish whether or not businesses and residents are in favour of the proposed LEZ scheme.

2.3.8 Council policies to improve vehicle emissions

OBJECTIVE: Increase the use of cleaner fuelled vehicles

The increased use of cleaner vehicles within Harrow will depend on their availability; their initial cost, their running costs and the refuelling network. The availability of cleaner vehicles will depend on car manufacturers and distributors. It is important that a choice is available to customers and that the advantages of alternative fuelled vehicles are understood. Conventional vehicles and fuel types have improved. European and National measures have achieved massive improvements in both clean vehicle and fuel technology. Improvements through EURO 4 and increased fuel standards will continue to reduce emissions. The availability of alternative fuel supplies also impacts upon the uptake of alternative vehicles. The availability of alternative fuels will depend on their uptake by petrol stations. There is a certain balance that needs to be achieved between alternative vehicle suppliers and fuel providers. Increased supply of vehicles without a network of refuelling stations will prevent uptake and a fuel supply network is redundant without the vehicles to utilise

the supply. It is therefore important for there to be contact between the two parties to aid expansion in both areas.

By 2005 the majority of road vehicles within London will still be running on petrol and diesel fuel. The introduction of alternative fuelled vehicles is likely to be a long-term measure that has a gradual positive impact. The Council can encourage the use of cleaner fuels through a number of initiatives, as outlined below.

2.3.8.1 Encourage an increased availability of alternative fuels

While there are now 1000LPG refuelling sites in the UK, only 34 of these are in Greater London with a further 12 within 10 km of greater London. At present there is only one LPG refuelling site within Harrow. This BP refuelling site in Bessborough Road is very close to Harrow town centre, an area where vehicle emissions are high.

UDP POLICY EP8: The Council's Deposit Draft UDP encourages the development of service station facilities to provide cleaner fuel alternatives to petrol and diesel to include the installation of LPG and other green refuelling technology. The Council will also encourage the development of recharging facilities for electric powered vehicles.

New Policy 2: The Council will develop a working group with fuel suppliers, vehicle distributors and representatives of other Agencies and interest groups with a commitment to improving vehicle emissions standards, to discuss and encourage the increased availability of alternative fuelled vehicles and fuel supplies. The working group will be established by the end of June 2004.

2.3.8.2 Encourage an increased use of alternative fuelled vehicles

To reduce emissions from road vehicles within Harrow it is important to encourage both fleet managers and private vehicle owners to switch to using cleaner vehicles. This can occur by simply replacing older conventionally fuelled vehicles with newer alternatives, a normal process for vehicle users, or by replacing vehicles with alternatively fuelled vehicles, a process which would bring about greater improvements in emissions.

POLICY: To encourage the uptake of alternative fuelled vehicles by Harrow residents, a 50% reduction is available for alternative fuelled vehicles when residents are purchasing a permit for permit holder only restricted areas. The vehicle types which comply with this scheme include:

- electric vehicles
- compressed natural gas (CHG) or methane gas powered vehicles
- liquefied petroleum gas (LPG) vehicles
- hydrogen fuel cell vehicles
- methanol and ethanol powered vehicles

- hybrid vehicles using a combination of petrol (or diesel) with electric (battery)

- dual fuelled vehicles using a combination of either petrol or diesel with LPG.

New Policy 3: Information on the Department for Transport (DfT) funded PowerShift and CleanUp schemes will be provided to local fleet operators via information packs. Information on these schemes will also be available on Harrow Council's website and leaflets will be provided to vehicle suppliers. The Council will maintain a dialogue with representatives of all parties having an interest in the transit of goods and/or delivery and servicing matters within the Borough, promoting the PowerShift and CleanUp schemes and the uptake of cleaner vehicles. Information will be made available by the end of June 2004.

New Policy 4: The council will encourage Central Government to continue the PowerShift and CleanUp schemes beyond the end of the 2004/05 financial year and to extend the amount of funds made available for these schemes.

The PowerShift and CleanUp schemes are essential schemes for encouraging the uptake of cleaner vehicles. The schemes are discussed in Section 2.3.3.

2.3.8.3 Reduce emissions from the Council's vehicle fleet

The Council have 180 vehicles in their fleet. 20 of those vehicles are EURO III diesel vehicles with Continuously Regenerating Traps (CRTs), 106 are EURO III, 5 are dual fuelled vehicles (petrol and LPG), 29 run solely on LPG and 19 are mopeds which run on Low Sulphur Petrol (For EURO standards see Table 2). A recent review of the fleet has meant that the older, more polluting vehicles have been removed and replaced with newer, less polluting vehicles. The continued rolling replacement of older vehicles will lead to lower air pollution emissions from Council vehicles, particularly if the cleanest available vehicles are utilised. Reduced emissions from Council activities will also occur if services are provided on a more co-ordinated basis so that the total mileage undertaken by the Council fleet is reduced. Driver training can also encourage more efficient fuel use and hence lead to reduced emissions.

New Policy 5: The Council will develop a fleet management plan to increase the use of cleaner vehicles within its fleet, to reduce the number of miles the fleet travels and to ensure regular driver training is undertaken. The fleet management plan, which will incorporate the Mayor's minimum emissions standards for Council vehicles, will be implemented by the end of March 2005.

This fleet management plan will ensure that the minimum emissions standards set out in the Mayor's Air Quality Strategy are applied to the Council fleet and contractors operating on the Council's behalf.

The minimum standards require vehicles to be either EURO III or EURO II plus retrofit technology approved by Transport Energy CleanUP, such as particulate traps, exhaust gas recirculation (EGR) or selective catalytic reduction (SCR). Some diesel additives do not increase costs significantly and can give significant reductions in NO_x and PM_{10} emissions. Water-diesel emulsion is one specific fuel technology that

the Council could consider as part of the fleet management plan, should positive air quality impacts be predicted for London as a result of diesel-water emulsion use.

The running costs of alternatively-fuelled vehicles can also save money.

New Policy 6: The Council will clearly label all 'cleaner vehicles' used in its fleet with its fuel supply and contact details for TransportEnergy. Council vehicles will be labelled by the end of December 2004.

By labelling cleaner vehicle technologies and fuels utilised by the Council fleet, the Council will be able to raise the profile of the use of these technologies and fuels as other road users will see the vehicles being successfully utilised by the Council for their functions. By advertising TransportEnergy's contact details, interested parties can follow up any queries they have about the provision of cleaner vehicles and the grant awards available for the uptake of these technologies.

OBJECTIVE: Reduce emissions from vehicles currently on the road.

Vehicles, which are not regularly serviced can impact upon air quality. An un-serviced vehicle can reduce economy by more than 10 %, which can lead to increased emissions and add to air pollution. The maintenance of vehicles is not time consuming. The problem caused by poor maintenance can often be resolved by a re-tune, that usually takes less than fifteen minutes. However, if the problem is one of oil being burnt, this can indicate that the engine is worn beyond repair. Regular maintenance, which includes changing the oil and filters, regular oil changes and tyre pressure checks, can greatly reduce emissions and can provide early detection of engine problems.

Driving style can also influence vehicle emissions. Breaking and accelerating can increase emissions, whereas smooth driving is more efficient and puts less strain on the engine and brakes. Driving at a constant moderate speed also reduces congestion, which in turn reduces emissions. Idling vehicles can cause unnecessary increases in air pollution.

A small number of vehicles utilising roads within Harrow, produce a disproportionately large amount of emissions. The reason for is poor maintenance and mechanical faults. Acknowledging this fact, the Government made certain powers available to seven pilot authorities under the Road Traffic (Vehicle Emissions) (Fixed Penalty) Regulations 1997,to test vehicles and fine drivers that do not meet standards set for MOT exhaust emissions

Although the pilot authorities found that the scheme was not self-funding, the results were promising. Westminster City Council found that the failure rate during the three pilot years fell from 13% in 1999 to an average of 5% during 2001. The failure rate fell to as low as 1% during this period (16). The scheme involves stopping those vehicles that are visually assessed as being the most polluting vehicles.

The powers which had originally been provided to only seven local authorities were extended to all local authorities who have declared an Air Quality Management Area, under the Road Traffic (Vehicle Emissions) (Fixed Penalty) Regulations 2002.

The use of powers to fine drivers is not intended to "catch out" individuals but is intended to promote the benefits of properly maintaining cars. It is therefore important to emphasise this in the publicity for the scheme and provide details to motorists on how to maintain their vehicles so that emissions do not fail the standards. During 2003/2004 Harrow (alongside other London Boroughs) participated in a joint emissions testing scheme across London. The scheme involved the stopping of vehicles travelling within Air Quality Management Areas across London and testing their emissions to determine whether certain pollutants exceeded the standards required by the MOT test. Drivers of vehicles who exceeded the emissions standards required where given a fixed penalty notice. Material containing advice on vehicle maintenance and the reasons for vehicle emissions testing was given to the drivers of all vehicles stopped. Additionally, information about the scheme was available from libraries, doctor's surgeries and other locations across the borough. This scheme, which was managed by the Association of London Government and supported by the Greater London Authority, was funded by the Department for Transport. Further funding after March 2004 has not been made available.

During the testing scheme a total of 512 cars were tested in Harrow over 11 testing days. Only 7 fixed penalty notices were issued. The aim of the scheme however is to raise the awareness of the consequences of poor car maintenance. It is therefore important to enforce the message that was provided by this scheme.

New Policy 7: The Council will continue a local vehicle emissions testing scheme issuing Fixed Penalty Notices to those vehicles that fail the emissions tests. The scheme will start by the end of 2004.

New Policy 8: Leaflets publicising the importance of car maintenance and driving styles which ensure reduced vehicle emissions, will be given to MOT test centres to distribute with MOT certificates. Leaflets will be distributed from May 2004.

2.4 Reducing Road Traffic - Discouraging Non-essential Journeys by Road

2.4.1 Traffic management

Car ownership within London is on the increase. Harrow's Census data from 2001 (www.statistics.gov.uk/census2001), shows that of a total of 75,498 householders, 26.5% did not have a car, 44.3% had a single car, 23.7% had two cars and 5.5% had three or more cars (www.statistics.gov.uk/census2001). Harrow has a higher car ownership per household than outer London as a whole. It is predicted that there will be a continued rise in the number of households who have multiple car ownership. However, in London, multiple car ownership is considerably lower than in the rest of the Southeast. The rate of household car ownership increase has reduced more recently since the rapid growth that occurred between 1985-86 and 1989-91(4).

2.4.2 Traffic

Vehicle congestion is an important influence on kerbside pollutant concentrations. Emissions from a vehicle vary depending on a range of factors, which include speed and the flow of traffic.

Congestion on roads leads to inefficient stop-start driving. When vehicles accelerate an increased amount of fuel is consumed. This fuel, which is burnt in the engine, increases emissions during the acceleration phase. When vehicles are travelling in a pattern of breaking and accelerating, air quality deteriorates. It is important that any scheme aimed at reducing air pollution from road vehicles identifies traffic reduction as a means of reducing air pollution. However, it does not necessarily follow that traffic reduction leads to a commensurate reduction in pollution emissions. This is because traffic reduction measures mainly concentrate on private car trips, which produce a proportionately lower amount of emissions to other vehicle types. It is important that traffic reduction is combined with other pollution reduction measures and in particular improvements in vehicle emissions as discussed in section 5.

"London's streets fall short of the needs of those who use them. They are too often severely congested, kerbside parking and loading is often badly organised and the regulation inadequately enforced…. In many places, inappropriate traffic is using the street" (8).

2.4.3 National policies to reduce traffic congestion

National policies to reduce congestion focus on improve public transport and to increase use, changing public attitudes and lifestyles, promoting cycling and developing land use policies which minimise the need to travel. The aim is a reduction in traffic levels brought about by a reduced dependence on the private car. National Policies are discussed in more detail in later sections.

2.4.4 GLA policies and proposals to reduce traffic congestion

The Mayor in his Transport Strategy emphasises the importance of traffic reduction in the improvement of air quality within London.

His strategy recognises that the car will remain the dominant form of transport in outer London and estimates that outer London will see a 7.5% increase in traffic flow by 2011 in the absence of a strategy for London and local action. Through the policies and proposals set out in the Mayor's Strategy, the Mayor proposes to reduce traffic growth in outer London by a third. The Mayor encourages Local Authorities to implement local policies to reduce traffic growth further. The Mayor also aims to reduce growth in outer London town centres to zero by 2011, which will be dependent on both strategy and local measures.

The Mayor foresees the reduction in congestion being met by a contribution of improvements in public and social transport, the introduction of a congestion charging scheme to deter unnecessary car journeys in central London, better enforcement of traffic and parking regulations, better management of the network and further encouragement of walking and cycling.

To improve the flow of traffic on roads, the mayor proposes to extend the red route scheme to the whole Transport for London road network and encourage a parallel initiative for all local authority 'A' roads (Principle Roads) and busy bus routes. In this way sustainable modes of travel, including buses, which are the dominant public transport option in outer London, have an undisrupted journey.

The Mayor's strategy also expresses the need for local authorities to identify bottleneck areas in their Local Implementation Plan and establish means of reducing associated congestion.

The Mayor's strategy highlights the importance of parking controls and restrictions in allowing free flow of traffic on roads. The mayor emphasises the need for stringent enforcement of both priority routes and parking restricted areas as such schemes would be ineffective without enforcement.

The Mayor's strategy highlights the need for an improvement in the control of street works which can lead to increased congestion. The strategy includes a proposal for Transport for London (TfL) to investigate the introduction of a pilot 'street space rental' scheme of works undertaken on or inside the inner ring road, whereby there is a financial incentive to complete street works quickly and with minimal disruption. This pilot could be extended to other parts of London if it is successful.

The Mayor identifies the need for the development of Freight Quality partnerships at local and regional levels. 14% of all vehicle kilometres on London's major roads are undertaken by 'freight vehicles'. A Heavy Goods Vehicle (HGV) emits 19 times the NOx and 56 times the PM_{10} of an average petrol car and it is therefore important to develop a means of discussing issues regarding air quality and other matters with 'freight operators' (8).

2.4.5 Council policies to reduce congestion

OBJECTIVE: To reduce congestion

The Council has developed an Interim Local Implementation Plan (2001), which sets the scene for the Local Implementation Plan, which will be the Borough's local interpretation of the Mayor's policies and proposals in The Mayors Transport Strategy. One of the aims of the Interim Local Implementation Plan is to reduce congestion and to make essential car journeys easier.

2.4.5.1 Parking and enforcement

Parking regulation and control is one of the more powerful means of effecting travel behaviour. It can be used both to facilitate car access to centres of activity and to manage levels of demand for road space. The ultimate success of any parking strategy however, will depend upon how well the various components are enforced. Enforcement priorities therefore need to be carefully set so that the key transport objectives are achieved. Illegal and inconsiderate parking obstructs traffic and pedestrians and can therefore cause traffic congestion.

ILIP POLICY P.1: The Council will develop and regularly review its parking strategy in the context of promoting a reduction in car use and securing reliable operation of bus services.

The bus is the most widely used public transport mode of travel in Harrow. Its use however, is limited to less than 10% of all journeys made to/within or from Harrow (11). The improvements in reliability provided by parking restrictions on certain bus routes will reduce congestion and encourage people to use buses for an increased number of journeys.

ILIP POLICY P.3: The Council will promote the use of a workplace parking levy as soon as practicable on all off-street car-parking places provided by an employer for employee use, but only as part of a scheme with similar levies being applied on a comparable, consistent and complementary basis in competing authorities both within London and outside the London area.

POLICY: The Council supports the introduction of road user charges, in conjunction with parking charges or as separate schemes, as appropriate measures for securing road traffic restraint, but only as part of a scheme with similar charges being applied on a comparable, consistent and complementary basis in competing authorities both within London and outside the London area.

Workplace parking charges and road user charges are very powerful tools in the regulatory toolkit available to restrain car use. However, any scheme for their introduction will have to be carefully planned, because they also have the potential to cause major economic harm and exacerbate inequality, contrary to the principles of sustainable development, including social inclusion. The introduction of charges is likely to cause firms to move to areas where they are not in force, or are lower. Therefore, a comprehensively planned approach is required so that at least the Greater London area, and an area around it, is the subject of a comprehensive scheme (particularly for work place charges). There must be realistic options for travelling by

modes other than the car, so that there are ways of avoiding being charged, otherwise the charge would become an additional, unacceptable tax, stultifying the economy. Significant improvements to the quality of the public transport network would need to include the creation of new bus routes in residential areas, as well as increases in the frequency and reliability of existing ones.

ILIP POLICY P.4: Apply any income that accrues to the Council from the application of a workplace-parking levy to the implementation of Strategy proposals for public transport, cycling and walking.

ILIP POLICY P.5: Seek the extension of the principle of the workplace-parking levy to other forms of high car generating development, particularly shopper's spaces in large developments that are currently free, on the same consistent and complementary basis.

ILIP POLICY P14:Explore the possibilities for reduction in the use of station car parks in the longer term, as other forms of station access improve but in any case not to increase car parking at stations.

The provision of large station car parks in outer London by the rail operators, for commercial reasons, will attract additional non-local car traffic to boroughs such as Harrow. With the implementation of a congestion charging scheme within central London, there is potential for Harrow to be adversely effected by an increased flow of traffic to stations by car drivers from outside the Borough. The whole thrust of the Council's strategy is to give Harrow residents the choice of an alternative to car use. This choice is intended to provide the opportunity for all residents to benefit from more reliable journeys (including journeys by car) and for a better local environment, not to free up space on roads to accommodate additional car drivers from outside the Borough.

ILIP POLICY P15: The Council will promote the use of 'walk and ride' and 'cycle and ride' in place of 'park and ride'.

ILIP POLICY P16: Progressively install on-street Controlled Parking Zones (CPZs) in all areas of the Borough experiencing on-street parking stress, subject to consultation with the local community.

CPZs are a fundamental component of national, regional and local policies. Traffic Management and Parking Guidance 1998 emphasises the importance CPZs play in transport strategy. CPZs form part of the Mayor of London's Transport strategy, West London Transport Strategy and are an integral part of the Council's Local Transport strategy. Further restraint based parking standards in new developments as required by national and regional policy cannot be effective unless on-street parking controls exist (otherwise parking can simply take place in local streets rather than lead to reduced trips). Hence there are strong strategic reasons for introducing CPZs as well as the local need to manage parking stress and parking demand as effectively as possible.

CPZs also allow the introduction of "resident permit restricted" developments which is in line with the strategy of reducing car parking provision at sites well served by public transport. CPZs incorporating Resident Parking Schemes can improve traffic

flow (reduce congestion) and hence reduce air pollution, safety, access and residential amenity and can assist management of parking in town centres to ensure more short stay shopper/visitor spaces are available.

ILIP POLICY P20: Give high priority to the enforcement of parking policies, the highest priority being afforded to the enforcement of those parking regulations and controls affecting the reliable operation of bus services.

The implementation of any strategy will ultimately only be as successful as its subsequent operation and enforcement allows. Effective enforcement, therefore, will be critical to the success of the Strategy. The strategy relies heavily upon securing significant improvements to a 'core' network of strategic bus services. Improved bus reliability could be seriously compromised by illegal parking on bus routes-and in particular in bus lanes.

The school run creates a large flow of traffic to certain locations. The traffic created by schools, further and higher education establishments is often in excess of the capacity provided for by the road network which serves them. For this reason, the flow of traffic to and from schools and further and higher education establishments can be greatly effected by illegal parking. Elevated air pollution caused by increased vehicle emissions as a result of congestion can provide an increased health risk because of the population exposed (i.e. Young children). It is therefore important to give high priority to the enforcement of parking policies near to schools, higher and further education establishments for safety reasons but also because of the effects congestion can have on air pollution.

New Policy 19 also identifies the need for schools, higher and further education establishments to develop Travel Plans to reduce the number of cars visiting their sites.

2.4.5.2 Civic Centre association congestion

Harrow Civic Centre is a large centre of employment and as such, it is a focus of many journeys by private car. Car parking at the Civic Centre is currently over subscribed. There is a greater demand for parking spaces than the number of spaces available. It is therefore important for the current car parking situation to be reviewed in conjunction with an analysis of the actual and perceived accessibility of the Civic Centre site by a range of travel modes. The review will identify the reasons why people drive to the Civic Centre, the actual and perceived barriers to accessing the site by alternative modes to the car and options for the future of Car Parking at the Civic Centre. It is intended that the review will identify measures that can be taken to encourage a reduced flow of traffic to the Civic Centre. This review will form the basis of a Civic Centre Travel Plan.

New Policy 9: The Council will undertake a review of the accessibility of the Civic Centre by a number of different travel modes and barriers associated with both staff and visitor car parking at the Civic Centre. The accessibility review will be completed by June 2004.

It is important that the review of Civic Centre accessibility is utilised as the basis for the development of a new Civic Centre Travel Plan. When an accessibility review has been undertaken as described in New Policy 9, it will allow the focus of a Travel Plan to be determined. Important aspects of a Travel Plan will include, improving accessibility to the site by alternative modes of transport to the private car and encouraging car sharing.

New Policy 10: The Council will implement a new Travel Plan for the Civic Centre by the end of 2005. The Travel Plan will be aimed at reducing single occupancy car travel to the Civic Centre and will include challenging but realistic targets for reducing car travel to the site.

2.4.5.3 Sharing out road space

The availability of road space is an important factor that impacts upon road congestion. Government guidance and the Mayor's Transport Strategy emphasis the need for reallocation of road space and the focus is on reallocation to allow for increased uptake of walking, cycling and bus journeys as an alternative to the use of private vehicles.

Road space, is broadly defined in the Council's Interim Local Implementation Plan as including pavements, roads and shared areas. In other words, all the space in between buildings or boundaries of parks and open space. The way in which road space is allocated is a very controversial matter. The increased provision for cycle lanes and bus priority lanes can greatly reduce the amount of road space allocated to other vehicles and can therefore impact upon road congestion. However, for buses to run on time and to provide safe cycle routes in the borough, it is important for road space to be allocated for these road uses. The aim is to encourage the uptake of alternative modes of transport to the private car. A reduction in use of the private car in this manner will bring about reduced traffic congestion and hence improved air quality.

ILIP POLICY REAL 1: The Council will reallocate road space to achieve improvements for bus users, cyclists and people on foot.

ILIP POLICY REAL 2: The need for this reallocation process will be included in an awareness campaign borough-wide and at local implementation level prior to its implementation.

Harrow's road space is limited and unlikely to be significantly expanded for general traffic use. To achieve the level of bus reliability or continuous, high quality facilities for people on foot or on bike, some reallocation from existing uses (mainly from parked or moving vehicles) will be essential. Running more buses without new priority or sending cyclists or pedestrians on longer, quieter routes will not achieve the necessary change in increasing the proportion of travel by non-car means.

It is important that a route long, network based approach is used to provide safe, attractive and reliable alternatives to the car. By providing attractive alternative modes of transport to the car, users will be encouraged to switch transport modes and congestion associated with high private car vehicle flow will be reduced.

ILIP POLICY REAL 3: The principles which will guide road space reallocation will be:

- reallocation will be focused on clearly defined routes for buses or cycles, or in areas such as town centres, where specific benefits can be achieved and monitored.
- proposals will be marketed relating to specific routes or areas which in turn relate to people's actual journeys.
- different approaches will be applied in different areas, for example "home zone" reallocation will differ from town centres.
- reallocation of space will take account of the need for deliveries and servicing
- the priority of schemes will be based on the scale of potential benefits they deliver without any major reallocation away from cars (parked and moving)
- the programme will be kept to as short a time scale as possible and those effected fully informed about it
- to ensure that accompanying actions (e.g. more reliable bus services), if they can not be secured in advance, become effective immediately after the most difficult reallocation schemes so that any "stick" is as closely followed as possible by a relevant "carrot".
- to consider the creation of additional local road space to facilitate road space reallocation in exceptional circumstances and subject to there being increase in overall capacity for general traffic use.

Home Zones are residential streets in which the use of road space is shared between motor vehicles and other road users, with the wider needs of residents, including pedestrians, children and cyclists being accommodated. The aim of a Home Zone is to improve the quality of life in residential streets by making them places for people, not just for traffic. The Mayor in his Transport Strategy emphasis' that speed reductions, such as 20mph limits in town centres and Home Zones, should not be achieved through measures that lead to increased acceleration and deceleration. Acceleration and deceleration increases vehicle emissions. Reduced vehicle speed in particular areas such as town centres and Home Zones encourage street use for walking and other activities and may impact upon localised congestion.

New Policy 11: Where safety is not compromised, Harrow Council will design traffic calming schemes, which avoid excessive acceleration and deceleration.

The integrated environmental consequences of traffic calming have been found to be complex. The main priority of any traffic calming measure is to improve road safety and this should not be compromised. However, certain traffic calming measures encourage increased acceleration and deceleration, which increases fuel use and subsequent emissions. It is therefore important for the air quality consequences of traffic calming schemes to be evaluated during the planning stages of any proposed traffic-calming scheme.

The order in which the "sticks and carrots" of the strategy are delivered to the public will be crucial to their support. "Carrots" such as bus reliability cannot be fully in place before any reallocation from car use, as reliability needs the extra road space to implement the bus priority schemes which, in turn, are essential to make the buses run on time. However, the "carrots" can be planned, in place and ready to go at the

moment the final schemes are implemented so the benefits are immediately felt. The nature of the benefits can also be clearly set out in advance. The "carrot" and the "stick" become simultaneously and completely interdependent.

2.4.5.4 Management of the Highway

This section concentrates on the range of tools available for organising traffic, whether parked or on the move. While the main priority for highway management is to improve road safety, highway management schemes also have secondary effects. Highway management is an important tool in the reduction of traffic congestion.

ILIP POLICY MH 1: The Council will pursue a range of management techniques to support the strategy including:

- "Hardware" based e.g. using existing powers of regulation and including elements such as speed limits, routing, traffic signal control, safety improvements, vehicle bans and lighting.
- "Soft" policies e.g. using the street environment and its signing to change perception, increase awareness and influence behaviour.
- Enforcement based e.g. using physical design to encourage compliance; introducing new techniques for automated enforcement; and linking through to travel awareness to make it important to comply.

ILIP POLICY MH 8: Increased efficiency in the use of road space brought about by new technology and traffic signal control will be used to implement new priority schemes for pedestrians, cyclists and buses.

Traffic signals were once a stand-alone means of sharing out road space, they can now be linked to computer control over a wide area. The use of computer control can allow for bus priority at signals and encourage increase bus service reliability. Computer control over traffic signalling such as "SCOOT", has been seen to have the effect of creating extra road space. This extra road space should not be used to increase vehicle numbers on roads but should be utilised to provide for increased street use by pedestrians and buses.

A related technological development is the use of routing systems which warn about congestion and suggest alternative routes. While this may lead to reduced queues and faster car journeys there are potential pitfalls, such as situations where traffic is diverted onto sensitive routes. Schemes need to be designed and prioritised to protect the local environment from these rat runs, which may also develop as a result of traffic growth causing congestion or from reallocating road space.

ILIP POLICY MH 4: The Council will manage the highway in the context of a broader urban design strategy to create a sense of place, including traffic control.

ILIP POLICY MH 5: The Council will seek to ensure that its proposals for managing the highway accord with policies for town centre regeneration, air quality monitoring, community safety and environmental improvements.

ILIP POLICY MH 9: In exceptional circumstances, the Council will consider increasing highway capacity where this will assist improvements in public transport,

walking and cycling, but ensure that this does not increase the overall capacity available for private motorised transport.

2.4.5.5 Freight

Freight does not make up a large proportion of the journeys made currently within Harrow. However, as the stage 4 review and assessment demonstrates, HGV's contribute 16.5% of NOx concentrations and 46.3% of PM_{10} concentrations on average at certain locations within the Borough[1]. It is therefore important to establish a clear policy framework in order to avoid potential future problems.

On a typical day in 1991, 5000 commercial vehicle trips were made wholly within Harrow (2,900 by small van, 2,000 by medium sized vehicles and 100 by other van or lorry), 7,400 commercial vehicle trips left Harrow (2,800 by small van, 3,900 by medium sized vehicles and 700 by other van or lorry), and 7,100 commercial vehicle trips entered Harrow (2,700 by small van, 3,800 by medium sized vehicles and 600 by other van or lorry) (11).

Commercial vehicle trips represent only 6% of the total amount of trips made within Harrow and 11% of total through flow (11).

Many freight issues will be better dealt with on a sub-regional rather than a local borough basis. Part of the West London Transport Strategy includes developing a sub-regional Freight Quality Partnership, on which work, including liaison with freight industry representatives and major players such as BAA, has been undertaken.

Given the close proximity of the M25, the A40, the A406 and the A41 peripheral routes, and no primary roads within Harrow, there are few serious problems with heavy goods vehicles that have no business in the borough. While heavy goods vehicles often emit a disproportionately high concentration of emissions, particularly particulate matter, their contribution to the total number of vehicles on Harrow roads is small. As stage 4 demonstrates, the contributions made by heavy vehicles to levels of nitrogen dioxide and PM_{10}s is relatively small.

The Interim Local Implementation Plan for Harrow has identified a number of principle local issues. These principle issues incorporate the need to restrict the effect that freight can have on congestion within Harrow, which indirectly effects pollution levels, and to limited their effect on air quality directly. The principles issues include:

- to provide reliable access to/from local premises, and between local premises and the primary road network

- to provide generally unimpeded access to, and mobility between, all locations within the borough for servicing and delivery vehicles

- to provide convenient servicing and delivery access to shops, businesses and other commercial premises, particularly in the context of 'just-in-time' delivery

[1]Average figures identified through source apportionment (excluding location 3 due to problems discussed in the stage 4 assessment (10)).

- to provide convenient servicing and delivery access to residential properties, particularly in the context of e-commerce and telephone-ordering/home delivery

- to ensure that heavy goods vehicles, serving locations in the Borough, do not use local access roads-other than to secure necessary final access to their destination

- to ensure that all development proposals make proper off-street provision for servicing and loading/unloading, as a condition of securing planning permission

- to maintain a dialogue with representatives of all parties having an interest in the transit of goods and/or delivery and servicing matters within the Borough-to forestall difficulties, and to anticipate and address potential problems to the mutual advantage of all parties.

ILIP POLICY F 1: The Council will seek to ensure that freight movement, delivery and servicing within the Borough is provided for in an environmentally sensitive, economic and efficient manner, which accommodates commercial needs and facilities competition.

ILIP POLICY F 2: The council will support and seek, via the responsible regional/sub-regional authorities, appropriate sub-regional provision of break-bulk, consolidation, distribution and modal transfer facilities for freight management, and appropriate and effective access to those facilities from the Borough.

ILIP POLICY F 3: The Council will support the continuation and effective enforcement of the London Lorry Ban.

ILIP POLICY F 4: The Council, while recognising that road transport will remain the basis for freight movement, delivery and servicing provision within Harrow, will promote and maintain local area lorry bans together with supporting initiatives to move freight by non-road transport modes.

ILIP POLICY F 5: The Council will seek to ensure adequate access to existing commercial, business and retail premises, periodically reviewing provision and, where appropriate, seek to agree advisory routes.

ILIP POLICY F 6: The Council will seek to ensure that, as far as possible, the measures proposed in the Strategy for reducing road traffic congestion, improving access, preventing illegal parking, and improving signing, are developed and implemented taking positive account of the needs for freight movement, delivery and servicing.

ILIP POLICY F 7: The Council will, with the representatives of freight, delivery, servicing and other relevant commercial interests in the Borough, seek to establish a 'freight quality partnership' (FQP) as a consultative forum for consideration of all matters of mutual interest, including:

- traffic management proposals, which affect commercial vehicle access and movement, and particularly where pedestrianisation is involved

- periodic joint reviews of different aspects of provision for servicing, delivery, loading/unloading and freight movement.

New Policy 12: The Council will consider and implement, where practicable, recommendations arising from the development of a West London Freight Quality Partnership.

There is a substantial measure of common ground, but inevitably there are some issues between servicing, delivery and freight operating interests and the Council, in it role as guardian of local interests, that do present conflict. It is appropriate therefore, to provide a forum to allow the former to be built upon and the latter to be sensitively addressed and resolved. Given the opportunity for an exchange of information, a better understanding of mutual concerns will be developed and an increased likelihood of achieving consensus will result. It is important that the effect of freight movement on air quality is discussed and means of improving vehicle emissions are identified.

ILIP POLICY F 8: The Council will require, as a condition for securing planning permission, that development proposals make proper off-street provision for servicing and loading/unloading within the development site, in such a way that all vehicles entering or leaving a site are enabled to do so in a forward gear.

In this way access to and from a site will be possible with the minimum disruption to other traffic on the road. Congestion resulting from vehicles entering or leaving a site will therefore be reduced, leading to lower emissions of pollutants from queuing vehicles.

ILIP POLICY F 9: The Council will seek to provide adequate delivery and servicing access to shops, businesses and residential premises and in particular to provide convenient on-street short-stay spaces for servicing/delivery vehicles by:

- permitting 'dual-use' of on-street metered spaces in controlled parking zones in residential areas, where road widths are adequate

- designating specific spaces where road widths do not permit 'dual use'

ILIP POLICY F 10: The Council will periodically review 'yellow-line' parking regulations and where appropriate revise the parking availability and regulations to release kerbside space for controlled short-stay waiting, loading and unloading spaces-possibly at particular times of the day.

ILIP POLICY F 11: The Council will produce and publish a map setting out key information in respect of restrictions on lorry movements within the Borough, in terms of:

- width, weight and length restrictions

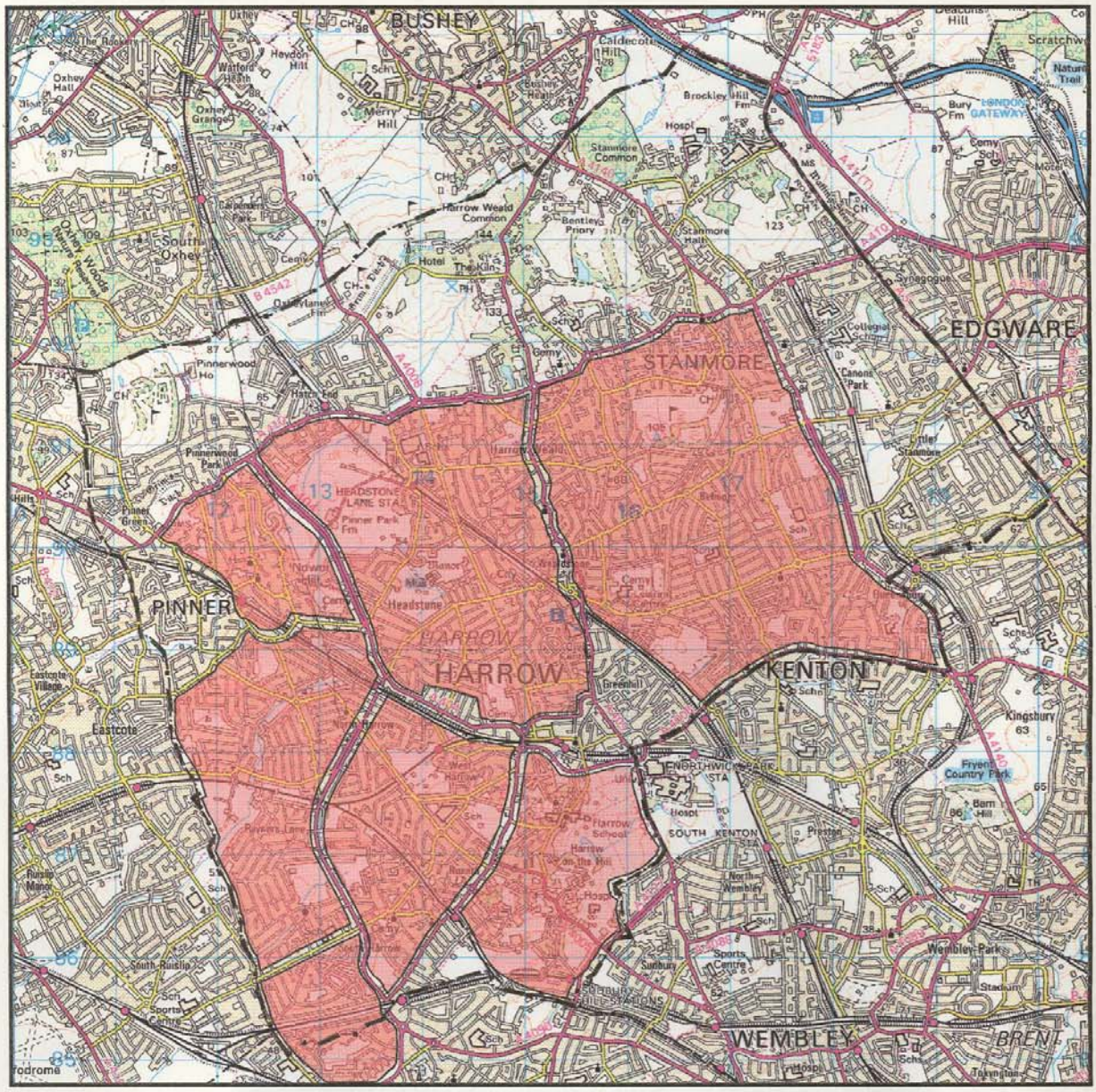
- low bridges

- loading bans
- access restrictions, including pedestrian areas
- preferred routes for lorries
- abnormal indivisible loads (AIL) routes.

In this way freight movement within Harrow will be undertaken on the most appropriate roads. This takes into account the effect on congestion and reduces the impact that the vehicles are likely to have on localised air quality. The free flow of freight traffic would be restricted if inappropriate roads were utilised, and this can impact upon air quality.

ILIP POLICY F 12: The Council will periodically review the provision in town centres for all aspects of servicing, delivery, loading/unloading and freight movement, with particular regard to its impact on pedestrian movement, the local economy and the local environment.

Figure 1



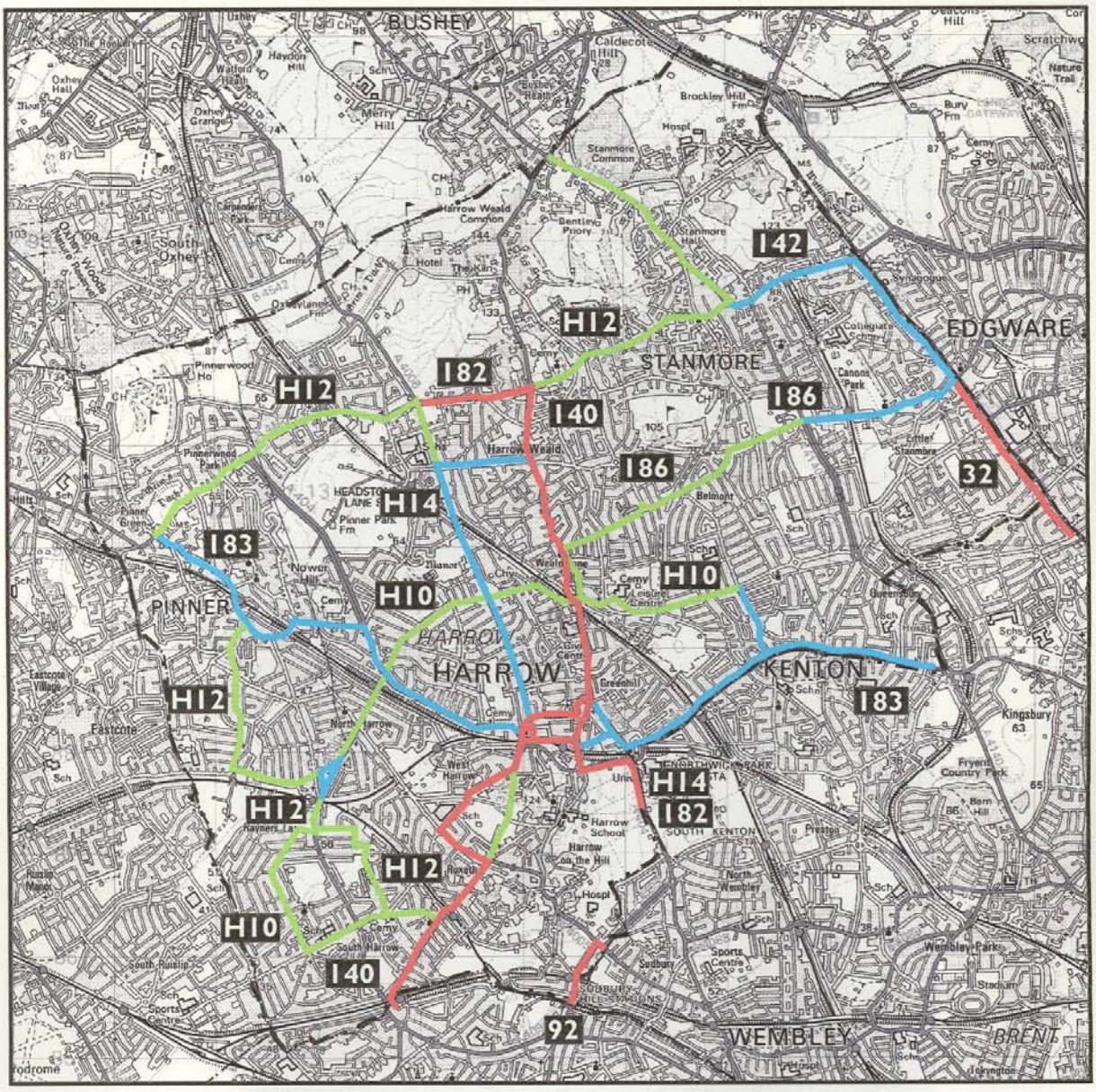
London Borough of Harrow

LORRY BAN ZONES

Lorry ban zones applying to goods vehicles over 7.5 tonnes gross vehicle weight, except for access.

June 2001

Figure 2



London Borough of Harrow

LONDON BUS PRIORITY NETWORK IN HARROW

- London Bus Initiative
- London Bus Priority Network
- Local Transport Strategy

June 2001

New Policy 13: Together with The Mayor of London through Transport for London and other London Borough's, the Council will assess the scope for the use of priority lanes by freight vehicles, and its implications for other road users, primarily cyclists.

By allowing freight vehicles to use the priority network, these vehicles which emit a disproportionately high level of air pollutants will be able to drive more smoothly on Harrow's roads. This will aid an improvement in air quality, particularly on bus priority network roads and where HGVs are not effected by the Lorry Ban. This includes London Road, Stanmore (A410); High Road, Harrow Weald (A409); Pinner Road, Harrow and North Harrow (A404) and Northolt Road, South Harrow (A312). These roads are highlighted in stage 4 as roads that will exceed objectives set for both nitrogen dioxide and PM10s. The Lorry Ban Zones in Harrow are shown on Figure 1, the London Bus Priority Network in Harrow is shown on Figure 2.

New Policy 14: The Council will consider and implement recommendations of The London Sustainable Distribution Partnership should they be relevant.

The Mayor of London, through Transport for London (TfL) set up the London Sustainable Distribution partnership in February 2002, bringing together many organisations concerned with road, rail and water freight. These include representative organisations from industry, business, local authorities, The London Development Agency (LDA) and those with environmental interests. The aim is to ensure that distribution, freight and servicing are carried out in the most appropriate way.

7. 2.5 Promoting Alternative Modes of Transport to the Private Car

A recent study by RAC concluded that most car trips do not have to be made by car (1). Using a car currently seems the sensible choice because of factors such as physical and time constraints and the poor quality of alternatives. Some car trips (up to 30%) were judged to be hardly necessary at all, or a perfectly good alternative was already available but ignored. Figure 2 shows the Harrow Bus Network and accessibility for Harrow residents. While the majority of Harrow residents live within 400m of a bus route only 8% of journeys beginning and/or ending in Harrow were undertaken by bus in 1991 (11).

Congestion is caused by a level of traffic that is in excess of road capacity. It is therefore important to reduce congestion as discussed in section 2.4, as congestion, leading to a driving style with more acceleration and deceleration, creates increased air pollutant concentrations. To reduce the number of vehicles utilising London roads, it is essential to provide drivers with viable alternatives. It is important to provide attractive alternatives to car travel, such as walking, cycling, bus use and the underground to reduce traffic congestion on roads.

2.5.1 National policies to encourage public transport use

In 1998 the Government produced a White Paper on the future of transport (1). This document set out the Governments strategy for improving public transport and reducing dependency on the car. The paper emphasised the need for an integrated transport system which would tackle the problems of congestion and associated air pollution concerns. The paper also highlights the need for an increased choice in travel modes by improving alternatives modes to the car and securing mobility that is sustainable in the long run.

A key area in the White Paper is the need for sustainable development in transportation. Sustainable development is "development that meets the needs of the present with out compromising the ability of future generations to meet their own needs" (The Brundt-Land Report ‘our common future’ in http://www.open2.net/reith2000/social.htm). The White Paper sets out a framework by which detailed policies will be taken forward:

- Integration within and between different types of transport
- Integration with the environment-so that our transport choices support a better environment
- Integration with land use planning-at national, regional and local level, so that transport and planning work together to support more sustainable travel choices and reduce the need to travel
- Integration with our policies for education, health and wealth creation-so that transport helps to make a fairer, more inclusive society

The key aims of the New deal for Transport include cleaner air to breath by tackling traffic fumes, including reducing congestion, and easier and safer routes to walk and cycle.

2.5.1.1 National policy to provide 'better buses'

"Buses to lead our transport revolution for the 21st Century" is one of the proposals in the Governments White Paper (1). The paper emphasis's the need to provide buses which are cleaner, more comfortable and more reliable-a real and attractive alternative to using the car. The Government will encourage industry to produce buses fit for the 21st Century. The improvement in the bus service will require an increase access for all. Reliability in services will be brought about through a decrease in congestion and an increased bus fleet.

2.5.1.2 National policy to provide 'better trains'

Through a new Strategic Rail Authority, the Government intends to 'bring vision to the privatised railway' and insure that it meets the needs of passengers and the freight customers it serves. This will include providing more and better trains, providing better information and better interchanges.

2.5.1.3 National policies to provide 'better protection for the environment'

National policy detailed in the New Deal for transport (1), is aimed at the increased use of greener, cleaner vehicles, an increased use of public transport and providing easier walking and cycling. The White Paper (1) acknowledges that these measures alone will not be sufficient to tackle the congestion and pollution that is caused by road traffic, 'we need to reduce the rate of road traffic growth, we also want to see an absolute reduction in traffic in these places and streets where its environmental damage is worse.

2.5.2 The London Underground

The Mayor sees the London Underground as the single most important part of Londons public transport infrastructure. The Mayor recognises that the London Underground in its current condition is not meeting the needs of the capital. The Mayor emphasises the need for the underground to be improved in terms of reliability and overcrowding so that a service can be provided that is reliable, comfortable, easy to use, safe and secure (8).

The Mayor sees some overcrowding problems being elevated through the running of a more reliable service but also emphasises the need for increased capacity.

The Mayor recognises that passengers want:

- a minimum delay in waiting for trains,
- a minimum delay on trains,
- reliable escalators, lifts and other assets,

- less crowded trains,
- less crowded, more attractive and easier to use stations,
- to feel secure when using trains and stations,
- easier to understand information relating to services, fares and local amenities,
- better access to trains and stations and
- a cleaner underground.

The Mayors proposals include identifying ways in which emissions from underground trains can be reduced, particularly PM_{10}s.

The Mayor sees the management of the London Underground as an important function to be taken on by TfL and will, through TfL, impose a number of improvement targets on London Underground (8).

2.5.3 Council policies to encourage Underground use

The core public transport policies and proposals are discussed jointly in Section 2.5.5 However, the Council has no responsibility for the Underground network and as such, policies addressing the underground are isolated to issues relating to the integration of all public transport modes.

2.5.4 The London bus network

Buses provide an essential service to residents, visitors and workers wishing to make local journeys and are a viable alternative to the car. Buses take up a considerably lower amount of road space compared to the equivalent number of passengers travelling by car and therefore have a considerable potential to reduce congestion.

The Mayor of London recognises that the reliability of the bus service, over crowding on buses, standards of driving and inadequate information is discouraging bus use. The Mayor therefore emphasises the need for an improvement in the service provided so that buses are (and are seen as being) reliable, quick, convenient, accessible, comfortable, clean, easy to use and affordable.

An important means of improving bus reliability is through the implementation of an increasing amount of bus priority and parking enforcement measures. The Mayor therefore proposes to increase bus priority London wide, both in the amount of street space allocated and the time of operation. The Mayor also emphasises the need to provide effective enforcement to prevent against illegal stopping and other traffic offences, using cameras wherever possible.

The Mayor recognises that the London Bus Initiative is an important strategic initiative for a comprehensive reform of the bus network. The aim of the programme is to give the priority to the movement of people rather than the movement of

vehicles. The Mayor sees this being achieved through the provision of more effective clearways, extended bus lane operating hours, and better bus stop facilities.

The London Bus initiative aims to provide both perceived and actual bus service quality in London. The key tool is the use of a whole route approach.

While the Mayor recognises that the bus network has expanded in recent years, he acknowledges that extra capacity is still required. The Mayor emphasises that local involvement is crucial to providing a service provision that meets local needs. The Mayor's Transport Strategy proposes a 40 % increase in both passenger numbers and service provision between 2001 and 2011. The Mayor also recognises that there has been an increased demand for night-time bus services. As such the Mayor proposes to expand the number of routes which operate a night-time service.

The Mayor emphasises the need for improved facilities for passengers waiting at bus stops. This includes the location of bus stops so that they are close to local shops and so that walking distances are minimised. The Mayor also emphasises the need for improved information at bus stops and improved access. The Mayor proposes to improve London bus stops so that they are all provided with appropriate passenger facilities and have the ability to serve low floor buses.

The Mayor's Transport strategy highlights that countdown facilities at bus stops, which provide information on the arrival of buses, is an important tool in encouraging bus use. The strategy also recognises that the reliability of such a service must be improved particularly in outer London. TfL will improve the reliability of such systems and will aim to extend it to 4000 locations by 2005.

The Mayor also highlights the need to increase the amount of information available to people about bus services. This includes different information locations and the use of information provided in different languages so that everybody has equal access to it.

The Mayor also addressees the issue of vehicle emissions arising for buses. The Transport Strategy proposed to reduce bus emissions so that all new buses were EURO III by October 2001 and to ensure that all buses are at least EURO II by 2005 (The EURO Standards are discussed in Section 2.3.4). TfL will also review opportunities to utilise alternative fuels and other methods for reducing emissions will be actively reviewed. Larger vehicles, such as buses, can often contribute a disproportionate amount to roadside air pollution concentrations, in comparison to their numbers. However, improving vehicle technology and reduced congestion as a result of increased bus use, can have a positive effect on air quality.

2.5.5 Council policies to encourage the use of public transport.

OBJECTIVE: Encourage the use of public transport

The provision of an effective bus network in Harrow is fundamental to providing people with a real travel choice. Providing a reliable, clean, safe and frequent bus service in, to and from Harrow, may influence peoples travel choice and therefore reduce the use of the private car particularly for shorter journeys.

At present, public transport within Harrow is a minority travel choice. Only for journeys made from Harrow into London was public transport dominant. In 1991 bus travel and underground/rail accounted for only 8% and 6% respectively of journeys starting or finishing in Harrow (11).

As identified by the Mayor, outer London, including Harrow, experience low journey reliability. In 1998/99, for 3 of the high-frequency bus services in Harrow, there was a 3% chance of waiting more than 30 minutes (i.e. more than five times the scheduled average waiting time of 6 minutes). For 6 of the 19 low frequency 'time-tabled' bus services, there was a 27% chance of a bus not arriving 'on time' (i.e. more than 2 minutes early or 5 minutes late) and a 9% chance of a bus not arriving at all (8).

It is important for the bus service provided within Harrow, and outer London in general, to improve so that services are reliable, frequent, quick, clean, safe and low in cost. For there to be a change in individuals travel choice to favour bus use rather than the car, it is important for an attractive service to be provided. Important issues that have been identified through public consultation include:

- walk time to the nearest bus stop or station
- wait time for desired service
- ease of access to buses
- length of journey time
- reliability of journey time (including wait)
- costs of travel
- availability of, and access to, travel information
- convenience of travelling for all purposes (e.g. with children or heavy bags)
- ambience of the travel environment and ride quality
- safe/security of the travel environment

ILIP POLICY PT 1: The Council will seek to persuade TfL to concentrate initially on developing a 'core strategic network' of reliable public transport services, using existing local railway services as its key radial components, to provide an acceptable public transport alternative to car use within the borough, by:

- prioritising the Council' available resources to provide the road space and traffic regulatory/management infrastructure to support the development of the key non-radial bus service links within the "core network" (see ILIP Policy PT 3 below)

- deploying, as appropriate, the full range of available bus priority measures; and, where necessary to secure the required degree of bus priority benefits, seeking to develop and deploy innovative measures.

- reallocating road space away from car use- principally towards promoting bus use, but also the use of other sustainable transport modes, when significant progress has been made towards providing an acceptable public transport alternative, or such provision is imminent.

The London Bus Priority Network in Harrow is shown in Figure 2.

ILIP POLICY PT 2: The Council will work with the key regulators and providers of rail, underground and bus services within the borough to progressively develop the "core network" of public transport services-to complement the "strategic" public transport network proposed in the WLTS and secure an initial minimum level of provision of 6 services per hour on each core route (see ILIP Policy PT 3 and ILIP Policy PT 9 below).

ILIP POLICY PT 3: The Council will adopt a 3-stage approach to securing the key non-radial components of the "core network" within Harrow, depending on the outcome of negotiations with TfL by:

- initially, as the highest priority, adopting six existing bus routes – in a priority order of H12, H10, 186 and subsequently 183, 142 and 140 – and implementing a phased programme of integrated bus priority measures.

- subsequently, (in conjunction with PT.6) further developing the "core network", possibly as a "figure-of-eight" style route - based largely on those same existing bus routes, but operating *wholly* within Harrow and linking the strategic interchange locations identified in the WLTS.

- finally, developing the full WLTS "core" network – either at a Borough-level or at a West London level.

ILIP POLICY PT 4: The Council will work with other West London boroughs to secure the implementation of the overall WLTS "core" network.

In the initial stages of strategy implementation, bus service performance on those routes comprising the "core network", will be improved by bus priority measures, which involve minimal road space reallocation away from general traffic use and parking for non-work purposes. This approach is intended to take account of the considerable concern expressed in the consultation and especially local centres. It is important that any changes made in road allocation present a minimum impact on traffic flows. In subsequent stages, the need to complete "whole-route" bus priority along routes on the "core network" will require more difficult decisions, but measures will still be designed to minimise their restraint effect on car use. Benefits occurring from bus priority measures will need to be "reinvested" in better services, and this process should be agreed before buses are allocated an extra share of road space.

In the later stages, as public transport is progressively improved, by time-scale and/or area location, the need to secure guaranteed reliability of bus service operation might

require measures that have a significant adverse impact on other modes, including cars. It will also become a specific purpose of the strategy to pursue the reduction of car use to reduce congestion and therefore road side air pollution, and support other modes, which will be secured by the implementation of road space reallocation. Reallocation of road-space for bus use will be integrated with improved provision for walking and cycling, and the regeneration of the local environment.

It will be a key challenge for strategy implementation to ensure that any increase in journey times experienced by car users switching to public transport use, are kept to a minimum. The advantages of the approach, for car users switching to public transport use, will include increasingly reliable journey times, relief from the increasing "hassle" of car use, an increasing choice of not owning a car, improved air quality and a safer travel environment.

ILIP POLICY PT 5: The Council will work, in partnership with TfL (see also PT.9 below), to establish a fully-accessible local network of high-quality and reliable bus services within Harrow by progressively improving:

- the "penetration" or local bus services into every local neighbourhood area – either by extending existing routes or, where necessary, by promoting new routes

- the quality and reliability of all bus routes serving the Borough on the basis that:

  - works will be undertaken progressively and, as far as practicable, subsequent to or in parallel with the development of the proposed 'core' strategic public transport route network

  - no measures, having the effect of increasing the overall level of restraint on general traffic movement, will be implemented until such time as the 'core' strategic network is able to provide a generally acceptable alternative to car use.

ILIP POLICY PT 6: The Council will seek to secure a fully integrated approach to the provision and operation of public transport services within Harrow, including:

- integration between bus and rail (including Underground services) – by providing / facilitating direct and convenient personal interchange between strategic Borough-level public transport services

- integration between Borough-level and local-area public transport services – by ensuring that local bus services, designed to penetrate local neighbourhood areas, are enabled to deliver their services to the appropriate points of access to the strategic public transport network

- integrated passenger access to public transport services – by improving the ease and convenience of approach routes to service access points, and quality and clarity of the access signing

- integrated and accessible provision of service information – by making current time-tabled and "real-time" operational information readily available to travellers and potential travellers, both within and outside the system

- integrated through ticketing, including for buses, and ease of access to ticket issuing facilities including development of Travelcard and SMART card initiatives covering all public transport modes

- taking account of the specific needs of people with impaired mobility

ILIP POLICY PT 7: The Council will seek to secure progressive and complementary upgrading of rail, Underground and bus service quality, operational performance and infrastructure, on the basis of a partnership working wherever possible, and more specifically will seek to enter into a formal "bus quality commitment" agreement with TfL at the earliest opportunity (see ILIP Policy PT 9 below)

ILIP POLICY PT 8: The Council will, wherever possible in partnership with public transport service providers and regulators, seek to ensure that all stations and bus stops locations in the Borough are progressively improved to offer a safe, secure and passenger-friendly environment and appropriate 'state-of-the-art' passenger interchanging facilities – by:

- identifying all bus stops and rail (including Underground) stations as one of the following:

  - strategic interchange access points – all locations where stations are served both by local radial rail services and by a 'core' strategic route, or which are served by two 'core' strategic routes

  - intermediate interchange access points – all other stations and 'intermediate' bus stops on the 'core` strategic bus routes, i.e. bus stops separated from each other and 'strategic` located at intervals of 2 to 3 minutes service running time (i.e. the same overall separation as local rail / Underground stations)

  - local interchange access point – all remaining 'local' bus stops in Harrow, which will be the usual initial point of access for Harrow residents to the overall public transport network

- comprehensively treating these identified access points, on a hierarchical basis, to provide secure, convenient and efficient interchange between transport modes (including walking) and a safe, secure and passenger-friendly environment, including provision of:

  - weatherproof waiting area(s)

  - seats

  - easy (preferably 'no-step') access

- scheduled and real-time service information
- clear access/interchange information and signing
- emergency, and passenger assistance, telephone links

- with options for the provision of:
  - pre-pay ticket machine(s)
  - CCTV coverage
  - public pay-phone/s
- subsequent utilising these access points, if appropriate, as a basis for developing:
  - a network of limited-stop services as envisaged in the WLTS if or when passenger numbers justify such an enhancement
  - fully wheelchair-accessible boarding/alighting points, as a basis for supporting a network of fully wheelchair-accessible scheduled bus services. (see also PT.9 below)

The Council will encourage an improvement in all public transport modes in the borough so that there is a greater interchange between modes of transport. It is important that the public transport network in Harrow provides an integrated system that enables an attractive travel alternative to the car to be provided. Proposals should include improved accessibility for people with disabilities, comfort and security for passengers and staff, pedestrian movement in general and facilities for cyclists.

ILIP POLICY PT 9: The Council will build on existing liaison arrangements with those parties responsible for regulating and operating public transport services in the Borough to ensure effective liaison at three inter-related hierarchical levels:

- to take an overview of public transport provision
- to develop the 'core' strategic bus priority proposals of the Strategy
- to develop and implement key route-corridor and interchange initiatives

ILIP POLICY PT 11: The Council will seek to negotiate with TfL in the context of a "quality bus commitment", an agreed set of bus operational performance standards in return for agreeing to provide specific levels of bus priority and enforcement.

ILIP POLICY PT 13: The Council will seek, in conjunction with TfL and operators, to carry out a fundamental review of public transport services in Harrow to ascertain ways in which current services can more effectively meet requirements, covering all aspects of the concerns raised and particularly those of specific client groups e.g. schools, older people or those with a mobility problem.

ILIP POLICY PT 10: The Council will prepare and publish a public transport leaflet and map, and will regularly distribute copies as well as seeking route information on buses

Information is an important tool in encouraging people to switch from the car to utilising public transport. At present public transport is often viewed as having a number of important disadvantages to car use. Some of the disadvantages such as the perceived waiting time at stations and stops can be improved through increasing bus service reliability and frequency. However, it is also necessary to provide accurate information regarding bus services so that people are aware of routing information, timetables and connections. Available, up-to-date and accessible information is essential for the effective use of a public transport network. Lack of information has been identified as deterring people from using existing services.

New Policy 15: The Council web-site will provide information on underground, train and bus routes throughout and beyond the borough. Information on specific routes and timetables will be available by the end of 2004.

New Policy 16: The Council will maintain a dialogue with representatives of public transportation operators to discuss issues that restrict accessibility to the services they provide.

New Policy 17: The Council will continue to investigate and implement measures to assist bus operations and promote greater use of buses.

New Policy 18: The Council will maintain a dialogue with the Harrow Public Transport Users Association to discuss issues which restrict accessibility to public transport within the borough.

In encouraging alternatives to the private car, the Council needs to regularly discuss relevant issues with public transport operators and users to ensure that all accessibility issues are addressed. By removing barriers to public transport use, more people will be encouraged to take public transport as opposed to the private car.

2.6 Encouraging Walking as a Means of Travel

Walking is fundamental to all modes of travel and for this reason it is often taken for granted. Without walking to and from the station or bus stop, most public transport journeys would be impossible. Walking combines travel with other activities such as socialising in the street or window-shopping. Many short journeys, which could be undertaken by walking, are far too often undertaken by car and therefore add to congestion and local air pollution. Walking not only provides health benefits by preventing emissions from vehicles, but also from the inherent physical exercise. As such, promoting walking can provide significant benefits in environmental, social, health and economic terms. At present the increase in car use in London has lead to an associated decline in walking (15% decrease) and an increase in premature deaths associated with inactive lifestyles (8).

2.6.1 National policies to encourage walking

The Government Paper ‘A New Deal for Transport' (1) emphasises the need to make walking "a more viable, attractive and safe option".

The Government through the ‘streets for people' proposals encourage local authorities to give priority to walking by:

- reallocating road space to pedestrians, for example through wider pavements and pedestrianisation;
- providing more direct and convenient routes for walking;
- providing more pedestrian crossings, where pedestrians want to cross;
- reducing waiting times for pedestrians at traffic signals and giving them priority in the allocation of time at junctions where this supports more walking;
- dealing with those characteristics of traffic that deter people from walking;
- introducing traffic calming measures near schools, in ‘home zones' and in selected country lanes;
- using their planning powers to ensure that the land use mix, layout and design of development is safe, attractive and convenient for walking.

A steering group including local government representatives and other organisations is currently working on the development of a National Walking strategy.

2.6.2 GLA policies and proposals to promote walking

The Mayor acknowledges the importance of walking as a mode of transport within London. London-wide, people make 7 million journeys on foot every day. This accounts for almost a quarter of the journeys made within London. However, many short journeys, which could be made by walking, are still made by car because people believe walking is inconvenient, unattractive and in some instances unsafe. ‘The

Mayor, through Transport for London and the London Borough's, and working with other relevant organisations, will aim to create and promote a connected, safe, convenient and attractive environment that encourages people to walk and enriches their experience of being out and about, making London one of the most walking friendly cities for pedestrians by 2015 (8)'.

Most studies agree that walking is under-reported, even on the basis of walking from home to a specific destination. The Mayor acknowledges this short coming and proposes to work with London Borough's and other relevant organisations to develop effective means of monitoring the extent of walking in central, inner and outer London.

The Mayor emphasis's that through the 'streets for all' initiative, safe and attractive walking routes will be provided. The Mayor will ensure effective promotion and delivery of better conditions for pedestrians. This will require a range of actions to be implemented across London, and will also require partnership between TfL, the Boroughs, other public bodies, the private sector, and voluntary groups. It is a co-ordinated approach that is required in which priority areas and actions are identified.

The Mayor also identifies the need to protect and enhance green spaces, and develop and promote a network of pedestrian routes. While the emphasis in the Mayor's strategy is on Central London, Harrow contains a number of green spaces which provide pedestrian routes through the borough.

The Mayor recognises that conditions for pedestrian's needs to improve, with reduced walking times and an enhanced pedestrian environment through design, pedestrian accessibility and security. The Mayor proposes to establish a partnership with London Boroughs and voluntary groups with expertise in walking and disability issues, to establish streetscape guidelines to encourage consistent good practice and design.

Apart from general needs for pedestrians, the Mayor also acknowledges that certain locations require specific treatment such as schools and hospitals. The mayor proposes to work in conjunction with the London boroughs to develop best practice guidance on audits of pedestrian facilities and accessibility, including issues relating to safety and the needs for disabled people.

The Mayor has recently published the London Walking Plan, which sets a number of targets for increased walking within the capital. The London Walking Plan requires local authorities to incorporate walking targets into their Local Implementation Plans. Local Implementation Plans are discussed in section 1.3.7 and specific targets set in the London Walking Plan are discussed in section 2.6.3 below.

2.6.3 Council policies to encourage walking

OBJECTIVE: To promote walking

In outer London the average distance walked in a year is 223 miles (1996-1998)-(National Travel Survey, Department of the Environment, Transport and the Regions-in (8)). 30% of all journeys within outer London are made entirely on foot (8).

ILIP POLICY W1: The Council recognises walking as a priority travel mode, to be treated on a par with other means of transport.

Harrow's Interim Local Implementation Plan focuses on foot travel as an important mode of transport. It looks at the importance of providing safe and pleasant direct routes to shopping and residential developments and looking at route audits for major pedestrian generators such as schools, health centres and offices. The Plan also looks at the importance of integrating pedestrian routes and public transport.

ILIP POLICY W2: The Council will assess walking permeability (a multiplicity of routes to give easy accessibility to form and within a site) for all new residential or business developments

How to encourage walking is a critical issue. The complex nature of walking and its sensitivity to details such as changes in level, feelings of security, air quality and the directness of the route make improvements very much a question of urban design as well as engineering. Residential developments need to be planned in a way which provides easy walking routes to the nearest local facilities.

ILIP POLICY W4: The Council will reinforce the need for new development to give priority to walking access in the revisions to the UDP.

ILIP POLICY W3: The Council will prepare a walking strategy, which sets our specific local criteria and action based on the national policy guidance, building on the LPAC's Walking Report and Sustainable Access to Town Centre.

The provision of circulation/exchange space, even in local centres, is essential to their functioning as commercial centres. Footfall is key to turnover and this is depends on getting people to circulate within a centre as freely as possible and with plenty of space to browse and socialise as well. For this reason the LPAC study 'Putting London Back on its Feet' (in 11) set out four different categories of walking:

- Access: where the whole journey is undertaken on foot
- Access sub-mode: where the walk is entirely related to using another mode (usually public transport)
- Circulation/exchange: where walking is part of the pattern of street life, especially in local and town centres
- Recreational: where the whole point of the walk is for pleasure or health reasons

Each of these needs a different approach:

- planning for "permeability" in residential and shopping developments, creating safe and pleasant direct routes at one level, undertaking route audits and catchment studies for major generators such as schools, health centres and offices as required in the Mayor of London's Transport Strategy
- improving access such as crossings at stations and bus stops, catchment area studies for public transport access points and interchanges

- creating enough space for people to congregate and undertake activities such as window shopping, talking and socialising; and providing frequent crossings "on demand" to increase footfall in local and town centres

- supporting the London Walking Forum routes but also looking at local links, for example to parks and leisure centres so that people do not have to drive somewhere to walk or run

ILIP POLICY W5: The Council will require that walking routes form an integral part of the improvement programme for public transport, with priority bus stops being treated as an interchange within the overall street design.

ILIP POLICY W6: The Council will require that any plans for local area packages or local initiatives, e.g. regeneration programme, a new school, employment site or other facility, are assessed to determine their catchments and how they can be enlarged.

ILIP POLICY W7: The Council will undertake street audits including assessing safety and security issues on defined routes as well as barriers – with priority being given to those identified by the community as particularly dangerous or important.

ILIP POLICY W8: The Council will ensure through its urban design activities that all aspects of the walking environment are effectively considered including signage, barriers and permeability.

ILIP POLICY W9: The Council will prepare a community street audit pack to enable local people to be involved or take the lead in undertaking the audits.

ILIP POLICY W10: The Council will utilise the outputs from the above audits and assessments as part of the on-going assessment of priorities for action.

ILIP POLICY W11: As part of any wider review the Council will reassess local and town centres as to whether the pavement space is adequate for its functions and how much extra space is needed, giving priority to those centres that are subject to regeneration action plans and thereby providing an input for the road space reallocation programme.

ILIP POLICY W12: In context of the reviews, the Council will give consideration to changing the emphasis given to vehicles at the expense of people in a limited number of areas, particularly in local centres or residential areas with high levels of pedestrian/vehicle conflict, as part of reinforcing safe walking routes.

ILIP POLICY W13: The Council will ensure that bus priority measures are designed to avoid creating additional problems for pedestrians and where necessary implemented outside areas identified for pedestrian priority, by relocating traffic queues.

ILIP POLICY W14: The Council will encourage recreational walking and special initiative on walking to sport and leisure facilities, linked to health policy, will be set up in partnership with the providers.

The ‘school run’ is often the busiest time on the road. Harrow has targeted the ‘school run’ as part of Agenda 21 activities. This scheme utilises the Walk to School week slogan to emphasis the benefits of improved health from walking to school, and to educate parents on the problems of, and alternatives to, driving to school. The Walk to School Week aims to establish reasons why children are driven to school and seeks to provide solutions to obstacles, which prevent them from walking.

The benefits of increased proportions of children walking to school include the obvious reduction in congestion and therefore a reduction in pollutant emissions and health consequences for children and their parents who travel to school. This is particularly important for parents who take younger children with them when they accompany school aged children, as it is young children (along with the elderly) who are more susceptible to health related problems resulting from high pollutant concentrations. Through the 'Safe Routes to School' initiative, walking routes will be developed that will provide parents with an alternative to driving their children to school. In this way walking to school will provide health benefits from the inherent exercise involved, from the reduction in exposure to elevated pollution levels, and also a reduction in road traffic accidents.

New Policy 19: Schools will be encouraged to develop a travel plan to assess current travel modes and to formulate initiatives to reduce the use of the private car. The Council will provide each school within the borough with information on implementing a travel plan. By the end of March 2005, 4 schools within in Harrow will have travel plans with measures in place to encourage walking, cycling and the use of public transport. By the end of 2006 this number will have doubled to 8 schools with travel plans.

It is also important to publicise the benefits of walking to all residents of the London Borough of Harrow. Walking has inherent health benefits as well as associated health benefits from reduced car use and hence reduced air pollution.

New Policy 20: The Council will publish and distribute walking information to residents in the borough. The information will include walking routes within the borough, connections to walking routes outside the borough and the health benefits of walking. The information will be distributed from October 2004.

The Mayor of London’s Walking Plan has recently been published (Feb 2004) and has, at it's heart, the vision that London should become one of the world's most walking friendly cities by 2015.

To help achieve this it proposes the following targets at a London-wide level have been established :

1. The short term target is to stop the decline in the number of journeys per person made on foot.

2. The long term 2015 targets are:
    a) to increase the modal share of walking trips under 2 miles by 10%
    b) to increase the average number of trips made on foot per person per year by 10%

c) to increase the level of London's 'walkability' both in terms of people's perceptions and in actual measured terms against other world cities.

In order for the plan to be successful each local authority must develop its own walking strategy that takes account of these broad London-wide targets. However the Mayor's Walking Plan does recognise that local circumstances vary greatly across London and that these broad targets must be translated into meaningful local targets.

In the development of the Councils Local Implementation Plan, targets will be identified for increased walking in the borough. While these will reflect the Mayor's targets for London, they will also include a consideration of local circumstances.

2.7. Encouraging Cycling as a Means of Travel

Cycling is a highly sustainable means of transport. The use of a cycle for a journey as opposed to the private car reduces congestion and does not provide any atmospheric pollution. Cycling also provides health benefits associated with the inherent exercise associated. In Many European countries cycling accounts for a large number of shorter journeys, such as those made by commuters to city centres. In London however, less than 2% or trips are made by bicycle. Half of all trips made in London are less than 2 miles and there is therefore room for an increased use of this environmentally friendly mode of travel. If all these journeys were undertaken by bicycle, a dramatic improvement in air pollution would result and road congestion would be reduced.

2.7.1 National policies to promote cycling

The National Cycling Strategy (NCS) was launched in 1996 (2). The NCS aims to establish a culture favourable to the increased use of bicycles for all age groups; develop sound policies and good practice; and seek out innovative and effective means of fostering accessibility by bike.

The central target of the NCS is to double the amount of cycling trips made in 1996 by 2002; and double it again by 2012.

1998 saw an important boost for cycling with the publication of the UK Transport White Paper 'A New Deal for Transport: Better for Everyone' (1). The White paper fully recognises the role of cycling and its potential to help deliver the aims of an integrated transport system. The White Paper sees cycling as being key to obtaining air quality objectives, reductions in traffic congestion and the health of the nation.

The White Paper emphasis's the importance of initiatives at a local level to achieve the targets set.

2.7.2 GLA policies to promote cycling

The Mayor acknowledges that there are a number of deterrents to cycling. While over one-third of London Households own at least one bicycle, most people are discouraged from using them because of traffic conditions and lack of facilities such as secure parking.

The Mayor's strategy identifies the main deterrents and sees that conditions must be improved to ensure that routes are fit for cycling so that they are safe, convenient and pleasant. The Mayor's focus on streets for all emphasis's the need to provide road space for all users and as such cycling routes will be identified and improved. The Mayor also recognises that there are specific requirements for bicycles and addresses these needs in a number of policies and proposals. One such proposal emphasises the need for Transport for London and Local Authorities to work with cycling groups to provide a safe and convenient cycling environment.

The Mayor also addresses the need to develop a consistence and balanced approach to cycling and proposes to develop a single body, a 'Cycling Centre of Excellence' to

prepare a plan to guide the development of cycling initiatives in consultation with local authorities and cyclist user groups.

2.7.2.1 The London Cycling Network

The London Cycle Network (LCN) is currently the major initiative for improving conditions for cycling within London. The implementation of the LCN has continued over a decade but its development has not been consistent. As such, the Mayor suggests that a new focus on cycling needs is required including a need for more resources and expertise. The mayor acknowledges that a scheme of this size needs to be dealt with on a phased basis so that those areas with the most important links are completed at the earliest opportunity. In this way the Cycling centre of Excellence will develop a project management model similar to the London Bus Initiative and will ensure that priority high demand routes will be completed by 2004 while the remaining network will be completed by 2008, to a consistently high standard.

The Mayor through Transport for London will also look at extending high quality cycle routes based mainly on the London Cycle Network. At the end of 2002 a high quality route had been identified. The aim now is to complete the extended high quality cycle route over the next ten years.

The Mayor's Strategy does not only concentrate on the roads covered by the LCN but also focuses on the other 80% of roads. Cyclist use these routes and improvements should be made so that cycling in London is safe. Route audit procedures were therefore in place at the end of 2001. Particular attention should therefore be focused on accident hot spots.

The Mayor's Strategy also emphasises the need to provide safe and secure cycle park facilities. Transport for London in partnership with rail operators, businesses and educational establishments, will provide additional secure cycle parking facilities including facilities at shopping centres and transport interchanges. The Mayor will also encourage the implementation of facilities at places of education and workplaces. The Mayor will also expect London Boroughs to require developers, where practicable, to provide good access for cyclists, safe and secure parking facilities and showers, lockers and changing facilities.

2.7.3 Council policies to encourage cycling

OBJECTIVE: To promote cycling

On a typical day in 1991, only 1.2% of journeys made wholly within Harrow were by bicycle (11). It is likely that this figure has increased through the implementation of sections of the London Cycle Network in Harrow, but there is still room for encouraging an increased use of the bicycle. Harrow's sections of the London Cycle Network are shown in Figure 3.

Cyclists in Harrow are 6.1% more likely to be fatally or seriously injured than car users (11). Cycling is even more widely perceived as being dangerous, and cyclists are often subject to a hostile local cycling environment.

ILIP POLICY C2: Given the inherent relative danger of cycling vis-à-vis other vehicular transport modes, the Council will give priority to the safety issues of cycling when considering schemes.

ILIP POLICY C4: The Council will seek to achieve the highest practicable standards of cycling safety and convenience, by means of engineering design and sensitive implementation; where ever practicable, and depending on the specific characteristics of an individual cycle route or site, segregate cyclists from other vehicular and pedestrian traffic

The council is obliged to provide LCN links within the borough and to ensure their connection with links in connecting boroughs. The Council however does have a choice as to whether it simply manages the links or promotes, and makes special provisions for, cycling.

ILIP POLICY C1: The council will promote, support and encourage the use of bicycles generally, and in particular for journeys to schools, workplaces and shops as a key element of the transport strategy.

There are a number of reasons for adopting a positive and proactive approach to cycling, including:

- the impact that increased use could have on improving air quality
- its role as a further alternative to car use
- the inherent sustainability of cycling as a transport mode
- its very efficient use of road space
- its availability as a matter of personal choice
- its contribution to personal health and well-being

ILIP POLICY C3: The Council will progressively develop a Borough-level network of cycle routes incorporating all LCN routes together with such additional routes and/or 'spurs' as will be necessary to serve all major generators/attractors of person-trips, such as town centres; schools/colleges; stations; libraries; parks; local shopping centres; sports centres; hospitals; and major work locations; and will undertake "cycle audits" at key stages of developing a cycling route.

Figure 3

London Borough of Harrow

LONDON CYCLE NETWORK IN HARROW

Cycle Routes

June 2001

ILIP POLICY C5: In considering individual schemes, the Council will seek to provide both for the most direct routes for cycling between places and for the segregation of cyclists from other vehicular traffic by means, in priority order, of:

- fully segregated cycle tracks (from both vehicles and pedestrians)
- cycle tracks fully segregated from vehicular traffic but occupying a clear delineated part of a footway
- mandatory cycle lanes on local or main roads or a "dual provision" approach to offer choice
- cycle tracks in parks, available at all hours and only where such provision is not practicable consider:
- shared use of bus lanes
- cycle tracks in parks, during park opening hours, together with appropriate diversionary routes at other times
- advisory cycle lanes on local or main roads
- shared use of footways

ILIP POLICY C6: Where schemes are designed to permit car parking beside cycle tracks/lanes, the Council will ensure, by appropriate design and implementation, that cyclists are not obliged to deviate from their 'normal' line of travel and are accommodated between the parked cars and the footway.

ILIP POLICY C7: The council will ensure the progressive achievement and maintenance of a high quality of cycle route provision, as well as clear continuity and consistency in design; and will ensure that, wherever practicable, provision is designed and implemented to cater for tricycle and trailer use.

Tricycle and cycle-trailer use is slowly increasing in popularity. Specific provision will help to maximise overall use of pedal cycles, by increasing the relevance of the available facilities-in particular, for older cyclists and cyclists who have made specialised arrangements to carry goods/luggage, as a means of maintaining cycling as their choice of transport.

ILIP POLICY C8: The Council will give a high priority in its maintenance and other programmes affecting the road network to keeping cycle facilities available and in good condition.

ILIP POLICY C9: In all future plans and when considering any transport and development proposals, the Council will give more priority to provision for non-motorised modes of travel including cycling on all local access roads.

ILIP POLICY C10: The council will publish and distribute cycling leaflets and maps, in areas of the Borough, identifying the locations of designated cycle routes, barriers to use (including main roads) and main road crossings.

New Policy 21: The council will distribute cycling information to residents in the borough and place cycle maps at information points and other locations around the borough. The information will include cycling routes within the borough, connections to cycling routes outside the borough, the health benefits of cycling and details of cycle retailers within the borough. The information will be distributed from October 2004.

The purpose of publishing and distributing cycling information and maps is to draw the attention of residents, workers and visitors to the borough of the realistic availability of cycling as an increasingly viable means of transport, and to pose cycling as a real choice of transport mode.

ILIP POLICY C11: The Council will use its powers and resources to provide secure and weather-protected cycle-parking at sites generating and/or attracting significant numbers of cycling trips-most particularly, at strategic interchanges and stations; and encourage other authorities with specific responsibilities within the Borough to do the same.

New Policy 22: The Council will continue to investigate and implement measures such as cycle routes and cycling parking facilities to promote greater use of cycles.

To be fully effective, in addition to providing for cycle movement, the Transport Strategy must ensure the availability of cycle parking. This is particularly important at the 'non-home' end of a journey, which will often be a point of access to the public transport network-usually an interchange or a station. Convenience will generally be determined by proximity to the actual destination. The overall attractiveness of cycle parking however will depend significantly on the security of any provision.

ILIP POLICY C12: The council will use its powers as local planning authority to make planning permission for future development conditional upon the availability of an appropriate level of pedal cycle parking and facilities such as showers and lockers and encouraged provision of "cycle pools".

ILIP POLICY C13: In existing developments, the Council will encourage employers to make provision for employees wishing to cycle to a similar standard to that it requires from new development including the provision of "cycle pools".

ILIP POLICY C14: The council will support schemes which make pedal cycles available for hire-possibly on the basis of an on-demand "take-here/leave-there" service.

Because of the very low current level of cycling in the borough it is important to encourage any initiative which increases the amount of access people have to cycling facilities. Such initiatives would assist the promotion of cycling as a viable and desirable means of transport.

ILIP POLICY C15: The Council will promote the recreational use of cycling-but give priority to its aim of increasing cycling as an alternative to car use.

POLICY: The Council provides cycle training, including on-road cycle training, for primary and secondary school children.

During school holidays, beginning during Easter and continuing until the October half term, cycling proficiency courses are available for primary and secondary school children. The courses provide valuable safety training for young cyclists and encourage cycling as a mode of travel.

2.8 Encourage Development which does not Impact Upon Air Quality

2.8.1 National policies to prevent development impacting upon air quality

Planning policy guidance notes (PPGs) that are produced by the DTLR, provide advise on the practical implementation of sustainable development strategies. Underpinning these PPGs is the Strategy for Sustainable Development for the UK: A Better Quality of Life (1999) (in 6), which includes effective protection of the environment as a key aim.

PPG1: General Policy and Principles (1997) (in 6) sets out the revised agenda for the planning system. The Government's approach is identified under three main themes:

1) Sustainable Development aims to deliver economic development which will secure higher living standards while protecting and enhancing the environment. PPG1 reiterates the importance of the UK Strategy for Sustainable Development, first produced in 1994 and now superseded by the 1999 Strategy. Objectives for creating a more sustainable pattern of development are highlighted, including:-

   i) concentrating development for uses which generate a large number of trips in places well served by public transport, especially town centres, rather than in out-of-centre locations; and
   ii) preferring the development of land within urban areas, particularly on previously developed sites, providing that this creates or maintains a good living environment, before considering the development of green-field sites.

2) Mixed-use developments are seen as a means of creating greater vitality and diversity and reducing the need to travel. They are seen as being more sustainable than development consisting of a single use, and development plans should include policies to promote new mixed-use and retain existing ones, particularly in town centres and in areas highly accessible by means of transport other than the private car.

3) Good Design is seen as the aim of everyone engaged in the development process and can help promote sustainable development, improve the quality of the existing environment, attract business and investment and reinforce civic pride and a sense of place. Importantly, good design is seen as one way of securing public acceptance of necessary new development.

PPG13: Transport (2001) (in 6) sets down objectives to integrate planning and transport at all levels in order to promote more sustainable transport, and reduce the need to travel, especially by car. This will entail focusing major generators of travel demand in town centres and near points of high public transport accessibility, such as major public transport interchanges, and encouraging local facilities where they can easily be reached by foot or cycle, particularly local centres. Higher densities of development, particularly housing, at points of high public transport accessibility should be encouraged wherever possible. This will assist the Government's strategy

on sustainable development, including promoting social inclusion, and revitalising towns and cities as places to live and work. Development plan policies should ensure close linkages with the local transport plan, whilst a range of more detailed advice aims to secure location of new development in order to reduce travel by car. Priority for people over traffic in town centres and other locations is also encouraged.

Conditions can be attached to planning permission to secure: facilities for cyclists, pedestrians and public transport users; the management of parking spaces; and the provision and implementation of a travel plan. The latter should set out the measures the occupier of a development will carry out to reduce the numbers travelling to the development by car. Planning obligations can be used to achieve improvements to public transport, cycling and walking facilities that would influence the means of travel to the site.

- priority should be given to people over traffic in town centres, other areas with a mixture of land uses and local neighbourhoods. More road space should be given to pedestrians, cyclists and public transport in these locations.

- A continuing shift away from investment in new roads towards investment in the public transport, cycle and pedestrian networks.

- A fundamental shift in parking management policy, involving much lower, maximum parking standards.

- The needs of disabled people should be taken into account in all new schemes and developments, and in the implementation of policies.

PPG3: Housing (2000) (in 6) set out the Government's housing objectives, including the need to create more sustainable patterns of development, the need to secure the most efficient and effective use of land, seeking to reduce car dependence, and the promotion of good design in new housing developments.

PPG12 (in 6): Includes a description of the relationship between the UDP and the Local Implementation Plan (LIP) (and Borough Spending Plan (BSP)-the Council's annual bid for Transport for London (TfL) finance), which is underpinned by the borough's Local Transport strategy (LTS), the Mayor's Transport strategy and Central Government guidance. PPG 12 also encourages Local Authorities to request a Transport Assessment from applicants for major developments. These need to set out the proposed modal split of traffic travelling to the development and the proposed measures to improve access by public transport, walking and cycling.

2.8.2 The GLA's London Plan

In February 2004, the Mayor published the London Plan for consultation (6). The London Plan has as its main theme the ambitious target of accommodating population and economic growth in London without encroaching further on open space within or outside its boundaries. To achieve this aim and to provide for sustainable development it will be necessary to make better use of land and buildings.

Development in London can have a major impact on air quality. Air quality can be impacted upon from the design phase right through to the end of life of the building. Air Quality can be affected by ignoring many simple issues such as: the effect of building aspect on heating requirements; developing in areas where travel by car is encouraged and by designing a building which has a very short life span.

The Mayor's London Plan identifies the need to prioritise development that is in previously developed sites and buildings within the urban area that are, or will be well served by public transport and encourages boroughs to include policies to ensure development in these areas.

The Mayor emphasises the need to also look for development which has good walking and cycling access.

The Mayor recognises that West London is a thriving part of the city with international businesses, a growing knowledge economy and some concentrations of manufacturing. The London Plan (6) estimates that West London alone could accommodate 60,000 additional homes. The target for 2016 is for a 6620 home increase in Harrow. It is important that development of this magnitude does not impact upon air quality. Increased population must be met by development in areas where public transport is accessible and there is access for walking and cycling. Development must also identify the need for energy efficiency. Buildings should be constructed so that they have a longer lifetime and so that modifications and changes in building use can be accommodated.

Section 2.4.5.1 identifies the need to focus on travel to schools. The Mayor's London Plan identifies the need to provide for new school developments only in locations that have good public transport access. Schools are major traffic generators and any new school development should be considered carefully in regard to local traffic flow effects.

The Mayor acknowledges the importance of co-ordinating development strategies with transport strategies. The Mayor discourages the development of high trip generating developments in areas that are not served by high levels of public transport accessibility and capacity, sufficient to meet the demands of the development.

The Mayor further recognises the impact that development can have on traffic congestion by encouraging boroughs to consider proposals for development in terms of existing transport capacity. Where existing transport capacity is not sufficient to allow for travel generated by proposed developments, and no firm plans exist for a sufficient increase in capacity to cater for this, boroughs should ensure that development proposals are appropriately phased until it is known these requirements can be met. Developments with significant transport implications should include a Transport Assessment and Travel Plan as part of planning applications.

2.8.3 Council policies to prevent development impacting upon air quality

OBJECTIVE: To prevent development impacting upon air quality

It is important for Council policies to reflect National and GLA policies. Development in Harrow must be undertaken in a way which encourages

sustainability. As such, it is important that development does not impact upon air quality. Development should not encourage an increased traffic flow, and it is important that policies reflect this. Buildings should also be designed with energy efficiency in mind, for extended life spans and to allow modification and change in use.

UDP POLICY EP24: The Council will take into account the effect of development and changes of use on local air quality in determining planning applications. Proposals likely to have an unacceptable impact on local air quality will not be permitted. The Council may require the developer to carry out an assessment of the impact of their development on local air quality.

New Policy 23: The Council will require an Air Quality Assessment for all new developments where there is potential for a significant increase in air pollution.

The definition of 'Significant' will be determined during the development of Sub-regional Policy Guidance for West London. In utilising a standard agreed across West London a more universal approach will be taken by adjacent Councils. The development of Sub-regional Policy Guidance is discussed in section 1.3.5.

Harrow's UDP (12) includes a number of targets which are based on the UK strategy for Sustainable Development (1999) (in 12), the report 'Quality of Life Counts' (1999) (in 12), and the handbook for a menu of local indicators of sustainable development entitled 'Local Quality of Life Counts' (2000) (in 12). Those targets that specifically and directly relate to air quality include:

- Increase the average density of new residential development in locations with good public transport accessibility by at least 10% over the average residential density achieved in the 5 year period 1996-2000.

  With certain housing development targets being identified for Harrow, it is important for development to be focused on areas where public transport accessibility is good so that developments are not creators of increased traffic flow. With congestion being a major factor effecting air quality in Harrow it is essential to reduce traffic flow and not intensify congestion problems.

- A 10% reduction of 1997 road traffic levels by 2010 (in terms of vehicle numbers)

- A reduction in the proportion of urban journeys undertaken by car by 35% by 2020.

- All medium/large development schemes to be designed to maximise integration of different modes, with pedestrian, cyclist and public transport user priority over the car.

- The implementation of 10 Travel Plans by employers, schools and community facilities over the plan period.

- Within centres where such data is collected, average footfall levels should not fall significantly below 1999 levels.

Providing an environment which is conducive to walking is an important factor in encouraging walking and reducing the number of journeys which are made by car.

2.8.3.1 Energy use and conservation

UDP POLICY SEP1: In assessing the impact of development proposals the Council will take into account their contribution towards reducing the use of and reliance on fossil fuel energy.

The burning of fossil fuel creates emissions of a number of different pollutants. Fossil fuel combustion produced high levels of carbon dioxide a contributor to climate change. Sulphur containing fossil fuels, such as coal lignite and heavy fuel oil release sulphur dioxide during combustion. Emissions of particulate matter also results from the combustion of fossil fuel including home heating and motor vehicle combustion The high burn temperature achieved during fossil fuel combustion causes the oxidation of nitrogen in the atmosphere and the production of nitrogen oxides such as nitrogen dioxide. Energy conservation, energy efficiency and sustainable resource are considered a material consideration in determining planning applications.

Building design and construction can greatly effect the energy use of a building, during its construction phase and through to the building use. Planning applications will need to address this and only suitable developments will receive planning permission.

UDP POLICY EP9: Development proposals should take into account the need to conserve energy through appropriate design, layout, orientation, density and location.

The promotion of energy efficiency and the adoption of sustainable design principles will help reduce the overall environmental impact of development and land use in the borough. Such matters need early consideration in the design process. Development proposals should maximise energy efficiency, and contribute to lower resource consumption, through layout, orientation, siting of windows, materials used, insulation, air movement, solar access and building design and construction.

UDP POLICY D4: The Council will expect a high standard of design and layout in all development proposals. Energy efficiency, sustainable design and construction will be taken into account when considering planning applications for development. Further details will be included in supplementary planning guidance.

New buildings in town centres will be expected to be designed with energy efficiency, sustainable design and construction in mind. Town centre development occurs in areas which are particularly sensitive to traffic flow. Development should not encourage an increased traffic flow. Town centres in Harrow, by their very nature, are a focus of the transport network and as such, are particularly susceptible to elevated air pollution levels.

UDP POLICY D7: New buildings in town centres should take into account energy efficiency, sustainable design and construction, and will be expected to contribute to the public realm, be distinctive and reflect their role as a focus for activity.

The Council also encourages energy conservation in private homes. The emissions of NOx and CO_2 from private houses within Harrow can be greatly affected by an improvement in energy efficiency. In support of the Home Energy Conservation Act 1995, Harrow have implemented a number of schemes to improve energy efficiency within private homes. Energy efficiency remains high on Harrow Partnership's agenda. The Council's Fuel Poverty Report 2000 sets out the Council's objectives for creating affordable warmth and energy efficiency across all housing tenures and the HECA Progress Report 2002 showed a 6.19% improvement in overall energy efficiency in Harrow from 1996-2002.

POLICY: Harrow will continue to work with partners to identify opportunities to seek additional resources, make strategic links and target the poorest households and properties. The Council will also raise awareness of the benefits of energy efficiency measures through advice, education and promotion.

2.8.3.2 Renewable energy

Energy use is vital to many activities undertaken at home, at work and in all areas of our life. Energy is used for cooking, heating the home, boiling the kettle, operating computers and in most activities we undertake during the day. The source of energy can be localised, such as gas boilers or produced at central locations, such as the production of electricity from coal fired power plants. While energy is essential to our daily routine, its production and use is often associated with air pollution emissions.
There are many ways of reducing the emissions of air pollution resulting from energy use and they can be grouped into two main areas. Firstly, we can obtain energy from energy sources which contribute a smaller amount of atmospheric emissions per unit of energy generated and secondly we can reduce the overall amount of energy used.

UDP POLICY EP7: The Council will encourage renewable energy schemes, such as passive and active solar energy schemes and small-scale windpower by:-

- Requiring new development to be designed in such a way as to maximise the potential for passive solar energy and natural ventilation and, where practicable, to accommodate future installation of solar panels;

- Supporting innovative proposals and demonstration schemes;

- Providing advise, including supplementary planning guidance and advice on grants

Providing there is no unacceptable impact on the environment or residential amenity.

Buildings account for more than half of all energy used and travelling between them a further quarter. Energy is used through out the development of a building from the extraction of raw materials to the use and end of life of a building. There are many

ways in which this energy use can be reduced and alternatively sourced, so that the impact upon air quality is reduced.

The use of renewable energy for the heating buildings can have a positive impact on air quality. Passive solar design makes the most of the sun's natural heat and light, a buildings orientation and available shade to ensure the optimal environment for the occupiers. Active systems, such as photo-voltaic systems convert sunlight directly into electricity. This technology is improving all the time. While the initial costs for the inclusion of photo-voltaic cells into buildings are often high the running cost for energy production is lower. Other renewable energy technologies such as the development in the wind power field may also provide for viable energy production schemes at the local level. With improvements in costs and developer experience, the use of renewable energy provided at a local scale may play an important role in reducing both localised emissions of air pollutants and national air quality.

2.8.3.3 Energy supply and generation

UDP POLICY EP8: The Council will foster the supply of environmentally sound, non-polluting and local forms of energy supply, by encouraging:-

- Combined heat and power and community heating schemes;
- Energy recovery from waste which does not generate unacceptable pollution;
- Development with photo-voltaic or solar water heating;
- Refilling facilities for alternative fuels at fuel filling stations; and
- Re-charging facilities for electrically powered vehicles

Provided there is no unacceptable impact on the environment or residential amenity.

Current patterns of energy generation and consumption rely primarily on burning fossil fuels which has a major impact upon air quality. The council therefore encourages the use of renewable energy production such as the use of photo-voltaic cells, and also energy production schemes that maximise energy efficiency, such as combined heat and power plants (CHP).

New Policy 24: The Council will assess combined heat and power proposals using the Custom and Excise ‘good quality CHP’ index.

It is also important to encourage the provision of refuelling facilities for cleaner fuelled vehicles. The uptake of cleaner technologies will in part be determined by the accessibility to a refuelling network. People are unlikely to switch to vehicles which are powered by Liquid Petroleum Gas, a cleaner , less polluting fuel than both petrol and diesel, if refuelling is seen as an inconvenience. Accordingly it is also important to encourage the re-charging facilities for electric-powered vehicles. Electric powered vehicles present a negligible impact to localised air pollution and it is therefore important to encourage their uptake. Obstacles to the use of electric vehicles will greatly effect their attractiveness.

2.8.3.4 Layout, design and movement

Buildings should be laid out in such a way as to encourage pedestrian movement, minimise the distance to other land uses and public transport, reduce car dependency and maintain a high level of accessibility. The layout of streets should take account of the range of different needs and offer safe, attractive and convenient environment to all users. Whilst car and service vehicles will need to be accommodated, traffic dominated development should be avoided and greater priority given to pedestrians, cyclists and public transport. The layout should also take into consideration desire lines, topography and access to the site. Walking through an area should be a pleasurable process of travelling between activities, and the number of people present will provide security.

The layout of buildings along the street can have a significant impact on the environment. Excessively wide roads with houses clustered around cul-de-sac and spaces do not contribute to a pedestrian-friendly environment. Cul-de-sac layouts result in higher traffic levels on feeder roads, longer, indirect routes for pedestrians, and limited visual interest. A permeable layout encourages pedestrian movement, resulting in a better used and safer environment. New development needs to be integrated with the surrounding area, with good connections to the existing network of roads and footpaths, allowing people and goods to move easily and safely from one place to another.

UDP POLICY D4: The Council will expect a high standard of design and layout in all development proposals. Layout, access and movement will be taken into account when considering planning applications for development. Further details will be included in supplementary planning guidance.

2.8.3.5 Mixed use development

UDP POLICY SD3: The council will promote mixed-use development, particularly in town centres and other areas with good public transport accessibility, and seek to retain development already in mixed-use. In other locations, a mixture of uses may be sought.

Mixed use developments reduce the need to travel and can therefore aid the reduction in traffic flow within the borough.

2.8.3.6 Land use and the transport network

Every new development has the potential to generate traffic and therefore influence air quality. Some redevelopment may not impact upon the number of vehicles travelling to a site but may alter the vehicle make up on roads. This can influence the air pollutant species. An increased flow of lorries may impact upon the particulate matter concentrations on the roadside. For minor schemes, depending on location, the impact may be small, but where there is an effect, the developer will be expected, in the first instant, to set out a realistic and practicable statement on how car use will be minimised, appropriate to the activities that will be carried out at the development. It is important for development policies to be co-ordinated with the Interim Local Implementation Plan so that transport strategies aimed at reducing congestion, and

hence air pollution, are not compromised by development that encourages an increased flow of cars or lorries.

UDP POLICY ST1: Proposals for the development and redevelopment of land and buildings in the borough must accord with the policies within the Harrow Local Transport Strategy and in particular the following criteria:-

a) Major trip generating developments should be located where there is good public transport, cycle and pedestrian access;
b) New developments which expand the range of facilities, including local facilities, that can be visited in one trip will be encouraged to locate in town centres;
c) Mixed-use and higher density development will be encouraged to locate where public transport access is good.

UDP POLICY T6: For all proposals which generate traffic, or where redevelopments will lead to the types of vehicles visiting the site changing significantly, the Council will:-

- Require the developer to demonstrate how the numbers travelling to and from the site by car will be minimised. A Transport Assessment will be required where the development will generate significant levels of traffic, or otherwise have significant transport implications;

- Require appropriate non-car orientated measures, funded by the developer, to minimise the non-sustainable traffic generated and its impact on the highway network and on the environment, both immediately adjacent to the site and in the surrounding area;

- Consider the effect on air quality, and may refuse proposals which would potentially cause a significant detrimental effect on air quality in the Air Quality Management Area (AQMA). An environmental statement including an assessment of the development's effects on air quality, will be required where the AQMA is likely to be adversely affected.

For schemes where there is a significant generation of traffic, or other significant transport implications, a Transport Assessment will be required, which should include the elements set out in PPG 13 (2001) (in 12) and good practise advice published by Government. The Transport Assessment should include the likely modal split of journeys to and from the development. It should also set out proposals to improve accessibility by public transport users, cyclists and pedestrians. The Transport Assessment should also contain measures to reduce the need for parking and to mitigate transport impacts.

However, measures taken by the developer may not prevent an impact by non-sustainable traffic (cars and lorries) and so in the second instance, the developer would be required to fund measures in the area surrounding the site to address problems such as increased congestion which may effect localised air pollutant concentration. In this manner the developer may contribute to the implementation of a controlled parking zone (CPZ) to free up road space and encourage free flowing

traffic. The developer may also include initiatives to improve pedestrian and cycling facilities so that these more sustainable modes of travel are encouraged.

The Council will consider the effect that all developments may have on air quality. Developments that are seen as threatening air quality will be refused. The Town and Country Planning (Environmental Impact Assessment (England & Wales) Regulations (1999) (in 12) states that any proposal:

- with the potential to increase volume of traffic flows by more than 10% on roads with flows greater than 20,000 vehicles per day; or

- which is located in, or is likely to affect, an AQMA, and which would significantly change patterns of traffic flows or could emit one of the pollutants specified in the NAQS (This includes all proposals within the London Borough of Harrow as Harrow has been declared a borough wide AQMA).

should be accompanied by an Environmental Statement that should include an assessment of the proposal's effect on air quality. The council will consult with neighbouring authorities where a development could have an effect on an AQMA in a wider area.

UDP POLICY ST2: Traffic management measures with the objectives of reducing growing congestion, pollution and environmental damage will be implemented on the borough's highway network giving public transport, cycles and pedestrians priority, and recognising servicing needs.

PPG13 (in 12) indicates that in town centres, local neighbourhoods, and other areas with a mixture of land uses, priority should be given to people over ease of traffic movement, and more road space should be given to pedestrians, cyclists and public transport. This will be achieved through re-allocation of road space and the installation of priority measures in favour of these three modes.

2.8.3.7 Proposals for new employment-generating development

UDP POLICY SEM3: The Council will consider favourable proposals for employment-generating uses in suitable locations with good access by modes of travel other than the car. The council may require that access by modes of travel other than the car is improved.

New business and industrial development in suitable locations other than established places of employment will be encouraged where these are accessible by public transport. While employment-generating development is encouraged because it will maximise the opportunities available to Harrow residents and will foster the Borough's economic health, it is important that traffic flow remains unaffected. Congestion resulting from increased employee car use and deliveries may have a major impact upon air quality. It is important that any such developments are in areas which have good provision of public transport.

2.8.3.8 Designing new development with good access in mind

UDP POLICY T7: All developments should be designed so that there is safe, easy access for all, from, and within, the site. Access for users of non-car modes should be provided in such a way that it is more convenient than access for users of cars, except that, in all cases, ease of access for disabled people shall be given the highest priority. For all developments a statement of accessibility will be required setting out how it is proposed to achieve good design.

The immediate access to a site needs to be carefully designed, however small or large the site. The position of a building on the site should allow for safe, clear, unimpeded access for pedestrians, cyclists and disabled people, whichever mode the later arrived by. Pedestrian routes from bus stops should be direct, obvious and signposted if the development attracts significant number of visitors. Where there is a conflict with vehicles, priority should always be for pedestrians and cyclists. Parking for the latter, and for vehicles used by disabled drivers, should be located as close to the building as possible. For larger sites, movement through the site for pedestrians and cyclists should be via direct, safe routes, using the shortest route to buildings possible, with priority over motor vehicles. Car parking, if provided, should be located so that it is not interposed between a building on the site and the access(es) to the site, thus lengthening walking distances.

2.8.3.9 Arts, culture, entertainment, tourist and recreational activities

UDP POLICY SR2: Provision and improvement of arts, cultural, entertainment, tourist and recreational facilities will be encouraged. Facilities proposed should be

A) Accessible to all;

B) Acceptable in terms of their environmental impact, on residential amenity, wildlife, and travel to and from those facilities; and

C) Located according to the following criteria:-

1) High intensity activities should be located in town centres or other areas of good public transport accessibility.
2) Low intensity activities or activities that require large areas of open land but few buildings, such as golf courses, sports pitches and riding stables, may be located within the green belt and metropolitan open land, provided these do not conflict with green belt and metropolitan open land aims.
3) For other types of activity (those not covered by the above) preferences will be given to locations easily reached by public transport, walking or cycling.

While it is important that the Council encourages a range of arts, cultural, entertainment tourist and recreational facilities for the benefit of the borough's residents, workers and visitors, it is important that such developments do not impact upon air quality. It is therefore important for such developments to be located in areas that have good public transport access and also access via walking and cycling. Siting leisure uses in town centres can help maintain the vitality of the centre and also provides a location where public transport accessibility is high.

For the purpose of applying criterion C) of the above policy, high intensity activities include uses that require a substantial building, or buildings, have large numbers of visitors and frequent activity, such as theatres, cinemas, bowling allies, skating rinks, night clubs, sports centres and swimming pools. Low intensity uses are quiet, casual informal or passive activities, such as picnicking, horse riding, walking and cycling. Activities that require small buildings, but are subject to continuous or intermittent use by large numbers of people, e.g. community halls, small scale indoor sports facilities should be located in built up areas, in locations easily reached by public transport, walking or cycling.

2.8.3.10 The release of controlled substances

Harrow has a number of industrial processes, which contribute to air pollution. One such process is a combustion process at Kodak's site in Headstone Drive. A number of combustion associated emissions, including nitrogen dioxide and particulate matter, which are released from this process are regulated by the Environment Agency under The Environmental Protection Act 1990. As such, stringent emission limits are set for the combustion process and intense monitoring is undertaken to ensure requirements placed on Kodak are adhered to. The combustion process at Kodak is therefore not seen as a major contributor to air pollution within Harrow. The Council is limited in its ability to control emissions from this source. The process is currently being reviewed under the Integrated Pollution Prevention and Control Act 1999 (IPPC) a new regime for authorisation. IPPC will include a review of the requirements placed on Kodak to control the emission of air land and water pollutants.

Harrow has 24 small industrial (Part B) processes, which are regulated under The Environmental Protection Act 1990 or Pollution Prevention and Control Act 1999. Of these small industrial authorised processes, 3 processes are authorised at Kodak, Headstone Drive including; one film coating process, a paper coating processes and a coating manufacturing process. 19 processes are petrol stations and the other process is a mobile concrete crushing facilities.

The concrete crusher is authorised because of the high emissions of particulate matter that can be produced by crushing processes. The crusher is mobile but the Authorisation is held with Harrow because the holding company has its head office within Harrow. The crusher is permanently located outside the borough.

The 3 processes at Kodak are controlled for their emissions of VOC's and Particulate Matter. The authorisation requires stringent emissions targets to be met and emissions monitoring is undertaken which is reported to the Local Authority at regular intervals.

19 petrol stations in Harrow are authorised under the Environmental Protection Act 1990. Vapour recovery from deliveries of petrol is a requirement of all petrol stations with a through put greater than $1000m^{30}$ per year. This is to reduce the emissions of Volatile Organic Compounds (VOC's) which can pose health concerns at high concentrations and contribute to the formation of other pollutants.

Vapour recovery will be extended to all petrol stations with a throughput of more than $1000m^3$ a year by 2005. The recovery of vapour from the fill nozzle/vehicle fuel tank is to be introduced under a new scheme for authorisation. The new scheme, Local Air

Pollution Prevention and Control (LAPPC), to control emissions to air, will be fazed in for all local authority controlled processes between now and 2007.

LAPPC is also likely to bring a number of paint spraying facilities within the threshold required for authorisation (a through put of more than 500Kg of organic solvent per annum). The paint spraying processes must control emissions of Volatile Organic Compounds (VOC's) and Particulate Matter. VOC's are controlled by the use of compliant coatings, which have a limited concentration of organic solvents, and/or through the use of emissions abatement controls within a controlled spray booth. Particulate matter is controlled by emission abatement equipment within the spray booth before final emissions are passed to the air.

New Policy 25: The Council will continue to regulate Part B processes (and Part A2 processes as necessary) within the borough and assess the permitting of such processes in light of air quality objectives.

It is essential for processes operated by the Council, such as power plants, do not lead to exceedences of National Air Quality Strategy Objectives.

New Policy 26: The Council will ensure that borough related process emissions do not lead to exceedences of the National Air Quality Objectives.

2.8.3.11 Under construction

Pollution is also produced temporarily when buildings are demolished or are under construction. Particulate matter is emitted either from the works themselves or from stock piles. Other pollutants may also increase in the area depending on traffic controls while work is being undertaken and from construction traffic itself. However, planning application conditions are used to minimise this type of pollution. This can be controlled by sheeting vehicles leaving and entering a site, cleaning mud which is transported to the road outside the site, dampening down the site to prevent dust entrainment, chuting material and covering stock piles.

2.9 Public Information and Education

Our own travel modes affect the amount of pollution we generate. Walking and cycling are emissions free and have the added benefit of improving health. Regular exercise, such as taking a short walk instead of driving, can reduce the risk of developing heart conditions, counter obesity and improve bone development. Car drivers are regularly exposed to higher levels of pollution than cyclists or pedestrians. In heavy traffic the exposure to pollution can be three times greater for car drivers.

Short journeys-of two miles or less-contribute disproportionately to air pollution if they are made by car, since engines and catalytic converters do not work effectively until properly warmed up. Reducing the number of short journeys made by car is an effective way in which individuals can improve local air quality.

The 'school run' is a time where congestion on roads is often at its greatest. Almost a third of primary school children in London are now taken to school by car, though four in five live within two miles of school (7). The development of initiatives such as 'safer routes to school' and 'walking buses' will only be a success if individuals respond to these schemes and increased numbers of children travel to school by foot.

Walking to school reduces children's exposure to air pollutants. Young children (along with the elderly) are most susceptible to the health affects associated with air pollutants. Walking to school also provides social interaction and has associated health benefits from the exercise aspect of the journey.

Peoples vehicle choice can also help to reduce air pollution emissions. Cars with smaller engines are generally more efficient. Purchasing an alternative fuelled vehicle such as LPG vehicles, electric vehicles and CNG vehicles, can also have a positive effect. As discussed in section 2.3.2, these cars have lower emissions than conventional fuelled vehicles and are a viable alternative in many situations.

Driving style also impacts upon air quality. Harsh accelerating and braking increases fuel use and pollutant emissions. Driving in a higher gear when traffic conditions allow also saves fuel and reduces emissions. Unnecessary idling also creates preventable air pollution emissions. Switching off the engine when it is safe to do so such as when in stationary traffic prevents unnecessary emissions.

As consumers we have a choice about the products we buy. Buying energy efficient electrical appliances, using energy saving light bulbs, purchasing locally produced goods which require less transportation, can all aid a reduction in air pollutant emissions. The Consumers' Association focuses on environmental issues as part of its product testing and provides more information on its web page, www.which.net. As consumers, through purchasing certain environmentally friendly products, we can impact upon the way in which products are produced and hence indirectly reduce air pollutant emissions.

Careful energy management in the home can also cut pollution and save money. Insulation soon pays for itself in reduced heating costs. Purchasing renewable electricity reduces pollution impacts upstream and is often cheaper than electricity from standard sources. Calculations can be made online at www.youswitch.com.

Reducing the average home's heating temperature by one degree Celsius will save ten per cent on the heating bill per year. www.saveenergy.co.uk has tips such as this for reducing energy use and saving money. Avoiding using heating wastefully saves energy and money. Npower has a useful area on its website with tips on using energy efficiently.

Grants for private homes are available for the installation of solar panelling. See www.solargrants.org.uk for further information. Solar panels can be used to generate electricity or to heat water.

2.9.1 National strategies to raise awareness of air quality issues

The Government has been running a National Campaign "are you doing your bit?". The campaign centres on the actions we, as individuals, can take to improve air quality. Changes in day-to-day actions at home, travelling, shopping and at work can help reduce our own impact upon air pollution. There are many suggestions in the campaign, including reducing energy use and driving more efficiently. More information can be found at www.doingyourbit.org.uk.

It is important for people to be informed about the effects that air quality can have on health. The Department of Health (DoH) funds a number of research studies relevant to air quality, such as identifying the effects of long term exposure to pollutants. The DoH's work is paralleled with that of the Committee On the Medical Effects of Air Pollutants (COMEAP) who advise on new scientific studies relevant to the effect of pollutants on health. COMEAP also identifies whether existing information regarding pollutants health impacts is adequate or whether further investigation is required. The Department for Environment, Food and Rural Affairs (DEFRA) also undertake a major research programme on air pollution. DEFRA are advised by the Expert Panel on Air Quality Standards (EPAQS) an independent body who provide information on non-occupational ambient air quality standards.

Other bodies such as the Air Quality Expert Group (AQEG), Traffic Management and Air Quality (TRAMAQ) and government departments such as the Department of Trade and Industry (DTI) also undertake research and identify air quality policy impacts upon industry.

2.9.2 GLA policies to raise awareness of air quality issues

The Mayor's Air Quality Strategy highlights the need for individuals to take action to improve air quality. The strategy also recognises the need for air quality research in London so that there is an increased understanding of the sources of air pollution, their dilution and dispersion and the evolution of chemical species.

The Mayor will collaborate with other organisations seeking to improve air quality in London, share appropriate research and information, and will work to raise awareness of research needs. This will be done on a continuous basis, through Air Pollution Research in London (APRIL) and by meeting with relevant organisations, published guidance documents, placing information on the Greater London Authority website and through organising seminars.

The APRIL network brings together the research community and those responsible for air quality management to establish priorities for research, and to collaborate in fulfilling these research needs. It was established with funding from the Engineering and Physical Science Research Council (EPSRC) and is supported by the Mayor, Environment Agency, DEFRA and London Boroughs. Its activities encompass research on:

- measurements of atmospheric concentrations of pollutants,
- meteorology,
- emissions and modelling of atmospheric dispersion and atmospheric chemistry,
- impacts of air pollution on human health and on London's flora and fauna,
- indoor air pollution,
- assessment of abatement strategies, and
- the social and economic aspects of air quality management.

The Mayor has a role in providing strategic data for Greater London and information for use, particularly by the London Boroughs, but also by others such as developers in assessing the air quality effects of their proposals.

The Mayor and Transport for London will produce an annually updated atmospheric emissions inventory for Greater London-the London Atmospheric Emissions Inventory (LAEI), based on the best data available at the time of its periodic release.

2.9.3 Council activities to inform and educate individuals on air quality issues

OBJECTIVE: Encouraging everybody to 'do their bit'

The National Air Quality Strategy requires Local Authorities to provide information on air quality. Harrow collects data on air pollution within the Borough in real time via two air quality monitoring stations. The first of these stations is in a background location at Aylward School in Stanmore and measures NO_x, PM_{10} and SO_2. The second station is located in a roadside location next to Pinner Road in North Harrow. This site monitors NO_x and PM_{10}.

At present Harrow's background site supplies information into the London Air Quality Network (LAQN) managed by ERG. The LAQN provides information about real-time air quality across London. Information collected from the air quality monitoring station at Aylward school in Stanmore can be accessed from a website managed by ERG (www.erg.kcl.ac.uk/home.asp).

POLICY: The Council has obtained Supplementary Credit Approval from DEFRA for the integration of the roadside site in Pinner Road, North Harrow into the LAQN. Information from this site (and the background site) will be accessible from the Council's Website via a link to the relevant ERG web page.

Harrow also has a diffusion tube network for both benzene tubes and nitrogen dioxide tubes. These provide information of monthly averages, which are useful in showing long term trends in pollutant levels.

New Policy 27: The Council has obtained BSP funding for the extension of the nitrogen dioxide diffusion tube network in the borough. The network will be

extended to include an increased number of kerbside locations. The additional exposure locations will be in place by the end of 2004.

The Council currently have four nitrogen diffusion tube locations. These sites have been long established and have therefore provided an important insight into long term nitrogen dioxide trends. Harrow has elevated air concentrations of nitrogen dioxide close to the main road network, as identified in Stages 3 and 4 of the Review and Assessment process (see Section 1.2.6). To monitor long-term trends and the effect of the Air Quality Action Plan on air pollutant concentrations in the borough, it would be ideal to have a more extensive diffusion tube network including an increased number of kerbside locations.

New Policy 28: Air pollution information collected by Harrow's nitrogen dioxide diffusion tube network will be available on the Council's website from the end of 2004.

The availability of pollution information has to be accompanied with information on what measures are being taken Nationally, on a London Wide scale and locally to reduce air pollution concentrations. This information must also provide people with information on the action that they can take to improve air quality.

New Policy 29: Harrow Council's web site will be expanded to provide an increased amount of information regarding Harrow's air quality. The site will provide information (and links to information) on:

- air quality within Harrow, London and nationally;
- Council, London-wide and national measures to improve air quality,
- how everyone can help improve air quality and,
- health care advice for those particularly effected by elevated pollution levels.

The website will be expanded by the end 2004.

It is important that more information is available regarding those actions individuals can take to improve the air quality within Harrow. To ensure that all residents of the borough have access to information relating to air quality, it is important that information is regularly available through a number of different media. Harrow People, a magazine distributed to residents across the borough on a regular basis, is a useful means of keeping people updated on air quality issues. The Urban Living reception at the Civic Centre is also an ideal location to provide information on air quality issues.

New Policy 30: Air pollution bulletins will be included in every addition of the Harrow People and will also be distributed to libraries within the borough. These Bulletins will include information on recent pollution levels, advice on how people can help improve air quality within the borough, information on walking, cycling, public transport and car sharing, and other articles related to air pollution. The first air pollution bulletin will be in the June 2004 edition of Harrow People.

New Policy 31: An air pollution information point computer will be installed in the Urban Living Reception at the Civic Centre. The system will have air quality

monitoring information, action plan update information, links to associated web pages and advice on how people can take there own action to improve air quality. The information point will be made available by the end March 2005.

Leaflets emphasising the need for proper car maintenance will be distributed to MOT testing station to be given to their customers. The aim is to improve awareness of the need for proper car maintenance. The leaflets will also publicise the vehicle emissions testing scheme operating in the borough (see New Policy numbers 7 & 8).

New Policy 32: Information will be provided to Civic Centre staff regarding ways of accessing the Civic Centre by alternative modes of transport to single car occupancy. This information will be provided on the staff notice boards and periodically with pay slips. The information will be provided from 2005.

It is important that everybody takes an active role in improving air quality within the Borough. While National, London wide and local policies will impact upon air quality, individual action is far more powerful. A reduction in traffic flow on roads will only be achieved if we all analyse our own means of travel. Energy efficiency at home and at work will play an important role in reducing air pollution emissions. By publicising the action we can take to reduce our own contributions to air pollution it is hoped that we will all make a positive impact on air quality.

2.10 A Summary of Action Plan Policies- Cost Implications

As discussed in this Air Quality Action Plan, there are a large number of policies detailed in the Interim Local Implementation Plan and Unitary Development Plan which can have a positive impact upon air quality. The approach taken in the development of these documents reflects the holistic manner in which the Council develops its policies. The Air Quality Action Plan highlights the major policies which the Council has adopted in pursuing an improvement in Air Quality. New policies detailed in this Action Plan are intended to strengthen existing policy and as such, enable Harrow to meet the air quality objectives set in the National Air Quality Strategy.

The majority of the proposals included in the Air Quality Action Plan centre around education and information, and there is therefore unlikely to be substantial revenue costs. The increased awareness and understanding of how individuals can affect air quality within Harrow will be brought about through an improved website and the dissemination of information in the form of leaflets and posters. The development of working groups is also an important tool for encouraging external bodies to focus on air quality. A Scientific Officer in the Environmental Protection Team is allocated to air quality issues and will be responsible for providing information for the Council website, developing posters and leaflets, and organising working groups.

2.11 New Policy check-list and costing evaluation

New Policies	Responsible Sections/Organisations	Air Quality Benefit	Cost Cost Bandings : Low <£5000 Medium >£5000 <£10,000, High > £10,000
New Policy 1: The Council will continue to work in partnership with other West London Boroughs to seek joint solutions to air pollution problems.	• Community Safety Services • Transportation • Planning	Best available initiative for improving air quality regionally.	Potentially high cost but currently fully funded by the BSP scheme (TfL) and SCE scheme (DEFRA) Officer time costs relating to cross borough co-ordinated approach circa 15days
New Policy 2: The Council will develop a working group with fuel suppliers, vehicle distributors and representatives of other Agencies and interest groups with a commitment to improving vehicle emissions standards, to discuss and encourage the increased availability of alternative fuelled vehicles and fuel supplies. The working group will be established by the end of June 2004.	• Community Safety Services • Planning • Harrow Agenda 21s Transport and Air Pollution Group • Fuel suppliers • Vehicle distributors	Will encourage the increased availability of cleaner vehicles and alternative/ cleaner fuel supplies.	Low cost. Cost associated with Officer time circa 10 days.
New Policy 3: Information on the Department for Transport (DfT) funded PowerShift and CleanUp schemes will be provided to local fleet operators via information packs. Information on these schemes will also be available on Harrow Council's website and leaflets will be provided to vehicle suppliers. The Council will maintain a dialogue with representatives of all parties having an interest in the transit of goods and/or delivery and servicing matters within the Borough, promoting the PowerShift and CleanUp schemes and the uptake of cleaner vehicles. Information will be made available by the end of June 2004.	• Community Safety Services • Business Connections • Department for Transport • The Energy Savings Trust • Greater London Authority	Will raise awareness and encourage fleet operators to improve emissions from their fleets.	Low cost. Initial Cost of £2500 for 'Fleet manager Packs' has been requested as DEFRA Supported Capital Expenditure. Costs associated with officer time circa 5 days
New Policy 4: The council will encourage Central Government to continue the PowerShift and CleanUp schemes beyond	• Community Safety Services • Association of London Government • Greater London Authority	The Department of Transport funded grant schemes have encouraged an increased	High cost Low cost to the Council.. Cost associated with Officer time circa 2

the end of the 2004/05 financial year and to extend the amount of funds made available for these schemes.	• Department for Transport	uptake of cleaner vehicles, hence improving vehicle emissions.	days. Large Central Government Budget required.
New Policy 5: The Council will develop a fleet management plan to increase the use of cleaner vehicles within its fleet, to reduce the number of miles the fleet travels and to ensure regular driver training is undertaken. The fleet management plan, which will incorporate the Mayor's minimum emissions standards for Council vehicles, will be implemented by the end of March 2005.	• Community Safety & Maintenance Services • Association of London Government • Community Safety Services	Reductions in Local Air Quality management pollutants and green house gas pollutant (CO_2) will result from reduced vehicle emissions. This scheme will also encourage other fleet managers to implement fleet management plans.	Medium Cost Initial Cost of £1000 for implementing scheme has been requested as DEFRA Supported Capital Expenditure. Most cost will be associated with time taken to implement management plan. Savings possible once plan is implemented. Costs associated with Officer time circa 15days
New Policy 6: The Council will clearly label all 'cleaner vehicles' used in its fleet with its fuel supply and contact details for TransportEnergy. Council vehicles will be labelled by the end of December 2004.	• Community Safety & Maintenance Services • Community Safety Services	Will encourage other fleet managers to take up grants available for clean vehicle technologies and will therefore improve vehicle emissions in the borough.	Medium Cost Initial cost for signage of £3500 has been requested as DEFRA Supported Capital Expenditure.
New Policy 7: The Council will continue a local vehicle emissions testing scheme issuing Fixed Penalty Notices to those vehicles that fail the emissions tests. The scheme will start by the end of 2004.	• Community Safety Services • Legal	Vehicle emissions testing is an important tool for raising the awareness of the need for regular car servicing.	High Cost £12500 has been requested as DEFRA Supported Capital Expenditure for 2004/05 Additional costs associated with Officer time circa 15 days will be required to set up administration of legal notices.
New Policy 8: Leaflets publicising the importance of car maintenance and driving styles which ensure reduced vehicle emissions, will be given to MOT test centres to distribute with MOT certificates. Leaflets will be distributed from May 2004.	• Community Safety Services	Will raise awareness and encourage more motorists to keep their car maintained.	High Cost £1000 has already been made available in DEFRA Supplementary Credit Approval, a further £10,000 has been requested as DEFRA Supported Capital Expenditure. Costs associated with Officer time circa 2 days.
New Policy 9: The Council will undertake a review of the accessibility of the Civic Centre by a number of different travel modes and barriers associated with both staff and visitor car parking at the Civic Centre. The accessibility review will be completed by June 2004.	• Community Safety Services • Transportation • Personnel • Civic Centre Parking Group	Will provide the basis for the development of a Civic centre Travel Plan to reduce single occupancy car travel to the Civic Centre.	High Cost £12,000 has been made available as DEFRA Supplementary Credit Approval in 2003/04. The report will be available from June 2004.
New Policy 10: The Council will implement a new Travel Plan for the Civic Centre by the end of 2005. The Travel Plan will be aimed at reducing single occupancy car travel to the Civic Centre and will include	• Transportation • Community Safety Services	A Travel Plan will encourage reduced single occupancy car travel to the Civic Centre.	High Cost Several options have been addressed in a Civic Centre accessibility study ranging from low to high cost.

challenging but realistic targets for reducing car travel to the site.			
New Policy 11: Where safety is not compromised, Harrow Council will design traffic calming schemes, which avoid excessive acceleration and deceleration.	• Transportation	Will encourage more fluent driving styles and hence reduced vehicle emissions.	Low Cost Will depend on specific schemes but unlikely to add significant costs to existing planned traffic calming measures.
New Policy 12: The Council will consider and implement, where practicable, recommendations arising from the development of a West London Freight Quality Partnership.	• Transportation	Will encourage reduced emissions from vehicle fleets	Potentially high cost, dependant on recommendations.
New Policy 13: Together with The Mayor of London through Transport for London and other London Borough's, the Council will assess the scope for the use of priority lanes by freight vehicles, and its implications for other road users, primarily cyclists.	• Greater London Authority • Association of London Government • Transportation	Will enable reduced congestion associated with fleet vehicles	Medium Cost Costs associated with Officer time circa 10 days. Additional high costs required for implementation should investigations support the use of priority lanes by freight vehicles.
New Policy 14: The Council will consider and implement recommendations of The London Sustainable Distribution Partnership should they be relevant.	• London Sustainable Distribution Partnership • Planning • Community Safety Services	Encourage sustainability	Dependant on recommendations
New Policy 15: The Council web-site will provide information on underground, train and bus routes throughout and beyond the borough. Information on specific routes and timetables will be available by the end of 2004.	• Community Safety Services • Business Connections • Transport for London	Raise awareness and encourage the use of public transport	Low Cost Costs associated with Officer time circa 5 days.
New Policy 16: The Council will maintain a dialogue with representatives of public transportation operators to discuss issues that restrict accessibility to the services they provide.	• Community Safety Services • Transportation • Public Transport Operators • Transport for London	Will encourage increased public transport usage by acting upon accessibility problems.	Potentially high cost, dependant on recommendations Costs associated with Officer time circa 10 days.
New Policy 17: The Council will continue to investigate and implement measures to assist bus operations and promote greater use of buses.	• Transportation	Will encourage increased use of public transport	High cost £ 2,972,000 has been requested as BSP bid (TfL) Costs associated with Officer time circa 50 days.
New Policy 18: The Council will maintain a dialogue with the Harrow Public Transport Users Association to discuss issues which restrict accessibility to public transport within the borough.	• Community Safety Services • Transportation • Harrow Public transport Users Association	Will encourage increased public transport usage by acting upon accessibility problems.	Potentially high cost dependant on recommendations
New Policy 19: Schools will be encouraged	• Transportation	Will encourage reduced car	Low Cost

to develop a travel plan to assess current travel modes and to formulate initiatives to reduce the use of the private car. The Council will provide each school within the borough with information on implementing a travel plan. By the end of March 2005, 4 schools within Harrow will have travel plans with measures in place to encourage walking, cycling and the use of public transport. By the end of 2006 this number will have doubled to 8 schools with travel plans.	• People First • Community Safety Services	travel to schools, higher and further education establishments	Costs associated with Officer time circa 15 days.
New Policy 20: The Council will publish and distribute walking information to residents in the borough. The information will include walking routes within the borough, connections to walking routes outside the borough and the health benefits of walking. The information will be distributed from October 2004.	• Community Safety Services • Transportation • Business Connections	Will raise awareness and encourage walking.	Medium Cost £10,000 has been requested as DEFRA Supported Capital Expenditure for raising the awareness of alternative modes of travel to the private car. Costs associated with Officer time circa 10 days.
New Policy 21: The council will distribute cycling information to residents in the borough and place cycle maps at information points and other locations around the borough. The information will include cycling routes within the borough, connections to cycling routes outside the borough, the health benefits of cycling and details of cycle retailers within the borough. The information will be distributed from October 2004.	• Community Safety Services • Transportation • Business Connections	Will raise awareness and encourage cycling.	Medium Cost £10,000 has been requested as DEFRA Supported Capital Expenditure for raising the awareness of alternative modes of travel to the private car. Costs associated with Officer time circa 10 days.
New Policy 22: The Council will continue to investigate and implement measures such as cycle routes and cycling parking facilities to promote greater use of cycles.	• Transportation	Will encourage use of cycles.	High cost £ 1,540,000 has been requested in BSP funding (TfL). Costs associated with Officer time circa 35 days.
New Policy 23: The Council will require an Air Quality Assessment for all new developments where there is potential for a significant increase in air pollution.	• Planning • Community Safety Services • West London Alliance	Will reduce the impact of new development on air quality.	Low Cost Costs associated with Officer time circa 5 days.
New Policy 24: The Council will assess combined heat and power proposals using the Custom and Excise 'good quality CHP' index.	• Planning	Will ensure that combined heat and power installations are of a high standard.	Low Cost Costs associated with Officer time circa 5 days.

New Policy 25: The Council will continue to regulate Part B processes (and Part A2 processes as necessary) within the borough and assess the permitting of such processes in light of air quality objectives.	• Community Safety Services	Reduced emissions from commercial operations	Low Cost System based on Polluter Pays principle. Scientific Officer post already exists with responsibility for these activities.
New Policy 26: The Council will ensure that borough related process emissions do not lead to exceedences of the National Air Quality Objectives.	• Property and Development • Community Safety Services	Reduce emissions from Council owned buildings.	Low Cost Costs associated with Officer time minimal.
New Policy 27: The Council has obtained BSP funding for the extension of the nitrogen dioxide diffusion tube network in the borough. The network will be extended to include an increased number of kerbside locations. The additional exposure locations will be in place by the end of 2004.	• Community Safety Services	Increase awareness of background nitrogen dioxide concentrations.	Low Cost Funding already available through BSP process (TfL).
New Policy 28: Air pollution information collected by Harrow's nitrogen dioxide diffusion tube network will be available on the Council's website from the end of 2004.	• Community Safety Services • Business Connections	Increase awareness of background nitrogen dioxide concentrations.	Low Cost Costs associated with Officer time for updating Council website circa 10 days
New Policy 29: Harrow Council's web site will be expanded to provide an increased amount of information regarding Harrow's air quality. The site will provide information (and links to information) on: • air quality within Harrow, London • Council, London-wide and national measures to improve air quality, • how everyone can help improve air health care advice for those particularly effected by elevated pollution levels. The website will be expanded by end 2004	• Community Safety Services • Business Connections	Increased awareness of air quality issues will encourage reduced car use.	Low Cost Costs associated with Officer time for updating Council website circa 10 days
New Policy 30: Air pollution bulletins will be included in every addition of the Harrow People and will also be distributed to libraries within the borough. These Bulletins will include information on recent pollution levels, advice on how people can	• Community Safety Services • Business Connections • Library Services	Increased awareness of air quality issues will encourage reduced car use.	Low Cost £5000 has been requested as DEFRA Supported Capital Expenditure.

help improve air quality within the borough, information on walking, cycling, public transport and car sharing, and other articles related to air pollution. The first air pollution bulletin will be in the June 2004 edition of Harrow People.			
New Policy 31: An air pollution information point computer will be installed in the Urban Living Reception at the Civic Centre. The system will have air quality monitoring information, action plan update information, links to associated web pages and advice on how people can take there own action to improve air quality. The information point will be made available by the end March 2005.	• Community Safety Services • Business Connections • Central Services	Increased awareness of air quality issues will encourage reduced car use.	Low Cost £5000 has been requested as DEFRA Supported Capital Expenditure.
New Policy 32: Information will be provided to Civic Centre staff regarding ways of accessing the Civic Centre by alternative modes of transport to single car occupancy. This information will be provided on the staff notice boards and periodically with pay slips. The information will be provided from 2005.	• Community Safety Services • Business Connections • Payroll	Combined with a Civic Centre Travel Plan reduced single occupancy car travel to the Civic Centre will reduce vehicle emissions.	Low Cost Costs associated with Officer time minimal.

2.12 Quantification of the possible impacts of New Policies

Impact	Air Quality Improvements				Non Air Quality Impacts							Perceptions		Practicability	
Measure	Short Term *[1]	Medium Term *[2]	Long Term *[3]	Main Area of Impact	Noise	Congestion	Traffic Reduction	Road Safety Issues	Public Transport Accessibility	Effects on Local Residents	Economic Development	Public Acceptability	Business Acceptability	Technical Feasibility	Financial Feasibility
New Policy 1		✔		Regional	+	++	+	O	++	+	+	+	++	++	-
New Policy 2		✔		Local	+	O	O	O	O	+	+	++	+	++	++
New Policy 3	✔			Local	+	O	O	O	O	+	+	++	++	++	++
New Policy 4	✔			Country wide	+	O	O	O	O	+	+	++	++	++	+
New Policy 5		✔		Local	+	+	+	O	O	+	+	+	+	++	+
New Policy 6	✔			Local	+	O	O	O	O	+	+	+	+	++	++
New Policy 7	✔			Local	O	+ -	O	O	O	+-	O	+-	+	+	+
New Policy 8	✔			Local	+	+	+	+	O	+	+	+	++	++	+
New Policy 9		✔		Local	+	+	+	+	+	+	+	++	+	+	++
New Policy 10		✔		Local	+	+	+	+	+	+	+	++	+	+	+
New Policy 11		✔		Local	+	+	O	+-	O	++	O	++	++	+	+
New Policy 12	✔			Regional	+	+	+	+-	O	+	+	++	+	++	+
New Policy 13		✔		Regional	+	+	+	+-	O	+	+	++	+	++	++
New Policy 14			✔	London wide	+	+	O	-	O	+-	++	-	++	+	+
New Policy 15			✔	Local	Dependant on recommendations										

New Policy 16	✔			Local	+	+	+	+	++	++	++	++	++	O	++
New Policy 17		✔		Local	+	+	+	+	++	++	+	++	+	+	+
New Policy 18	✔			Regional	O	++	++	+-	++	++	+	++	+	+	+
New Policy 19		✔		Local	+	+	+	+	++	++	+	++	+	+	+
New Policy 20		✔		Local	+	+	+	+	O	++	+	+-	++	+	+
New Policy 21	✔			Local	+	+	+	+-	+	+	+	++	+	+	+
New Policy 22	✔			Local	+	+	+	+-	+	+	+	+	+	+	+
New Policy 23	✔			Local	+	++	++	+-	O	++	O	+-	+-	+	+
New Policy 24	✔			Local	+	+	+	+	+	+	+	++	+	++	++
New Policy 25		✔		Local	+	O	O	O	O	+	++	++	++	++	+
New Policy 26	✔			Local	O	O	O	O	O	+	+-	++	+-	++	++
New Policy 27	✔			Local	O	O	O	O	O	+	O	+	++	++	+
New Policy 28	✔			Local	O	O	O	O	O	O	O	+	+	++	++
New Policy 29	✔			Local	O	O	O	O	O	+	O	+	+	++	++
New Policy 30	✔			Local	+	+	+	+-	++	++	+	++	+	+	++
New Policy 31	✔			Local	+	+	+	+-	++	++	+	++	+	+	++
New Policy 32	✔			Local	+	+	+	+-	+	++	+	++	+	+	++
New Policy 33	✔			Local	+	+	+	+-	++	+	O	+	+	+	++

Key

*[1] Air quality improvements to be achieved prior to the end 2005

*[2] Main air quality improvements to be achieved after 2005 but prior to 2007

*[3] Main air quality improvements to be achieved after 2007

++ Strong positive impact

+ Positive impact

O No significant impact

- Negative impact

+- Both positive and negative impacts

Glossary

ALTER – The ALTER project aims, through joint action by European cities, to generate a demand for clean vehicles which encourages manufacturers to shift to volume production at lower costs.

AQAP - Air Quality Action Plan

AQMA – Air Quality Management Area.

BAA - British Airports Authorities

Benzene – Benzene is a minor component of petrol (≈ 2% by volume). It occurs naturally in crude oil and forms during the upgrading of fuel oil. The main source of benzene in the atmosphere is from vehicle emissions. Benzene is a carcinogen.

1,3-Butadiene – 1,3 Butadiene is emitted mainly from the combustion of petrol and diesel vehicles. 1,3 Butadiene is formed from olefins in fuel during the combustion process. 1,3 Butadiene is an accepted genotoxic carcinogen.

BSP – Borough Spending Plan. The BSP seeks to implement the Mayors Transport Strategy and Council's ILIP. BSP bids are made to TfL for the funding of specific schemes.

Carbon monoxide – Carbon monoxide is produced during the incomplete combustion of fuels such as wood, coal and oil. Its main source in the UK is road transport. Carbon monoxide exerts its toxic effect on humans by binding very tightly with haemoglobin in the blood.

CNG – Compressed Natural Gas.

DEFRA –Department of Food, Environment and Rural Affairs.

DETR - Department of the Environment, Transport and the Regions. Obsolete.

EPAQS – Expert Panel on Air Quality Standards.

ERG – Environmental Research Group (Previously SEIPH)

ILIP – Interim Local Implementation Plan. A transportation policy document on which the borough's LIP will be based.

LIP – Local Implementation Plan. Sets out the Council's policy to implement the Mayor of London's Transport Strategy

LPG – Liquid Petroleum Gas

$\mu g/m^3$ – Micrograms per cubic metre.

NAQS – National Air Quality Strategy

Nitrogen Dioxide –Nitrogen oxides, such as nitrogen dioxide, are generated during combustion. High temperatures that occur during combustion cause naturally occurring oxygen and nitrogen in the air to combine. The main source of nitrogen oxides is from vehicle emissions. Exposure to high concentrations of nitrogen dioxide can effect lung function.

NOx – Oxides of nitrogen. All combustion processes in air produce oxides of nitrogen as a result of the thermal oxidation of nitrogen.

ppb – parts per billion.

ppm – parts per million.

PM_{10} – Particulate matter with a aerodynamic diameter of 10 micrometers or less.

Reduced Pollution Certificate – The Reduced Pollution Certificate scheme enables vehicles with modifications or particulate traps fitted to reduce particulate matter, to benefit from reduced vehicle excise Duty.

SCA – Supplementary Credit Approval. Government support for authorities capital expenditure on air quality management.

SCE – Supported Capital Expenditure. Replaced SCA's in 2004. Government support for authorities capital expenditure on air quality management.

SEIPH – South East Institute of Public Health.

Sulphur dioxide (SO_2) – Sulphur dioxide arises mainly as a result of the burning of sulphur-containing fuels. Sulphur dioxide is a potent bronchiole constrictor in high concentrations.

UDP – The Unitary Development Plan sets out the Council's framework for development, development control and conservation in Harrow.

WLTS - West London Integrated Transport Strategy.

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