

Low Emission Strategy



Environmental Protection Unit
Communities and Neighbourhoods

October 2012

Foreword

Welcome to City of York's first Low Emission Strategy (LES), one of the first documents of its kind in the UK, and hopefully the first of many.

Low emission strategies aim to reduce emissions of both 'global' and 'local' air pollutants; those that give rise to climate change and those that have an adverse impact on public health. We are all responsible for these emissions, mainly through the generation of power, industry, heating of our homes and use of transport.

This LES outlines the latest steps the council intends to take to reduce the impact of emissions to air on public health and the wider environment. It will help deliver Council Plan priorities on protection of vulnerable people and the environment, as well as helping to 'Get York Moving' and providing opportunities for new 'green' job creation. It will also help deliver the wider sustainability vision and objectives for the city set out in the 'Strategy for York', York's first Sustainable Community Strategy (SCS) developed by the 'Without Walls' partnership.

The main 'global' air pollutant of concern in York is carbon dioxide CO₂, a powerful greenhouse gas that accumulates in the upper atmosphere and prevents heat from escaping from the Earth. CO₂ is linked to global climate change and for York its direct impacts could mean an increase in the occurrence of violent storms, increased flooding and changes to our local flora and fauna. It may have significant economic impacts and could place additional pressure on our emergency services. Wider indirect implications on population, food supplies etc may be even more serious.

'Local' air pollutants are those that have a direct impact on public health, especially that of the young and old. The main air pollutants of concern in York are nitrogen dioxide (NO₂) and particulates (PM). These have been linked to lung diseases (asthma, bronchitis, and emphysema), heart conditions and cancer. Based on national estimates of the number of premature deaths due to air pollution, pro rata potentially between 94 and 163 people die prematurely each year in York which is very concerning¹. York, like many other cities, is currently failing to meet health based objectives for NO₂ so the real position may be worse.

After an initial decline in NO₂ concentrations between 2002 and 2005, concentrations of NO₂ have since risen year on year in York, a trend that must be reversed. The main, but not sole factor, are traffic related emissions, which give rise to almost three quarters of the NO₂ arising in some congested areas of the city. Elevated concentrations of NO₂ relate to volume of vehicles, vehicle engine type and

¹ Committee on medical effects of air pollution (COMEAP, 2009) estimate 29,000 premature deaths each year in UK. Environmental Audit committee estimate up to 50,000 premature deaths (Environmental Audit Committee Report, March 2010). UK population in 2010 - 62,262,000, York population in 2010 – 202,400 (Office of National Statistics 2011)

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emission profiles, congestion and idling, and lack of opportunity for pollution dispersion within York's many enclosed and narrow streets.

We have already done much in York to tackle our impact on climate change and improve local air quality. A particular focus has been to manage the overall volume of traffic, primarily by seeking a shift away from private cars to walking, cycling and public transport. Some of the key achievements to date include:

- York has signed up to the EU Covenant of Mayors, and the Friends of the Earth campaign, pledging to reduce CO₂ emissions far beyond those which are legally required. We have produced a Climate Change Framework and Action Plan (CCFAP) and a Private Sector Housing Strategy (PSHS) through which we have set up a number of energy efficiency and renewable energy schemes to reduce CO₂ emissions. These have tackled sources such as houses, offices, schools and street lighting.
- Through a series of successful Local Transport Plans (LTPs) and Air Quality Action Plans (AQAPs) traffic levels in the city have been reduced. Bus patronage increased by over 5 million passengers (+54%) between 2001 and 2006 (and has been broadly stable since despite falling patronage elsewhere in the country, although the introduction of free bus travel for the elderly and disabled disguises a fall in fare paying passengers in the city), peak period traffic levels have remained stable since 2006 and cycling levels have increased more than 15% since the introduction of the Cycling City York programme in 2008.
- Planning based measures are in place to encourage sustainable design and construction and to ensure the impact of new development on air quality is adequately assessed. City of York Council (CYC) has led by example providing exemplar sustainable buildings at the eco-depot and the new council HQ.
- Emissions of harmful gases from industrial processes are subject to strict local regulation and much of the York area is covered by smoke control orders preventing emissions of smoke from both industrial and domestic premises

Despite this success we can not afford to be complacent. Improvements in NO_x emission from petrol vehicles, driven primarily by EU regulation, have largely been offset by an increase in the number of new diesel vehicles entering the market and an increase in the weight and engine size of vehicles. Additionally, the drive cycles on which vehicle emission standards for new vehicles are based are not representative of real life driving in congested urban conditions. This means that actual emissions in urban environments are often higher than suggested by the emission standards due to abatement equipment not operating to its full potential and vehicles being driven inefficiently. Uptake of low emissions vehicles such as

electric and hybrid vehicles has so far been low in York despite local encouragement, and bus use has been largely stagnant since 2006.

Recent air pollution monitoring data has shown that the emission reduction measures taken so far in York will not do enough to deliver the health based targets for NO₂ in our existing air quality management areas (AQMA's). If no further action is taken more AQMA's may need to be declared. Likewise, our targets for CO₂ reduction remain challenging.

This LES sets out a more sophisticated analysis and approach to emission reduction than before and sets out the additional measures York intends to take to reduce emissions of CO₂ and local air pollutants during the next 3 years and beyond. It provides a holistic overview of all the current strategies CYC has in place to reduce emissions to air and examines where further emission reduction can be achieved, particularly in relation to transport emissions. It recommends that in the future more emphasis should be placed on the use of low emission technologies and alternative fuels, particularly in relation to those vehicles that provide essential public services (such as buses and taxis) and whose emissions can not be controlled through modal shift alone.

We will aim to do this by:

- Promoting and supporting innovation in increasingly low carbon development and retrofitting to reduce CO₂ and other emissions
- Continuing to tackle congestion by promoting walking, cycling and public transport
- Minimising the volume of vehicles and ensuring only the lowest emission buses, lorries and taxis available can access the areas of the city with the poorest air quality
- Promoting and incentivising the use of low emission vehicles, particularly those which run on electric, compressed natural gas (CNG), bio-methane and /or make use of hybrid technologies
- Increasing access to low emission vehicle re-fuelling infrastructure, such as electric vehicle re-charging points and gas re-fuelling systems
- Providing recognition and support for those vehicle operators who are leading the way in adopting low emission technologies and adopting industry best practices
- Investigating freight transshipment and electric vehicle deliveries for the city centre

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- Using licensing controls to improve the emission profile of local taxis / private hire
- Promoting York as a centre of excellence for low emission technologies, attracting new businesses and industries and increasing opportunities for specialist 'green sector' training
- Striving to lead by example by reducing mileage and emissions from vehicles used on council business and sharing our experiences of low emission vehicles and alternative fuels with others

The LES will build upon and support existing emission reduction measures in the city but will not replace them. Measures to reduce emission from new and existing buildings will continue to be delivered primarily through the Climate Change Framework and Action Plan (CCFAP), Public Sector Housing Strategy (PSHS) and the sustainable development principles contained within the emerging Development Plan. The main focus of the LES will be on reducing transport emissions from new and existing vehicle fleets through improved vehicle efficiency (driver and vehicle), the use of low emission technologies and fuels and continuing to encourage modal shift. Alongside LTP3 and the existing AQAP2 it will form the basis of a fully revised and updated AQAP3 to follow in 2013.

Clean air to breathe and a safe place to live are essential to the health and well being of all of us. The toll on life and health this invisible issue causes is simply unacceptable. Potentially harmful climate change presents a much wider threat for the future and neglect now will only make it worse and cost more. It is therefore only right that we should share the responsibility of protecting local air quality and reducing the impacts of climate change.

I look forward to working with you all to deliver this low emission strategy for York.



Councillor Dave Merrett

Cabinet Member for City Strategy and Air Quality

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Introduction

- E1. Low emission strategies aim to reduce emissions of both 'global' and 'local' air pollutants; those that give rise to climate change and those that have an adverse impact on public health. We are all responsible for these emissions, mainly through the generation of power, industry, heating of our homes and use of transport.
- E2. This LES outlines the latest steps the council intends to take to reduce the impact of emissions to air on public health and the wider environment. It will help deliver Council Plan priorities on protection of vulnerable people and the environment, as well as helping to 'Get York Moving' and providing opportunities for new 'green' job creation. It will also help deliver the wider sustainability vision and objectives for the city set out in the 'Strategy for York', York's first Sustainable Community Strategy (SCS) developed by the 'Without Walls' partnership.

Air pollution issues and challenges

- E3. Two of the greatest challenges currently faced by York are:
- the need to reduce emissions of greenhouse gases, primarily carbon dioxide (CO₂)
 - the need to protect residents from the harmful effects of local air pollutants, especially nitrogen dioxide (NO₂) and particulate matter (PM).

Both these problems have common sources.

- E4. Uncontrolled, climate change is predicted to have serious local implications for York's communities, economy and its built and natural environments. Such changes may lead to increased local flooding, structural damage to buildings and loss of wildlife. It may also place additional pressure on local emergency services, transport networks and the economy². Wider indirect implications on population, food supplies etc may be even more serious.
- E5. Like other local authorities York has an obligation to meet the Climate Change Act (2008) targets, but has also gone beyond this requirement, setting a number of other challenging climate change reduction targets. These include:
- Reducing CO₂ emissions across CYC operations by 25% by 2013
 - Participation in the national 10:10 campaign to reduce CO₂ emissions by 10% in 2010

² A Climate Change Framework and Action Plan for York (2010-2015)

- Signatory to the Friends of the Earth campaign to reduce CO₂ emissions by 40% by 2020
- Signatory to the European Covenant of Mayors to meet and exceed the European Union (EU) 20% CO₂ reduction objective by 2020

York has produced and adopted a Climate Change Framework and Action Plan (CCFAP), setting out how it intends to move towards meeting these challenging targets.

- E.6 Local air quality also remains a high priority. The main air pollutants of concern in York are NO₂ and PM. These have been linked to lung diseases (asthma, bronchitis and emphysema), heart conditions and cancer. Based on national estimates, pro rata between 94 and 163 people die prematurely in York each year due to the impacts of poor air quality. This is more than the estimated combined impact of obesity and road accidents together. Poor air quality puts the health of York's residents at risk, creates an unpleasant environment for visitors, may damage historic buildings and places an additional financial burden on local health service providers.
- E.7 Concentrations of NO₂ within the city centre Air Quality Management Area (AQMA) have continued to increase year on year since 2006, despite the introduction of two Air Quality Action Plans (AQAPs) and award winning Local Transport Plans (LTPs). The health based annual average NO₂ objective continues to be exceeded at many locations around the inner ring road and more recently further air quality issues have been identified in suburban locations. A second AQMA was declared in Fulford in April 2010 and another on Salisbury Terrace in May 2012. The original city centre AQMA has recently been extended (September 2012) to include exceedances of the annual average objective on Queen Street and the short term hourly objective on Rougier Street. It is only in recent years that evidence of breaches of the short term hourly objective for NO₂ has been found in the city despite long term monitoring. This is a clear indication that air quality is continuing to decline.
- E.8 Improving local air quality and reducing CO₂ emissions are essential to the future well being of the city and its residents, but this has to be balanced against opportunities for economic growth, new development and the ability of residents and visitors to travel freely around the city. York's population is predicted to expand by 25% by 2029³, resulting in greater heating and energy demands and a doubling in traffic levels by 2021 (based on 2011 baseline). Additional emissions to air will arise from the increased number of vehicles but also as a result of the additional congestion and delay created on the road network. There is predicted to be a disproportionately high impact on congestion compared with traffic growth. Carbon modelling studies undertaken in York have indicated that without positive intervention to reduce emissions CO₂ emissions will have risen by around 31% by 2050⁴. Some of these additional emissions will be offset by energy efficiency and renewable energy use, but

³ City of York Council LDF Core Strategy Submission Draft – April 2011

⁴ Carbon descent 2010: Carbon modelling study for York.

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without intervention transport, business, commercial and domestic emissions to air are all likely to increase in the future.

- E.9 Not all CO₂ reduction measures deliver a corresponding improvement in local air quality. For example, biomass burners offer an attractive opportunity to produce low carbon heat and power, particularly from new developments, but biomass burners can emit greater quantities of NO₂ and PM at a local level than natural gas equivalents. There are also additional local, and often global, emissions associated with transportation of the fuel. Biomass burners can therefore pose an additional threat to local air quality within an already polluted urban environment.⁵
- E.10 Reducing vehicle emissions in York is arguably the most difficult emission reduction challenge. York is one of five local authorities in the Yorkshire and Humber Region that experience a net inward flow of trips to work (22,500 commute trips in, 17,200 commute trips out). The ten-year period 1991 – 2001 saw a rise in commuting trips of approximately 65%. Inward commuting is set to increase into the future.

The exact reasons for the continued decline in local air quality in York are not certain, but are thought to include:

- i. An increased proportion of primary NO₂ emissions from modern diesel fuelled vehicles. This is due to the emission controls added to these vehicles to reduce other pollutants such as PM and carbon monoxide (CO).
- ii. An overall increase in the number of diesel cars in the fleet, combined with a corresponding increase in vehicle size, weight and engine size
- iii. Inefficient driving techniques and inefficient operation of vehicle emission controls within the urban environment
- iv. Increasing congestion and delay on the road network which increases fuel consumption and limits the effectiveness of emission control technology
- v. An increase in the use of bio-fuels in vehicles and boiler plant
- vi. The cumulative impact of small scale development
- vii. An increase in the availability of relatively cheap city centre car parking which makes the use of service buses and Park & Ride financially less attractive

Current approach to emission reduction

Local air pollution

- E.11 In York measures to reduce concentrations of local air pollutants are focused primarily on traffic as this is the main source. Historically the approach has been to 'shift' trips

⁵ Biomass and Air Quality Guidance for Local Authorities, LACORS, June 2009

to more sustainable transport modes, such as walking, cycling and public transport and to ensure the network moves as smoothly as possible through wider traffic management measures. This has been achieved through Local Transport Plans (LTP1 and LTP2) and two Air Quality Action Plans (AQAP1 and AQAP2). There have been some notable successes including:

- an increase in bus patronage by over 5 million passengers (+54%) between 2001 and 2006 (and has been broadly stable since despite falling patronage elsewhere in the country, although the introduction of free bus travel for the elderly and disabled disguises a fall in fare paying passengers in the city)
- peak period traffic levels have remained stable since 2006
- cycling numbers have increased more than 15% since the introduction of the Cycling City York programme in 2008.

- E.12 As well as transport planning based measures, emissions of local air pollutants are also controlled through the planning (development management) system. Larger developments are subject to air quality impact assessments and in some cases developers are required to implement air quality mitigation measures. At present mitigation measures usually relate to changes to the design or layout of a building (to prevent further human exposure to existing poor air quality) and/or the provision of cycling and public transport infrastructure / incentives. Recently some success has been achieved in requiring developers to provide incentives for the uptake of low emission vehicles on their developments. For example, the provision of electric vehicle recharging points has been negotiated at the new Waitrose store, Nestle South (mixed use development) and the new stadium development. More general planning principles relating to the need to provide mixed use developments and sustainable building design also assist in minimising emissions of local air pollutants.
- E.13 Whilst the LTP, AQAP and planning measures are currently the main delivery mechanisms for controlling and reducing emissions of local air pollutants, other policies and programmes also have a role to play. Emissions from some industrial processes are controlled locally in line with the requirements of the Integrated Pollution Prevention and Control Directive 96/61/EC (as amended). Enforcement of the PPC regulations is a shared responsibility between the Environment Agency and the local authority depending on the size of the installation. As this is a national based system there is little scope to achieve any further reduction in industrial process emissions in York without placing local industries at a disadvantage to those in other areas. Further measures to reduce industrial emissions therefore fall outside the scope of this LES but enforcement of the existing regulations should be considered an essential part of the overall emission reduction strategy in York.
- E.14 Another important function undertaken by CYC to protect local air quality is the enforcement of Smoke Control Areas (SCAs). SCAs were introduced mainly in the 1950s /1960s under the provisions of the Clean Air Acts to control emissions from the burning of solid fuels in homes and industry. They were introduced in direct response to the fatal 'peasouper' smogs of the 1950s and continue to be in operation today. With increasing costs of gas and electricity solid fuel appliances are once again

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becoming increasingly popular. Whilst there are currently no plans to increase the size of the areas covered by SCAs in York it is essential that the requirements of existing SCAs continue to be enforced to ensure that the new generation of solid fuel appliances are fitted and operated in a way that will not give rise to widespread smoke emissions.

Climate Change

E.15 Measures to reduce emissions of CO₂ and prevent climate change are set out in the Climate Change Framework and Action Plan (CCFAP) for York, produced by CYC and the local strategic partnership - Without Walls (WoW). The framework identifies ten key areas for focus:

- Sustainable homes
- Sustainable buildings
- Sustainable energy
- Sustainable waste management
- Sustainable transport
- Sustainable low carbon economy
- Low carbon lifestyle
- Sustainable planning and land use
- Sustainable strategic partnership (WoW) – illustrating the climate change work they are doing as a partnership
- Prepared York – how we start to prepare and adapt our infrastructure, services, homes and businesses for a changing climate.

E.16 The CCFAP is broken down into:

- **mitigation** – actions that will reduce greenhouse gas emissions from across York
- **adaptation** – actions that will help York to better prepare and adapt to the predicted effects of a future changing climate.

The framework and action plan aim to help everyone in York to live and work in a more sustainable, low-carbon city where people:

- live and work in energy-efficient buildings with smaller fuel bills
- can drive less and walk and cycle more
- use renewable sources of energy to heat buildings or power cars and buses
- create less waste, recycle and compost more.

- E.17 Delivery of the CCFAP is already well advanced with a comprehensive programme of energy efficiency and renewable energy schemes already being delivered across the city. Significant reductions in CO₂ emissions from council owned housing, offices, schools and street lighting have already been achieved and many more measures are planned. Further reductions in CO₂ emissions from the housing sector are being sort through the Private Sector Housing Strategy (PSHS) which aims to maintain and where possible improve the energy efficiency of York's private housing stock (including private rented homes)⁶. In most cases the CO₂ reduction measures being implemented through the CCFAP and the PSHS also deliver reductions in emissions of local air pollutants. The notable exception to this is the use of biomass boilers where the impact on local air quality may occasionally out weight the CO₂ benefit, or vice versa.

A Low Emission Strategy – a new approach

- E.18 In recent years LESs have been championed as a new approach to reducing both local and global air pollutants from development.

In their simplest form LESs,

*'provide a package of measures to help mitigate the transport impacts of development. Their primary aim is to accelerate the uptake of low emission fuels and technologies in and around development sites.'*⁷

This overarching LES for York takes the LES concept a step further. It moves outside the boundaries of new development demonstrating how LES principles can be applied to a wider range of activities such as marketing, land use planning, fleet management, procurement, transport planning and economic development. Applying the concepts of a LES to a wider range of activities presents further opportunities for emission reduction (particularly in relation to traffic emissions) and provides a more strategic overview of all emission reduction measures currently taking place in the city.

What do we want the LES for York to achieve?

- E.19 The long term vision for York's overarching LES is

'To transform York into a nationally acclaimed low emission city'

- where the population, and the business and development community particularly, are aware of their impact on the environment and health and play an active role in reducing all emissions in the city

⁶ York Private Sector Housing Strategy, 2008-2013

⁷ Low Emissions Strategies using the planning system to reduce transport emissions, DEFRA / LESP, January 2010

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- where new development is designed to minimise emissions and maximise sustainable transport access
- where there are noticeably higher rates of walking and cycling than in other UK cities and rates are comparable to those in exemplar European cities
- where there are noticeably greater numbers of alternatively fuelled vehicles (electric, gas and hybrid) than in other UK cities and widespread eco-driving behaviour
- where there is a well developed infrastructure to support low emission (alternatively fuelled) vehicles
- where the number of vehicles accessing air quality hotspots and risk areas are minimised and where lorries, buses and taxis meet minimum emission standards and embrace new emission reduction technologies
- where the council leads by example, operating the lowest emission fleet affordable and seeking to minimise emissions from procured services
- where local air quality and global warming issues are considered and tackled together
- where inward investment by low emission technology providers is actively sought, encouraged and supported
- where innovation and investment in infrastructure and services that reduce emissions are actively sought, encouraged and promoted.
- where as a result of the above there are no exceedances of air quality limits

How will this be done?

E.20 The LES vision will be delivered through a series of measures aimed at achieving the following objectives:

- i. To raise public and business awareness and understanding of emissions to air in order to protect public health and meet the city's ambitious carbon reduction targets.
- ii. To minimise emissions to air from new developments by encouraging highly sustainable design (via the sustainable design aspects of the emerging Development Plan) and the uptake of low emission vehicles and fuels on new developments (via LES and LTP3)
- iii. To minimise emissions to air from existing vehicles by encouraging eco-driving, optimising vehicle maintenance and performance (including that of abatement equipment) and providing businesses, residents and visitors with incentives and opportunities to use low emission vehicles and fuels
- iv. To lead by example by minimising emissions from council buildings (via CCFAP), fleet and other activities and to showcase low emission technologies whenever possible

- v. To encourage inward investment by providers of low emission technology, fuels and support services
- vi. To maximise sustainable transport and reduce localised air quality breaches through traffic demand management, smart travel planning, and potentially regulatory control (via LTP3, the emerging Development Plan, LES and revisions to the AQAP).

Each of the measures to deliver the LES objectives are based on one or more of the following LES principles:

Inform people as to how and why they should reduce their emissions to air

Reduce as far as possible the energy demand that gives rise to emissions to air

Improve the emission characteristics of the technology used to deliver the remaining energy demand

E.21 Some of the headline measures include:

- Promoting and incentivising the use of low emission vehicles, particularly those which run on electric, compressed natural gas (CNG), bio-methane and /or make use of hybrid technologies
- Increasing access to low emission vehicle re-fuelling infrastructure, such as electric vehicle re-charging points and gas re-fuelling systems
- Considering the feasibility of only allowing low emission lorries, buses and taxis to access areas of the city with the poorest air quality
- Providing recognition and support for those vehicle operators who are leading the way in adopting low emission technologies and adopting industry best practices (e.g. eco-driving)
- Ensuring emissions from new development are adequately mitigated against, whilst continuing to encourage economic growth and prosperity
- Promoting York as a centre of excellence for low emission technologies, attracting new businesses and industries and increasing opportunities for specialist 'green sector' training

Links to other strategies and plans

E. 22 The LES will build upon the success of the existing emission reduction measures for CO₂ and local air pollutants already being delivered in the city but will not replace them. The CCFAP and PSHS will continue to be the main delivery mechanisms for

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measures to reduce CO₂ emissions from existing housing stock and other buildings in York. In most cases this will also deliver some associated improvements in local air quality. Where this might not be the case, for example in the case of using biomass fuels, steps will be taken to ensure that in the future full consideration is given to both CO₂ and local air quality issues before decisions are taken. Any additional measures to reduce emissions from buildings will be brought forward via the CCFAP and have been deliberately excluded from inclusion in this LES.

- E.23 For new buildings coming forward as part of the development process, emissions from the heating and power requirements will continue to be controlled mainly through the CCFAP and associated sustainable development planning policies (principally the emerging Development Plan policies), whilst emissions arising from development based traffic will be addressed mainly through the LES and revised AQAP3. Again where there is potential for conflict between CO₂ and local air quality, steps will be taken to ensure both are given adequate consideration prior to decisions being taken.
- E.24 The LES will enhance the existing provision for reducing emissions from the general vehicle fleet currently provided by the LTP and AQAP2. The LES will place a greater emphasis on the need to reduce the total number of vehicle trips and ensure that the remaining trips are undertaken by the lowest emission vehicles possible. During 2013 the additional traffic emission reduction measures presented in this LES will be incorporated into a fully revised and updated AQAP3. This will bring together all the current and planned measures to reduce emissions from traffic in the city and set emission reduction targets where possible. As the LTP (LTP3) is the main delivery document for the AQAP it remains an important aspect of the overall approach to emission reduction in the city.
- E.25 The relationship between the LES and other existing plans and strategies is examined further at section 3.16.

Document Layout

- E.26 This document comprises six parts:

1. Drivers for emission reduction

This section provides a brief overview of the policies, legislation and emerging scientific evidence that has driven the development of the overarching LES in York.

2. Air quality and carbon emissions in York

This section presents a background to air quality monitoring in York highlighting the initial improvement, but then subsequent deterioration in local air quality in the city over the past 6 years. It also considers sources and trends of CO₂ emissions in York. The data presented forms the main evidence base for the development of the York LES.

3. Current approach to emission reduction in York

This section examines the main measures currently in place to control and reduce emissions of local air pollutants and greenhouse gases in York and introduces the concept of a LES.

4. A LES for York

This is the main body of the report. It sets out the vision and objectives for the York LES and presents the main measures to be taken to further reduce emissions to air in York.

5. Baseline data requirements

This section outlines the baseline data that will be required to monitor the performance of the LES, and to set emission reduction targets in AQAP3.

Annex 1: Low emission vehicles and fuel technologies

This annex provided an overview of the current availability and use of various low emission vehicles and fuel technologies. It is provided as an informative to the main strategy.

How can you get involved?

- E.27 The production of this document is just the first step in delivering an overarching LES for York. It will be followed by a more detailed air quality action plan (AQAP3), stating exactly how, when, where and by whom the low emission measures outlined in this document will be delivered. You can help influence the content and delivery of AQAP3 by sending an email registering your interest to environmental.protection@york.gov.uk or by telephoning (01904) 551555. Further consultation activities relating to the development of AQAP3 will be advertised on the CYC website and in the local press.
- E.28 The success of the LES will depend highly on raising the profile of low emission fuels and technologies in the city and increasing access to them. To assist with this in the coming months we will be actively seeking a number of 'trailblazers' for the York LES. These will be organisations and / or individuals who are already using low emission fuels and technologies in their everyday lives, or who would be willing to consider investing in them.

Examples of the types of organisations and individuals we are looking for include:

- Transport operators willing to trial new types of buses and HGVs eg. hybrid technologies, bio-methane
- Taxi drivers using low emission vehicles eg. plug in hybrid, petrol/diesel hybrid, LPG/CNG

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- Businesses who provide low emission vehicles for use by staff / customers or provide access to low emission re-charging / re-fuelling infrastructure
- Developers looking to provide exemplar low emission developments
- Individuals who have invested in low emission technology and would be willing to share their experiences
- Transport operators and business fleets interested in becoming early adopters of the Eco-stars fleet recognition scheme

Getting involved as a 'trailblazer' will give you the opportunity to showcase your achievements across the city and to help lead the way in delivering cleaner air for York.

- E.29 This overarching LES relates specifically to York, but the LESP and DEFRA who have supported the development of this document are keen to see a similar approach adopted across the country. We welcome the use of this document as a framework for the development of other overarching LESs.

Contact us

- E.30 Any comments on the content of this document, offers of assistance to deliver LES measures in York, or advice on producing your own overarching LES should in the first instance be sent to:

Environmental Protection Unit
City of York Council
Communities and Neighbourhoods
York
YO1 7ET

t: 01904 551555 | e: environmental.protection@york.gov.uk
www.york.gov.uk | [facebook.com/cityofyork](https://www.facebook.com/cityofyork) | [@CityofYork](https://twitter.com/CityofYork)

Please contact us if you would like this information in an accessible format (for example, large print or by email) or another language

This information can be provided in your own language.

我們也用您們的語言提供這個信息 (Cantonese)

এই তথ্য আপনার নিজের ভাষায় দেয়া যেতে পারে। (Bengali)

Bu bilgiyi kendi dilinizde almanız mümkündür. (Turkish)

یہ معلومات آپ کی اپنی زبان (بولی) میں بھی میرا کی جاسکتی ہیں۔ (Urdu)

 (01904) 613161

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Acknowledgements

This document has been developed in partnership with the Low Emission Strategies Partnership (LESP). We thank them for their assistance and support throughout the process, particularly Andrew Whittles of Low Emission Strategies Ltd who has contributed significantly to the production of this document, particularly Annex 1. City of York Council (CYC) and Leeds City Council (LCC) have been working with the LESP as joint low emission champions for the Leeds City Region (LCR) since January 2010. The LCR regional group initiative is one of three regional low emission partnership groups established during January 2010. More information on the work of the LESP and the LCR regional group initiative can be found at:

[Low Emission Strategies - Home](http://www.lowemissionstrategies.org/) (www.lowemissionstrategies.org/)

[Leeds City Region – Regional Group Initiative](http://www.lcrrgi.org.uk/) (http://www.lcrrgi.org.uk/)

Thanks are also extended to the University of Leeds for allowing Dr James Tate, Institute of Transport Studies (ITS), to undertake a part-time secondment to York. Dr Tate's specialist knowledge of in-use vehicle emissions and real-time emissions modelling has been invaluable in the development of the LES and will impact significantly on the action planning measures arising from this document.

Thanks are also extended to the members of the City of York Council Low Emission Steering Group who assisted with the development of the vision and objectives for the LES and will continue to play a role in its delivery. Specific thanks are extended to Mike Southcombe (Environmental Protection Manager), Andrew Gillah (Principal Environmental Protection Officer – Air Quality), Derek McCreadie (Low Emissions Officer) and Chris Parkinson (Equipment Maintenance Officer) for their assistance and support in the development of the LES concept and collation of the evidence base to support it.

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1.0 Drivers for emission reduction

Background

1.01 The development of this overarching LES has been driven primarily by:

International and National Policy and Legislation

- The setting of challenging EU, national and local targets to reduce CO₂ emissions
- A national responsibility for the Secretary of State for Environment, Food and Rural Affairs to meet the limit values for ambient air set down in the EU ambient air quality directive ([2008/50/EC](#)). The 2008 directive replaced nearly all previous EU air quality legislation setting legally binding limits for concentrations in outdoor air of major air pollutants that impact public health including NO₂ and particulates (PM₁₀ and PM_{2.5}). Failure to meet the air quality limit values could result in large daily fines being imposed on the UK.
- A duty under the Environment Act 1995 for all local authorities to pursue health based national air quality objectives (NAQOs) set by the UK government. Fines imposed at a national level by the EU for failure to meet the EU limit values could potentially be passed on to local authorities perceived not to be pursuing the national air quality objectives at a local level.

Local policies and priorities

- The vision, aims and objectives of the sustainable community partnership 'Without Walls' as set out in the '*Strategy for York*' (York's Sustainable Community Strategy (SCS)) and the accompanying '*City Action Plan*'. The Without Walls Partnership is made up of key partners from across York whom have committed to ensure the delivery of a long-term vision for York. This vision covers the issues that affect people's lives and can be divided into seven areas covering the creation of a sustainable, thriving, learning, cultural, safe, healthy and inclusive city. Delivering air quality improvement and carbon reduction are key elements for delivery of the SCS vision
- The Council Plan priorities for the next four years. CYC has five priorities relating to creating jobs and growing the economy, getting York moving, building strong communities, protecting vulnerable people and protecting the environment. Air quality improvement and carbon reduction are essential to deliver the priorities on protecting vulnerable people and the environment. The LES will also contribute extensively to the other priority areas by reducing emissions from transport, improving transport infrastructure and creating opportunities for jobs and inward investment by alternative fuel technology and service providers.

Research and Emerging Evidence

- Evidence that air pollution has a significant impact on health

- Evidence that vehicle emissions (particularly NO_x) are not falling in line with national predictions

Policy and legislative framework

Climate Change Management

- 1.02 The UK is legally bound by a number of international and national agreements to reduce emissions of greenhouse gases. The first and most well known of these is the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, which binds the UK to reduce emissions of greenhouse gases by 12.5% from 1990 levels by 2020. Other targets specific to individual industries have also been set.
- 1.03 In 2008 the Climate Change Act was passed. This is now (with the exception of Scotland) the UK's primary climate change framework legislation. The Climate Change Act 2008 commits the UK Government to achieving an 80% cut in greenhouse gas emissions (from 1990 levels) by 2050. This is to be achieved through the setting of a series of 5-year carbon 'budgets'. The first three budgets were set in 2009, committing to cuts (from 1990 levels) of 22% by 2012, 28% by 2017 and 34% by 2022. Advice on the setting of targets and budgets is given by the Committee on Climate Change.
- 1.04 Like other local authorities York has an obligation to meet the Climate Change Act (2008) targets, but has also gone beyond this requirement, setting a number of other challenging climate change reduction targets. These include:
- Participation in the national 10:10 campaign to reduce CO₂ emissions by 10% in 2010
 - Reducing CO₂ emissions across CYC operations by 25% by 2013
 - Signatory to the Friends of the Earth campaign to reduce CO₂ emissions by 40% by 2020
 - Signatory to the European Covenant of Mayors to meet and exceed the European Union (EU) 20% CO₂ reduction objective by 2020

York has produced and adopted a Climate Change Framework and Action Plan (CCFAP), setting out how it intends to move towards meeting these challenging targets.

Local Air Quality Management (LAQM)

- 1.05 The Environment Act 1995 requires all local authorities to regularly 'review' and 'assess' air quality in their areas and to declare 'Air Quality Management Areas (AQMAs)' where health based objectives set by the government are not met. Where an AQMA is declared an 'Air Quality Action Plan (AQAP)' must be drawn up detailing how the local authority intends to improve air quality. Currently there are around 500 AQMAs in the UK, the majority due to elevated NO₂ concentrations.

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- 1.06 York currently has three AQMAs, one around the inner ring road and parts of the approaching radials (declared in 2002), a second along the A19 south corridor at Fulford (declared in 2010) and a third area around Salisbury Terrace declared in 2012.
- 1.07 The Environment Act 1995, and the subsequent National Air Quality Strategy (NAQS) (1997), were pre-cursors to the European Union Air Quality Directives that emerged in the late 1990s, and were consolidated into a single Ambient Air Quality Directive in 2008. Directive 2008/50/EC sets air quality limit values for a number of pollutants to be met by all member states. The UK is currently failing to meet standards for PM₁₀ in some parts of London, and for NO₂ across large parts of the country. If the UK continues to fail to meet the EU limit values it could face substantial EU fines.

Planning Policy

- 1.08 In March 2012, the Government published the National Planning Policy Framework (the Framework). This Framework replaces the previous suite of national Planning Policy Statements, Planning Policy Guidance notes and some Circulars with a single, streamlined document. In relation to emissions the Framework states that *'Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.'* Furthermore, with specific reference to air quality the Framework states *'Planning policies should sustain compliance with and contribute to wards EU limit values or national objectives for pollutants, taking into account the presence of AQMAs and the cumulative impacts on air quality from individual sites in local areas.'*

Local Transport Act 2008

- 1.09 The Local Transport Act 2008 retains the statutory requirement (from the Transport Act 2000) to produce and review Local Transport Plans and policies. One of the five strategic themes in the City of York's Local Transport Plan 2011-2031 (LTP3) is 'Theme 4 – Tackle Transport Emissions'. This theme encompasses the actions required to reduce emissions of CO₂ and oxides of nitrogen (NO_x), particularly NO₂, attributable to transport. LTP3 will also be the main delivery document for AQAP3 and the LES.'

Research and Emerging Evidence

Air pollution and health

- 1.10 The fact that poor air quality leads to poor human health is widely accepted and documented and forms the basis for the existence of the EU Air Quality Directives and the LAQM system in the UK. Air pollution has been linked to asthma, chronic bronchitis, heart and circulatory disease, and cancer. It is known to have both acute short-term and chronic long term impacts. The causes, extent and cost of air pollution on health continue to be the subject of much research and debate.

- 1.11 The Committee on the Medical Effects of Air Pollutants (COMEAP) is an advisory committee of independent experts that provides advice to government departments on the health effects of air pollutants. In 1998 COMEAP estimated that on average up to 24,000 people in the UK die prematurely every year as a result of short-term exposure to air pollution and thousands more are hospitalised⁸.
- 1.12 In June 2009 COMEAP published *Long-term Exposure to Air Pollution: Effect on Mortality*⁹. This suggested that PM has a greater effect on mortality in the UK than previously thought and gave a revised estimate of the number of premature deaths from air pollution of 29,000 people per year. In 2011 COMEAP issued a statement indicating that traffic pollution, mainly from HGVs may cause as well as worsen asthma in individuals that live close to busy roads¹⁰.
- 1.13 In 2009 the Environmental Audit Committee concluded that as many as 50,000 people a year may die prematurely as a result of poor air quality¹¹ and that DEFRA's estimated costs of poor air quality (£8-£20 billion¹²) are likely to be too low. It also concluded that poor air quality probably causes more mortality and morbidity than passive smoking, road traffic accidents or obesity, yet receives little or no attention in the media and scant attention in Parliament and within Government.

Comparable numbers of pre-mature deaths in UK

- Air pollution	29-50,000 ^{9,11}
- Alcohol	15-22,000 ¹³
- Obesity	9,000 ¹⁴
- Smoking	87,000 (England only) ¹⁵
- Road accidents	2,222 (in 2009) ¹⁶

NO_x emissions from vehicles

- 1.14 At the time York's most recent AQAP¹⁷ was prepared it was anticipated that even if no local action was taken to reduce vehicle emissions there would be around a 5% reduction in NO₂ concentrations in the city centre AQMA by 2011 due to expected improvements in vehicle emission technology. This improvement was predicted to occur as the result of increasingly stringent European Union (EU) emission standards being introduced (Euro IV and Euro V).

⁸ Quantification of the effects of air pollution on health in the United Kingdom, COMEAP, January 1999

⁹ Long-term Exposure to Air Pollution: Effect on Mortality, COMEAP, June 2009

¹⁰ COMEAP statement 'Does outdoor air pollution cause asthma?', November 2011

¹¹ The Environmental Audit Committee – Fifth Report (Air Quality), March 2010

¹² National Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA 2007

¹³ Health inequalities: Progress and Next Steps, Department of Health, 9 June 2008

¹⁴ Health risks and costs of obesity". Department of Health website, 3 September 2007

¹⁵ Consultation on the future of tobacco control". Department of Health, December 2008

¹⁶ Reported Road Casualties in the Great Britain 2009, Department of Transport, 24 June 2010

¹⁷ City of York Local Transport Plan 2006-2011, Annex U, Air Quality Action Plan, April 2006

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- 1.15 The EU emission standards are those emission standards that new vehicles must meet at the date of their manufacture when tested under the New European Drive Cycle (NEDC)¹⁸ on a rolling road. Some of the problems with this approach are¹⁹:
- the standard 'drive cycle' does not necessarily reflect the type of driving that occurs in real life within a congested city centre environment
 - the predicted emissions are based on emissions achieved by a newly manufactured vehicle. These will deteriorate with time depending on how well the vehicle is driven and maintained
 - current EU emission standards focus primarily on reducing PM₁₀, NO_x and carbon monoxide (CO). They do not set limits for NO₂ or CO₂
- 1.16 Predicted air quality improvements assume that vehicles operate to their emission standard as measured under the NEDC cycle and that the fleet will remain similar in future years. In reality vehicles are driven inefficiently (due to traffic conditions and driver behaviour), may not be well maintained and may be replaced with different models. Predictions based on emission standards do not take account of the recent gain in popularity of heavier, larger engine diesel cars or the increased demand for items such as air conditioning that increase vehicle energy use and emissions. Although York has done much at a local level to try to reduce vehicle emissions, alongside the introduction of the Euro IV and V emission standards, it has still seen a year on year rise in NO₂ concentrations since 2006 (following a reduction from 2002-05). This is due in part to the failure of the EU vehicle emission standards to deliver real life emission reduction in urban environments.
- 1.17 The recent report '*Trends in NO_x and NO₂ emissions and ambient measurements in the UK (Carslaw et al)*'¹⁹ examines the lack of improvement in ambient NO_x and NO₂ concentrations across Europe and the reasons for this. Some of the main findings of this report are:
- Ambient trends in the concentrations of NO_x and NO₂ across the UK have not decreased by as much as suggested by current UK emission factors
 - The fraction of primary NO₂ (f-NO₂) has increased from around 5–7% in 1996 to 15–16% in 2009. Most of the increase occurred in the years preceding 2004. (*primary NO₂ is that emitted directly from a vehicle exhaust, some NO₂ is formed in the atmosphere from other pollutants this is known as secondary NO₂*)
 - In-situ emission measurements made on vehicles operating within urban environments have shown that:
 - Real life emissions of NO_x from Euro I and II petrol cars are higher than those suggested by the National Atmospheric Emissions Inventory

¹⁸ www.dft.gov.uk/pgr/roads/environment/emissions/ppr-354.pdf

¹⁹ Carslaw, D.C., Beevers, S.D. Westmoreland, E. Williams, M.L. Tate, J.E., Murrells, T. Stedman, J. Li, Y., Grice, S., Kent, A. and I. Tsagatakis (2011). Trends in NO_x and NO₂ emissions and ambient measurements in the UK. Version: July 2011. © Crown copyright 2011

(NAEI). This is thought to be related to catalyst degeneration in older petrol vehicles. Agreement with emission factors is better for Euro IV petrol cars showing that emissions from newer petrol cars have decreased broadly as expected.

- For diesel cars and light goods vehicles real life emissions of NO_x are greater across all the Euro classes than is suggested by the NAEI. The difference gets progressively larger for the later Euro classes where the expected reduction in NO_x emissions has not occurred as rapidly as originally predicted.
- Euro III-V diesel cars can emit up to twice the amount of NO_x under higher engine load conditions compared with older generation vehicles; possibly the result of the increased use of turbo-charging in modern diesel cars.
- NO_x emissions from HGVs were static until Euro IV, where NO_x decreased by about one third. Recent evidence suggests that selective catalytic reduction (SCR) used on HGVs may be ineffective under urban style driving.
- Bus emissions of NO_x have been static, or even increasing over the past 10–15 years. There are a variety of reasons for this including; poor performance of emission abatement equipment in urban environments, increased congestion (resulting in lower operating speeds) and greater energy demands of some vehicles due to addition of items such as air conditioning. Driver behaviour can also significantly impact in-use emissions.

1.18 This study indicates that NO_x emissions from diesel vehicles, particularly buses and HGVs are probably one of the main reasons why York has so far failed to meet the air quality objective for NO₂ despite steps taken in AQAP2. A source apportionment study undertaken on Fulford Road in York (see figure 5 – section 2) has shown that buses and HGVs are particularly large emitters of NO_x. It is emissions from these vehicles that sensibly should be tackled first if local air quality is to be improved. The emissions per person-kilometre reduce with increasing numbers of passengers on buses so bus occupancy must also be targeted alongside trying to reduce total tailpipe emissions. Measures to reduce congestion should also be pursued to optimise the running speeds for buses.

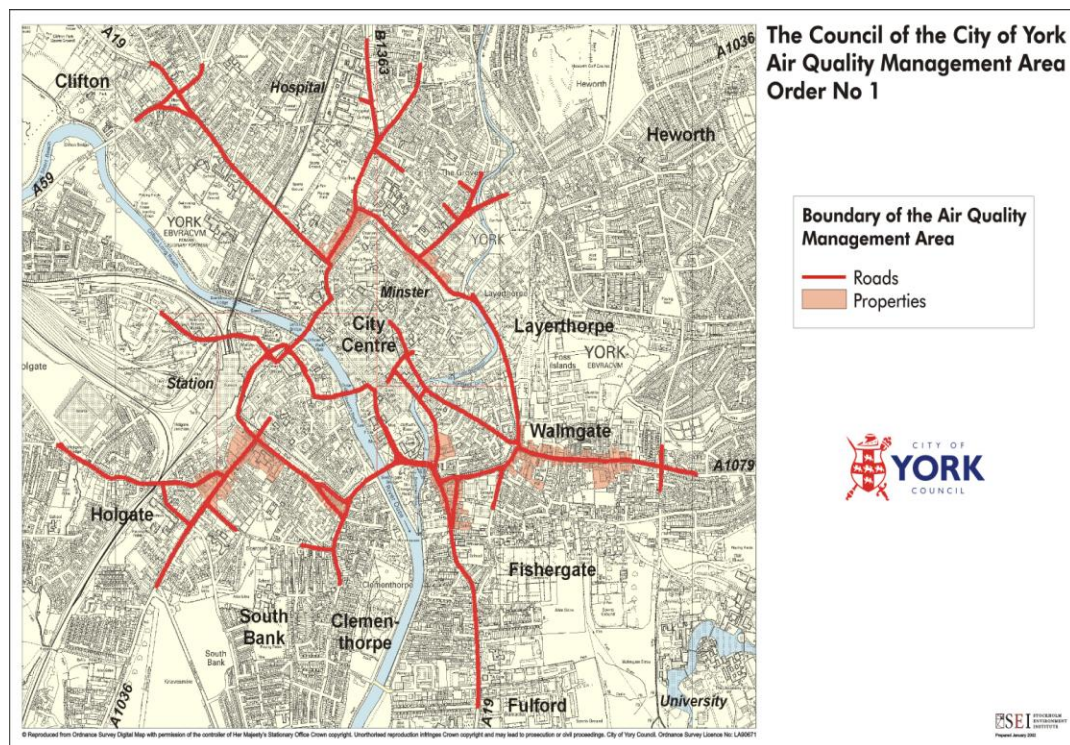
2.0 Local air quality and carbon emissions in York

Local Air Quality

2.01 Monitoring of NO₂ and PM₁₀ has been undertaken in York since 1999. In 2001 five areas of the city around the busy inner ring road were identified as having NO₂ concentrations in excess of the government's health based annual average NO₂ objective²⁰. The long term annual average objective for NO₂ is aimed at protecting the most vulnerable members of society (the young, old and those already suffering from respiratory illnesses) from the long term (chronic) impacts of poor air quality. The five areas of 'technical' breach were incorporated into a single Air Quality Management Area (AQMA) declared in 2002.²¹

The extent of AQMA order no.1 is shown in figure 1 below:

Figure 1: Extent of AQMA order no. 1



2.02 Within the five areas of technical breach 'relevant' locations were included within the AQMA boundary. 'Relevant' locations for the purpose of the annual average NO₂

²⁰ *Second and Third Stage Review and Assessment of Air Quality in York, February 2001* (www.jorair.org.uk)

²¹ *City of York Council Executive Meeting, 30th November 2001 – Agenda Item 8 Declaration of Air Quality Management Area(s)*

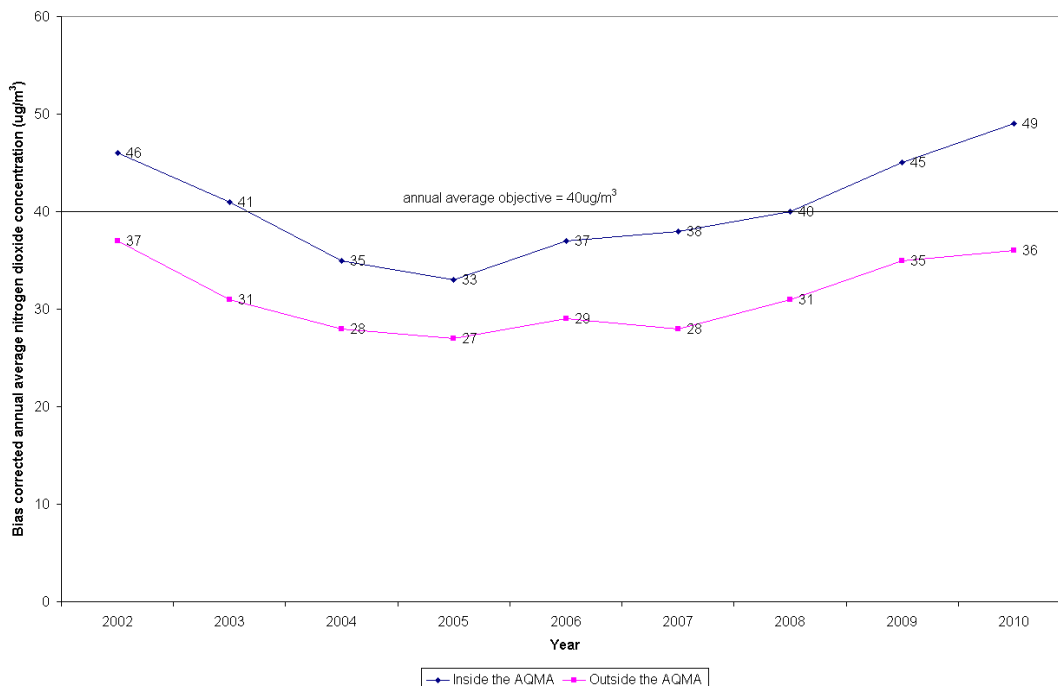
objective are those places where members of the public are likely to be exposed to air pollution regularly over long periods of time. This includes residential property and other buildings such as nursing homes and schools where members of the public are regularly present for long periods of time. For the purpose of LAQM places of work, such as offices, do not fall into the definition of 'relevant locations' unless there is frequent public access. Outside the technical breach areas only roads were included in the AQMA.

- 2.03 AQMA order no.1 has recently been revoked (September 2012) and replaced with AQMA order no.4. The revised order reflects the wider area of the city centre now known to be affected by breaches of the annual average NO₂ objective and includes some additional areas where breaches of the hourly objective for NO₂ have also recently been detected. More information on AQMA order no.4 and breaches of the hourly NO₂ objective can be found in paragraph 2.06.

Recent trends in local air quality

- 2.04 Following the declaration of the AQMA in 2002, annual average concentrations of NO₂ inside and outside the AQMA started to decline. However, since 2005 this trend has reversed. As shown in figure 2 the highest average concentrations to date within the city centre AQMA were monitored during 2010²².

Figure 2: Average concentrations of NO₂ inside and outside the AQMA (2002 – 2010)



²² City of York Council Progress Report, April 2011 (www.jorair.co.uk)

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2.05 Wider air pollution monitoring across the city has shown that there remain a large number of locations both inside and outside the AQMA where exceedances of the annual average NO₂ objective are still being recorded. In April 2010 a further AQMA was declared along the A19 corridor to the south of the city (figure 3). This followed repeated exceedances of the annual average NO₂ objective on Main Street, Fulford. A further AQMA was also declared for NO₂ on Salisbury Terrace in 2012 (figure 4)

Figure 3: York's Second Air Quality Management Area (declared April 2010)

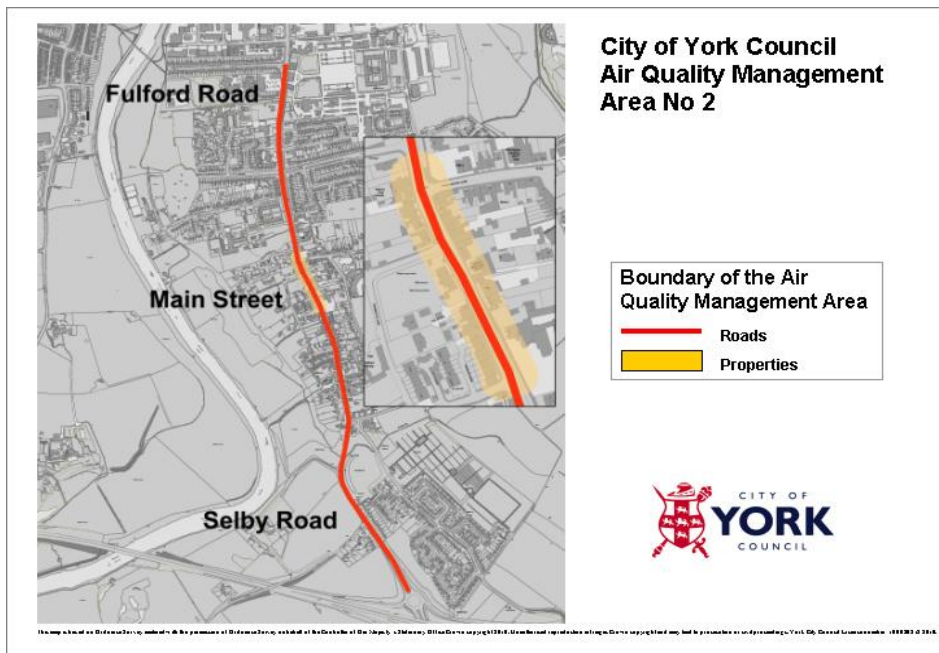
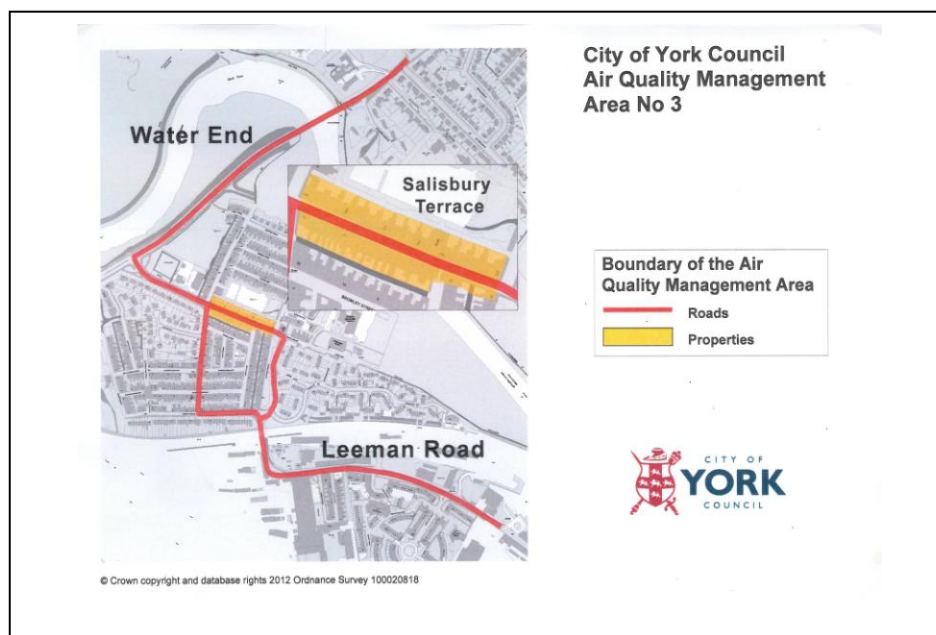
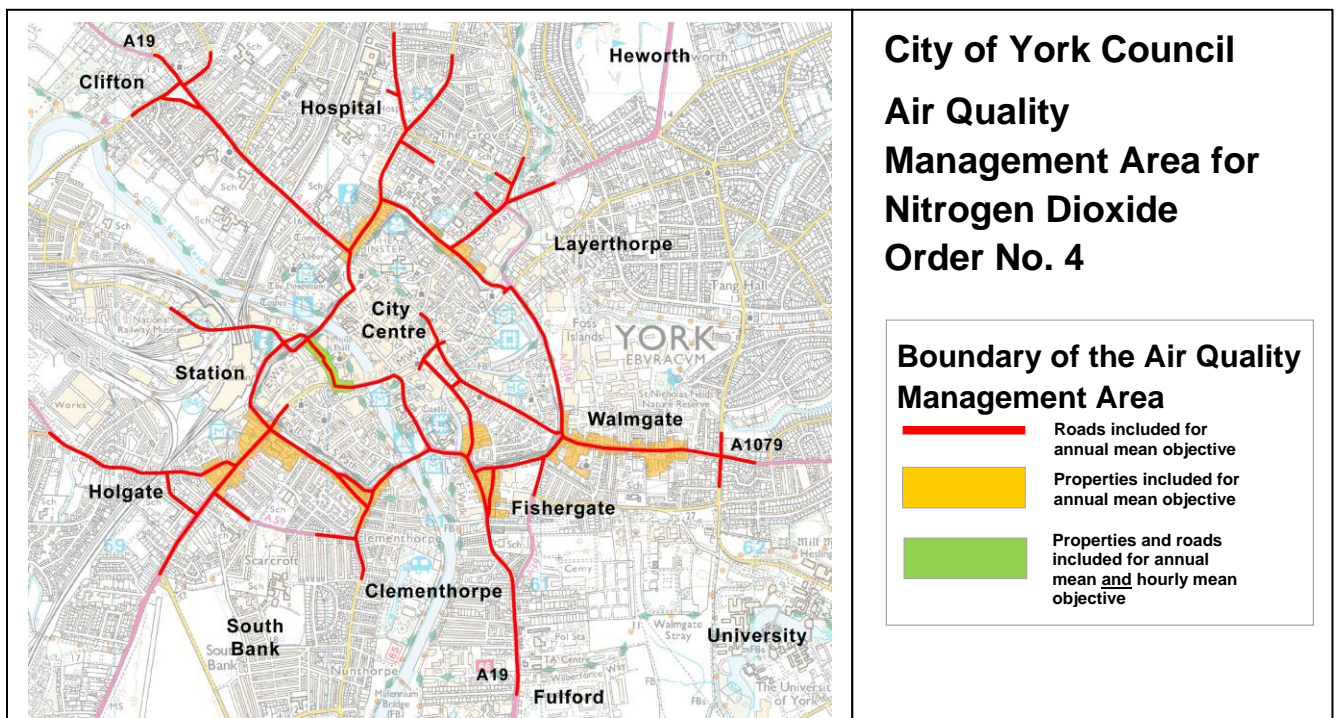


Figure 4: York's Third Air Quality Management Area (declared May 2012)



- 2.06 More recently breaches of the short term hourly objective for NO₂ have also been identified at a number of locations on the inner ring road. The short term objective is set at a level aimed at minimising the ‘acute’ impacts of existing respiratory conditions, for example the severity and frequency of asthma attacks in an existing sufferer. Breaches of the hourly objective for NO₂ put the most vulnerable members of York’s society at increased risk of severe health impacts.
- 2.07 Breaches of the hourly objectives for air pollutants have the potential to significantly impact on the council’s aspirations in relation to improving the public realm and reinvigorating the city centre. The city centre AQMA has been recently amended (AQMA order no.4) to reflect the increased number of properties affected by poor air quality and those areas where the hourly objective is now known to be exceeded (figure 5).
- 2.08 It is clear that local air quality continues to deteriorate in York, despite national predictions indicating that concentrations should have fallen in line with improvements in vehicle technology. Without prompt and widespread action to address deteriorating air quality the number of people exposed to concentrations of pollutants above health based objectives will increase and more AQMAs will need to be declared. It may also become necessary to limit the types of development allowed in some parts of the city for health reasons, e.g. developments that regularly attract members of the public for periods of greater than an hour. This could include outdoor entertainment areas, pavement cafes and accommodation (including short term accommodation such as hotels and guest houses).

Figure 5: York’s fourth Air Quality Management Area (declared September 2012 and replaces AQMA order 1)



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Sources of NO₂

- 2.09 Previous source apportionment studies undertaken for York²³ have shown that traffic is the greatest source of NO₂. It accounts for around 50 to 75% of total concentrations depending on which area of the city is being examined. There is very little impact from the remaining industry in the city, with the residual NO₂ arising mainly from local domestic and commercial heating / power needs. There is also an underlying concentration of 'imported' pollution known as 'regional background'.
- 2.10 Recently CYC EPU has been working with the Institute of Transport Studies (ITS) at the University of Leeds to undertake more detailed analysis of the contribution individual vehicle types make to total NO₂ concentrations²⁴. This study has utilised detailed traffic count data to accurately represent the types of vehicles travelling in York, and employed coupled micro traffic-emission simulation models to accurately represent vehicle speed-acceleration profiles. This approach to traffic source apportionment offers a considerable advancement on previous studies which have relied on national traffic composition datasets and 'average' emission profiles.
- 2.11 Figure 6 (pg 30) shows the composition of traffic in each of CYCs air quality technical breach areas based on counts undertaken in May 2011. Figure 7 (pg 31) shows the results of the detailed traffic source apportionment study for Fulford Road based on this dataset and Figure 8 (pg 31) shows the relative emissions per km travelled for each vehicle type. Further detailed source apportionment for the other areas is planned in 2012 once a wider coupled traffic and emission micro-simulation model becomes available that covers most of the main roads inside and leading on to, the York inner ring-road.

Key issues

- 2.12 As can be seen from figure 6 the percentage of cars running on diesel in York ranges from 34 to 40%. This is typical of count data collected recently in other cities and reflects an increase in the uptake of new diesel cars in recent years, particularly within company vehicle fleets. In 2010 national statistics suggested that the percentage of cars running on diesel was 29%, far below that recorded from local count data. Current NAEI factors are based on this lower diesel/petrol split so can not be relied upon to give an accurate assessment of current road vehicle emissions in York, particularly in relation to NO_x.
- 2.13 In addition to the increasing percentage of diesel cars in the vehicle fleet, it can be seen from figure 8 that the relative contribution to roadside NO₂ levels per km travelled is much higher for diesel cars than petrol cars. It is well known that older diesel engine vehicles emit significant quantities of NO_x, but to date exhaust after-treatment systems have been concentrated on abating PM. An un-wanted by-product

²³City of York Local Transport Plan 2006-2011, Annex U, Air Quality Action Plan, April 2006

²⁴ Further Assessment for Fulford Main Street, EPU, CYC, April 2011

of modern diesel car exhaust after-treatment systems (i.e. particle traps and diesel oxy catalysts) to control PM emissions is that a greater proportion of diesel NO_x emissions are now being emitted as NO₂. This is a growing concern as the share of vehicle miles driven by modern diesel cars continues to increase.

- 2.14 The proportion of HGVs in the York vehicle fleet is relatively small but the impact on NO₂ emissions is disproportionately high. In Fulford, HGVs make up around 4% of the total flow but account for around 23% of the NO₂. Nearer the city centre HGVs make up to 5% of the flow in some areas and will have an even greater impact on NO₂ emissions. In 'real-world' heavy-vehicle fleet operations, there are remaining uncertainties about the efficiency of emission reduction technology when operating in urban environments¹⁹. A reduction in emissions from the HGV fleet will be essential to the success of the LES in York. This may be achievable by re-routing deliveries away from areas of poor air quality and/or by transferring goods to cleaner/smaller vehicles prior to entering the city centre (freight transshipment /consolidation). A freight study is currently being commissioned by CYC to examine some of these options further. Further information about the employment of alternative vehicle technologies in the HGV fleet can be found in Annex 1.
- 2.15 The numbers of buses and coaches in the York fleet are also relatively small ranging from around 2 to 5%, however the small number of buses and coaches on the Fulford Road corridor (approximately 2% of total traffic flow) are responsible for up to 15% of the NO₂ measured in the same area. As can be seen from figure 8, buses and coaches have higher relative emissions per km travelled than any other type of vehicle, with coaches being the highest emitters per km of all. It should however be noted that when considered as emissions per passenger-km (or person-km) the relative contribution of buses and coaches can be reduced significantly compared with cars depending on passenger loadings.
- 2.16 Heavy duty vehicles by definition have a high un-laden and laden weight. The kerb weight of a standard UK double-decker bus is approximately 18 tonnes. The power-demands and fuel use of the heavy-duty diesel engines used to accelerate these large vehicles is therefore significant, and in the case of service buses operation must be undertaken many times as the bus moves between stops. Reducing NO_x emissions from buses and coaches will also be essential to the success of the LES in York. As buses are intensively operated heavy-duty vehicles, their substantial power demands make the widespread uptake of electric buses (to completely remove local bus emissions) an unlikely future scenario with current and envisaged battery technology. Currently the most promising emission reduction technologies for buses are gas and hybrid technologies (see Annex A)

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Figure 6: Composition of traffic in CYC technical breach areas

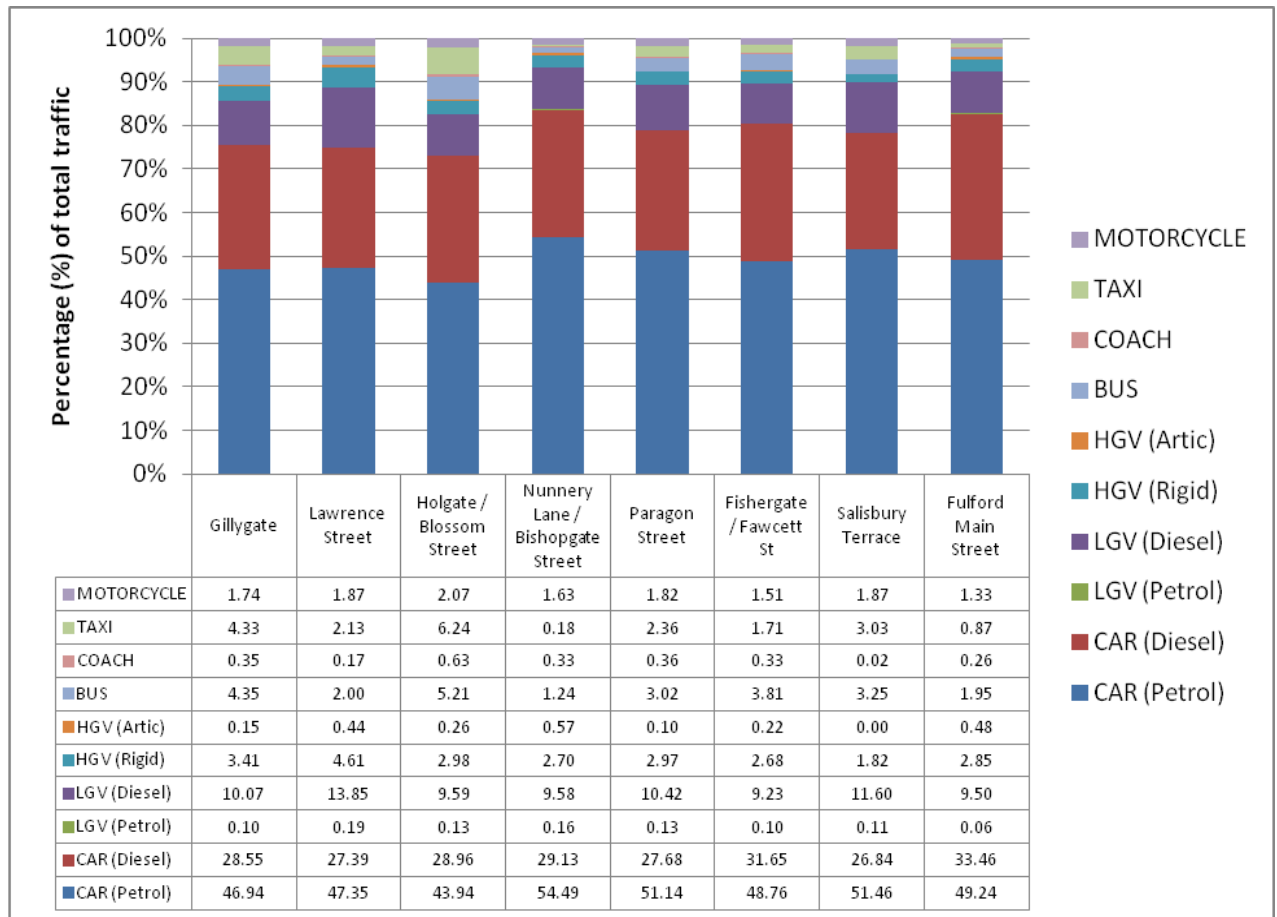


Figure 7: Detailed source apportionment for NO₂ on Fulford Road corridor

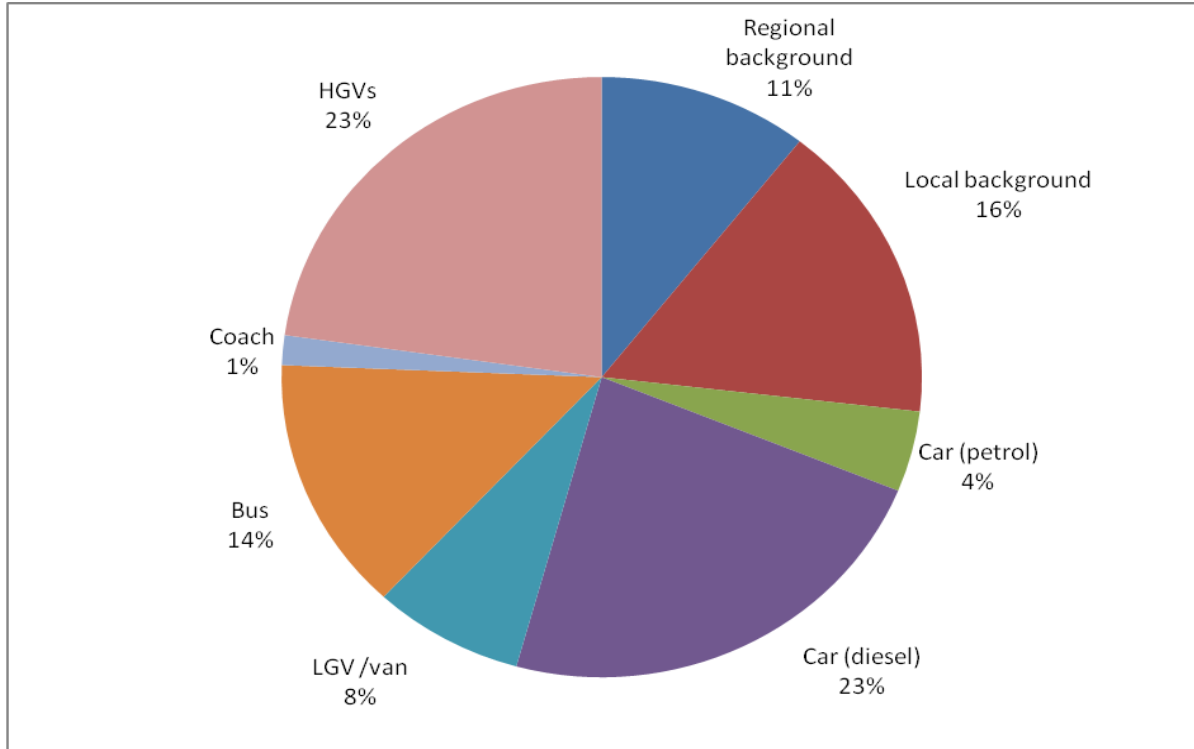
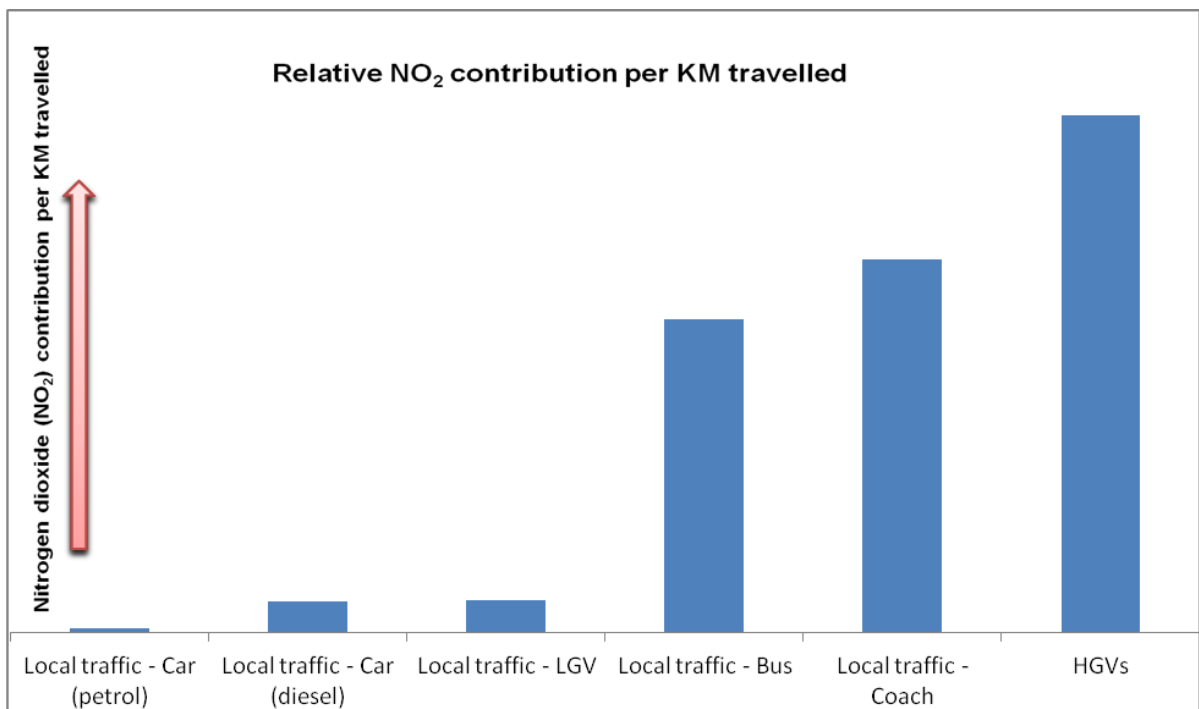


Figure 8: Relative contribution to roadside NO₂ levels per km travelled for different vehicle types



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Local air quality and carbon emissions in York

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Carbon emissions

- 2.17 Since 2005, York's CO₂ emissions from end users (emissions based on the energy consumption from businesses, the public sector and residential housing; along with fuel data on York's roads (excluding major roads such as motorways)) have begun to fall from 1.3 million tonnes of CO₂ emissions to just under 1.1 million tonnes of CO₂ emissions. Table 1 illustrates the decrease in emissions per sectors since 2005²⁵.
- 2.18 To meet the requirements of the national Climate Change Act (2008), York will need to reduce CO₂ emissions by 80 per cent by 2050 (based on 1990 levels). This means York's total end user CO₂ emissions from businesses, homes and transport will need to be just 261,000 tonnes based on 2005 levels (baseline data for 1990 is not available) and per capita emissions will have to fall to around 1 tonne per person.

Table 1: CO₂ emissions in York

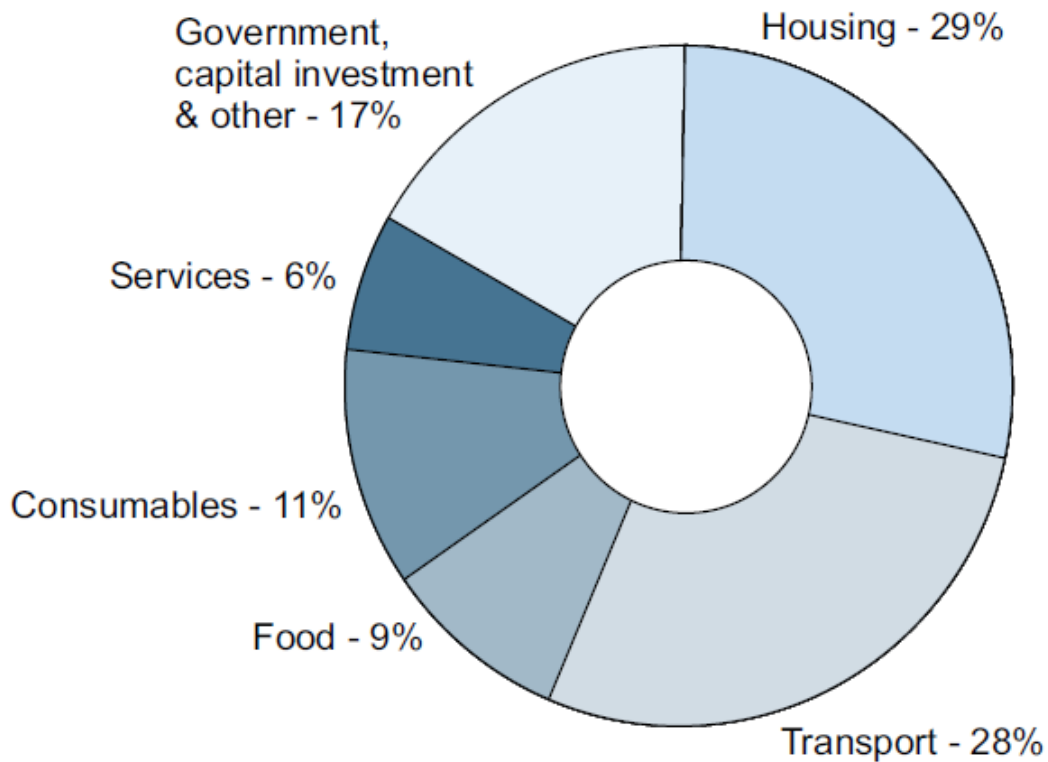
Year	York industries and commerce CO ₂ (Kt)	York homes CO ₂ (Kt)	York roads CO ₂ (Kt)	Average per person CO ₂ (Kt)
2005	556	461	307	7.0
2006	551	458	305	6.9
2007	461	440	306	6.3
2008	451	438	293	6.1
2009	404	398	283	5.5

York's carbon footprint

- 2.19 In 2009 the Stockholm Environment Institute (SEI) calculated the average York Resident's carbon footprint. This included the total amount of carbon emissions that resulted directly, as well as indirectly, from residents' consumption of goods and services (e.g. car use) as well as indirect emissions arising in the supply of the goods and services (e.g. transporting the raw materials to manufacture your car).
- 2.20 The results showed that the average York resident, including direct and indirect emissions, has a carbon footprint of nearer 12.58 tonnes of CO₂ per year. The percentage breakdown of the average York resident's carbon footprint is shown in figure 9²⁶. The 17% for Government, capital investment and other covers activities such as public administration, health and education per individual.

²⁵ Local and Regional CO₂ emission estimates for 2005-2009, DECC (www.decc.gov.uk)

Figure 9: The carbon footprint of an average York resident²⁶



2.21 As well as the Climate Change Act (2008) targets, York has also set a number of other challenging carbon reduction targets. These include:

- Participation in the national 10:10 campaign to reduce CO₂ emissions by 10% in 2010
- Reducing CO₂ emissions across CYC operations by 25% by 2013
- Signatory to the Friends of the Earth campaign to reduce CO₂ emissions by 40% by 2020
- Signatory to the European Covenant of Mayors to meet and exceed the European Union (EU) 20% CO₂ reduction objective by 2020

²⁶ Green Streets – The Neighbourhood Carbon Footprint of York – Stockholm Environment Institute, University of York, October 2009

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Current approach to emission reduction in York

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3.0 Current approach to emission reduction in York

Local Air Quality Management

Air Quality Action Planning

- 3.01 Where an AQMA has been declared the relevant local authority has a duty to draw up an Air Quality Action Plans (AQAP). To date York has drawn up two modal shift based AQAPs aimed primarily at reducing NO₂ arising from traffic sources. AQAP1²⁷ was produced in 2004 as a stand alone document. Most of the measures in the document were traffic related and picked up on the key themes of walking, cycling and public transport. AQAP 2²⁸ was produced in 2006 in response to DEFRA guidance recommending the integration of AQAPs with local transport plans (LTPs). AQAP2 contained some measures to accelerate the uptake of cleaner vehicles and fuels (low emission measures) but remained predominantly a modal shift based document. Some of the measures relating to cleaner vehicle use have not yet been delivered but have been identified as action points in the most recent Local Transport Plan (LTP3). Table 2 details the current status of the transport based AQAP measures.

Table 2: Current status of AQAP transport based measures (to March 2012)

Action Plan	Measure / Target	Progress
AQAP 1	Introduce a car club	Delivered
AQAP 1	Adopt a new cycling strategy	Delivered
AQAP 1/2	Undertake a footstreets review	Ongoing
AQAP 1	Have school travel plans in place at all schools adjacent to AQMA	Delivered
AQAP 1	Improve bus patronage to 28% on Metro routes	Delivered
AQAP 1	Introduce BLISS ²⁹ on 5 routes	Delivered
AQAP 1	Introduce concessionary fares on buses for young people	Delivered
AQAP 1/2	Undertake improvements to outer ring road junctions	Ongoing
AQAP 1	Promote car share club	Delivered
AQAP 1	Introduce reduced parking charges for smaller and cleaner vehicles	Delivered
AQAP 1	Introduce a Traffic Congestion Management System (TCMS)	Delivered

²⁷ AQAP1 – Improving Air quality in York - July 2004

²⁸ AQAP 2 – City of York Council Second Local Transport Plan (Annex U)

²⁹ BLISS – Bus Location and Information Sub-System

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Current approach to emission reduction in York

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AQAP 2	Provide covered cycle parking at all CYC schools	Delivered
AQAP 2	Have active school travel plans in all York schools	Delivered
AQAP 2	Increase capacity at Askham Bar Park & Ride site	Ongoing
AQAP 2	Introduce bus priority measures on A19	Delivered
AQAP 2	Investigate pay before you board bus ticketing	Ongoing
AQAP 2	Introduce BLISS on 3 more routes	Delivered
AQAP 2	Introduce bus information SMS text messaging service	Delivered
AQAP 2	Provide 4 city centre bus information kiosks	Delivered
AQAP 2	Produce Carwise leaflet to encourage efficient driving and cleaner vehicle use	Delivered
AQAP 2	Review taxi licensing process to identify how use of cleaner vehicles can be encouraged	New standards planned for 2013
AQAP 2	Introduce graduated charges for resident parking permits	Delivered
AQAP 2	Complete upgrading of Hopgrove Roundabout	Delivered
AQAP 1/2	Open a 6 th Park & Ride site	Awaiting final funding approval. Design and tendering in progress.
AQAP 1	Produce an alternative fuels strategy	Delivered (LTP2 Annex N)
AQAP 2	Undertake an alternative vehicles and smaller vehicles awareness campaign	To be included in AQAP 3
AQAP 2	Undertake a feasibility study for a Low Emission Zone	Ongoing - Study commissioned November 2011
AQAP 2	Work with bus companies to ensure that 89% of public service buses operated in York (including Park & Ride services) meet Euro III emission standards or better	Progressing April 2011 – 69.4% of fleet Euro III or better
AQAP2	Undertake a feasibility study into a freight transshipment centre	Freight study currently ongoing

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Current approach to emission reduction in York

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Land Use Planning and Development Control

- 3.02 Emissions of local air pollutants are also controlled through the planning system. Larger developments are subject to air quality impact assessments and in some cases developers are required to implement air quality mitigation measures. At present mitigation measures usually relate to changes to the design or layout of a building (to prevent further human exposure to existing poor air quality) and/or the provision of cycling and public transport infrastructure / incentives. Recently some success has been achieved in requiring developers to provide incentives for the up take of low emission vehicles on their developments. For example, the provision of an electric vehicle recharging point was recently negotiated at the Waitrose store. More general planning principles relating to the need to provide mixed use developments and sustainable building design also assist in minimising emissions of local air pollutants.
- 3.03 Improvements to air quality and the implementation of the LES are important priorities for the Council. The emerging Development Plan will play a key role in helping to deliver both these aims by supporting measures to help reduce emissions of NO₂, particulate and CO₂.

Other measures

- 3.04 Whilst the LTP, AQAP and planning measures are currently the main delivery mechanisms for controlling and reducing emissions of local air pollutants, other policies and programmes also have a role to play. Emissions from some industrial processes are controlled locally in line with the requirements of the Integrated Pollution Prevention and Control Directive 96/61/EC (as amended). Enforcement of the PPC regulations is a shared responsibility between the Environment Agency and the local authority depending on the size of the installation. As this is a national based system there is little scope to achieve any further reduction in industrial process emissions in York without placing local industries at a disadvantage to those in other areas. Further measures to reduce industrial emissions therefore fall outside the scope of this LES but enforcement of the existing regulations should be considered an essential part of the overall emission reduction strategy in York.
- 3.05 Another important function undertaken by CYC to protect local air quality is the enforcement of Smoke Control Areas (SCAs). SCAs were introduced mainly in the 1950s /1960s under the provisions of the Clean Air Acts to control emissions from the burning of solid fuels in homes and industry. They were introduced in direct response to the fatal 'peasouper' smogs of the 1950s and continue to be in operation today. With increasing costs of gas and electricity solid fuel appliances are once again becoming increasingly popular. Whilst there are currently no plans to increase the size of the areas covered by SCAs in York it is essential that the requirements of existing SCAs continue to be enforced to ensure that the new generation of solid fuel appliances are fitted and operated in a way that will not give rise to widespread smoke emissions.

Climate Change Management

Climate Change Framework and Climate Change Action Plan

- 3.06 To help residents and businesses play a vital role in tackling climate change, CYC and the local strategic partnership (Without Walls), have produced a Climate Change Framework and Action Plan (CCFAP) for York.
- 3.07 The Climate Change Framework will enable York to accelerate actions to reduce carbon emissions across the city. It demonstrates the actions already on-going and highlights the key areas the city needs to begin to drive forward for coordinated action to tackle climate change.

The framework identifies ten key areas for focus, creating:

- Sustainable homes
 - Sustainable buildings
 - Sustainable energy
 - Sustainable waste management
 - Sustainable transport
 - Sustainable low carbon economy
 - Low carbon lifestyle
 - Sustainable planning and land use
 - Sustainable strategic partnership (Without Walls) – illustrating the climate change work they are doing as a partnership
 - Prepared York – how we start to prepare and adapt our infrastructure, services, homes and businesses for a changing climate.
- 3.08 The Climate Change Action Plan for York will deliver coordinated actions across the city to meet the Climate Change Framework's targets and ambitions. The plan is broken down into:
- **mitigation** – actions that will reduce greenhouse gas emissions from across York
 - **adaptation** – actions that will help York to better prepare and adapt to the predicted effects of a future changing climate.

The framework and action plans will help everyone in York to live and work in a more sustainable, low-carbon city where people:

- live and work in energy-efficient buildings with smaller fuel bills

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- can drive less and walk and cycle more
- use renewable sources of energy to heat buildings or power cars and buses
- create less waste, recycle and compost more.

The Way Forward

An 'overarching' Low Emission Strategy – a new approach

3.09 In January 2010 the 'Low Emission Strategies Good Practice Guidance', was published by DEFRA in collaboration with the Low Emission Strategies Partnership (LESP). The guidance establishes ways in which the planning system may be used to reduce emissions from transport, in order to improve local air quality and work towards climate change targets.

3.10 In their simplest form LESs can be defined as:

*'a package of measures to help mitigate the transport impacts of development. Their primary aim is to accelerate the uptake of low emission fuels and technologies in and around development sites.'*³⁰

3.11 Planning based LESs are designed to complement other planning design and mitigation options, such as the location and layout of development, travel planning and the provision of public transport infrastructure. The strategies can be secured through a combination of planning conditions and planning obligations and may incorporate policy measures and/or require financial investments and contributions to the delivery of low emission transport projects and plans, including strategic monitoring and assessment activities. Planning based LESs are already well established in some local authorities, such as London Borough of Greenwich, but for most local authorities they are still a relatively new concept.

3.12 During 2010/11 York took on a joint role with Leeds City Council to act as 'regional champions' for the roll out of LES measures in the Yorkshire region. As part of this role York has been considering how LES measures can be applied across a wider range of council activities. The result of this work is the 'overarching' LES presented here.

3.13 The overarching LES for York takes the LES concept a step further. It moves outside the boundaries of new development demonstrating how LES principles can be applied to a wider range of activities such as marketing, land use planning, fleet management, procurement, transport planning and economic development. It examines how vehicles can be used more efficiently (through eco-driving and improved maintenance) and considers how the uptake of low emission vehicles and alternative fuels can be incentivised and enabled across the city. It aims to build upon the existing modal shift approach to emission reduction by tackling emissions from those service vehicles that

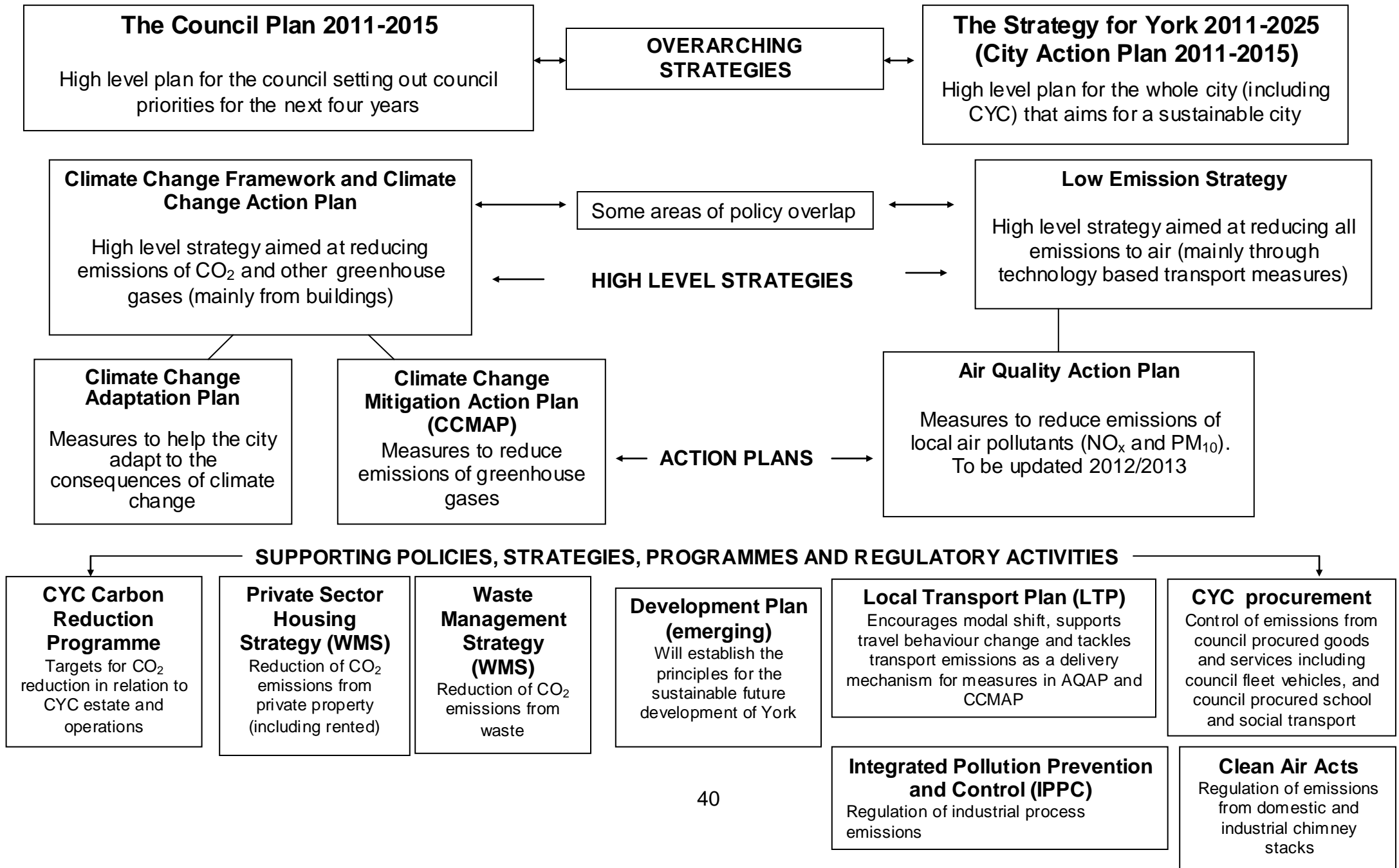
³⁰ Low Emissions Strategies using the planning system to reduce transport emissions, DEFRA / LESP, January 2010

we need to keep on our streets such as buses, taxis and HGVs. The additional traffic emission improvement measures identified within this LES will be incorporated into a fully updated AQAP3 to be produced during 2013.

Links to other strategies and plans

- 3.14 The LES will be a key delivery policy for achieving the visions and priorities of the Strategy for York (SCS) and the Council Plan. It will build upon the success of the existing emission reduction measures for CO₂ and local air pollutants already being delivered in the city but will not replace them. The CCFAP and PSHS will continue to be the main delivery mechanisms for measures to reduce CO₂ emissions from existing housing stock and other buildings in York. In most cases this will also deliver some associated improvements in local air quality. Where this might not be the case, for example in the case of using biomass fuels, steps will be taken to ensure that full consideration is given to both CO₂ and local air quality issues before a decision is taken. Any additional measures to reduce emissions from buildings will be brought forward via the CCFAP and have been deliberately excluded from inclusion in the LES.
- 3.15 For new buildings coming forward as part of the development process, emissions from the heating and power requirements will also continue to be controlled mainly through the CCFAP and associated sustainable development planning policies. Emissions arising from development based traffic will be addressed through the LES and revised AQAP3. Again where there is the potential for conflict between CO₂ and local air quality steps will be taken to ensure both are given adequate consideration prior to decisions being taken.
- 3.16 The relationship between the LES and other existing strategies and plans is further summarised in Figure 10.

Figure 10 – Framework for CYC emission reduction policies



4.0 A LES for York

Vision and Objectives

4.01 This section sets out the vision and objectives for the York LES and details the measures to be implemented over the short-term (by end of 2012), medium-term (by end of 2013) and the long-term (2014 and beyond).

4.02 Overall vision

'To transform York into a nationally acclaimed low emission city'

- where the population, and the business and development community particular are aware of their impact on the environment and health and play an active role in reducing all emissions in the city
- where new development is designed to minimise emissions and maximise sustainable transport access
- where there are noticeably higher rates of walking and cycling than in other UK cities and rates are comparable to those in exemplar European cities
- where there are noticeably greater numbers of alternatively fuelled vehicles (electric, gas and hybrid) than in other UK cities and widespread eco-driving behaviour
- where there is a well developed infrastructure to support low emission (alternatively fuelled) vehicles
- where the number of vehicles accessing air quality hotspots and risk areas are minimised and where lorries, buses and taxis meet minimum emission standards and embrace new emission reduction technologies
- where the council leads by example, operating the lowest emission fleet affordable and seeking to minimise emissions from procured services
- where local air quality and global warming issues are considered and tackled together
- where inward investment by low emission technology providers is actively sought, encouraged and supported
- where innovation and investment in infrastructure and services that reduce emissions are actively sought, encouraged and promoted.
- where as a result of the above there are no exceedances of air quality limits

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4.03 Objectives

The LES vision will be delivered through a series of measures aimed at achieving the following objectives:

- i. To raise public and business awareness and understanding of emissions to air in order to protect public health and meet the city's ambitious carbon reduction targets.
- ii. To minimise emissions to air from new developments by encouraging highly sustainable design (via sustainable design aspects of the emerging Development Plan) and the uptake of low emission vehicles and fuels on new developments (via LES and LTP3)
- iii. To minimise emissions to air from existing vehicles by encouraging eco-driving, optimising vehicle maintenance and performance (including that of abatement equipment) and providing businesses, residents and visitors with incentives and opportunities to use low emission vehicles and fuels
- iv. To lead by example by minimising emissions from council buildings (via CCFAP), fleet and other activities and to showcase low emission technologies whenever possible
- v. To encourage inward investment by providers of low emission technology, fuels and support services
- vi. To maximise sustainable transport and reduce localised air quality breaches through traffic demand management, smart travel planning, and potentially regulatory control (via LTP3, the emerging Development Plan, LES and revisions to the AQAP).

4.04 The following sections set out the approach to be taken to deliver each of the LES objectives. In each case the objective is clearly stated and background provided in relation to the current level of progress in the city. The way forward to meeting each objective is then discussed and a list of desired outcomes provided.

Timescales and costs

4.05 The measures to deliver each of the objectives are set out in tables as follows:

1. Short term measures to be achieved by the end of 2012
2. Medium term measures (by end of 2013)
3. Long term measures (2014 and beyond)

Each table is divided into low cost (<£40,000), medium cost (£40,000 to £100,000) and high cost (>£100,000).

4.06 Low cost measures are those which are considered fully deliverable within current budget and staffing. All of these measures should be delivered within the specified timescales.

Medium cost measures are those which require additional funding which it is anticipated will be achievable through the provision of additional government grants and private investment. In some cases additional air quality grant funding and Local Sustainable Transport Funding (LSTF) has already been obtained to support these measures. The majority of these measures should be delivered within the specified timescales.

- 4.07 High cost measures are those measures which currently remain aspirational and are indicative of what could be achieved without funding and staffing constraints. They require significant levels of local investment for which no funding resource has yet been identified. Consequently the delivery of these measures may be delayed or may not take place at all.
- 4.08 The tables have been colour coded as follows:

SHORT TERM (by end of 2012)	LOW COST < £40,000
SHORT TERM (by end of 2012)	MEDIUM COST £40,000 to £100,00
SHORT TERM (by end of 2012)	HIGH COST > £100,000
MEDIUM TERM (by end of 2013)	LOW COST < £40,000
MEDIUM TERM (by end of 2013)	MEDIUM COST £40,000 to £100,00
MEDIUM TERM (by end of 2013)	HIGH COST > £100,000
LONG TERM (2014 and beyond)	LOW COST < £40,000
LONG TERM (2014 and beyond)	MEDIUM COST £40,000 to £100,00
LONG TERM (2014 and beyond)	HIGH COST > £100,000

LES principles

- 4.09 The measures to deliver the LES objectives are based on the following three LES principles:

Inform people as to how and why they should reduce their emissions to air

Reduce as far as possible the energy demand that gives rise to emissions to air

Improve the emission characteristics of the technology used to deliver the remaining energy demand

For each measure the principle(s) in use are clearly identified. A summary of all the measures and their expected delivery dates is provided at the end of this section.

Objective 1: Raising awareness and understanding of emissions to air

To raise public and business awareness and understanding of emissions to air in order to protect public health and help meet the city's ambitious carbon reduction targets

4.10 This objective is focused on providing York residents, visitors and businesses / developers with:

- information about the sources and impacts of air pollutants
- advice on how they can help reduce emissions of air pollutants
- advice about how they can protect themselves from the health impacts of air pollutants

Background

4.11 Past 'hearts and minds' style campaigns in York to encourage emission reduction have tended to focus on:

- encouraging people to reduce their energy consumption (home energy efficiency measures delivered mainly through the CCFAP and the PSHS) for the purpose of reducing CO₂ emissions.
- encouraging people to change their travel behavior (modal shift measures delivered mainly through the LTP and AQAP2) for the purpose of reducing congestion, improving road safety, improving health through exercise and improving local air quality.

Life support machines...

Heart disease is the biggest cause of early death in Britain

To help protect yourself, leave the car at home and walk to work, school or the shops



To date limited information has been provided on how choice of vehicle, choice of fuel, level of vehicle maintenance and driver behaviour can help reduce emissions.

There has also been limited work to date on providing advice to the public on the health impacts of air pollution and how to protect themselves. This is especially important for the most vulnerable members of society already suffering from respiratory and cardiovascular illnesses. The recent re-introduction of public health services into local authority control offers a good opportunity to improve service provision in this area.

The way forward

4.12 Successful implementation of a LES in York depends on a high level of public acceptance and 'buy in' to emission reduction measures. This requires widespread

public appreciation of the drivers for emission improvement and the ability of individuals to identify how emission reduction measures will be of benefit to themselves and their families. A high profile marketing campaign is therefore proposed to:

- Improve public understanding of the sources of both local and global air pollutants and raise awareness about the emission impact of their own everyday activities
- Raise awareness of the large impact of air pollution on public health (compared to other factors such as alcohol and obesity) with a particular emphasis on links to respiratory illnesses, heart conditions, and the vulnerability of the young and old
- Inform people how they can assist with emission reduction through their choice of vehicle and fuel, and the way in which they drive and maintain their vehicles
- Promote incentives for the use of low emission vehicles and fuels
- Provide easier access to air quality information
- Improve health protection advice to the most vulnerable members of society

Other local authorities are already undertaking successful campaigns of this nature. An excellent example of this is the award winning 'Care4air' scheme operated in South Yorkshire www.care4air.org/

4.13 The LES will build on the energy saving and modal shift measures already initiated through the CCFAP and LTPs, and will support the roll out of the Intelligent Travel York (ITY) programme³¹. It will aim to educate the population of York about the impacts and sources of both local and global air pollutants and to promote emission reduction specifically through improved vehicle efficiency (eco-driving and improved maintenance) and the use of low emissions vehicles and fuels. It will also aim to provide better access to air quality data and health protection advice.

4.14 **Planned outcomes from awareness raising LES measures in York**

1. An improved level of awareness about the sources and impacts of local and global air pollutants amongst the general population of York
2. An improved level of understanding of what can be done to improve air quality and tackle climate change amongst the general population of York

³¹ CYC has been awarded £4.645m in funding from the Department for Transport to improve sustainable transport in the city over the next four years. The programme will reduce congestion and its impact on the environment and enhance the city's prosperity and growth potential. It will deliver an integrated programme of personal, business and school travel planning combined with targeted infrastructure enhancements to increase people's travel choices. <http://www.york.gov.uk/transport/lstf/>

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3. An increased awareness of the technological and behavioural solutions that exist for reducing emissions to air. This will be reflected by a continued modal shift to walking, cycling and public transport, an increase in the uptake of low emission vehicles and fuels, a greater awareness and implementation of eco-driving techniques and improved standards of vehicle maintenance. The latter points will deliver financial as well as emission reduction benefits.
4. Improved understanding of the health impacts of poor air quality and better opportunities for members of the public to access air quality advice and health protection information

LES measures to improve awareness and understanding of emissions to air

Short Term Measures (by end of 2012)

Low cost measures(<£40k)				
I.D	Measure	Measure type	Delivery	Resources
1A	Promote concept and reasons for LES via local media, CYC publications, JorAir website.	Inform	EPU	EPU (existing staff and budget)
1B	Continue with existing programme of JorAir school visits to promote understanding of air quality issues and travel choices amongst primary school children	Inform Reduce	EPU	EPU (existing staff and budget)
1C	Through the Intelligent Travel York (ITY) programme promote the concept of a low emission city within the local business and development community	Inform Reduce Improve	EPU, Sustainable Transport	New LSTF funded post in EPU, other ITY staff.
1D	Develop a framework for a high profile LES marketing campaign to target residents, visitors and businesses, investigate how it can support / integrate with the ITY programme.	Inform Reduce Improve	EPU, Sustainable Transport	New LSTF funded post in EPU

Medium Term Measures (by end of 2013)

Low cost measures(<£40k)				
I.D	Measure	Measure type	Delivery	Resources
1E	Continue to promote LES and provide regular progress reports via local media, CYC publications and JorAir website	Inform	EPU	EPU (existing staff and budget)
1F	Continue with existing programme of JorAir school visits to promote understanding of air quality issues and travel choices amongst primary school children	Inform Reduce	EPU	EPU (existing staff and budget)
1G	Incorporate promotion of low emission vehicles and technology into current travel planning programmes / business link schemes. Link to the ITY programme.	Inform Reduce Improve	EPU, Sustainable Transport	New LSTF funded post in EPU, other ITY staff

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1H	Engage with public health staff to develop an air quality based health promotion campaign	Inform	EPU, Public Health	Air quality grant funding
1I	Investigate possibility of providing a social media based air quality alert system linked to health advice	Inform	EPU, Public Health	Air quality grant funding
Medium cost measures (£40k to £100k)				
1J	Instigate a high profile LES marketing campaign aimed at residents, visitors and businesses that integrates with the ITY programme (subject to funding)	Inform Reduce Improve	EPU, ITY	Air quality grant and LSTF funding

Long Term Measures (2014 and beyond)

Low cost measures (£40k)				
I.D	Measure	Measure type	Delivery	Resources
1K	Continue to promote LES and provide regular progress reports via local media, CYC publications and JorAir website (as above)	Inform	EPU	EPU (existing staff and budget)
1L	Continue with existing programme of JorAir school visits (as above)	Inform Reduce	EPU	EPU (existing staff and budget)
1M	Continue promotion of low emission vehicles and technology via travel planning programmes / business link schemes.	Inform Reduce Improve	EPU	New LSTF funded post in EPU (funded until 2015)
Medium cost measures (£40k to £100k)				
I.D	Measure	Measure type	Delivery	Resources
1N	Continue with high profile LES marketing campaign aimed at residents, visitors and businesses (subject to funding availability)	Inform Reduce Improve	EPU	Yet to be identified – see 1D above
1O	Implement social media based air quality alert system linked to health advice	Inform	EPU, public health	Exact cost currently unknown. Some AQ grant funding available but may need additional funding to complete

Objective 2: Minimising emissions from development

To minimise emissions to air from new development by encouraging highly sustainable design and the uptake of low emission vehicles and fuels

4.15 This objective has two main purposes:

1. To minimise emissions from all new developments, and where possible, to ensure that new developments on brown field sites have lower emissions to air than previous uses.
2. To raise funding for the provision of wider low emission community infrastructure via developer contributions

Background

- 4.16 In 2010 DEFRA published a good practice guidance note 'Low Emission Strategies, using the planning system to reduce transport emissions'³². This document sets out how local authorities can reduce emissions of both local air pollutants and greenhouse gases from new developments by accelerating the uptake of low emission fuels and technologies in and around development sites. The guidance complements the new National Planning Framework (the Framework). This Framework replaces the current suite of national Planning Policy Statements, Planning Policy Guidance notes and some Circulars with a single, streamlined document. It also supports the Government's New Approach to Transport Appraisal (NATA), delivered via the web-based Transport Analysis Guidance (webTAG) <http://www.dft.gov.uk/webtag/>
- 4.17 The LES planning guidance cites a number of high profile developments, such as the Greenwich Peninsula, where low emission measures have been used to deliver large scale regeneration and renewal with minimal impact on local air quality and greenhouse gas emissions. A key message from the guidance is that economic growth does not need to come at the expense of the environment, and likewise environmental controls do not necessarily have adverse impacts on the economy and growth. These are important messages for York as it seeks to promote economic growth and protect the health of residents and visitors.
- 4.18 Planning based LESs can take many forms but generally place the onus on developers to demonstrate how they can take all reasonable efforts to reduce the emission impact of a proposed development. This may be achieved through appropriate design features, and/or by implementation of agreed mitigation. Where site specific emission mitigation is not possible, financial contributions, which are proportional to the unmitigated impact can be

³² Low Emissions Strategies using the planning system to reduce transport emissions, DEFRA / LESP, January 2010

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pursued to fund local low emission plans and measures, thereby directly offsetting the residual impacts of the development.

- 4.19 Planning based LES measures to reduce the transport emissions arising from a development, may include the sustainable location and layout of development and provision of walking, cycling and public transport modal shift based measures, but the aim is to go beyond these and use technology based measures to reduce emissions from any remaining residual transport.

Typical low emission mitigation measures include, but are not restricted to:

- Preferential parking / reserved parking for low emission vehicles (with a particular emphasis on electric, bio-methane and hybrid vehicles)
- Specification of minimum standards and /or fuel type for vehicle fleets serving an industrial, business or retail development
- The provision of, or a contribution towards the cost of providing low emission vehicle refuelling / recharging infrastructure such as electric vehicle recharge points, community gas refuelling stations etc.
- Provision of low emission vehicle car clubs
- Contributions towards the cost of providing low emission buses, refuse trucks or other vehicles e.g. community / social transport, school minibuses etc
- Enabling measures, such as requiring the segregation of food waste in order to encourage the production of bio-methane via anaerobic digestion
- Low emission travel and vehicle ownership incentives such as free or reduced parking charges, improved loyalty card terms, discounted entry to local attractions etc
- Adoption of low emission vehicle procurement policies

Current situation in York

- 4.20 Planning policy to ensure sustainable development and reduced emissions to air is already at an advanced stage in York. The emerging Development Plan will seek to ensure that future development is concentrated in locations accessible by walking and cycling, and well served by public transport and services. The Interim Planning Statement (IPS) on Sustainable Design and Construction³³ sets out provisions to encourage walking and cycling, sets minimum standards for the use of renewable energy. It also has an overriding requirement to 'minimise pollution to air'. The IPS is supported by a further internal document entitled 'Planning and Air Quality'. This requires the likely impact of larger developments on concentrations of local air pollutants to be assessed. The internal 'Planning and Air Quality' document is a local guidance note but is based on the Environmental Protection UK (EPUK) air quality guidance note - '*Planning for Air Quality (2010 update)*'³⁴ and reflects national best practice guidance on assessing air quality impacts. It is focused mainly on trying to prevent any further deterioration in local air

³³ IPS on sustainable design and construction (2007)

³⁴ Development Control: Planning for Air Quality (2010 update), EPUK (2010)

quality and on protecting new and existing residents from the health impacts of poor air quality. This can sometimes be achieved through the setting back of buildings, appropriate orientation of rooms and requirements for ventilation from an alternative facade.

- 4.21 Whilst the current IPS and air quality guidance have been successful in improving the environmental credentials of new development there are some outstanding issues that need to be addressed and improved to support the objectives of the LES. These are:
1. Developers don't always respond to planning guidance and planning refusal on grounds of emissions alone can seldom be justified given economic pressures
 2. The current set of guidance is of limited use in dealing with 'creeping' cumulative emissions from small scale developments (those that are too small to currently trigger the need for an air quality impact assessment).
 3. The current set of guidance does not set any standards or requirements for the use of low emission vehicles and does not contain any provision for the supply of associated infrastructure.
 4. Conflict can sometimes arise between the use of renewable energy and the need to minimise emissions to air. An example of this is the use of bio-mass burners which offer considerable savings in emissions of the greenhouse gas CO₂ but can give rise to increased local concentrations of PM and NO₂. (depending on the size, scale and location of the installation).³⁵
 5. The current system does not actively pursue developer contributions for the development of community based low emission infrastructure e.g. gas vehicle re-fuelling plants, low emission refuse truck fleets, low emission buses etc.

The way forward

- 4.22 Since the publication of the DEFRA guidance on LESs, York has already had some success in obtaining low emission vehicle provisions on new developments through informal negotiations. These include provision of electric vehicle recharging points at Waitrose and the promise of more on the Nestle South site and at the new stadium. The LES aspirations of York are already becoming recognised by developers with some planning applications now being submitted with proposals for electric vehicle recharging points without the need for negotiations to secure their inclusion. The LES will seek to formalise the requirements for LES based planning measures and financial contributions on new developments by reviewing and updating current planning documents and guidance notes.

³⁵ Technical Guidance: Screening assessment for biomass boilers, Report to DEFRA, AEA Technology, July 2008

Planned outcomes from LES planning based measures

1. To obtain a wide and sympathetic understanding of the need (and best practice) to deliver low emission developments (for both carbon and local air pollutants) including the need to reduce development related transport emissions
2. To clarify and formalise the approach to obtaining LES based mitigation measures on developments in York by reviewing and updating current planning documents and guidance notes.
3. To increase the number of LES based mitigation measures occurring on developments in York
4. To increase the number and value of development contributions towards the cost of low emission community infrastructure and services in York e.g. gas re-fuelling station, low emission refuse trucks, low emission buses etc.
5. To minimise total emissions arising from development in York.

LES measures to minimise emissions from development

Short Term Measures (by end of 2012)

Low cost measures(<£40k)				
I.D	Measure	Measure type	Delivery	Resources
2A	Continue to improve and expand scope of negotiations for LES measures on large development sites	Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets)

Medium Term Measures (by end of 2013)

Low cost measures(<£40k)				
I.D	Measure	Measure type	Delivery	Resources
2B	Produce and consult on revised planning documents to ensure incorporation of LES measures on new developments. To include requirements for low emission vehicle technology, alternative fuels, requirements for eco-driving and eco-maintenance	Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets)
2C	Set up a local database of LES planning based measures and financial contributions achieved and promote their existence locally	Inform	EPU	EPU, Integrated Strategy, Sustainability (existing staff and budgets)
2D	Include LES mitigation requirements in Local Area Action Plans and / or development briefs for all major development sites.	Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets) requires funding for initial study during 2012 – see 2C above)

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Medium Term Measures (by end of 2013) (continued)

Medium cost measures (£40k to £100k)				
2E	<p>Undertake a study of major development sites in the city to determine:</p> <ul style="list-style-type: none"> • what form of LES mitigation may be appropriate on each site • what low emission infrastructure and services are needed in the city and their cost e.g. Gas refuelling station, low emission refuse trucks, low emission buses etc • what level of developer contribution may be appropriate for each site to support the development of low emission community infrastructure <p>Use the results of this study to inform the revised planning guidance (2B)</p>	Inform Improve	EPU, Integrated Strategy	<p>Requires additional staff resources above current provision /or contracting out.</p> <p>Some AQ funding available but additional resources may be needed to complete</p>

Long Term Measures (2014 and beyond)

Low cost measures (£40k)

Low cost measures (£40k)				
Measure		Measure type	Delivery	Resources
2F	Adopt and implement revised planning documents to incorporate LES measures. Continue to review and improve revised planning documents following implementation	Inform Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets)
2G	Promote revised planning guidance and examples of LES best practice amongst developers	Inform Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets)
2H	Continue to ensure LES mitigation measures are delivered on major development sites.	Improve	EPU, Integrated Strategy	EPU, Integrated Strategy, Sustainability (existing staff and budgets). Requires funding for study in 2E

Medium cost measures (£40k to £100k)

Medium cost measures (£40k to £100k)				
Measure		Measure type	Delivery	Resources
2I	Adopt a BREEAM ³⁶ style accreditation scheme for low emission developments (including LES transport measures) subject to national scheme becoming available (currently under development)	Improve	EPU, Integrated Strategy	Likely to require additional staff resources to implement and scheme registration / accreditation fees. No funding source currently identified.

³⁶ BREEAM (Building Research Establishment's Environmental Assessment Method) a voluntary scheme that works by awarding credits for meeting different environmental targets on development. Local authorities can specify BREEAM standards to be met on new developments, currently mainly in relation to energy use / conservation.

Objective 3: Improving vehicle efficiency and providing incentives and opportunities for the use of low emission vehicles and fuels

To minimise emissions to air from existing vehicles by encouraging eco-driving, optimising vehicle maintenance and performance (including that of abatement equipment) and providing businesses, residents and visitors with incentives and opportunities to adopt low emission vehicles and fuels

- 4.23 The main purpose of this objective is to minimise emissions from existing transport sources across the city. It excludes measures relating to CYC transport (objective 4) and measures to be introduced specifically for improving air quality within the AQMAS (section 6).

The LES aims to reduce emissions from transport by:

1. Improving transport efficiency (by reducing total mileage, promoting eco-driving, and optimising vehicle maintenance and performance (including that of abatement technology))
2. Providing incentives for the use of low emission vehicles and fuels
3. Enabling the use of low emission vehicles and fuels

Background

Promotion of transport efficiency savings

- 4.24 Persuading people to reduce their transport emissions through simple lifestyle changes and improved driving skills is an essential part of the LES. Some of the steps that can be taken by individuals to reduce their transport emissions include:
- reducing car use – either by travelling less (e.g. by combining the purpose of different trips, shopping on-line etc), or by switching to an alternative emission free mode such as walking or cycling for some short journeys
 - sharing journeys with others
 - driving more efficiently – reducing speeds, accelerating and braking more smoothly, removing unnecessary items from the boot to reduce vehicle weight (eco-driving)
 - maintaining vehicles better to optimise fuel efficiency and performance of abatement equipment

Some measures to improve transport efficiency have already been taken in York through the CCFAP and LTP.

- 4.25 The CCFAP is focused mainly on reducing emissions from buildings but also includes some transport based measures. Examples include the promotion of energy efficient driving techniques through the use of a driving simulator, and the publication of the 'Are you carwise in York?' booklet giving advice on ways to reduce the emissions and financial costs associated with car ownership
<http://www.york.gov.uk/environment/sustainability/travel/>
- 4.26 The Local Transport Plan (LTP) supports the delivery of CO₂ emission reduction targets in the CCFAP and is also a key delivery mechanism for the AQAP which focuses on improving local air quality. Historically, the main aim of previous LTPs (LTP1 and LTP2) has been to achieve modal shift to walking, cycling and public transport. Car sharing has also been promoted previously through the LTP and there have been some steps taken towards the promotion of low emission vehicles and alternative fuels via graduated parking charges.
- 4.27 To date most of the measures implemented to reduce car use, encourage eco-driving and improve vehicle maintenance have been targeted at the private motorist. There is now a need to extend the scope of this work to incorporate business vehicle fleets, HGVs, buses and taxis.

Providing incentives for the use of low emission vehicles and fuels

- 4.28 Reducing emissions from transport through energy efficiency and modal shift measures has assisted in trying to meet the CO₂ reduction targets and air quality objectives in York, but hasn't gone far enough. To achieve further reductions in emissions from transport there must be a step change in the types of vehicles used in the city.
- 4.29 Encouraging people to invest in and try out low emission technologies is essential to increasing their prevalence in the city. One way of achieving this is to offer incentives linked to the use of low emission technologies such that some form of personal gain or competitive edge is obtained by those who make the change. There are various types of incentives that can be offered including:
- **Financial savings** – e.g. free recharging for electric vehicles, reduced parking charges for low emission vehicles, grants towards the cost of low emission vehicles.
 - **Financial rewards** – e.g. enhanced reward point schemes at supermarkets for users of low emission vehicles, increased mileage rates for low emission vehicle business users
 - **Time saving** – e.g. priority access / parking for users of low emission vehicles, low emission vehicle lanes / corridors to help avoid congestion
 - **Competitive advantage** – e.g. low emission only taxi ranks in high fare demand areas, greater access to city centre access for low emission buses and delivery

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vehicles, preferential low emission procurement of goods and services by large organisations

- **Public recognition** – e.g. awarding of ‘eco-stars’ to operators of clean vehicles, holding award ceremonies for pioneering companies and individuals

4.30 To date the use of incentives to reduce emissions in York has been limited to:

- provision of energy efficiency grants to improve boilers and insulation (CCFAP)
- provision of incentives for the installation of solar panels on buildings
- green tourism business scheme to award different levels of accreditation based on green tourism credentials (CCFAP)
- incentives for the use of public transport by particular groups, for example the YOzone scheme that offers reduced bus fares to young people and other discounts and the national free travel scheme for over 60’s (LTP2)
- A range of reduced parking charges for vehicles in lower tax bands (A to C), vehicles less than 2.7m in length, vehicles powered by electric and vehicles running on LPG.

In 2010/11 4.2% of residents parking permits were issued to low emission vehicles compared with 1.9% in 2009/10 and 1.3% in 2008/09. The figures suggest that there has been a small increase in the uptake of low emission vehicles amongst residents living close to the city centre in recent years but that there is still room to improve this number considerably.

4.31 To date incentives to reduce emissions have been targeted mainly at homes and private cars. Little has been done to incentivise the use of low emission HGVs, buses and taxis. Incentives to reduce emissions from these vehicles form an essential part of the LES.

Enabling the use of low emission vehicles and fuels

4.32 If people are to be provided with incentives to use low emission vehicles and fuels then they must be able to access and service them without excessive costs or inconvenience.

Examples of how this can be done include:

- Providing low emission vehicles within car clubs, car hire and business fleets
- Establishing a network of both public and privately owned electric vehicle recharging points in a wide variety of locations
- Ensuring cabling provided on new developments is adequate enough to allow additional electric vehicle charging points to be added in the future or for existing ones to be upgraded (enabling cabling works)
- Establishing gas re-fuelling infrastructure and allowing public access

- Hosting demonstration projects and demonstration days for low emission vehicles
- Marketing York as a low emission destination where visitors will be rewarded and supported if they choose to arrive by low emission vehicles and/or use alternative modes of transport during their stay

The Way Forward

- 4.33 Many steps have already been taken through the CCFAP, LTPs and AQAPs to reduce emissions from vehicles but more needs to be done. To deliver the levels of CO₂ reduction and air quality improvement needed in York, further action is needed to reduce emissions from the remaining vehicle fleet. This includes the buses and taxis that form the basis of the public transport system in the city and, HGVs and LGVs, which carry out essential deliveries and servicing. To achieve an improvement in local air quality and reduce CO₂ emissions further vehicles must be driven more efficiently, maintained to a better standard and where possible make better use of low emission technologies and fuels (such as electric and bio-methane).
- 4.34 A host of additional incentive and enabling measures are required to improve driving and vehicle maintenance standards and accelerate the uptake of low emission vehicles and fuels across the city. These include:
- Adoption of the Eco-stars fleet recognition scheme in York www.care4air.org/eco_stars_scheme. This is a free, voluntary scheme designed to provide recognition and guidance on operational best practice to operators of goods vehicles, buses and commercial fleets. Operators can work towards obtaining increasing numbers of eco-stars based on the emissions of their vehicles and standards of fleet management (including provision of eco-driving training and enhanced levels of vehicle maintenance / efficiency)
 - Measures to reduce emissions from idling buses and coaches
 - Improved emission standards for taxis and provision of additional financial incentives to encourage purchase of lower emission and alternatively fuelled vehicles
 - Supporting the introduction of biomethane / CNG refueling facilities in the city
 - Re-launch a quality freight partnership
- 4.35 LES measures in relation to each of the following are outlined below:
1. Reducing HGV emissions
 2. Reducing bus emissions
 3. Reducing taxi emissions

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4. Reducing private user and fleet vehicle emissions

These incentive and enabling measures will support, improve and continue the emission reduction and energy efficiency measures already commenced across the city through the CCFAP, LTP and ITY programme. They also link closely to the LES marketing and planning measures outlined in this document. As well as the city wide measures to reduce vehicle emissions, additional localised measures are needed to tackle air quality specifically within the AQMAs. These are detailed under objective 6.

4.36 **Planned outcomes from city wide efficiency, incentive and enabling LES measures**

1. A significant increase in the number of low emission vehicles operational on York's roads (across all vehicle types)
2. Increased ownership of low emission vehicles by York residents
3. A visible presence of alternative refuelling infrastructure in the city, including gas and electric refuelling / recharging facilities
4. A reduction in emissions from public transport on York's roads (including buses and taxis)
5. A reduction in emissions from HGVs

LES measures to increase opportunities for the use of low emission technologies

1. Reducing emissions from HGVs

Short Term Measures for HGVs (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	HGV Measures	Measure type	Delivery	Resources
3A	Adopt voluntary eco-stars award scheme for HGVs and actively pursue sign up by local and national haulage companies. Adopted scheme to include enhanced level of recognition for operators of bio-methane, compressed natural gas (CNG) and hybrid vehicle operators.	Inform Reduce Improve	EPU	£47,500 obtained from DEFRA air quality grant fund to meet initial set up costs.
3B	Work towards re-launch of the quality freight partnership. Obtain fleet data for main operators.	Improve	Sustainable Transport	Initial contact to be made via eco-stars project – 3A.

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Medium Term Measures for HGVs (by end of 2013)

Low cost measures(<£40k) by end of 2013				
I.D	HGV Measures	Measure type	Delivery	Resources
3C	Officially launch Eco-stars award scheme and assist companies to develop low emission strategies for their fleets	Inform Reduce Improve	EPU Sustainable Transport Integrated Strategy CANS	Scheme administration and sign up duties to be continued by LSTF funded post in EPU until 2015
3D	Undertake a feasibility study to identify costs, potential location and potential partners for development of a CNG re-fuelling station in York to support use of gas-hybrid delivery vehicles.	Improve	EPU, Integrated Strategy, Sustainable Transport, Fleet Manager	Existing staff and resources

Long Term Measures for HGVs (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	HGV Measures	Measure type	Delivery	Resources
3E	Continue roll out of Eco-stars award scheme. Encourage and assist some operators to obtain advanced rating for use of bio-methane and other alternatively fuelled vehicles.	Inform Reduce Improve	EPU, Integrated Strategy	LSTF funded post in EPU until 2015 – continuation of scheme beyond this date will depend on available funding
High cost measures (£40k to £100k) – 2014 and beyond				
I.D	HGV Measures	Measure type	Delivery	Resources
3F	Deliver gas re-fuelling infrastructure in York	Improve	CYC Private Investors	Private funding / grants

2. Reducing emissions from buses

Short Term Measures for buses (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	Bus Measures	Measure type	Delivery	Resources
4A	Adopt voluntary eco-stars award scheme for buses and actively pursue sign up by all local operators. Adopted scheme to include enhanced level of recognition for operators of bio-methane, compressed natural gas (CNG), electric and hybrid vehicle operators.	Inform Reduce Improve	EPU	£48,000 obtained from DEFRA air quality grant fund to meet initial set up costs. LSTF post to assist in future years.
4B	Erect signs reminding bus and coach drivers of the environmental and economic advantages of switching off engines whilst idling	Inform Reduce	Sustainable Transport Bus operators	AQ grant fund
4C	Commence investigation into potential efficiency savings and review emission standards for CYC procured bus services as part of ongoing fleet review.	Improve	Procurement Integrated Transport Unit (ITU)	Current staff and resources
4D	Investigate sources of funding (including any future government green bus funding rounds) to support the uptake of hybrid, electric and gas buses in York and provision of associated infrastructure. Work with bus operators and research establishments to attract alternatively fuelled bus demonstration projects to York	Inform Improve	Sustainable Transport, EPU	To be assisted by LSTF funded post in EPU

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Medium Term Measures for buses (by end of 2013)

Low cost measures(<£40k) by end of 2013				
I.D	Bus Measures	Measure type	Delivery	Resources
4E	Launch Eco-stars award scheme and assist local bus companies to develop low emission strategies for their fleets. Consider minimum eco-stars requirement for vehicles entering the LEZ bus corridor.	Inform Reduce Improve	EPU, Sustainable Transport	Scheme administration and sign up duties to be continued by LSTF funded post in EPU until 2015
4F	Undertake a feasibility study to consider cost implications and likely level of air quality improvement associated with potential adoption of anti-idling legislation in York. Report findings to members.	Reduce	To be determined	AQ grant funding available to support the study. Would require a uniformed service to check compliance and enforce legislation.
4G	Implement bus based efficiency and route optimisation savings for CYC procured bus services as identified by fleet review. Set emission standard for bus services procured by CYC	Reduce Improve	Procurement ITU	May be additional costs associated with procurement of lower emission buses

Long Term Measures for buses (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	Bus Measures	Measure type	Delivery	Resources
4H	Continue roll out of Eco-stars award scheme. Encourage and assist some operators to obtain advanced rating for use of bio-methane / hybrid vehicles.	Inform Reduce Improve	EPU, Sustainable Transport	LSTF funded post in EPU until 2015 – continuation of scheme beyond this date will depend on available funding
Medium cost measures (£40k to £100k) – 2014 and beyond				
I.D	Bus Measures	Measure type	Delivery	Resources
4I	Undertake regular reviews of emission standard set for CYC procured bus services and move towards the use of bio-methane / gas/ hybrid and electric vehicles as they become more affordable.	Improve	Procurement ITU Transport providers	Additional costs likely to be associated with procuring of low emission services
High cost measures (>100k) – 2014 and beyond				
4J	Have zero emission buses operating on some services (starting with Park & Ride)	Improve	EPU Bus operators Private partners	Will require large investment in new technology by bus operators and/ or private partners

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3. Reducing emissions from taxis

Short Term Measures for taxis (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	Taxi Measures	Measure type	Delivery	Resources
5A	Review current taxi fleet emissions and set emission reduction targets.	Inform	EPU	Current resources
5B	Investigate sources of funding to support the uptake of hybrid, gas and electric vehicles within the taxi fleet and provision of associated infrastructure. Work with taxi drivers and research establishments to attract alternatively fuelled taxi demonstration projects to York.	Inform Improve	EPU Licensing	Current resources and LSTF officer in EPU
5C	Commence investigation into potential efficiency savings and review emission standards for CYC procured taxis as part of ongoing fleet review.	Improve	Procurement	Current staff and resources

Medium Term Measures for taxis (by end of 2013)

Low cost measures(<£40k) by end of 2013				
I.D	Taxi Measures	Measure type	Delivery	Resources
5D	Develop and adopt new emissions based licensing criteria for taxis	Improve	EPU, Licensing	Current resources and LSTF officer in EPU
5E	Develop and promote local incentives to encourage the uptake of hybrid, gas and electric vehicles within the taxi fleet (including additional local financial incentives for new vehicle purchase). Provide information events for taxi drivers.	Inform Improve		Current resources and LSTF officer in EPU
5F	Implement taxi based efficiency and route optimisation savings for CYC procured taxi services as identified by fleet review. Set emission standard for taxi services procured by CYC	Reduce Improve	Procurement, Licensing, ACE, ITU	Current staffing and resources

Long Term Measures for taxis (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	Taxi Measures	Measure type	Delivery	Resources
5G	Extend voluntary eco-stars award scheme to include taxis ³⁷ . Encourage and assist some operators to obtain advanced rating for use of bio-methane, electric and hybrid vehicles.	Inform Reduce Improve	EPU Integrated Strategy, Licensing	LSTF funded post in EPU until 2015 – continuation of scheme beyond this date will depend on available funding
5H	Undertake regular reviews of taxi licensing emission requirements to gradually tighten emission controls. Move towards compulsory use of low emission vehicles as they become more generally available and affordable.	Improve	EPU, Licensing	Current staffing and resources
Medium cost measures (£40k to £100k) – 2014 and beyond				
I.D	Taxi Measures	Measure type	Delivery	Resources
5I	Undertake regular reviews of emission standard set for CYC procured taxi services and move towards the use of bio-methane / gas/ hybrid vehicles as they become more affordable.	Improve	Procurement, Transport providers, ITU	Additional costs likely to be associated with procuring of low emission services

³⁷ The eco-stars award scheme currently only caters for HGVs, buses and commercial fleets. Mid-Devon Council have recently received DEFRA funding to develop new criteria for taxis. York would look to adopt a similar scheme once it has been developed and tested.

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4. Reducing emissions from private and fleet vehicles

Short Term Measures for private and fleet vehicles (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	Private and Fleet Measures	Measure type	Delivery	Resources
6A	Adopt voluntary eco-stars award scheme and encourage fleet operators to join. Adopted scheme to include enhanced level of recognition for operators of bio-methane, electric, compressed natural gas (CNG) and hybrid vehicle operators.	Inform Reduce Improve	EPU	£48,000 obtained from DEFRA air quality grant fund to meet initial set up costs. LSTF post to assist in future years.
6B	Determine most suitable scheme for installation and use of public recharging infrastructure in CYC car parks. Commence tendering process.	Improve	EPU, Network Management, Parking services	£30k available in LTP3 capital programme 2011/12
6C	Commence roll out of electric vehicle recharging infrastructure in hotels, B&Bs and leisure facilities in partnership with Zero Carbon World (ZCW)	Improve	EPU Zero Carbon World	Charging points provided free by Zero Carbon World. Small grant towards installation costs from AQ grant fund
6D	Undertake networking activities with potential partners for the provision of alternative vehicles and refuelling infrastructure. Collect baseline data and set targets for provision of refuelling infrastructure and uptake of low emission/ alternatively fuelled vehicles in the city.	Improve	EPU Economic development, Private partners	Current resources and LSTF officer based in EPU
6E	Investigate opportunities to financially support the uptake and use of alternative vehicles and fuels by residents, visitors and local businesses. Including funding for purchase / leasing of vehicles and provision of further refuelling infrastructure.	Inform Improve	EPU, Sustainable Transport Services	Current resources and LSTF officer in EPU
6F	Discuss provision of alternatively fuelled vehicles in car club and car hire fleets with car club providers and car hire companies.	Inform Improve	EPU, fleet manager	Current resources and LSTF officer in EPU, Fleet Manager

Medium Term Measures for private and fleet vehicles (by end of 2013)

Low cost measures (<£40k) by end of 2013				
I.D	Private and Fleet Measures	Measure type	Delivery	Resources
6G	Officially launch eco-stars programme and assist local fleet operators to develop low emission strategies for their fleets.	Inform Reduce Improve	EPU	Current resources and LSTF officer
6H	Commence delivery of further privately funded EV infrastructure in public places / business premises	Improve	EPU ITY Private partners	LSTF officer in EPU, private capital funding
6I	Develop and implement local incentives to encourage the uptake of electric, gas and hybrid vehicles by residents, visitors and fleet operators. Market York as a low emission city.	Improve	EPU ITY Parking services Economic development Private partners	Current resources and LSTF officer in EPU. Private funding.
6J	Publicise and undertake further in-use vehicle emission testing. Contact drivers of highly polluting vehicles and recommend vehicle servicing / check up	Inform Reduce	EPU, ITS (University of Leeds)	Air Quality Grant Fund (DEFRA)
Medium cost measures (£40k to £100k) by end of 2013				
I.D	Private and Fleet Measures	Measure type	Delivery	Resources
6K	Commence roll out of alternatively fuelled vehicles in car clubs and car hire fleets.	Improve	Procurement, Fleet Manager, Transport providers	Some match funding or increased cost for use of car club vehicles might be incurred

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Long Term Measures for private and fleet vehicles (2014 and beyond)

Low cost measures (£40k) – 2014 and beyond				
I.D	Private and fleet Measures	Measure type	Delivery	Resources
6L	Continue roll out of Eco-stars award scheme for fleet operators. Encourage and assist some fleet operators to obtain advanced rating for use of electric, bio-methane / hybrid vehicles.	Inform Reduce Improve	EPU	LSTF funded post in EPU until 2015 – continuation of scheme beyond this date will depend on available funding
6M	Continue delivery of privately funded EV infrastructure in public places / business premises	Reduce Improve	EPU, Network Management, Private partners	LSTF officer in EPU, Network Management, private capital funding
6N	Continually review and improve incentives for the use of alternatively fuelled vehicles	Improve	EPU Parking services Economic development Private partners	Current resources and LSTF officer in EPU. Private funding.
High cost measures > £100k) - 2014 and beyond				
I.D	Private and fleet Measures	Measure type	Delivery	Resources
6O	Provide public / private fleet access to gas refuelling infrastructure in York	Improve	To be determined	To be determined

Objective 4: Reducing CYC transport emissions

To lead by example by minimising emissions from council buildings (via CCFAP), fleet and other activities and to showcase low emission technologies whenever possible

Background

- 4.37 CYC is a large organisation providing services to around 86,000 households. It is directly responsible for emissions to air from a large fleet of CYC owned vehicles and indirectly responsible for emissions from private staff vehicles (used on council business) and emissions from vehicles providing CYC procured transport services e.g. school and social transport. CYC also owns / occupies a large number of buildings in the city including offices, schools, care homes, leisure facilities and housing, all of which use energy and give rise to emissions of both GHGs and local air pollutants. In 2007/08 it was estimated that CYC was responsible for the emission of 28,238 tonnes of CO₂. It has a target to reduce this by 25% by 2013.
- 4.38 The purpose of this objective is mainly to reduce emissions from vehicles used on CYC business and to identify opportunities for CYC to showcase low emission vehicles and fuels.

The main approaches to emission reduction will be:

1. Improving transport efficiency (reducing total mileage and promoting more fuel efficient driving techniques)
2. Reducing emissions from remaining vehicle trips through the use of low emission vehicles and fuels

Background

- 4.39 In 2010 CYC approved the CCFAP which committed the city to meeting very challenging targets for reducing CO₂, cutting emissions by 40 per cent by 2020 and 80 per cent by 2050. Delivery of this action plan is already well underway with many CYC CO₂ reduction measures already in place or in the process of being implemented. Examples include:
- Installation of new IT equipment to reduce energy use such as replacing PCs with thin Client terminals, switching to LCD monitors and using 'virtual' servers – estimated 256 tonnes of CO₂ saved
 - Refurbishment of CYC's housing stock to the Decent Homes Standard with schemes such as loft insulation, replacement boilers and rendering programmes estimated to save over 3000 tonnes of CO₂ per annum.

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- Designing of new CYC buildings to the highest environmental standards e.g. Eco-Depot at Hazel Court and new CYC headquarters. The latter will be designed to excellent BREEAM sustainable standards and include PV panels.
- Development of a draft Sustainable Schools Corporate Strategy that will help schools to reduce their carbon footprint and embed sustainability into the heart of the school's operations and curriculum.
- Reducing emissions from street lighting by replacing inefficient lanterns with newer versions, making use of LED lighting where possible and installing solar-powered bollards and signs.

A full list of CYC carbon reduction measures can be found in the CCFAP.

- 4.40 Within CYC there is currently a corporate drive for efficiency savings to help meet the current shortfalls in CYC budgets. As part of this process a corporate fleet review is currently being undertaken looking at all aspects of transport and travel within CYC. The Cleaner Road Transport Vehicle Regulations 2011 require public sector organisations to take into account the operational lifetime energy and environmental impacts when buying or leasing vehicles. When the lifetime emission costs of CO₂, NO_x and PM₁₀ are taken into account, the true costs of alternative fuelled vehicles are often significantly less than conventional, fossil fuelled vehicles. For further information see the EU Clean Vehicle portal (www.cleanvehicle.eu).
- 4.41 In addition to the ongoing internal corporate fleet review, CYC recently successfully bid to take part in the Energy Saving Trust's Plugged-In Fleets initiative. CYC is one of only three local authorities in the country to achieve this and will receive analysis from experts at the Energy Saving Trust and EDF Energy on how electric vehicles can be most effectively used within the council fleet to save money and reduce emissions. Currently CYC owns and operates over 300 vehicles, including cars, vans, refuse trucks, welfare buses and other service vehicles such as road-sweepers. Together this fleet travel over 4 million miles per year with over 95% of the fleet made up of diesel engine vehicles. The remainder of the fleet is petrol or dual fuel petrol/LPG with no current uptake of ultra low emission technology such as electric, bio-methane or hybrid technology.
- 4.42 In addition to the 4 million miles travelled in its own vehicles, CYC business also accounts for almost an additional 1 million miles travelled by staff using their own private vehicles for work purposes. There is also additional mileage associated with council procured transport services (such as school buses and taxis for special needs and looked after children). At the present time CYC has little control over the age and type of private and procured vehicles used on council business. Once the additional mileage undertaken by staff getting to and from work is added into the equation it can be seen that there is huge potential to reduce emissions (and costs) associated with travel within CYC. Many of these opportunities have already been identified as part of the current fleet review and improvements are already starting to be implemented.

The Way Forward

- 4.43 Measures to reduce emissions from CYC owned / operated buildings are already well established under the CCFAP and will continue to be delivered mainly through this mechanism. There is however a need to establish a policy on the use of renewable energy sources in CYC buildings where there may be implications for local air quality. The main example of this is in relation to the use of biomass boilers. These can offer significant CO₂ reduction potential but can have implications for local air quality, particularly in relation to emissions of oxides of nitrogen and particulate. The overarching LES will seek to address this issue.
- 4.44 The greatest remaining potential for emission reduction within CYC lies within the use of transport. Some of the key issues to be addressed include:
- High proportion of diesel vehicles in CYC fleet and the need to lead by example on adoption of alternative technologies
 - High levels of mileage undertaken by staff in their own vehicles and lack of control over age and types of these vehicles and authorisation of journeys undertaken
 - Lack of corporate 'green travel decision trees' to ensure walking, cycling and public transport are used by staff in preference to the car on every occasion
 - A need to consider vehicle emission standards (amongst other issues) as well as costs in procurement of transport services
- 4.45 The LES measures outlined below aim to address some of these issues. These measures will complement the existing CYC CO₂ reduction measures already being pursued through the CCFAP.

Planned outcomes from CYC leading by example and efficiency measures:

1. A continued reduction in emissions of CO₂ and local pollutants from CYC buildings in line with targets set within CCFAP
2. A reduction in the total mileage undertaken on CYC business
3. An improvement in the emission standard of vehicles used on CYC business (including private vehicles used for council business)
4. A greater uptake of low emission technologies within the CYC fleet, procured transport services and by staff using their own vehicles for work purposes and for getting to work.

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Short Term Measures for CYC (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	CYC Measures	Measure type	Delivery	Resources
7A	Continue internal transport and fleet review (commenced 2011) and due to report March 2013	Inform Reduce Improve	CANS transport review team.	Existing working group
7B	Facilitate undertaking of independent EST /EDF review of CYC fleet and act on the recommendations	Inform Reduce Improve	Fleet manager Low Emission Officer (EPU) EST	EST review externally funded
7C	Commence implementation of low cost recommendations arising from internal and EST transport and fleet reviews. May include: <ul style="list-style-type: none"> Improved vehicle routing, greater sharing of services by clients Development and implementation of corporate 'green travel decision trees' plans 	Reduce	Fleet Management Procurement ITU (once fully established)	Existing resources
Medium cost measures(<£40k to 100K) by end of 2012				
I.D	CYC Measures	Measure type	Delivery	Resources
7D	Commence implementation of medium cost recommendations arising from internal and EST transport and fleet reviews. May include: <ul style="list-style-type: none"> Introduction of some stop-start technology into CYC fleet Greater use of car club vehicles for council trips Support for alternatively fuelled vehicles in car club and CYC fleet 	Reduce Improve	Fleet Management Procurement ITU	Some additional costs will be associated with procurement of newer emission standard vehicles and use of stop-start technology

Medium Term Measures for CYC (by end of 2013)

Low cost measures(<£40k) by end of 2013				
I.D	CYC Measures	Measure type	Delivery	Resources
7E	Complete internal fleet review and implement further low cost recommendations arising from internal and EST transport and fleet reviews. May include: <ul style="list-style-type: none"> Setting of minimum emission standard for private vehicles used on CYC business Reducing incentives to use private vehicles for work purposes staff eco-driving training 	Reduce Improve	Fleet Management Procurement	Scope for considerable savings on mileage payments.
7F	Adopt Eco-stars scheme for CYC fleet	Inform Reduce Improve	EPU Fleet Management	Existing resources and LSTF officer in EPU
7G	Develop and adopt guidance to inform decision making on use of biomass technology within CYC buildings. To include requirements for undertaking emission impact assessments and criteria for sourcing of biomass fuels. Will link to revised planning guidance .	Inform	EPU Sustainability team	Existing resources.
Medium cost measures (£40k to £100k) by end of 2013				
I.D	CYC Measures	Measure type	Delivery	Resources
7H	Commence implementation of further medium cost recommendations arising from transport and fleet review. May include: <ul style="list-style-type: none"> Adoption of LES procurement guidance Setting of minimum emission standards for CYC procured transport services and new vehicle purchases 	Reduce Improve	Fleet Management Procurement ITU	Some additional costs will be associated with procurement of newer emission standard vehicles and use of stop-start technology
7I	Identify potential partners and sources of funding for delivery of bio-methane / CNG refuelling infrastructure at council depot	Improve	EPU Planning Transport Fleet Manager ITU	Existing staff and resources LSTF funded posts in EPU and transport

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High cost measures (>100k) by end of 2013				
I.D	CYC Measures	Measure type	Delivery	Resources
7J	Aim to introduce some alternatively fuelled vehicles into CYC fleet	Improve	Fleet Management Procurement	Significant additional resources will be needed to support introduction of alternatively fuelled vehicles into CYC fleet at this stage

Long Term Measures for CYC (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	CYC Measures	Measure type	Delivery	Resources
7K	Continue to implement low cost recommendations arising from internal and EST transport and fleet reviews including continued eco-driving training for all staff	Reduce Improve	Corporate policies	Existing staff and resources.
Medium cost measures (£40k to £100k) – 2014 and beyond				
I.D	CYC Measures	Measure type	Delivery	Resources
7L	Continue to implement medium cost recommendations from transport and fleet review	Improve	Corporate policies	To be identified
High cost measures > £100k) - 2014 and beyond				
I.D	CYC Measures	Measure type	Delivery	Resources
7M	Deliver bio-gas refuelling infrastructure (ideally at CYC depot)	Improve	CYC Private partners	Grants Private funding Match funding
7N	Aim to achieve highest Eco-stars award for CYC fleet	Improve	EPU Fleet management ITU	Requires considerable additional investment in CYC fleet vehicles

Objective 5: Encouraging inward investment by low emission industries**To encourage inward investment by providers of low emission technology, fuels and support services**

- 4.46 The purpose of this objective is to ensure that York takes full advantage of the economic investment and job opportunities that could arise through becoming an early adopter of low emission technologies.

Background

- 4.47 A recent study undertaken by Coventry University³⁸ valued the low carbon vehicle business sector at a potential £13 billion per annum to the West Midlands region. Whilst much of this value is attributed to opportunities within the already well established motor manufacturing industry in that area, there are some opportunities that could be just as readily applicable to York. Examples include;
- Opportunities to attract new businesses in the field of low emission technology, for example, supply and maintenance of electric vehicles and associated refuelling infrastructure, generation and supply of bio-gas as a fuel.
 - Opportunities to lead on the training and education of the 'green' workforce
- 4.48 Additionally York could explore opportunities in more familiar markets such as tourism. Here there is scope to develop low emission based incentives to attract further visitors to the city (for example by providing discounted entry to key attractions for users of low emission vehicles) and to improve opportunities for visitors to use low emission transport whilst in the city, by working with hotels, car hire and car club providers. The latter would help accelerate the uptake of new technologies within the city, would strengthen the business case for attracting new supply and maintenance companies and increase demand for specialist 'green sector' training opportunities. Other business opportunities may exist within the further promotion of cycling in the city.
- 4.49 York's new community strategy - *The Strategy for York* sets out the long term visions for the city, these include:
- Building confident, healthy and inclusive communities
 - Being a leading environmentally-friendly city
 - Being at the forefront of innovation with a diverse and thriving economy
 - Being a world class centre for culture, education and learning for all
 - Celebrating our historic past and creating a successful and ambitious future

³⁸ Donnelly T, Begley J, Jarvis D (2010) Transformation Technologies and Business Investment: The Low Carbon Vehicles Sector, Coventry University.

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The vision is supported by six strategic ambitions designed to help deliver it. The LES supports several of these ambitions including:

1. Improve the physical and cultural environment of the city as a basis for community and economic development - *LES will help improve air quality*
2. Keep York's employment levels high and economy buoyant by supporting local employers, entrepreneurship, developing a diverse and sustainable economy and balanced employment structure – *delivery of the LES offers new job and business opportunities*
3. Ensure the process of physical development is used to improve the environmental sustainability of the city, and that growth accommodates the challenges of climate change and other built and natural environmental challenges – *the LES (in conjunction with LTP3 and the emerging Development Plan) will promote the use of low emission technology on new developments and require additional emissions of air pollutants to be adequately mitigated against*
4. Use York's brand and position to promote the city within the regional, national and global network – *the LES offers an opportunity to promote York as a low emission city*
5. Encourage partnerships within the city and beyond that benefit everyone and achieve mutual advantage – *the LES will promote partnership working to deliver low emission travel opportunities and associated infrastructure*

4.50 In 2009 CYC in collaboration with Yorkshire Forward commissioned the production of a long-term, economic vision for the City of York in entitled 'York New City Beautiful: Towards an Economic Vision (2010)'. This document proposes an economic vision for York, which includes working with businesses, universities and colleges and supporting the high quality small business community linked to the science and knowledge sectors. It also states that the City must embed low-carbon economic opportunities into all of its enterprises; build on the strong bioscience and renewable research; and link this to the City's carbon reduction targets and its strategy for renewable energy.

4.51 The delivery of the measures outlined in this low emission strategy are therefore well placed to assist in achieving York's wider sustainability and economic development priorities and aspirations. These opportunities must not be overlooked.

The Way Forward

4.52 As York seeks to transform itself into a low emission city it must engage effectively with the business community and market itself widely as a centre of excellence for low emission technology. It must actively seek to attract new low emission based business and industry into the city and ensure that there is a highly skilled and educated workforce for these new businesses to employ. This will require the establishment of new training and development programmes and continued support for small business set up etc. An early activity must be the undertaking of a full assessment of the low emission technology opportunities available

to York followed up by a comprehensive set of measures to ensure these opportunities are fully capitalised upon.

- 4.53 The LES measures below outline the first steps needed to successfully integrate the low emission strategy agenda into the city's wider economic development strategy. Further measures will undoubtedly emerge as more understanding is gained of the potential markets and business opportunities that exist in the low emission technology field.
- 4.54 **Planned outcomes from encouraging inward investment by low emission industries:**
1. A significant increase in the number of people employed in York's 'green' job sector
 2. A visible presence of low emission industries and service providers within York
 3. York to become the regional centre for low emission technology and service provision
 4. York to see an increase in the training and development opportunities offered at local colleges and universities for employees (and potential employees) of the low emission technology industry
 5. York to work with other local authorities to develop and apply low emission technology

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Short Term Measures for inward investment (by end of 2012)

Low cost measures(<£40k) by end of 2012				
I.D	Investment Measures	Measure type	Delivery	Resources
8A	Raise awareness of the York LES via regional and national events.	Inform	EPU, City Strategy, Economic Development	Existing staff and resources
8B	Incorporate the low emission city message into 'York' marketing campaigns	Inform	City Strategy, Economic Development, Visit York	Existing staff and resources
Medium cost measures (£40k to 100k) by end of 2012				
	Investment Measures	Measure type	Delivery	Resources
8C	Actively promote York as a centre for low emission technology amongst suppliers of low emission vehicles, technologies and support services	Inform	EPU, City Strategy	To be determined
8D	Commission a study into the economic growth potential associated with the LES	Inform	Economic Development, EPU, academic organisation / consultant	To be determined

Medium Term Measures for inward investment (by end of 2013)

Low cost measures (<£40k) by end of 2013				
I.D	Investment Measures	Measure type	Delivery	Resources
8E	Undertake promotional events to showcase low emission progress being made in York	Inform	Economic Development, EPU	Existing staff and resources
Medium cost measures (£40k to £100k) by end of 2013				
I.D	Investment Measures	Measure type	Delivery	Resources
8F	Develop a package of incentives / opportunities for suppliers of low emission vehicles, technologies and support services to encourage them to locate to and/or invest in York	Inform Improve	Economic Development	To be determined
8G	Work with local educational establishments and the Green Jobs Task Force to develop suitable low emission technology training courses, qualifications and research programmes	Inform Improve	Economic Development	To be determined
High cost measures (>100k) by end of 2013				
I.D	CYC Measures	Measure type	Delivery	Resources
8H	Undertake international promotion of York as a centre of excellence for low emission technology	Inform Improve	Economic Development	To be determined

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Long Term Measures for inward investment (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	Investment Measures	Measure type	Delivery	Resources
8I	Continue with ad-hoc events to promote York as a centre of excellence for low emission technology	Inform	Economic Development	To be determined
Medium cost measures (£40k to £100k) – 2014 and beyond				
I.D	CYC Measures	Measure type	Delivery	Resources
8J	Continue to actively market York to suppliers of low emission vehicles, technologies and support services	Inform Improve	Economic Development	To be determined
8K	Continue to develop training and research opportunities to support the roll out of low emission technology	Inform Improve	Economic Development	To be determined
High cost measures (> £100k) - 2014 and beyond				
I.D	CYC Measures	Measure type	Delivery	Resources
8L	Continue to promote York internationally as a centre of excellence for low emission technology	Inform Improve	Economic Development	To be determined

Objective 6: Maximising sustainable transport and reducing localised air quality breaches

To maximise sustainable transport and reduce localised air quality breaches through traffic demand management, smart travel planning and potentially regulatory control

- 4.55 The main purpose of this objective is to deliver a series of additional LES measures targeted specifically at reducing emissions within the existing AQMAs and other areas of the city where air quality is of particular concern. These measures will be based on the extensive modal shift and sustainable travel initiatives that have, and are continuing to be delivered through previous LTPs, the current LTP3, Intelligent Travel York, and other major transport initiatives currently taking place in the city to 'Get York Moving'.

Background

Local Transport Plan

- 4.56 The Local Transport Plan (LTP) supports the delivery of CO₂ emission reduction targets in the CCFAP and is a key delivery mechanism for the AQAP which focuses on improving local air quality. CYC's Third Local Transport Plan (LTP3), covering the period April 2011 to March 2015 and beyond to 2031 sets out the transport policies and measures that will contribute to the city's economic prosperity over the next 20 years, whilst meeting challenging national and local targets for reducing emissions. It builds on the success of the first two LTPs including:
- An increase in bus patronage by over 5 million passengers (+54%) between 2001 and 2006 (and has been broadly stable since despite falling patronage elsewhere in the country, although the introduction of free bus travel for the elderly and disabled disguises a fall in fare paying passengers in the city)
 - Peak period traffic levels have been stable since 2006
 - More than a 15% increase in cycling numbers since 2008 (during the lifetime of the Cycling City York programme).
- 4.57 The priority for LTP3 is to provide a high quality, well planned, fully integrated and efficiently operated transport network in order to limit, as far as possible, increasing future delays and to enable the city to continue to function as it grows. This is to be achieved by:
- Providing quality alternatives to the car to provide more choice and enable more trips to be undertaken by sustainable means.
 - Improving strategic links to enhance the wider connections with the key residential and employment areas in and around York, and beyond.

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- Encouraging behavioural change to maximise the use of walking, cycling and public transport and continue improving road safety
- Tackling transport emissions to reduce the release of pollutants harmful to health and the environment.
- Enhancing public streets and spaces to improve the quality of life, minimise the impact of motorised traffic and encourage economic, social and cultural activity.

Further information about LTP3 can be found at [Local Transport Plan 2011-2031 - City of York Council](http://www.york.gov.uk/content/45053/64877/64891/Local_transport_plan/ltp3/default)

(http://www.york.gov.uk/content/45053/64877/64891/Local_transport_plan/ltp3/default)

Local Sustainable Transport Fund (LSTF)

- 4.58 During 2012 York was awarded £4.645m in funding from the Department for Transport (DfT) to further improve sustainable transport in the city over the next four years. The LSTF programme 'Intelligent Travel York (ITY)' will aim to deliver a step change in transport provision, reducing congestion and its impact on the environment, and enhance the city's prosperity and growth potential. It will deliver an integrated programme of personal, business and school travel planning combined with targeted infrastructure enhancements to increase people's travel choices, particularly for the more sustainable and active forms of travel. The primary focus will be the Northern Quadrant of the city where there are high numbers of short car trips to employment and retail destinations.

Access York Phase 1

- 4.59 York's existing Park & Ride is a key component of sustainable travel provision in the city. It is used by more than 3 million passengers per year and has already removed around one million cars from the city centre. Despite this success there is still substantial room for more capacity.
- 4.60 Access York Phase 1 (Park & Ride) is a major scheme that CYC is seeking to implement with funding support from the Department for Transport (DfT). The key objectives of the scheme are to provide an alternative means for car based visitors to reach the city centre in order to reduce traffic congestion, improve air quality in the city centre, and support the projected economic growth for the sub-area. The original Access York Phase 1 major scheme bid comprised:
- A larger relocated Park & Ride site at Askham Bar to replace the existing site that is now too small for the city's needs
 - A new Park and Ride site on the A59 at Poppleton Bar, together with an upgrade of A1237/A59 junction and bus priority measures on A59
 - A new Park and Ride site at Clifton Moor, next to Wigginton Road with associated bus priority measures
- 4.61 In November 2011, the DfT reconfirmed 'Programme Entry' status for Access York Phase 1. However, this was for only two of the sites (Askham Bar and Poppleton Bar) at a cost of £21.9m (funding split 70% DfT to 30% CYC). Alternative ways to deliver the Clifton Moor site (not included in the 'Best and Final Offer' for the Major Scheme bid to DfT) are currently

being investigated. The new Park & Ride sites will be accompanied by bus route improvements to ensure it is quicker to travel to the city centre by bus than by car.

York City Centre Movement and Accessibility Framework Study

- 4.62 York led the way with the large scale pedestrianisation of the footstreets area 25 years ago and now has emerging aspirations to make York the most special place in England by 2030 through, for example, having a city centre with an enhanced public realm and much less intrusion by motor vehicles. These aspirations will be an integral part of the emerging Development Plan. Over the next year, further measures to reduce car traffic and increase the use of public transport, walking and cycling in the city centre will be explored along with increases to the operating hours and extent of the central 'footstreets' area. Public realm improvements and bus priority measures will be central to improving movement through the city centre. As a result pedestrians are expected to have greater priority in the centre of York and the effects of through traffic and vehicle emissions are expected to diminish.

Better Bus Area bid

- 4.63 In March 2012, the Department for Transport announced that CYC was successful in its £2.9m 'Better Bus Area Fund' bid to improve the city's bus services. This funding will be used to increase the quality, reliability and punctuality of local bus services. Partnership arrangements will be agreed with the bus operators to develop all aspects of bus travel. This will include improvements to vehicle fleets, better timetables, and real-time information and more bus priority measures. Through ticketing will also be introduced, which means passengers will only need to buy one ticket to complete a journey, even if they have to use more than one bus operator's services. All of these improvements look to support a 10% increase in bus based trips over the next four years.

20mph Initiative

- 4.64 Proposals for the roll out of a city wide 20mph limit in residential areas are currently being developed. These are designed to address, amongst wider aspirations to improve the quality of life and place, the two key issues of making streets friendlier for more sustainable modes of travel and to address perceptions around safety risks for cyclists and pedestrians, that will allow for much greater uptake of those modes.

The way forward

- 4.65 Much is already being done to 'Get York Moving' by:
- improving the quality and choice of sustainable transport
 - improving traffic demand management
 - encouraging smarter travel choices
 - reducing the need to travel

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The LES not only relies on these transport and public realm initiatives but can reinforce and assist this process by helping to ensure that in the future only low emission vehicles will be able to operate within areas of poor air quality. Furthermore the LES will seek to ensure that these vehicles will be driven in the most efficient way possible and properly maintained to optimise environmental performance. The aim will be to achieve the shift to low emission vehicles as far as possible through education, incentives and enabling measures (as outlined under the other LES objectives) but some regulatory measures to accelerate the uptake of low emission vehicles may become necessary in the future.

- 4.66 The measures detailed under this objective are those additional measures that may be needed to ensure compliance with the national air quality objectives at all locations in the city. They include:
- Assessing the feasibility study of only allowing buses of a specified emission standard to enter a proposed low emission bus corridor in the city centre. Similar low emission bus schemes already operate in Oxford and Norwich
 - Investigation of the feasibility of introducing a freight consolidation / trans-shipment centre to serve the city centre using low / zero emission vehicles
 - Looking at the potential for a wider Low Emission Zone (LEZ) incorporating a wider range of vehicles
 - Looking at selective queue relocation and other more direct traffic management measures to reduce emission concentrations in sensitive locations
- 4.67 **Planned outcomes from the additional LES measures to maximise sustainable transport and reduce localised air quality breaches**
1. An improvement in air quality within the AQMAs
 2. A significant reduction in emissions from buses, HGVs and taxis in the city centre
 3. A reduction in the total number of vehicles accessing the city centre
 4. Increased use of public transport
 5. More cycling and walking

Additional LES measures to maximise sustainable transport and reduce localised air quality breaches

Short term additional measures for HGVs (by end of 2012)

Low cost measures (<£40k) by end of 2012				
I.D	HGV Measures	Measure type	Delivery	Resources
9A	Undertake a freight improvement study to include development of an outline business case for a freight transshipment centre and assessment of other potential improvements to freight transport in the city centre. Consider outcomes.	Inform	Sustainable Transport	Already actioned under LTP3
Medium cost measures (£40k to £100k) by end of 2012				
9B	Commission a city centre LEZ feasibility study linked to city centre access and movement study (HGV aspects) <i>Links to 9H,9M,9P</i>	Inform	EPU Sustainable Transport	Bus and air quality ASR funded

Medium term additional measures for HGVs (by end of 2013)

Low cost measures (<£40k) by end of 2013				
I.D		Measure type	Delivery	Resources
9C	Progress outcomes of freight improvement study Engage in discussions with potential investors in freight trans-shipment / consolidation centre if appropriate.	Reduce Improve	EPU, Integrated Strategy, Sustainable Transport	Existing staff and resources.
Medium cost measures (£40k to £100k) by end of 2013				
9D	Complete LEZ feasibility study for HGVs and consider linkages with city centre movement and accessibility programme ³⁹ . Consider findings and recommendations. <i>Links to 9J,9N,9Q</i>	Reduce Improve	EPU, Integrated Strategy, Sustainable Transport	City Strategy

³⁹ <http://democracy.york.gov.uk/ieListDocuments.aspx?CId=128&MId=6497&Ver=4>

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Long term additional measures for HGVs (2014 and beyond)

High cost measures (> £100k) – 2014 and beyond				
I.D	HGV Measures	Measure type	Delivery	Resources
9E	Deliver a privately funded freight trans-shipment / consolidation centre in York if considered necessary and appropriate	Reduce Improve	CYC Private Investors	Private funding / grants
9F	Implement recommendations of city centre access and movement study including LEZ measures for HGVs if considered necessary / appropriate <i>Links to 9L,9O,9R</i>	Improve	EPU, Sustainable Transport, Integrated Strategy	To be identified

Short term additional measures for buses (by end of 2012)**Medium cost measures (£40k to £100k) by end of 2012**

I.D	Bus Measures	Measure type	Delivery	Resources
9G	Undertake a low emission bus corridor feasibility study to include: <ul style="list-style-type: none"> • Establishment of a database of current bus operators and emission standards of their vehicles • A cost / benefit analysis of the implications of establishing a LEZ bus corridor on operators • Modelling of the emission and air quality impacts of different LEZ entry requirements for buses Consider findings and recommendations	Improve	EPU, Sustainable Transport	£40,000 for a bus based LEZ corridor study obtained from DEFRA. Study to commence late 2011 for a period of 1 year. Additional funds from previous DEFRA funding and bus quality partnership
9H	Commission a city centre LEZ feasibility study (bus aspects) linked to city centre access and movement study <i>Links to 9B,9M,9P</i>	Inform	EPU Sustainable Transport	Bus and air quality ASR funded

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Medium term additional measures for buses (by end of 2013)

Low cost measures (<£40k) by end of 2013				
I.D	Bus Measures	Measure type	Delivery	Resources
9I	Implement recommendations of low emission bus corridor feasibility study	Reduce Improve	EPU, Sustainable Transport,	LTP3 funding
Medium cost measures (£40k to £100k) by end of 2013				
I.D	Bus Measures	Measure type	Delivery	Resources
9J	Complete LEZ feasibility study for buses and consider linkages with city centre movement and accessibility programme ⁴⁰ . Consider findings and recommendations. <i>Links to 9D,9N,9Q</i>	Inform	EPU, Integrated Strategy, Sustainable Transport	City Strategy

Long term additional measures for buses (2014 and beyond)

Low cost measures (£40k) - 2014 and beyond				
I.D	Bus Measures	Measure type	Delivery	Resources
9K	Undertake regular reviews of effectiveness of bus based LEZ corridor and entry requirements. Update and amend as appropriate.	Inform Reduce Improve	EPU, Sustainable Transport	Existing staff and resources
High cost measures > £100k) - 2014 and beyond				
I.D	Bus Measures	Measure type	Delivery	Resources
9L	Implement recommendations of city centre access and movement study including LEZ measures for buses if considered necessary / appropriate <i>Links to 9F,9O,9R</i>	Reduce Improve	EPU, Sustainable Transport, Integrated Strategy	To be identified

⁴⁰ <http://democracy.york.gov.uk/ieListDocuments.aspx?CId=128&MId=6497&Ver=4>

Short term additional measures for taxis (by end of 2012)**Medium cost measures (£40k to £100k) by end of 2012**

I.D	Taxi Measures	Measure type	Delivery	Resources
9M	Commission a city centre LEZ feasibility study (taxi aspects) linked to city centre access and movement study <i>Links to 9B,9H,9P</i>	Inform	EPU Sustainable Transport	City Strategy Bus and air quality ASR funded

Medium term additional measures for taxis (by end of 2013)**Medium cost measures (£40k to £100k) by end of 2013**

I.D	Taxi Measures	Measure type	Delivery	Resources
9N	Complete LEZ feasibility study for taxis and consider linkages with city centre movement and accessibility programme ⁴¹ . Consider findings and recommendations. <i>Links to 9D,9J,9Q</i>	Inform	EPU, Integrated Strategy, Sustainable Transport	City Strategy Bus and air quality ASR

Long term additional measures for taxis (2014 and beyond)**High cost measures > £100k) - 2014 and beyond**

I.D	Taxi Measures	Measure type	Delivery	Resources
9O	Implement recommendations of city centre access and movement study including LEZ measures for taxis if considered necessary / appropriate <i>Links to 9F,9L,9R</i>	Reduce Improve	EPU, Sustainable Transport, Integrated Strategy	To be identified

⁴¹ <http://democracy.york.gov.uk/ieListDocuments.aspx?CId=128&MId=6497&Ver=4>

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Short term additional measures for private and fleet vehicles (by end of 2012)

Medium cost measures (£40k to £100k) by end of 2012

I.D	Private and fleet measures	Measure type	Delivery	Resources
9P	Commission a city centre LEZ feasibility study (cars and LGV aspects) linked to city centre access and movement study <i>Links to 9B,9H,9M</i>	Inform	EPU Sustainable Transport	City Strategy Bus and air quality ASR funded

Medium term additional measures for private and fleet vehicles (by end of 2013)

Medium cost measures (£40k to £100k) by end of 2013

I.D	Taxi Measures	Measure type	Delivery	Resources
9Q	Complete LEZ feasibility study for cars and LGVs and consider linkages with city centre movement and accessibility programme ⁴² . Consider findings and recommendations. <i>Links to 9D,9J,9N</i>	Inform	EPU, Integrated Strategy, Sustainable Transport	City Strategy Bus and air quality ASR

Long term additional measures for private and fleet vehicles (2014 and beyond)

High cost measures > £100k) - 2014 and beyond

I.D	Taxi Measures	Measure type	Delivery	Resources
9R	Implement recommendations of city centre access and movement study including LEZ measures for cars and LGVs if considered necessary / appropriate <i>Links to 9F,9L,9O</i>	Reduce Improve	EPU, Sustainable Transport, Integrated Strategy	To be identified

⁴² <http://democracy.york.gov.uk/ieListDocuments.aspx?CId=128&MId=6497&Ver=4>

Summary of LES measures by end of 2012

Low cost measures by end of 2012	LES references	Objective
Promotion of LES via local media	1A	1
JorAir school visits	1B	1
LES promotion at a small number of business events	1C,8A	1,5
Develop framework for high profile LES marketing campaign	1D,8B	1,5
Continue to negotiate LES measures on developments	2A	2
Adopt eco-stars for HGVs, buses, council fleet, other fleets	3A, 4A,6A,	3,4
Re-launch quality freight partnership	3B	3
Erect anti-idling bus emission signs	4B	3
Continue CYC fleet efficiency and emissions review for bus services, taxis and council fleet	4C,5C,7A	3,4
Investigate sources of funding for alternatively fuelled buses, taxis, lease and hire vehicles . Try to attract demonstration projects to the city	4D,5B,6E	3
Review current taxi emissions and set targets for emission reduction	5A	3
Commence tendering for installation of public EV recharging points in CYC car parks	6B	3
Roll out EV charging points in hotels, B&Bs and other leisure sites with ZCW	6C	3
Network with potential partners for the provision of alternatively fuelled vehicles and associated infrastructure. Set targets for numbers of alternatively fuelled vehicles and associated infrastructure.	6D	3
Open dialogue with car club providers and car hire companies regarding provision of alternatively fuelled vehicles in car club and car hire fleets	6F	3
Facilitate completion of EST fleet review and consider recommendations	7B	4
Commence Implementation of low cost measures from CYC fleet efficiency and emissions review	7C	4
Undertake a freight improvement study (to include freight consolidation / trans-shipment aspects)	9A	6
Medium cost measures by end of 2012	LES references	Objective
Implement medium cost measures from CYC and EST fleet reviews	7D	4
Actively promote York as a centre for investment by low emission technology businesses	8C	5
Commission a study into the economic growth potential associated with the LES	8D	5
Undertake a low emission bus corridor feasibility study	9G	6
Commission a city centre LEZ feasibility study linked to city centre access and movement study (including HGV, bus, taxi, LGV and car aspects)	9B,9H,9M,9P	6

Summary of LES measures by end of 2013

Low cost measures by end of 2013	LES reference	Objective
Continued promotion of LES via local media	1E,8E	1,5
Continued JorAir school visits	1F	1
Inclusion of LES measures in travel planning activities	1G	1
Engage with public health to develop an air quality based health promotion campaign	1H	1
Investigate possibility of a social media linked air quality alert system	1I	1
Develop and consult on revised planning documents to minimise emissions from development (including associated traffic)	2B	2

Develop a database of LES based planning measures achieved	2C	2
Include LES mitigation requirements in LAAPs / development briefs	2D	2
Launch eco-stars for HGVs, buses, council fleet, other fleets	3C,4E,6G,7F	3,4
Undertake a CNG refuelling feasibility study	3D	3,4,5
Implement new emission standards for taxi licensing	5D	3
Provide localised financial incentives to encourage uptake of new lower emission and alternatively fuelled taxis	5E	3
Undertake feasibility study into adoption of anti-idling legislation	4F	3
Implement further low cost measures from CYC and EST fleet reviews	4G,5F,7E	3,4
Commence delivery of privately funded EV infrastructure	6H	3
Develop and implement incentives for the use of alternatively fuelled vehicles by residents, visitors and local business community	6I	3
Progress outcomes of freight improvement study	9C	6
Implement recommendations of low emission bus corridor feasibility study (if considered necessary and appropriate)	9I	6
Undertake further in-use vehicle emission testing. Contact drivers of highly polluting vehicles and recommend vehicle servicing / check up.	6J	3
Develop guidance on use of biomass technology within CYC buildings	7G	4
Medium cost measures by end of 2013	LES references	Objective
Undertake a study of known development sites to identify opportunities for future LES measures	2E	2
Commence roll out of alternatively fuelled vehicles in car clubs and car hire fleets	6K	3,4
Develop incentives / opportunities for inward investment by suppliers of low emission vehicles, technologies and support services	8F	5
Work with local educational establishments and the Green Jobs Task Force to develop suitable low emission technology training courses, qualifications and research programmes	8G	5
Instigate high profile LES marketing campaign	1J	1,5
Implement further medium cost measures from CYC fleet efficiency and emissions review	7H	4
Identify potential partners and funding for CYC owned gas refuelling infrastructure at CYC depot	7I	3,4
Complete city centre LEZ study linked to city centre access and movement study (HGV, bus, taxi, LGV and car aspects) and consider outcomes	9D,9J,9N,9Q	6
High cost measures by end of 2013	LES references	Objective
Aim to introduce some alternatively fuelled vehicles into CYC fleet	7J	4
Undertake international promotion of York as a centre of excellence for low emission technology	8H	5

Summary of LES measures - 2014 and beyond

Low cost measures 2014 and beyond	LES reference	Objective
Continued promotion of LES via local media	1K,8I	1,5
Continued JorAir school visits	1L	1
Continued promotion of LES via travel planning activities	1M	1
Adopt and implement revised planning guidance to minimise emissions from development (including traffic)	2F	2
Promote revised planning guidance amongst developers	2G	2
Ensure delivery of LES measures on major development sites	2H	2
Continue with roll out of eco-stars for HGVs, buses, CYC fleet, other fleets, taxis	3E,4H,5G,6L	3,4
Continue to review and tighten taxi emission licensing criteria	5H	3
Continue delivery of privately funded EV infrastructure	6M	3
Continue to review and deliver incentives for use of alternatively fuelled vehicles	6N	3
Continue to implement low cost measures from CYC transport and fleet review	7K	4
Review effectiveness of low emission bus corridor (if implemented)	9K	6
Medium cost measures 2014 and beyond	LES reference	Objective
Implement social media based air alert system	1O	1
Continue to implement medium cost measures from CYC transport and fleet review	7L	4
Continue to actively market York to suppliers of low emission vehicles, technologies and support services	8J	5
Continue to develop training and research opportunities to support the roll out of low emission technology	8K	5
Continued high profile LES marketing campaign	1N	1,5
Adopt BREEAM style accreditation for low emission development (including transport measures)	2I	2
Continue to review efficiency and emission standards for CYC procured buses, taxis and fleet vehicles, move towards alternative fuels as they become more affordable	4I,5I,7I	3,4
Implement social media AQ alert system if feasible	1O	1
High cost measures 2014 and beyond	LES reference	Objective
Continue to promote York internationally as a centre of excellence for low emission technology	8L	5
Aim to achieve highest Eco-stars award for CYC fleet	7N	4
Deliver privately funded freight trans-shipment / consolidation centre (if considered necessary and appropriate)	9E	6
Deliver privately funded gas refuelling infrastructure (if necessary)	3F,6O	3,4
Deliver CYC owned gas refuelling infrastructure (if necessary)	7M	4
Implement LEZ aspects of city centre access and movement study for all vehicle types if considered necessary and appropriate	9F,9L,9O,9R	6
Zero emission buses on Park & Ride	4J	4

CYC Low Emission Strategy

Baseline data requirements

October 2012

5.0 Baseline data requirements

5.01 The measures set out in this action plan indicate the proposed approach to the development of the LES. Further work will now be undertaken to draw up a new AQAP setting targets for delivery of the LES measures. To inform this process the following will be required:

1. Collation of baseline data on current emissions and sources of emissions
2. Assessment of emission reduction potential of each of the proposed measures (where possible)
3. Setting of emission reduction targets for the proposed measures (where possible)

This chapter sets out the baseline data requirements against which emission reduction potential and emission reduction targets will be set. Emission reduction potential and targets for each of the LES measures will be included in a revised AQAP to be published in 2012/13.

Objective 1: To raise awareness and understanding of emissions to air

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
Improved awareness of sources and impacts of air pollutants amongst the population of York	Responses to resident survey questions	By August 2012	Marketing / EPU
Improved understanding of what can be done to improve air quality and tackle climate change amongst the population of York	Responses to resident survey questions	By August 2012	Marketing / EPU
Increased awareness of the behavioural patterns and technological solutions that exist for reducing emissions to air. Reflected by an increased uptake of low emission technologies in York and	Number of alternatively fuelled vehicles observed in traffic counts during 2011 <u>LTP3 sustainable travel indicators</u> LI 1 – pedestrians	2011 data available (collected June 2011) 2009/10 baseline data available in	EPU Sustainable Transport

further increases in walking, cycling and public transport use	LI2 – citywide cycle usage LI3 – bus journeys LI4 – mode of arrival to York station	LTP3	
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Objective 2: To minimise emissions to air from new developments by encouraging highly sustainable design and the uptake of low emission vehicles and fuels

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
To obtain a wide and sympathetic understanding of the need to clarify and formalise the approach to obtaining LES based mitigation measures on developments in York through revised planning documents (including more holistic travel / AQ plans). To achieve a good understanding of best practice approaches.	No. of new residential developments (10+ dwellings) that meet the Code for Sustainable Homes Level 3*** (or equivalent) up to and including 2013, Code for Sustainable Homes Level 4**** (or equivalent) from 2014, and zero carbon standard from 2016 onwards	Data for 2010/11 available December 2012 via Development Plan monitoring report	Research and Development team – Integrated Strategy
	Number of new non-residential developments (over 1,000 m ²) that meet ‘very good’ standards (BREEAM) up to and including 2014, ‘Excellent’ standards (BREEAM) from 2015 and Zero Carbon Standards from 2019 onwards	Data for 2010/11 available December 2012 via Development Plan monitoring report	Research and Development team – Integrated Strategy
	Number of developments submitting travel plans	Data for 2010/11 available December 2012 via Development Plan monitoring report	Research and Development team – Integrated Strategy

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<p>To increase the number of LES based mitigation measures occurring on developments in York via implementation of revised planning documents.</p>	<p>Number of electric vehicle charging points on new developments</p>	<p>Data for 2010/11 available December 2012 via Development Plan monitoring report</p>	<p>Research and Development team – Integrated Strategy and EPU</p>
<p>To increase the number and value of development contributions towards the cost of low emission community infrastructure and services in York e.g. gas re-fuelling station, low emission refuse trucks, low emission buses etc.</p>	<p>Number of new developments which incorporate low emission technologies</p>	<p>Data for 2010/11 available December 2012 via Development Plan monitoring report</p>	<p>Research and Development team – Integrated Strategy and EPU</p>
<p>To minimise total emissions arising from development in York with an improved approach to balancing emissions of CO₂ and local air pollutants.</p>	<p>The value of developer contributions to wider LES measures received during 2011/12</p>	<p>December 2013</p>	<p>Research and Development team – Integrated Strategy and EPU</p>
	<p>No baseline data required – changes to policy only</p>	<p>Not applicable</p>	<p>EPU / Integrated Strategy / Sustainability</p>

Objective 3: To minimise emissions to air from existing vehicles by encouraging eco-driving, optimising vehicle maintenance and providing businesses, residents and visitors with incentives and opportunities to use low emission vehicles and fuels

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
To achieve a significant increase in the number of alternatively fuelled vehicles operational on York's roads (across all vehicle types)	Number of alternatively fuelled vehicles observed in traffic counts during 2011	2011 data available (collected June 2011)	EPU
A visible presence of alternative vehicle refuelling infrastructure in the city, including gas and electric refuelling / recharging facilities	Number of EV recharging points and gas re-fuelling points available in the city during 2011/12	August 2012	EPU
A reduction in emission rates from public transport on York's roads (including buses and taxis)	Observed bus and taxi fleet 2011	2011 data available (collected June 2011)	EPU
	LTP3 indicator LI5 – percentage of bus fleet meeting Euro III emission standard	2009/10 data available in LTP3	Sustainable Transport
A reduction in emission rates from HGVs	Observed HGV data 2011	2011 data available (collected June 2011)	EPU

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Baseline data requirements

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Objective 4: To lead by example by minimising emissions from council buildings, fleet and other activities, and to showcase low emission technologies wherever possible

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
A continued reduction in emissions of greenhouse gases (GHG) from CYC buildings in line with targets set within CCFAP	GHG emissions from CYC occupied buildings for 2011/12	2010/11 data available in CYC GHG emission inventory	Sustainability – energy manager
A reduction in the total mileage undertaken on CYC business	Total CYC business mileage for 2011/12. To include CYC fleet and private vehicle use.	August 2012	Transport fleet review
An improvement in the emission standard of all vehicles used on CYC business (including private vehicles used for council business)	Emission standard of all vehicles used on CYC business for 2011/12	August 2012	Transport fleet review
A greater uptake of low emission technologies within the CYC fleet, procured transport services and by staff using their own vehicles for work	Fleet data for all vehicles used on CYC business or procured by CYC during 2011/12	August 2012	Transport fleet review
Increased number of CYC staff having undertaken and practising eco-driving / eco-vehicle maintenance	Driver training records 2011/12	August 2013	EPU / Fleet manager
	Council vehicle fuel use efficiency figures (fuel per mile travelled)	August 2013	Fleet manager

Objective 5: To encourage inward investment by providers of low emission technology, fuels and support services

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
A significant increase in the number of people employed in York's 'green' job sector	Employment figures by sector for 2011/12	To be determined	To be determined
A visible presence of low emission industries and service providers within York	Number of low emission industries operating in the city in 2011/12	To be determined	To be determined
York to become the regional centre for low emission technology and service provision	As above	To be determined	To be determined
York to see an increase in the training and development opportunities offered at local colleges and universities for employees (and potential employees) of the low emission technology industry	Number of relevant courses available during 2011/12	To be determined	To be determined

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Baseline data requirements

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Objective 6: To maximise sustainable transport and reduce localised air quality breaches through traffic demand management, smart travel planning, and potentially regulatory control

Expected outcomes to be monitored	Baseline data required	Expected availability date	Data collection
Traffic growth maintained below national levels for similar areas	<u>LTP 3 traffic level indicators</u> L10 – change in area wide traffic volumes L11 – traffic flow to city centre in the am peak	2009/10 baseline data in LTP3	Sustainable transport
Increase in the use of sustainable transport modes (walking, cycling , public transport)	<u>LTP3 sustainable travel indicators</u> LI 1 – pedestrians LI2 – citywide cycle usage LI3 – bus journeys LI4 – mode of arrival to York station	2009/10 baseline data in LTP3	Sustainable transport
Reduced congestion	<u>LTP3 congestion indicator</u> L12 – congestion (time taken to travel 1 mile in am peak)	2009/10 baseline data in LTP3	Sustainable transport
Increase in percentage of freight deliveries to city centre by low emission vehicles	Observed HGV data 2011 Additional data to be collected as part of Freight study during 2012	2011 vehicle count data available (collected June 2011)	EPU
A reduction in emission rates from public transport on York’s roads (including buses and taxis)	Observed bus and taxi fleet 2011 LTP3 indicator LI5 – percentage of bus fleet meeting Euro III emission standard	2011 vehicle count data available (collected June 2011) 2009/2010 baseline data in LTP3	EPU Sustainable transport

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Baseline data requirements

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Local air quality Improvement	Annual average and hourly average NO ₂ concentrations in AQMAs	2011/12 baseline data available May 2012	EPU
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CYC Low Emission Strategy

List of abbreviations

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List of Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
BIS	Department for Business, Innovation and Skills
BLISS	Bus Location and Information Sub System
BREEM	BRE Environmental Assessment Method
BSOG	Bus Service Operator Grant
CBG	Compressed Bio-Gas
CCFAP	Climate Change Framework and Action Plan
CIL	Community Infrastructure Levy
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO₂	Carbon Dioxide
COMEAP	Committee on the Medical Effects of Air Pollutants
CYC	City of York Council
DEFRA	Department for the Environment, Food and Rural Affairs
DfT	Department for Transport
EPU	Environmental Protection Unit
EST	Energy Savings Trust
EU	European Union
EV	Electric Vehicle
f-NO₂	Primary nitrogen dioxide
GHG	Green House Gases
HGV	Heavy Goods Vehicle
IPPC	Integrated Pollution Prevention and Control
IPS	Interim Planning Statement
ITS	Institute of Transport Studies
ITU	Integrated Transport Unit
LAQM	Local Air Quality Management
LCC	Leeds City Council
LES	Low Emission Strategy

LESP	Low Emission Strategy Partnership
LEZ	Low Emission Zone
LGV	Light Goods Vehicle
LPG	Liquid Petroleum Gas
LSTF	Local Sustainable Transport Fund
LTP	Local Transport Plan
NAEI	National Atmospheric Emission Inventory
NAQO	National Air Quality Objective
NAQS	National Air Quality Strategy
NEDC	New European Drive Cycle
NO	Nitric oxide
NO₂	Nitrogen dioxide
NO_x	Oxides of nitrogen
PM	Particulate Matter
PM₁₀	Particulate Matter of less than 10 micron diameter
PPC	Pollution Prevention and Control
PSHS	Private Sector Housing Strategy
RCV	Refuse collection vehicle
SCA	Smoke Control Area
SCR	Selective Catalytic Reduction
SMMT	Society of Motor Manufacturers
µg/m³	microgrammes per cubic metre
WoW	Without Walls
ZCW	Zero Carbon World

CYC Low Emission Strategy

Glossary of Terms

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Glossary of Terms

Air Quality Management Area	An area where a breach of the national air quality objectives has been formally identified and for which an air quality action plan is required
Air Quality Action Plan	A plan of measures for improving air quality within an AQMA
Bio-fuel	A fuel produced from renewable resources, especially plant biomass, vegetable oils and waste food. Biofuels are considered neutral with respect to the emission of carbon dioxide (CO ₂) because the CO ₂ given off by burning them is balanced by the CO ₂ absorbed by the plants that are grown to produce them.
Biomass burner	A boiler or furnace which uses wood and / or other organic material as a fuel
Bio-methane	Methane produced from the anaerobic digestion of organic matter such as farm waste, sewage sludge and energy crops
Carbon footprint	A method of expressing the total greenhouse gas emissions from an individual, organisation, event, product or person over a specified period of time
Car club	A scheme where individuals can pay to use a vehicle on a pay as you go basis hence removing the need for private car / pool car ownership
Community Infrastructure Levy	A new planning based levy that local authorities can choose to charge on new developments in their area. The money can be used to support development by funding infrastructure that the council, local community and neighbourhoods want.
Coupled micro traffic-emission simulation model	A model which links a traffic micro-simulation model to a detailed emissions model. The model used by ITS for the purpose of this document uses PARAMICS and PHEM

Development Plan	A plan that addresses the spatial implications of economic, social and environmental change, setting out opportunities for development and clear policies on what will or will not be permitted and where. The plan should include a vision for the future development of the city and spatial strategy, and cover both strategic policies and allocations, alongside detailed development management policies
Drive cycle	A driving cycle is a series of data points representing the speed of a vehicle versus time during a rolling road test. Drive cycles are used to quantify parameters such as vehicle fuel consumption and exhaust emissions.
Eco-stars	A free voluntary scheme designed to provide recognition, guidance and advice to operators of fleet vehicles. Eco-stars are awarded based on the emission credentials of vehicles and emission management practices
Efficiency saving	A reduction in the emission of a pollutant achieved by reducing the amount of fuel burnt. This can be achieved either by reducing the need for energy or by improving energy conservation.
Enabling measure	A measure which allows something else to happen, for example, the provision of electric vehicle charging points allows the use of electric vehicles
EU air quality directives	Legally binding standards for air quality which must be met by all EU member states by specified dates.
Full hybrid	A vehicle that can run on just the combustion engine, just the alternative energy supply (electric or gas) or a combination of both. Electric models usually employ regenerative braking.
Global air pollutant	A pollutant that enters the higher atmosphere where it can give rise to global impacts such as ozone destruction or global warming
Hybrid electric vehicle	Vehicles that combine an internal combustion engine with one or more electric motors or batteries or with a gas propulsion system
Hybrid vehicle	A vehicle that uses two or more distinct power sources to move it

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Glossary of Terms

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Incentivising measure	A measure which encourages behavioural change by offering a form of reward or personal gain to participants
In-use vehicle emissions	Vehicle emissions measured whilst a vehicle is moving along a road in a real-life situation
Local air pollutant	A pollutant emitted within a local environment which has the potential to cause harm to people within the same locality
Local Air Quality Management	The process of reviewing and assessing air quality, declaring AQMAs and drawing up AQAPs by local authorities as required by Environment Act 1995
Low Emission Vehicle	Vehicles that have much lower tailpipe emissions than other typical vehicles in their class due to the nature of the fuel they use and/or engine technology / abatement equipment employed. Vehicles using battery technology can have zero tailpipe emissions and are sometimes referred to as 'ultra-low' emission vehicles.
Local Strategic Partnership	Representatives from the local statutory, voluntary, community and private sectors who work together to address local problems, allocate funding, discuss strategies and initiatives. They aim to encourage joint working and community involvement, and prevent 'silo working' .
Mild hybrid	Vehicles equipped with a motor or generator that allows the combustion engine to be shut down during coasting, braking or at standstill. Mild hybrids do not have a full electric mode of operation
Modal shift	Measures which encourage the use of walking, cycling and public transport in preference to the private car
National air quality objectives	Targets set for air quality in the UK which all local authorities must try to meet. These are based on the standards set in the EU air quality directives
New European Drive Cycle	The rolling road laboratory based drive cycle on which new vehicle models have their emissions tested for the purpose of obtaining type approval
Plugged in Places	A recent government funding initiative to help accelerate the uptake of electric vehicles and provide electric vehicle recharging infrastructure
Plug in hybrids	A new generation of electric hybrid vehicles in which the batteries can be recharged from an external source to help

	improve the range of the vehicle
Primary NO₂	Nitrogen dioxide (NO ₂) emitted directly into the atmosphere from a pollutant source eg. vehicle exhaust or chimney stack
Regenerative braking	During regenerative braking the driving motor becomes a generator and recovers potential and kinetic (inertial) energies through its conversion to electrical energy, a process which in turn is able to slow the vehicle and thus preventing wasteful transfer of this energy as thermal losses within the friction brakes.
Relevant location	A place where members of the public are regularly exposed to ambient outdoor air quality over the averaging period of an air quality objective.
Secondary NO₂	Nitrogen dioxide (NO ₂) formed in the atmosphere from secondary reactions of nitric oxide (NO)
Selective Catalytic Reduction	A type of catalytic convertor fitted to diesel engines that can convert harmful NO _x emissions into nitrogen gas (N ₂) and water
Source Apportionment	The process of attributing quantities of emissions to specific sources
Technical Breach Area	An area in York where there are relevant locations and where one or more of the national air quality objectives are not being met
Vehicle Emission Standard	The level of emissions a vehicle is allowed to emit at the point of manufacture
Whole life costs	An assessment of the costs associated with all stages in a products life from production through to disposal
Whole life cycle emissions	An assessment of the emissions associated with all stages in a products life from production through to disposal. Sometimes also referred to as a 'cradle to grave' assessment

**Annex A: Low emission vehicle and fuel
technologies**

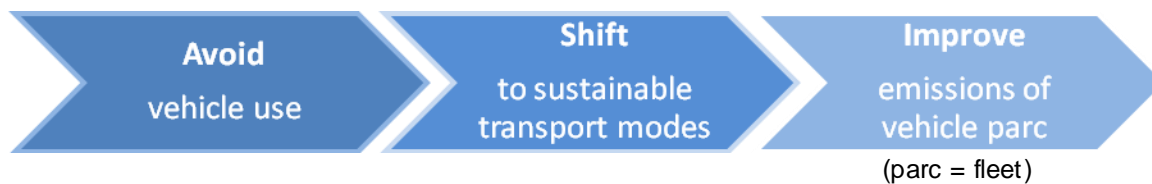
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A.0 Low Emission vehicle and fuel technologies

Background

- A.01 The road transport sector is a significant contributor to both greenhouse gas and local air quality pollutant emissions. Passenger cars account for the majority of road transport CO₂ emissions (58.3% compared with 20% HGVs, 11% vans and 2.3% buses), however, they make less of a contribution to local air quality pollutant emissions (18% of NO_x emissions in the UK). HGVs and buses are much more significant emitters of local air pollutants being responsible respectively for 19% and 15% of total national NO_x emissions.⁴³
- A.02 It is clear that in order to tackle both greenhouse gas and air quality pollutant emissions further effort is required to modify the operations and emission profile of the UK vehicle fleet. It is recognised that emission reduction activity should follow the progression below:



The RAC Foundation Report – Keeping the Nation Moving⁴⁴ estimates that there will be 4 million more cars on the road over the next 25 years and traffic volumes will increase by 43% by 2035, causing an average of 54% increase in delays over the same period. More locally, modelling undertaken for York’s emerging Local Development Framework Core Strategy shows that by 2026 the overall delay on its transport network could more than double in the absence of suitable mitigation measures.

- A.03 It is essential that in addition to facilitating alternatives to (private) motorised vehicle use (avoid and shift), efforts are also focussed on improving the residual emissions of the remaining vehicle fleet, including public transport. This can be achieved by seeking to accelerate the uptake of lower emission vehicles and fuels and by encouraging better driving behaviour (eco-driving) and improved vehicle operation and maintenance. Some of the key issues to address are ensuring efficient operation of catalytic converters (through good maintenance and running at adequate temperatures) and optimisation of engine timings etc. This section looks at the various road transport vehicle types and current and emerging technologies and

⁴³ Air Quality Plans for the achievement of EU air quality limit values for nitrogen dioxide (NO₂) in the UK – Draft UK overview document, DEFRA (June 2011)

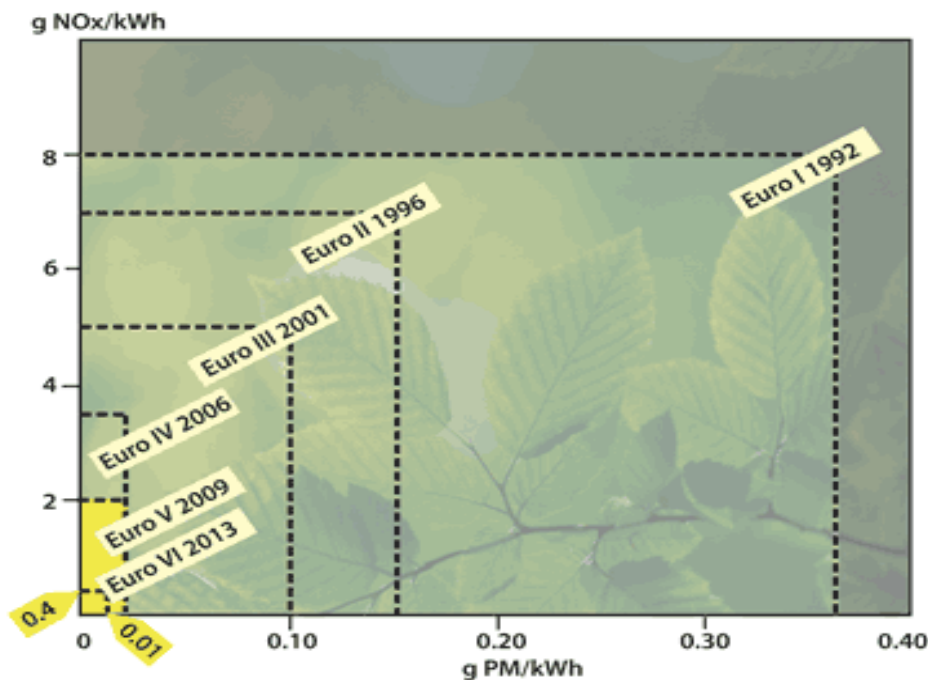
⁴⁴ www.racfoundation.org

fuels and their potential for reducing emissions of CO₂ and regulated air quality pollutants.

Passenger Cars

- A.04 Since 1992, all new vehicles produced or sold in the EU have to comply with improving European Emission Standards (Euro Standards) which tighten the emissions of NO_x and Particulate Matter (PM) over time. These Standards, imposed by European Directive, can be seen in figure 8 (pg 34).

Figure A1: European emission standards for cars



Source – Defra 2010

- A.05 Additionally, voluntary standards for CO₂ emissions for cars produced in the EU have been developed. The improvement in the average CO₂ emissions for new cars can be seen in figure 9 (pg 35). The CO₂ emissions of all car models produced since 2001 can be found on the Society of Motor Manufacturers and Traders (SMMT) database⁴⁵
- A.06 A key issue when considering the real-world emissions of cars and other vehicles is that both the Euro standards and CO₂ classifications are based on the New European Drive Cycle (NEDC)⁴⁶ which is the reference methodology for establishing emission levels. This test cycle is known to underestimate real-world driving

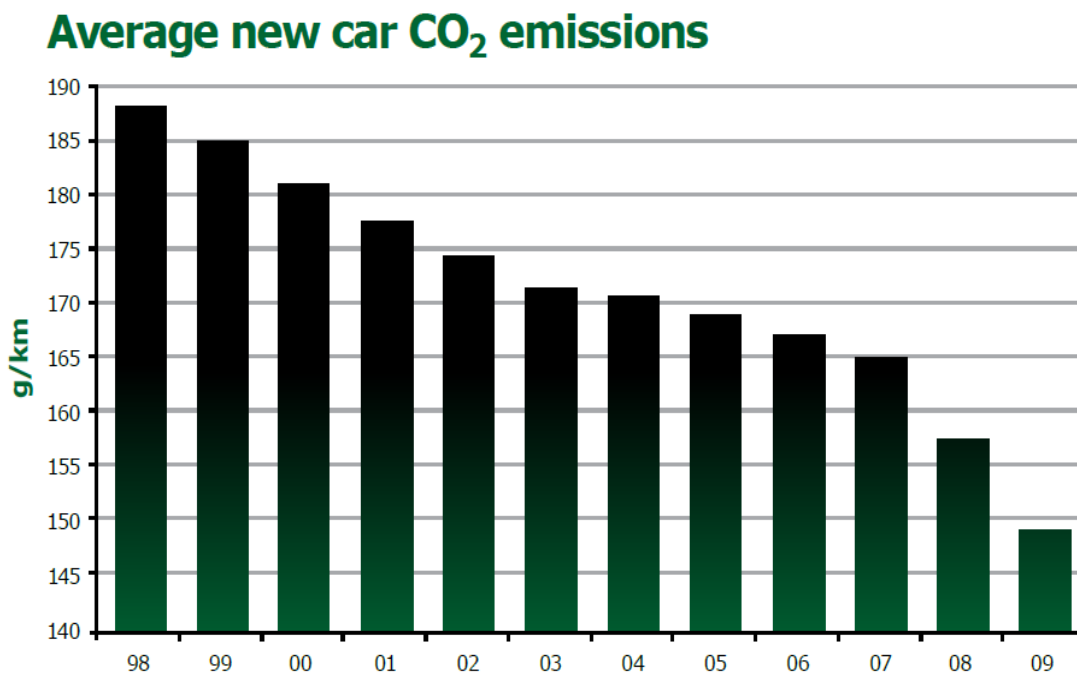
⁴⁵ <http://www.smmtco2.co.uk/co2search2.asp>

⁴⁶ www.dft.gov.uk/pgr/roads/environment/emissions/ppr-354.pdf

emissions. The implications of this for ambient concentrations of NO₂ have already been discussed at 1.15, but there are also important consequences for CO₂ emissions.

A.07 Research⁴⁷ into real-world driving CO₂ emission levels has shown that they can be 15% to 40% higher than those predicted by the NEDC tests and is illustrated in table 4 (pg 35). These differences are also observed in relation to electric and hybrid electric cars.

Figure A2: Average new car CO₂ emissions



Source – SMMT 2011

⁴⁷ Preparing for a Lifetime CO₂ Measure – LowCVP (Ricardo 2011)

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Annex A: Low emission vehicle and fuel technologies

October 2012

Table A1: Difference in real-world driving and NEDC predicted CO₂ emissions

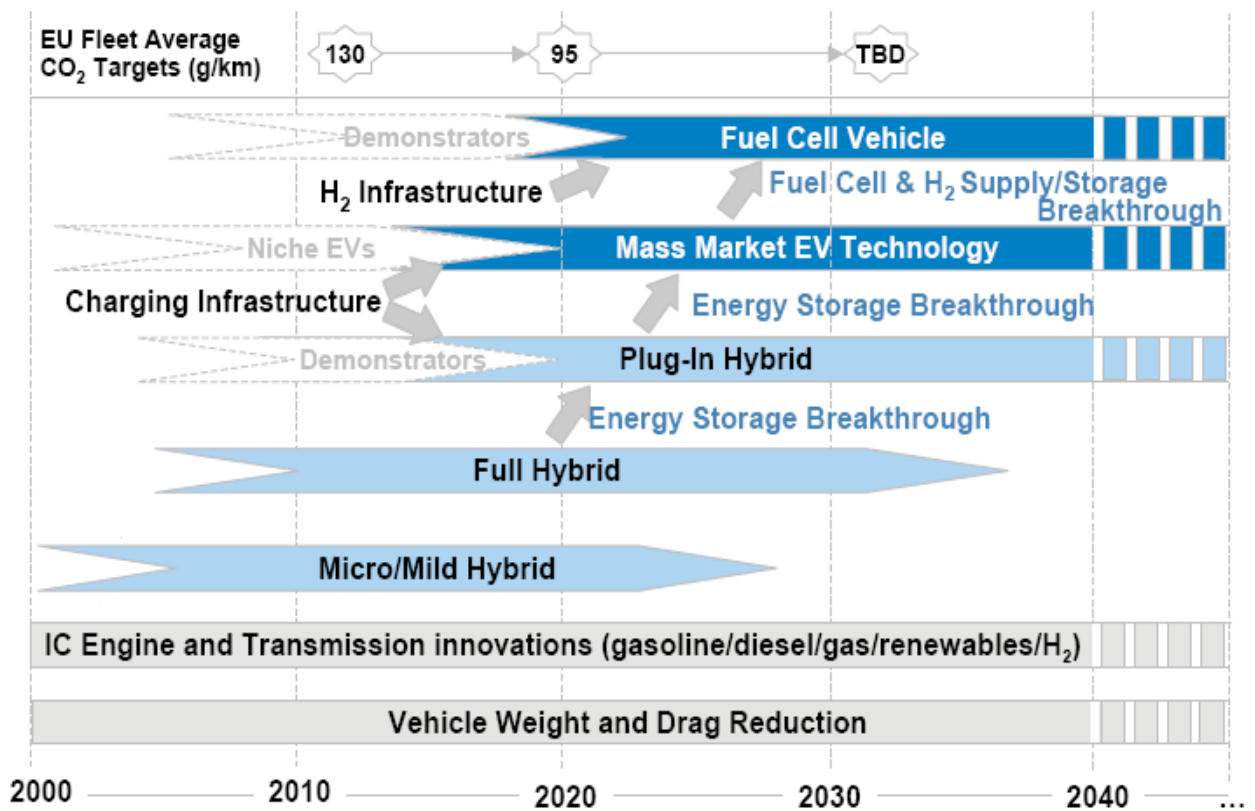
Segment	Vehicle	Fuel	Fuel Consumption		Tailpipe CO ₂		Difference [%]
			NEDC [L/100km]	AutoCar Test [L/100km]	NEDC [gCO ₂ /km]	AutoCar Test [gCO ₂ /km]	
A: Mini	Hyundai I10	Gasoline	5	7.5	120	180	33%
	Fiat Panda	Gasoline	4.3	5.5	103.2	132	22%
	Mini	Gasoline	6.9	9.5	165.6	228	27%
B: Small	Renault Clio	Gasoline	6.6	8	158.4	192	18%
	Seat Ibiza	Gasoline	6.2	7.9	148.8	189.6	22%
	Ford Fiesta	Gasoline	6.5	8.3	156	199.2	22%
C: Lower Medium	Audi A3	Gasoline	9.1	12.2	218.4	292.8	25%
	Ford Focus	Gasoline	6.4	8.4	153.6	201.6	24%
D: Upper Medium	BMW 3-series	Diesel	5.7	7.1	151.1	188.2	20%
	Ford Mondeo	Diesel	6.1	7.2	161.7	190.8	15%
E: Executive	BMW 5-series	Diesel	6.2	7.8	164.3	206.7	21%
	Mercedes C-class	Gasoline	6.1	8	146.4	192	24%
F: Luxury	Bentley Continental	Gasoline	17.1	20.3	410.4	487.2	16%
	Jaguar XJ	Gasoline	7.2	10.2	172.8	244.8	29%
	BMW 7-series	Gasoline	7.2	9.7	172.8	232.8	26%
G: Sports	Nissan 370Z	Gasoline	10.4	10.9	249.6	261.6	5%
	Mazda MX-5	Gasoline	8.2	11.8	196.8	283.2	31%
	Audi TT	Gasoline	10.3	12.6	247.2	302.4	18%
SUV	Land Rover Freelander	Diesel	7.5	10.1	198.8	267.7	26%
	BMW X5	Diesel	8.7	10.7	230.6	283.6	19%
	Suzuki Grand Vitara	Diesel	9.1	11.3	241.2	299.5	19%
MPV	Ford S-max	Diesel	6.4	9.1	169.6	241.2	30%
	Mazda 5	Diesel	5.2	8.1	137.8	214.7	36%
	Vauxhall Zafira	Gasoline	7.3	10.8	175.2	259.2	32%

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The Way Forward

A.08 Whilst there is no clear indication as to which technologies will prevail over the coming years, the Department for Business, Industry and Skills (BIS) has developed a road map (figure 10) based on current thinking into emission reduction technology development.

Figure A3: Road map for emission reduction technology development



©New Automotive Innovation Growth Team, NAIGT (BIS 2010)

A.09 It can be seen that while there is a progression towards tailpipe zero emission vehicles using hybrid and battery technology, further technological breakthroughs are required before their full potential is realised. It can also be seen that increasingly efficient internal combustion engines (ICE) and renewable fuels will have a major role to play in reducing emissions.

Electric cars

A.10 The Government is committed to supporting the take up of **electric and plug-in hybrid electric cars** and has introduced an **Electric Car Grant**⁴⁸ of up to £5k

⁴⁸ <http://www.dft.gov.uk/topics/sustainable/olev/plug-in-car-grant>

towards their purchase. It has also pledged £30m towards developing recharging infrastructure through the **Plugged in Places** scheme⁴⁹. Electric vehicles produce no emissions at tailpipe and their well-to-wheels (emissions from a vehicle and its power sources) CO₂ emissions are dependent on the carbon intensity of the national grid. The average carbon intensity of the UK national grid at 542g CO₂/kWh is significantly higher than other European countries, such as France and Sweden, and is scheduled to reduce over the coming years with the continued increase in renewable electricity production, however, electric cars are still capable of reducing CO₂ emissions by up to 40% compared with diesel cars⁵⁰

Electric and plug-in hybrid electric cars in production



- A.11 In order to more accurately evaluate the true emissions from vehicles, including those associated with vehicle production, an assessment is needed of the **whole life cycle** as follows:



Electric and electric hybrid vehicles, due to the extra components needed for manufacture, compared with conventional ICE vehicles, usually have increased embedded energy requirements from production but with reduced emissions during the in-use phase. Life cycle CO₂ emissions from different car types are shown in table 5 below⁵¹ (battery disposal not taken into account).

⁴⁹ <http://www.dft.gov.uk/topics/sustainable/olev/recharging-electric-vehicles>

⁵⁰ BERR & DfT- Investigation into the Scope for the Transport Sector to Switch to Electric Vehicles and Plug-in Hybrid Vehicles (Cenex/Arup 2008)

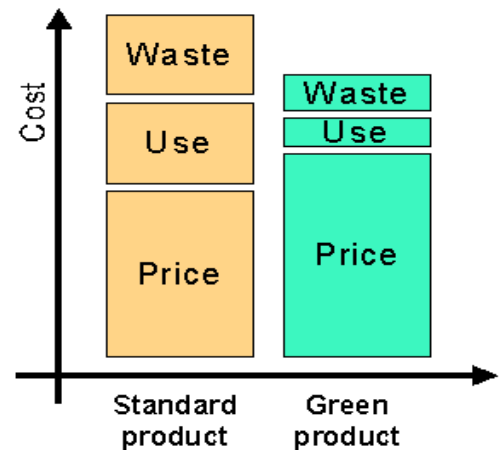
⁵¹ Preparing for a Lifetime CO₂ Measure – LowCVP (Ricardo 2011)

Table A2: Life cycle CO₂ emissions from different car types

Vehicle	Description	Lifetime Mileage [km]	Life Cycle Total CO ₂ e [tonnes CO ₂]	Life Cycle [%]			Source
				Production	In-Use	Disposal	
Conventional	Based on Toyota Corolla type vehicle Li-Ion battery technology	240,000	64.6	13%	87%	Not considered	Samaras and Meisterling (2008)
HEV			46.1	18.8%	81.3%		
PHEV 30			43.9	20.8%	79.2%		
PHEV 60			43.4	23.2%	76.8%		
PHEV 90			43.9	24.6%	74.9%		
Standard Car	C-segment vehicle (e.g. VW Golf)	150,000	40.3	12.9%	87.1%	Not considered	Gauch et al. (2009)
EV	C-segment vehicle (e.g. VW Golf), with 300 kg, 30 kWh Li-Ion battery pack	150,000	19.5	34.7%	65.3%		

©Ricardo 2011

A.12 Alternative vehicle technologies, such as electric and hybrid electric cars, are often more expensive to purchase compared with conventional vehicles. In order to accurately evaluate their true cost, it is necessary to look at the **whole life costs**⁵² (see adjacent diagram) whereby the costs of fuel and maintenance are considered along with the initial vehicle costs. Research has shown that dependant on mileage driven over a 5 year period, the Smart EV has lower whole life costs when compared to a Smart diesel car⁵³



A.13 The **Cleaner Road Transport Vehicle Regulations 2011** require public sector organisations to take into account the operational lifetime energy and environmental impacts when buying or leasing vehicles. When the lifetime emission costs of CO₂, NO_x and PM₁₀ are taken into account, the true costs of alternative fuelled vehicles are often significantly less than conventional, fossil fuelled vehicles. For further information see the EU Clean Vehicle portal (www.cleanvehicle.eu)

⁵² http://www.lowemissionstrategies.org/les_procurement_guidance.html

⁵³ <http://www.cenex.co.uk/projects/electric-vehicle-trials/smart-move>

Gas cars

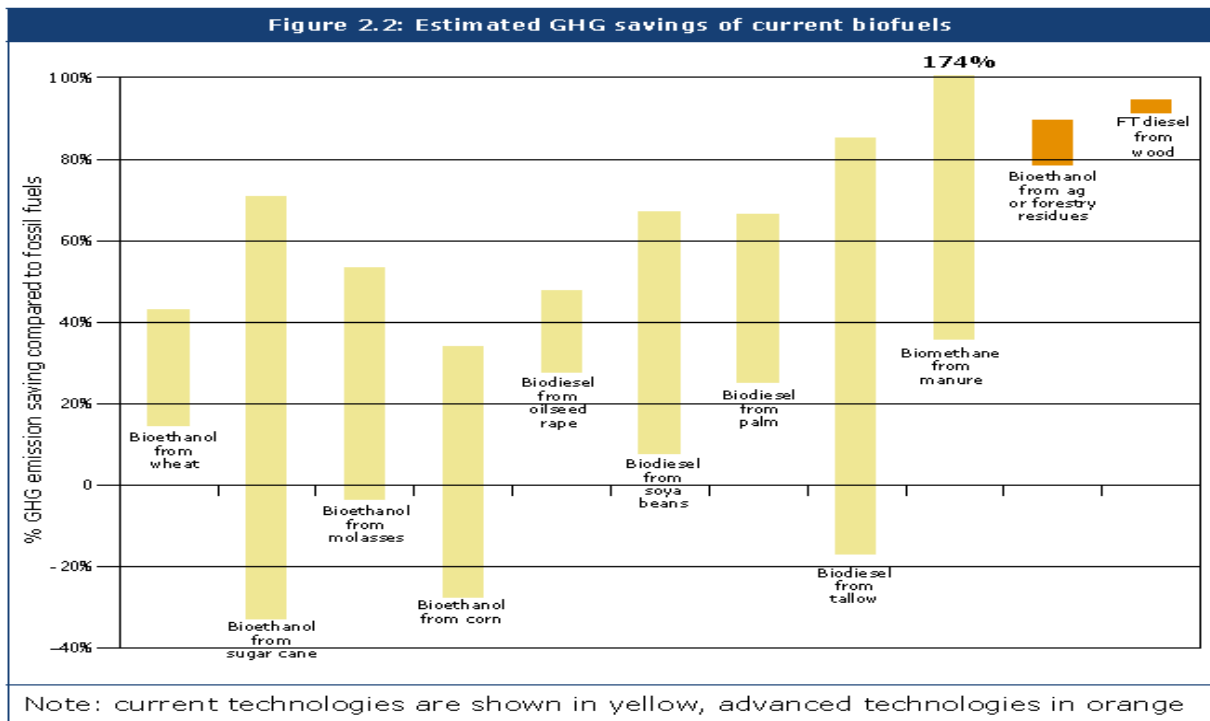
A.14 Methane technology has typically 11% lower CO₂ emissions compared with diesel plus lower NO_x and PM₁₀ emissions. **Natural gas (methane)** powered cars are widespread around the world and throughout Europe but there are only a handful in the UK, mainly due to the lack of refuelling infrastructure. Right hand drive models exist in countries such as Japan and India. If gas refuelling infrastructure increases in the UK there is likely to be an increase in vehicle availability. The ability to blend natural gas with biomethane (gas produced from the anaerobic breakdown of organic waste material) offers significant potential to reduce CO₂ emissions (see below).



Biofuels

A.15 There is significant potential to reduce CO₂ emissions through the use of **renewable biofuels** (see figure 11 below). By 2013 both diesel and petrol will be required to have a minimum 5% biofuel content through the Renewable Transport Fuels Obligation⁵⁴.

Figure A4: Estimated GHG savings of current biofuels



Taken from the Gallagher Review into the indirect effects of biofuel production⁵⁵

⁵⁴ <http://www.dft.gov.uk/topics/sustainable/biofuels/rtfo>

⁵⁵ Gallagher Review into the indirect effects of biofuel production, Renewable Fuels Agency, 2008

- A.16 Vehicles are available that are capable of running on higher blends of biofuel eg E15, E85, B30, B100, however, there are concerns as to the sustainability of producing such fuels. In 2008, Renewable Fuels Agency looked into the indirect impacts of producing biofuels (Gallagher Review) and concluded that further targets for the introduction of crop based biofuels should be put on hold until further research into their sustainability was undertaken.

Vans

- A.17 Similar to passenger vehicles, vans incorporating a wide variety of low emission vehicle technology and capable of running on various alternative fuels are readily available. Like cars, their emissions vary depending on the drive cycle they are tested over and, additionally, on the payload they carry⁵⁶. A comprehensive database of van CO₂ emissions can be found on the **Vehicle Certification Agency CO₂ and Fuel Consumption Database** website.⁵⁷

Electric vans

- A.18 Electric vans have zero emissions at tailpipe and offer significant potential to improve emissions in an urban environment, however, their incremental cost compared with conventional vans can be as much as 100% (for a car derived van) to 200% (for a 6m³ vehicle)⁵⁸ using Lithium Ion battery technology. Cheaper lead acid battery vans are also available but have a much reduced range. Hybrid electric diesel vans can achieve an approximate 10 to 25% reduction in tailpipe emissions and like electric vans they can carry a significant cost premium. It is anticipated that vehicle costs for both electric and hybrid vans will reduce over time as production volumes increase. As with cars, the price differential with conventional fuelled vehicles is reduced when whole life costs are taken into account (see www.cleanvehicle.eu)



Smiths Electric Van

Ashwoods Diesel Electric Hybrid Van

⁵⁶ Light Goods Vehicle – CO₂ Emission Study: Final Report, AEAT for DfT, February 2010

⁵⁷ <http://vanfueldata.dft.gov.uk/Default.aspx>

⁵⁸ Vehicle manufacturers data

Gas Vans

- A.19 There is increasing availability and take up of methane/biomethane powered vans, particularly in the supermarket and local authority sectors, including dedicated CNG and bi-fuel (petrol and gas) vehicles. The cost premium for a gas powered vehicle is approximately 15% to 20%¹⁴ and when powered by biomethane there is significant potential for CO₂ emission reductions. Tests have shown that gas vehicles also provide significant reductions in NO_x and PM₁₀ emissions⁵⁹



Iveco CNG Daily



Mercedes NGT



VW Eco-Caddy (bi-fuel)

Heavy Goods Vehicles (HGVs)

Electric vehicles

- A.20 Low emission vehicle options for heavy goods vehicles are more limited than for other road transport types. There are several electric vehicles available in the 7.5 tonne class, however, battery technology, due to cost, weight and range, would be impractical in the heavier classes. Air quality benefits from zero tail-pipe emissions offer significant potential when operated in an urban environment.



Smith Newton 7.5t Electric Truck

Manufacturers such as Volvo and DAF have produced electric-diesel hybrid systems that are capable of reducing fuel consumption by around 15%, depending on duty cycles⁶⁰. The cost premium for such systems, however, due to low volume manufacturer is relatively high.

⁵⁹ <http://www.cenex.co.uk/projects/biomethane-vehicle-trials/camden-van-trial>

⁶⁰ Manufacturers data

Gas vehicles

- A.21 Vehicle manufacturers such as Iveco are continuing to roll out their dedicated methane powered vehicles in the UK and it is likely that other manufacturers will follow. The potential to utilise biomethane in these vehicles is an added incentive. Coca Cola has carried out tests⁶¹ on the Stralis vehicles they operate using biomethane and have found a reduction of well-to-wheels CO₂ emissions of 65%, a reduction in NO_x emissions of 80% compared to an equivalent Euro Standard diesel and a reduction in PM emission mass of x35. Coca Cola are also undertaking noise tests.
- A.22 Assessment of the emissions arising from the compressed biomethane powered refuse collection vehicle (RCV) operated by Leeds City Council has shown results as per the Coca Cola tests⁶²



Leeds CC Biomethane RCV

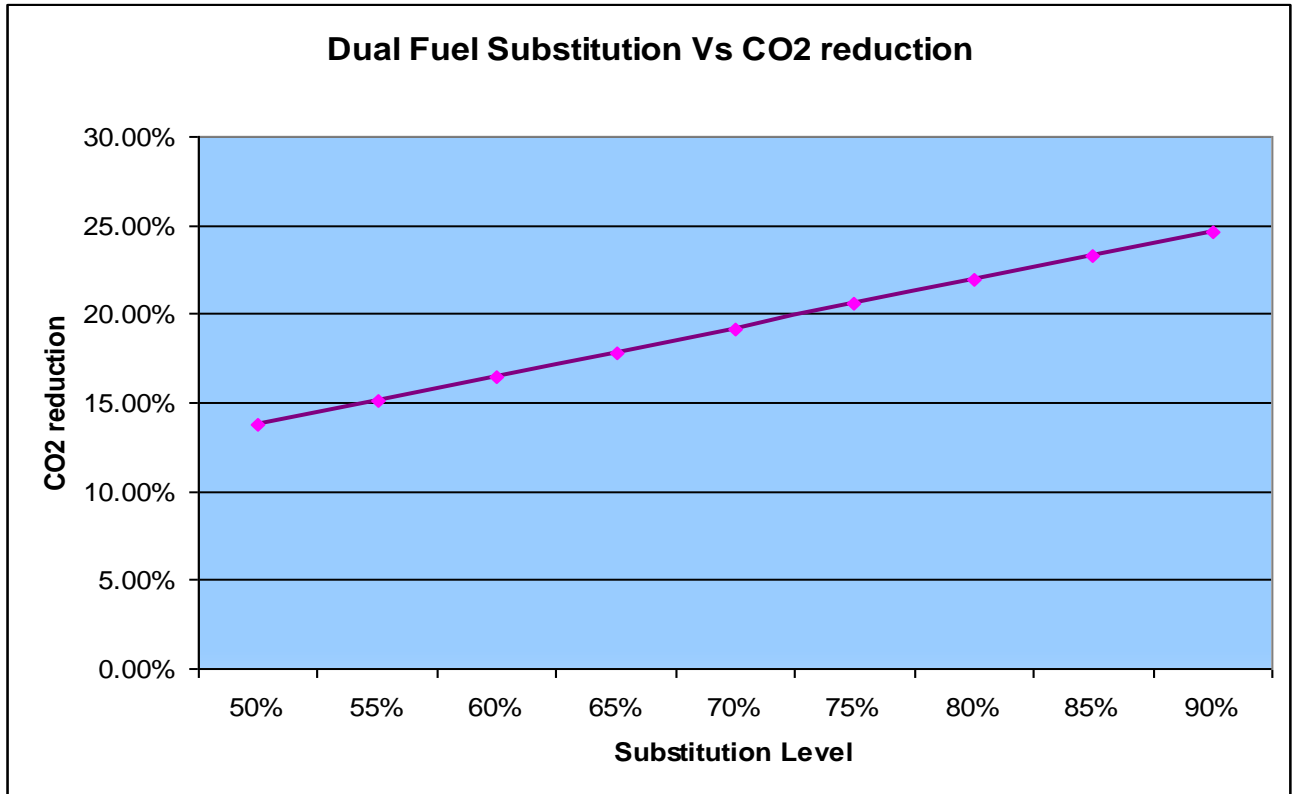
- A.23 It is estimated that by 2020 approximately 20% of all 44 tonne trucks will be operated as dual fuel (methane/diesel)⁶³. Both Mercedes and Volvo are committed to providing fully warranted vehicles with widespread interest from the haulage industry. These vehicles start on diesel and begin to substitute gas at higher duty cycle rates. The CO₂ emission benefits with respect to methane (grid gas) substitution are shown in figure 12 below.

⁶¹ Coca Cola presentation at UK AD & Biogas 2011, NEC, 7th July

⁶² Communications with Leeds CC – October 2011

⁶³ Report into the Costs of Gas and Diesel Trucks – LowCVP 2011 (draft)

Figure A5: Dual fuel substitution vs CO₂ reduction



©Hardstaff

Sainsbury's dual fuel vehicle trial



A.24 Due to Government incentives to produce and inject biomethane into the national grid⁶⁴, it is estimated that there will be 40 TWh of biomethane in the national grid by

⁶⁴ http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/incentive/incentive.aspx

2020 and 100 TWh by 2050⁶⁵. 40TWh represents 20% of the national grid and would represent a 30-35% reduction in carbon intensity in grid gas compared with diesel. The reducing carbon intensity of the national gas grid offers significant potential for methane as a road transport fuel.

- A.25 A key issue in facilitating the uptake of gas vehicle technology is the **provision of gas refuelling infrastructure**, which at present is limited. The graphs in Figure 13 (pg 45) show the whole life costs (vehicle purchase, maintenance, tax and fuel costs) for a 44 tonne truck with and without gas refuelling infrastructure availability. It can be seen that with refuelling infrastructure available, gas trucks can cost less over their whole life. When the cost of pollution emissions are taken into account the cost differential with diesel trucks widens in favour of the gas truck.
- A.26 The Government has offered limited incentives to improve the emissions from HGVs of regulated air pollutants through the **Reduced Pollution Certificate**⁶⁶. This allows the reduction in Vehicle Excise Duty for the purchase and use of Euro 6 HGVs until the general introduction of Euro 6 in 2013, when the benefits will cease. The Government has also evaluated the feasibility of introducing a certification scheme for retrofitting heavy duty vehicles with NO_x abatement technology⁶⁷. The study suggests that technological issues with abatement technology integration into vehicles can be overcome and significant emission reductions may be achieved. DEFRA referred to the reported emission reduction potential of certain retrofit abatement technology in their Time Extension Notification correspondence with the EU⁶⁸. See table 6 (pg 45). It should be noted that the performance of NO_x abatement equipment in congested urban environments (particularly selective Catalytic Reduction (SCR) is still under investigation and may not be as substantial as that achieved under motorway driving conditions.

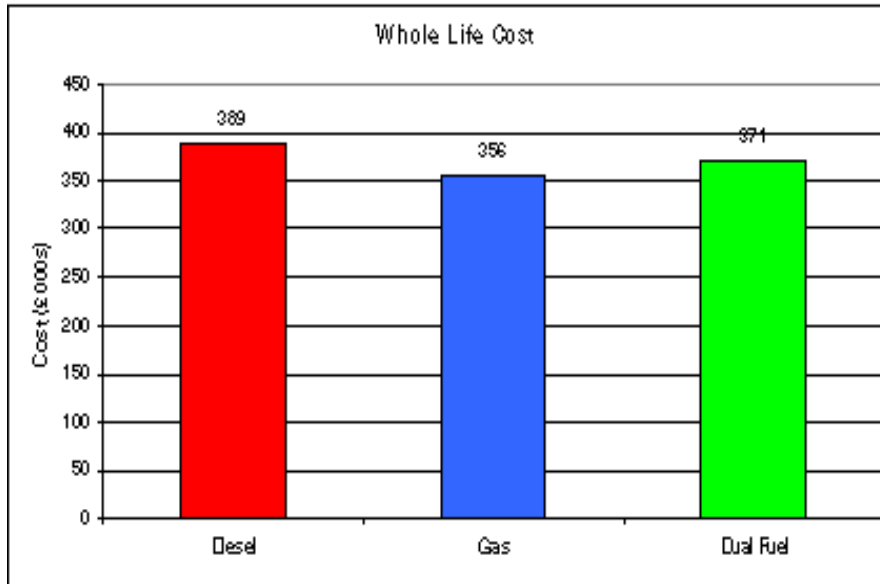
⁶⁵ National Grid estimates

⁶⁶ http://cdn.hm-treasury.gov.uk/2011budget_complete.pdf

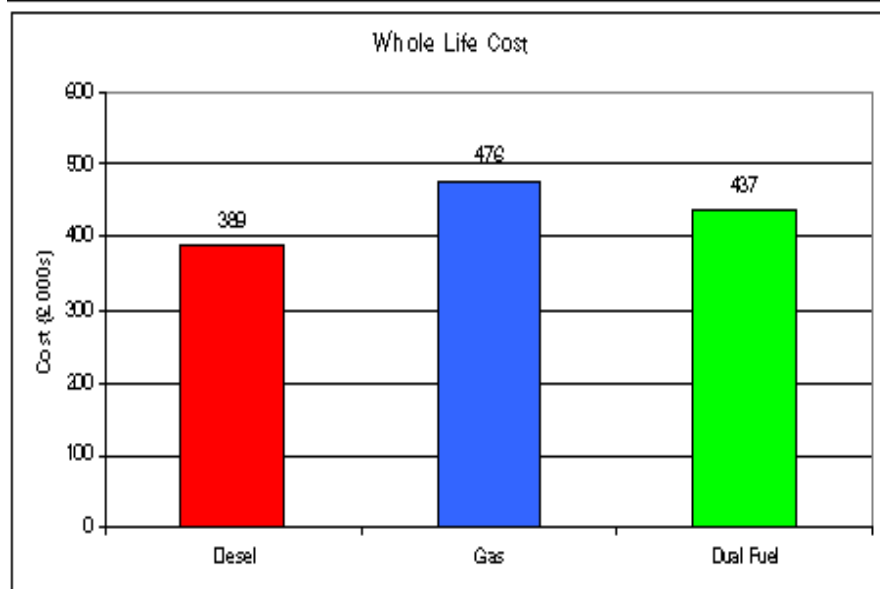
⁶⁷ AMEC Study on behalf of Defra, July 2011 (www.defra.gov.uk)

⁶⁸ Time Extension Notification (draft) to EU, Defra, 2011

Figure A6: Whole life costs for a 44 tonne truck with and without refuelling infrastructure



Whole life costs with refuelling infrastructure provided



Whole life costs without refuelling infrastructure provided

©LowCVP 2011

Table A3: Impact of retrofitting emission reduction technology to HGVs

Selective catalytic reduction and DPF trap applied to Euro III	% reduction in pollutant achieved through retrofit technology to Euro IV (relative to Euro III)	
	NO _x	PM ₁₀ and PM _{2.5}
Buses	70%	90%
HGVs (Rigid and Articulated)	50%	90%

©Defra 2011

Buses

A.27 While buses only contribute 2.3% to total transport CO₂ emissions in the UK (DfT 2010) their impact on urban air quality is more significant, particularly due to stop/start and idling characteristics. Several Low Emission Zones (LEZs) have been developed in the UK based on Euro Standards for buses (see table 7 below).



Table A4: EU Emission Standards for Buses, g/kWh (smoke in m⁻¹)

Tier	Date	Test cycle	CO	HC	NO _x	PM	Smoke
Euro I	1992, < 85 kW	ECE R-49	4.5	1.1	8.0	0.612	
	1992, > 85 kW		4.5	1.1	8.0	0.36	
Euro II	October 1996		4.0	1.1	7.0	0.25	
	October 1998		4.0	1.1	7.0	0.15	
Euro III	<i>October 1999 EEVs only</i>	ESC & ELR	1.0	0.25	2.0	0.02	0.15
	October 2000		2.1	0.66	5.0	0.10 0.13*	0.8
Euro IV	October 2005	ESC & ELR	1.5	0.46	3.5	0.02	0.5
Euro V	October 2008		1.5	0.46	2.0	0.02	0.5
Euro VI	January 2013		1.5	0.13	0.4	0.01	

* for engines of less than 0.75 dm³ swept volume per cylinder and a rated power speed of more than 3,000 per minute. EEV is "Enhanced environmentally friendly vehicle".⁶⁹

A.28 London will introduce a complete Euro 4 Standard for buses in 2015, Norwich introduced a Euro 3 Standard in 2010, Oxford will introduce a Euro 5 Standard in 2014 and Birmingham is looking at a Euro 4 Standard for 2016. The majority of bus services in York currently operate at Euro 3 or above. A feasibility study to consider the emission reduction potential of a low emission bus corridor in York is currently being undertaken. As with car emissions, the actual real world emissions from buses can differ substantially from those suggested by the emission standard. The study currently being undertaken in York will utilise real-world emissions data obtained from buses in the city combined with a coupled micro-simulation and emissions model to predict the likely impact of introducing a variety of low emission bus scenarios.

A.29 Based on current levels of research the costs and benefits of various low emission bus technologies can be found in table 8.⁷⁰

⁶⁹ Wikipedia 2011

⁷⁰ Table sourced from Low Emission Strategies Ltd

CYC Low Emission Strategy

Annex A: Low emission vehicle and fuel technologies

October 2012

Table A5: Cost and benefits of low emission bus technologies

Bus Technology	Cost Premium*	CO ₂ Emission Reduction	AQ Pollutant Emission Reduction		Notes
			NOx	PM	
Diesel Electric Hybrid Single Deck Double Deck	£60-£80k £150- £185k	15% - 40% 15% - 40%	Significant when idling	Significant when idling	Total emission savings dependant on local operating conditions
Electric Single	£100- £120k	Significant with renewable energy	Zero tailpipe emissions	Zero tailpipe emissions	Recharging infrastructure required
Dedicated CNG Single	£25-50k	11+% depending on grid CO ₂	Significant	Significant	Refuelling Infrastructure required
Dedicated CBG Single	£25-50k	Significant	Significant	Significant	Refuelling Infrastructure required
Dual Fuel Gas/Diesel Single	£20k	Good with grid gas. Significant with biomethane use	Dependant on duty cycle (highway better than urban stop start)	Dependant on duty cycle (highway better than urban stop start)	Refuelling Infrastructure required

*additional cost over a conventional vehicle
Source: Low Emissions Strategies Ltd

- A.30 Without incentives, the costs of alternatively fuelled buses are prohibitive compared with diesel, due to the fuel duty rebate provided through the **Bus Service Operator Grant (BSOG)**. This makes pay back periods for certain low emission technology less attractive than for other road transport sectors. Buses capable of achieving a 30% improvement in CO₂ emissions compared with Euro 3 buses can be classified as a **Low Carbon Emission Bus** and receive a 6p /km additional subsidy through BSOG. This emission reduction cannot be achieved through the use of a biofuel unless it is biomethane (or biohydrogen).
- A.31 As buses are intensively operated heavy-duty vehicles, their substantial power demands make the widespread uptake of electric buses (to completely remove local

bus emissions) an unlikely future scenario with current and envisaged battery technology.

- A.32 Hybrid vehicle technology, with its regenerative braking, can be well matched to the frequent stop-start operation of urban buses. Most of the fuel savings of hybrid vehicles comes from storing and reusing the kinetic energy that would otherwise have been lost through braking. The current generation of diesel-electric hybrid buses promise 30% fuel and CO₂ savings, and are reported to reduce emissions of the air quality pollutants, NO_x and PM₁₀, by a substantial 50% or more (under ideal operating conditions). This level of emission saving may not be achievable where buses are unable to achieve reasonable stretches of clear running between scheduled stops. The suitability of York for hybrid bus operation is still under discussion with local bus operators.
- A.33 Hybrid buses commonly switch off the diesel engine when braking (regenerative) and at a stand-still, then use the captured kinetic energy to operate in electric mode whilst pulling away from bus stops and junctions. Passengers queuing at a hybrid bus stop therefore are not exposed to the noise from a diesel engine, nor the emissions from an idling, heavy-duty diesel engine, as it approaches, and whilst at standstill at the bus stop. The reduction in exposure to harmful air pollutants is therefore expected to be greater than simply the total decrease in emissions. The accelerated introduction of hybrid bus technology, could offer significant air quality advantages in both the short and long term in some cities. Currently the cost premium and availability of hybrid vehicles will limit the numbers able to be deployed nationally in the short term.
- A.34 Gas propelled buses and dual fuel gas powered buses also have significant emission reduction potential, particularly where bio-methane can be utilised. The cost premiums for gas propelled vehicles are not as high as for hybrid vehicles but they do require the provision of local gas re-fuelling infrastructure. This is the main limiting factor in most areas. A move towards the widespread use of gas fuelled buses in York would require major investment in a gas re-fuelling infrastructure in the city.