Notice of a public meeting of

Economic Development and Transport Policy and Scrutiny Committee (Pre Decision Calling In)

To: Councillors Cuthbertson (Chair), D'Agorne (Vice-Chair), N Barnes, Cullwick, Gates, D Myers, Rawlings and Warters

Date: Wednesday, 18 November 2015

Time: 5.00 pm

Venue: The Thornton Room - Ground Floor, West Offices (G039)

AGENDA

1. Declarations of Interest

At this point in the meeting, Members are asked to declare:

- Any personal interests not included on the Register of Interests
- Any prejudicial interests or
- Any disclosable pecuniary interests

Which they may have in respect of the business on the agenda.

2. Public Participation

At this point in the meeting, members of the public who have registered their wish to speak regarding an item on the agenda can do so. Any one who wishes to register or requires further information is requested to contact the Democracy Officer on the contact details listed at the foot of the agenda. The deadline for registering is **Tuesday 17 November 2015** at **5.00 pm**.

Filming, Recording or Webcasting Meetings
Please note this meeting will be filmed and webcast and that includes any registered public speakers, who have given their permission. This broadcast can be viewed at: http://www.york.gov.uk/webcasts.

Residents are welcome to photograph, film or record Councillors and Officers at all meetings open to the press and public. This includes the use of social media reporting, i.e. tweeting. Anyone wishing to film, record or take photos at any public meeting should contact the Democracy Officer (whose contact details are at the foot of this agenda) in advance of the meeting.

The Council's protocol on Webcasting, Filming & Recording of Meetings ensures that these practices are carried out in a manner both respectful to the conduct of the meeting and all those present.

It can be viewed at: https://www.york.gov.uk/downloads/file /6453/protocol_for_webcasting_filming _and_recording_council_meetingspdf

3. **Called In Item Pre Decision: York's Third Air Quality Action Plan (AQAP3)** (Pages 1 - 234)
To consider the pre-decision call-in of the above item from the Council's Forward Plan by Councillors D'Agorne, Kramm and Craghill in accordance with the Council' new pre-decision call-in arrangements.

A cover report is attached which sets out the reasons for the pre-decision call-in and the role of and options available to this Committee.

Following consideration of the Officer's report, reasons for call-in and the comments made the Executive Member for the Environment will be invited to make a decision on the issue at the Decision Session following the close of this meeting.

4. **Urgent Business**
Any Other Business which the Chair considers urgent under the Local Government Act 1972.

Democracy Officer:

Name: Judith Betts
Contact Details:

- Telephone – (01904) 551078
- E-mail –judith.betts@york.gov.uk

For more information about any of the following please contact the Democratic Services Officer responsible for servicing this meeting:

- Registering to speak
- Business of the meeting
- Any special arrangements
- Copies of reports and
- For receiving reports in other formats

Contact details are set out above.

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)**

Ta informacja może być dostarczona w twoim własnym języku. **(Polish)**

Bu bilgiyi kendi dilinizde almanız mümkündür. **(Turkish)**

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

☎ **(01904) 551550**

This page is intentionally left blank

Agenda Item 3

Economic Development & Transport Policy & Scrutiny Committee (Pre-Decision Calling – In) **18 November 2015**

Report of the Assistant Director, Governance and ICT

Called-in Item Pre-Decision: York's Third Air Quality Action Plan (AQAP3)

Summary

1. At its meeting in August 2015, the Executive agreed some operational guidelines for enabling and supporting a pre-decision call-in process. This supplements the pre-existing arrangements for post-decision call in and is intended to provide all backbench and scrutiny Members with opportunities to comment upon relevant upcoming Executive or Executive Member decisions.

2. In accordance with the arrangements for pre-decision scrutiny call-in, 3 Members (Councillors D'Agorne, Kramm, Craghill) have called in the Executive Member for Environment's intended decision in relation to the 3rd Air Quality Action Plan, for the following reason:

   "The bad air quality in York is one of the major health risks for residents particularly in the city centre area. Actions are needed that can deliver fast and sufficient relief for people affected. After an intense consultation for the AQAP3 it would be beneficial for the process if councillors can have an early opportunity to value and analyse the data from a political and ward-orientated perspective and assist officers in the wording of the recommendation of the Action Plan for execution"

3. This report sets out brief background to the issue called-in and the role of and options available to this Committee, under the agreed pre-decision call-in arrangements.

Background

4. Due to the health implications and costs associated with air quality, the government set health based air quality objectives for seven of the most common pollutants found in our cities.

5. The Environment Act 1995 requires all local authorities to review and assess air quality in their areas and to declare Air Quality Management Areas (AQMAs) where the objectives set by the government are unlikely to be met. Where an AQMA is declared, an Air Quality Action Plan (AQAP) must be developed to demonstrate how the local authority intends to improve air quality.

6. Air quality monitoring has been undertaken in York since 1999. In 2001 the Council identified five areas of the city centre, around the busy inner ring road, where it was unlikely that the long term objective for nitrogen dioxide (NO2) would be met. These five areas were incorporated into a single Air Quality Management Area (AQMA) declared on 22 January 2002.

7. The AQMA included areas where members of the public were likely to be exposed to air pollution regularly over long periods of time, such as residential properties, nursing homes and schools. Roads were also included within the AQMA boundary and showed the wider area that residents and businesses stated they wanted to see air quality improved during consultation on the AQMA boundaries.

8. Following the publication of AQAP2 (2006) average concentrations of NO2 continued to rise across the city and new declarations became necessary.

9. In April 2010, a further AQMA was declared along the A19 corridor to the south of the city. This followed repeated exceedances of the annual average NO2 objective on Main Street, Fulford. Another AQMA was declared for NO2 on Salisbury Terrace on 18th May 2012 due to further evidence of elevated levels of NO2 in the Leeman Road area.

10. The continued deterioration of air quality prompted a review of AQAP2 and the review prompted the development of York's Low Emission Strategy (LES). The York LES was adopted in October 2012 and was the first overarching LES in the UK; it sets out a low emission based approach to air quality improvement using a variety of incentive, technology and enforcement based methods to further reduce emissions of air pollutants. The LES recognises the particular need to reduce NO2 from diesel vehicles, including buses, HGVs and taxis that fall outside the scope of previous modal shift based AQAPs.

11. The development of AQAP3 is to achieve further air quality improvement in York with emissions being minimised as far as possible and a significant shift away from the reliance of diesel vehicles to provide essential public transport and delivery services.

The Process

12. One (or more depending upon the Chair's discretion) of the Calling-In Members will have the opportunity to address the Committee, making comments on their reasons for bringing this pre-decision call in forward. Their will be opportunities for the Executive Member and Officers to address the Committee. In light of the submissions made and their own views, Members of the Committee will then debate and agree upon recommendations to make to the Executive Member for decision upon this matter. The full process according to which the Chair will manage this meeting is attached at Appendix (i) to this report.

13. Having heard the views of various Members and speakers and the recommendations of this Committee, the Executive Member will then be invited to make his decision publicly, upon the conclusion of this Scrutiny call-in meeting, if feasible.

Consultation

14. In accordance with the requirements of the Constitution, the calling-in Members have been invited to attend and/or speak at the Call-In meeting, as appropriate. Corporate & Scrutiny Management Policy & Scrutiny Committee was fully consulted on the implementation of the pre-decision call-in arrangements in advance.

Options

15. The following options are available to this Committee in relation to dealing with this pre decision call-in, in accordance with the new agreed arrangements:

    (i) Agree comments or recommendations for submission to the Executive Member, to take into account when making his decision; or

    (ii) Decide not to make any specific comments/recommendations to the Executive Member on the issue in hand

Analysis

16. Members need to consider the reasons for call-in and any comments made at the meeting by speakers, as well as have regard to the information in the officer's report to the Executive Member on this matter, attached at Annex (ii) to this report, before inviting the Executive

Member to make a decision.

Council Plan

17. There are no direct implications for this call-in in relation to the delivery of the Council Plan and its priorities for 2015-19.

Implications

18. There are no known Financial, HR, Legal, Property, Equalities, or Crime and Disorder implications in relation to the following in terms of dealing with the specific matter before Members; namely, to consider and handle the pre decision call-in. However, if it became clear to the Committee from information received that there were implications associated with any comments/recommendations it wished to make then it would be appropriate for the Committee to also recommend that any such implications be looked into, prior to the Executive Member making a decision which might be affected by those implications.

Risk Management

19. There are no direct risk management implications associated with considering the call in of this matter. However, the Committee would be advised to invite the Executive Member to take account of any risks associated with any comments/recommendations which the Committee may wish to make on the matter in hand, prior to implementing any decision.

Recommendations:

20. Members are asked to:

    (i) consider the reasons for calling in this matter prior to decision, together with all submissions made and decide whether they wish to make any specific comments/recommendations for consideration by the Executive Member; and

    (ii) invite the Executive Member to make their decision upon the conclusion of the call-in meeting in light of (i) above.

Reason: To enable the called-in matter to be dealt with efficiently and in accordance with the new pre-decision call in arrangements.

Contact details:

Author:	**Chief Officer Responsible for the report:**
Dawn Steel Head of Civic & Democratic Services 01904 551030	Andrew Docherty Assistant Director, Governance and ICT

Report Approved √ **Date** 2 November 2015

Specialist Implications Officer(s) None

Wards Affected: **All** √

For further information please contact the author of the report

Annexes

Annex (i) – Process for handling pre-decision call in at the meeting
Annex (ii) – Third Air Quality Monitoring Report to Executive Member and associated Annexes, as follows:

Annex A – Letter from DEFRA re infraction fines
Annex B – AQAP consultation questionnaire and responses
Annex C – Individual written responses to AQAP3 consultation
Annex D – Community Impact Assessment for AQAP3
Annex E – Glossary of acronyms and abbreviations
Annex F – The main AQAP3 report "Towards an ultra low emission city"

Annex F, the main AQAP3 report, has 5 separate annexes

Annex 1 – Feasibility studies: Low Emission Zone, electric buses and anti-idling
Annex 2 – Clean Air Zone
Annex 3 – Assessment of AQAP3 measures
Annex 4 – Emission Factor Toolkit modelling
Annex 5 – Low Emission Partnership planning guidance and technical guidelines

Background Papers
Report to Executive – Proposed Decision Making Arrangements -27 August 2015

Annex (i)

Process for handling Pre-Decision Call In at the Meeting

Pre-Decision Called-in Item: *Insert Name of Item*

The order of business will be as follows:

a) One of the Calling In Members *(or more at the Chair's discretion)* will be invited to address the Committee on the reasons for their pre-decision call-in - *3 minutes*

b) The Committee Members will be invited to question the calling in speaker on their reasons

c) The Executive Member will be invited to attend the meeting to address the Committee on the issue and respond to the reasons for calling in– *3 minutes*

d) Committee Members will then question the Executive Member, if required

e) Officers will be invited to address any issues raised by the Calling In Members and to provide updates (if any) on the called in item

f) The Committee Members will be invited to question the Officers, if required

g) Members will then debate the item, considering the reasons for call-in and any comments made by speakers at the meeting, whilst having regard to the information in the Officer's report. The Committee can then *either:*

- Agree comments or recommendations for submission to the Executive Member, to take into account when making *his/her* decision *or*
- Decide not to make any specific comments/recommendations to the Executive Member on the issue in hand

h) The Executive Member will then consider whether they are in a position to make a decision, on the issue immediately following the calling-in debate, having heard the comments /recommendations made by the Scrutiny Committee on the issue.

This page is intentionally left blank

CITY OF YORK COUNCIL	
Decision Session **Executive Member for the Environment**	18November 2015
Report of the Assistant Director – Housing and Community Safety	

Adoption of York's Third Air Quality Action Plan (AQAP3)

Summary

1. In October 2014 the Cabinet Member for Environmental Services, Planning and Sustainability approved a draft framework for a new Air Quality Action Plan (AQAP3). AQAP3 will be the main delivery plan for the York Low Emission Strategy (LES) (adopted October 2012) and supports York's bid to become an exemplar ultra-low emission city.
2. AQAP3 supports the new council plan by improving air quality, supporting residents to live healthy lives, encouraging and supporting a green economy and helping to deliver a sustainable city with efficient and affordable transport links. With all the proposed AQAP3 measures in place it is predicted (with the exception of Nunnery Lane) that the health based national air quality objectives for nitrogen dioxide (NO_2) will be met in all the current air quality technical breach areas in York by 2021[1].
3. This report presents the final draft of AQAP3 (Annex F), summarises the results of the public consultation and provides an update on new evidence relating to air quality and public health. The Executive Member is asked to note the results of the public consultation and to formally adopt AQAP3

[1] The modelling work to support this prediction was undertaken in September 2014. It is based on total projected long term development targets of an additional 17,503 residential units and 266,466m^2 of employment use by 2031. For the 2021 modelling scenario (reported here) it was assumed that only 8724 housing units and 115,506m^2 of employment use would have been delivered. The modelling also assumes delivery of a number of key transport projects by this date. Targets for new housing provision and site allocations are currently under review and are expected to be reduced. The traffic impact of new development in the city by 2021 is therefore likely to be lower than the modelling undertaken during the development of AQAP3 suggests. New emission reduction figures for AQAP3 will be calculated once revised traffic growth figures for the city become available and these may show compliance with the air quality objectives at all locations in the city by 2021.

National policy

4. In February 2014 the European Commission launched infraction proceedings against the UK for breach of NO_2 limit values under the EU Air Quality Directive. In April 2015 a UK Supreme Court ruling required the UK government to provide a new national AQAP by the end of 2015. A revised draft national AQAP was issued for public consultation on 12 September 2015[2]. This includes proposals for a national network of low emission zones called Clean Air Zones (CAZs) to achieve compliance with the EU limit values within 6 UK zones and agglomerations currently predicted to exceed the EU limit values after 2020. Initial entry requirement proposals for the CAZs are Euro IV petrol and Euro VI diesel. There is still considerable uncertainty about on road performance of Euro VI diesel vehicles (as highlighted by the recent VW scandal). If Euro VI vehicles do not perform as expected the number of UK zones and agglomerations exceeding the EU limit values in 2020 may be greater than the number currently predicted.

5. The UK Government is responsible for ensuring compliance with EU limit values but DEFRA has written to all local authorities warning that infraction fines could be passed on to local authorities using a discretionary power in Part 2 of the Localism Act (Annex A). No details have been released about how these fines will be imposed but it is understood they will be recurring annual fines.

6. Local authorities that demonstrate good progress with local air quality management (LAQM) and have robust AQAPs in place are less likely to incur significant fines from DEFRA than those where progress and investment in LAQM has been poor. York currently has an excellent national reputation for LAQM and action planning and has recently been shortlisted to become one of a handful of ultra-low emission cities (competing for funding of up to £35 million). Similar bids are being compiled to further increase the numbers of low emission buses and taxis in the city. The results of the ultra-low emission city bid will be announced in late 2015.

7. DEFRA is currently reviewing the national LAQM framework with findings due to be published in early 2016[3].

---

[2] Consultation on draft plans to improve air quality, Tackling nitrogen dioxide in our cities (DEFRA, September 2015)
https://consult.defra.gov.uk/airquality/draft-aq-plans

[3] Local Air Quality Management Consultation on options to improve air quality management in England (DEFRA, July 2013)
https://consult.gov.uk/communications/https-consult-defra-gov-uk-laqm_review

It is expected that a greater emphasis will be placed on local air quality action planning and a more streamlined approach will be taken to annual reporting requirements. Advanced proposals for the London Boroughs (issued by the London Mayor) indicate a greater role for local authorities in the control of $PM_{2.5}$ emissions and a more involved role for transport and public health directors in the development and sign off of AQAPs[4].

Air Quality and Health

8. The health impacts of fine particulate matter (PM_{10} and $PM_{2.5}$) are well documented with strong links established to lung diseases (asthma, bronchitis and emphysema) and heart conditions.[5,6] In June 2012 the World Health Organization (WHO) classified diesel engine exhaust as carcinogenic to humans[7] and said everyone should reduce exposure to diesel exhaust emissions. In March 2015[8] the Committee on the Medical Effects of Air Pollutants (COMEAP) stated reductions in particles is likely to benefit public health. Both WHO and COMEAP highlight the importance of reducing all sources of PM as far as possible, particularly sources of diesel particulate. Public health framework indicator 3.01 states that the fraction of mortality in York attributable to anthropogenic (man-made) $PM_{2.5}$ air pollution is 4.8% of all deaths (82 deaths)[9]. The average for this indicator across England is 5.1%.

9. The links between nitrogen dioxide (NO_2) and health have until recently been less understood. In March 2015 COMEAP's report on *'The evidence for the effects of NO_2 on health[10]'* concluded that evidence on

---

[4] Draft London Local Air Quality Management Framework (Greater London Authority, July 2015) https://www.london.gov.uk/priorities/environment/consultations/consultation-on-proposals-for-a-new-london-local-air-quality-0

[5] *Long-Term Exposure to Air Pollution: Effect on Mortality* (COMEAP, 2009) https://www.gov.uk/government/publications/comeap-long-term-exposure-to-air-pollution-effect-on-mortality

[6] *Mortality effects of long term exposure to particulate air pollution in the UK (COMEAP,2010)* https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-ukThe Mortality Effects of Long Term Exposure to Particulate Air Pollution in the United Kingdom, Committee on the Medical Effects of Air Pollutants (COMEAP, 2010)

[7] *Press release 213 (IARC, June 2012)* http://www.iarc.fr/en/media-centre/iarcnews/2012/mono105-info.php

[8] *Statement on the evidence for differential health effects of particulate matter according to source or components (COMEAP, 2015)* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411762/COMEAP_The_evidence_for_differential_health_effects_of_particulate_matter_according_to_source_or_components.pdf

[9] Estimating Local Mortality Burdens associated with particulate air pollution, (Public Health England, 2014)

[10] Statement on the evidence for the effects of nitrogen dioxide on health https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411756/COMEAP_The_evidence_for_the_effects_of_nitrogen_dioxide.pdf

the causal effects of NO_2 had strengthened substantially in recent years. NO_2 is now considered to be directly responsible for some health impacts, which may include lung conditions (asthma, bronchitis and emphysema), premature births, reduced birth weights and reduced lung function in children.

10. Public Health England (PHE) is expected to shortly announce a new health outcome indicator for NO_2, similar to that already in place for $PM_{2.5}$. This is an important development as most of the AQMAs in the UK, including those in York, have been declared due to exceedance of NO_2 air quality objectives. Most NO_2 is locally derived from traffic and local heat / energy generation (unlike PM where a considerable amount is imported from elsewhere as 'background' pollution). Reducing the health impacts of NO_2 at a local level requires an emphasis on local measures to reduce emissions from traffic and local heat /energy generation.

11. DEFRA have also recently (September 2015) revised the social damage costs for NO_x increasing them from around £900 per tonne of NO_x (all sources) to £25,252 per tonne (transport sources) and £13,131 per tonne (industrial sources)[11]. Different costs per source have been introduced to reflect the importance of population density in relation to the pollutant source. As most traffic pollution is emitted in densely populated urban areas the NO_x damage cost from transport is now much higher than that from industry and other sources.

12. Poor air quality is the biggest cause of premature mortality in the UK after smoking, greater than the estimated impact of obesity and road accidents combined. Previous COMEAP estimates of 29,000 deaths per annum in the UK from air pollution were based on exposure to PM. Taking into account the revised evidence relating to NO_2 exposure the combined impact from PM and NO_2 (assuming they act independently of each other) is 48,625 deaths a year with social damage costs of £27billion per year [11]. The calculated social damage costs include the impact of exposure to air pollution on health (including life years lost and cost of additional hospital admissions) and damage to buildings (through building soiling) and impacts on materials[12].

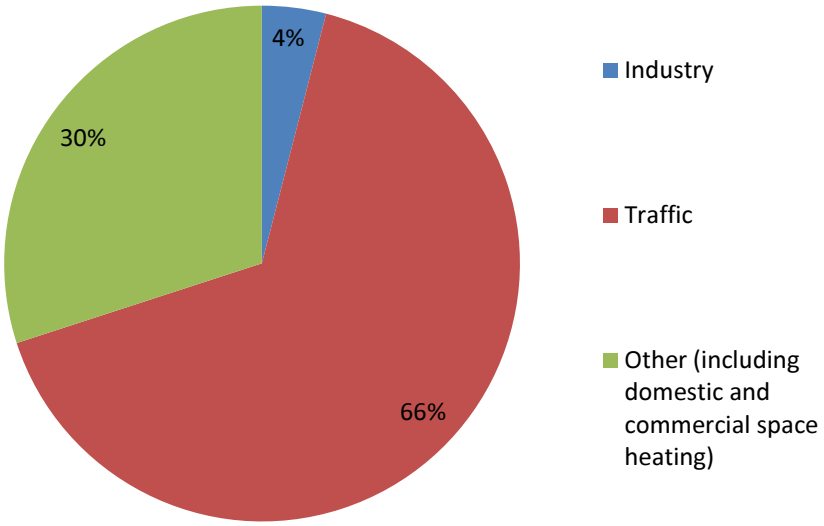
[11] Valuing impacts on air quality: Updates in valuing changes in emissions of Oxides of Nitrogen (NOX) and concentrations of Nitrogen Dioxide (NO2) (DEFRA, September 2015)
https://www.gov.uk/guidance/air-quality-economic-analysis

[12] Air Quality Appraisal, Damage Cost Methodology, Interdepartmental Group on Costs and Benefits (Air Quality Subject Group) (February, 2011)

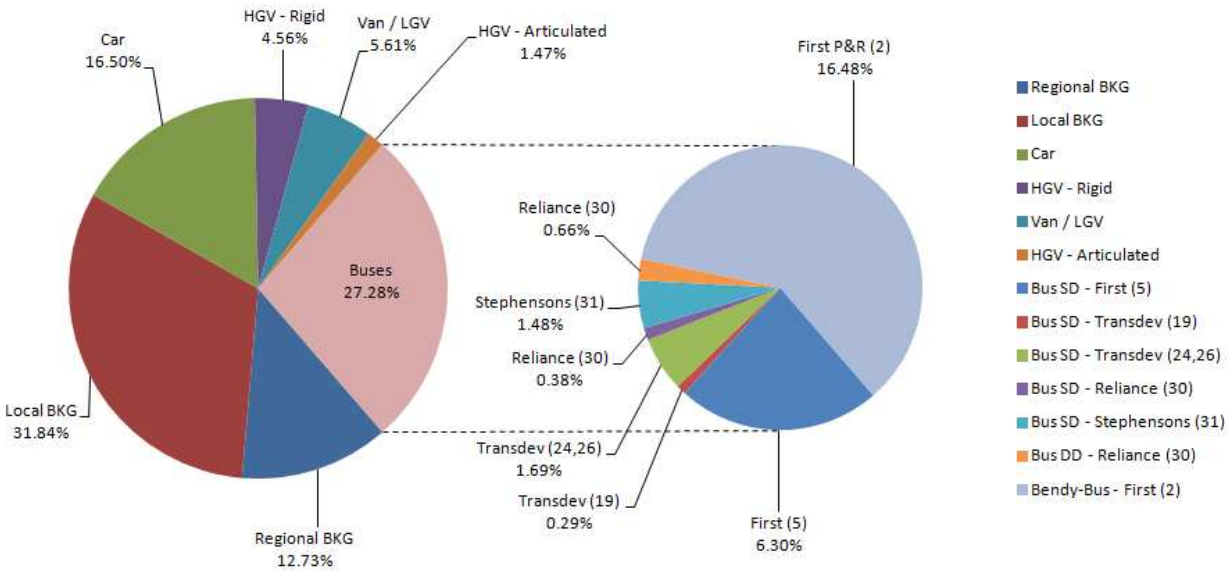
Current air quality situation in York

13. CYC has declared 3 Air Quality Management Areas (AQMAs) where the health based national air quality objectives for NO_2 are currently exceeded. CYC has a statutory duty to try to reduce NO_2 concentrations within these AQMAs, and additional obligations in relation to the protection of public health and reduction of greenhouse gas emissions. The main air pollutants of concern in York are NO_2 and particulate matter (PM). Typically traffic is responsible for around 50 to 70% of the total NO_2 at any particular location (the exact amount varies according to proximity to roads, industrial sources etc). The contribution from any individual vehicle type varies according to the types of vehicle present and the age / condition of those vehicles. The graphs below show some typical NO_2 source apportionment graphs for York.

All sources (NO_2) – Holgate Road area



Traffic sources (NO_2) – Salisbury Terrace area (November 2012)



14. Recent air pollution monitoring data for York (2014) indicates that the annual average air quality objective for NO_2 is still being breached at numerous locations around the inner ring road (within the city centre AQMA)[13]. City centre pollutant concentrations in 2014 were generally slightly higher than those observed in 2013. With all the proposed AQAP3 measures in place it is estimated that the majority of the city centre AQMA (with the exception of Nunnery Lane) will be able to be revoked shortly after 2021, if not before[1]. Recent monitoring results for the Nunnery Lane AQMA indicate that the majority of the area (including Bishopthorpe Road and Scarcroft Road) currently meets the air quality objectives. There are two remaining 'hotspots' on Nunnery Lane and Prices Lane where very slight exceedances of the annual average NO_2 objective have been recorded in recent years (up to 42µg/m^3). This is due to the regular occurrence of queuing traffic and poor dispersion in these two particular locations.

15. Conditions in the Fulford Road and Salisbury Terrace AQMAs have already improved slightly in recent years with levels in both locations currently just below the 40 µg/m^3 objective limit. If the concentration in these locations stays below the 40 µg/m^3 objective level, and continues to improve over the next two to three years, these AQMAs will be revoked.

16. National air quality objectives for PM_{10} are currently met in York. Health based objectives for ultra-fine particles have not yet been set for local authorities to meet. The EU limit value for $PM_{2.5}$ is 25 µg/m^3 as an annual average with an additional requirement to reduce average urban background concentrations by 15% by 2020 (against a 2010 baseline) . In 2014 the annual average $PM_{2.5}$ concentration at Gillygate was 9.7µg/m^3. There are currently no known safe exposure limits for $PM_{2.5}$.

17. DEFRA predict that the Yorkshire and Humberside Zone (which includes York) is expected to meet the EU limit values by 2020 (assuming Euro VI diesel engines perform as expected (early evidence suggests that most Euro VI cars are already failing to achieve the EU emission targets in the real world) and all current local air quality action plans within the zone are fully delivered). More detailed monitoring and modelling work undertaken by CYC staff indicates that with all the proposed AQAP3 measures in place the health based national air quality objectives for NO_2 will be met in all the current air quality technical breach areas in York by 2021, with the exception of Nunnery Lane[1].

[13] Update and Screening Report, City of York Council (April 2015)

Scope of AQAP3

18. The measures included in the draft AQAP3 consultation aim to reduce emissions from all forms of transport. The main headlines are:

- **Reducing emissions from buses through the development of a Clean Air Zone (CAZ) in the city centre** - the Clean Air Zone entry requirements would be based on the frequency at which buses enter the city centre. The most frequent services (entering the CAZ more than 10 times per day) would be required to have zero emission capability in the city centre by 2018. Less frequent services would be initially set minimum Euro emission standards with a longer term upgrade programme allowing them to work towards zero emission capability. The CAZ could potentially be expanded in the future to include other vehicle types.
- **Introduction of anti–idling measures** – initial proposals are for an education based awareness campaign targeted at local transport operators and supported by increased anti-idling signage. An option remains to adopt enforcement powers in the future if necessary.
- **Reducing emissions from taxis –** via continuation of the local financial incentive scheme that encourages taxi drivers to switch to hybrid / electric vehicles. Further improvements to the taxi licensing system to further encourage the use of low emission vehicles in the taxi fleet are being discussed with the taxi licensing team. Currently the number of low emission taxis in York are:

Hackney Carriages	14 out of 183 vehicles (7.7%)
Private Hire	40 out of 572 vehicles (7.0%)

- **Reducing emissions from new development -** by requiring all developers to routinely provide electric vehicle recharging infrastructure and Construction Emission Management Plans (CEMPs) on new developments, and by requiring full emission impact assessments for larger developments supported by emission mitigation plans.
- **Reducing emissions from fleets** via the ECO-stars fleet recognition scheme.
- **Reducing emissions from CYC fleet** – by encouraging the use of low emission car club vehicles (as an alternative to use of personal vehicles for CYC business), switching the council fleet vehicles to alternative fuels and striving for long term improvements in the council fleet through membership of the ECO stars fleet recognition scheme.

- **Increasing awareness of the impact of air pollution on public health** - via an improved marketing and communications strategy focused on health impacts of air pollution.
- **Reducing emissions from all vehicle types** - by continuing to expand the electric vehicle (EV) charging network within York (and the wider region), by providing a Compressed Natural Gas (CNG) Refuelling station and by developing local incentives for the uptake of low emission vehicles. CYC currently provides 11 rapid charge and 19 fast charge locations around the city. There are currently approximately 20 other privately owned charging points located at hotels, retail parks, supermarkets etc with customer access.
- **Attracting low emission industries, businesses and jobs to York** - by developing a 'green business' hub and working towards development of a freight transhipment centre.
- **Continued modal shift and network improvement measures** - via LTP3 capital programme and LSTF programme.

19. AQAP3 measures are intended to build upon (but do not replace) the modal shift based measures included in previous AQAPs, and are intended to support other emission reduction measures included in the Climate Change Framework and Action Plan (CCFAP) and the Local Transport Plan (LTP3).

Consultation process

20. Public consultation on the first draft of AQAP3 was undertaken from 21 November 2014 to 2 January 2015. An online questionnaire and electronic copy of the document were made available on the CYC website and the consultation period was advertised locally via a general press release, the main council website, JorAir website and Buzz (CYC staff magazine). Posters, consultation questionnaires and copies of the draft AQAP3 were also placed in all the York Explore libraries and at West Offices reception. Additional email notification of the consultation was sent directly to all statutory consultees and a number of other relevant stakeholders. York Press contained a main feature on the AQAP3 consultation on 30 December 2014. A copy of the consultation questionnaire is at annex B.

Consultation responses

21. 35 online questionnaires and 10 written responses from a wide range of people were received during the consultation period; these are detailed in annexes B and C respectively.

22. The majority of respondents provided a positive response to the overall plan with a significant level of support shown for the CAZ concept and the use of anti-idling measures. The main suggested areas for improvement were inclusion of more information on the role of green infrastructure in improving air quality and a greater emphasis on anti-idling signage and enforcement. Some respondents indicated that they would like to see more consultation with bus operators on the CAZ and others said they would like to see the CAZ concept expanded to include other vehicles.

23. The main changes made to the draft AQAP3 as a result of the consultation responses were:

    - Better recognition of the role green infrastructure can play in removing pollutants from the environment
    - A commitment to provide anti-idling signage
    - Clarification that AQAP3 builds upon, but does not replace, the sustainable transport and congestion management programmes already in place in the city

24. Other updates to the draft AQAP3 since the Cabinet Member decision session on 26 August 2014 reflect progress on delivery of low emission measures and the air pollution monitoring results for 2014. There have also been some changes to responsibilities and timescales for delivering some AQAP3 measures (due to the recent Public Protection restructure) and a current inability to fund the ECO-stars scheme beyond 2015. Further funding for ECO-stars and other low emission measures is being sought via the OLEV ultra-low emission city bid. Updates have also been made to reflect the latest health evidence and social damage cost associated with air pollution, as detailed earlier in this document (paragraphs 8-12) as well as the new Council Plan priorities.

Options

25. **Option 1** - To accept the findings of the AQAP3 consultation (detailed in sections 21 to 22 of this report) and the resulting amendments to the consultation draft AQAP3 (detailed in sections 23 to 24 of this report). To formally adopt the amended AQAP3 circulated with this report as York's Third Air Quality Action Plan (subject to any amendments at the meeting)

26. **Option 2 -** To reject the findings of the AQAP3 consultation and the resulting amendments to the consultation draft AQAP3.

To defer formal adoption of the amended AQAP3 circulated with this report until further consultation / further amendments as requested at this meeting have been completed.

Analysis

27. Option 1 will ensure York continues to have a robust, current and relevant AQAP based on a strong local emission evidence base. This will facilitate continued delivery of the aims and objectives of the LES. AQAP3 measures will deliver emission reduction and health improvement benefits throughout the city and should deliver the national air quality objectives for NO_2 at most locations in York by 2021. Adoption of AQAP3 will demonstrate to DEFRA that York is continuing to strive to improve air quality in the city and may reduce the possibility of substantial air quality fines in the future. AQAP3 will ensure that York continues to attract low emission vehicles, technologies and associated jobs ahead of other local authorities and having a newly adopted LES based AQAP3 in place will strengthen York's bid to become one of OLEV's designated ultra-low emission cities. If successful this bid could attract millions of pounds of investment in low emission vehicles and infrastructure to York from 2016 onwards.

28. Option 2 - will delay the timescale for formal adoption of a new AQAP for York. This will reduce and slow down delivery of the LES resulting in higher emissions in the city and greater health impacts. This would damage York's reputation with DEFRA as a high achieving authority in relation to air quality and reducing emissions, and could make the council vulnerable to substantial fines from DEFRA. Delaying adoption of AQAP3 may result in lost opportunities for attracting low emission vehicles, technologies and associated jobs and will weaken York's ability to attract millions of pounds of ultra-low emission city funding.

Council Plan

29. The new council plan aims to deliver a prosperous city for all. Steps taken to improve air quality will be a key indicator of the progress made in delivering the plan. AQAP3 will support the new council plan as follows:

    - **Help residents to live healthier lives so that they can contribute fully to their communities, reach their full potential and retain good quality and well paid jobs -** Good air quality reduces the amount of time lost off work or away from education due to air quality related illnesses helping to improve personal attainment and ability to contribute to the wider economy.

AQAP3 will contribute to quality of life in York by promoting healthy lifestyles and providing safe, pleasant places to live, learn, exercise and meet. Providing better information and advice on air quality and health impacts will empower individuals to make better lifestyle choices and take steps to reduce their own exposure to air pollutants reducing hospital admissions and costs to the NHS.

- **Encourage and supporting a green economy –**accelerating the uptake of alternatively fuelled vehicles in York will stimulate the market for supply and maintenance of new vehicle technology and refuelling infrastructure. This will attract new manufacturing and service industries to the area creating new 'green' jobs and training opportunities. There is also potential for developing a 'green' tourism offer based around low emission travel opportunities. Providing alternative vehicle fuel infrastructure is essential to ensure York retains transport links with other cities as alternative technology penetrates the mass vehicle market. The use of alternatively fuelled vehicles can also offer considerable financial savings to local businesses helping them to thrive.
- **Provide efficient and affordable transport links –** AQAP3 will deliver cleaner, more attractive and reliable public transport in York, resulting in increased patronage and a further reduction in private vehicle trips. The total cost of ownership of low emission technologies can be substantially lower then diesel due to much lower fuel cost. Where initial investments are higher, leasing arrangements can enable financial benefits from the outset. These fuel savings could be used by operators to limit the need for further increases in public transport fares.
- **Help to deliver an environmentally sustainable city –** AQAP3 will help to ensure the city can continue to grow without an unacceptable impact on local air quality, carbon emissions and health. AQAP3 supports greenhouse gas emission reduction measures in York's Climate Change Framework and Action Plan helping to protect York's communities from the impacts of climate change. New low emission planning guidance will help to ensure that emissions from new developments are minimised as far as possible whilst still allowing the creation of new jobs and homes.

- **Help to protect and support York's unique heritage** – air pollution damages buildings as well as people. Improving air quality will help to protect the city's many historic buildings and support tourism.

Implications

30. The various implications of this report are summarised below:

(a) **Financial**

Implementation of the measures in AQAP3 will require both capital and revenue funding. AQAP3 measures are identified as being low, medium or high cost. It is envisaged that all low cost measures (<£40k) will be deliverable from within existing budgets, mainly the LTP3 capital programme and air quality grant funding. Medium cost measures (£40K to £100k) will require additional funding above and beyond current resources. It is anticipated that the majority of this funding will be obtainable from additional government grant opportunities and private investment. If successful, the OLEV low-emission city bid will provide funding to support many of the medium cost measures. The high cost measures > £100k will need significant additional investment from either the private sector or from grant funding. If this can not be secured the high cost measures are unlikely to proceed. Any request for funding will follow the council's budgetary (capital & revenue) process. Approving this report does not commit further funding to support the delivery of the AQAP3.

(b) **Human Resources (HR)**

The delivery of low emission vehicle and infrastructure projects requires a cross-directorate approach that is currently co-ordinated by the low emission officer with support from air quality, transport and fleet colleagues. The low emission officer post is a temporary post currently funded through the LSTF programme and is due to end in March 2016. Timescales for delivering AQAP3 measures assume that the low emission officer post will continue to exist until at least 2021. If funding to support this post until 2021 cannot be found it is likely that some if not most of the measures in AQAP3 will become unachievable or will be delivered later than stated. Specific departmental responsibility for the delivery of each LES measures is clearly identified within the draft consultation LES.

(c) **Equalities**

A community impact assessment has been undertaken for AQAP3 (Annex D). Older people, children, pregnant women and vulnerable people with respiratory and other illnesses are more likely to be adversely affected by poor air quality. LES measures aim to mitigate the health effects of poor air quality detailed in paragraphs 8-12 of this report.

(d) **Legal**

AQAP3 is a statutory document. CYC has a statutory duty to periodically review the air quality within its area both at the present time and as regards future air quality. There is a duty to designate an AQMA where air quality objectives are not being achieved or are not likely to be achieved. Once an area has been designated there is a duty to carry out an assessment and prepare an air quality action plan (AQAP) for the area. DEFRA have issued statutory guidance to which the Council must have regard in exercising these functions. This includes annual reporting on progress with delivery of AQAPs and refreshing of AQAPs when necessary. AQAP3 is an update of the previous AQAP2 (2006) and incorporates the aims and objectives of York's LES and addresses the continued breaches of air quality objectives in the city.

The implementation of AQAP3 will involve the use of other legal powers such as traffic regulation and planning powers, and their use will need to be considered on a case by case basis.

Having consulted the public on the contents of AQAP3, in making its decision the Executive Member is under an obligation to pay due regard to the comments received.

(e) **Crime and Disorder**

There are no crime and disorder implications

(f)**Information Technology (IT)**

There are no IT implications

(g) **Property**

Energy efficiency and emission reduction measures in domestic properties are currently delivered via the measures set out in the Climate Change Framework and Action Plan. There will be no change to this arrangement as part of AQAP3 implementation. There will be a requirement to accommodate electric vehicle recharging infrastructure in some council owned car parks, offices, housing and leisure facilities. There will also be a need to consider in more detail the suitability of biomass technology for use in council owned buildings, particularly schools and residential care homes where vulnerable receptors are likely to be located close to the emission source.

(h) **Other**

There may be highways implications associated with implementing a CAZ within the city centre. This will be explored, consulted upon and fully reported to members before any CAZ is established.

The implementation of AQAP3 will include a significant change to the way planning applications are assessed in relation to air quality impacts. Currently most large planning applications are only assessed on the basis of the resultant change in local air quality concentration they are likely to cause. In future, the emphasis will be on the total emissions arising as a result of a new development and how these will be mitigated, both on and off site. The aim is to reduce emission 'creep' across the city arising from the cumulative impact of development. Further consultation on this approach will be needed at a local level to ensure it is fully compatible with the emerging Local Plan. New technical low emission planning guidance has recently been drawn up for the city with assistance from the Low Emission Partnership. The methodologies are currently being tested on suitable planning applications and the technical note is being converted into a more public facing document prior to a wider consultation taking place. The methodologies build on the approach to low emission planning already widely adopted in West Yorkshire.

Risk Management

31. In compliance with the Council's risk management strategy, failing to meet the health based air quality targets, considering the likelihood and impact, the current net risk rating is 21 or High. The continued implementation of the LES and adoption and implementation of AQAP3 should reduce the risk to Medium.

Recommendations

32. The Executive Member is advised to:

Approve Option 1: To accept the findings of the AQAP3 consultation and the resulting amendments to the consultation draft AQAP3. To formally adopt the amended AQAP3 circulated with this report as York's Third Air Quality Action Plan (subject to any further minor amendments requested at this meeting)

Reason: This option will ensure that York continues to have a robust, current and relevant AQAP based on a strong local emission evidence base.

This will facilitate continued delivery of the aims and objectives of the LES. AQAP3 will deliver emission reduction and health improvement benefits throughout the city and by 2021 should deliver the national air quality objectives for NO_2 at most locations in York. Adoption of AQAP3 will demonstrate to DEFRA that York is continuing to strive to improve air quality in the city and may reduce the possibility of substantial air quality fines in the future. AQAP3 will ensure that York continues to attract low emission vehicles, technologies and associated jobs ahead of other local authorities and having a newly adopted LES based AQAP3 in place will strengthen York's bid to become one of OLEV's designated Ultra-Low Emission Cities. If successful this bid will attract millions of pounds of investment in low emission vehicles and infrastructure to York from 2016 onwards.

Contact Details

<table>
<tr><td>Author:</td><td colspan="4">Chief Officers Responsible for the report:</td></tr>
<tr><td rowspan="4">Elizabeth Bates
Principal Air Quality Officer
Public Protection (CANS)
tel (01904) 551529

Mike Southcombe
Public Protection Manager
Public Protection (CANS)
tel (01904) 551514</td><td colspan="4">Steve Waddington
Assistant Director, Housing and Community Safety, CANS</td></tr>
<tr><td>Report Approved</td><td>√</td><td>Date</td><td>16th October 2015</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5">Specialist Implications Officer(s)

None</td></tr>
<tr><td colspan="3">Wards Affected: List wards or tick box to indicate all</td><td>All</td><td>X</td></tr>
<tr><td colspan="5">For further information please contact the author of the report</td></tr>
</table>

Background Papers

A draft framework for York's Third Air Quality Action Plan (AQAP3) 2014 to 2020 – Decision Session Cabinet Member for Transport, Planning and Economic Development (30 October 2014)

Air Quality Update - Decision Session Cabinet Member for Transport, Planning and Economic Development (14 November 2013)

Air Quality Update - Meeting of Cabinet Member for City Strategy and Air Quality (June 2012)

Adoption of a Low Emission Strategy for York - Cabinet (9 October 2012)

Low Emission Strategy Consultation –– Cabinet (3 April 2012)

Air Quality Update – Meeting of Cabinet Member for City Strategy and Air Quality (5 January 2012)

Draft Framework for York Low Emission Strategy - Executive (15 March 2011)

Air Quality Update – Executive Member for Neighbourhoods (16 Nov 2010)

City of York's Local Transport Plan 3 – Draft 'Framework' LTP3 – Decision Session Executive Member City Strategy (5 Oct 2010)

A Low Emission Strategy for York - Executive Member for Communities and Neighbourhoods (8 June 2010)

Low Emission Strategies – Using the Planning System to reduce transport emissions – DEFRA Good Practice Guidance (January 2010)

Annexes

Annex A: DEFRA letter regarding infraction proceedings

Annex B: Consultation questionnaire and responses

Annex C: Summary of additional consultation responses

Annex D: Community Impact Assessment

Annex E: List of acronyms and abbreviations

Annex F: AQAP3 (following consultation)

ANNEX A: EXTRACT OF LETTER FOR LA's (inside the zones identified by the Commission)

You may have heard that the European Commission has formally launched infraction proceedings against the UK for breach of nitrogen dioxide limit values under the EU Air Quality Directive. This is to give you some further background as to what that means.

The Commission has formally written to the UK under article 258 of the Treaty on the Functioning of the EU. This is the first stage of an infraction process and we now have 2 months to respond to the Commission. After that the Commission may move to the next stage of the infraction process and issue something called a "reasoned opinion". The UK would then have 2 months to respond to that before the case may be referred to the European court. The European Court would then consider the case and all the arguments and decide on the course of action. If the court decides that the UK is in breach of its obligations then it will make a judgment to that effect. The Commission may then bring a further action to the European Court for it to set fines should the UK fail to comply with the court judgment.

The whole of this process may take several years to complete, however, throughout this the focus is for all parties to work together to try to ensure compliance as soon as possible. To this end the Commission has stated that it would like to "to achieve full compliance with existing air quality standards by 2020 at the latest".1

Air quality has improved significantly in recent decades. However, meeting the nitrogen dioxide limit values alongside busy roads in urban areas continues to be a significant challenge for the UK and for most other Member States. The Government is committed to working towards full compliance with the Air Quality Directive and we will be working with the Commission to ensure compliance in the shortest possible time.

Local authorities have already done much to help improve air quality: not just to comply with legal duties for air quality management - especially action planning - but also because you appreciate the local public health benefits. We also know that achieving further NO_2 reductions will not be easy and will need us to work together and to take action by central government and its agencies as well as local authorities. We will use existing channels of communication to tell authorities how the case is progressing and to discuss steps for meeting the NO_2 limit values.

For completeness, we feel we ought to remind you of the discretionary power in Part 2 of the Localism Act under which the Government could require responsible authorities to pay all or part of an infraction fine. The procedures are set out in a policy statement published by DCLG. We strongly hope though, that through

[1] See Clean Air Programme for Europe

cooperative working between Government and Local authorities, the GLA and the Highways Agency and through engaging with the Commission we will be able to avoid the infraction reaching the European court, with the prospect of fines.

The GLA (which has responsibility for local air quality management in London) will also be writing separately to London Boroughs on this matter.

I hope this is helpful if you have any questions please respond to [air quality mailbox]

Defra

Annex B

AQAP3 consultation questionnaire and responses

A 1.0 Consultation Questionnaire

An online consultation questionnaire was made available on the CYC website between 21 November to 2 January 2015. The following questions were asked:

What is your postcode?

Which of these statements best describes the views you have provided in this consultation response?

- I am a local resident and these are my personal views (please go to question 4)
- I am a non-York resident and these are my personal views (please go to question 4)
- These comments are provided in my professional capacity (please go to question 3)

What is your area of employment?

- Bus operator / driver
- Taxi operator / driver
- Freight operator / haulier
- Local authority officer
- Academic
- Consultant
- Charity
- Local business owner / employee (please state nature of the business)
- Other

Please state other/nature of the business here

4. Do you agree or disagree that the council should be working to reduce emissions to air?

- Strongly agree
- Agree
- Neither agree or disagree
- Disagree
- Strongly disagree

5. Do you agree or disagree that the measures in the draft AQAP3 will help reduce emissions to air in York?

- Strongly agree
- Agree
- Neither agree or disagree
- Disgree
- Strongly disagree

6. Are there any measures in the draft AQAP3 that you consider should be given greater priority?

7. Are there any measures in the draft AQAP3 that you have concerns about?

8. Are there any other measures that you would like to see included in the draft AQAP3 that are currently not included?

9. Do you have any further comments on the draft AQAP3?

Questionnaire made available online, in West Offices reception, at York Explore libraries and emailed directly to the following:

- all statutory consultees
- all local authorities within the Yorkshire region
- local health professionals (including NHS practitioners and members of the Health and Wellbeing board)
- bus operators
- taxi operators
- local 'Breathe Easy' group
- University of York and University of Leeds
- Business / other stakeholder contacts from previous LES consultation work
- consultants involved in the LEZ, anti-idling and electric bus feasibility studies
- members of the Low Emission Strategy Partnership (LESP)
- air quality journals

A1.1 Consultation Questionnaire Responses

A total of 35 questionnaire responses were received during the consultation period. A summary of the responses is provided below.

Questions 1, 2 and 3

- **What is your postcode?**
- **Which of these statements best describes the views you have provided in this consultation response?**
- **What is your area of employment?**

34 out of the 35 responses came from YO postcode areas (table 1). 31 people stated they were responding in their personal capacity as a York resident, 3 people answered in their professional capacity, one respondent was a non-York resident giving a personal view. Although not required to do so, some residents gave their occupations. These are shown in brackets in Table 1.

Table 1: Postcode of questionnaire respondents

Postcode area	Number of responses	View point
YO1	2	1x local authority officer 1 x bus operator / driver
YO10	4	4 x York resident opinion (1 resident stated leisure employment)
YO19	3	3 x York resident opinion
YO23	4	4x York resident opinion (1 resident stated self employed crafter)
YO26	5	1 x cycle touring club 4 x York resident opinion (1 resident stated academic employment, 1 resident stated support work employment)
YO30	5	5 x York resident opinion (2 residents stated academic employment)
YO31	5	5 x York resident opinion (1 resident stated central government employment, 1 resident stated transport

		infrastructure employment, 1 resident stated local business employment)
Y032	3	3 x York resident opinion
Y024	2	2 x York resident opinion
YO41	1	1 x York resident opinion
S43	1	1 non-York resident opinion

Question 4

- **Do you agree or disagree that the council should be working to reduce emissions to air?**

28 of the respondents strongly agreed that the council should work to improve air quality and 6 agreed. 1 respondent neither agreed or disagreed.

Question 5

- **Do you agree or disagree that the measures in the draft AQAP3 will help reduce emissions to air in York?**

3 respondents strongly agreed, and 19 respondents agreed that the draft AQAP3 would reduce emissions to air in York. 7 respondents disagreed that the plan would reduce emissions. 6 respondents neither agreed or disagreed.

Question 6

- **Are there any measures in the draft AQAP3 that you consider should be given greater priority?**

When asked which measures within the draft AQAP3 should be prioritised a mixed response was received. There was clear support for prioritising the following aspects of the LES:

- Development of the CAZ (with some respondents wanting to see scope of CAZ increased to include other vehicles and some requesting removal of private vehicles from the CAZ)
- Development of anti-idling measures
- Developing measures to encourage the uptake of low emission vehicles and fuels

- Development of measures to reduce the impact of freight

A number of respondents stated that they wanted existing LTP3 measures, particularly in relation to walking and cycling, to take precedent over LES measures. It is already clearly acknowledged within AQAP3 that the LES based measures are in addition to the sustainable transport measures already being delivered through other CYC policies and programmes and through previous air quality action plans. Sustainable transport delivery remains a high priority for the city and the need to include this on new developments is being incorporated into the new LES planning guidance.

A number of respondents did not prioritise the measures in the draft AQAP3 but gave their own views on other measures that should be treated as priority. These views have been included in the list of other ideas arising from question 8.

Table 2 provides a more detailed breakdown of the responses to question 6 and commentary on how the suggestions have been considered in relation to the AQAP3 development processes.

Some respondents provided more than one suggestion as to which measures should be prioritised.

Question 7

- **Are there any measures in the draft AQAP3 that you have concerns about?**

The main concerns raised about the draft AQAP3 measures were:

- Lack of anti-idling signage and exclusion of anti-idling enforcement measures
- Issues surrounding creation of CAZ
- Potential for further road closures / access restrictions for cars
- Lack of inclusion of walking and cycling measures

A full list of concerns can be found in Table 3. Some respondents used this question as an opportunity to raise concerns about issues not specific to individual AQAP3 measures or to suggest additional

improvement measures. These have been included in the responses to question 8.

Question 8

- **Are there any other measures that you would like to see included in the draft AQAP3 that are currently not included?**

Question 8 provided the questionnaire respondents with an opportunity to provide their own ideas for inclusion in AQAP3. A list of these additional ideas (including those raised in response to other questions) are included in table 4 along with a response to each individual suggestion. The majority of the additional ideas related to sustainable transport and congestion reduction policies which fall within the remit of LTP3. These have been discussed with colleagues in transport planning and the responses incorporate their views on the proposed measures.

Question 9

- **Do you have any further comments on the draft AQAP3?**

The majority of the responses to this question consisted of further suggestions of measures to include in AQAP3 or repeated earlier comments. The additional measures suggestions have been included in the list in table 4.

Issues raised for the first time in response to question 9 are shown in table 5. The main concerns were:

- Level of ongoing political support for the measures
- Length of consultation period

Table 2: Measures identified for prioritisation by consultees

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise anti-idling measures		
Reduce emissions from idling coaches / idling buses (particularly in Leeman Road)	The draft AQAP proposes delivery of an anti-idling marketing and communications campaign in line with the recommendations made within the York anti-idling feasibility study. The adoption and enforcement of anti-idling legislation was not included.	In response to the consultation it is recommended that the marketing and communications based approach to reducing idling measures should be prioritised for action during 2015/2016. A review of possible locations for anti-idling signage will also be undertaken to establish where this can be practically implemented. Adoption of anti-idling legislation will remain optional for the future. This is in line with current council policy to reduce enforcement burdens for businesses, and recognition of the limited staff resources available to undertake such work.
Reduce idling / provide anti-idling signage (no specific vehicle type identified)		
Enforce anti-idling		
Address impact of idling at traffic lights		

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise CAZ / change CAZ proposal		
Prioritise delivery of CAZ	The draft AQAP3 suggested delivery of a CAZ for buses by 2018 through the use of a Traffic Regulation Condition (TRC) enforced by the Traffic Commissioner. The proposal is already under discussion with local bus operators and could be implemented relatively quickly using a staged approach that will give bus operators time to upgrade their fleets.	Other vehicles could be included / excluded from the CAZ through the use of a Traffic Regulation Orders. Introduction of TROs would require consultation with a large number of stakeholders and would generate significant implementation and enforcement costs for CYC (unlikely to be affordable at the present time). Emission modelling work to support the development of AQAP3 indicates that a bus based CAZ (along with other proposed AQAP3 measures) should be enough to deliver the air quality objectives at most locations in York. The extent and scope of the CAZ will be subject to further public consultation and member approval. Opportunities to extend the CAZ requirements beyond buses could be reviewed as part of the CAZ implementation process or in 2021 once the bus based CAZ is fully operational.
Include taxis in CAZ		
Remove cars from CAZ to allow easier access for buses / reduce use of private cars in city centre		

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise LTP3 / Sustainable Transport Measures		
Prioritise walking and cycling over LES measures	AQAP3 is intended to set out CYC's new low emission approach to air quality improvement whilst avoiding duplication of existing policies and programmes. Walking, cycling and public transport improvements are already delivered in York through LTP3, existing sustainable development policies and the Local Sustainable Transport Programme (I-travel York). It is not necessary to repeat these existing policies and programmes within AQAP3 but it should be clear that they are an important aspect of the overall approach to air quality improvement in York	The draft AQAP3 has been revised to further emphasis links to sustainable transport policies and programmes New LES planning guidance has been developed that requires developers to calculate the emission impact of their proposals and demonstrate how this will be mitigated against using a variety of sustainable transport and low emission mitigation measures. A further period of public consultation is required before this document can become formal supplementary planning guidance.
Reduce journeys		
Prioritise walking and cycling within planning guidance		

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise use of low emission vehicles and fuels		
Reduce use of diesel vehicles / ban diesel vehicles / set a reasonable date by which all taxis and buses must be diesel free	The primary aim of AQAP3 is to encourage the uptake of low emission vehicles and fuels. The bus based CAZ will considerably reduce the number of diesel buses operating in the city centre by 2021 with the majority of 'frequent flyer' services replaced with electric buses or other ultra low emission technology. The hybrid taxi incentive scheme is working towards reducing the number of diesel taxis in the city and a further review of taxi licensing policies is planned. CYC already successfully supports bus operators to assist them in obtaining grants for low emission buses. A network of EV charging points has been established.	Many of the consultation respondents wanted to see more action on reducing diesel emissions, particularly from buses and taxis. A complete diesel ban is not proposed at the present time but the scope of the CAZ could be extended in future years to achieve this (subject to public consultation and member support). CYC will continue to work with bus operators to deliver the cleanest bus fleets economically possible. A review of taxi licensing emission standards has recently been completed and further consultation with the taxi trade on proposed new emission standards is planned prior to a report to licensing committee by April 2016. It has already been established that the introduction of a reduced licensing fee for low emission vehicles is not legally possible (as the licensing fee must only cover administrative costs which are the same for all vehicles). Currently funding for the ECO-stars scheme beyond 2015 is uncertain.
Reduce emissions from taxis, cheaper licences for low emissions taxis, hackney licenses only to be release for electric / hybrid vehicles		
Ban all non-low emission buses, have minimum emission standards for all buses (including those that fall outside proposed CAZ controls), Provide more electric buses, Provide grants to bus operators for bus upgrades		
Incentives for other fuels, EV vehicle infrastructure provision, link ECO-stars to procurement		

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise freight reduction / freight transhipment measures		
Prioritise freight transhipment	The draft AQAP3 included measures to support creation of a CNG refuelling plant in the city and an associated freight transhipment centre where goods could be transferred to smaller low emission vehicles before entering the city centre. A CNG feasibility study for York has already been completed and a potential refuelling site identified.	Negotiations with potential investors to build and run a CNG refuelling centre and associated freight transhipment centre are currently ongoing. The delivery of these facilities requires a high level of commitment by CYC and other local businesses / transport operators to convert their vehicles to CNG and support the operation of the freight trans-shipment centre. Further improvements are now planned to outer ring road roundabouts which will assist further with keeping 'through' traffic out of the city centre.
Reduce amount of freight		

Comment type	Status in draft AQAP3?	Proposed action / response arising from the consultation
Prioritise LTP3 / Sustainable Transport Measures		
Prioritise walking and cycling over LES measures	AQAP3 is intended to set out CYC's new low emission approach to air quality improvement whilst avoiding duplication of existing policies and programmes. Walking, cycling and public transport improvements are already delivered in York through LTP3, existing sustainable development policies and the Local Sustainable Transport Programme (I-travel York). It is not necessary to repeat these existing policies and programmes within AQAP3 but it should be clear that they are an important aspect of the overall approach to air quality improvement in York	The draft AQAP3 has been revised to further emphasis links to sustainable transport policies and programmes New LES planning guidance has been developed that requires developers to calculate the emission impact of their proposals and demonstrate how this will be mitigated against using a variety of sustainable transport and low emission mitigation measures. A further period of public consultation is required before this document can become formal supplementary planning guidance.

Table 3: Consultee concerns about draft AQAP3 measures

Concern	Number of respondents raising this concern	Response
Effectiveness of the anti-idling measures. Particularly lack of signage and enforcement aspects	3	The proposed approach is in line with the recommendations of the anti-idling feasibility study and reflects successful schemes in other cities. In response to the consultation process, anti-idling signage is proposed in the report, where this can be practically achieved within current signage guidelines for the city. Adoption of anti-idling legislation will remain optional for the future. This is in line with current council policy to reduce enforcement burdens for businesses, and recognition of the limited staff resources available to undertake such work.
Effectiveness of the CAZ controls / potential for operators to reduce bus frequencies to avoid CAZ requirements/potential for CAZ to be extended to cars	6	The use of a TRO has already been successfully used in other cities to control the emission standards of buses within city centres e.g. Oxford CYC officers have held discussions Oxford to identify potential barriers to the approach and will consult closely with local bus operators in York to deliver a workable scheme that does not have a detrimental impact on bus service provision. Currently there is no intention to include other vehicles within the CAZ but this may need to be reviewed in the future if the AQAP3 is unsuccessful in delivering the level of emission reduction needed to meet the air quality objectives.
Impact of CAZ on bus operators	1	The CAZ will be developed in close consultation with local bus

		operators to ensure they have an opportunity to raise any issues and concerns they have about the scheme. CYC will continue to assist bus operators to access grants to upgrade their vehicles and reduce their fuel costs
Cost of marketing and communications strategy versus impact	1	The marketing and communications strategy will be funded through an external DEFRA grant fund obtained for this purpose. It will be delivered in conjunction with the CYC marketing and communications team to ensure maximum impact and the outcomes will be monitored and reported upon.
Not enough emphasis on sustainable transport	4	The low emission vehicle technology and fuels measures included in AQAP3 are intended to build upon and complement the existing sustainable transport measures included in LTP3, I-travel York programme and sustainable development policies. The new LES planning guidance note will continue to require sustainable transport measures as a minimum standard for many new developments and in many cases will require these to be enhanced with the inclusion of low emission vehicle and fuel technology measures.
To much emphasis on bus emissions, more needed to reduce impact of private cars	1	AQAP3 includes a wide range of measures to reduce tailpipe emissions from all vehicle types including buses, HGVs, taxis and cars. CYC is currently in the process of applying to become and ultra-low emission city. If successful this bid will allow more emphasis on measures to encourage the uptake of low emission cars. Measures relating to modal split for journeys, trip reduction and congestion reduction are already included within LTP3 and do not need to be duplicated within AQAP3.

Document not ward specific	1	The air pollution issues in York occur within a relatively small number of wards and are all caused primarily by traffic. The mix of vehicles across these wards is similar for all areas. Preventing access or diverting vehicles from one ward to another will simply shift the problem to another ward and will not reduce the total amount of emissions in the city. AQAP3 takes an holistic approach to emission reduction that will reduce emissions across the whole city and maximise the health benefits for all residents. Where specific problems are reported to the council with respect to unnecessary idling emissions or pollution from sources other than traffic these will can be dealt with on a case by case basis.

Table 4: List of additional LES ideas proposed by consultees with potential for inclusion in AQAP3

Suggestion	Response
Use smaller buses on P&R at non-peak times	CYC will be re-tendering towards the end of 2015 for a new P&R contract commencing early 2017. Specification of the vehicle type/size will be part of this tendering process. The current P&R contract specifies the passenger capacity per hour required by the council, it is currently down to the operator to determine how this capacity is met. Smaller, fully electric, buses already operate on the Poppleton Bar and Monks Cross Park & Ride services.
Provide a timescale for extending CAZ to all vehicles and AQMAs	Other vehicles could be included / excluded from the CAZ through the use of a Traffic Regulation Orders. Introduction of TROs would require consultation with a large number of stakeholders and would generate significant implementation and enforcement costs for CYC (unlikely to be affordable at the present time). Emission modelling work to support the development of AQAP3 indicates that a bus based CAZ (along with other proposed AQAP3 measures) should be enough to deliver the air quality objectives at most locations in York. The extent and scope of the CAZ will be subject to further public consultation and member approval. Opportunities to extend the CAZ requirements beyond buses could be reviewed as part of the CAZ implementation process or in 2021 once the bus based CAZ is fully operational.
Prioritise LES measures over capital road programme	Prioritisation of individual policies and programmes is subject to the council decision making process which is influenced by many different factors. Air quality improvement is just one consideration

	and on some occasions it may not be able to take priority over other issues such as road safety.
Improve marketing and communication of emission reduction messages	AQAP3 already includes plans for a marketing and communication strategy relating to health and emission reduction
Reduce numbers of HGVs and buses (Clifton, Bootham and St Peters specifically mentioned)	AQAP3 includes measures to reduce emissions from buses across the whole city centre and to transfer movement of some goods onto lower emission vehicles through the creation of a freight transhipment centre.
Monitor emissions from Harewood Whin landfill site and water treatment works	Emissions from the Harewood Whin landfill site and water treatment works are regulated by the Environment Agency not CYC
Make businesses contribute towards improved road infrastructure	The new LES planning guidance requires developers to take a greater account of the additional emissions arising from their proposals and damage costs arising from this. Where possible they will be required to mitigate emissions using on-site sustainable transport and low emission vehicle measures and in some cases may be required to make a financial contribution towards wider low emission measures in the city
Greater promotion of sustainable transport health benefits	The I-travel York programme already promotes the health benefits of walking and cycling.
Make bus companies more responsible for their emissions and require them to re-invest in cleaner buses	The CAZ , new Park & Ride standards and anti-idling measures will help to address this issue

Address emissions from large sightseeing boats	The feasibility and cost effectiveness of doing this requires further investigation.
Provide information to householders on how to reduce all their emissions	This will form part of the LES marketing and communications package
Provide a free electric bus service to encourage modal shift	The feasibility and cost effectiveness of providing such a service requires further investigation.

The following transport policy and infrastructure measures were also suggested during the consultation period and have been referred to transport colleagues for further consideration:

- Introduce city centre traffic restrictions to reduce vehicle numbers
- Introduce congestion charging
- Clarify emission impact of 20mph zones
- Improve traffic light sequencing / manage traffic flow better
- Introduce box junctions at all major road junctions
- Remove traffic pinch points
- Address mis-use of cycle lanes by parked
- Prevent / reduce workplace parking
- Improve road infrastructure

- Remove all on street parking
- Remove cycle lanes from pavements
- Introduce box junctions at all major road junctions
- More provision of off-road / green cycle ways
- Remove all traffic calming measures
- Limit stops for P&R buses where other services are available
- Ensure city centre parking charges are significantly higher than P&R fares and remove all free parking in city centre car parks

Table 5: Other concerns and issues

Concern	Response
Lack of political support / commitment to the AQAP3 measures and impact of this on future delivery of the measures	Once approved the measures in AQAP3 will be adopted council policy. Progress on delivering AQAP measures has to be reported annually to DEFRA. Under the provisions of the Localism Act DEFRA has the ability to pass on EU fines to local authorities who do not deliver sufficient measures to improve air quality.
Consultation period was too short	A standard CYC 6 week on-line public consultation was undertaken on AQAP3 as detailed in the main report
Document will be ineffective	The modelling undertaken to support the development of AQAP3 indicates that it has the potential to significantly reduce emissions in the city and deliver the air quality objectives at all but one of the technical breach areas by 2021. This modelling is based on the draft Local Plan as it stood at the end of 2014[1]

[1] Traffic growth due to development is currently expected to offset some of the emission benefit that would otherwise arise from national emission technology improvements, but a net reduction in NO_x emissions is still expected at most locations. Housing targets within the draft Local Plan are under review and the resultant growth in traffic may not be as great as that predicted using the 2014 projections. Depending on the final housing targets, and the location and timing of new developments, it may be possible to meet the AQ objectives in all the technical breach areas by 2021. Revised modelling of the AQAP3 outputs will be undertaken once the Local Plan targets and allocations have been finalised.

Document only provides modelled data	The draft AQAP3 gave a full update on actual monitored air pollution concentrations to the end of 2013. The final version of AQAP3 provides air quality data for 2014 as well. Predictions of future air quality and the impact of the AQAP3 measures can only be achieved using models.

This page is intentionally left blank

Annex C

Individual written responses to AQAP3 consultation

This Annex provides a summary of the individual written responses received during the AQAP3 consultation period.

A total of 10 individual written responses were received and are summarised in Table 1.

A summary of the additional suggestions arising from the written consultation submissions are given in Table 2.

Table 1: Summary of written responses to AQAP3 consultation

Respondent	Focus of comments / concerns	Action taken
CYC arboricultural officer	No mention of green infrastructure within the document and the benefits this can have for local air quality	The impact of green infrastructure on air quality is now included within AQAP3
Chair of York Environment Forum	No mention of green infrastructure within the document and the benefits this can have for local air quality	The impact of green infrastructure on air quality is now included within AQAP3
Cambridge City Council	Stated the document was '*a good piece of work, concise and factual*'	None required
Air Quality Bulletin Magazine	Stated that the document was '*very interesting and ambitious'*	None required
York Green Party	Expressed support for the CAZ and public awareness raising measures but stated they did not go far enough, particularly in relation to the scope of the CAZ and the lack of anti-idling enforcement measures. Requested a number of additional measures (see table 2).	See table 2
Regional Manager of the Confederation of Passenger Transport UK (East Midlands and Yorkshire)	Raised a number of concerns relating to the impact of the CAZ on bus operators. Considered there was too much emphasis on buses and	Consultee to be involved in further discussions around CAZ development.

	not enough on other vehicles. Voiced support for the principle of CNG but wanted more information. Supported voluntary membership of ECO-stars	
Member of the public	A detailed response suggesting a number of additional measures (mainly relating to cycling).	See table 2
Member of the public	A very detailed response suggesting a number of alternative traffic management solutions for the city	These detailed alternative traffic management and major infrastructure proposals have been considered previously by the Transport Strategy team. They do not contain any further proposals to promote the uptake and use of low emission vehicles and fuels so have not been included in the revised AQAP3.
CYC Development Officer (Transport Strategy)	A number of minor changes suggested	These changes have been incorporated into AQAP3 where possible

Table 2: List of additional ideas proposed by consultees submitting written responses

Suggestion	Response
Have an i-Tree canopy survey / green infrastructure audit carried out for the city	i-Tree canopy surveys allow the pollution removal capacity of existing trees to be fully assessed and monetised in terms of DEFRA health damage cost savings. In Torbay for example the contribution local trees make to air pollution removal and carbon sequestration alone has been estimated to be worth £6.4m a year. The draft AQAP3 has been amended to include information on the contribution trees can make to improving local air quality and the undertaking of an i-tree canopy survey / green infrastructure audit within the city centre and Fulford AQMAs is recommended.
Have a clear timetable for introducing other vehicles such as tour buses, taxis and HGVs into the CAZ requirements.	Under the draft AQAP3 CAZ proposals tour buses would be required to meet the same standards as other buses entering the zone (determined by the frequency of entry into the zone). Other vehicles could be included / excluded from the CAZ through the use of a Traffic Regulation Orders. Introduction of TROs would require consultation with a large number of stakeholders and would generate significant implementation and enforcement costs for CYC (unlikely to be affordable at the present time). Emission modelling work to support the development of AQAP3 indicates that a bus based CAZ (along with other proposed AQAP3 measures) should be enough to deliver the air quality objectives at most locations in York. The extent and scope of the CAZ will be subject to further public consultation and member approval. Opportunities to extend the CAZ requirements beyond buses

	could be reviewed as part of the CAZ implementation process or in 2021 once the bus based CAZ is fully operational.
Have a policy to require all school travel service transport contractors and major suppliers of council goods and services to join ECO-stars and develop their own low emission strategies.	AQAP3 includes measures to further develop ECO stars and link this to procurement of good and services by CYC. Currently there is no long term funding identified for the ECO-stars scheme so this level of development, whilst desirable is not currently achievable. Further funding for ECO-stars is currently being sort through the ultra low emission city bid.
Set a timetable for transition to a 100% low emission taxi fleet within the CAZ	A review of taxi licensing emission standards has recently been completed and further consultation with the taxi trade on proposed new emission standards is planned, prior to a report to licensing committee by April 2016
Anti-idling policy should be strengthened to incorporate signage and enforcement aspects	The proposed approach is in line with the recommendations of the anti-idling feasibility study and reflects successful schemes in other cities. In response to the consultation process anti-idling signage will be provided where this can be practically achieved within current signage guidelines for the city. Adoption of anti-idling legislation will remain optional for the future. This is in line with current council policy to reduce enforcement burdens for businesses, and recognition of the limited staff resources available to undertake such work.
The LES planning guidance should include sustainable transport measures	New LES planning guidance is being developed that requires developers to calculate the emission impact of their proposals and demonstrate how this will be mitigated against using a variety of sustainable transport and low emission mitigation measures. A

	further period of public consultation is required before this document can become formal supplementary planning guidance. Provision of a sustainable transport travel plan will be considered the minimum requirement for most developments under this approach.
Freight transhipment should be shown to be deliverable within the local plan and mechanisms put in place to ensure relevant developments make use of such a facility	A potential site for a freight transhipment centre has been identified within the draft Local Plan. Use of such a facility could form part of an emission mitigation strategy for a development site as required via the new LES planning guidance.
Introduce ‘ train’ taxis at the railway station	This concept allows people wanting to travel to similar areas of the city to share a taxi by the creation of taxi ranks that serve particular locations or districts. This reduces the total number of taxi trips needed and reduces the cost for users. It has been used successfully in the Netherlands. The idea has been shared with colleagues in the Directorate of City and Environmental Services for further consideration as part of the station redevelopment programme. The idea would require extensive consultation with the station, taxi trade and CYC taxi licensing.
Permit pedi-cabs to operate in the city	There are already 10 pedi-cabs operating in the city but only two are currently operational.
Cycling should be encouraged for a greater range of journeys by: • Widening bike paths and remove chicanes at entrances to allow better use of bike trailers or	Measures to improve and encourage cycling will be expected to be included in the emission mitigation plans required from developers under the new LES planning guidance. This could include facilities such as cycle / trailer hire, cycle repair racks etc

bikes designed to transport luggage • Subsidising or offering hire of cycles designed to carry loads. Could include an incentive for supermarkets, DIY stores etc to offer such a service • Publicise green travel initiatives (such as cycle hire schemes etc) • Encourage distribution from the freight transhipment centre by a variety of alternatively fuelled vehicles • Install bike repair racks in key public places to assist cyclists with breakdowns • Reducing car access to city centre and improving cycle access. Those unable to cycle could be chauffeured using companion bikes, wheel chair platform bikes etc • Prevent obstruction of cycle lanes by other users should be addressed (specific reference made to St Leonard's Place) • not asking cyclists to 'dismount' at roadworks • Upgrading of CYC vehicles to cleaner vehicles should include incorporation of safety features	as suggested. As plans for a freight transhipment centre move forward the range of alternatively fuelled vehicles suitable for servicing it will be fully reviewed. Sustainable travel opportunities are already widely advertised and promoted through the I-travel York programme and events such as the Cycling festival. The draft AQAP3 includes plans to extend promotional work to include information on the use of low emission vehicles and fuels. Issues relating to cycle access, cycle infrastructure and cycling polices are more appropriately dealt with through the Local Transport Plan and associated Cycling Strategy and have been referred to the relevant CYC staff. Comments relating to the opportunity to improve the safety features of the council fleet have been passed to the fleet manager.

such as lorries with side guards to protect other road users	
Remove the NRM road train as it causes congestion and idling	Further evidence to support this statement would be needed prior to any discussion with the NRM. The road train plays an important role in connecting the NRM to the rest of the city centre.
Council should extend the 20mph zone to improve traffic flow, reduce emissions and improve safety	No further extension of the 20mph zones is currently planned.
Once a month pollution levels should be displayed at key locations in the city to highlight the issue	AQAP3 includes plans for a new marketing and communication strategy to raise awareness about air pollution and health issues. Improving public access to air quality data will form part of this strategy. Council officers are working in partnership with the University of York to test a new monitoring network. Part of this project will consider how air quality information can be better disseminated to the general public.

This page is intentionally left blank

Annex D

SECTION 1: CIA SUMMARY

Community Impact Assessment: Summary

1. Name of service, policy, function or criteria being assessed:

The Third Air Quality Action Plan

2. What are the main objectives or aims of the service/policy/function/criteria?

To reduce emissions and improve air quality, health and the environment in York from all sources, but in particular traffic emissions. The report is as a result of public and business consultation.

3. Name and Job Title of person completing assessment:

Mike Southcombe, Public Protection Manager

4. Have any impacts been Identified?	**Community of Identity affected:**	**Summary of impact:**
Yes	Age, gender	Poor air quality is likely to adversely affect the health of the most vulnerable such as the elderly, pregnant women and children. The proposals aim to mitigate these effects so will have a positive impact.

5. Date CIA completed: 2 November 2015

6. Signed off by:

7. I am satisfied that this service/policy/function has been successfully impact assessed.

Name:

Position:

Date:

8. Decision-making body:	**Date:**	**Decision Details:**

Send the completed signed off document to ciasubmission@york.gov.uk It will be published on the intranet, as well as on the council website.

Actions arising from the Assessments will be logged on Verto and progress updates will be required

SECTION 2: CIA FORM

Community Impact Assessment (CIA)

Community Impact Assessment Title:	Third Air Quality Action Plan

What evidence is available **to suggest that the proposed service, policy, function or criteria could have a negative (N), positive (P) or no (None) effect** on quality of life outcomes? (Refer to guidance for further details)

Can negative impacts be justified? **For example: improving community cohesion; complying with other legislation or enforcement duties; taking positive action to address imbalances or under-representation; needing to target a particular community or group e.g. older people.** NB. Lack of financial resources alone is NOT justification!

Community of Identity: Age

Evidence	Quality of Life Indicators	Customer Impact (N/P/None)	Staff Impa (N/P/Non
The health impacts of fine particulate matter (PM_{10} and $PM_{2.5}$) are well documented with strong links established to lung diseases (asthma, bronchitis and emphysema) and heart conditions.[1,2] In June 2012 the World Health	Longevity and health	AQAP3 is positive	AQAP3 is positive

[1] *Long-Term Exposure to Air Pollution: Effect on Mortality* (COMEAP, 2009) https://www.gov.uk/government/publications/comeap-long-term-exposure-to-air-pollution-effect-on-mortality

[2] *Mortality effects of long term exposure to particulate air pollution in the UK (COMEAP,2010)* https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-ukThe Mortality Effects of Long Term Exposure to Particulate Air Pollution in the United Kingdom, Committee on the Medical Effects of Air Pollutants (COMEAP, 2010)

Organization (WHO) classified diesel engine exhaust as carcinogenic to humans[3] and said everyone should reduce exposure to diesel exhaust emissions. In March 2015[4] the Committee on the Medical Effects of Air Pollutants (COMEAP) stated reductions in particles is likely to benefit public health. Both WHO and COMEAP highlight the importance of reducing all sources of PM as far as possible, particularly sources of diesel particulate. Public health framework indicator 3.01 states that the fraction of mortality in York attributable to anthropogenic (man-made) $PM_{2.5}$ air pollution is 4.8% of all deaths (82 deaths)[5]. The average for this indicator across England is 5.1%. The links between nitrogen dioxide (NO_2) and health have until recently been less understood. In March 2015 COMEAP's report on *'The evidence for the effects of NO_2 on health*[6]*'* concluded that evidence on the causal effects of NO_2 had strengthened substantially in recent years. NO_2 is now considered to be directly responsible for some health impacts, which may include lung conditions (asthma,			

[3] *Press release 213 (IARC, June 2012)* http://www.iarc.fr/en/media-centre/iarcnews/2012/mono105-info.php

[4] *Statement on the evidence for differential health effects of particulate matter according to source or components (COMEAP, 2015)* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411762/COMEAP_The_evidence_for_differential_health_effects_of_particulate_matter_according_to_source_or_components.pdf

[5] Estimating Local Mortality Burdens associated with particulate air pollution, (Public Health England, 2014)

[6] Statement on the evidence for the effects of nitrogen dioxide on health https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/411756/COMEAP_The_evidence_for_the_effects_of_nitrogen_dioxide.pdf

bronchitis and emphysema), premature births, reduced birth weights and reduced lung function in children. Public Health England (PHE) is expected to shortly announce a new health outcome indicator for NO_2, similar to that already in place for $PM_{2.5}$. This is an important development as most of the AQMAs in the UK, including those in York, have been declared due to exceedance of NO_2 air quality objectives. Most NO_2 is locally derived from traffic and local heat / energy generation (unlike PM where a considerable amount is imported from elsewhere as 'background' pollution). Reducing the health impacts of NO_2 at a local level requires an emphasis on local measures to reduce emissions from traffic and local heat /energy generation.				
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completic Date**
The health impacts of fine particulate matter are lung diseases (asthma, bronchitis and emphysema) and heart conditions.[7,8] Diesel engine exhaust is classified as carcinogenic to humans[9];everyone should reduce exposure to diesel exhaust emissions.	None for AQAP3		Mike Southcombe	2 November 2015

[7] *Long-Term Exposure to Air Pollution: Effect on Mortality* (COMEAP, 2009) https://www.gov.uk/government/publications/comeap-long-term-exposure-to-air-pollution-effect-on-mortality

[8] *Mortality effects of long term exposure to particulate air pollution in the UK (COMEAP,2010)* https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-ukThe Mortality Effects of Long Term Exposure to Particulate Air Pollution in the United Kingdom, Committee on the Medical Effects of Air Pollutants (COMEAP, 2010)

4.8% of all deaths in York (82 deaths)[10] are due to anthropogenic (man-made) $PM_{2.5}$ air pollution. NO_2 is now considered to be directly responsible for some health impacts, which may include lung conditions (asthma, bronchitis and emphysema), premature births, reduced birth weights and reduced lung function in children. AQAP3 will improve help for this community.				

Community of Identity: Carers of Older or Disabled People

Evidence		Quality of Life Indicators	Customer Impact (N/P/None)	Staff Impact (N/P/None
None			None	None
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completic Date**
None				

[9] *Press release 213 (IARC, June 2012)*
http://www.iarc.fr/en/media-centre/iarcnews/2012/mono105-info.php

[10] Estimating Local Mortality Burdens associated with particulate air pollution, (Public Health England, 2014)

Community of Identity: Disability				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
People with respiratory illnesses are more adversely affected by poor air quality.		Longevity and health	AQAP3 is positive.	AQAP3 is positive.
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**
The health impacts of fine particulate matter are lung diseases (asthma, bronchitis and emphysema) and heart conditions.[11,12] Diesel engine exhaust is classified as carcinogenic to humans[13];everyone should reduce exposure to diesel exhaust emissions. 4.8% of all deaths in York (82 deaths)[14] are due to anthropogenic (man-made) $PM_{2.5}$ air pollution.	None for AQAP3		Mike Southcombe	2 Novembe 2015

[11] *Long-Term Exposure to Air Pollution: Effect on Mortality* (COMEAP, 2009) https://www.gov.uk/government/publications/comeap-long-term-exposure-to-air-pollution-effect-on-mortality

[12] *Mortality effects of long term exposure to particulate air pollution in the UK (COMEAP,2010)* https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-ukThe Mortality Effects of Long Term Exposure to Particulate Air Pollution in the United Kingdom, Committee on the Medical Effects of Air Pollutants (COMEAP, 2010)

[13] *Press release 213 (IARC, June 2012)* http://www.iarc.fr/en/media-centre/iarcnews/2012/mono105-info.php

[14] Estimating Local Mortality Burdens associated with particulate air pollution, (Public Health England, 2014)

NO_2 is now considered to be directly responsible for some health impacts, which may include lung conditions (asthma, bronchitis and emphysema), premature births, reduced birth weights and reduced lung function in children. AQAP3 will improve help for this community.				

Community of Identity: Gender				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
Impact except on pregnant women (and women of childbearing age) due to the impact of air pollution on premature births, reduced birth weights and reduced lung function in children.		Health and longevity	AQAP3 is positive	**AQAP3 is positive**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**
Premature births, reduced birth weights, reduced lung function and lowered IQ in children. AQAP3 will improve help for this community.	None due to AQAP3	AQAP3 will improve air quality	Mike Southcombe	2 November 2015

Community of Identity: Gender Reassignment				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
No specific impact.			**None**	**None**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**

Community of Identity: Marriage & Civil Partnership				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
No specific impact.			**None**	**None**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**

Community of Identity: Pregnancy / Maternity				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
Impact except on pregnant women (and women of childbearing age) due to the impact of air pollution on premature births, reduced birth weights and reduced lung function in children.		Health and longevity	AQAP3 is positive	**AQAP3 is positive**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completic Date**
Premature births, reduced birth weights, reduced lung function and lowered IQ in children. AQAP3 will improve help for this community.	None due to AQAP3	AQAP3 will improve air quality	Mike Southcombe	2 November 2015
See above.				

Community of Identity: Race				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
No specific impact.			**None**	**None**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**

Community of Identity: Religion / Spirituality / Belief				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impa** (N/P/Non
No specific impact.			**None**	**None**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**

Community of Identity: Sexual Orientation				
Evidence		**Quality of Life Indicators**	**Customer Impact** (N/P/None)	**Staff Impact** (N/P/None)
No specific impact.			**None**	**None**
Details of Impact	***Can negative impacts be justified?***	**Reason/Action**	**Lead Officer**	**Completion Date**

This page is intentionally left blank

Annex E

List of Acronyms and Abbreviations

ADMS	Atmospheric Dispersion Modelling System
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
CAZ	Clean Air Zone
COMEAP	Committee on the Medical Effects of Air Pollutants
CYC	City of York Council
DEFRA	Department for the Environment, Food and Rural Affairs
EU	European Union
HGV	Heavy Goods Vehicle
LAQM	Local Air Quality Management
LES	Low Emission Strategy
LGV	Light Goods Vehicle
LTP	Local Transport Plan
$\mu g/m^3$	micrograms per cubic metre
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
PHE	Public HealthEngland
PM_{10}	Particulate matter with a diameter of less than 10 microns
$PM_{2.5}$	Particulate matter with a diameter of less than 2.5 microns
UK	United Kingdom
WHO	World Health Organization

Glossary of Terms

Air Pollution Dispersion Model

A mathematical method of predicting air pollution concentrations at a particular location. ADMS is one type of dispersion model operated by CYC.

Air Quality Action Plan (AQAP)

A plan of action drawn up by a local authority for improving air quality in an AQMA.

Air Quality Management Area (AQMA)

An area formally designated by a local authority where one or more of the air quality objectives are unlikely to be met.

Air Quality Objectives

Targets set by the Government for air quality which are considered to be achievable in terms of cost, benefit and technical feasibility.

Air Quality Standards

Legal limits for air quality set by the European Union. Infraction proceedings have been launched against the UK for failire to comply with the EU limits for NO_2.

ADMS-Urban

A type of air pollution dispersion model used by City of York Council

Committee on the Medical Effects of Air Pollution

A panel of air quality and medical experts that advise the UK government on the medical impacts of air pollution and the setting of UK air quality objectives.

Clean Air Zone

An area where vehicle access is limited based on the type, age or emission standard of the vehicle. The proposed CAZ for York would be initially limited to buses with the most frequent buses (entering the CAZ 10 times per day or more) required to be zero emission by 2018.

Euro emission standards

Emission limits set out in EU directives for new vehicles entering the market in the EU. The latest set of EU emission standards are the Euro VI (Euro 6) standards. There are different standards set for different types of vehicles. Currently new vehicles obtain 'type approval' via emission testing under laboratory conditions. Emission measurements undertaken under 'real life' driving conditions suggest that many vehicles (particularly Euro VI/6 diesel vehicles) are failing to meet the EU emission limits under real life driving conditions.

Local Transport Plan

A statutory document setting out local transport strategies. They usually include policies to reduce traffic related problems including; congestion, air pollution and accidents.

Relevant Location

Outdoor, non-occupational locations where members of the public are likely to be regularly exposed to pollutants over the averaging time of the air quality objectives.

Source Apportionment Study

An investigation into the relative contribution different emitters make to the total emissions of a pollutant in a specified area.

Technical Breach Areas

Relevant locations in York where the upper 90% confidence limit of annual average nitrogen dioxide diffusion tube data is predicted to be greater than 40$\mu g/m^3$ by 2005.

This page is intentionally left blank

Towards an ultra-low emission York

Air Quality Action Plan 3

(2015 to 2020)

Public Protection
(Regulatory Support and Advice)
Communities and Neighbourhoods
November 2015

CITY OF YORK COUNCIL

This page is intentionally left blank

Executive Summary

Introduction

This is City of York Council's (CYC) third Air Quality Action Plan (AQAP3), setting out how York intends to continue to deliver its' ambitious and pioneering overarching Low Emission Strategy (LES), and to work towards becoming an internationally recognised ultra- low emission city.

York's overarching LES (published in October 2102) was the first document of its kind in the UK and has already changed the way York delivers public transport and plans for future transport trips. Since the publication of the LES, York has:

- delivered a new fully electric Park & Ride site at Poppleton Bar
- introduced electric buses at the existing Monks Cross Park & Ride site
- retrofitted the world's first electric double decker sightseeing bus
- converted around 7% of the taxi fleet (50+ vehicles) to low emission alternatives (Euro 5+ hybrid or electric)
- implemented an extensive 'pay as you go' fast charge public electric vehicle recharging network
- established 11 publicly accessible rapid chargers
- achieved a 34% reduction in 'grey fleet[1]' trips by council staff, reducing CO_2 emissions by 47%
- developed low emission planning guidance

At the same time York continues to deliver on walking, cycling and public transport improvements, maintaining its' national reputation as a leader in sustainable transport.

York already has much to celebrate in relation to reducing emissions and protecting and improving the health of its residents. However, with an increasing population and thriving local economy, preventing further emission growth and improving air quality remain significant and difficult challenges for the foreseeable future.

This new AQAP3 for York sets out the emission reduction and air quality improvement measures to be delivered in York over the next 5 years (2015 to 2020). It will firmly build on what has been achieved so far, and with further external investment, could become the foundation for creating an internationally recognised ultra- low emission city.

[1] Grey fleet trips are those business trips undertaken by staff in their privately owned vehicles. The council has no control over the age or emission standards of these vehicles so is actively shifting these trips to smaller, lower emission car club vehicles

Air Quality and Public Health in York

CYC has declared 3 Air Quality Management Areas (AQMAs) where the health based national objectives for nitrogen dioxide (NO_2) are currently exceeded. CYC has a statutory duty to try to reduce NO_2 concentrations within these AQMAs, but also has wider obligations in relation to the protection of public health and reduction of greenhouse gas emissions. There is increasing evidence that the health impacts of NO_2 may be greater than previously been recognised[2].

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[3]. This is more than the combined estimate of those who die prematurely from obesity and road accidents. Public health framework indicator 3.01 states that the fraction of mortality in York attributable to anthropogenic (man-made) $PM_{2.5}$ particulate air pollution is 4.8% of all deaths (82 deaths). The average for this indicator across England is 5.1%.

It is widely accepted that fine particulate matter has a significant impact on both morbidity and mortality[4] and diesel emissions have been classified as carcinogenic by the International Agency for Research on Cancer[5] (part of the World Health Organisation)[6]. There is particular concern about the 'black carbon' fraction of particulate matter due to its health impacts, and its strong ability to absorb light energy and increase global warming. Black carbon emissions in urban environments arise predominantly from diesel transport, but are also a product of biomass combustion, used increasingly for energy production and space heating.

Emissions of oxides of nitrogen (NO_x) and man-made particulate must be reduced to meet the health based national air quality objectives in York and improve public health. The main source of NO_x and man-made particulate in York is traffic, particularly diesel vehicles.

Improving Air Quality in York – Progress to date

CYC has previously produced two AQAPs in 2004 and 2006. These were primarily modal shift and congestion reduction based plans with an emphasis on reducing vehicle trips.

Despite the introduction of the two AQAPs, air quality in York continued to deteriorate between 2004 and 2010. In response, York published an overarching Low Emission Strategy in 2012. This document was the first of its kind in the UK and set out a new approach to local air quality management based on reducing tailpipe emissions from individual vehicles. The approach seeks to encourage the uptake of alternative fuels and low emission vehicle technologies, and to ensure that all

[2] Statement on the evidence for the effects of nitrogen dioxide, COMEAP (2015)
[3] 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)
[4] The mortality effects of long term exposure to particulate air pollution in the UK, COMEAP (2010)
[5] IARC No 213, June 2012
[6] Statement on the evidence for the effects of nitrogen dioxide, COMEAP (2015)

vehicles are well maintained and driven as efficiently as possible. It is particularly effective at tackling emissions from essential service vehicles such as buses, taxis and HGVs which fall outside the scope of trip reduction based modal shift improvement measures.

Modal shift and congestion reduction measures remain fundamental to the delivery of air quality improvement and emission reduction in York. The primary local delivery programmes for these measures are the Local Transport Plan (LTP3) and the I-Travel York (Local Sustainable Transport Fund (LSTF) programme). These programmes include many measures to encourage the uptake of walking, cycling and public transport in the city. They are supported by planning policies that ensure sustainable travel is embedded into all new developments in York.

It is intended that York's congestion reduction and sustainable transport measures will be enhanced, but not replaced, by the low emission technology and eco-driving measures included in AQAP3.

AQAP3 aims

AQAP3 has four main aims:

1. To achieve compliance with the health based national air quality objectives at all relevant locations in York
2. To prevent the need for further AQMA declarations.
3. To allow eventual revocation of all current AQMAs.
4. To minimise emissions to air across the whole York area to prevent further background 'emission creep'[7] and improve public health outcomes.

The AQMAs to be addressed by the plan are:

- **AQMA order number 2**
  A19 south (including Fulford Main Street) (April 2010)
- **AQMA order number 3**
  Salisbury Terrace and surrounding areas (May 2012)
- **AQMA order number 4**
  City Centre AQMA (July 2012) (revoked and replaced AQMA order number 1)

AQMA orders 2 and 3 declared due to exceedance of the health based annual average objective for NO_2.

AQMA order number 4 declared due to exceedance of the long term annual average NO_2 objective and the short term hourly NO_2 objective.

[7] A continuous and gradual increase in emissions across the city due to the cumulative impact of ongoing development

Drivers for AQAP3 development

AQAP3 builds upon and replaces all previous AQAPs for York. The development of AQAP3 has been driven mainly by:

- The failure of current vehicle emission standards ('Euro' standards) to deliver the level of NO_x reduction expected at the time AQAP2 was developed.
- The increasing number of diesel vehicles in York (which have increased primary emissions of NO_2 and carcinogenic diesel particulate)
- The need to manage development related 'emission creep'
- The need to reduce unnecessary vehicle idling

These factors are primarily responsible for the continued existence of elevated NO_2 concentrations in York and the main reasons for the current AQMA declarations.

Whilst emission reduction and prevention is the main aim of AQAP3, there is an increasing body of evidence to show that in some circumstances green infrastructure can help to reduce the impact of air pollution. In direct response to the public consultation on AQAP3, this final version acknowledges the contribution green infrastructure can make towards air quality improvement.

AQAP3 development process

The measures in AQAP3 are drawn mainly from York's Local Transport Plan (LTP3) and Low Emission Strategy (LES). Both documents were developed by internal officer working groups and have been subject to public consultation.

The AQAP3 development process has focussed on:

- Obtaining a better understanding of emission sources and traffic compositions within York's AQMAs
- Assessing the level of NO_2 and NO_x reduction needed within the AQMAs
- Undertaking feasibility studies to assess the cost benefit of low emission options and using the results of this work to further refine ideas and aspirations included in LTP3 and the LES
- Developing timescales and assigning responsibilities for the delivery of AQAP3 measures
- Assessing the potential for compliance with the health based national air quality objectives as a result of implementing the AQAP3 measures
- Developing targets and indicators against which to monitor delivery and success of the AQAP3 measures

AQAP3 has been developed in conjunction with the following CYC plans and policies:

- **York's Sustainable Community Strategy** - *'Strategy for York'* and accompanying '*City Action Plan'*
    - This 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
- **Draft Council Plan (2015 - 2019) –** sets out the Council's priorities until 2019. AQAP3 will contribute towards the draft council plan by:
    - Improving air quality
    - Helping residents to live healthy lives
    - Encouraging and supporting a green economy
    - Providing efficient and affordable transport links
    - Helping to deliver an environmentally sustainable city
    - Protecting York's unique heritage
- **York's Health and Well Being Strategy (2013 to 2016) -** a plan to help people living and working in York live full, healthy and happy lives.
- **City of York Council's third Local Transport Plan (LTP3) (2011)** - 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.
- **City of York Council's overarching Low Emission Strategy (October 2012)** – sets out additional technology based emission reduction measures for York. It builds upon the emission reduction measures contained in LTP3, Climate Change Framework and Action Plan (CCFAP) and previous AQAPs.
- **City of York Council emerging draft Local Plan –** York is currently developing a new citywide Local Plan that will help shape future development in York up to 2030 and beyond.
- **Climate Change Framework and Action Plan (2010) –** sets out measures to be taken to reduce carbon emissions and tackle climate change in York (currently under review)

Summary of AQAP3 measures

AQAP3 must:

(a) Tackle as a priority the disproportionate impact that buses and HGVs have on air quality in the city by:

- Rapidly reducing the number of diesel buses operating in the city (whilst maintaining current or better levels of service)
- Tackling unnecessary idling emissions
- Providing funding opportunities and infrastructure to allow vehicle operators to switch to alternative fuels (e.g. electric, CNG / biomethane)
- Progressing delivery of a freight transhipment centre to reduce the number of diesel HGVs entering the city centre
- Providing recognition and reward to those operators that lead by example

(b) Encourage and incentivise the use of low emission taxis

(c) Ensure CYC continues to lead by example by undertaking further emission reduction measures within its own fleet

(d) Minimise further increases in emissions as the result of future development (by requiring greater emission mitigation by developers)

(e) Encourage and facilitate a reduction in the number of diesel vehicles used by individuals and other private fleets by:

- Linking and highlighting the emission consequences of vehicle choice and driving style to impacts on public health
- Providing information, advice and training to help people make more informed vehicle purchase / lease choices and drive more responsibly (eco-driver training)
- Providing access to grants and other incentives to support cleaner vehicle choice by the general public and other fleets
- Providing easy public access to alternative refuelling and recharging infrastructure
- Recognising and rewarding those who lead by example

(f) Continue to support modal shift and network improvement measures

(g) Continue to minimise emissions from sources other than traffic (through continued enforcement of smoke control legislation and regulation of industries which emit significant levels of pollutants to air)

(h) Use green infrastructure to help remove pollution from the atmosphere

AQAP3 must also continue to recognise the important role climate change policies have in delivering air quality improvements and identify how air quality improvement policies can help to support economic growth and job creation.

Summary of AQAP3 measures

Number	Measure	AQMAs where emissions are expected to reduce due to measure			Timescale
Direct actions that can be implemented now to reduce emissions from existing vehicles					
1	a. Development of a Clean Air Zone (CAZ); b. Implementation of a CAZ	City Centre	Fulford	Salisbury Terrace	2015 2018
2	Development and implementation of anti-idling measures	City Centre			2015 to 2016
3	Further development of Eco-stars fleet recognition scheme	City Centre	Fulford	Salisbury Terrace	ongoing
Plans and actions that will be implemented over the next 6 years to reduce emissions					
4	Planning and delivery of CNG refuelling infrastructure in York	City Centre	Fulford	Salisbury Terrace	ongoing
5	Reducing emissions from freight	City Centre	Fulford	Salisbury Terrace	ongoing
6	Development and implantation of LES based planning guidance	City Centre	Fulford	Salisbury Terrace	2015 to 2016
7	Reducing emissions from taxis	City Centre	Fulford	Salisbury Terrace	ongoing
8	Planning and delivery of a strategic EV charging network	City Centre	Fulford	Salisbury Terrace	ongoing
9	Reducing emissions from CYC fleet	City Centre	Fulford	Salisbury Terrace	ongoing
Plans and action that will help to win 'hearts and minds' and encourage local engagement in AQAP3 delivery					
10	Marketing and communications strategy	Supports AQAP delivery	Supports AQAP delivery	Supports AQAP delivery	2016 onwards
11	Local incentives for low emission vehicles and alternative fuel use	City Centre	Fulford	Salisbury Terrace	2016 onwards
12	Attracting low emission industries, business and jobs to York	Supports AQAP delivery	Supports AQAP delivery	Supports AQAP delivery	ongoing
Plans and actions that will continue to tackle congestion and deliver sustainable transport improvements					
13	Modal shift and network improvement measures	City Centre	Fulford Salisbury Terrace		ongoing LTP3 and LSTF delivery
Plans and actions that will deliver other air quality improvement measures					
14	Regulation of industrial and domestic emissions	City Centre	Fulford	Salisbury Terrace	ongoing

15	Provide more green infrastructure in the city	Supports AQAP delivery	Supports AQAP delivery	Supports AQAP delivery	ongoing

Expected emission impact of AQAP3 and compliance with annual average NO_2 objective

AQAP3 aims to reduce all emissions to air with an emphasis on NO_2 and particulate emissions from traffic (especially diesel vehicles).

Reducing NO_2 is important to ensure compliance with the health based national air quality objectives for NO_2 that are currently breached in some areas of the city.

Minimising particulate emissions (especially PM_{10} and $PM_{2.5}$ arising from diesel vehicles) is essential for the longer term protection of public health and improvement in local health outcome indicators.

The exact emission impact of the air quality action plan is difficult to predict as there are many factors which may influence future emission levels in the city. These include:

- The extent to which the AQAP measures are delivered locally
- The real life on-road performance of individual vehicles on the road, especially in congested urban environments (compared with Euro emission standards for new vehicles which are tested under laboratory conditions under set drive cycles)
- The age and rate of replacement of vehicles in York compared with national averages
- Future trip demand on the York road network, influenced by factors such as the state of the economy and development allocations in the emerging draft local plan (currently unadopted and subject to further change)

Indicative predictions of future emissions in York in 2021 (with and without the AQAP3 measures in place) have been undertaken using:

- DEFRA's Low Emission Factor Toolkit – this enables predictions to be made about future vehicle emissions based on current and future Euro emission vehicle standards
- Locally collected traffic data relating to the age and type of vehicles currently operating in York
- Predictions of future traffic levels in York for 2021 (including development related traffic expected to arise from allocations in the draft Local Plan as it stood at the end of 2014)[8].

[8]. Based on total projected long term development targets of an additional 17,503 residential units and 266466m^2 of employment use by 2031. For the 2021 modelling scenario it was assumed that only 8724 housing units and 115,506m^2 of employment use would have been delivered. The modelling also assumes delivery of a number of key transport projects by this date. Targets for new housing provision and site allocations are currently under review and are expected to be reduced. The traffic impact of new development in the city by 2021 is therefore likely to be lower than the modelling undertaken during the development of AQAP3 suggests. New emission reduction figures for AQAP3 will be calculated once revised traffic growth figures for the city become available and these may show compliance with the air quality objectives at all locations in the city by 2021.

- Assumptions about the number of ultra low emission vehicles operating in the city by 2021 based on upper and lower estimates of what the AQAP3 measures may deliver in terms of local fleet changes

Assuming that all vehicles operating in York meet current and future national emission standards[9], and that all the AQAP3 measures are delivered in full, it is anticipated that by 2021 there could be up to a 47% reduction in NO_x emissions and a 16% reduction in PM_{10} emissions in York by 2021. This level of emission reduction should be enough to deliver the health based national air quality objectives for NO_2 in all but one of the current AQMA technical breach areas by 2021.

The possible exception to this is Nunnery Lane where the current emissions modelling data suggests that the low emission measures in AQAP3 will not be enough to completely off-set the current predicted development led traffic growth in this area (expected under the emerging draft Local Plan proposals as they stood at the end of 2014). If the housing delivery rates in final Local Plan are lower than those assumed in the current emissions modelling work then the AQAP3 measures may also be able to deliver compliance with the health based air quality objectives in Nunnery Lane. This will however depend on the final allocation of development sites and how fast they are brought forward for development.

The emissions modelling work for AQAP3 will be updated once the emerging draft Local Plan has been finalised and revised traffic growth data for the city becomes available.

Further details on the emission modelling assumptions and outputs can be found in Chapter 8 of the main report.

Recent monitoring results for the Nunnery Lane AQMA indicate that the majority of the area (including Bishopthorpe Road and Scarcroft Road) currently meets the air quality objectives. There are two remaining 'hotspots' on Nunnery Lane and Prices Lane where very slight exceedances of the annual average NO_2 objective have been recorded in recent years (up to 42µg/m^3). This is due to the regular occurrence of queuing traffic and poor dispersion in these two particular locations.

[9] Recent evidence suggests that 'on-road' emissions from many vehicles, particularly current Euro V diesel cars may be considerably higher than national emission factors used in the York modelling work suggest. This is further exacerbated due to the recent discovery of emission test 'defeat' devices in some vehicles. As stated in the recent consultation on the National Air Quality Action Plan (September 2015) the government is to take steps to remedy this situation as soon as possible. York will need to further assess the impact of the AQAP3 measures if new emission factors for 'in-use' vehicles are provided in the future.

Contents

List of Figures

List of Tables

Introduction

1.0 Background to AQAP3

York currently has 3 Air Quality Management Areas (AQMAs), declared due to exceedances of the health based national air quality objectives for nitrogen dioxide (NO_2). CYC has a statutory duty to try to reduce NO_2 concentrations within the AQMAs, but also has wider obligations in relation to the protection of public health and reduction of greenhouse gas emissions.

Public health framework indicator 3.01 states that the fraction of mortality in York attributable to anthropogenic (man-made) $PM_{2.5}$ particulate air pollution is 4.8% of all deaths (82 deaths). This means that between 94 and 163 people die prematurely in York each year due to the impacts of poor air quality[10]. This is more than the combined estimate of those who die prematurely from obesity and road accidents.

Diesel emissions have been classified as carcinogenic by the International Agency for Research on Cancer[11] (part of the World Health Organisation) and there is growing evidence that the health impacts of NO_2 may be greater than previously recognised[12]. There is particular concern about the 'black carbon' fraction of particulate matter due to its health impacts, and its strong ability to absorb light energy and increase global warming. Black carbon emissions in urban environments arise predominantly from diesel transport, but are also produced by biomass combustion, used increasingly for energy production and space heating.

Therefore emissions from vehicles (particularly diesel vehicles) must be reduced to meet the health based national air quality objectives in York and improve and protect public health.

CYC has previously produced two AQAPs (2004 and 2006). These were primarily modal shift and congestion reduction based plans with an emphasis on reducing vehicle trips. Despite these AQAPs, air quality in York continued to steadily deteriorate between 2004 and 2010. To address this, York published an overarching Low Emission Strategy in 2012 setting out a new approach to local air quality management based on reducing tailpipe emissions from individual vehicles.

The LES approach seeks to encourage the uptake of alternative fuels and low emission vehicle technologies and to ensure that all vehicles are well maintained and are driven as efficiently as possible. It is particularly effective at tackling emissions from essential service vehicles such as buses, taxis and HGVs which fall outside the scope of trip reduction based modal shift improvement measures.

This new AQAP (AQAP3) sets out how York intends to continue to deliver its' ambitious and pioneering overarching Low Emission Strategy (LES), and to work

[10] 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)
[11] IARC No 213, June 2012
[12] Statement on the evidence for the effects of nitrogen dioxide, COMEAP (2015)

towards becoming an internationally recognised ultra- low emission city. It has been prepared in line with CYC's statutory obligations under Section 84 [2] of the Environment Act 1995. It builds upon and replaces all previous AQAPs for York. The development of AQAP3 has been driven primarily by:

- The failure of current vehicle emission standards ('Euro' standards) to deliver the level of NO_x reduction expected at the time AQAP2 was developed.
- The increasing number of diesel vehicles in York (which have increased primary emissions of NO_2 and other carcinogenic diesel emissions)
- The need to manage development related 'emission creep'
- The need to reduce unnecessary vehicle idling

These are the main factors responsible for elevated NO_2 concentrations in York and the existence of the current AQMAs.

The AQAP3 measures have been drawn mainly from York's Local Transport Plan (LTP3) and Low Emission Strategy (LES). Both documents were originally developed by an internal officer working group and subject to widespread public consultation. The AQAP3 development process has concentrated mainly on refining timescales and responsibilities for delivery of air quality improvement measures, assessment of what the revised air quality improvement measures might achieve and development of suitable indicators against which to monitor progress.

Whilst emission reduction and prevention is the main aim of AQAP3, there is an increasing body of evidence to show that in some circumstances green infrastructure can help to reduce the impact of air pollution. In direct response to public consultation on AQAP3, this final version acknowledges the contribution green infrastructure can make towards air quality improvement.

1.1 Report Content and Structure

AQAP3 has been developed with due regard to DEFRA Policy Guidance note LAQM.PG(09). This states that as a minimum an AQAP is expected to include the following:

- quantification of the source contributions to the predicted exceedences of the relevant health based objectives; this will allow the Action Plan measures to be effectively targeted;
- evidence that all available options have been considered;
- information on how the local authority will use its powers and also work in conjunction with other organisations in pursuit of the health based air quality objectives;
- clear timescales in which the authority and other organisations and agencies propose to implement the measures within its plan;
- where possible, quantification of the expected impacts of the proposed measures and an indication as to whether the measures will be sufficient to

meet the health based air quality objectives. Where feasible, data on emissions could be included as well as data on concentrations where possible; and

- how the council intends to monitor and evaluate the effectiveness of the plan.

The remainder of this report is structured as follows:

- **Chapter 2** provides a brief overview of the review and assessment process in York, the declaration of the AQMAs and a summary of the existing plans and strategies which may influence air quality within York;

- **Chapter 3** presents a summary of the source apportionment studies and detailed traffic counts undertaken since AQAP2. It includes results from a coupled traffic micro-simulation and emissions modelling studies undertaken by the University of Leeds

- **Chapter 4** summarises the required reduction in NO_2 concentrations and NO_x emissions within the AQMA areas

- **Chapter 5** describes the background to the development of AQAP3 including the development of previous AQAPs and York's Low Emission Strategy (LES)

- **Chapter 6** describes the additional feasibility and cost-benefit work undertaken to inform the development of AQAP3. It includes an overview of the Low Emission Zone (LEZ), anti-idling and electric bus feasibility studies.

- **Chapter 7** summarises the AQAP3 measures

- **Chapter 8** summarises the expected emission impact of the AQAP3 measures

- **Chapter 9** sets out the progress monitoring indicators for AQAP3 to be used in future progress reporting

- **Chapter 10** summarises the consultation exercise undertaken by CYC in relation to AQAP3

Air Quality Management in York

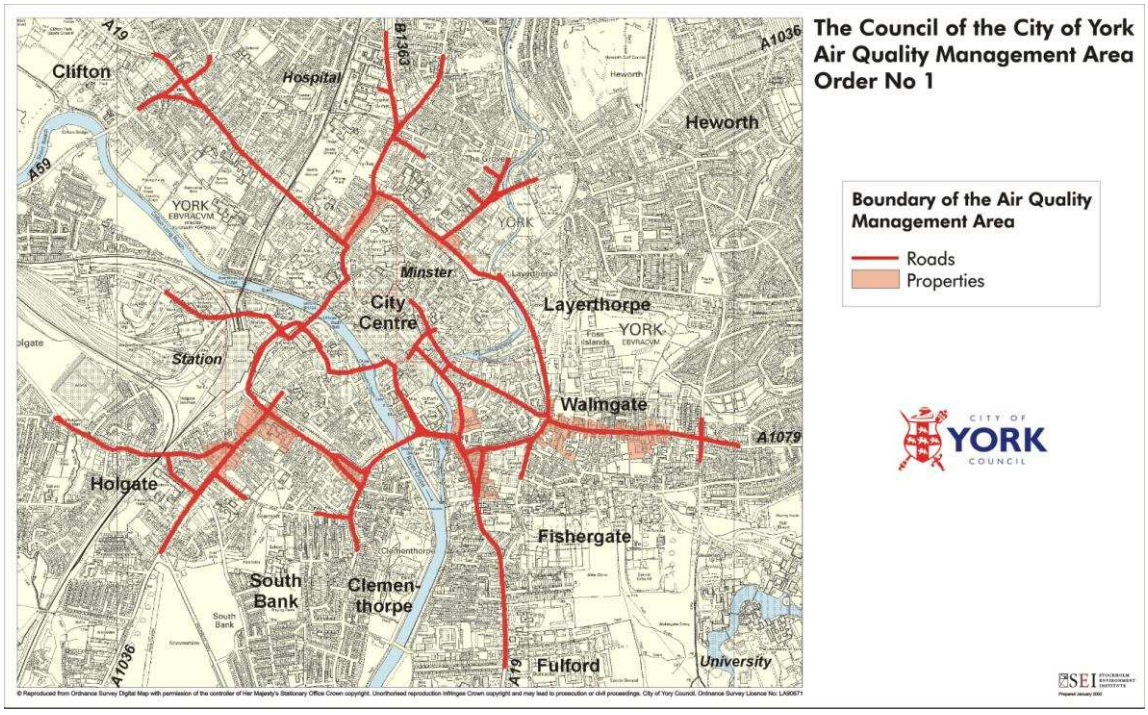
2.0 Review and Assessment in York

Air quality monitoring has been undertaken in York since 1999. In 2001 the Second and Third Stage Review and Assessment of Air Quality in York concluded that there were five areas of the city around the busy inner ring road where it was unlikely the health based long term objective for NO_2 would be met.

The long term annual average objective for NO_2 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.[13]

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

Figure 1: Extent of AQMA order no. 1



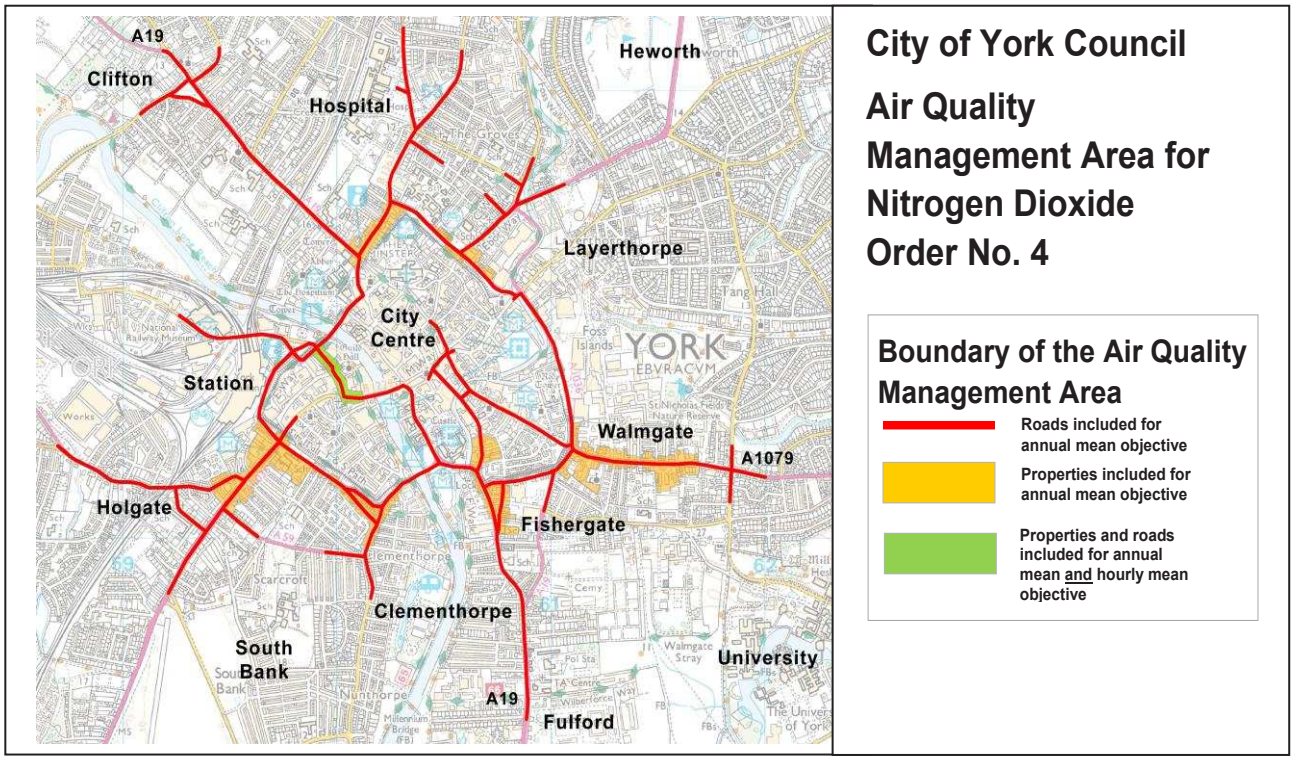
[13] *City of York Council Executive Meeting, 30th November 2001 – Agenda Item 8 Declaration of Air Quality Management Area(s)*

Within the five areas of technical breach 'relevant' locations[14] were included within the AQMA boundary. Outside the technical breach areas only the roads were included in the AQMA.

In April 2012 an Update and Screening report identified a number of additional relevant locations around the inner ring road that were breaching the health based annual average air quality objective for NO_2. Diffusion tube evidence also suggested that the health based hourly objective was being breached in some locations.

In September 2012 AQMA order no.1 was revoked 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 health based annual average NO_2 objective and includes the additional areas where breaches of the hourly objective for NO_2 have been detected. The extent of AQMA order no.4 is shown in Figure 2.

Figure 2: AQMA order 4 (September 2012 - replaced AQMA order 1)



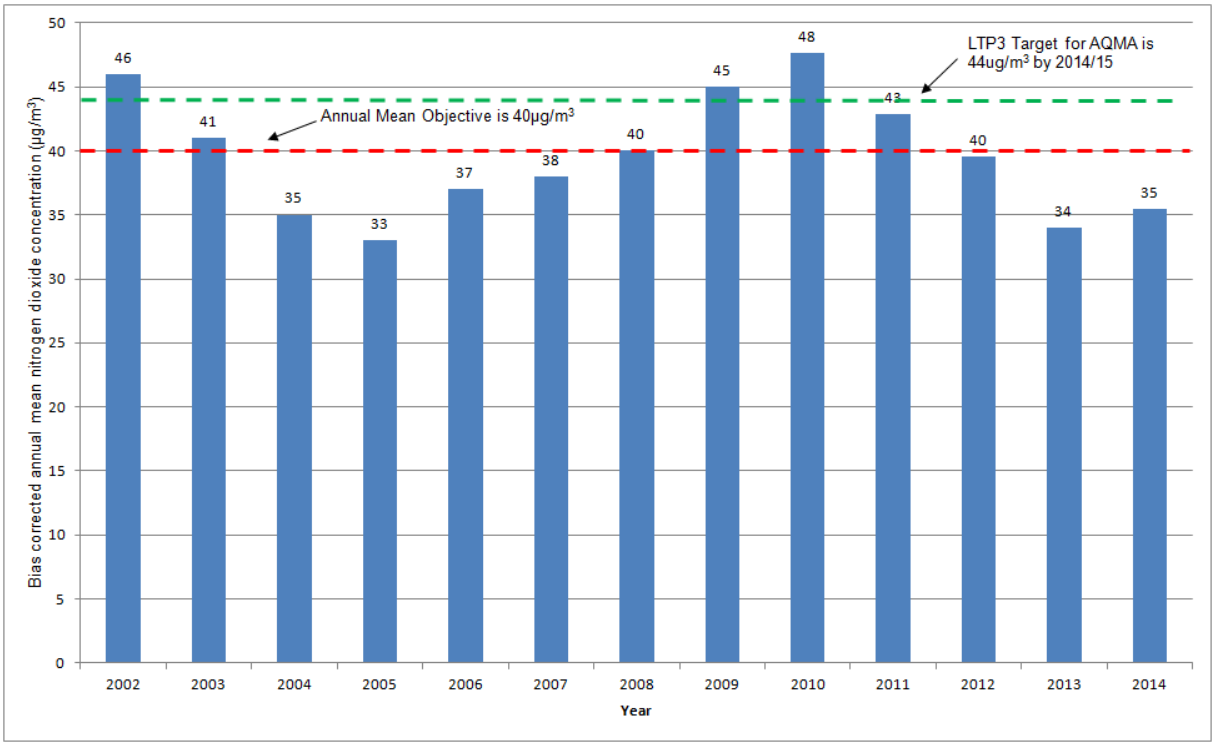
[14] 'Relevant' locations (for the purpose of the health based annual average NO_2 objective) are those places where members of the public are likely to be exposed to air pollution regularly over long periods of time. This includes residential property and other buildings such as nursing homes and schools . 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.

2.1 Recent trends in city centre AQMA

Following the declaration of the city centre AQMA in 2002, annual average concentrations of NO_2 in the city centre reduced (Figure 3). This decline continued until 2006 when concentrations started to rise again year on year. This continued until 2010. Data for 2011, 2012 and 2013 showed a general improvement in air quality with levels in 2013 falling to levels similar to those in 2005. The 2014 data showed a very slight increase compared with 2013 but the change was within the margin of error for the monitoring method. It is too early to determine what the longer term air quality trend might be.

Air quality concentrations can be influenced by many factors including fluctuations in weather conditions and levels of economic activity / fuel use. Whilst in general air quality appears to be improving in York there are still a significant number of individual locations within the city centre AQMA where both the health based annual and hourly objectives for NO_2 are exceeded[15].

Figure 3: Average concentrations of NO_2 in city centre (2002 – 2014)



[15] City of York Council Update and Screening Report 2015

2.2 Other AQMA declarations in York

In April 2010 a further AQMA was declared along the A19 corridor to the south of the city (Figure 4). This followed repeated exceedances of the health based annual average NO_2 objective on Main Street, Fulford. Another AQMA was declared for NO_2 on Salisbury Terrace in 2012 (Figure 5).

Figure 6 summarises NO_2 concentrations in each of York's technical breach areas between 2010 and 2014.

Between 2010 and 2013 there appears to have been a general reduction in NO_2 concentrations within each of the technical breach areas. During 2014 some sites showed a slight increase compared with 2013 but in all cases the 2014 levels were well below those monitored in 2010.

There were no breaches of the health based annual average NO_2 air quality objective in the Fulford and Salisbury Terrace AQMAs during 2013 or 2014, but levels in these areas currently remain elevated. Monitoring continues in both these areas and the requirement for the AQMA orders in these areas will be reviewed again in 2016.

Figure 4: York's Second Air Quality Management Area (declared April 2010)

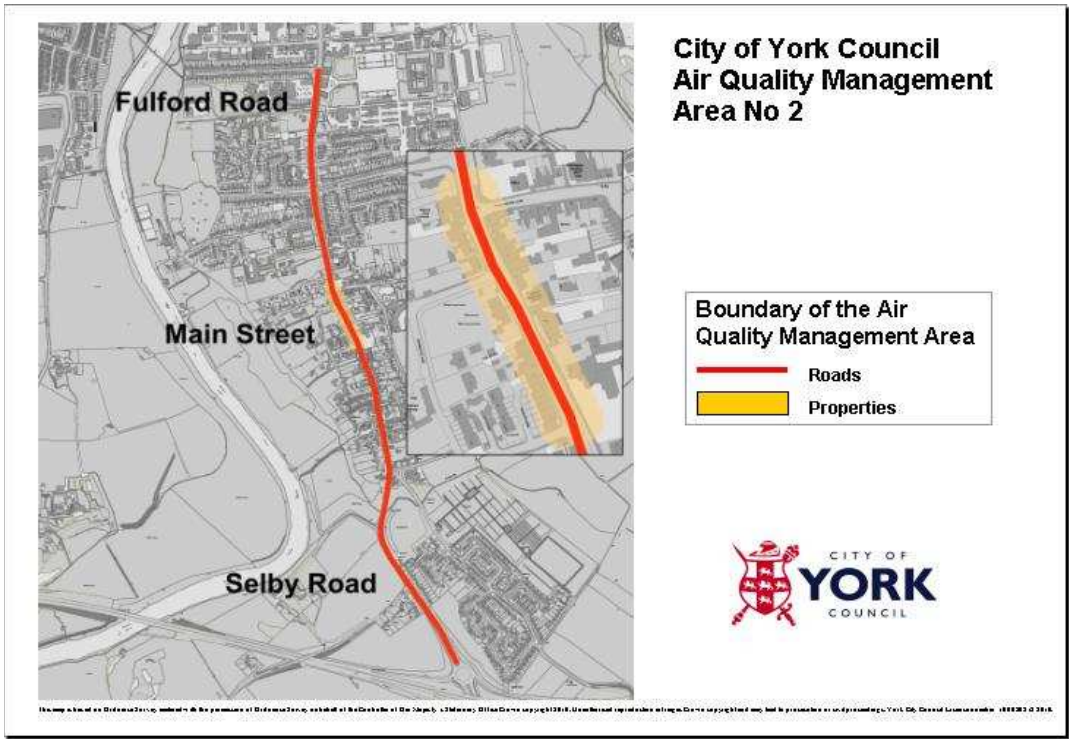


Figure 5: York's Third Air Quality Management Area (declared May 2012)

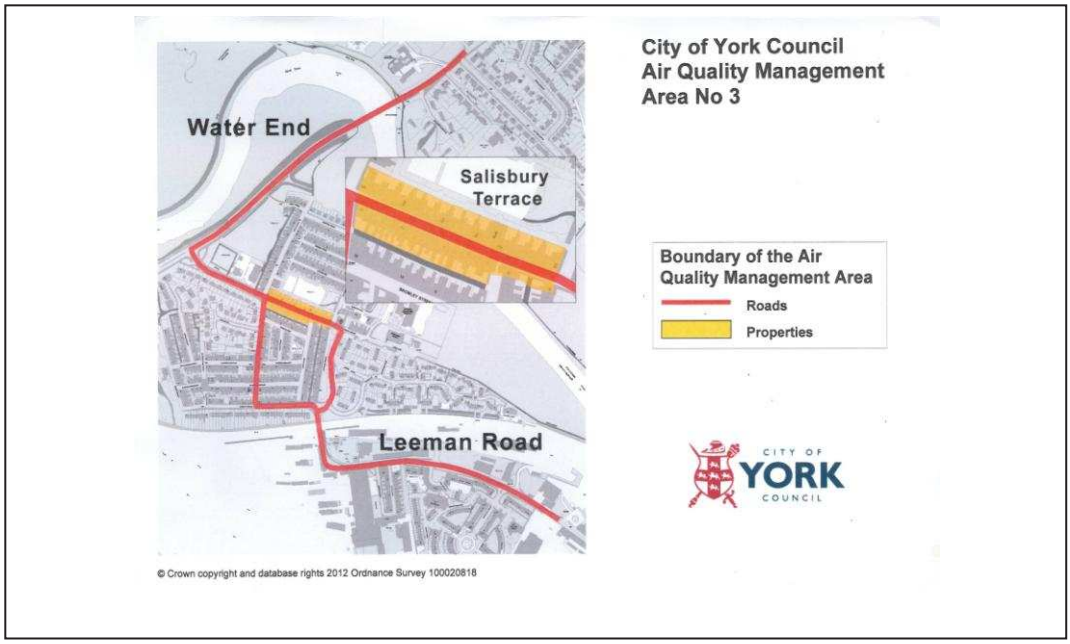
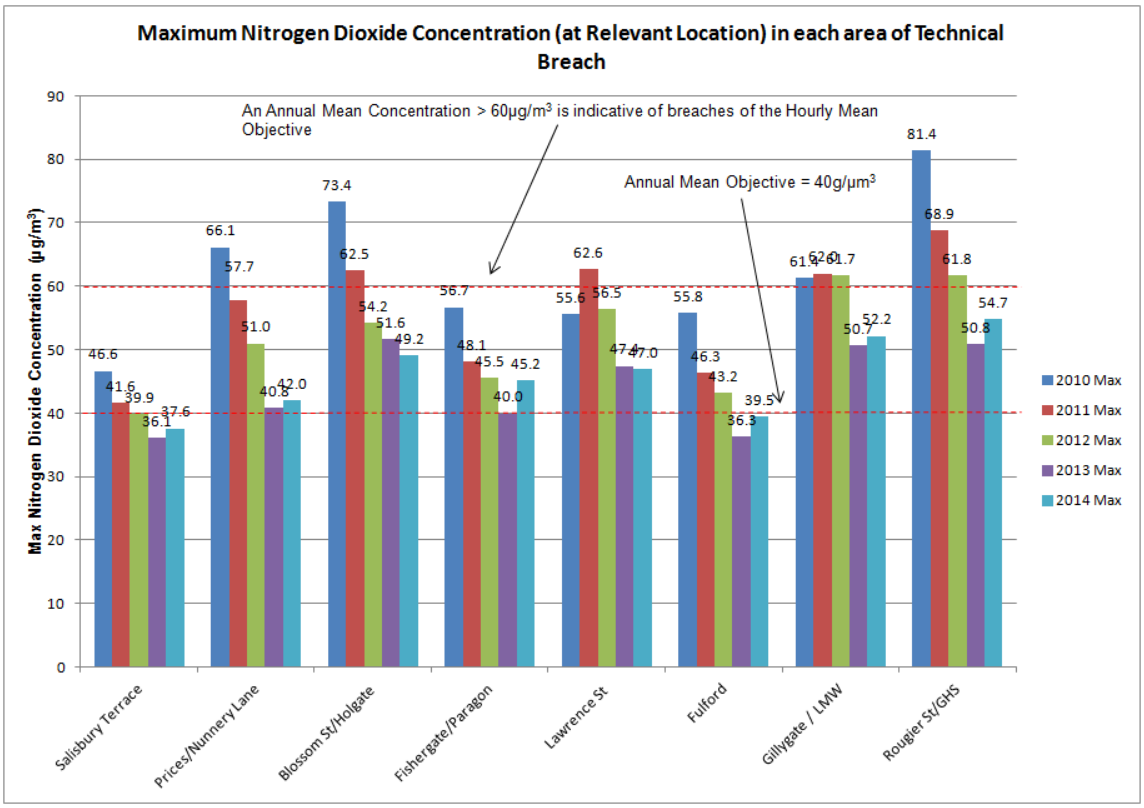


Figure 6: Air quality trends in York technical breach areas (2010 to 2014)



2.3 Existing Strategies and Policies

AQAP3 has been developed with due consideration to the following policies and strategies which have the potential to impact directly on York's air quality, and / or influence the scope of measures likely to be acceptable to the city.

2.3.1 The Strategy for York 2008 to 2025 - *A city making history*

York's Sustainable Community Strategy (SCS) '*A city making history'* is the overarching strategic plan for York. It provides a framework for every other strategy and plan that CYC puts in place setting out a long term vision for the city and a set of immediate priorities. Delivering air quality improvement and carbon reduction are key elements for delivery of the SCS vision

2.3.2 Draft Council Plan 2015 – 2019

The new draft Council Plan sets out the Council's priorities until 2019. AQAP3 will contribute towards the draft council plan by:

- Improving air quality
- Helping residents to live healthy lives
- Encouraging and supporting a green economy
- Providing efficient and affordable transport links
- Helping to deliver an environmentally sustainable city
- Helping to protect York's unique heritage

2.3.3 York's Health and Well Being Strategy (2013 to 2016)

This strategy aims to create '*a community where all residents enjoy long, healthy and independent lives'.* AQAP3 has an important role to play in delivering this vision by minimising and reducing public exposure to air pollutants and raising public awareness about the impacts of air pollution on health. AQAP3 will also help to ensure new developments provide a safe and healthy environment for occupants, support active travel initiatives and help to address health inequalities in the city.

2.3.4 York Low Emission Strategy

In 2012 CYC developed and adopted an 'overarching' Low Emission Strategy (LES) to holistically reduce air pollution and carbon emissions in the city . The LES built upon the existing congestion reduction and modal shift approach to air quality improvement in York, by encouraging the uptake of low emission fuels and technologies and encouraging better vehicle maintenance and driving techniques.

The York LES places a particular emphasis on reducing emissions from diesel vehicles, especially the heavy goods vehicles (HGVs), buses and taxis which form an essential part of York's transport network. Emissions from these vehicles can not

be dealt with effectively through modal shift. AQAP3 is the main delivery mechanism for the measures outlined in York's LES. Further information on the development of the LES is provided in chapter 5.

2.3.5 Local Transport Plan 2011-2031 (LTP3)

York's most recent LTP3 (2011-2031) (LTP3) is based around five themes:

- Theme 1 - Provide Quality Alternatives
- Theme 2 - Provide Strategic Links
- Theme 3 - Implement and Support Behavioural Change
- Theme 4 - Tackle Transport Emissions
- Theme 5 - Improve Public Streets and Spaces.

AQAP3 contains elements from each of these themes, particularly Theme 4 – Tackle transport emissions. This theme encompasses the actions required to reduce emissions of CO_2 and oxides of nitrogen (NO_x), particularly NO_2, attributable to transport. Together LTP3 and AQAP3 are the main delivery documents for York's LES.

2.3.6 Draft Local Plan

CYC is in the process of developing a new Local Plan that will respond to the issues facing York today. These include the need to improve local air quality and reduce climate change. The plan will reflect the city's economic ambitions and help to deliver its continued economic success, whilst building strong communities and protecting and enhancing its unique environment. AQAP3 contains a number of measures that relate directly to the new draft Local Plan. These include adoption of new LES planning guidance to ensure that the emission impacts of new development are adequately mitigated.

2.3.7 Climate Change Framework and Action Plan

York is committed to reducing carbon emissions and tackling the impacts of climate change. In addition to the statutory CO_2 reduction targets set out in the Climate Change Act (2008), York aims to reduce city-wide CO_2 emissions by 40% by 2020 and 80% by 2050.

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. The Climate Change Framework will enable York to accelerate actions over-time 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 Climate Change Action Plan is currently being refreshed and will contain new actions to be delivered between 2015 and 2018. Whilst care has been taken to avoid unnecessary duplication between the CCFAP and AQAP3 there remain a number of areas of cross over between the two action plans and each must be implemented with due regard for the other.

Sources of nitrogen dioxide in York

3.0 Sources of nitrogen dioxide in York

Nitrogen dioxide arises from a number of different sources in York. These include:

- Localised 'point source' emissions: emissions from large industrial chimney stacks which can be quantified.
- Localised 'line source' emissions: transport related emissions arising mainly from road transport, but also including a small contribution from rail.
- Localised 'area source' emissions: emissions from domestic and commercial space heating, and any other source of emissions which arise locally that cannot be easily quantified.

During the development of York's previous AQAPs the computer model ADMS-Urban was used to estimate the contribution each type of source makes to total NO_2 concentrations in each of the city centre technical breach areas in York. These studies clearly identified traffic as the main source of NO_2 in the city centre with between 50 to 70% of NO_2 believed to be arising from transport in the city centre technical breach areas.

The contribution traffic makes to total NO_2 concentrations varies between locations depending on the proximity to other sources and the make up of the vehicle fleet in each area, for example some areas have a greater proportion of buses or HGVs than others. Determining which sources / vehicle types contribute the most to pollutant concentrations within AQMAs is an important aspect of air quality action planning as it allows the most important sources to be identified and appropriate improvement measures to be identified and assessed. Table 1 summarises previous source apportionment work.

Table 1: Source apportionment of nitrogen dioxide in the city centre AQMA technical breach areas

Technical breach area	Industry	Traffic	Other (including domestic and commercial space heating)
Gillygate	8%	58%	34%
Lawrence Street	4%	72%	24%
Holgate Road	4%	66%	30%
Nunnery Lane	4%	52%	44%
Fishergate	3%	57%	40%

Since the completion of AQAP2 (2006) there have been some changes to point source emission sources in the city. These include closure of British Sugar in 2007 and establishment of a number of small scale biomass heating plants at various locations around the city. These changes will have resulted in some small variations to the contribution industry makes to localised NO_2 concentrations, but overall traffic remains the greatest source of emissions in York and the main focus of AQAP3.

The source apportionment work undertaken in relation to the development of AQAP3 has concentrated on:

1. Detailed source apportionment studies for the most recently declared AQMAs at Fulford Road and Salisbury Terrace.
2. Obtaining a better understanding of the contribution individual vehicles make to air quality in the city taking into account their type, age, fuel use, abatement equipment and the way they are driven

3.1 Fulford Road source apportionment study

Following the declaration of an AQMA in Fulford in April 2010 a further assessment of air quality[16] was undertaken to:

- confirm the exceedence of the annual average health based objective for NO_2
- define what improvement in air quality and corresponding reduction in emissions was required to attain the health based objective
- provide information on source contributions.

The source apportionment study was undertaken in conjunction with Dr James Tate of the Institute of Transport Studies, University of Leeds, using a coupled traffic micro-simulation (PARAMICS) and emissions model (PHEM) to derive detailed traffic emission estimates for the area.

The traffic model was calibrated using ANPR traffic count data for the area (collected July 2010) and GPS tracking of real life vehicle movements through the area. The source apportionment study took into account regional background, local background and local emission sources. In November 2011 the source apportionment work was further updated to take account of more recent traffic counts (May 2011) and refinements to the modelling technique.

3.1.1 Results of Fulford Road source apportionment study

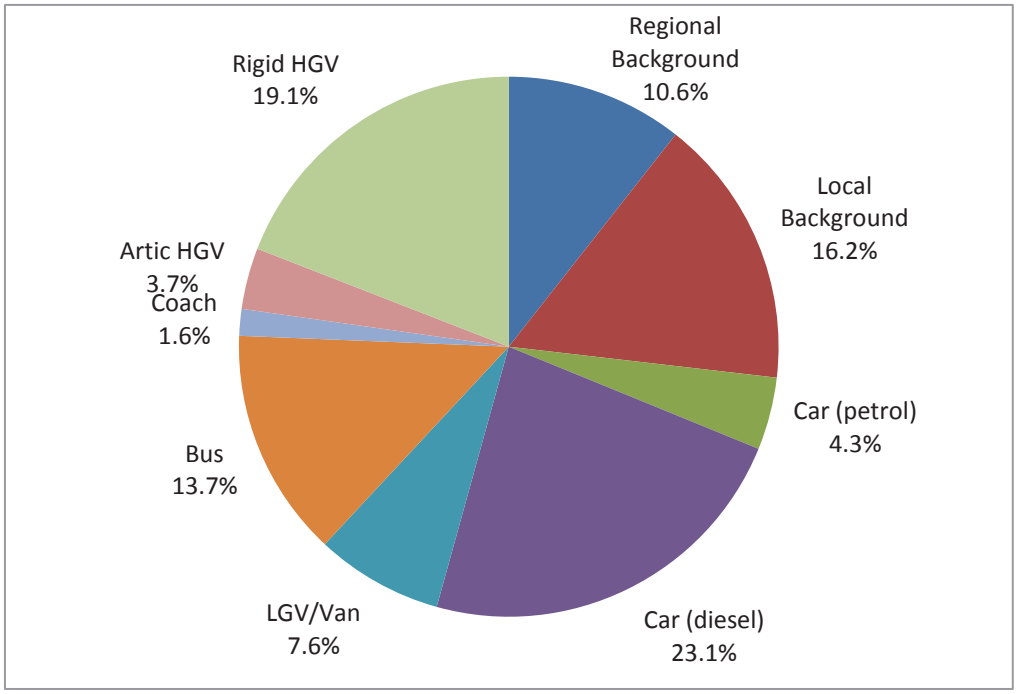
Figure 7 shows the results of the source apportionment undertaken for the Fulford AQMA in November 2011. This was undertaken in accordance with Example 7.1 in LAQM.TG(09).

Traffic emissions in Fulford are estimated to account for 73% of the total NO_2 concentration. This is slightly higher than for other parts of the city and reflects the lack of industrial emissions in this area and the smaller amounts of commercial activity.

[16] Further Assessment for Fulford Main Street, CYC, April 2011

Domestic emissions have the potential to influence NO_2 concentrations in Fulford as parts of the village are not covered by a smoke control order. However, observations of domestic smoke emissions and the results of a questionnaire about domestic fuel use in the area suggest this is unlikely to be a major contributor.

Figure 7: Apportioned local contributions to total NO_2 in Fulford (November 2011).



3.1.2 Impact of traffic emissions in Fulford

Figure 8 shows the daily average vehicle fleet proportions in Fulford recorded during traffic counts undertaken in May 2011. Passenger cars make up the majority of the vehicle fleet with petrol cars more prevalent than diesel. The percentages of buses and HGVs in the fleet are relatively small making up around 3% and 4% of the total fleet respectively.

Figure 9 shows the total NO_x and NO_2 emissions from different vehicle types in Fulford[17]

[17] calculated by the Institute of Transport Studies using the coupled traffic microsimulation and PHEM emissions model.

Figure 8: Daily average fleet proportions for Fulford (%)

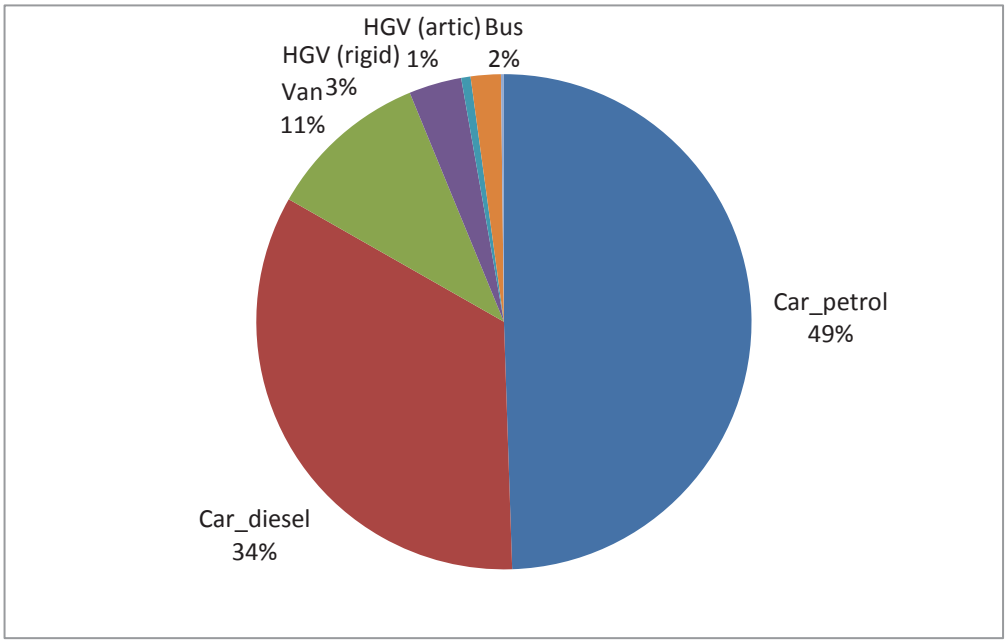
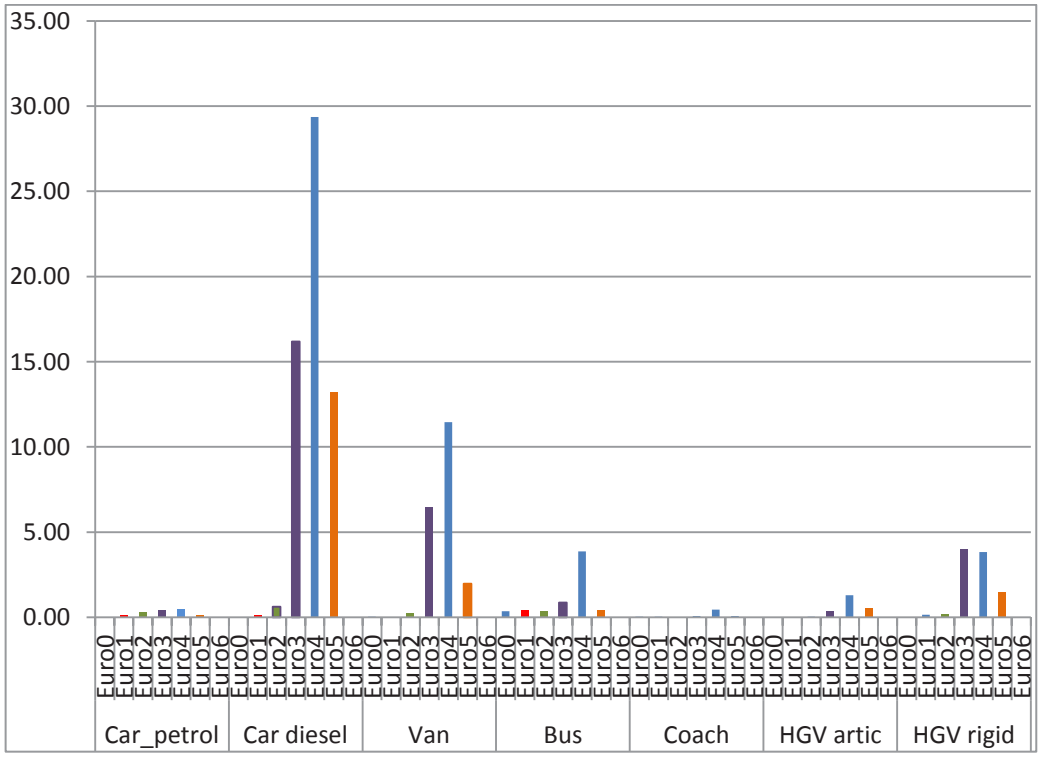


Figure 9: % contribution of individual vehicle types to total NO_2 emissions from traffic in Fulford (Nov 2011)



The majority of the traffic derived NO_2 emissions in Fulford can be attributed to diesel cars. Although diesel cars make up the minority of the total car fleet in Fulford, collectively they give rise to 40 times more NO_2 emissions than the petrol vehicles. Diesel cars produce more NO_2 than petrol equivalents and their emissions have been classified as carcinogenic.

Recent research clearly shows that NO_x emissions from diesel vehicles have not declined as expected with successive Euro standards[18] and that in many cases the fraction of NO_x emitted as primary NO_2 (directly from the tailpipe) has increased significantly. For passenger cars, emissions of NO_x from Euro 5 diesel cars are in many cases equivalent to those from pre-Euro vehicles (i.e. pre 1992 vehicles).

It has also been found that diesel cars emit increased emissions of NO_x with increasing power and engine capacity. The current trend is towards larger and more powerful diesel cars, particularly within taxi fleets that operate predominantly within city centre environments.

Under a '*business as usual'* scenario the emission impact of diesel cars is set to increase across York due to recent growth in diesel car sales. Interventions have been included in AQAP3 to try and off set and reduce the emission impact of diesel passenger cars. These include provision of infrastructure and incentives to encourage the uptake and use of electric and hybrid passenger cars. A particular emphasis has been placed on trying to reduce the number of diesel vehicles in the York taxi fleet as these vehicles operate predominantly in the city centre and generate a high number of trips through York's AQMAs.

Whilst cars are the main source of NO_2 in Fulford (due to their large numbers compared with other vehicle types) in terms of emissions per vehicle km travelled they are relatively low emitters.

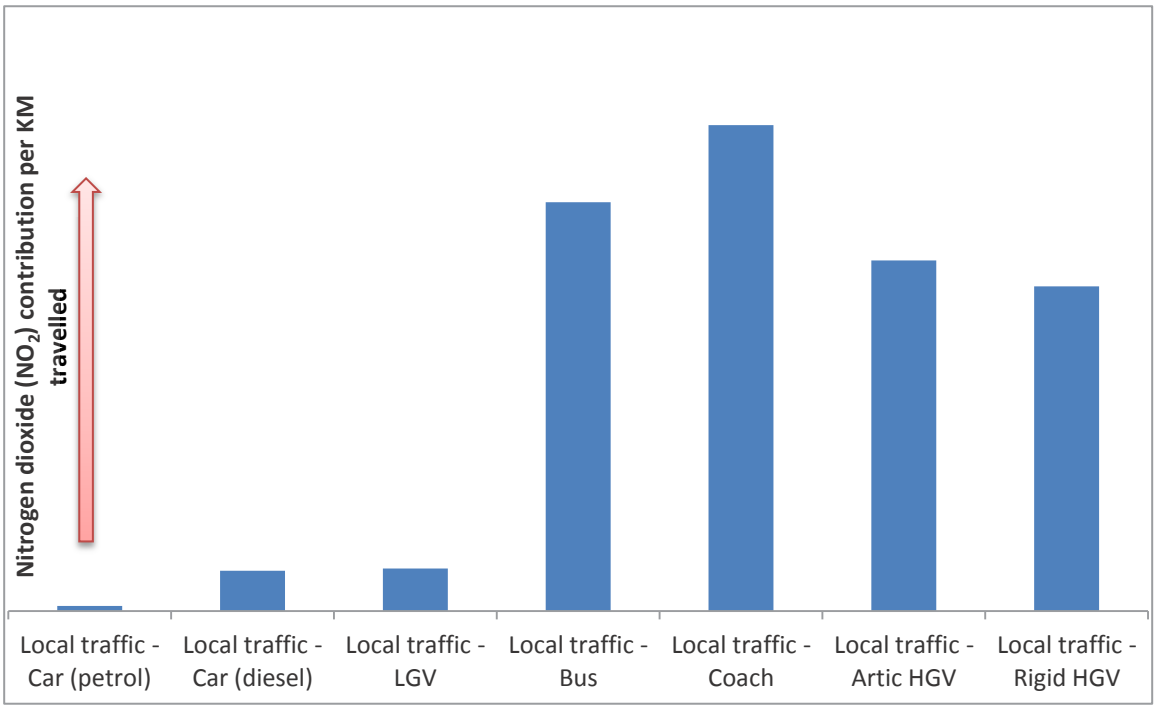
Buses, coaches and HGVs make up only small proportions of the total vehicle fleet in Fulford but their emission impact per vehicle km travelled is much greater than that of individual cars[19] (Figure 10). Due to their high emissions per km travelled buses, coaches and HGVs have a disproportional impact on local air quality compared to their prevalence in the vehicle fleet. Measures to reduce emissions from HGVs and buses are therefore also included in AQAP3. These include plans to introduce a Clean Air Zone (CAZ) for buses, the use of the Eco-stars scheme to promote cleaner HGV operations and longer term plans to establish a Compressed

[18] Remote sensing of NO_2 exhaust emissions from road vehicles (a report to DEFRA), Carslaw et al (April 2013)

[19] It is important to recognise that buses are capable of moving many more people per vehicle than a car and take up less space on the road than numerous private cars. The emission rate per passenger on a bus with high occupancy levels may be similar or even less than the emission rate per passenger for a car, but if bus occupancy rates are consistently low then the emission rate per passenger will go up substantially. As a scheduled bus service will operate irrespective of the number of passengers on board it is important to ensure that emissions from all buses are as low as they can possibly be at all times. Bus operators can therefore contribute twice to emission reduction strategies 1) By removing as many private car journeys from the road as possible; 2) By reducing their own emissions as far as possible

Natural Gas (CNG) refuelling station in the city along with a freight transhipment centre.

Figure 10: Relative NO_2 contribution per km travelled by vehicles in Fulford



3.2 Salisbury Terrace source apportionment study (November 2012)

Following the declaration of the AQMA in Salisbury Terrace in May 2012 a further assessment of air quality[20] was undertaken to:

- confirm the exceedence of the health based objective
- determine what improvement in air quality and corresponding reduction in emissions was required to attain the health based objective
- provide information on source contributions.

The methodology used for the Salisbury Terrace source apportionment work was a refined version of the coupled traffic micro-simulation and emissions model (PHEM) work undertaken for the Fulford AQMA. The traffic model was calibrated using ANPR traffic count data for the area (collected May 2011). As for Fulford the source apportionment study took into account regional background, local background and local emission sources.

[20] Further Assessment of Nitrogen Dioxide (NO_2) on Salisbury Terrace, CYC, November 2012

3.2.1 Results of Salisbury Terrace source apportionment study

Figure 11 shows the results of the source apportionment undertaken for the Salisbury Terrace AQMA. This was undertaken in accordance with Example 7.1 in LAQM.TG(09).

The source apportionment study for Salisbury Terrace shows that buses make a significant contribution to NO_2 concentrations in this area, significantly more than in Fulford. The Salisbury Terrace source apportionment work therefore built upon the Fulford Road coupled traffic and emissions modelling study with an emphasis on attributing emissions to individual bus types. Further details of this work can be found in the 'Further Assessment for Salisbury Terrace' submitted to DEFRA in November 2012.

3.2.2 Impact of traffic emissions in and around Salisbury Terrace

Figure 12 shows the average vehicle fleet proportions in the Salisbury Terrace area based on traffic counts undertaken in May 2011.

Like the Fulford study, passenger cars make up the majority of the vehicle fleet with petrol cars more prevalent than diesel. The percentages of buses and HGVs in the fleet were again relatively small (3% and 2% of the total fleet respectively).

Using the results from the coupled traffic micro-simulation and emissions model (PHEM) the contribution of individual vehicle types to total vehicle derived NO_2 have been calculated. These are shown in Figure 13.

Figure 11: Apportioned local contributions to total NO_2 in the Salisbury Terrace AQMA

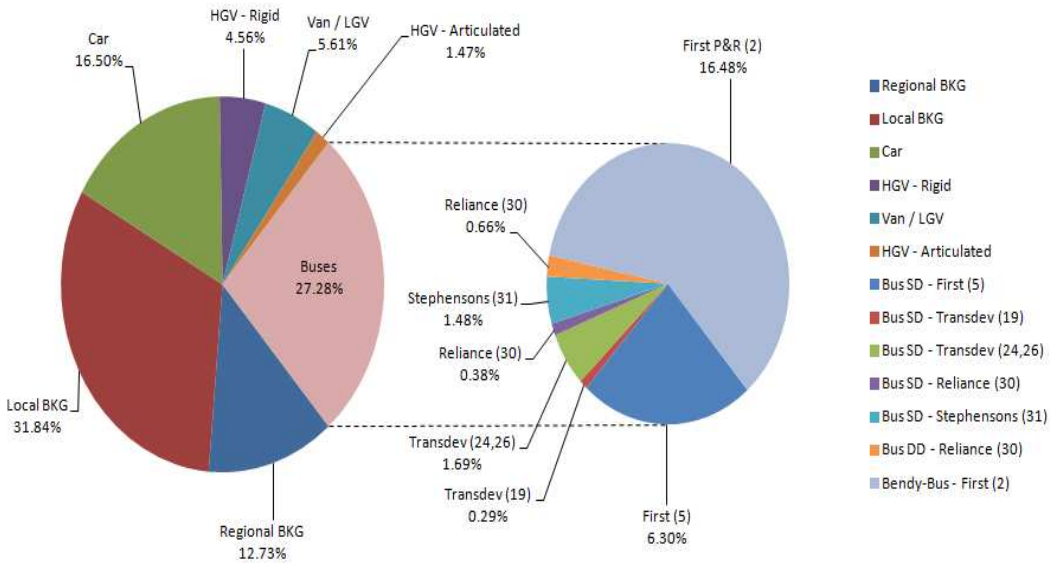


Figure 12: Vehicle fleet proportions in Salisbury Terrace and surrounding area (%)

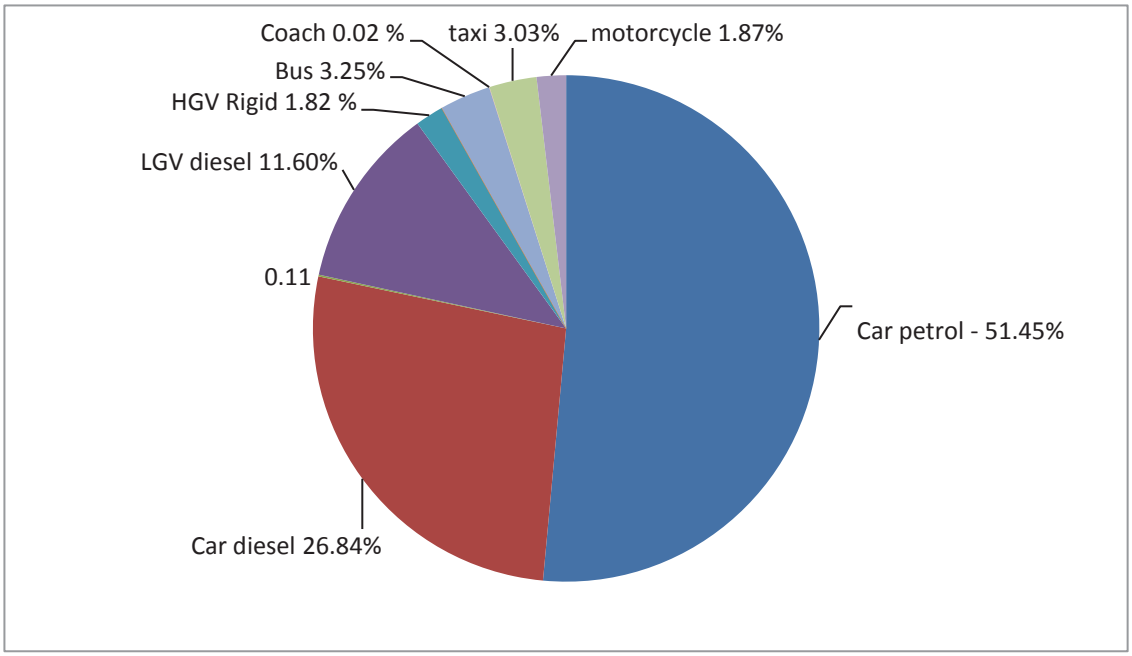
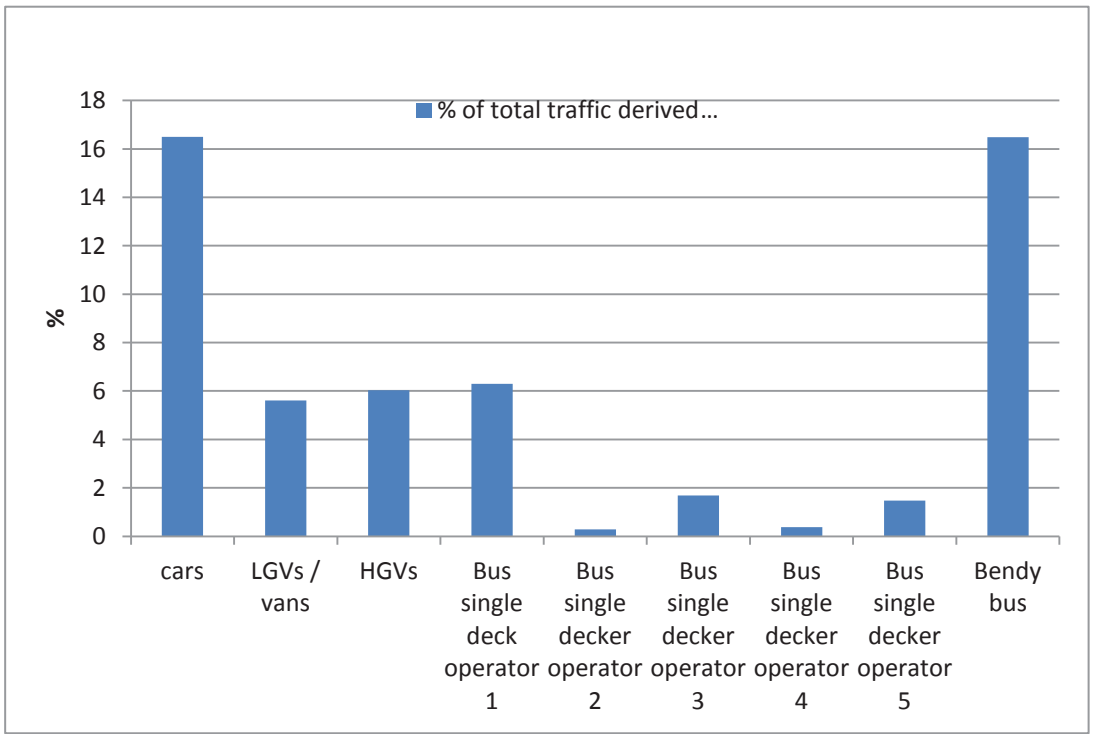


Figure 13: % contribution of individual vehicle types to total NO_2 from traffic in the Salisbury Terrace area



Although buses only make up approximately 3% of the vehicle fleet in this area they are responsible for 27% of the total traffic derived NO_2. This is more than the total contribution from cars (16.5%) even though cars make up over 78% of the vehicle fleet. A further analysis of the impact of individual bus services has identified Park & Ride bendy buses as the major contributor to traffic derived NO_2 in the Salisbury Terrace area, even though this service is operated by relatively new vehicles.

The Salisbury Terrace source apportionment study highlighted the importance of considering both the frequency and age of vehicles when developing AQAP measures. This approach forms the basis of the proposed Clean Air Zone (CAZ) which aims to convert the most frequent bus movements to electric by 2018. The first fully electric P&R service in York opened in June 2014 at Poppleton Bar and the second at Monks Cross in May 2015; other P&R services will be converted to electric as soon as possible, including the route through Salisbury Terrace.

3.3 Additional source data for York

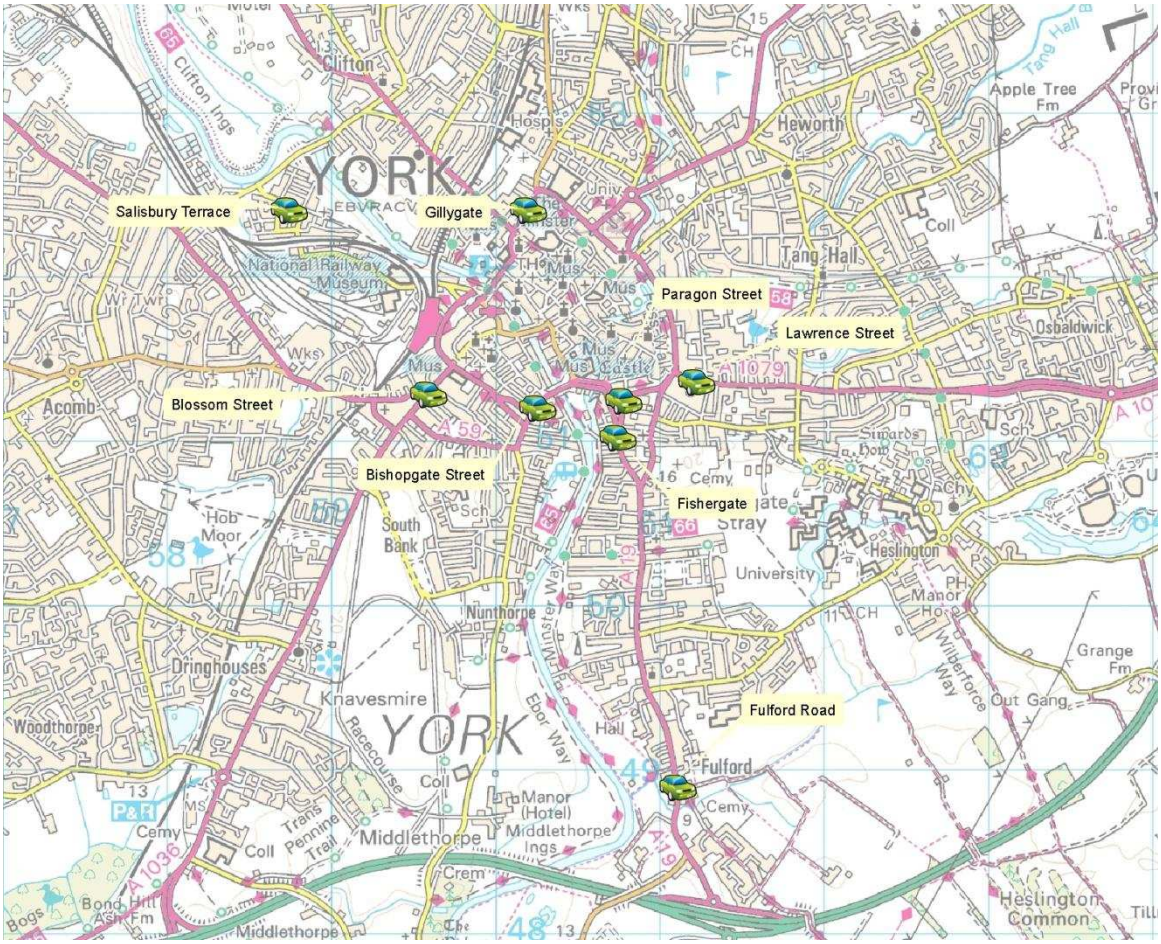
In addition to the detailed source apportionment studies undertaken for the Fulford and Salisbury Terrace AQMAs, further analysis has been undertaken of traffic in all the York AQMAs for the purpose of informing the development of AQAP3.

In May 2011 CYC commissioned Nationwide Data Collection (NDC) to undertake manual classified counts (MCC) and ANPR (Automatic Number Plate Recognition) surveys at each of the following locations:

- MCC Site 1 – Gillygate
- MCC Site 2 – Lawrence Street
- MCC Site 3 – Blossom Street
- MCC Site 4 – Bishopgate Street
- MCC Site 5 – Paragon Street
- MCC Site 6 – Fishergate (N) /Fawcett Street (S)
- MCC Site 7 – Salisbury Street
- MCC Site 8 – Main Street, Fulford

The count locations are shown in Figure 14.

Figure 14: Location of manual classified counts (May 2011)



3.3.1 Summary results from manual and ANPR traffic counts (May 2011)

Figure 15 shows the mix of vehicles identified in each of the 8 locations.

Figure 16 shows the petrol to diesel split for each of the different vehicle types at the 8 locations.

Figures 17 a, b, c and d show the Euro standard mix across the main vehicle types in each of the count areas.

Figure 15: Vehicle mix at 8 locations in York (May 2011)

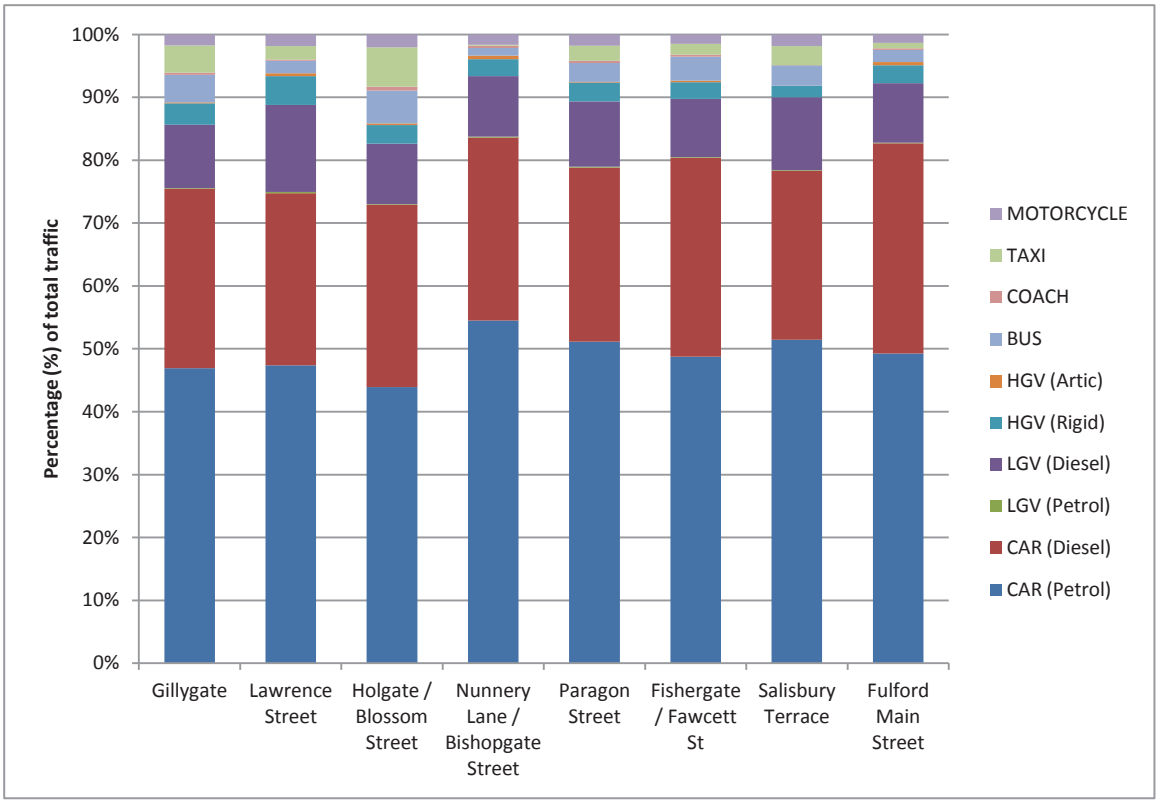


Figure 16: Petrol / diesel split across all vehicle types

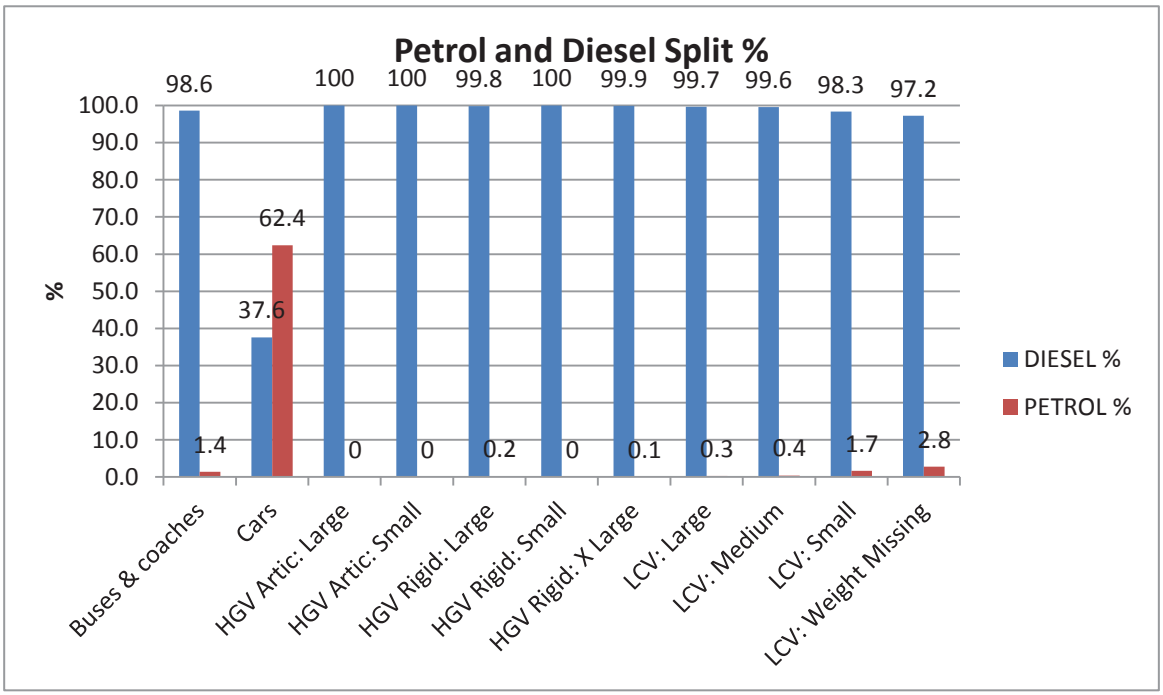


Figure 17(a): Euro classification of cars (petrol and diesel combined)

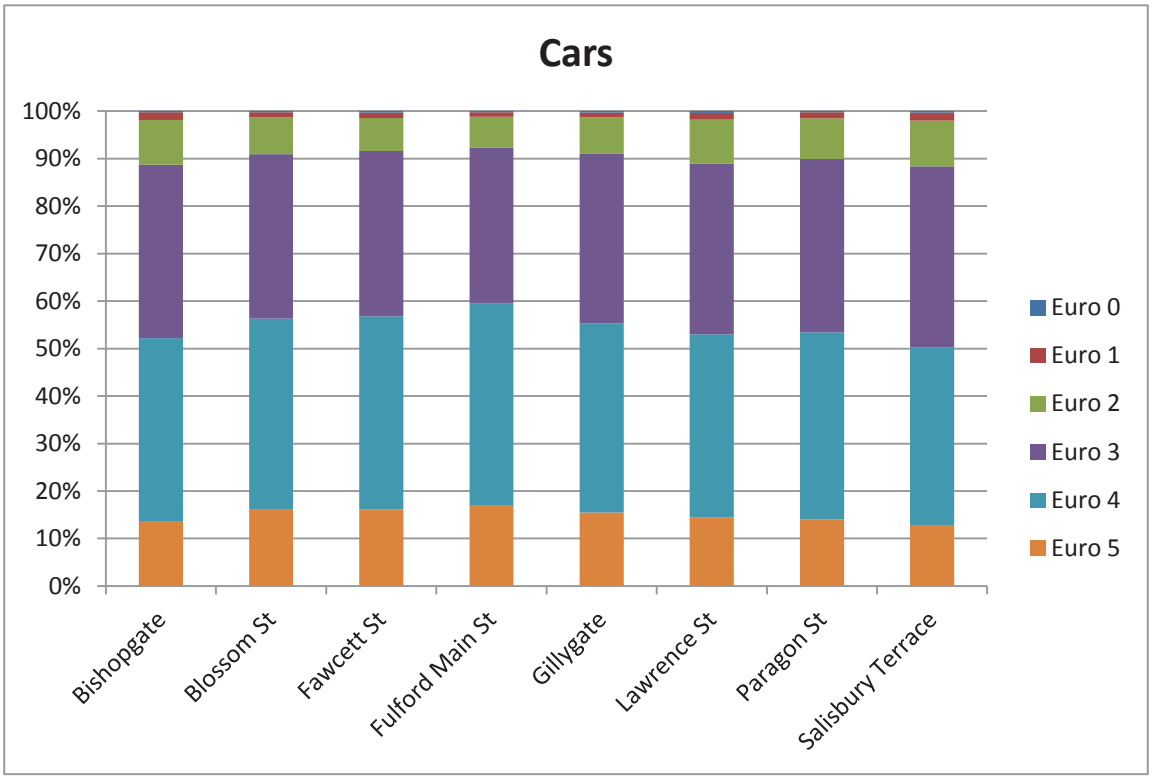


Figure 17(b): Euro classification of buses and coaches

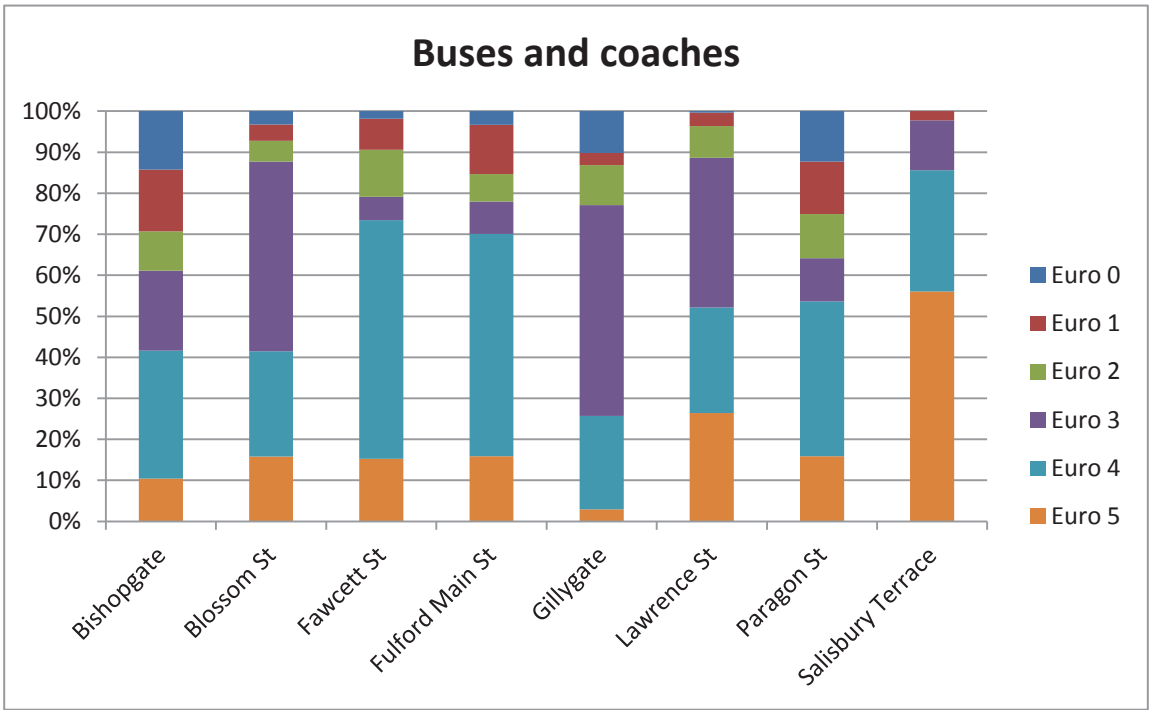


Figure 17(c): Euro classification of rigid HGVs

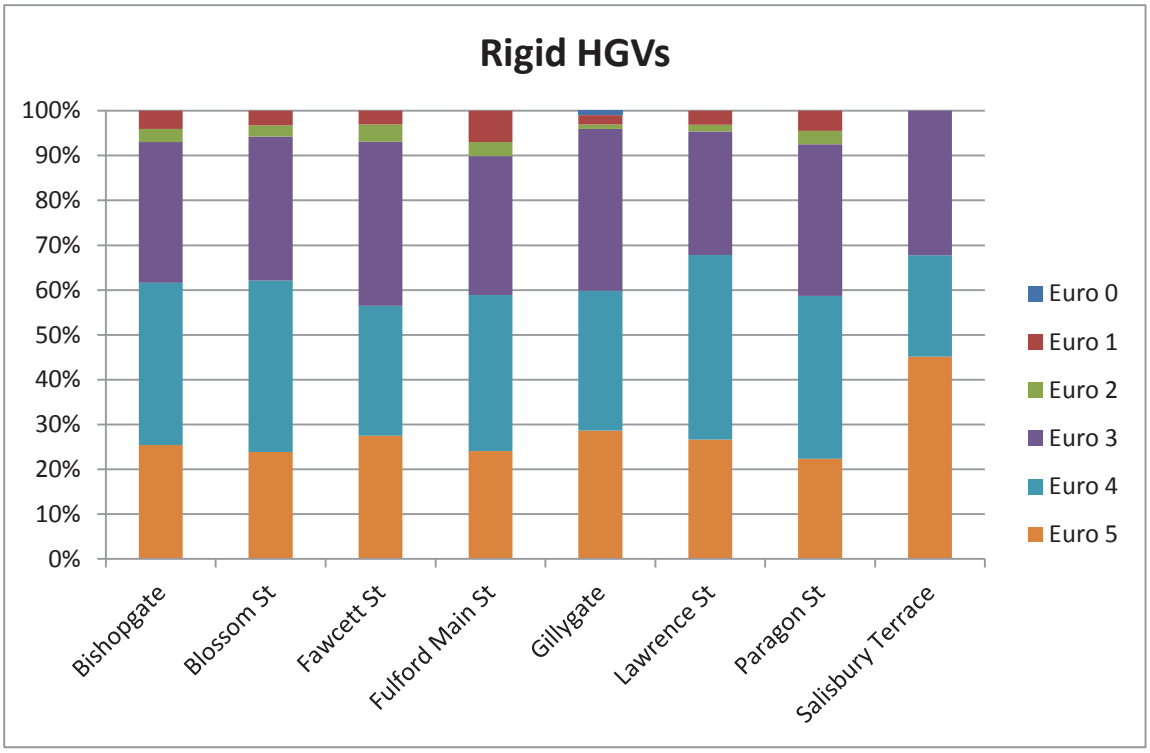
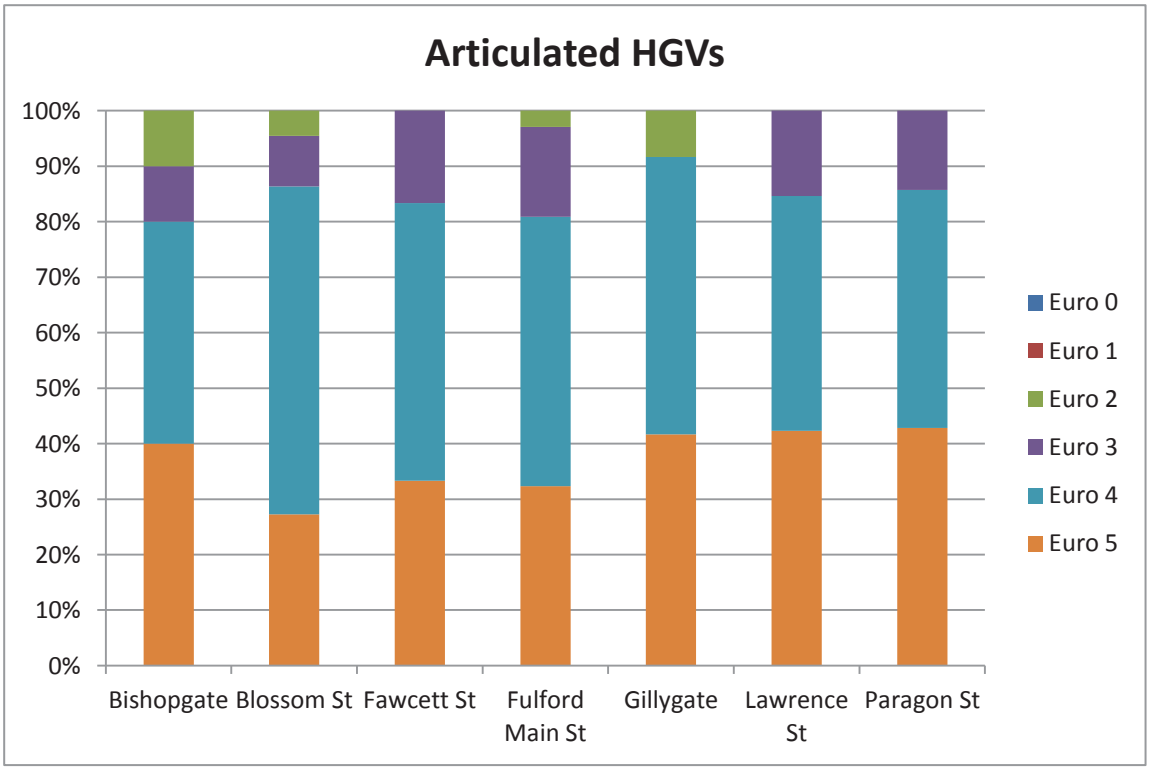


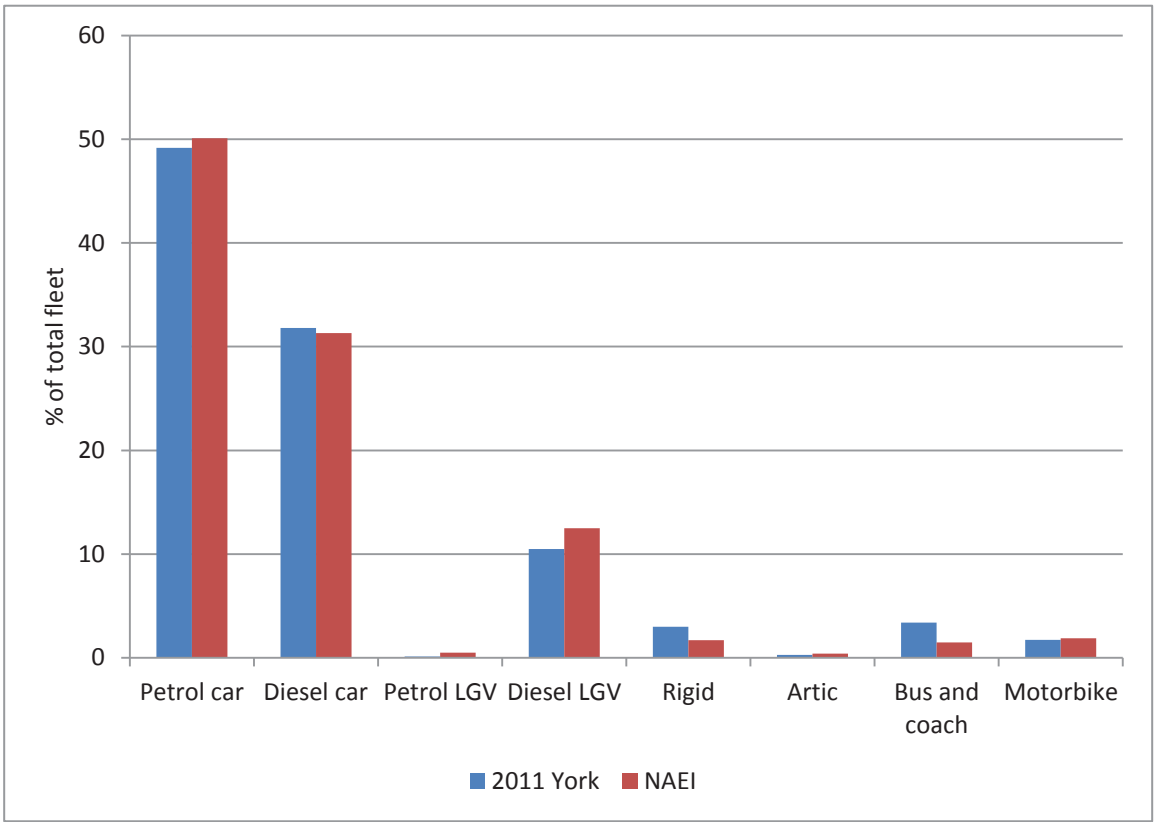
Figure 17(d): Euro classification of articulated HGVs



3.3.2 Comparison of York traffic data with NAEI statistics

To understand how traffic in York compares with that in other cities the 2011 traffic mix data for York has been compared with NAEI traffic data for 2011 (for urban centres outside London) (figure 18).

Figure 18: % of total traffic mix - York traffic data (2011) vs NAEI urban centres outside London (2011)



3.3.3 Comparison of York traffic data (2011) with previous York traffic data(2006)

To understand how traffic in York has changed in recent years, the 2011 traffic count data has been compared with similar data collected in York during 2006 (Figures 19 and 20).

Figure 19: % of total traffic mix for York traffic data (2006) compared with York data (2011)

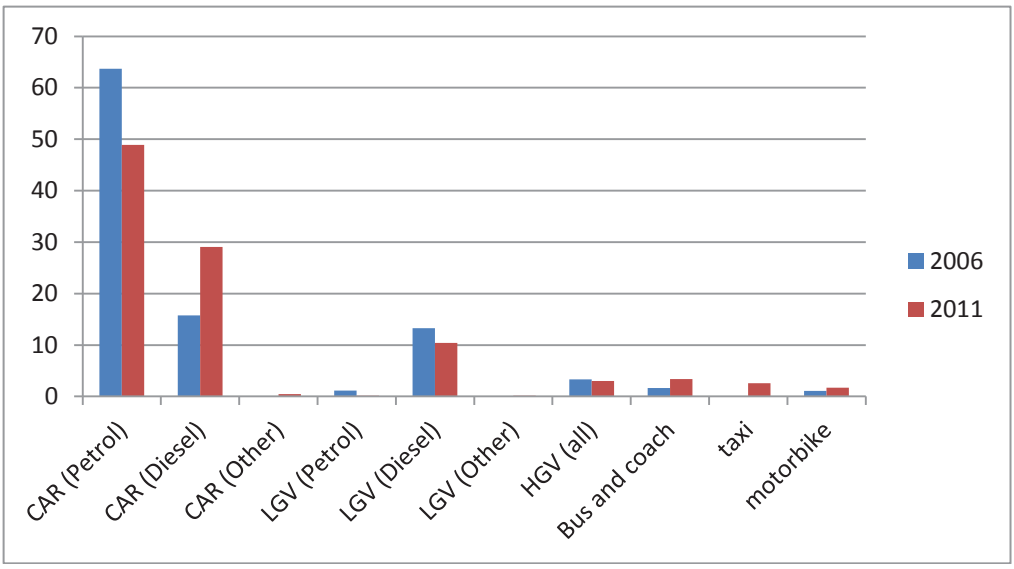
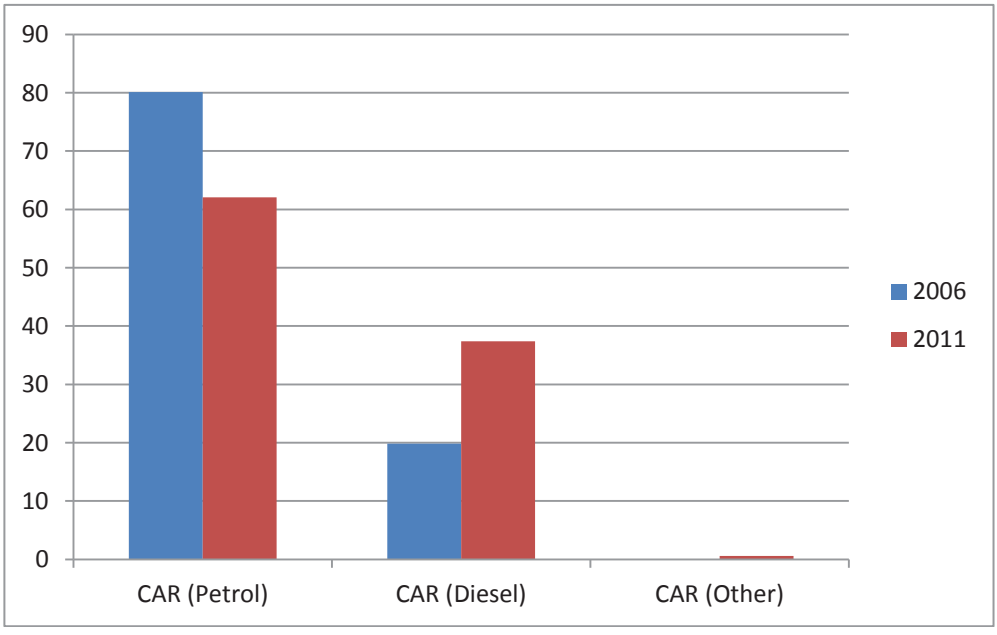


Figure 20: % petrol v diesel split (cars only) (York 2006 v York 2011)



3.4 Analysis of additional source data

3.4.1 General Fleet composition

The fleet composition in York varies between different locations. At all locations passenger cars make up the majority of the traffic (between 72 and 83%) with petrol cars making up the greatest proportion. The greatest variations in the percentage vehicle mix occur for buses and taxis which are more prevalent in some areas of the city than others.

The majority of cars operating in York are Euro 3 and Euro 4 with the next largest group being Euro 5. There are very few pre-Euro 2 cars operating in the city.

The Euro standard of buses operating in the city varies depending on the location. This reflects the tendency for bus operators to run specific vehicles on certain routes, the newer buses tending to be used on the most frequent and profitable routes.

There appears to be a higher proportion of Euro III buses operating through the Gillygate area than the other AQMAs, whilst Salisbury Terrace has a higher proportion of Euro V and VI buses than the other AQMA areas. However, as the Salisbury Terrace source apportionment work has clearly shown, the impact of buses on local air quality is determined by both the frequency and emission standard of the vehicles. It should not be assumed that a newer diesel bus fleet will automatically equate to improved air quality.

Fleet percentages and Euro standards of LGVs and HGVs are fairly consistent across the city. Articulated HGVs tend to be newer than rigid HGVs.

3.4.2 Comparison of York with national fleet

York has a slightly higher proportion of diesel cars, rigid HGVs and buses than other cities. As diesel vehicles are known to be significant emitters of primary NO_2 the above average numbers of these vehicles in York is likely to be contributing significantly to the city's air quality issues. The implementation of the low emission measures within York's AQAP3 will help to reduce the impact of diesel vehicles in the city and bring the proportion of diesel vehicles in the local fleet down to become more in line with national averages. In the longer term York would like to have a lower than average number of diesel vehicles operational in the city and above average numbers of alternatively fuelled vehicles.

3.4.3 Changes in the York vehicle fleet

The percentage of diesel cars in York has risen dramatically since 2006. In 2011 diesel cars made up 37.4% of the total car fleet compared with just 20% in 2006. The shift towards diesel cars is a national phenomenon driven by carbon based vehicle taxation policies and the car scrappage scheme. The latter resulted in many older petrol cars being replaced with new diesel vehicles. AQAP3 aims to address

the growth in diesel passenger cars by encouraging the uptake of lower emission alternatives such as battery operated electric cars and hybrids.

3.5 Summary of source emissions and priorities for AQAP3

York has higher than average proportions of diesel cars, HGVs and buses than other cities and the proportion of diesel cars in the fleet has increased significantly in recent years. The air quality issues in York's most recent AQMAs are due mainly to the influence of diesel car emissions and the frequency of bus movements. These are therefore priority areas for AQAP3.

HGVs generally have less of an impact on air quality in York's AQMAs than diesel cars and buses but on a km by km basis they still have a disproportional impact on NO_2 emissions across the wider York area. HGVs also contribute significantly to emissions of diesel particulate. York currently has a higher than average number of rigid HGVs operating in and around the city centre so additional AQAP3 measures have been developed to address this issue and to encourage the uptake of alternative fuels (particularly CNG) by HGV operators.

Required reductions in NO_2 and NO_x

4.0 Required reduction in NO_2 and NO_x

4.1 Relationship between NO_x and NO_2

Calculating the reduction in pollutant emissions required to attain the health based air quality objectives allows local authorities to judge the scale of effort required within an Air Quality Action Plan (AQAP).

For roadside NO_2, the required reduction in NO_2 concentration can be simply stated as the required $\mu g/m^3$ reduction in the NO_2 concentration in order to meet the health based air quality, for example a $5\mu g/m^3$ reduction from 45 to $40\mu g/m^3$. This provides an indication of the scale of the air quality challenge faced by a local authority but it is not a suitable parameter for assessing the actual level of emission reduction needed.

The required percentage reduction in local transport emissions should be expressed in terms of NO_x. NO_2 is both a primary and a secondary pollutant with some emitted directly from source (vehicle exhaust) and some formed in the atmosphere from other pollutants (including nitric oxide, NO). A reduction in NO_2 concentration therefore requires a reduction in both NO and NO_2 emissions. Together these are referred to as NO_x. There is a non-linear relationship between primary NO_x emissions and resultant roadside NO_2 concentrations.

4.2 Required reduction in NO_x emission

DEFRA's air quality guidance note LAQM.TG(09) provides a methodology for estimating the required reduction in NO_x (from road traffic) necessary to meet the health based annual mean NO_2 objective. This method has been used as the basis for calculations to determine the required level of traffic NO_x reduction in each of York's areas of air quality technical breach. Advice on the approach used for these calculations was sought from the Local Authority Air Quality Support Helpdesk[21]. The latest version (version 4.1) of the NO_x to NO_2 calculator was used for the calculations.

Estimates of background concentrations of NO_x and NO_2 in each of the areas of air quality technical breach were made using DEFRA's air quality background maps. These background concentrations are shown in tables 2 and 4. DEFRA publish and regularly update the background maps to assist local authorities in carrying out review and assessment of local air quality. The maps can be used in air quality assessments to better understand the contribution of local sources to total pollutant concentrations. The maps provide information on how pollutant concentrations change over time and across a wide area; they also provide an estimated breakdown of the relative sources of pollution. The background maps available on the DEFRA

[21] *The methodology was approved by Anna Czerska, on behalf of the Helpdesk, on 13th June 2014 (e-mail correspondence)*

website during May 2014 were used for the calculations, with the year set to 2012 or 2013 as appropriate.

Levels of pollution measured in 2012 were generally the highest recorded in the last three years. Levels of pollution measured in 2013 were generally the lowest recorded in the last three years. 2014 results generally fell within these upper and lower limits (with the exception of the Blossom Street / Holgate Road site where the 2014 value was slightly lower than that recorded in 2013). By using the 2012 and 2013 data the best estimate of the upper and lower levels of NO_x reduction needed in these areas taking into account 'normal' annual variations due to weather etc have been obtained. The results of these calculations are shown in tables 3 and 5 below. A graph summarising the results is presented in Figure 22.

4.2.1 Calculations based on 2012 monitoring data

The background concentrations and required reduction in pollutant concentrations based on worst case monitoring undertaken in 2012 are shown in tables 2 and 3.

Table 2: Background data used for 2012 calculations

Technical Breach Area	X-Coordinate of required grid square	Y-Coordinate of required grid square	Background NO_x (µg/m^3)	Background NO_2 (µg/m^3)
Fulford	460 500	449 500	21.5	15.1
Fishergate	460 500	451 500	34.4	22.0
Gillygate	460 500	452 500	30.9	20.2
Salisbury Terrace	458 500	452 500	25.1	16.9
Nunnery Lane	460 500	451 500	34.4	22.0
Lawrence Street	461 500	451 500	26.2	17.6
Holgate Road	459 500	451 500	40.0	24.5
George Hudson St	459 500	451 500	40.0	24.5

Table 3: Required reductions in pollutant concentrations based on 2012 worst-case monitoring data

Technical Breach Area	2012 Required Reduction in NO_2 (µg/m3)	2012 Required Reduction in NO_2 (%)	2012 Required Reduction in Road NO_x (µg/m3)	2012 Required Reduction in Road NO_x (%)
Fulford	3.2	7.3	8.7	13.3
Fishergate	5.5	12.1	14.7	26.5
Gillygate	21.7	35.1	66.0	59.5
Salisbury Terrace	0.0	0.0	0.0	0.0
Nunnery Lane	11.0	21.5	30.4	42.8
Lawrence Street	16.5	29.2	49.2	49.2
Holgate Road	14.2	26.2	39.8	53.1
George Hudson St	21.8	35.2	64.3	64.7

Note on the table above - where a figure of zero is given for the required reduction, this indicates that that the health based objective is already met in that particular location, for that particular year

In 2012, the health based annual mean nitrogen dioxide objective was met in the Salisbury Terrace technical breach area. Required reductions in NO_2 ranged from 7.3% along Fulford Main Street to 35.2% at along George Hudson Street. Corresponding required reductions in NO_x ranged from 13.3% to 64.7% along Fulford Main Street and George Hudson Street respectively.

4.2.2 Calculations based on 2013 monitoring data

The background concentrations and required reduction in pollutant concentrations based on worst case monitoring undertaken in 2013 are shown in tables 4 and 5 below:

Table 4: Background data used for 2013 calculations

Technical Breach Area	X-Coordinate of required grid square	Y-Coordinate of required grid square	Background NO_x (µg/m^3)	Background NO_2 (µg/m^3)
Fulford	460 500	449 500	20.77	14.62
Fishergate	460 500	451 500	33.18	21.41
Gillygate	460 500	452 500	29.85	19.63
Salisbury Terrace	458 500	452 500	24.48	16.51
Nunnery Lane	460 500	451 500	33.18	21.41
Lawrence Street	461 500	451 500	25.29	17.11
Holgate Road	459 500	451 500	38.74	23.91
George Hudson St	459 500	451 500	38.74	23.91

Table 5: Required reductions in pollutant concentrations based on 2013 worst-case monitoring data

Technical Breach Area	2013 Required Reduction in NO_2 (µg/m3)	2013 Required Reduction in NO_2 (%)	2013 Required Reduction in Road NO_x (µg/m3)	2013 Required Reduction in Road NO_x (%)
Fulford	0.0	0.0	0.0	0.0
Fishergate	0.0	0.0	0.0	0.0
Gillygate	10.7	21.1	29.4	39.3
Salisbury Terrace	0.0	0.0	0.0	0.0
Nunnery Lane	0.8	2.0	2.1	4.8
Lawrence Street	7.4	15.7	20.4	28.4
Holgate Road	11.6	22.5	31.1	46.5
George Hudson St	10.8	21.3	29.0	44.7

Note on the table above - where a figure of zero is given for the required reduction, this indicates that that the health based objective is already met in that particular location, for that particular year

In 2013, the health based annual mean NO_2 was met along Fulford Main Street, in Fishergate and in the Salisbury Terrace technical breach areas. Required reductions in NO_2 ranged from 2.0% at Lawrence Street to 22.5% at Holgate Road. Corresponding required reductions in NO_x ranged from 4.8% to 46.5% at Nunnery Lane and Holgate Road respectively.

Figure 22 summarise the NO_x and NO_2 reduction required in each of the York AQMAs based on 2012 and 2013 monitoring data.

4.3 Implications for Air Quality Action Planning

The required road NO_x reduction calculations summarised in this chapter have important implications for air quality action planning in York.

4.3.1 Fulford and Salisbury Terrace

In the Fulford and Salisbury Terrace AQMAs, background concentrations of NO_x are lower than those in the city centre AQMA. This is likely to be due to the more isolated nature of these AQMAs (which are located away from the main city centre) and the fact that pollution displaced from the inner ring road is less likely to impact on these areas. In these technical breach areas the quantity and type of local traffic has a major influence on the ability to meet/maintain the health based air quality objectives.

The source apportionment data presented in chapter 3 suggests that in Fulford and Salisbury Terrace reducing emissions from frequent bus services may be a particularly effective way of reducing NO_x emissions in these areas. Additional HGV NO_x reduction measures may also be advantageous in Fulford.

Based on the latest monitoring figures (from 2013 and 2014) the health based annual mean NO_2 objective is currently being met in both Fulford and Salisbury

Terrace (although NO_2 concentrations in excess of 36µg/m^3 still remain). This suggests that relatively minor reductions in emissions in these areas may be enough to deliver lasting long term compliance with the health based air quality objectives allowing eventual revocation of these AQMA orders.

4.3.2 Lawrence Street

As with Fulford Road and Salisbury Terrace, Lawrence Street appears to experience lower background concentrations of NO_x than the other city centre technical breach areas. The reasons for this are unclear but may be related to the distance from other major roads, prevailing wind directions and the orientation of the street which limits the importing of pollution into this area from other locations. Like Fulford and Salisbury Terrace the local traffic make-up in Lawrence Street is likely to be having a major influence on the ability to meet the health based air quality objectives.

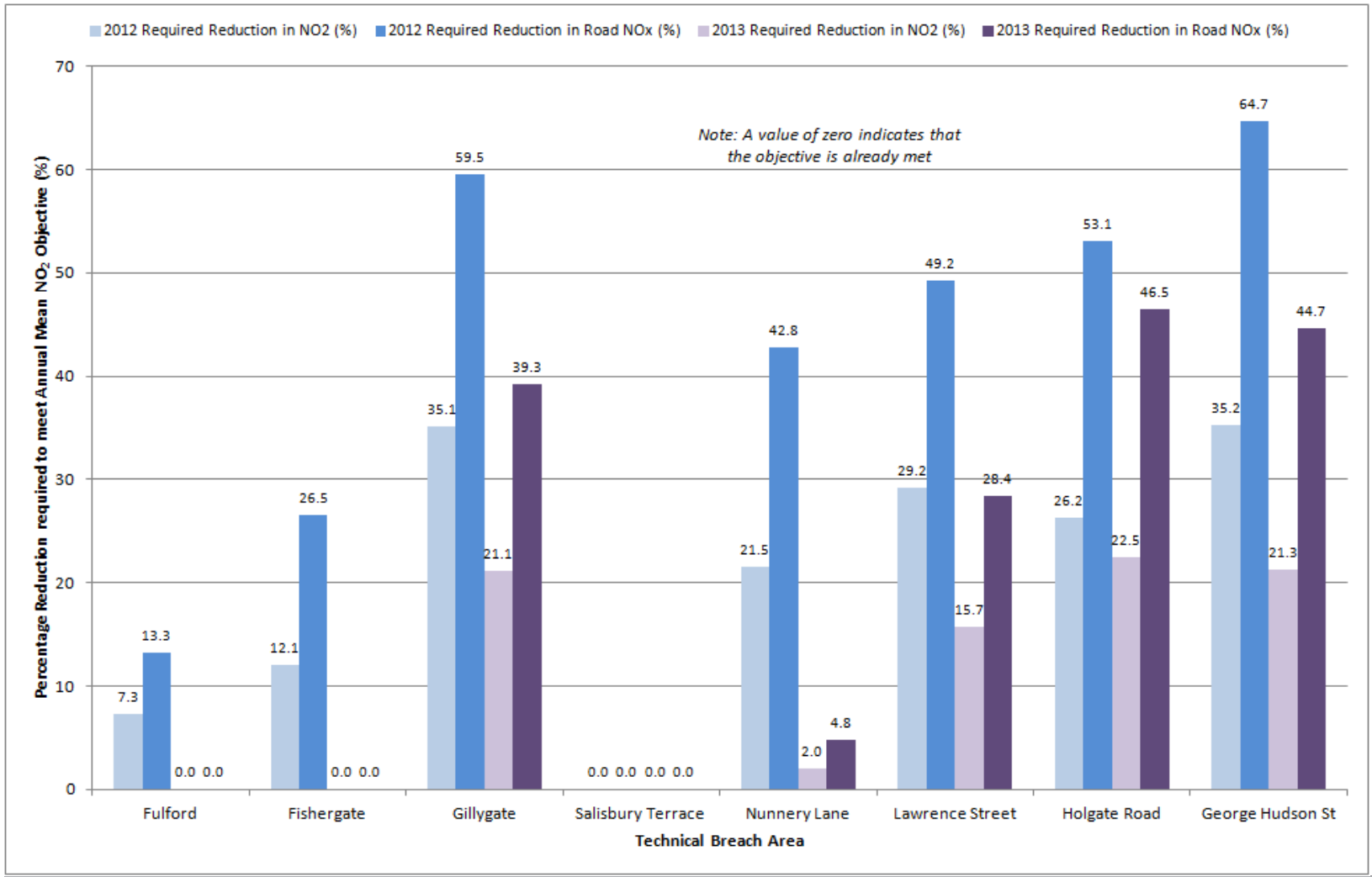
Lawrence Street experiences slightly higher levels of bus traffic then other areas of the city because it is one of the major routes back to a large bus depot on James Street where many buses return for overnight storage and servicing. It is anticipated that as the Clean Air Zone (CAZ) is established (in accordance with this action plan) the emission characteristics of the general York bus fleet will improve and that this will result in some air quality improvements on Lawrence Street.

4.3.3 Other technical breach areas

In the other city centre technical breach areas background concentrations of NO_x are much higher than at Lawrence Street, Fulford and Salisbury Terrace. There are no major industrial processes, significant point sources or domestic smoke emissions in York city centre so the high background concentration of NO_x in the other city centre technical breach areas must be due mainly to traffic pollution dispersed into these areas from other parts of the city centre. It is likely that even if all local traffic was removed from some of the city centre AQMAs, elevated NO_2 concentrations would still remain due to traffic pollution dispersed from other roads in the vicinity. This has previously been observed during short-term closures of major sections of the inner ring road.

To improve air quality in the other city centre AQMAs where background NO_x levels are high and pollution is known to be imported from other areas a more holistic approach to air quality improvement is needed that reduces emissions across the city centre and beyond. The Low Emission Strategy approach adopted by CYC (and reflected within this revised AQAP) aims to reduce emissions (particularly from vehicles) across the whole of the York area, both to help deliver health based air quality objectives within AQMAs and to minimise the public health impacts of air pollution across the wider York area. The expected impact of this approach is considered further in chapter 8.

Figure 21: Required reduction in NO_x and NO_2 in all areas of technical breach (based on monitoring undertaken in 2012 and 2013)



Background to development of AQAP3

5.0 Background to development of AQAP3

5.1 Development of previous AQAPs

DEFRA Policy Guidance LAQM.PGS(09) states that Air Quality Action Plans must focus on 'effective, feasible, proportionate and, quantifiable measures' and provide 'evidence that all available options have been considered on the grounds of cost effectiveness and feasibility'. A wide range of potential options are available to City of York Council and other stakeholders to improve local air quality and have been considered at various stages throughout the action planning process in York. These have included:

- Public transport measures (e.g. bus improvements)
- Alternative transport systems (eg. trams, water buses)
- Car-sharing
- Promotion and provision of alternative fuels
- Cycling measures
- Traffic management measures e.g. congestion charge, low emission zone
- Parking based measures
- Planning based measures
- Promotional activities e.g. travel planning, advice leaflets
- Anti-idling campaigns
- Roadside emission testing
- Energy efficiency measures

York has previously developed two AQAPs:

AQAP1: Action Plan for reducing nitrogen dioxide concentrations in York (July 2004)

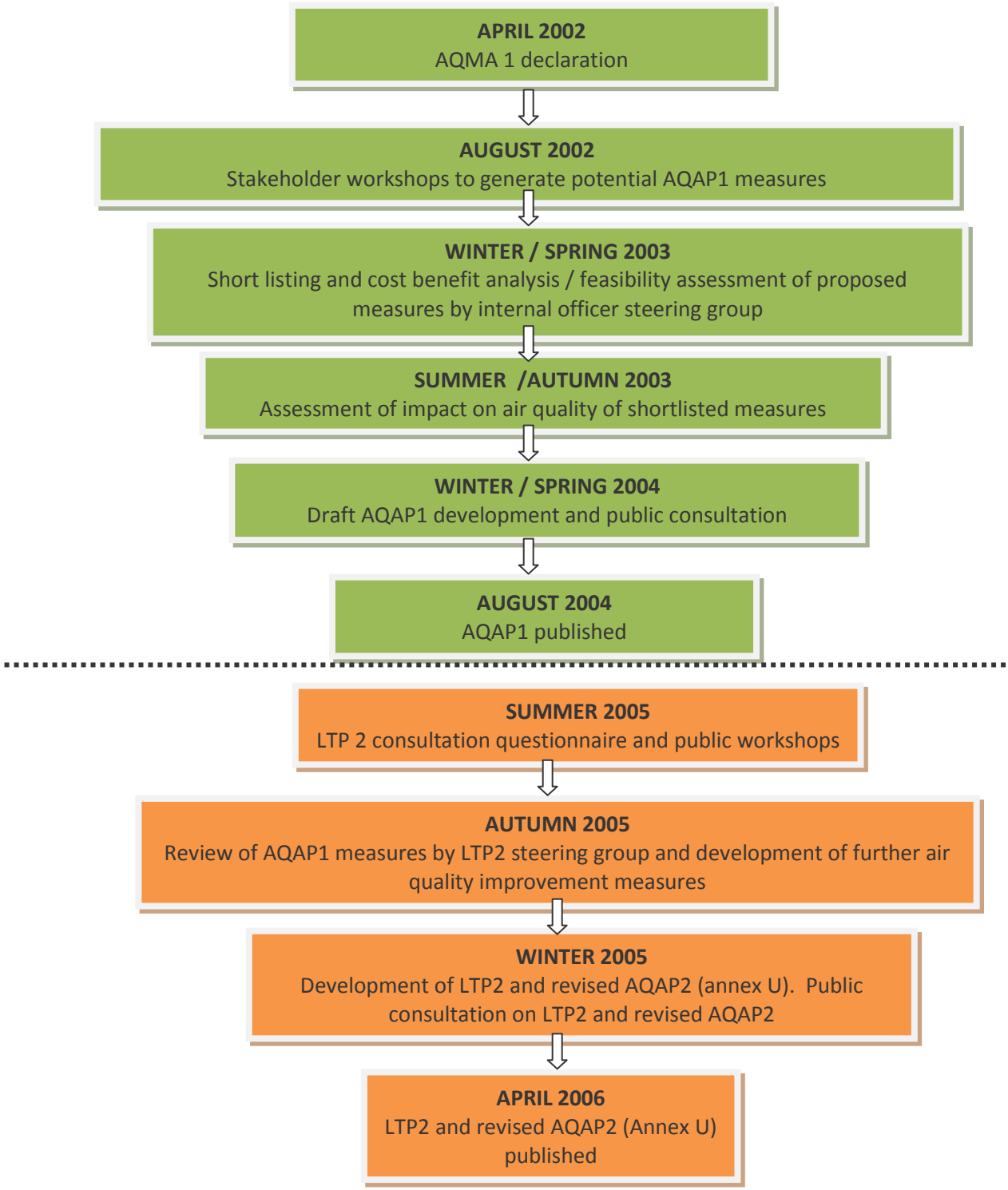
AQAP2: City of York Council Transport Plan 2006-2001 – Annex U (Air Quality Action Plan) (March 2006)

The development of these AQAPs (including cost / benefit analysis) has previously been reported in full (AQAP1 and AQAP2) and is summarised in Figure 23.

AQAP1 was mainly a modal shift based AQAP including the measures that were considered affordable at the time.

AQAP2 built upon AQAP2 and included some of the more expensive measures initially excluded from AQAP1. AQAP2 also started to introduce the concept of alternative vehicles and fuels into air quality action planning in York but little progress was made with delivery in this area between 2006 and 2009 due to prioritisation of other LTP2 measures during this period.

Figure 22: Previous AQAP development in York



5.2 Drivers for the development of the LES and AQAP3

The York Air Quality Update and Screening Report (April 2009) drew two main conclusions:

1. AQAP1 and AQAP2 had failed to achieve an improvement in air quality within the city centre AQMA
2. The declaration of a further AQMA in Fulford was likely

In response to this report the York AQAP officer steering group was reconvened to review the content of AQAP1 and AQAP2 and determine what further steps could be taken to improve air quality in York. At the same time there was increasing interest nationally around the concept of LES Planning Strategies and how the use of alternative vehicle technologies and alternative fuels could help prevent further deterioration in local air quality due to the cumulative impacts of development.

The York AQAP steering group determined that to improve air quality in York AQAP measures needed to go beyond a modal shift approach and start to tackle emissions at the tailpipe. Of particular concern were emissions from taxis, buses and HGVs that had not been previously been addressed through the modal shift approach to air quality action planning. The cumulative long term impact of ongoing development in the city was also recognised as another threat to long term air quality improvement.

The steering group review concluded that a new Low Emission Strategy (LES) approach to air quality improvement was needed that would encourage the uptake of cleaner vehicles and technologies and ensure that existing vehicles were operated as cleanly and efficiently as possible. This approach would follow the principles of LES planning being developed in other local authorities but would be more holistically applied in York to cover existing fleets and developments as well as those being brought forward through the planning system.

5.3 Development of the York LES

The York LES was developed over a 3 year period between October 2009 and October 2012.

The vision, aims and objectives of the LES were developed by the reconvened AQAP steering group that included planners, transport planners, sustainability officers, highways engineers, environmental protection officers and economic development staff.

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
- 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

The vision is supported by 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 Local 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 objective in the LES is supported by a number of delivery measures which have formed the basis for development of AQAP3 (Chapter 6).

A full public consultation on the York LES was undertaken in summer 2012 prior to its adoption in October 2012.

The York LES has been fully integrated into wider CYC policies including the Council Plan, the emerging draft Local Plan and LTP 3 (April 2011). A Low Emission Officer was appointed in March 2012 to oversee the roll out of the main LES measures.

The York LES can be viewed in full at www.jorair.co.uk/index.php?page=reports

Development of AQAP3

6.0 Development of AQAP3

6.1 Purpose of AQAP3

AQAP3 is the main delivery document for the air quality improvement measures originally set out in the LES. It aims to set out a clear timetable for delivery of these measures and to provide a better understanding of what they are likely to achieve in terms of emission reduction and compliance with the health based national air quality objectives. Targets and indicators are included to ensure delivery of air quality improvement measures remains on track and that the impact of the plan can be adequately monitored and reported.

6.2 AQAP3 development process

The York LES contained two types of measures:

1. Those that were fully agreed, costed and starting to be implemented at the time the LES was completed.
2. Those that were conceptual at the time the LES was completed and required further investigation, feasibility testing and cost benefit analysis prior to being progressed.

Where possible the LES measures have been transposed directly into AQAP3 and an update provided on progress and expected timescales for further delivery. Where additional development / feasibility work has been undertaken AQAP3 has been developed to reflect this improved evidence base and in some cases the LES measures have changed significantly from those originally suggested.

The final content of AQAP3 has been highly influenced by the following pieces of development work:

1. The York Low Emission Zone feasibility study (July 2013)
2. The York electric bus feasibility study (July 2013)
3. The York Anti-idling study (January 2014)

An overview of the main findings of these reports and how they have influenced the final content of AQAP3 is summarised here. Further detail about each of the studies can be found in Annex 1.

6.2.1 The York Low Emission Zone feasibility study (July 2013)

The detailed and further assessment work undertaken in Fulford and Salisbury Terrace highlighted the disproportional impact bus emissions of NO_x have in York's AQMAs.

Measure 9G in the LES was to '***Undertake a low emission bus corridor feasibility study'.***

In 2011/12 CYC obtained a DEFRA air quality grant to progress this study. The study was undertaken by Halcrow and the Institute of Transport Studies (ITS) at Leeds University. The study utilised and further developed the coupled PARAMICS traffic micro-simulation and PHEM emission model used initially to undertake the detailed and further assessment work in Fulford and Salisbury Terrace.

The LEZ study examined the potential impact of introducing a variety of blanket emission controls (Euro 3, Euro 4 or Euro 5) to all buses operating along the Ouse Bridge / George Hudson Street/ Rougier Street / Lendal Bridge corridor. The study assumed that a single emission standard would be applied to all buses entering the LEZ corridor irrespective of their frequency or age. An emission standard control of this type would require as a minimum the replacement of all older diesel buses with newer diesel models or the fitting of exhaust abatement equipment to ensure compliance with the specified emission standard. As a separate scenario, the LEZ study also considered what would happen if all Park & Ride buses were able to operate on electric within the LEZ corridor and other AQMAs.

The LEZ study indicated that blanket style application of Euro 4 or Euro 5 emission controls to buses could result in some sizeable reductions in NO_2 at some locations in the city centre. However, even with these emission controls in place, exceedances of the health based annual average NO_2 air quality objective would still exist in some areas. The study also showed that applying a zero emission standard (electric bus requirement) to a smaller number of frequent bus services might be more effective than requiring the whole fleet to upgrade to Euro 4.

6.2.2 Electric bus feasibility study (July 2013)

The detailed and further assessment work undertaken for Salisbury Terrace showed that in this location the Euro V Park & Ride bus passing through the area on a 10 minute frequency is responsible for a considerable proportion of the NO_2 emissions in this area. Coupled with the conclusions drawn from the LEZ bus corridor study it was evident that a LEZ for all buses based on imposition of a blanket Euro emission standard would be unlikely to deliver the health based air quality objectives in York and may cause unnecessary expense for smaller operators that only enter the city a few times per day. A system that incorporated ultra low emission standards for the most frequent bus services looked like being potentially a more effective option but the feasibility and cost of this required further investigation. ARUP were commissioned in January 2013 to undertake an electric bus feasibility study.

The electric bus feasibility study identified around 65 scheduled bus routes currently operating through the city centre. These routes are operated by approximately 200 buses of varying type, age and emission standard. 82% of all bus movements are carried out by only 49% of the buses and these buses operate on only 20 routes (including all the P&R services). These ‘frequent’ flyer services have a disproportionate impact on local air quality. Those with short, frequent duty cycles are generally well suited to the adoption of electric bus technology.

The electric bus feasibility study showed that converting the majority of the frequent flyer services to electric could offer substantial benefits for air quality as well as providing a 60% reduced greenhouse gas impact and reduced noise levels. A 'roadmap' for reducing emissions from buses in York was included in the electric bus feasibility study that demonstrated that the widespread introduction of electric buses into the city could become a reality by 2018 with the right level of investment and incentives in place. This roadmap has formed the basis of the proposals for a 'Clean Air Zone (CAZ)' incorporated into AQAP3. Initial proposals for the scope of a CAZ can be found in Annex 2. These will be subject to further consultation, especially with bus operators.

Significant progress has already been made towards the widespread introduction of electric buses in York. A brand new P&R site was opened in June 2014 that utilises battery operated electric buses and further electric buses were introduced to the existing Monks Cross P&R site in May 2015. A battery operated electric bus is operational on the University bus route and six city centre tour bus are scheduled for retrofitting with electric drive trains following the successful completion of a demonstration project in 2014. All these projects have been made possible through Greener Bus Fund (GBF) and Cleaner Bus Technology Funds (CBTF). CYC is continuing to work closely with bus operators to bring further low emission buses to the city.

6.2.3 York anti-idling feasibility study

Anti-idling policies aim to prevent unnecessary emissions from stationary vehicles and can take a variety of forms ranging from provision of basic advice and signage through to adoption of anti-idling legislation.

Measure 4F in the LES was to '***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.'***

In 2011/12 CYC obtained a DEFRA air quality grant to progress this study. The study was undertaken by TTR Ltd. The purpose of the study was to determine the extent of idling emissions in York and to consider the cost-effectiveness of introducing anti-idling policies.

The anti-idling study identified a number of areas in York where idling is regularly taking place and concluded that where a vehicle is expected to be stationary (parked, waiting or loading) for more than 1 minute it is both economically and environmentally advantageous to switch off the engine. By adopting basic anti-idling policies, a significant reduction in emissions (both local air pollutants and CO_2) could be achieved, along with even greater fuel cost savings for operators.

The draft AQAP3 proposed introduction of a basic anti-idling strategy for York that would involve working with transport operators to highlight the air quality impacts and fuel costs associated with idling. Following feedback from the consultation process

this will now also be supported by the erection of anti-idling signage in some locations.

The consultation process also highlighted some degree of local support for the introduction of anti-idling enforcement. However, due to the costs associated with adopting and enforcing this type of legislation, and the fact that the CAZ will remove the majority of diesel buses from the city centre by 2021, it is recommended that the need for enforcement of anti-idling powers is kept under review throughout the lifetime of AQAP3 (as originally planned).

6.3 Evidence base for the development of AQAP3

The final framework for AQAP3 has been developed to reflect current levels of understanding about sources of air pollution in York and the relative contribution these sources make to York's air quality issues.

The supporting evidence base has been drawn from:

- Detailed ANPR traffic counts undertaken within all the AQMA technical breach areas in 2011
- Results of air pollution monitoring undertaken in York and reported in recent Progress Reports (2012, 2013)
- Detailed and further assessments of air quality and emission sources in the Fulford and Salisbury Terrace AQMAs using coupled traffic micro-simulation and emissions modelling
- The York Low Emission Zone feasibility study
- The York Electric bus study
- The York anti-idling feasibility study

This evidence base clearly shows that:

(a) Diesel vehicles (particularly newer diesel cars) are the main source of NO_2 and man-made $PM_{2.5}$ in York. NO_2 emissions from these vehicles continue to rise due to an increase in the total number of diesel vehicles in the city and an increase in the primary NO_2 fraction emitted from individual vehicles (as a result of abatement technology fitted to control emissions of PM_{10} and CO_2).

(b) Buses and HGVs make up only a small proportion of the total vehicle fleet but have a disproportionate impact on total traffic derived NO_2 emissions. Emissions from these vehicles have not been adequately addressed through previous AQAPs.

(c) When tackling vehicle emissions the frequency of vehicle trips as well as the emission standard of the vehicle is an important consideration. High frequency bus services and other vehicles making frequent trips within AQMAs, such as taxis, HGVs and commuter cars, must therefore be tackled as a priority. A step change in air quality within York's AQMAs can only be achieved if the vehicles regularly accessing these areas are replaced with low and ultra low emission

technologies, such as battery electric, electric hybrid and CNG based technologies.

(d) There is currently widespread vehicle idling in the city which adds unnecessary emissions to the existing air quality problems. Raising awareness about the cost and environmental impact of vehicle idling could help to significantly reduce emissions in the city.

6.4 The role of green infrastructure in improving York's air quality

Measures to prevent emissions arising are the main focus of AQAP3 because emission reduction and prevention is likely to return the greatest public health benefits. However, it is not possible to prevent all emissions to air and in some circumstances it may be possible to reduce and mitigate the health impacts of emissions through the provision of green infrastructure.

Green infrastructure in the form of trees and other plants has been shown in numerous studies[22] to be capable of removing pollutants from the environment and reducing the impacts of the 'urban heat island effect'[23].

The types of trees must be carefully chosen to avoid species that produce lots of pollen or emit large quantities of volatile organic compounds (VOCs). The size and shape of the leaf is also an important factor in how efficient a plant will be at removing pollution from the atmosphere. In a city such as York where the worst air pollution conditions often occur during the winter period evergreen species may be more effective at year round pollution removal than deciduous alternatives, although some evergreens are high VOC emitters and should be avoided.

In recognition of the role green infrastructure can play in helping to reduce pollution levels in the city (as highlighted in the responses received to the public consultation on the draft plan) AQAP3 now includes a commitment to support the future development of green infrastructure in the city.

It is recommended that a Green Infrastructure Assessment is undertaken for the city and that the use of green infrastructure is recognised as a valid emission mitigation measure on new developments. As well as reducing pollutant concentrations green infrastructure can have many other benefits for health and well being.

[22] A good balanced account of the impact of green infrastructure on local air quality can be found in 'Urban Air Quality', The Woodland Trust, April 2012 by Jim Smith

[23] The urban heat island occurs in towns and cities because the buildings, concrete and other hard surfaces absorb heat during the day and release it at night. Higher city centre temperatures can increase ground-level ozone (providing more opportunity for the formation of NO_2) and exacerbate the symptoms of chronic lung conditions. High temperatures can also bring on heart or respiratory failure or dehydration, particularly amongst the elderly.

6.5 AQAP3 Framework

The key components of AQAP3 are:

6.5.1 Headline Measures

These are the direct actions that can be taken now to reduce emissions from vehicles frequently entering the AQMAs and reduce incidence of vehicle idling. The main headline measures are:

Measure 1: Development and implementation of a Clean Air Zone (CAZ)

The development of the ***Clean Air Zone (CAZ)*** replaces the concept of a corridor based Low Emission Zone (based on Euro emission standards) originally included in the LES.

Within the CAZ bus emissions will be regulated based on the frequency at which individual vehicles enter the inner ring road. Ultra low emission bus standards will be introduced for the most frequent buses (entering the CAZ 10 times per day or more) ensuring that by 2018 over 80% of bus movements in York will be made by ultra low emission buses. Less frequent buses will be initially exempt from the ultra low emission CAZ requirements but will be set a more gradual timetable for emission improvement based on Euro emission standards. The CAZ will be developed in partnership with local bus operators and if necessary enforced through a Traffic Regulation Condition (TRC).

The move away from a Euro emission standard based LEZ reflects the evidence base developed through the York Low Emission Zone feasibility study and the York electric bus feasibility study. These have clearly shown that both the frequency of a bus service and the emission standard of the vehicles operated on the service are important factors for consideration in the development of any bus emission reduction strategy. At this stage the CAZ proposals are only for buses as these are a locally defined fleet for which emission standards can be regulated by the Traffic Commissioner through the use of a Traffic Regulation Condition (TRC).

Expansion of the CAZ concept to other vehicles that do not form part of a local fleet or make routine journeys through the city would require the use of a camera or manual based enforcement system. Implementing a scheme of this type would involve considerable costs and is not a cost-effective option for the city at the present time.

In the longer term other fleet improvement measures included within AQAP3 may make it possible to roll out the CAZ requirements to other ‘fleet’ vehicles such as taxis, delivery vehicles and the CYC fleet. For example, entry into the CAZ could require use of a certain type of fuel and/or specified Eco-star rating. The first step will be to provide the support and encouragement needed to increase the uptake of low emissions vehicles within these fleets. This is the main priority for AQAP3.

Measure 2: Development and implementation of anti-idling measures

The LES recommended a feasibility study to be undertaken to investigate the incidence of idling in York and to consider the cost-effectiveness of anti-idling

enforcement measures. The anti-idling measures included in AQAP3 directly reflect the findings of this study.

In the first instance anti-idling measures will be limited to promotional and educational work with transport operators to highlight both the economic and environmental impacts of idling. This will be supported by the provision of anti-idling signage in some locations, particularly those locations used by coach operators.

Promotional and educational work was highlighted as the most cost-effective approach to reducing idling emissions in the anti-idling feasibility study and has been proven to work in many other cities. The anti-idling signage will be provided in direct response to concerns about idling coaches raised during the public consultation on the draft AQAP3.

Consultation on the draft AQAP3 identified some support for use of anti-idling enforcement powers by CYC. However the costs associated with adopting and using such powers are significant and are likely to be of limited use once the majority of the bus fleet is converted to electric under the terms of the planned CAZ. The need for anti-idling enforcement powers will be kept under review during the lifetime of AQAP3.

Measure 3: Further development of Eco-stars fleet recognition scheme

Eco-stars is a fleet recognition scheme aimed at recognising good environmental practice by fleet operators. The York Eco-stars scheme was launched in March 2012 and currently has over 50 members.

Currently Eco-stars is a completely voluntary scheme. This can make it difficult to engage with smaller local operators and those whose fleets are unlikely to obtain the higher star ratings. Linking the Eco-star scheme to local procurement requirements could encourage a greater range of operators to sign up. In the first instance only membership of the Eco-stars scheme would be a mandatory requirement with potential to extend the scheme later to ensure certain service providers meet minimum Eco-stars standards. Further development of the ECO-stars scheme will be dependant on additional funding being found to support the scheme.

6.5.2 Future Measures

These are measures that will be rolled out over the next 6 years to help reduce emissions. In many cases work on these measures has already commenced.

Measure 4: Planning and delivery of CNG refuelling infrastructure in York

Vehicles that operate on compressed natural gas (CNG) offer considerable reductions in emissions of NO_2 and particulate when compared with conventional diesel engines. CNG is the same fossil fuel derived methane gas that is used in domestic heating and cooking. Under the right pressure conditions (available at limited locations) CNG can be taken directly from gas mains and put into vehicles at purpose built re-fuelling stations.

Methane gas can also be derived from the anaerobic digestion of waste, under these conditions it is referred to as 'bio-methane' and offers considerable additional CO_2 savings above the use of natural gas. Gas mains already routinely carry a blend of natural gas and bio-methane.

CNG and/or bio-methane offer a lower emission solution than diesel for vehicles that travel long distances and / or have power requirements that currently exceed those deliverable through battery based electric technology. Gas operated vehicles are generally also much quieter then their diesel counterparts. HGVs and long distance bus services are generally suited to the use of CNG.

A CNG feasibility study has been undertaken for York and a site suitable for the development of a gas refuelling plant has been identified within the emerging draft Local Plan. Discussions have already commenced with potential site users and third party investors. The identified site also offers scope for development of an anaerobic digester (for the production of biomethane) and freight consolidation opportunities.

Measure 5: Reducing emissions from freight

A freight improvement study was completed in 2013. The study made recommendations under the following headings:

- Access restrictions
- Loading and unloading facilities
- Out of hours deliveries
- Low emission zone
- Delivery and service plans
- Marketing , promotion and best practice
- Freight consolidation

The recommendations from the freight improvements study will be incorporated into the delivery programme for LTP3.

Measure 6: Development and implementation of LES based planning guidance

New development often results in increased vehicle trips and emissions. Previously air quality assessments have only been undertaken for the largest developments and have focused on changes in ambient air pollution concentrations. There are very few developments that considered in isolation can be shown to give rise to a 'significant' change in ambient air pollution concentration, yet almost every development has a 'hidden' emission increase associated with it. If not controlled this emission 'creep' gives rise to cumulative impacts on local air quality and may counteract the effectiveness of other AQAP emission reduction measures.

The LES recommended the development of new LES based planning guidance to address the issue of emission 'creep'. The policy hooks to support the development of this guidance have been incorporated into the emerging draft Local Plan and a new LES planning guidance document has been prepared (Annex 5). The York LES planning guidance builds upon best practice included in similar documents already being used in West Yorkshire, West Midlands, Sussex and Mid-Devon and is likely to form the basis of a new national DEFRA planning guidance note.

Under this new planning system most developments will be required to make some provision for electric vehicle recharging and ensure suitable emission controls during the development phase. Larger developments will be required to undertake emission impact assessments and provide suitable on-site emission mitigation measures to off-set the additional emissions. Contributions towards city wide emission reduction projects may also be sort in some instances.

Measure 7: Reducing emissions from taxis

The current focus of emission reduction work with taxis is the successful local incentive scheme through which taxi drivers can access grants to help upgrade their vehicles to lower emission alternatives. The incentive scheme gives 10% discount off a hybrid taxi capped at £2000 or 15% off a plug-in taxi capped at £3000.

When the incentive scheme began in 2013 there was only 1 hybrid (Euro 4) taxi in the entire taxi fleet (approximately 755 vehicles). This has now increased to over 50 (Euro 5+ hybrid or electric taxis).

The taxi and private hire trade are regularly consulted and made aware of the offer and there is still considerable interest in the scheme. This project has produced significant financial and emissions savings for taxi drivers. Funding through the Local Sustainable Transport Fund (LSTF) is available for a further 13 to 14 taxis in 2014/15 and 15 to 16 taxis in 2015/16.

OLEV has recently created an 'Ultra Low Emission Taxi' fund of value £20 million to incentivise the uptake of ULEVs in the sector by discounting purchase price in a similar way to the York pilot scheme and includes infrastructure funding.

A review of local taxi licensing emission standards has recently taken place. It is to be recommended to members that all new taxis should meet a minimum Euro 5 standard for petrol and hybrid vehicles and a Euro 6 standard for diesel vehicles. The adoption of these recommended minimum emission standards will be subject to local consultation with the taxi trade prior to a report to the taxi licensing committee.

Measure 8: Planning and delivery of strategic EV charging network

The Office for Low Emission Vehicles (OLEV) strategy '*Driving the Future Today*' states that by 2040 almost every new car and van in the UK fleet will be an ultra low emission vehicle[24]. This means that vehicles that operate solely or partially on

[24] OLEVs definition of an Ultra Low Emission Vehicle (ULEV) is one which emits less than 75g/km of CO_2

electric will form an increasing proportion of the vehicle fleet and it is anticipated that the demand for EV recharging points will rise considerably in coming years.

York has already made significant progress towards a strategic EV charging network in the city and is leading the way within the Yorkshire region. Eleven rapid charge and twelve fast charge 'pay as you go' public EV charging points are already available in public car parks in York and at Park & Ride sites (each able to charge two vehicles simultaneously). There are around 20 additional privately owned sites at hotels, supermarkets and other developments around the city. Further publicly accessible EV charging points have been achieved through a planning condition at the Vanguard site and Clifton Moor development and many other privately owned recharging points have been conditioned for delivery at domestic properties.

The draft AQAP3 framework sets out timescales for further EV charging provision in York and the development of a strategic EV charging map against which the need for further developer based EV provision will be considered.

Measure 9: Reducing emissions from CYC fleet

CYC must lead the way in reducing emissions of local air pollutants and CO_2 from its own vehicle fleet and from those of contractors. Over the past three years grey fleet mileage (that undertaken by staff in their own vehicles for which mileage payments are made) has been cut by 34 per cent and transport carbon dioxide emissions reduced by 47%. This has been achieved mainly by transferring staff journeys to smaller petrol and hybrid car club vehicles. In recognition of this CYC was recently awarded the EST Fleet Heroes Award for grey fleet management.

CYC is now moving towards the provision of electric vehicles for staff use with infrastructure to support 12 CYC electric pool vehicles recently installed at the council depot. These vehicles will be in addition to the fully electric Nissan Leaf pool car already in use. Other low emission measures being pursued by CYC include trial of a 'Light Foot' system to warn against excessive breaking and acceleration, a programme of ECO-driver training for CYC staff and further measures to reduce grey fleet use and minimise overall mileage and emissions.

6.5.3 Supporting Measures

These are measures that provide a more indirect route to emission reduction or are already routinely delivered and monitored via other council strategies and programmes. They fall into three broad categories:

1. Those that will help to win '*hearts and minds'* and encourage local engagement in delivery of AQAP3 measures.
2. Those that will lead to congestion reduction and wider transport improvements
3. Those that will reduce emissions from non-transport sources

Measure 10: Marketing and communications strategy

Delivering a clear message to the public about the aims and objectives of the LES and how they can engage in emission reduction is an essential aspect of the AQAP3 delivery programme.

A marketing and communications campaign is planned that will:

a) Highlight the impacts of vehicle pollution on health
b) Provide advice on how to choose vehicles that are better for local air quality and cheaper to operate
c) Become a mechanism for promoting incentives available to operators of low emission vehicles (as and when these are developed)

This campaign will support and build upon the existing I-travel York campaign that promotes sustainable travel http://www.itravelyork.info/

Measure 11: Local incentives for low emission vehicles and alternative fuel use

As low emission vehicles and associated recharging / refuelling infrastructure become more prominent in the city the next phase of LES/AQAP3 development process will focus on encouraging the wider uptake and use of the facilities provided. Development of the incentive plan has not yet commenced but it is likely to include a package of financial incentives and rewards for the use of low emission vehicles. These might be linked to access rights, parking charges, parking locations, shopping vouchers, attraction entrance fees etc. The incentive plan will be closely linked to the marketing strategy and must be sustainable in the longer term as the numbers of electric vehicles grows and more people want to access the incentives provided.

Measure 12: Attracting low emission industries, business and jobs to York

York is looking to create a designated ‘green hub’ development area to encourage investment by ‘green’ and ‘low emission’ industries, in line with the new council plan. The measures in AQAP3 will support this ambition.

Already a recognised leader in the delivery of low emission measures, York has the potential to attract growth in the areas of low emission vehicle sales and maintenance, EV charging point manufacture, installation and maintenance, CNG refuelling, production of bio-methane from waste and low emission tourism. The electric buses recently introduced in York are Optare vehicles built locally at Sherburn in Elmet, an example of how the LES has already helped to support manufacturing jobs within the Leeds City Region.

Measure 13: Modal shift and network improvement measures

The LES and the measures included in this new AQAP3 are focussed predominantly on tackling emissions from vehicles that remain on the network after development control and sustainable transport planning measures have been applied. However, measures to reduce trips, encourage modal shift and reduce congestion are the most important first steps in any air quality improvement programme as recognised in the previous AQAP1 and AQAP2.

Local Transport Plan (LTP3) remains an intrinsic part of the overall approach to air quality improvement and emission reduction in York. The air quality improvement, trip reduction and congestion reduction targets and indicators included in LTP3 are equally important to air quality action planning in York as the 'additional' LES based measures presented here. For completeness and to avoid duplication only the major local transport based schemes that support air quality action planning in York have been included in this revised AQAP3. Further information on trip reduction, modal shift and congestion reduction measures can be found in LTP3 available at the following link
http://www.york.gov.uk/info/200230/ltp3/319/ltp3/3

Measure 14: Other air quality improvement measures

Whilst traffic is the main source of air pollution in York, industrial and domestic emissions also contribute to the total emissions and resultant air quality in the city. CYC Public Protection officers help to minimise the impact of these by:

- Controlling emissions from some industrial premises (IPPC)
- Enforcing smoke control orders (domestic emissions)
- Prevention of dark smoke emissions (Clean Air Acts)

Additionally, the Environment Agency regulates emissions to air from larger industrial processes in the city.

Research suggests that once released into the environment, some pollutants can be removed through the use of 'green infrastructure'. Opportunities for the use of green infrastructure in York as a means of removing air pollutants have not yet been fully exploited. AQAP3 therefore includes a recommendation to introduce more green infrastructure into the city.

6.6 Prioritisation of AQAP3 measures

Guidance on air quality action planning requires that the measures in an AQAP should be ranked and prioritised based on their cost and overall benefit for local air quality.

The measures included in AQAP3 have been assessed as follows:

Stage 1

Individual measures were assessed in terms of their impact on the following criteria to ensure they were suitable for inclusion in AQAP3:

- Local economy
- Feasibility
- Congestion
- Local Air Quality
- Greenhouse gas emissions
- Planning and Development
- Socio-economic impacts
- Communities
- Public perception
- Other benefits

In each case the impact was described as either Positive, Neutral or Negative using the following key.

Impact	
	Positive impact
	Neutral impact
	Negative impact

Where a measure was determined to have a negative impact on any of the criteria consideration was given as to whether the positive benefits outweigh any negative implications before progressing to stage 2. The results of the stage 1 screening can be found in Annex 3.

Stage 2

Individual measures were assessed further in terms of delivery cost, impact on air quality in AQMAs and total emission reduction potential.

The cost assessment took into account both capital and revenue costs. Each measure was defined as falling into one of the following cost categories

Cost		Description
£	< £10,000	Low cost
££	>10,000 < 50,000	Medium cost
£££	>50,000 < 100,000	High cost
££££	>100,000	Very high cost

The air quality impact in AQMAs and total emission reduction potential were identified as follows:

Impact	
✓✓✓	High impact
✓✓	Medium impact
✓	Low impact

Those measures that have the potential to yield high air quality and emission reduction benefits will be given priority in the AQAP3 delivery process. Where measures have similar air quality and emission improvement potential the lower cost options will be prioritised if necessary. Chapter 7.0 summarises the ranked AQAP3 measures.

AQAP3 Framework and Measures

7.0 AQAP3 Framework and Measures

The following tables provide a summary of the AQAP3 measures ranked according to the methodology outlined in Chapter 6.

TABLE 6A: DIRECT ACTIONS THAT CAN BE IMPLEMENTED NOW TO REDUCE EMISSIONS FROM EXISTING VEHICLES									
Number	**Measure**	**AQMAs affected**	**Timescale**	**Cost**	**Expected AQ impact in AQMAS**	**Expected overall emission impact**	**Progress**	**Next steps**	**Responsibility**
1	Development and implementation of a Clean Air Zone (CAZ)	City Centre Fulford Salisbury Terrace	2015 to 2021	**££££** (High costs are associated with purchase or retrofitting of vehicles not the physical implementation of the CAZ. Anticipated that vehicle costs will be offset by grant applications)	✓✓✓	✓✓✓	Supporting feasibility studies completed Electric bus technology operational in York	Development of TRC	CYC Air quality CYC Sustainable Transport
2	Development and implementation of anti-idling measures	City Centre	2015 to 2016	**££**	✓✓	✓✓✓	Feasibility study completed	Development of implementation programme	CYC Air quality CYC Sustainable Transport
3	Further development of Eco-stars fleet recognition scheme	City Centre Fulford Salisbury Terrace	ongoing	**£££**	✓✓	✓✓✓	Eco-stars scheme launched March 2013 First target of 40 members achieved June 2014 Cost benefit assessment of Eco-stars in York Dec 2014	Linking of Eco-stars to local procurement	CYC Air quality CYC Procurement TTR Ltd

TABLE 6B : PLANS AND ACTIONS THAT WILL BE IMPLEMENTED OVER THE NEXT 6 YEARS TO REDUCE EMISSIONS									
Number	**Measure**	**AQMAs affected**	**Timescale**	**Cost**	**Expected AQ impact in AQMAS**	**Expected overall emission impact**	**Progress**	**Next steps**	**Responsibility**
4	Planning and delivery of CNG refuelling infrastructure in York	City Centre Fulford Salisbury Terrace	ongoing	**££££** (It is anticipate that the majority of these cost will be met by third party investors)	✓✓	✓✓✓	CNG feasibility study completed Possible CNG refuelling site identified in Local Plan Potential investors identified	Encourage and facilitate investment at the site	CYC Air quality CYC City Development Make it York
5	Reducing emissions from freight	City Centre Fulford Salisbury Terrace	ongoing	**££££** (It is anticipated that the majority of the freight improvement costs will be met by third party investors e.g freight consolidation centre)	✓✓	✓✓✓	Freight improvement study completed	Develop and implement freight action plan	CYC Sustainable Transport
6	Development and implementation of LES based planning guidance	City Centre Fulford Salisbury Terrace	2015 to 2016	**££**	✓	✓✓✓	LES planning principles embedded into draft Local Development Plan Review of existing LES planning guidance undertaken Development of new York LES planning guidance completed June 2015	Application, testing and review of new LES planning guidance at a local level	CYC Air quality CYC City Development

TABLE 6B CONTINUED

Number	Measure	AQMAs affected	Timescale	Cost	Expected AQ impact in AQMAS	Expected overall emission impact	Progress	Next steps	Responsibility
7	Reducing emissions from taxis	City Centre Fulford Salisbury Terrace	ongoing	**£**	✓✓	✓✓	Local financial incentive for hybrid and electric taxis developed and implemented. Review of taxi licensing emission standards completed York's largest private hire firm have committed to providing a low emission fleet	Consultation with taxi trade on proposed new emission standards and report to licensing committee by April 2016 ULEV bid for further low emission taxi funding by end of 2015	CYC Air quality CYC Taxi licensing
8	Planning and delivery of strategic EV charging network	City Centre Fulford Salisbury Terrace	ongoing	**£** (The initial EV charging network has already been implemented using grant funding. Future costs for infrastructure will be met through grant applications and third party investment)	✓	✓✓	EV charging provided at 12 hotels in conjunction with Zero Carbon World Public Pay as You Go EV charging network implemented in CYC car parks 11 Rapid charging points deployed	Identify further EV charging requirements and identify delivery mechanism	CYC Air quality
9	Reducing emissions from CYC fleet	City Centre Fulford Salisbury Terrace	ongoing	**£££££** (High costs are associated with purchase of vehicles. Some of this may be offset by accessing low	✓	✓✓	CYC grey fleet trips already reduced by 34% (diverted to car club) Electric leaf pool car in operation and a further 24 vehicles on	Trial light foot system Eco-driver training for staff Further route	CYC Fleet Manager

				emission vehicle grants)			order. EV charging for pool cars installed at CYC depot.	optimisation and reduction in grey fleet trips	

TABLE 6C PLANS AND ACTIONS THAT WILL ENCOURAGE LOCAL ENGAGEMENT IN AQAP3 DELIVERY

Number	Measure	AQMAs affected	Timescale	Cost	Expected AQ impact in AQMAS	Expected overall emission impact	Progress	Next steps	Responsibility
10	Marketing and communication strategy	Supports AQAP delivery	2014 to 2016	**££**	✓	✓✓	Communication strategy under development with Public Health	Completion and delivery of communication strategy	CYC air quality CYC Public Health CYC Marketing and Communications
11	Local incentives for low emission vehicles and alternative fuel use	City Centre Fulford Salisbury Terrace	2016 onwards	**££**	✓	✓✓	Currently focusing on delivery of low emission infrastructure and uptake of low emission vehicles in fleets e.g. buses, taxis, HGVs. Incentives to encourage uptake of low emission vehicles by the general population will follow. A successful public low emission vehicle event was held in April 2012.	Identify staffing and budget resources to support this work	CYC air quality CYC Sustainable Transport CYC Marketing and Communications
12	Attracting low emission industries, business and jobs to York	Supports AQAP delivery	ongoing	**£**	✓	✓	Work has commenced on creation of a 'green hub' development area	Further develop 'green hub' aspirations and identify other ways to create e high value / high productivity jobs in the 'green' business sector	Make It York

TABLE 6D: PLANS AND ACTIONS THAT WILL CONTINUE TO TACKLE CONGESTION AND DELIVER SUSTAINABLE TRANSPORT IMPROVEMENTS									
Number	**Measure**	**AQMAs affected**	**Timescale**	**Cost**	**Expected AQ impact in AQMAS**	**Expected overall emission impact**	**Progress**	**Next steps**	**Responsibility**
13	Modal shift and network improvement measures	City Centre Fulford Salisbury Terrace	Ongoing LTP3 delivery (2011 to 2015 and beyond	**££££** (LTP3 capital programme)	✓✓	✓✓	Implementation of access York Phase 1 scheme – Poppleton and Askham Bar P&R sites Delivery of I-travel York sustainable travel programme	Continued delivery of I-travel York programme Continued delivery of bus improvement programme	CYC Transport Planning

TABLE 6E: PLANS AND ACTIONS THAT WILL DELIVER OTHER AIR QUALITY IMPROVEMENT MEASURES									
Number	**Measure**	**AQMAs affected**	**Timescale**	**Cost**	**Expected AQ impact in AQMAS**	**Expected overall emission impact**	**Progress**	**Next steps**	**Responsibility**
14	Regulation of industrial and domestic emissions	City Centre Fulford Salisbury Terrace	Ongoing	**££** (continued staff resources)	✓	✓✓	Enforcement of relevant air quality legislation is currently undertaken by the Environmental Protection Unit (CANS)	Continued enforcement of air quality legislation within new CANS structure	CYC Transport Planning
15	Provide more green infrastructure in the city	City Centre Fulford Salisbury Terrace	Ongoing	**£**	✓	No emission reduction	The draft York Local Plan Policy GI1 deals with Green Infrastructure in relation to new development. There are plans already in place to develop an Green Infrastructure Strategy in the form of an SPD. A Business Improvement District (BID) is currently being created in York. Improving the existing green infrastructure could be a possible project for this organisation	Develop a green infrastructure SPD Investigate inclusion of green infrastructure in BID programme	City Strategy to produce green infrastructure strategy following adoption of York Local Plan. York BID to consider future activity in relation to green infrastructure provision

Expected impact of AQAP3

8.0 Expected impact of AQAP3

AQAP3 aims to reduce all emissions to air with an emphasis on NO_2 and particulate emissions from traffic (especially diesel vehicles).

Reducing NO_2 is important to ensure compliance with the health based national air quality objectives for NO_2 that are currently breached in some areas of the city.

Minimising particulate emissions (especially PM_{10} and $PM_{2.5}$ arising from diesel vehicles) is essential for the longer term protection of public health and improvement in local health outcome indicators.

The exact emission impact of the air quality action plan is difficult to predict as there are many factors which may influence future emission levels in the city. These include:

- The extent to which the AQAP measures are delivered locally
- The real life on-road performance of individual vehicles on the road (compared with Euro emission standards for new vehicles which are tested under laboratory conditions under set drive cycles)
- The age and rate of replacement of vehicles in York compared with national averages
- Future trip demand on the York road network, influenced by factors such as the state of the economy and development allocations in the draft local development plan (currently unadopted and subject to further change)

Indicative predictions of future emissions in York in 2021 (with and without the AQAP3 measures in place) have been undertaken using:

- DEFRA's Low Emission Factor Toolkit – this enables predictions to be made about future vehicle emissions based on current and future Euro emission vehicle standards
- Locally collected traffic data relating to the age and type of vehicles currently operating in York
- Predictions of future traffic levels in York for 2021 (including development related traffic expected to arise from allocations in the draft Local Plan as it stood at the end of 2014)[25].

[25] Based on total projected long term development targets of an additional 17,503 residential units and 266466m^2 of employment use by 2031. For the 2021 modelling scenario it was assumed that only 8724 housing units and 115,506m^2 of employment use would have been delivered. The modelling also assumes delivery of a number of key transport projects by this date. Targets for new housing provision and site allocations are currently under review and are expected to be reduced. The traffic impact of new development in the city by 2021 is therefore likely to be lower than the modelling undertaken during the development of AQAP3 suggests. New emission reduction figures for AQAP3 will be calculated once revised traffic growth figures for the city become available and these may show compliance with the air quality objectives at all locations in the city by 2021.

- Assumptions about the number of ultra low emission vehicles operating in the city by 2021 based on upper and lower estimates of what the AQAP3 measures may deliver in terms of local fleet changes

8.1 Modelling approach

The Emissions Factors Toolkit (EFT v 4.2) published by Defra and the Devolved Administrations has been used to assess the likely levels of NO_x and PM_{10} reduction from some of the measures included in AQAP3.

City of York Council's strategic transport model (SATURN) was used to estimate Annual Average Daily Traffic flows (AADTs) on each of the road links contained within the areas of air quality technical breach for a 2014 base year and a 2021 future year scenario. The 2021 future year scenario included the predicted traffic impact of planned traffic schemes and development in the city (based on the emerging draft local plan as it stood at the end of 2014 – see footnote on page 62).

A range of traffic composition scenarios for 2021 have been modelled to determine which AQAP3 measures are likely to have the greatest emissions impact. These included:

- Base 2014
- Base 2021Business as usual (no AQAP3 interventions)
- 2021 with various levels of AQAP3 intervention including:
    - 2021 (with 1.5% and 5% electric cars in the fleet respectively)
    - 2021 with 90% hybrid buses in the fleet
    - 2021 with 90% electric buses in the fleet
    - 2021 with various % combinations of electric cars and electric buses

Full details of this modelling study including the major assumptions and full range of modelled scenarios can be found in Annex 4.

8.2 Modelling outputs

8.2.1 Impact of 'business as usual scenario (BAU) – (do nothing)

Table 7 shows the total expected emission change within York's AQMAs under a do-nothing scenario. This is the expected situation if all planned schemes and development continues in the city (as per emerging draft local development plan at the end of 2014) and no further action is taken to reduce vehicle emissions at a local level.

The ‘worst case’ scenario assumes that vehicles in 2021have similar emissions to those in 2014 i.e. the expected national reduction in emissions due to improved vehicle technology does not arise. Under this scenario emissions increase because local traffic levels are expected to increase in 2021 due to development.

The ‘best case’ scenario assumes that national improvements to vehicle emission technology fully meet expectations. Under this scenario emissions decrease because the impact of the traffic level increase will in most cases be off-set and exceeded by the emission improvement per vehicle.

In practice the actual emission levels in the York AQMAs in 2021 (without local interventions) is likely to be somewhere between these upper and lower estimates.

Table 7: Baseline modelling results

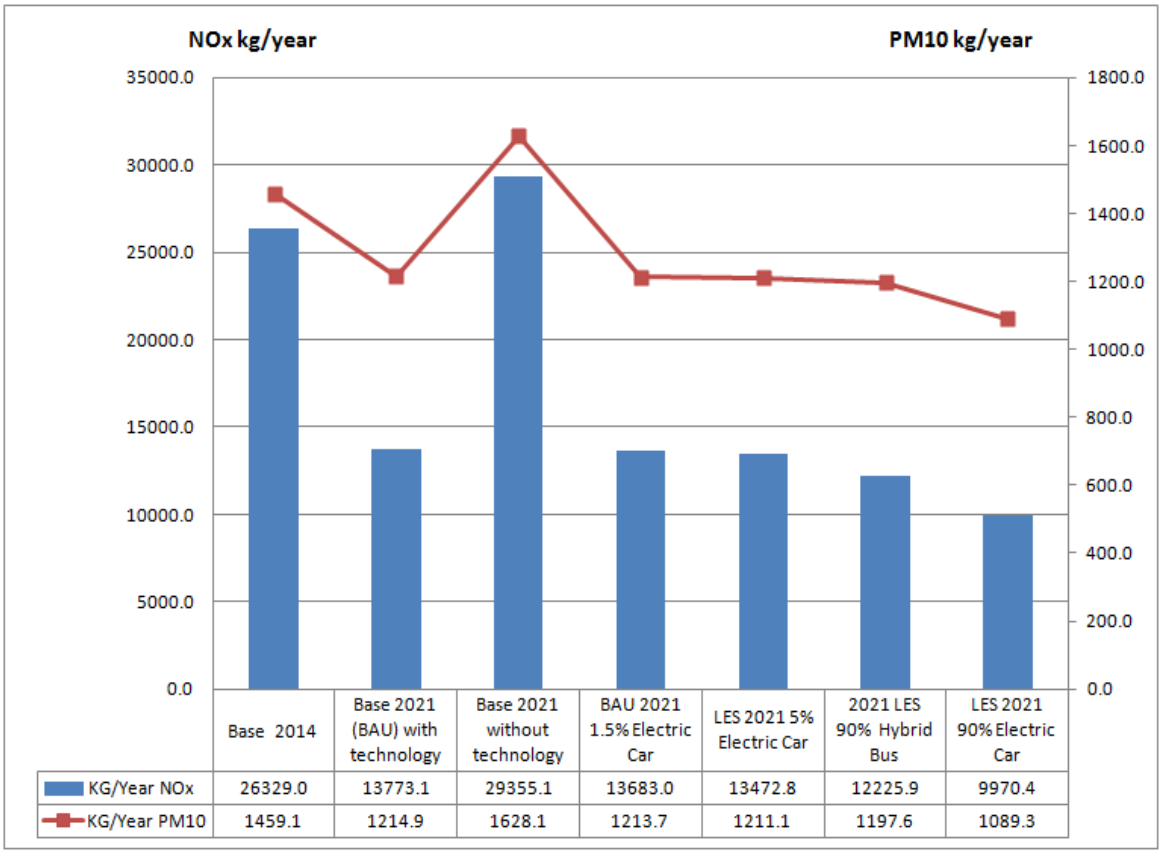
Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)
A	Base 2014	26329.0	1459.1
B	Base 2021(best case)	13773.1	1214.9
C	Base 2021 (worst case)	29355.1	1628.1
A-B	Impact of additional traffic and cleaner vehicle technology in 2021(assuming emission reduction technology works as expected)	12556.0 (47.5% reduction)	244.2 (16.7% reduction)
A-C	Impact of additional traffic in 2021 (assuming national emission technology doesn’t work)	-3026.1 (11.5% increase)	-169.0 (11.6% increase)

Note on table above – figures highlighted in red indicate where emissions have increased relative to the base case. Figures highlighted in green indicate where emissions have decreased relative to the base case.

8.2.2 Impact of 'do-something' scenarios

Figure 23 compares the impact of changes in traffic composition that could be pursued locally through implementation of AQAP3 measures to different extents.

Figure 23: Comparison of different approaches to emission reduction for cars and buses

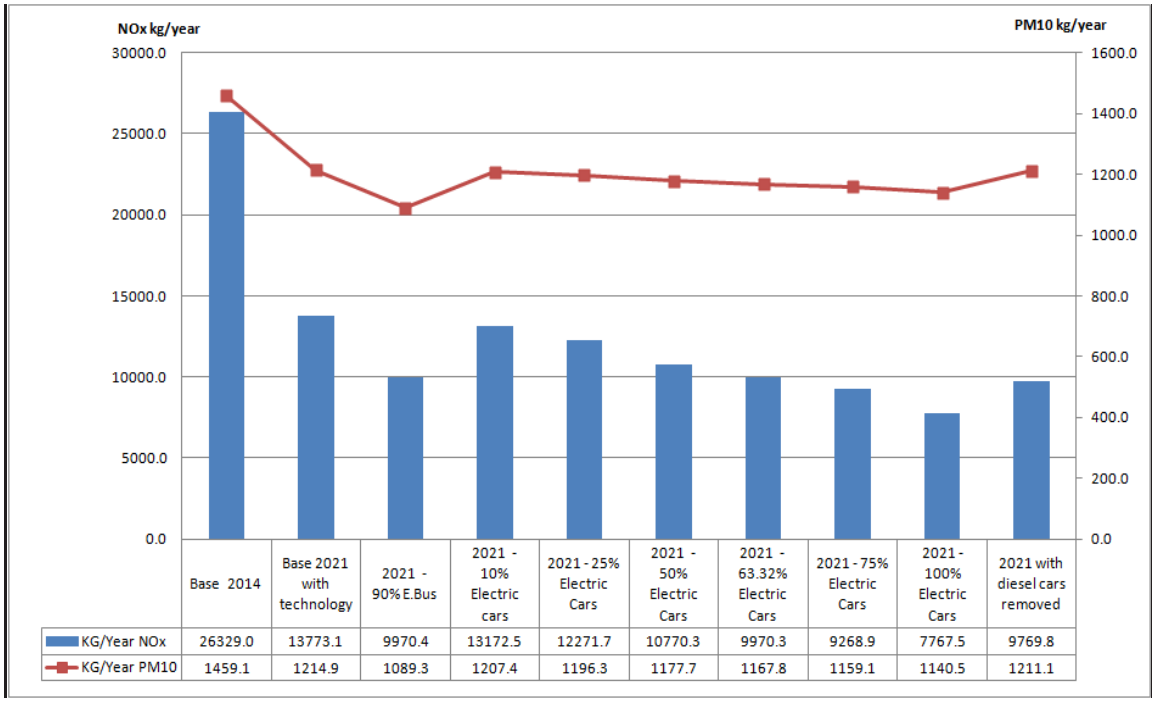


	Base 2014	Base 2021 (BAU) with technology	Base 2021 without technology	BAU 2021 1.5% Electric Car	LES 2021 5% Electric Car	2021 LES 90% Hybrid Bus	LES 2021 90% Electric Car
KG/Year NOx	26329.0	13773.1	29355.1	13683.0	13472.8	12225.9	9970.4
KG/Year PM10	1459.1	1214.9	1628.1	1213.7	1211.1	1197.6	1089.3

When compared to the impact of improved vehicle emission technology at a national level (*Base 2021 (BAU) with technology*) the additional emission impact of local measures is likely to be relatively small. Electric bus scenarios are predicted to yield greater emission reductions than hybrid bus scenarios (for both PM_{10} and NO_x) and converting 90% of the bus fleet to electric is likely to be far more effective than converting a smaller percentage of all cars to electric (even though the actual number of cars would be far higher). This provides strong evidence to support the concept of a bus based CAZ in York and the setting of zero emission standards for the most 'frequent flyer' buses.

Figure 24 further examines the percentage of cars needing to be converted to electric to provide an equivalent emission reduction to that likely to be delivered by the CAZ.

Figure 24: Electric Car and electric buses sensitivity testing



	Base 2014	Base 2021 with technology	2021 - 90% E.Bus	2021 - 10% Electric cars	2021 - 25% Electric Cars	2021 - 50% Electric Cars	2021 - 63.32% Electric Cars	2021 - 75% Electric Cars	2021 - 100% Electric Cars	2021 with diesel cars removed
KG/Year NOx	26329.0	13773.1	9970.4	13172.5	12271.7	10770.3	9970.3	9268.9	7767.5	9769.8
KG/Year PM10	1459.1	1214.9	1089.3	1207.4	1196.3	1177.7	1167.8	1159.1	1140.5	1211.1

The introduction of electric buses is estimated to deliver a 27.6% reduction in NO_x and a 10.3% reduction in PM_{10} compared with a 2021 do-nothing situation (with national technology improvements in place). It can be seen from figure 25 that 63% of the car fleet would need to be converted to electric in order to obtain a NO_x emission reduction similar in magnitude to that achievable through the introduction of electric buses. None of the electric car scenarios are able to deliver the same level of PM_{10} reduction as the electric bus scenario.

As detailed in Annex 4 further modelling work has been undertaken to determine the impact of converting all the diesel cars in the fleet to petrol. It is estimated that by removing the diesel cars a 21% reduction in NO_x emissions and a 0.2% reduction in PM_{10} emissions could be achieved (compared to a 2021do-nothing situation with all diesel cars still in place).

Replacement of diesel cars with petrol alternatives offers scope for significant reductions in NO_x emissions but is unlikely to be as effective at reducing PM_{10} emissions as the widespread introduction of electric buses and cars. The widespread introduction of electric vehicles therefore offers the best opportunity to reduce both NO_x and PM_{10} emissions in York for the purpose of meeting the health based air quality objectives and delivering longer term public health improvements.

8.3 Expected level of compliance with national air quality objectives for NO_2

In February 2014 the European Commission formally launched infraction proceedings against the UK government for breach of NO_2 limit values under the EU Air Quality Directive. This was followed in April 2015 by a UK Supreme Court ruling requiring the UK government to provide new plans to meet the health based nitrogen dioxide air quality objective by the end of 2015 (the result of a 5 year legal battle by Client Earth http://www.clientearth.org/news/latest-news/)

Whilst overall responsibility for complying with the EU air quality obligations remains with the UK government, Defra has written to local authorities warning of possible fines being passed on to those with elevated NO_2 concentrations to pay all or part of the infraction fine, using a discretionary power in Part 2 of the Localism Act. No details have been released to date about how these fines will be imposed, but it is understood these will be recurring annual fines.

To minimise the chance of receiving fines it is essential that CYC can demonstrate that it is taking all reasonable steps to improve air quality and that it has fully assessed the likelihood of complying with the health based national air quality objectives as a result of locally delivered air quality improvement measures. For this purpose DEFRA's Emission Factor Toolkit (EFT) has been used to predict changes in NO_x emission levels in York's AQMA areas in 2021 (compared with a 2014 baseline) for 'do-nothing' and 'do-something' scenarios.

The 'do-nothing' scenario assumes that between 2014 and 2021 the only improvement in vehicle emissions in York will arise from national improvements in vehicle emissions driven by higher Euro emission standards. These estimates include the impact of local traffic growth (associated with the emerging draft Local Plan as it stood at the end of 2014)[26].

The 'do-something' scenario assumes that the proposed AQAP3 measures (including the CAZ) are implemented alongside the national measures such that the equivalent of 90% of the local bus fleet is assumed to be running on electric and 5% of the local car fleet.

The resulting % change in NO_x emissions arising from the 'do-nothing' and 'do-something' scenarios have been compared with the % NO_x reduction needed to meet the health based air quality objectives in each of the AQMAs at the present time (see chapter 4.0). The results of this work are shown in Figure 25.

[26] Traffic growth due to development is currently expected to offset some of the emission benefit that would otherwise arise from national emission technology improvements, but a net reduction in NO_x emissions is still expected at most locations. Housing targets within the draft Local Plan are still under review and the resultant growth in traffic may not actually be as great as that predicted using the 2014 projections. The figures presented here should therefore be considered a 'worst-case' scenario in terms of traffic growth impacts.

Figure 25: Expected level of NO_x reduction under 'do-something' and 'do-nothing' AQAP3 scenarios compared with required level of NO_x reduction to meet the AQ objectives

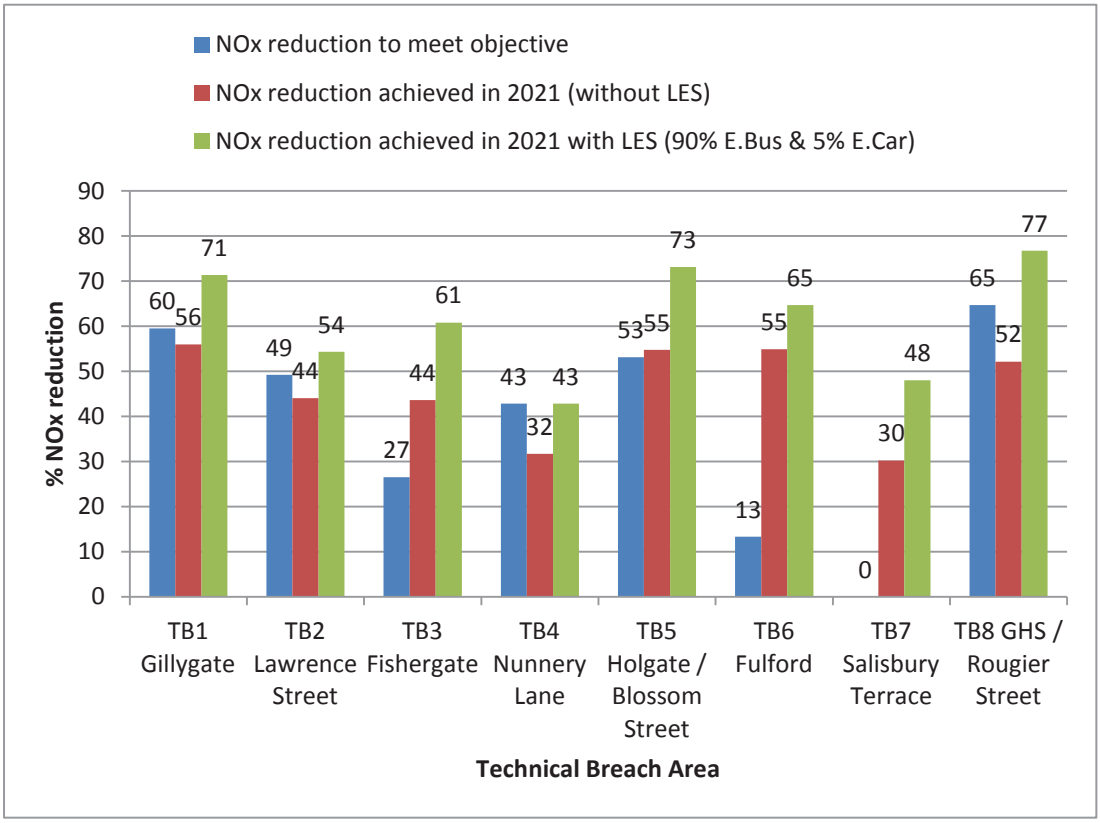


Figure 25 shows that by 2021under a 'do-nothing' scenario (without the AQAP3 measures in place) the health based annual mean NO_2 air quality objective is likely to be met in Fishergate and Fulford Road due to national improvements in vehicle emission technology alone. There is also a possibility that this might be the case for Holgate Road but the modelling suggests a more borderline outcome in this location without the additional impact of local AQAP3 measures.

Recent air quality data for Salisbury Terrace has already shown an improvement in air quality such that the health based annual average NO_2 objective was met in this location during 2012, 2013 and 2014. This improvement is expected to continue further as the AQAP3 measures start to be delivered and revocation of the Salisbury Terrace AQMA may soon be possible.

In Gillygate, Lawrence Street, Nunnery Lane and George Hudson Street the health based national air quality objectives are unlikely to be met through national vehicle improvement measures alone. Here the additional impact of the local AQAP3 measures will be essential to deliver the health based air quality objectives by 2021.

By rolling out AQAP3 to the extent that it delivers an equivalent of 90% electric buses and 5% electric cars, there is potential for the health based annual mean NO_2 objective to be met in all the current AQMAs by 2021. The possible exception to this is Nunnery Lane where the current emissions modelling data suggests that the low emission measures in AQAP3 will not be enough to completely off-set the current predicted development led traffic growth in this area (expected under the emerging draft Local Plan proposals as they stood at the end of 2014). If the housing delivery rates in final Local Plan are lower than those assumed in the current emissions modelling work then the AQAP3 measures may also be able to deliver compliance with the health based air quality objectives in Nunnery Lane. This will however depend on the final allocation of development sites and how fast they are brought forward for development.

Recent monitoring results for the Nunnery Lane AQMA indicate that the majority of the area (including Bishopthorpe Road and Scarcroft Road) currently meets the air quality objectives. There are two remaining 'hotspots' on Nunnery Lane and Prices Lane where very slight exceedances of the annual average NO_2 objective have been recorded in recent years (up to 42µg/m^3). This is due to the regular occurrence of queuing traffic and poor dispersion in these two particular locations.

The emission reduction figures presented here assume that national vehicle emission improvements will be delivered in full and that AQAP3 will be fully implemented at a local level. Past experience has shown that vehicle emission factors for future years have a high level of uncertainty associated with them, particularly in relation to national vehicle emission standards where the standard expected to be met by a new vehicle at point of sale is often not reflected by the actual emissions from that vehicle once it is operational within an urban street environment. Recently it has emerged that emission test 'defeat devices' have been incorporated into some new vehicles and this adds to this uncertainties around vehicle emission levels.

Whilst it is impossible to predict exact levels of air pollution in 7 years time it is certain that the implementation of the proposed AQAP3 measures will deliver significant emission improvements over and above those that will arise under a 'do-nothing' scenario. Without the proposed AQAP3 measures compliance with the health based national air quality objectives in at least four of York's current technical breach areas is unlikely.

AQAP3 is an ambitious, targeted and quantified air quality improvement plan that tackles the main sources of pollution in the city and is supported by a detailed evidence base. It represents the best possible course of action that CYC can be reasonably be expected to take at this time to improve air quality and must be supported by continued action at a national level to reduce vehicle emissions.

AQAP3 Targets and Indicators

9.0 AQAP3 Targets and Indicators

Delivery of the AQAP3 measures over the next three years will be monitored against the targets and indicators shown in Table 10. These will be used as the basis for annual statutory AQAP Progress Reporting to DEFRA and will also be used to keep the local Environment Board up to date on progress with AQAP3 delivery.

In addition to the indicators shown in Table 10 progress with meeting the health based air quality objectives within each of the current AQMAs will continue to be reported annually to DEFRA via Progress reports and update and screening reports. Figure 26 shows the position at the end of 2014.

Figure 26: Compliance with the annual average air quality objectives within each of the AQMAs (to December 2014)

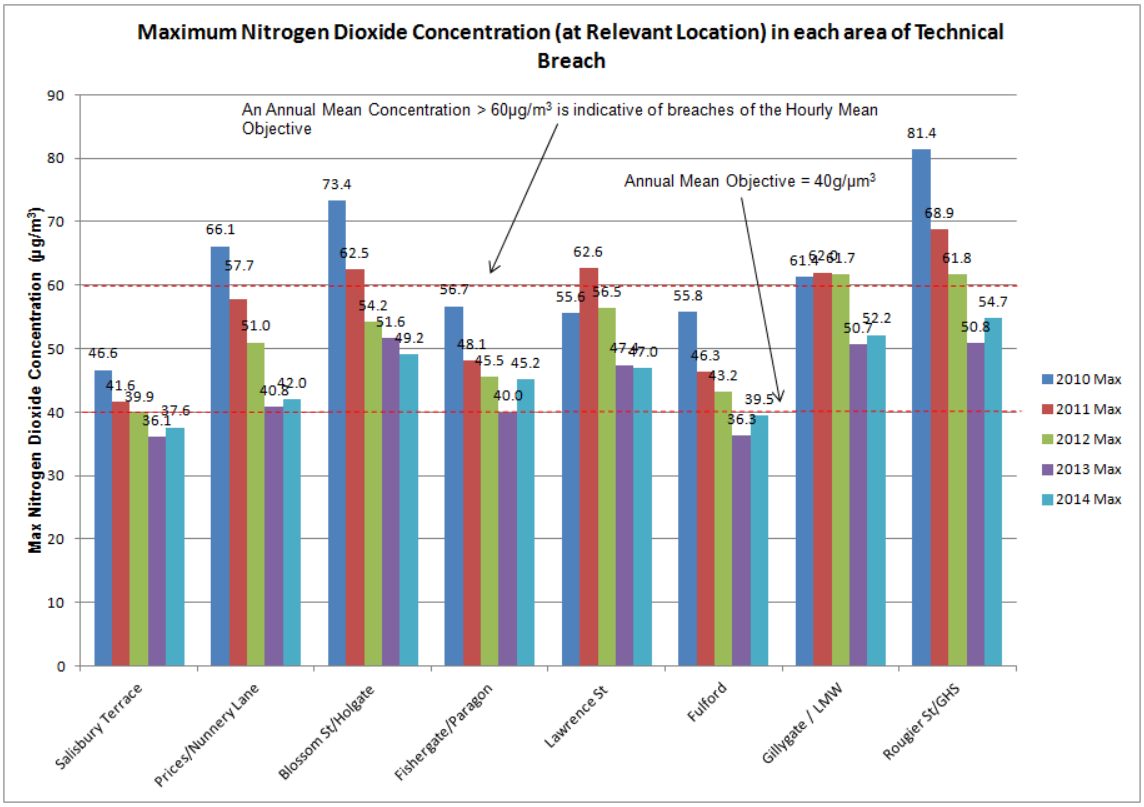


Table 8: AQAP3 Targets and Indicators

Indicator	Intended outcome	Delivery Mechanism	Data source	Baseline		Targets			
				12/13	13/14	14/15	15/16	17/18	18/19
Indicator 1 Number of publicly accessible electric vehicle parking bays available in York. Includes parking bays on private land that are accessible to the general public in their capacity as a customer e.g. supermarket charging points, hotel charging points. (Excludes charging points provided for domestic and employee use only)	Development of a comprehensive EV charging network to support increased uptake of electric vehicles in York	Planning conditions Infrastructure grants Low emission vehicle grants and projects Parking incentives	Internal LES delivery spreadsheet Public information on charging points available at http://www.itravelyork.info/driving/electric-vehicles/electric-vehicle-recharging-network	**20**	**36**	*66* achieved 70	*74*	*100*	*130*

Indicator	Intended outcome	Delivery Mechanism	Data source	Baseline		Targets			
				12/13	13/14	14/15	15/16	17/18	18/19
Indicator 2 Number of registered taxis (private and hackney) which have emissions of less than 100g CO_2/km (currently Band A VED) (These are high end targets that assume continuation of hybrid taxi incentive scheme and development of new taxi licensing policy in accordance with AQAP3)	Increase in number of low emission taxis registered in York (Hackney and Private Hire)	Taxi incentive scheme Development of taxi emission strategy	CYC taxi licensing database	**1**	**13**	*35* achieved 44	*61*	*114*	*208*
Indicator 3 Number of electric buses operating in York (These are high end targets assuming CAZ is introduced and electric buses become mandatory for P&R operations after 2017 when contracts are due for	Increase in number of zero emission buses operating in York	Implementation of Clean Air Zone (CAZ) Joint funding bids with local bus operators	QBP contacts	0	8	*14* achieved 14	*16*	*40*	*90*

Indicator	Intended outcome	Delivery Mechanism	Data source	Baseline		Targets			
				12/13	13/14	14/15	15/16	17/18	18/19
renewal)									
Indicator 4 Number of LGV and cars in CYC fleet with which have emissions of less than 100g CO_2/km (currently Band A VED. Includes car club vehicles block booked for CYC use during office hours.	Increase in number of zero and low emission vehicles within CYC fleet	Procurement of single provider for pool cars. Procurement will be based on successful provider using all EV or Hybrid vehicles. To be implemented early in 2015/16 In 17/18 a number of the LCV vehicles in building repairs are due for replacement. Trials show that EVs and hybrids fit this portfolio very well.	CYC Fleet management	-	10	*32* *achieved 32*	*32*	*72*	*80*

Indicator	Intended outcome	Delivery Mechanism	Data source	Baseline		Targets			
				12/13	13/14	14/15	15/16	17/18	18/19
Indicator 5 Number of fleets signed up to York ECO-stars scheme (Future targets will be set once funding for continuation of ECO-stars scheme has been confirmed.)	Increase in number of fleet operators accessing free advice on how to reduce emissions from their vehicles	Continued expansion of York ECO-stars scheme Linking of ECO-stars membership to CYC service procurement	Eco-stars members database	14	34	*53* achieved 53	TBA	TBA	TBA
Indicator 6 Annual average NO_2 concentration measured within city centre AQMA (This is the average result obtained across a number of fixed monitoring locations in the city centre. Annual average concentrations at individual sites will vary from this figure and may still be in excess of 40ug/m^3 by 2019. Indicator already used for monitoring LTP3 progress)	City wide compliance with health based annual average NO_2 air quality objective	AQAP3 and LTP3 implementation	LTP3 funded diffusion tube monitoring in city centre AQMA (fixed locations)	40	34	*34* achieved 35	*32*	*31*	*30*

AQAP3 Consultation

10.0 Consultation process

As detailed in Chapter 6 the majority of the measures included in AQAP3 have been drawn from LTP3 and the LES. Both these documents were subject to extensive public consultation both internally and external to CYC.

A public consultation on the first draft of AQAP3 was undertaken from 21 November to 2 January 2015. An online questionnaire and electronic version of the draft AQAP3 were made available on the CYC website and the consultation period was advertised locally via a general press release, the main council website, JorAir and Buzz (CYC staff magazine). Posters, copies of the draft AQAP3 and copies of the questionnaire were also placed in all the York libraries and at West Offices reception.

Additional email notification of the consultation was sent out directly to:

- all statutory consultees
- all local authorities within the Yorkshire region
- local health professionals (including NHS practitioners and members of the Health and Well being board)
- bus operators
- taxi operators
- local 'Breathe Easy' group
- University of York and University of Leeds
- Business / other stakeholder contacts from previous LES consultation work
- consultants involved in the LEZ, anti-idling and electric bus feasibility studies
- members of the Low Emission Strategy Partnership (LESP)
- air quality journals

A full report on the response to the public consultation was taken to York members in September 2015.

The main changes made to this AQAP3 document as a direct result of the draft AQAP3 consultation responses are:

- Better recognition of the role green infrastructure can play in removing pollutants from the environment

- A commitment to further investigate the provision of anti-idling signage at some locations in the city

- Further clarification that AQAP3 builds upon, but does not replace, the sustainable transport and congestion management programmes already in

place in the city and that walking, cycling and public transport improvement schemes remain an essential part of York's approach to local air quality improvement.

During the refining of the AQAP3 measures CYC officers have attended a number of Quality Bus Partnership (QBP) meetings to disseminate information about York's LEZ study and electric bus project and to commence initial discussions around the Clean Air Zone (CAZ) concept. CYC will continue to work in partnership with local bus operators to develop and deliver the CAZ and anti-idling aspects of AQAP3.

The development of AQAP3 has also resulted in closer links being established with colleagues in public health, economic development, fleet management, taxi licensing and marketing and communications. Colleagues in these areas will continue to be consulted on the AQAP3 measures as they are further developed and implemented.

Annex 1

Overview of feasibility studies supporting the development of the draft AQAP3 framework

York Low Emission Zone Feasibility Study (July 2013)

Halcrow and Institute of Transport Studies (University of Leeds)

What is a LEZ?

1. A LEZ is an area where only vehicles meeting a specified emission standard are allowed to enter. Vehicle emission standards are set by the EU: new vehicles have to meet increasingly more stringent emission standards for specific pollutants over time. Oxford and Norwich already operate LEZs for buses. London has a much larger LEZ which applies to large vans, minibuses, buses and HGVs. Brighton has also recently introduced a LEZ. A large number of other local authorities are currently undertaking LEZ feasibility studies. These include the West Yorkshire Integrated Transport Authority (Bradford, Calderdale, Kirklees, Leeds and Wakefield) and Sheffield City Council.

Why was a LEZ feasibility study undertaken for York?

2. Buses are known to be responsible for over 40% of the road transport derived NO_2 in some areas of York even though they typically only make up about 3% of the total vehicle fleet. They are also responsible for high levels of diesel particulate emissions for which there is no known safe level. As buses have a disproportionately high impact on NO_x emissions, reducing emissions from buses is a priority for AQAP3.

3. CYC commissioned a LEZ feasibility study in November 2011 to investigate the level of air quality improvement that might be achievable through the creation of a low emission bus and coach corridor in the city centre. This project was partially funded from a DEFRA air quality grant.

How was the study undertaken?

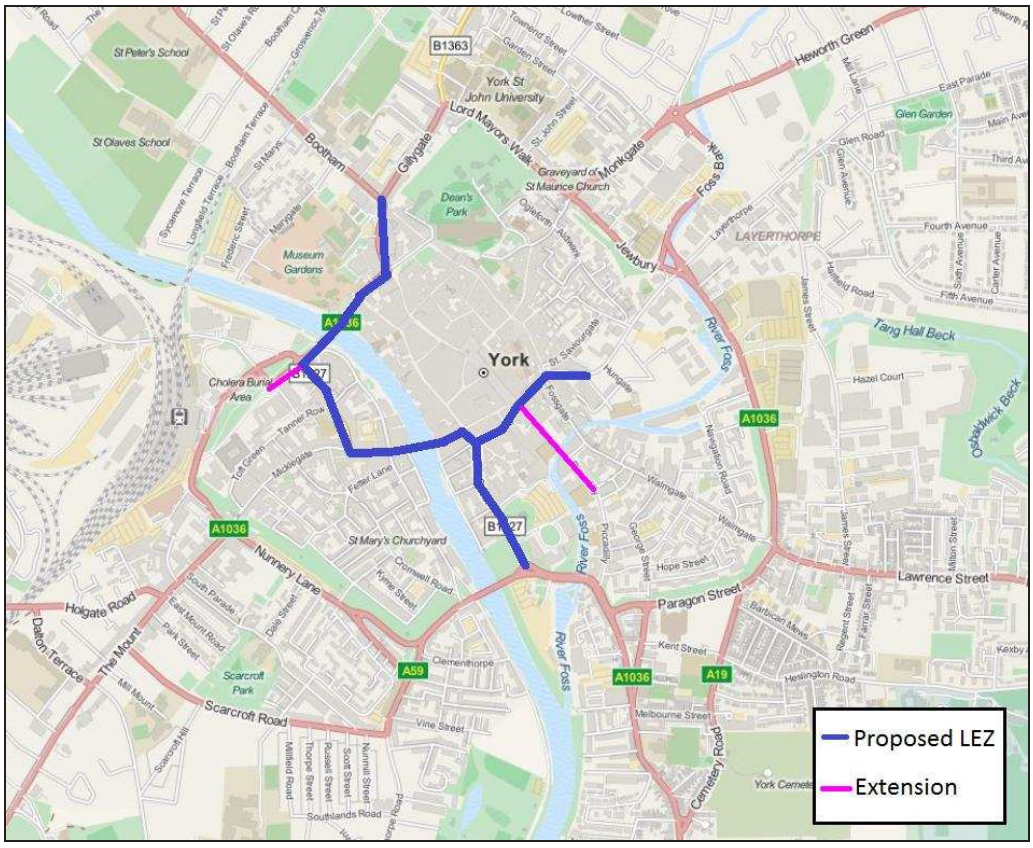
4. The project was undertaken in conjunction with Halcrow and the Institute of Transport Studies (ITS) at the University of Leeds. The study used a traffic micro-simulation model (PARAMICS) linked to a detailed emissions model (PHEM) to allow emissions from individual vehicles on the network to be modelled. The model could take account of factors such as the age of the vehicles, the number of stops made along the route and the level of congestion encountered along a typical journey. The emission factors used by the model were linked to real life measured bus emissions making this study one of the most detailed LEZ studies undertaken in the UK to date. For the majority of the modelled scenarios an air pollution dispersion model was also used to predict

what impact reducing emissions from individual vehicles would have on ambient pollutant concentrations in the city.

Scope of the study

5. The area assessed covered 2km of roads in the city centre through which all current scheduled bus services pass through (figure 1). Because most scheduled bus services pass through this small area any LEZ policy applying emission controls to this area would effectively create a city wide LEZ for scheduled bus services. The study also included a cost-benefit analysis which considered the cost to operators and CYC of implementing the LEZ bus corridor and the likely air quality / health benefits that would be achieved.

Figure 1 – Area considered in the York LEZ study



6. The York LEZ feasibility study considered the following scenarios:

   - Euro 3 LEZ for buses and coaches (all bus services in the study area assumed to be upgraded to meet the criteria)
   - Euro 4 LEZ for buses and coaches (all bus services in the study area assumed to be upgraded to meet the criteria)

- Euro 5 LEZ for buses and coaches (all bus services in the study area assumed to be upgraded to meet the criteria)
- A hybrid P&R scenario which could reflect either the use of full electric buses or hybrid diesel-electric buses on all P&R routes (with battery operation within the AQMAs). This scenario was modelled separately from the other LEZ scenarios and could be implemented in conjunction with any of the other scenarios.
- Some further emission scenarios were also run looking at the emission impact of including HGVs in the emission controls (the impact of these on air quality concentrations were not modelled).

Results of the study

7. The study showed that implementation of LEZ style controls in the city for buses and coaches has the potential to significantly reduce average NO_x emissions in the city centre and beyond. LEZ policies restricting access to buses and coaches that did not comply with the Euro 3, 4 and 5 emission standards, were predicted to reduce the total NO_X emitted in the city centre AQMA by 4.0%, 11.8% and 14.3% respectively. If the LEZ policy was widened to also restrict access to all Euro 3, 4 and 5 heavy-duty vehicles (rigid- and articulated-HGVs), average reductions in total NO_X emissions of 5.1%, 13.9% and 18.1% were predicted.
8. However, the impact of LEZ style controls is not consistent across the entire road network. This is because emissions are strongly influenced by the numbers and types of each vehicle operating in a certain areas and the amount of congestion individual vehicles encounter as they move around the network. The predicted change in emissions varied between the different air quality technical breach areas depending on the number of bus and HGV movements in these areas. Rougier Street for example is dominated by bus movements; therefore the bus / coach LEZ scenarios are forecast to deliver much greater reductions in NO_x (e.g. Euro 4 Bus LEZ, ≈26%) and even greater cuts in tail-pipe emissions of PM (e.g. Euro 4 Bus LEZ, ≈43%) on these critical streets than the average figures suggest.
9. The main pollutant of concern in York is NO_2. This can be emitted directly from the back of vehicles (primary NO_2) or can be formed in the atmosphere from nitric oxide (NO). Whilst all the LEZ scenarios predicted a total reduction in NO_x (NO + NO_2), some of the scenarios indicated that they might give rise to an increase in the amount of primary NO_2 . This is because some vehicle emission technology reduces the quantity of NO_x emitted but at the same time increases the proportion emitted as NO_2. On this basis it was found that scenarios

requiring a Euro 3 emission standard would not deliver significant reductions in NO_2 and in some locations could potentially increase the current NO_2 concentrations. All other scenarios were predicted to give rise to slightly lower primary NO_2 emissions than under the current situation.

10. Unlike the NO_x standards, Euro emission standards for PM (Particle Matter), have led to consistent improvements in the on-road emission performance of light and heavy-duty vehicles. All the LEZ scenarios considered were therefore expected to deliver significant PM benefits (including the Euro 3 scenario). As with NO_x the predicted impact of the LEZ scenarios on PM emissions is not consistent across the network with the greatest impacts likely to be in areas that have a high density of bus movements. Rougier Street was predicted to experience a 43% reduction in PM emissions with a Euro 4 emission standard in place for buses and coaches.

11. The introduction of Euro 4 and Euro 5 scenarios for all buses and coaches were predicted to give rise to sizeable reductions in NO_2 at some receptors. However, even with these restrictions in place some exceedances of the UK health based annual AQS objectives and the EU Limit values for NO_2 were still predicted to exist. It is therefore unlikely that blanket Euro 4 or Euro 5 LEZ controls applied to all buses and coaches would deliver the national air quality objectives at all locations in York.

12. The scenario considering the introduction of electric / hybrid P&R buses was shown to have the potential to deliver a reduction in NO_2 of 1.0 $\mu g\ m^{-3}$ across the study area compared with 0.1 μgm^{-3} in the Euro 3 (all buses) scenario to 2.6 μgm^{-3} in the Euro 5(all buses) scenario. This indicates that applying zero emission controls to a small number of frequent bus services could potentially be more effective at reducing NO_2 concentrations than applying a blanket Euro 3 or 4 emission standard across the whole fleet. Whilst a blanket Euro 5 emission standard would be likely to give rise to a greater overall reduction in NO_2 it would require the entire bus fleet to be rapidly upgraded to a Euro 5 standard. This would be difficult and costly to achieve, particularly for smaller operators who normally buy their vehicles second hand.

Electric bus feasibility study July 2013 (ARUP)

Purpose of the study

1. Early results from the York LEZ study indicated that using electric P&R buses within the AQMAs could potentially offer similar or greater reductions in NO_2 concentrations than blanket Euro emission standard controls across the whole bus fleet. The purpose of this study was to examine the feasibility of operating electric buses in York.

Scope of study

2. In January 2013 ARUP were commissioned to :

    - Provide a full review of low emission bus technology (considering both electric and gas powered solutions)

    - Develop a realistic roadmap for introducing low emission buses into York based on matching the real life duty cycles of current services with the most suitable and available low emission technology.

    - Provide an operations and economic analysis to support the proposed low emission bus road map.

Study outcomes

Low emission bus technology review

3. This review has provided a detailed evidence base for the use of electric buses within urban environments. It provides examples of electric buses in use in a variety of different locations and using a variety of different battery and charging solutions. The review includes a case study for the Travel de Courcey Park & Ride site in Coventry. This site is already using three plug-in rapid charge pure electric buses to provide a successful 15 minute Park & Ride service along a 6 mile city centre route (including a number of stops on-route). This is a similar to the service in York using conventional diesel engines.

Development of a low emission bus roadmap

4. The York study identified around 65 scheduled bus routes through the city serviced by approximately 200 buses of varying age and emission standards. It was found that 82% of all bus movements are carried out by only 49% of the buses and that these buses operate on only 20 routes (including all the Park & Rides). As demonstrated by the LEZ study these 'frequent' flyers are having a disproportionate impact on local air quality.

5. Due to their predominantly short, frequent duty cycles the majority of 'frequent flyer' buses operating on the 20 main routes have been found to be well suited to adoption of electric bus technology. Converting these services to electric would offer substantial benefits for air quality as well as 60% reduction in greenhouse gas impact. There would be additional benefits in that noise is greatly reduced and passenger experience enhanced.

6. Those buses which make less frequent journeys or pass through the city as part of a longer journey are not suited to the use of pure electric technology. In these cases hybrid, or even conventional diesel technology remain the most suitable options at the present time. There are also opportunities for the use of gas powered vehicles if suitable refuelling infrastructure is made available in the city.

7. Table 1 shows what is considered to be a challenging but achievable timetable for the introduction of electric buses into the York fleet based on the findings of the ARUP study. This timetable would ensure that by 2017 80% of all bus movements in the city will be made by electric vehicles. The economic analysis carried out in relation to the development of this proposed timetable has shown that there is a commercial case for upgrading buses based on fuel savings alone, however early engagement with bus operators is required if this timetable is to be pursued. The introduction of electric buses into York has already commenced and table 1 has informed the development of the Clean Air Zone (CAZ) proposals (see Annex 2).

Table 1: Timetable for introducing low emission buses into York (Electric Bus Feasibility Study 2013)

Year	Percentage of Bus Movements Electric
2014	6%
2015	8%
2016	45%
2017+	87%

Progress to date

8. Significant progress has already been made towards the widespread introduction of electric buses in York. A brand new P&R site was opened in June 2014 that utilises battery operated electric buses and further electric buses were introduced to the existing Monks Cross P&R site in May 2015. A battery operated electric bus is operational on the University bus route and six city centre tour bus are scheduled for retrofitting with electric drive trains following the successful completion of a demonstration project in 2014. All these projects have been made possible through Greener Bus Fund (GBF) and Cleaner Bus Technology Funds (CBTF). CYC is continuing to work closely with bus operators to bring further low emission buses to the city.

9. It is anticipated that the electric bus feasibility work and the resultant road map for low emission bus technology will help CYC and the relevant bus operators to continue to take maximum advantage of further rounds of GBF and CBF funding. The inclusion of a CAZ in the AQAP3 framework can only strengthen this position as it will allow York to formalise its commitment to cleaner bus technology and provide greater confidence and certainty in the market to bus operators. Whilst the cost of electric bus technology (in the absence of grant funding) currently remains a challenge to operators it is expected that the cost effectiveness of green bus technology will rapidly improve as the cost of battery technology continues to fall and the price of diesel rises. A full copy of the electric bus feasibility study and the roadmap for low emission buses can be obtained on request from public protection.

York idling study

Transport & Travel Research Ltd (January 2014)

Purpose of the study

1. York's LES identified adoption of an anti-idling policy as a potential measure to support emission reduction and air quality improvement. Anti-idling policies aim to prevent unnecessary emissions from stationary vehicles and can take a variety of forms ranging from provision of basic advice and signage through to adoption of anti-idling legislation. In February 2013 CYC commissioned an anti-idling feasibility study to determine the extent of idling emissions in York and to consider the cost-effectiveness of introducing anti-idling policies. The study was carried out by TTR Ltd and funded by a DEFRA air quality grant.

Scope of study

2. TTR-Ltd were commissioned to undertake the following:
    - A review of current scientific evidence in relation to the advantages and disadvantages of switching off an idling engine
    - A review of anti-idling polices in place within other LAs and the legislative powers available to LAs to deal with idling
    - Consultation with operators (bus and HGV) to determine current practice, principles and policy options
    - A survey of observed vehicle idling at a number of key locations in the city
    - A cost benefit analysis of a basic package of anti-idling measures for York

Study outcomes

Scientific evidence to support anti-idling measures

3. The anti-idling study concludes that where a vehicle is expected to be stationary (parked, waiting or loading) for more than 1 minute it is both economically and environmentally advantageous to switch off the engine. In these situations research indicates that it is unlikely that any damage would be caused to the battery above and beyond normal driving behaviour. The report also addressed a number of other 'myths' surrounding the use of anti-idling policies including impact on catalytic convertors, use of ancillary vehicle equipment and requirements to

maintain in-vehicle temperatures. In all cases it was found that solutions exist which can operate alongside anti-idling polices.

Uptake of anti-idling measures by other LAs

4. The study provides many examples of anti-idling measures already in place in other areas e.g. North Lincolnshire, Croydon and Aberdeen. In the majority of cases promotional activity, erection of signs and polite requests by LA officers to switch off engines have been enough to reduce idling.

Consultation with operators

5. During the study consultation took place with operators of Heavy Duty Vehicles (HGV, Bus and Coach).

   Feedback from discussions with freight operators were that:
   - All operators were aware of cost of idling so were conscious of the activity as a negative influence to business;
   - All managers/owners wanted to reduce vehicle idling;
   - Technology is often used to either control or monitor idling;
   - Driver behaviour was recognised as the primary reason for vehicle idling, and raising driver awareness was part of all company policy.

   Feedback from discussions with local bus operators were that:
   - There was awareness of the direct cost of idling to the business;
   - Vehicles always remain idling whilst loading and unloading passengers;
   - Idling during laying over (non-operational periods) was targeted for reduction by some but not all operators;
   - All operators had some automatic shut-down varying between 2 and 7 minutes on their newer vehicles and larger operators had full telematics tracking and reporting on their vehicles, including idling;
   - Some older vehicles are never switched off during the working day due to likelihood of failed re-starting;
   - Vehicles in bus fleets tend to be older than road freight – due to purchase costs – so technology interventions are slower to be introduced.

Feedback from discussions and correspondence with coach operators was that:

- vehicles are reliant on engine power to operate heating and air conditioning. This results in vehicle engines being switched on up to 10-15 minutes prior to passenger loading. Operators stated this was a passenger expectation;
- Telematics were not as widespread as for freight
- Drivers were regularly briefed to minimise idling, but not at the expense of passenger comfort

Idling observations

6. In-depth observations were made of idling vehicles at 10 locations in York including the railway station, coach parks, Memorial Gardens, Coney Street and Rougier Street . Additional surveys were undertaken by observers located on buses travelling along various route throughout the city. These observations concluded that there are currently significant levels of bus and coach idling across the city centre, but less evidence of idling emissions arising from HGVs.

7. At one bus stop and one loading/unloading area outside the railway station in a typical morning period (3 hour, 20 minute observation) the total amount of time all vehicles spent idling waiting at bus, coach and loading bays was equivalent to 6 hours 30 minutes. This is equivalent to 20 g Particulate Matter (PM) and 861 g NO_x, 26.86 kg CO_2 emitted and 10.14 litres of fuel used unnecessarily. When factored across the city and over a year it can be seen that an anti-idling campaign has the potential to result in significant emission and fuel savings.

Cost –benefit analysis

8. An estimate has been made of the costs and benefits arising from one option for an anti-idling campaign which would include 20 street signs, a basic promotion and marketing campaign and minimal enforcement (4 days per month for first 2 months and 2 days thereafter). The option would also include a telephone hotline for public reporting of idling. The anti-idling campaign would focus mainly on buses, would run for a period of 5 years. It would aim to prevent vehicles idling for more than two minutes over the whole network. The benefits of a scheme of this type have been identified in terms of :

    - fuel saving (and value);
    - emissions saving (and value);

An additional benefit is likely to be reduced noise levels but this was outside the scope of the York anti-idling feasibility study.

9. If successfully implemented it is estimated that an anti-idling scheme of this magnitude could yield benefits worth around £200,000 over a 5 year period set against an investment of around £54,000. The possibility of some of this investment coming via the Better Bus Area Fund 2 is being investigated. The majority of this benefit would be to bus operators in terms of fuel savings. If all idling for greater than 2 minutes was anticipated and prevented before the 2 minute period had elapsed benefits would be much greater (in the range of £560,000). In reality benefits are likely to fall somewhere between these two figures. The cost of implementation could be reduced significantly if the enforcement role was undertaken by existing bus monitoring officers and/ or local operators made a contribution towards setting up the scheme.

10. The cost benefit analysis undertaken to date assumes the bus fleet remains a diesel fleet, the reported savings will be less if a large proportion of the fleet are switched to electric services over the coming years as recommended by the electric bus feasibility study. Under this scenario the length and extent of an anti-idling campaign could be scaled down to target in later years only those services expected to be still operating with hybrid or diesel technology.

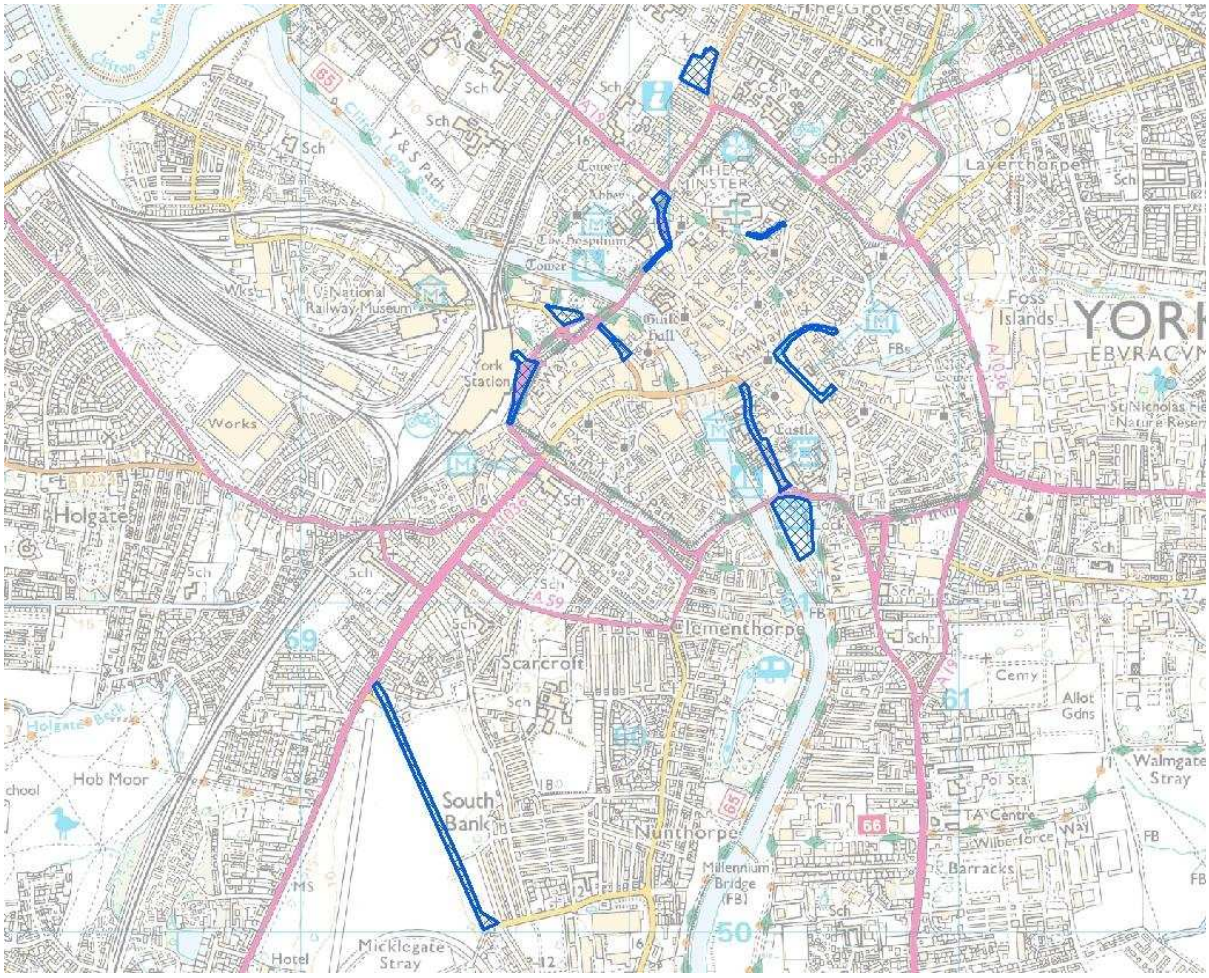
Progress to date

11. The anti-idling study provides compelling evidence of excess emissions currently arising from idling activities in the city which could be reduced significantly through the erection of anti-idling signage, further information and advice sessions with vehicle operators and some on-street spot checks combined with provision of anti-idling advice. It is recommended that all these actions should be progressed as part of the AQAP3 delivery programme. At this stage adoption of anti-idling legislation is not considered necessary to tackle the problem, but should be kept as an option within AQAP3 should other measures prove ineffective.

12. A number of locations around the city centre have been identified as potential anti-idling zones as shown in Figure 2 (these are in addition to the area to be included in the proposed CAZ). Further consultation with HGV, bus and coach operators to determine an appropriate level of anti-idling action within these zones will be undertaken over the coming

months and an anti-idling delivery programme drawn up. A full copy of the York idling study can be obtained from public protection.

Figure 2 – Potential anti-idling zones in York (subject to further consultation)



This page is intentionally left blank

Annex 2 – CAZ

What is a Clean Air Zone (CAZ)?

1. Like a LEZ the proposed CAZ will control the types of vehicles able to be used in certain areas of the city based on emissions. However, unlike a LEZ, the entry criteria will not be a blanket Euro emission standard for all vehicles. The CAZ will set different entry standards for vehicles based on the frequency at which they enter the CAZ. The entry criteria will be set in a way that requires the most frequent (and hence the most polluting) vehicles to upgrade to operate on ultra low emission technology, whilst vehicles that enter the city less frequently will work towards meeting achievable minimum Euro emission standards.

2. Only local service buses and tour buses are expected to be subject to the CAZ requirements; there is scope to extend the principle to other vehicles such as HGVs, coaches and taxis at a later date. Other vehicles have not been included at this stage due to the complexity of the administration that would be associated with tracking and approving all types of vehicle for entry into the CAZ. This is particularly the case for coaches and HGVs that do not form part of easily identifiable and relatively static local fleets.

Why has this approach been suggested?

3. The CAZ approach has been developed because:

   (a) It requires emission improvement costs that are more proportionate to the frequency at which vehicles travel through AQMAs and the impact they have on local air quality.

   (b) It is likely to achieve greater overall air quality benefits than a blanket Euro emission standard based LEZ applied to all buses, but will limit the financial impact on smaller operators and infrequent rural services.

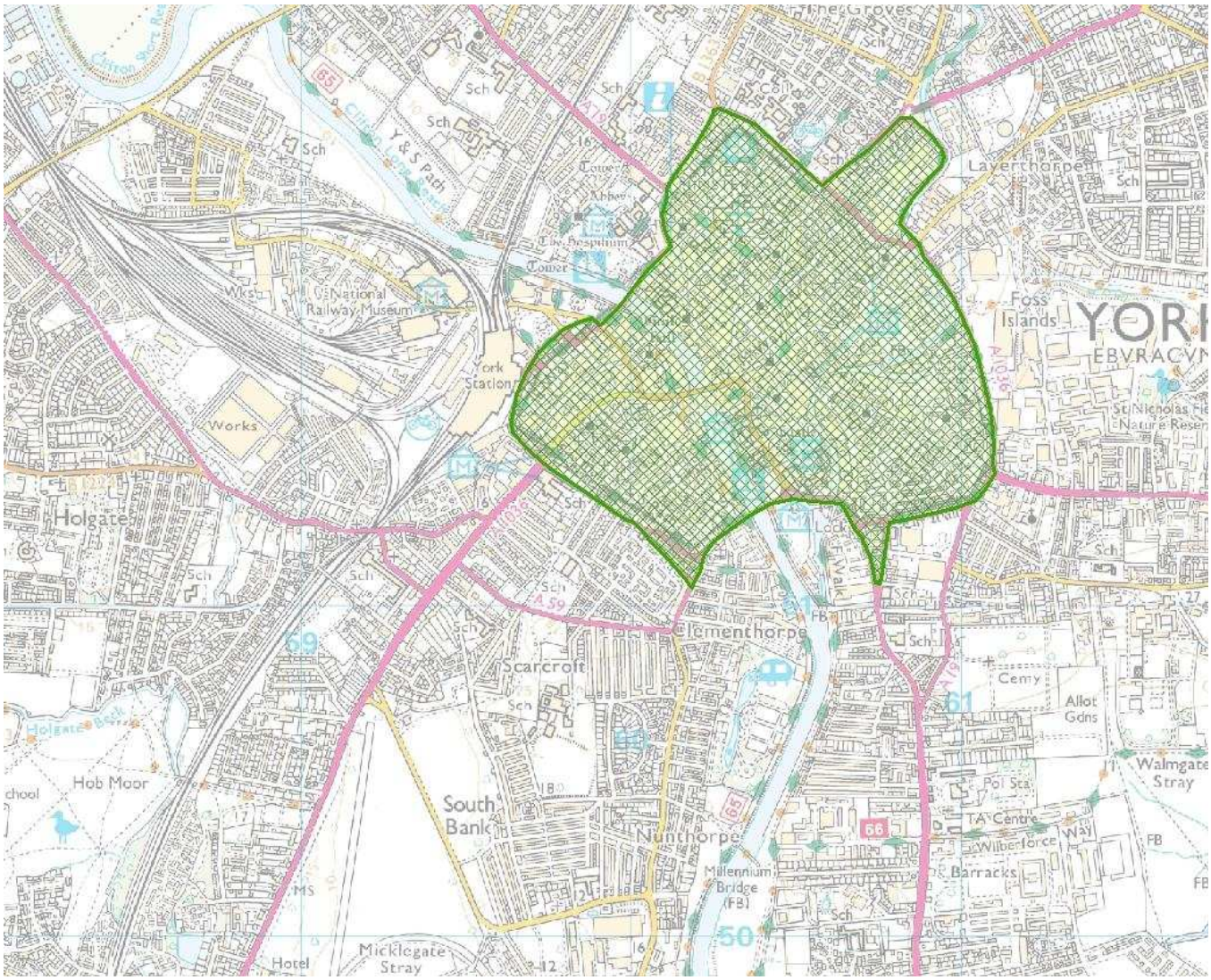
   (c) It will give operators a clear 10 year timetable from which to plan their upgrades and organise their fleets in a way that limits the number of vehicles that have to be exchanged or redirected to other cities.

   (d) It allows expansion of similar flexible emission entry controls for other vehicle types in the future if this becomes necessary

Where will the CAZ be?

4. It is recommended that as a minimum the CAZ should initially apply to the area shown in Figure 3. The area includes all roads that make up part of the inner ring road and any other roads that lie within the area shaded in green. This minimum area is suggested based on current bus routes and the need to improve air quality in all the AQMAs. An alternative approach may be to apply the CAZ requirements to the already established Better Bus Area which bus operators are already familiar with. The CAZ concept will be subject to further consultation with bus operators and the final location of the CAZ boundaries will form part of this process. The potential for future expansion of the CAZ to other vehicles also needs to be considered in determining the final location of the boundaries.

Figure 3: Proposal for minimum area to be covered by the CAZ (subject to consultation)



What are the CAZ entry requirements likely to be?

5. Based on an analysis of current bus routes and the type and age of vehicles operating on them a first draft of possible CAZ entry requirements is shown in Table 1. Like the boundaries these entry requirements are subject to wider consultation with bus operators and may change as a result of this process. They should only be considered indicative at this stage in the process.

Table 1: Indicative CAZ entry requirements (subject to consultation)

	High frequency buses (10 times per day or more)	Medium frequency buses (5 times per day or more)	Low frequency buses (under 5 times per day)
April 2016	Euro 3 (82% of bus traffic)	Euro 3 (11% of bus traffic)	No standard (7% of bus traffic)
April 2018	Ultra low emission (82% of bus traffic)	Euro 4 (11% of bus traffic)	Euro 3 (7% of bus traffic)
April 2021	Ultra low emission (85% of bus traffic)	Euro 5 (9% of bus traffic)	Euro 4 (6% of bus traffic)
April 2024	Ultra low emission (87% of bus traffic)	Euro 6 (8% of bus traffic)	Euro 5 (5% of bus traffic)

What are the implications for bus operators?

6. Table 2 shows the estimated emission standard of buses operating on current routes (based on baseline data from 2011). The accuracy of this baseline data will be further refined during the CAZ consultation work with bus operators.

Table 2: Emission standard of current bus fleet (based on 2011 data)

	High frequency buses (10 times per day or more)	Medium frequency buses (5 times per day or more)	Low frequency buses (under 5 times per day)
2011	**Euro 5 = 20** **Euro 4 = 23** **Euro 3 = 53** **Euro 2 = 5** **Euro 1 = 2** **Euro 0 = 3** **Total buses = 106**	**Euro 5 = 8** **Euro 4 = 24** **Euro 3 = 2** **Euro 2 = 0** **Euro 1 = 0** **Euro 0 = 0** **Total buses = 34**	**Euro 5 = 11** **Euro 4 = 23** **Euro 3 = 6** **Euro 2 = 4** **Euro 1 = 3** **Euro 0 = 0** **Total buses = 47**

7. Table 3 shows the predicted bus fleet composition in 2016 and 2018 without the CAZ intervention, but including the addition of the electric buses for which funding has already been obtained. As with the baseline data the accuracy of these assumptions will be subject to further consultation with operators during the CAZ consultation period. The total non-compliant buses for each year represents the number of vehicles that operators would have to upgrade or replace in order to continue providing the same level of service should the CAZ be introduced.

Table 3: Comparison of bus fleet composition with CAZ entry standards in 2016 and 2018 (based on 2011 data; including recent orders of Ultra low emission buses (ULEBs))

Year	High frequency buses (10 times per day or more)	Medium frequency buses (5 times per day or more)	Low frequency buses (under 5 times per day)
April 2016 high frequency – Euro 3 medium frequency – Euro 3 low frequency– No standard	**ULEB = min 16** **Euro 5 = 23** **Euro 4 = 21** **Euro 3 = 47** **Euro 2 = 3** **Euro 1 = 2** **Euro 0 = 3** **Total compliant = 107** **Total non-compliant = 8**	**ULEB = 0** **Euro 5 = 8** **Euro 4 = 24** **Euro 3 = 2** **Euro 2 = 0** **Euro 1 = 0** **Euro 0 = 0** **Total compliant = 34** **Total non-compliant = 0**	**ULEB = 0** **Euro 5 = 11** **Euro 4 = 23** **Euro 3 = 6** **Euro 2 = 4** **Euro 1 = 3** **Euro 0 = 0** **Total compliant = 47** **Total non-compliant = 0**
April 2018 high frequency – ULEB	**ULEB = min 16** **Euro 5 = 23** **Euro 4 = 21** **Euro 3 = 47** **Euro 2 = 3** **Euro 1 = 2**	**ULEB = 0** **Euro 5 = 8** **Euro 4 = 24** **Euro 3 = 2** **Euro 2 = 0** **Euro 1 = 0**	**ULEB = 0** **Euro 5 = 11** **Euro 4 = 23** **Euro 3 = 6** **Euro 2 = 4** **Euro 1 = 3**

medium frequency - Euro 4 Low frequency – Euro 3	**Euro 0 = 3** **Total compliant = 16** **Total non-compliant = 99**	**Euro 0 = 0** **Total compliant = 32** **Total non-compliant = 2**	**Euro 0 = 0** **Total compliant = 40** **Total non-compliant = 7**

The 2016 and 2018 scenarios assume no natural replacement of buses. Total non-compliant buses are likely to be less than listed due to the business-as-usual sale/disposal of older buses and addition of new buses to the fleet over the period.

How would a CAZ be enforced?

8. CYC will work in partnership with local bus operators to develop a CAZ which all operators can comply with. There are two main options available:

   (a) Development of a voluntary agreement with local bus operators backed up by the implementation of a Traffic Regulation Condition (TRC) at an agreed date in the future. A TRC would prevent entry to certain roads for non-compliant vehicles and prevent new companies from opening up operations in the city that do not comply with the locally negotiated standards. This is the approach used in Oxford.

   (b) Development of a Statutory Quality Bus Partnership Scheme under which suitable entry requirements would be agreed in writing with bus operators and approved by the traffic commissioner. This approach has been used in Birmingham.

   The suitability of the two approaches and associated costs are currently under investigation and will be the subject of further consultation.

9. A CAZ enforced by a TRC or through a SBP agreement would be almost self enforcing, the main workload being administrative tasks associated with ensuring local buses meet the entry criteria and that any upgrading they have undergone is of the required standard. There may be requirements for occasional on street spot checks or camera observations. The need and detail of this is yet to be established.

This page is intentionally left blank

Annex 3

Results of AQAP3 stage 1 screening

HEADLINE MEASURES

Direct actions that can be implemented now to reduce emissions from existing vehicles:

Measure 1: Development and implementation of a Clean Air Zone (CAZ)

Measure 2: Development and implementation of anti-idling measures

Measure 3: Further development of Eco-stars fleet recognition scheme

FUTURE MEASURES

Plans and actions that will be implemented over the next 6 years to reduce emissions:

Measure 4: Planning and delivery of CNG refuelling infrastructure in York

Measure 5: Reducing emissions from freight

Measure 6: Development and implantation of LES based planning guidance

Measure 7: Reducing emissions from taxis

Measure 8: Planning and delivery of strategic EV charging network

Measure 9: Reducing emissions from CYC fleet

SUPPORTING MEASURES

That will help to win 'hearts and minds' and encourage local engagement in AQAP3 delivery

Measure 10: Marketing and communications strategy

Measure 11: Local incentives for low emission vehicles and alternative fuel use

Measure 12: Attracting low emission industries, business and jobs to York

That will continue to tackle congestion and deliver sustainable transport improvements

Measure 13: Modal shift and network improvement measures

That will deliver other air quality improvement measures

Measure 14: Regulation of industrial and domestic emissions

Measure 15: Provide more green infrastructure in the city

Table key

Impact		Cost	
	Positive impact	**£**	**< £10,000**
	Neutral impact	**££**	**>10,000 < 50,000**
	Negative impact	**£££**	**>50,000 < 100,000**
		££££	**>100,000**

Measure 1	**Development and implementation of a Clean Air Zone (CAZ)**		
Key intervention			
Setting of differential emission standards for buses entering the inner ring road based on frequency of bus entry.			
Expected outcome			
82% of bus movements on inner ring road will be electric (zero emission) by 2018.			
Target			
Emission sources	Local buses		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	**Responsibility**	**Target date**
(a) Develop a roadmap for low emission buses	CYC	completed
(b) Develop draft proposal for CAZ and consult with bus operators	CYC	ongoing
(c) Implement CAZ	CYC	2018
(d)Work with operators to secure funding / loans for vehicle upgrades	CYC	ongoing
(e) Monitor impact of CAZ on local air quality and emissions	CYC	ongoing

Estimated implementation cost	Direct costs to CYC (implementation and enforcement) = £TBA Cost of bus upgrades to meet requirements =£ TBA
Estimated emission / fuel savings	Every electric bus introduced into the CAZ will completely remove local emissions of NO2 and PM10 and reduce CO2 emissions by approx 35 tons.
Proposed funding streams	Routine operator investment Developer contributions Green Bus Fund bids Cleaner Bus Technology Fund bids
Related LES measures	9G,9I,8J,8L,4J
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city

Expected impacts	**overall**	**comment**
Local economy		Low emission buses will improve the image of the city with positive implications for tourism and inward investment
Feasibility		Similar schemes already in place in Oxford and Norwich. Electric P&R scheme already operational in York.
Congestion		No change to bus numbers, may be a slightly positive impact if electric buses appear more attractive to current car users or fares reduce as a result of fuel savings
Capital costs	£££££	Upgrading of buses involves high costs but where possible these will be met or offset by grant applications
Revenue costs	£	After initial scheme set up resourcing costs will be low
Local air quality		Zero emission buses will result in significant emission reductions for NO_x and particles across the city, especially in AQMAs
Greenhouse gas emissions		Reduced emissions of CO_2 in York. Less CO_2 produced from generation of electricity needed to run electric buses than that generated by equivalent diesel bus engines. Use of green electricity tariffs can improve this further.
Planning and development		Improved air quality offers more opportunity for city centre living. Zero emission buses lessen environmental impact of increased demand on public transport from population growth. Contributions towards low emission buses can be sort from developers
Socio-economic		Impact on bus fares currently unknown. Some may pass on fuel cost savings to reduce fares, others may pass on cost of purchasing newer or retrofitted vehicles and increase fares
Communities		No loss of bus services anticipated as a result of this measure. May accelerate provision of easy access buses on some routes. Will improve public health and the environment.
Public perception		Replacement of older diesel buses with newer, cleaner, quieter buses likely to have positive implications
Other benefits		Reduced noise from vehicles, improved passenger experience

Measure 2	**Development and implementation of anti-idling measures**		
Key intervention			
Engagement with vehicle operators to highlight economic and environmental impacts of idling.			
Expected outcome			
Reduced idling emissions			
Target			
Emission sources		Local service buses, coaches, HGVs	
AQMAs where emissions are expected to reduce due to this measure		City centre	
Key Actions		**Responsibility**	**Target date**
(a) Undertake anti-idling feasibility study		CYC / consultant	completed
(b) Develop draft proposal and consult with stakeholders		CYC	2015
(c) Draw up delivery programme for anti-idling measures		CYC	2015
(d) Implement anti-idling measures		CYC	To be determined
(e) Evaluate impact of anti-idling measures		CYC	Ongoing after implementation
Estimated implementation cost	£34,500 (based on 3 years with enforcement), less without enforcement		
Estimated emission / fuel savings	At 5 busiest service bus locations in York estimated savings per annum of 1,526kg NOx, 36kg PM_{10}, CO_2 46555 kg and 17949 litres of fuel (assuming no idling from buses over 1 minute). Actual savings anticipated to be much higher if enforced at all locations and inclusive of all vehicle types.		
Proposed funding streams	To be determined		
Related LES measures	4B, 4F		
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city		

Expected impacts	**overall**	**comment**
Local economy		Reduced idling will improve the image of the city with positive implications for tourism and inward investment.
Feasibility		Similar schemes already in place around the UK eg. North Lincs, Croydon, Scotland, Dudley
Congestion		May help to discourage waiting which could assist congestion
Capital costs	£	Some small costs associated with signage - possibly from Better Bus Area 2 Fund TBC
Revenue costs	£	Staffing costs – possibly from Better Bus Area 2 Fund TBC
Local air quality		Reduced emissions will have positive impact on local air quality
Greenhouse gas emissions		Significant reduction in local CO_2 emissions
Planning and development		Improved air quality offers more opportunity for city centre living. Anti-idling measures will help reduce impact of increased bus services associated with population growth.
Socio-economic		No implications
Communities		Will help protect public health and improve the environment.
Public perception		Control of idling emissions will reduce complaints about this issue and create a safer and more pleasant environment.
Other benefits		Will assist bus operators to enforce their own policies and could result in considerable fuel savings and reduced operating costs. Reduced noise from idling vehicles.

Measure 3	**Further development of ECO-stars fleet recognition scheme**		
Key intervention			
Provision of advice and encouragement to fleet operators to help them reduce emissions from their fleets through the use of better driving techniques, improved fuel management and vehicle upgrading			
Expected outcome			
Reduced emissions from fleet vehicles			
Target			
Emission sources	buses, coaches, HGVs, LGVs (possible expansion to taxis)		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace
Key Actions	**Responsibility**		**Target date**
(a) Implement ECO-stars scheme in York	CYC / consultant		Completed (March 2013)
(b) Evaluate impact of current ECO-stars scheme	consultant		Completed December 2014
(d)Investigate future funding for ECO-stars	consultant		ongoing
(e)Draw up action plan for ECO-stars beyond 2014 (if funding is obtained to continue the scheme)	CYC / consultant		December 2015

Estimated implementation cost	Eco-stars currently funded until December 2015 – additional costs approximately £30,000 annum
Estimated emission / fuel savings	Total for whole scheme is unknown. Figures are available for some individual operators.
Proposed funding streams	To be determined
Related LES measures	3A,4A,6A,3C,4E,6G, 7F,3E,4H,5G,6L,7N
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city, encouraging and supporting a green economy

Expected impacts	**overall**	**comment**
Local economy		Improved driving behaviour and cleaner vehicles will improve the image of the city with positive implications for tourism and inward investment. The implementation of ECO-stars fleet roadmaps can result in considerable fuel cost-savings for local operators allowing them to become more competitive
Feasibility		Eco-stars is already operational in York.
Congestion		No impact on congestion
Capital costs		Scheme already operational no further capital costs anticipated
Revenue costs	£££	Staffing /consultancy costs associated with continuing the scheme beyond Dec 2015
Local air quality		Reduced emissions will have a positive impact on local air quality
Greenhouse gas emissions		ECO-stars membership also delivers reductions in emissions of greenhouse gases both in York and the wider areas travelled through by scheme operators
Planning and development		Eco-stars membership can help offset the impact of increased economic activity and population growth.
Socio-economic		ECO-stars is free to join and participate in. It is therefore equally accessible to all fleet operators as long as they are willing to provide the necessary fleet data.
Communities		No implications
Public perception		Improved driver behaviour and cleaner vehicles likely to have a positive impact on public perception of buses, coaches and HGVs.
Other benefits		Eco-driving techniques and the introduction of newer and alternatively fuelled vehicles can help reduce the noise impact of traffic

Measure 4	Planning and delivery of CNG refuelling infrastructure in York		
Key intervention			
Providing the infrastructure required to enable fleet operators to run their vehicles on compressed natural gas (CNG) and / or bio-methane which both offer reduced emissions of local and global air pollutants.			
Expected outcome			
Increased uptake of CNG and bio-methane as an alternative fuel within local fleets			
Target			
Emission sources	Local service buses, coaches, HGVs, LGVs (potential for expansion to other vehicles e.g. taxis)		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	**Responsibility**	**Target date**
(a) Investigate feasibility of establishing a CNG refuelling plant in York and potential demand levels	CYC / external consultant	Completed March 2015
(b) Work towards securing external investment in a CNG refuelling plant	CYC / external consultant	Ongoing
(c)Deliver a CNG refuelling plant in York	CYC / external consultant	To be determined

Estimated implementation cost	To be determined – likely to be privately funded
Estimated emission / fuel savings	A vehicle running on CNG has significantly smaller emissions of NO_2, PM_{10} and CO_2 compared with a diesel equivalent. Exact reductions depend on the type of conversion, size of vehicle. Even greater reductions in CO_2 arise from use of bio-methane (gas derived from anaerobic digestion.
Proposed funding streams	Private investment, Developer contributions, Grant schemes
Related LES measures	2F,2G,2H,3D,3F,6N,6O,7M,8J,9E
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city, encouraging and supporting a green economy

Expected impacts	**overall**	**Comment**
Local economy		Reduces operator transport costs, creates new industry and jobs, allows late night deliveries and improvement of public realm, can help facilitate development of freight consolidation facilities, industrial units and office space.
Feasibility		CNG refuelling plants already operational in Leeds and Sheffield
Congestion		Quieter operation of CNG vehicles may allow some deliveries to occur later at night or earlier in the morning helping to free up road space during peak delivery periods.
Capital costs	ffff	High capital costs involved but should be able to attract private investment
Revenue costs	ff	Some CYC staffing resources required to deliver the project but will be met from existing staffing resources. Longer term resource costs will be met by private operator.
Local air quality		CNG and bio-methane produce less NO_x and PM
Greenhouse gas emissions		CNG and bio-methane offers considerable CO_2 savings compared with diesel engines. Bio-methane can be produced from digestion of waste materials.
Planning and development		Work is ongoing to try and secure a site for CNG refuelling infrastructure within the Local Plan allocations
Socio-economic		Presence of CNG / bio-methane refuelling will offer cheaper and cleaner fuel to fleet operators which in turn should help reduce the cost of local goods and services.
Communities		No implications
Public perception		May be some local objections to development of refuelling infrastructure.
Other benefits		Reduced vehicles noise levels, potential diversion of waste from landfill or incineration to produce bio-methane.

Measure 5	**Reducing emissions from freight**		
Key intervention			
Introduction of delivery and servicing plans for major organisations and key streets in the city and provision of a freight transhipment centre (FTC)			
Expected outcome			
Reduction in the number and size of delivery vehicles entering the city centre and other AQMAs. More deliveries being made by foot, cycle or low emission vehicle.			
Target			
Emission sources	HGVs, LGVs		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace
Key Actions	**Responsibility**		**Target date**
(a) Undertake a freight improvement study	CYC / external consultant		Completed (June 2013)
(b) Draw up an action plan for freight improvement based on finding of freight improvement study. To include mechanism and timescale for delivery of a FCC.	CYC (CS)		TBA

Estimated implementation cost	TBA
Estimated emission / fuel savings	TBA
Proposed funding streams	Private investment, Grant funds
Related LES measures	3B,9A,9C,9E
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city, encouraging and supporting a green economy

Expected impacts	**overall**	**comment**
Local economy		Removal of some HGVs from the network and rescheduling of deliveries would improve reliability of deliveries for local businesses and create a more pleasant environment for shoppers and visitors. FTC would create new jobs.
Feasibility		FCC centres are operational in Newcastle and Bath. Ongoing discussions with a logistics company,
Congestion		Would help tackle city centre congestion particularly in shopping streets outside foot street hours
Capital costs	££££	Scheme would need considerable investment from private sector
Revenue costs	£££	Staffing and operation of the FTC.
Local air quality		Reduced HGV emissions will have positive impact on local air quality.
Greenhouse gas emissions		Reduced HGV emissions will have a positive impact on greenhouse gas emissions
Planning and development		The Local Plan recognises the need for freight consolidation facilities
Socio-economic		No implications
Communities		No implications
Public perception		Removal of queuing HGVs from city centre in the morning will improve public realm.
Other benefits		Removal of large HGVs from the city centre will help protect historic buildings. CNG refuelling and freight consolidation potentially can be linked together to provide delivery to city centre by low emission CNG vehicles.

Measure 6	Development and implementation of LES based planning guidance

Key intervention

Development of local planning guidance that will require developers to fully demonstrate the emission impact of their development, calculate emission damage costs and provide emission mitigation in the form of on-site low emission measures and/or contributions towards the provision of wider low emission infrastructure

Expected outcome

Minimisation of development related emissions and financial support for low emission infrastructure projects

Target

Emission sources	Development related transport and vehicles that service new developments e.g buses, refuse collection		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	Responsibility	Target date
(a) Embed low emission requirements into draft LDP	CYC	Completed
(b) Develop new LES planning guidance	CYC	Completed July 2015

Estimated implementation cost	No additional costs outside current staffing resources to develop guidance. Additional staff may be required to implement guidance.
Estimated emission / fuel savings	These will be calculated and reported per development. The cumulative emission savings per annum are likely to be very large for NO_x, PM and greenhouse gases.
Proposed funding streams	No additional funding required for development of guidance note
Related LES measures	2F,2G,1M,1G,2B,2C,2H,2I,2A,2D,2E
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city, encouraging and supporting a green economy

Expected impacts	overall	Comment
Local economy		Effective management and mitigation of development related emissions will help maximise development opportunities.
Feasibility		LES based planning guidance is already adopted and in use in Bradford. Other documents are at an advanced stage of development e.g. West Midlands, Sussex
Congestion		No impact on congestion
Capital costs		No capital cost implications
Revenue costs	££	Staff costs associated with assisting developers to comply with the new guidance and to check the accuracy and effectiveness of emission impact assessments and mitigation plans. In the longer term may need to increase staffing levels
Local air quality		Emission mitigation measures should help minimise further deterioration in local air quality as the result of development and may result in air quality improvement in some cases.
Greenhouse gas emissions		LES planning guidance will also help reduce greenhouse gas emissions
Planning and development		LES planning guidance principles already embedded into draft Local Plan. Enables low emission measures to be installed into new developments
Socio-economic		Developers may add on cost of emission mitigation to property purchase / rental costs which may exclude some buyers/ users
Communities		Enables low emission measures to be installed into new developments
Public perception		Provision of low emission vehicle infrastructure, low emission vehicles and travel planning measures on new developments will make developments more attractive to the end users and offer opportunities to showcase low emission measures to the wider population of York.
Other benefits		Contributions towards low emission public transport, service vehicles and other low emission infrastructure will have positive air quality and climate change benefits beyond development sites and help to achieve a general improvement in public transport. Developers will have a clear indication of what is expected from them reducing the amount of pre-planning discussion required.

Measure 7	Reducing emissions from taxis		
Key intervention			
Introduction of incentives and licensing requirements that will encourage replacement of older diesel taxis (hackney and private hire) with newer hybrid vehicles. There are currently 750+ licensed vehicles operating in York.			
Expected outcome			
Removal of older diesel vehicles from taxi fleet			
Target			
Emission sources	Hackney and private hire taxis (particularly diesel vehicles)		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	Responsibility	Target date
(a) Develop a local incentive for the uptake of hybrid vehicles in the taxi fleet	CYC	In operation
(b) Secure funding to continue hybrid taxi incentive	CYC	ongoing
(c) Review emission standards for taxis	CYC	Completed July 2015
(d) Consult on revised emission standards for taxis	CYC	December 2015
(e) Adopt new emission standards for taxis	CYC	April 2016

Estimated implementation cost	TBC
Estimated emission / fuel savings	A hybrid taxi produces approx 8 tonnes per annum of CO2 less than a diesel equivalent and has considerably lower emissions of NOx and PM10. 5% of the taxi fleet have already been converted to hybrid or electric through the existing grant scheme.
Proposed funding streams	OLEV funding bid being developed
Related LES measures	5A,5B,5C,5D,5E,5F,5G,5H,5I
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city

Expected impacts	overall	comment
Local economy		A cleaner taxi fleet will improve the image of the city with positive implications for tourism and inward investment. Use of hybrid vehicles offers considerable fuel cost-savings for local taxis operators.
Feasibility		Hybrid taxi incentive has been very successful to date
Congestion		No impact on congestion
Capital costs	ffff	A high level of capital investment is needed to incentivise replacement of the majority of the taxi fleet with hybrids. Grant funding is needed to meet this cost.
Revenue costs	ff	Currently being met through existing resources, any significant expansion of the scheme would require further resourcing.
Local air quality		Reduced emissions will have positive impact on local air quality
Greenhouse gas emissions		Reduced emissions will have a positive impact on greenhouse gas emissions
Planning and development		Cleaner taxis can help offset the impact of increased economic activity and population growth.
Socio-economic		May be some increased vehicle purchase costs for new drivers but these are offset as far as possible by provision of local vehicle grants. Drivers should experience significant fuel cost savings over lifetime of vehicle ownership.
Communities		Need to ensure an adequate number of wheelchair accessible taxis remain in the fleet. Electric taxis are cheaper to run so could reduce costs.
Public perception		Cleaner, quieter vehicles likely to have a positive impact on public perception of taxis.
Other benefits		Reduced noise levels from late night taxis, newer vehicles improve taxi fleet image

Measure 8	Planning and delivery of strategic EV charging network		
Key intervention			
Planning and provision of a strategic network of EV charging points to maximise the uptake of electric and plug-in electric hybrid vehicles in the city.			
Expected outcome			
Increased uptake of electric vehicles			
Target			
Emission sources	Buses, LGVs, taxis and cars (fleet and privately owned)		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	Responsibility	Target date
(a) Provide fast charge public EV charging capacity in CYC car parks	CYC	Achieved (October 2013)
(b) map existing EV charging infrastructure and identify further requirements needs	CYC	Completed March 2015
(c) Provide rapid charge EV charging facilities	CYC	5 in place by July 2015
(d) Develop a strategic approach to obtaining EV charging on new developments linked to EV infrastructure map	CYC	Ongoing
(e) Pursue provision of privately owned EV charging points in areas where a need has been identified	CYC	Ongoing

Estimated implementation cost	10 fast chargers already provided in CYC car parks, £232,500 for 7 rapid chargers has already been secured, with 5 already in place.
Estimated emission / fuel savings	Total impact of implementing EV charging is difficult to quantify due to uncertainties over electric vehicle uptake but for every conventionally fuelled vehicle replaced local emissions of NO_x and PM_{10} are eliminated.
Proposed funding streams	Developer contributions / Local sponsorship / provision of open use points / grants
Related LES measures	2A,2B,2C,2D,2E,2H,2I,4D,5B,B,6C,6D,6E,6M,8F,8J
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city, supporting a green economy

Expected impacts	overall	comment
Local economy		Good EV charging network provides EV drivers with more confidence to visit York for business or leisure trips and may influence destination choice. Development and maintenance of EV charging network creates jobs. Switching to EVs can offer considerable fuel and tax savings to local businesses and residents.
Feasibility		Public EV charging and a pay as you go back office system already in place in York
Congestion		No impact on congestion
Capital costs	ff	Major capital costs already met through external grants. Future infrastructure provision needs to be met through developer contributions, local sponsorship and further grants.
Revenue costs	ff	Revenue costs associated with operating the back-office systems to support public EV charging. As EV ownership increases revenue costs will be offset by profit made from electricity sales to become cost neutral or better.
local air quality		EVs have a positive impact on local air quality as zero emission at point of use
Greenhouse gas emissions		Electric vehicles will have a positive impact on greenhouse gas emissions especially if power is obtained through green tariffs.
Planning and development		LES planning guidance principles already embedded into draft Local Plan including requirement for EV infrastructure on new developments.
Socio-economic		Provision of a strategic EV network opens up the option of EV ownership to more people. Initial vehicle purchase price may currently be a barrier to some people.
Communities		Those unable to afford an EV will not be able to benefit from the provision of EV charging infrastructure but will be free to continue using their existing vehicles
Public perception		Initial concerns about need for EV charging infrastructure expected to decrease and become more positive as the public begin to recognise the benefits of EV ownership.
Other benefits		Widespread EV vehicle uptake will reduce traffic noise levels.

Measure 9	Reducing emissions from CYC fleet

Key intervention

Further reduction in emissions from CYC fleet by reducing total mileage, using lower emission vehicles and encouraging better driver behaviour.

Expected outcome

Reduction in NO_x and PM_{10} emissions from CYC fleet vehicles and those operated on behalf of CYC (including staff owned vehicles). Reduced CO_2 emissions and significant fuel cost savings should also be achieved.

Target

Emission sources	CYC owned vehicles, CYC staff owned vehicles (grey fleet)		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	Responsibility	Target date
(a) Introduction of further electric and hybrid vehicles into CYC fleet	Fleet manager	Ongoing
(b) Trial of 'Light Foot' system to reduce excessive breaking and acceleration	Fleet manager	Completed 2014
(c) ECO-driver training for CYC staff	Fleet manager	All LCV drivers to be trained within 2 years. Other staff to follow.
(d) Further use of route optimisation tools to reduce total mileage and emissions	Fleet manger	Ongoing
(e) Further reduction in grey fleet emissions and introduction of a CO_2 emission limit for personal vehicles eligible for mileage payments	Fleet manager	Ongoing

Estimated implementation cost	TBA
Estimated emission / fuel savings	TBA
Proposed funding streams	Fleet renewal funding, grants
Related LES measures	4C,4G,5C,5F,6F,6K,7A,7B,7C,7D,7E,7F,7H,7J
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city

Expected impacts	overall	comment
Local economy		A cleaner CYC fleet improves city image and reduces operating costs. Uptake of new technology can promote local green job creation.
Feasibility		There are already a number of low emission vehicles within CYC fleet and links to car clubs are well established. Good progress has already been made with reducing grey fleet trips.
Congestion		May reduce unnecessary vehicle journeys.
Capital costs	££££	Requires investment in new vehicles. Where possible this will be offset using grant funding for alternatively fuelled vehicles.
Revenue costs		Fleet improvements to be delivered by existing staff.
Local air quality		A cleaner CYC fleet will contribute towards improving local air quality
Greenhouse gas emissions		A cleaner CYC fleet will help contribute towards reducing local CO_2 emissions
Planning and development		A larger CYC fleet will be needed to service an expanding population and new developments. Cleaner CYC vehicles will help reduce the impact of a growing population.
Socio-economic		No implications
Communities		Fleet improvements help to protect the health of vulnerable residents
Public perception		A cleaner CYC fleet improves public perception of CYC and may encourage uptake of low emission vehicles by others
Other benefits		Alternatively fuelled vehicles can provide a better driving experience for operator, potential for considerable financial savings for CYC

Measure 10	**Marketing and Communications Strategy**		
Key intervention			
Raising awareness of air quality and health issues and providing information and advice on the purchase and use of low emission vehicles			
Expected outcome			
Increased awareness of the health impacts arising from vehicle emissions and behavioural change in relation to the purchase and use of low emission vehicles			
Target			
Key Audiences		Local residents, businesses and visitors	
AQMAs where emissions are expected to reduce due to this measure		No direct impact but will support wider AQMA improvement measures	
Key Actions		**Responsibility**	**Target date**
(a) Develop a marketing and communications strategy		CYC EPU and public health	TBA
(b) Undertake a public information campaign		CYC EPU and public health	TBA
(c) Upgrade JorAir website		CYC EPU and public health	TBA
Estimated implementation cost		£45,000 (air quality grant)	
Estimated emission / fuel savings		Not quantifiable	
Proposed funding streams		Air quality grant (secured funding)	
Related LES measures		1A,1B,1C1D,1E,1F,1H,1I, 1J,1K,1L1N,8A,8B,8I	
Links to council plan		Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city	

Expected impacts	**overall**	**comment**
Local economy		Increasing awareness of air quality and health issues and providing advice can help reduce sick days and reduce pressure on local health facilities. Savings made on personal transport costs may result in more spending in other areas eg. shopping, eating out.
Feasibility		Air quality and health campaigns are taking place in other cities
Congestion		Campaign will link to existing I-travel York sustainable travel initiatives.
Capital costs		AQ grant funding has been secured to support this work
Revenue costs		To be met from existing staff resources and grant fund
Local air quality		The campaign will encourage investment in cleaner vehicles that will help reduce emissions of local air pollutants
Greenhouse gas emissions		The campaign will encourage investment in cleaner vehicles that will help reduce emissions of CO_2
Planning and development		Not applicable
Socio-economic		Campaign will provide economic advice based on vehicle choice and access to grants
Communities		Campaign will provide information and advice on the impact of poor air quality on health
Public perception		A successful campaign will be perceived as worthwhile and informative.
Other benefits		Potential for increased support for CYC work on air quality and transport issues

Measure 11	**Local incentives for low emission vehicles and alternative fuel use**		
Key intervention			
Providing incentives for the purchase and use of low emission vehicles by residents, visitors, commuters and businesses			
Expected outcome			
Increased uptake of low emission vehicles by residents, visitors, commuters and businesses			
Target			
Key Audiences	Residents, visitors, commuters, businesses		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace
Key Actions	**Responsibility**		**Target date**
(a) Develop a low emission vehicle incentive plan to include parking incentives, vehicle purchase incentives and vehicle use incentives	CYC		June 2016
(b) Implement low emission vehicle incentive plan and report against delivery timescales within it.	CYC		Ongoing beyond June 2016
Estimated implementation cost	TBA		
Estimated emission / fuel savings	TBA		
Proposed funding streams	To be investigated		
Related LES measures	5E,6N,6I,8F		
Links to council plan	Improving air quality, healthy lives, efficient and affordable transport, environmentally sustainable city		

Expected impacts	**overall**	**comment**
Local economy		Financial savings made through purchase and use of low emission vehicles will reduce fuel costs for users leading to improved competiveness for local business and greater consumer spending in other areas e.g. leisure, shopping etc. Low emission vehicles will help improve public realm with benefits for tourism and inward investment. Links to an “Oyster” type card
Feasibility		The incentives will be innovative and there will be previously untested risks and challenges associated with implementation.
Congestion		No impact on congestion
Capital costs	£	There may be some small capital costs relating to signage, leaflets, point collection cards etc
Revenue costs	££	Provision of incentives will have some ongoing revenue costs e.g. potential loss of parking income, provision of rewards etc.
Local air quality		Increased uptake of low emission vehicles will have positive implications for local air quality
Greenhouse gas emissions		Increased uptake of low emission vehicles will have positive implications for greenhouse gases
Planning and development		Some incentives may be able to be linked to developer emission mitigation measures
Socio-economic		Can be applied to walking, cycling, public transport and low emission vehicle use to ensure all positive behavioural changes are rewarded and not limited only to those able to afford low emission vehicles.
Communities		Incentives to be accessible to all, including non-drivers and those with disabilities
Public perception		Opportunities for financial or material gain are likely to be viewed positively by the majority
Other benefits		Incentives can be linked through to tourism and inward investment opportunities

Measure 12	**Attracting low emission industries, business and jobs to York**		
Key intervention			
Promotion of York as a supportive and welcoming environment for low emission businesses and industries, including the provision of relevant education and skills development.			
Target			
Key Audiences		Potential inward investors and existing low emission businesses and industries. Educational establishments and other training providers.	
AQMAs where emissions are expected to reduce due to this measure		No direct impact but will support wider AQMA improvement measures	
Key Actions		**Responsibility**	**Target date**
Creation of a designed 'green hub' development area to encourage investment by 'green' and 'low emission' industries		Make it York	ongoing
Creation of more high value / high productivity jobs in the 'green' business sector		Make it York	ongoing
Estimated implementation cost	Facilitation by existing Make it York staff		
Estimated emission / fuel savings	Not quantifiable		
Proposed funding streams	To be investigated		
Related LES measures	1C,6D,6H,7I,8A,8C,8D,8G,8L		
Links to council plan	Supporting green jobs		

Expected impacts	**overall**	**comment**
Local economy		Development of new job and training opportunities
Feasibility		York has already successfully marketed itself as a 'science city' a similar approach can be take to place an emphasis on low emission / green technology
Congestion		Inward investment may result in traffic growth, but this can be minimised through the use of sustainable sites and good travel planning.
Capital costs		Small levels of additional investment may be needed to support promotional and marketing activities. Larger capital projects such as provision of new training facilities are likely to be met through private investment or partnerships with other organisations.
Revenue costs		Measures to be facilitated by existing Make it York staff resources and partner organisations
Local air quality		Presence of low emission industries will help raise the profile of the Low Emission Strategy and promote further use of low emission vehicles and renewable energy sources. This will help reduce emissions of local air pollutants
Greenhouse gas emissions		Presence of low emission industries will help raise the profile of the Climate Change Action Plan and promote the use of low emission vehicles and renewable energy sources. This will help reduce emissions of greenhouse gases.
Planning and development		Opportunities for low emission industries can be incorporated into the planning system
Socio-economic		Creates new high value / high productivity jobs and training opportunities
Communities		Employment and other opportunities will be available to all
Public perception		Creation of new job and training opportunities likely to have a positive impact
Other benefits		Opportunities to divert waste from landfill and incineration if gas industries can be attracted to the area. Potential for increased uptake of wind and solar energy production at a local level.

Measure 13	Modal shift and network improvement measures		
Key intervention			
Continued application of modal shift and congestion reduction measures through Local Transport Plan 3, Better Bus Area and Local Sustainable Transport Fund initiatives. Capital funding for larger transport infrastructure interventions such as an upgrade of the Outer Ring Road, providing an alternative route for city centre through traffic, Bus improvement measures and a further P&R site at Clifton Moor are dependent on the success of the £83.5m West York Plus Transport Fund bid.			
Target			
Emission sources	All vehicles		
Key audiences	walkers, cyclists, public transport users, motorists		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace
Key Actions	**Responsibility**	**Target date**	
Continued delivery of I-travel York sustainable travel programme which includes walking, cycling and public transport improvements, personalised journey planning, provision of travel information, promotional events etc. http://www.itravelyork.info/	Sustainable Transport Service	On going	
Implementation of Access York Phase 1 - delivery of P&R sites at Poppleton and Askham, improvements to the A59/A1237 roundabout and creation of bus priority route	Sustainable Transport Service	Completed	
Public Transport schemes. City centre bus stop improvements, off bus ticket machines, interchange improvements, Real Time Information provision.	Sustainable Transport Services	On going	

Estimated implementation cost	Access York £22.7m, BBAF £2.5m, LSTF £4.6m. New funding from BBA2 Approx. £1.2m up to 2017/18
Estimated emission / fuel savings	Not quantified
Proposed funding streams	LTP3, LSTF, Major Schemes Funding, Better Bus Area, Local Growth Fund (Dependent on Strategic Economic Plan bid by LEPs)
Related LES measures	9F,9L,9R
Links to council plan	efficient and affordable transport

Expected impacts	overall	comment
Local economy		Reduced congestion and improved public transport improve the public realm and support economic growth
Feasibility		Measures are included in existing CYC policies
Congestion		LTP3 aims to control congestion increases by encouraging use of sustainable modes. LSTF programme aims to increase cycling levels by 20%, walking by 10% and bus use by 10%
Capital costs	£££	To be confirmed. Major Transport interventions such as an upgrade of the Outer Ring Road, Bus improvement measures and a further P&R site at Clifton Moor are dependent on the success of the £83.5m West York Plus Transport Fund.
Revenue costs	££	To be confirmed. £1.2m from the Better Bus Area 2 package will provide revenue resource to support Public Transport in the City. Continuation of the LSTF project beyond 2014/15 is dependent on the success of a bid to the DfT in March 2014.
Local air quality		Congestion reduction and sustainable transport measures support local air quality improvement
Greenhouse gas emissions		Congestion reduction and sustainable transport measures support greenhouse gas reduction
Planning And development		Measures to reduce congestion and encourage sustainable travel can help offset traffic impact of new development
Socio-economic		Some measures may improve access to some areas of the city for some users
Communities		Modal shift measures support provision of accessible transport for all
Public perception		Some measures to reduce congestion and improve access for public transport may be unpopular with the general public.
Other benefits		None identified

Measure 14	**Regulation of industrial and domestic emissions**		
Key intervention			
Control of emissions to air from PPC regulated industries, enforcement of Clean Air Act provisions in relation to dark smoke and smoke control areas			
Target			
Emission sources		Industrial and domestic point source emissions	
AQMAs where emissions are expected to reduce due to this measure		City centre	Salisbury Terrace
Key Actions		**Responsibility**	**Target date**
(a) Active regulation of industries subject to PPC regs		CYC Public Protection	ongoing
(b) Active enforcement of dark smoke offences under Clean Air Act		CYC Public Protection	ongoing
(c) Active enforcement of smoke control areas		CYC Public Protection	ongoing
Estimated implementation cost	Ongoing costs delivered by existing staff resources		
Estimated emission / fuel savings	Not quantified		
Proposed funding streams	Existing staff resources		
Related LES measures	Wider air quality measure not related directly to LES delivery		
Links to council plan	Improving air quality, healthy lives, environmentally sustainable city		

Expected impacts	**overall**	**comment**
Local economy		EPU provides advice and support to local industries to help them to meet emission regulation requirements. This can also reduce costs.
Feasibility		All measures are currently ongoing and resourced
Congestion		No impact on congestion
Capital costs		No capital costs
Revenue costs	££	Ongoing CYC staffing resources only
Local air quality		Control of domestic and industrial emissions helps to protect and improve local air quality
Greenhouse gas emissions		Control of domestic and industrial emissions helps to reduce and control greenhouse gas emissions
Planning and development		No issues arising
Socio-economic		Legislation applies to everyone irrespective of socio-economic status. Large fines can arise if offences take place.
Communities		Legislation exists to protect the health and environment of local people
Public perception		Most people are generally supportive and comply with controls on industrial and domestic emissions
Other benefits		Control of smoke can help to avoid occurrence of smoke nuisance and odours and identify occurrences of illegal waste disposal

Measure 14	**Provide more green infrastructure in the city**		
Key intervention			
Provision of more green infrastructure to remove pollution from the environment			
Target			
Emission sources	All		
AQMAs where emissions are expected to reduce due to this measure	City centre	Fulford	Salisbury Terrace

Key Actions	**Responsibility**	**Target date**
(a) Develop green infrastructure SPD	City Strategy	ongoing
(d) Investigate inclusion of green infrastructure in York BID	York BID	To be determined – BID still in development phase

Estimated implementation cost	Not known
Estimated emission / fuel savings	Not quantified
Proposed funding streams	Existing staff resources/ developer contributions
Related LES measures	Wider air quality measure not related directly to LES delivery
Links to council plan	Improving air quality, healthy lives, environmentally sustainable city

Expected impacts	**overall**	**comment**
Local economy		Providing a more attractive environment may encourage more visitors to the city
Feasibility		A similar approach is already taken in many other cities. A green wall is in place at Marks and Spencer on the York Vanguard site.
Congestion		No impact on congestion
Capital costs		Provision of green infrastructure requires significant investment. Most of this investment could be obtained from developers / local business sponsorship.
Revenue costs	£	Trees and other green infrastructure require significant ongoing maintenance including pruning and leaf collection.
Local air quality		In the right conditions certain species of plant have been shown to improve local air quality
Greenhouse gas emissions		Plants remove CO_2 from the atmosphere.
Planning and development		Green infrastructure can enhance new developments
Socio-economic		Green infrastructure is free to be enjoyed by all
Communities		Green infrastructure can provide meeting places and places to play
Public perception		Green infrastructure improves the appearance of the urban environment
Other benefits		Green infrastructure has been shown to have many other health and well being benefits, provides shade in summer months and provides habitats for wildlife

Annex 4: Emission Factor Toolkit Modelling

Background information on the Emissions Factor Toolkit

The Emissions Factors Toolkit (EFT) is published by Defra and the Devolved Administrations to assist local authorities in carrying out Review and Assessment of local air quality as part of their duties under the Environmental Act 1995.

The EFT allows users to calculate road vehicle pollutant emission rates for NO_x, PM_{10}, $PM_{2.5}$ and hydrocarbons for a specified year, road type, vehicle speed and vehicle fleet composition. Full details of the Emissions Factor Toolkit can be found online at http://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html

The latest version of the emission factor toolkit has been used (version 4.2) for all calculations presented in this Annex.

The EFT can be used to provide a breakdown of emissions for conventional vehicle types which include 8 conventional vehicle categories (such as petrol and diesel cars) for the UK (plus taxis for London), and alternative vehicles such as hybrid petrol cars (depending on user information). A full list of the vehicle categories available are shown in the user guide, available on the DEFRA website[1].

Traffic data used to construct base models

City of York Council's strategic transport model (SATURN) has been used to estimate Annual Average Daily Traffic flows (AADTs) on each of the road links contained within the areas of air quality technical breach. A base (2011) and future year (2021) model were available to reflect baseline and future year network operating conditions. A list of schemes and developments that have been included in the future year 2021 model are shown in table 1 below[2].

In an attempt to understand the composition of traffic using the links within all technical breach area, traffic counts were undertaken by 'Nationwide Data Collection' using Automatic Number Plate Recognition (ANPR) camera systems. Two cameras were installed to allow bi-directional flows to be captured. A comparison of the manual and ANPR information demonstrated that 94% of complete Vehicle Registration Marks (VRM) or number plate records were captured. Whilst these counts were undertaken in 2010, they are considered representative of conditions in 2011 for the purposes of developing an accurate breakdown of the local vehicle

[1] http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html

[2] Targets for new housing provision and site allocations are currently under review and expected to be reduced. The traffic impact of new development in the city is therefore likely to be lower than the modelling undertaken during the development of AQAP3 suggests. Revised emission reduction figures for AQAP3 will be calculated once revised traffic growth figures for the city become available.

composition. The vehicle composition in the future 2021 year is considered to be comparable to that in the base 2011 year (with the exception of the modelled scenarios that consider alternative vehicle technologies).

Table 1: Developments included in the future year 2021 SATURN model

Type	Description	Local Plan Reference
MAJOR SCHEMES	Manor Lane - Hurricane Way Link	-
	A59 Bus Corridor	-
	York Central Link	-
	James St Link	-
	A59 Poppleton roundabout	-
	Great North Way roundabout	-
	A19 Shipton Rd rbt (Rawcliffe Bar)	-
	Clifton Moor Gate rbt	-
	Haxby Road roundabout	-
	Wigginton Road roundabout	-
	Strensall Road roundabout	-
	Clifton Moor Park and Ride	-
	Wetherby Road roundabout	-
	Wiggington Road Bus Priority	-
	Clarence Street Bus Priority	-
	Poppleton Park and Ride	-
	Askham Bar Park and Ride	-
	Germany Beck pinchpoint	-
	New Askham Bar Park and Ride	-
	Haxby Station	-
RESIDENTIAL USES	British Sugar	-
	Nestle South (a)	ST17
	Nestle South (b)	ST17
	Land adj Hull Road	ST4
	Land at Grimston Bar	ST6
	York Central	ST5
	N Monks Cross	ST8
	E Metcalfe Lane	ST7
	Moor Lane, Woodthorpe	ST10
	N Haxby	ST9
	Former Civil Service Sports Ground	ST2
	New Lane, Huntington	ST11
	Moor Lane, Copmanthorpe	ST10
	Manor Heath Rd, Copmanthorpe	ST12
	Terry's	ST16
	Germany Beck	ST22
	Castle Piccadilly	ST20

	Designer Outlet	ST21
	N Clifton Moor	ST14
	Whinthorpe	ST15
EMPLOYMENT USES	Monks Cross North	-
	York Central	-
	Northminster Business Park	-
	Terry's	-
	Cement Works Monks Cross	-
	Ford Garage Jockey Lane	-
	Nestle South	-
	Hungate	-
	Plot 6b Monks Cross Drive	-
	Land N Monks Cross Drive	-

A Geographic Information System (ArcMap v.10) was used to identify the SATURN road links that fell within City of York Council's Air Quality Management Areas / areas of air quality technical breach (see Figure 1). Information was collated for each of these links and manually entered into the Emissions Factor Toolkit.

Results produced by the EFT are combined emissions (KG/Year) from all road links within all areas of technical breach (however, each road link has been modelled separately within the EFT, results available on request). The change (Δ) in emissions from the base scenario has also been expressed as a percentage reduction / increase.

A description of each of these scenarios is provided in table 2.

Figure 1: Example of GIS plot used to identify SATURN road links that fell within the Gillygate / Lord Mayors Walk technical breach area

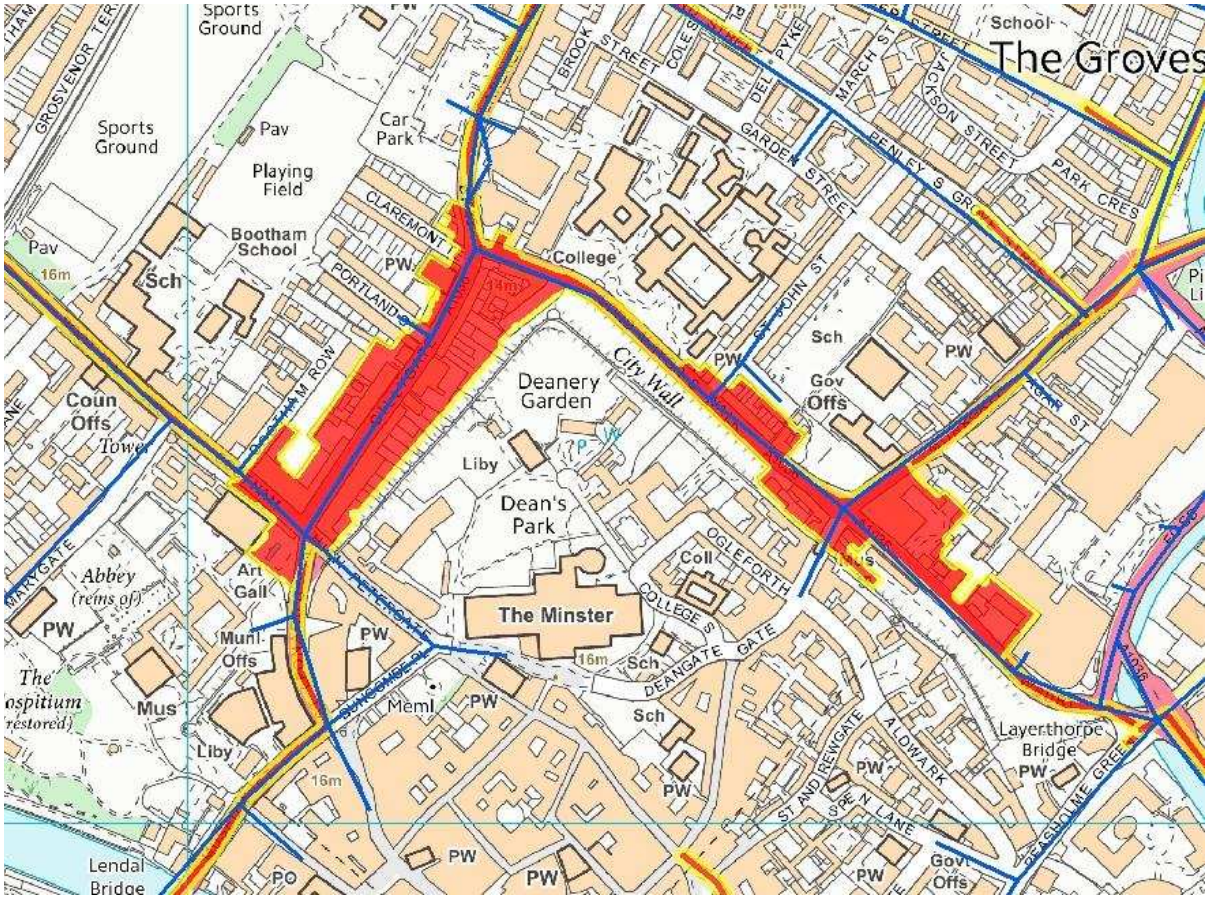


Table 2: Description of Modelled Scenarios

Scenario	Scenario Name	SATURN Data	EFT Modelled Year	Scenario details
A	Base 2014	2011	2014	Current year base case scenario using 2011 SATURN data and 2014 modelled EFT year.
B	2014 (2021 EFT)	2011	2021	A purely hypothetical scenario which looks at the impact of cleaner vehicles (2021 modelled EFT year) operating on a 2011 network
C	Base 2021	2021	2021	2021 Base case, with development traffic and 2021 modelled EFT year
D	2021 (2014 emissions)	2021	2014	A hypothetical scenario based on a 2021 SATURN model, but with a 2014 EFT modelled year. The scenario considers what would happen if traffic levels were to increase with development in the city, but emissions from vehicles did not fall in line with current EFT predictions. This is considered to be a very much worst case scenario in terms of vehicle emissions in the city in 2021.
E	2021 (1.5% Electric Car)	2021	2021	The situation in 2021, assuming 1.5% of all cars are converted to battery electric technology (it is anticipated that without Low Emission Strategy in place, this figure could realistically be achieved with no intervention from City of York Council).
F	LES 2021 (5% Electric Car)	2021	2021	With the Low Emission Strategy in place, it is anticipated that 5% of all cars could be converted to battery electric technology by 2021.
G	LES 2021 (90% Hybrid Bus)	2021	2021	A 2021 scenario where 90% of buses are converted to hybrid-electric technology
H	LES 2021 (90% Electric Bus)	2021	2021	A 2021 scenario where 90% of buses are converted to full electric technology

I	LES 2021 (5% Electric Car and 90% Electric Bus)	2021	2021	A 2021 scenario where 90% of buses and 5% of cars are converted to full electric technology.
J	LES 2021 (5% Electric Car and 90% Hybrid Bus)	2021	2021	A 2021 scenario where 5% of cars are converted to full electric technology and 90% of buses are converted to hybrid electric technology.
K	2021 - 1.5% Electric Car (2014 EFT)	2021	2014	As scenario E, but using 2014 emission factors
L	2021 LES - 5% Electric Car (2014 EFT)	2021	2014	As scenario F, but using 2014 emission factors
M	2021 LES - 90% Hybrid Bus (2014 EFT)	2021	2014	As scenario G, but using 2014 emission factors
N	2021 LES - 90% Electric Bus (2014 EFT)	2021	2014	As scenario H, but using 2014 emission factors
O	2021 LES - 90% Electric Bus 5% Electric Car (2014 EFT)	2021	2014	As scenario I, but using 2014 emission factors
P	2021 LES - 5% Electric Car 90% Hybrid Bus (2014 EFT)	2021	2014	As scenario J, but using 2014 emission factors

Q	2021 LES - 10% Electric car	2021	2021	A 2021 scenario where 10% of cars are converted to electric technology. Undertaken as part of a sensitivity analysis looking at how electric car uptake can influence emissions from this vehicle sector.
R	2021 LES - 25% Electric Car	2021	2021	A 2021 scenario where 25% of cars are converted to electric technology. Undertaken as part of a sensitivity analysis looking at how electric car uptake can influence emissions from this vehicle sector.
S	2021 LES - 50% Electric Car	2021	2021	A 2021 scenario where 50% of cars are converted to electric technology. Undertaken as part of a sensitivity analysis looking at how electric car uptake can influence emissions from this vehicle sector.
T	2021 LES - 75% Electric Car	2021	2021	A 2021 scenario where 75% of cars are converted to electric technology. Undertaken as part of a sensitivity analysis looking at how electric car uptake can influence emissions from this vehicle sector.
U	2021 LES - 100% Electric Car	2021	2021	A 2021 scenario where 100% of cars are converted to electric technology. Undertaken as part of a sensitivity analysis looking at how electric car uptake can influence emissions from this vehicle sector. This scenario effectively removes all emissions associated with cars.
V	2021 Base with Detailed Option 3 Split	2021	2021	This is an alternative 2021 scenario that had been run using the 'Detailed Option 3' split in the EFT, which allows the user to specify the relative proportions of diesel and petrol cars (this is not possible with the 'Alternative Technologies' option used for the rest of the modelling work). This scenario should only be used to compare to scenario W below.

W	2021 with only petrol cars (remove all diesel cars)	2021	2021	This is a scenario that has been run to examine the impact of removing all diesel cars from the fleet. The total number of cars has not changed, but all cars are all modelled to be fuelled on petrol. The results of this scenario should be compared to scenario V only.
X	2021 (63.32% Electric Car)	2021	2021	A scenario that considers converting 63.32% of cars to battery electric technology. This scenario produces the same level of NO_x reduction as scenario H (which looks at converting 90% of buses to electric technology).

Results

Table 3 below shows the results for the base case scenarios. Base models have been constructed for 2014 and for 2021, to reflect current road network operating conditions and conditions in 2021 based on planned development in the city. The impact of additional traffic (assuming no improvement in vehicle emissions) and cleaner vehicle technology is also estimated in the table below by comparing specific scenarios.

Table 3: Base case scenarios

Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)
A	Base 2014	26329.0	1459.1
B	Base 2014 (2021 Emissions)	12299.9	1099.5
C	Base 2021	13773.1	1214.9
D	Base 2021 (2014 Emissions)	29355.1	1628.1

				Δ NO_x (%)	Δ PM_{10} (%)
A-C	Impact of additional traffic and cleaner vehicles	12556.0	244.2	47.7	16.7
A-B	Impact of cleaner vehicles only in 2014	14029.2	359.6	53.3	24.6
A-D	Impact of additional traffic only in 2021	-3026.1	-169.0	-11.5	-11.6

Note on table above – figures highlighted in red indicate where emissions have increased relative to the base case. Figures highlighted in green indicate where emissions have decreased relative to the base case.

Table 4 below shows the emission savings possible by converting a proportion of the bus and car fleet to electric and hybrid-electric technology. Percentage changes are expressed as a percentage of the 'Base 2021' scenario.

Table 4: Electric bus and car scenarios

Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)	Δ NO_x (KG/Year)	Δ PM_{10} (KG/Year)	Δ NO_x (%)	Δ PM_{10} (%)
C	Base 2021	13773.1	1214.9	-	-	-	-
E	2021 (1.5% Electric Car)	13683.0	1213.7	90.1	1.1	0.7	0.1
F	LES 2021 (5% Electric Car)	13472.8	1211.1	300.3	3.7	2.2	0.3
G	LES 2021 (90% Hybrid Bus)	12225.9	1197.6	1547.1	17.3	11.2	1.4
H	LES 2021 (90% Electric Bus)	9970.4	1089.3	3802.7	125.6	27.6	10.3
I	LES 2021 (5% Electric Car and 90% Electric Bus)	9670.1	1085.5	4102.9	129.3	29.8	10.6
J	LES 2021 (5% Electric Car and 90% Hybrid Bus)	11925.6	1193.9	1847.4	21.0	13.4	1.7
X	2021 (63.32% Electric Car)	9970.3	1167.8	3802.7	47.1	27.6	3.9

Table 5 below shows the results for the many of the same scenarios a shown in table 4, but assuming that vehicle emissions do not improve (from 2014). The base case emissions shown in table 5 are considered to be very much worst case.

Table 5: Electric bus and car scenarios (2021 Saturn, 2014 EFT)

Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)	Δ NO_x (KG/Year)	Δ PM_{10} (KG/Year)	Δ NO_x (%)	Δ PM_{10} (%)
D	Base 2021 (2014 EFT)	29355.1	1628.1	-	-	-	-
K	2021 - 1.5% Electric Car (2014 EFT)	29213.8	1624.9	141.3	3.1	0.5	0.2
L	2021 LES - 5% Electric Car (2014 EFT)	28884.1	1617.7	471.0	10.4	1.6	0.6
M	2021 LES - 90% Hybrid Bus (2014 EFT)	25046.2	1547.3	4309.0	80.8	14.7	5.0
N	2021 LES - 90% Electric Bus (2014 EFT)	19961.1	1486.6	9394.0	141.5	32.0	8.7
O	2021 LES - 90% Electric Bus 5% Electric Car (2014 EFT)	19490.1	1476.2	9865.1	151.9	33.6	9.3
P	2021 LES - 5% Electric Car 90% Hybrid Bus (2014 EFT)	24575.1	1536.9	4780.0	91.2	16.3	5.6

Table 6 shows the emissions savings possible by converting a proportion of the 2021 car fleet to battery electric technology. It is considered that with City of York Council's intervention, the percentage of electric cars can be increased in 2021 from 1.5% to 5%. A figure of up to 5% is considered to be a realistic estimate of the proportion of electric cars on York road network in 2021 with a Low Emission Strategy in place.

Table 6: Electric car sensitivity testing

Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)	Δ NO_x (KG/Year)	Δ PM_{10} (KG/Year)	Δ NO_x (%)	Δ PM_{10} (%)
C	Base 2021	13773.1	1214.9	-	-	-	-
E	2021 (1.5% Electric Car)	13683.0	1213.7	90.1	1.1	0.7	0.1
F	LES 2021 (5% Electric Car)	13472.8	1211.1	300.3	3.7	2.2	0.3
Q	2021 LES - 10% Electric car	13172.5	1207.4	600.6	7.4	4.4	0.6
R	2021 LES - 25% Electric Car	12271.7	1196.3	1501.4	18.6	10.9	1.5
S	2021 LES - 50% Electric Car	10770.3	1177.7	3002.8	37.2	21.8	3.1
T	2021 LES - 75% Electric Car	9268.9	1159.1	4504.2	55.7	32.7	4.6
U	2021 LES - 100% Electric Car	7767.5	1140.5	6005.6	74.3	43.6	6.1

Table 7 shows the emissions savings possible by removing all diesel cars from the areas of technical breach. In this scenario, the number of cars is kept constant between the base case and the scenario under consideration (the diesel cars removed are assumed to be replaced with petrol cars).

Table 7: Removing diesel cars (number of cars the same but all petrol engine)

Scenario	Description	NO_x (KG/Year)	PM_{10} (KG/Year)	Δ NO_x (KG/Year)	Δ PM_{10} (KG/Year)	Δ NO_x (%)	Δ PM_{10} (%)
V	2021 Base with Detailed Option 3 Split	12590.7	1213.7	-	-	-	-
W	2021 with only petrol cars (remove all diesel cars)	9769.8	1211.1	2820.9	2.6	22.4	0.2

Emission Assessment for Development Site Appraisal Pilot Technical Guidelines (EMA-TG-1.1)

1 Introduction

1.1 Traditionally, the term Air Quality Impact Assessment has referred to an assessment focusing on concentrations, albeit with elements of exposure and emission assessment included. The Low Emission Partnership promotes an alternative more explicit terminology:

- Emissions Assessment: used to quantify changes in bulk emissions as a result of the development and associated mitigation.

- Concentration Assessment: used to assess changes in ambient pollutant concentrations arising from development and the implications this has for meeting air quality objectives.

- Exposure Assessment: used to determine if future occupants of a development are likely to be exposed to unacceptable levels of air pollutants.

1.2 This note provides *technical guidelines for undertaking emissions assessment for a development site.* The method is designed to meet the evolving assessment needs of *Local Air Quality and Low Emission Planning Policies*.

1.3 When applying the guidelines it is important to tailor their use, to reflect any specific requirements detailed in relevant local documents and in particular to take reference from the latter in relation to:

- Triggers for when an emission assessment is required.
- Scope of anticipated mitigation and detailed choice of measures
- Site performance indicators, benchmarks and targets

1.4 It is recommended that site assessment be approached in four stages (Scope, Specification, Assessment and Report) - subsequent sections of this note provide guidance on each:

2	Scope	assessment purpose, principles, work stages and expected outputs
3	Specification	inputs/outputs, methodology, mitigation options and data sources/tools
4	Assessment	base design, base fleet and mitigation
5	Report	content, format and review criteria

1.5 Supporting information is provided as appendices

A	Standard input variables and method variants
B	Standard output indicators and metrics
C	Standard scope and structure of emissions mitigation for development sites
D	Example presentation of base fleet structure and mitigation impact factors
E	Method Development Notes

1.6 Low emission planning policies remain at a relatively early stage, especially with regards the standardisation of emissions assessment methodology. Evaluation and evidence gathering continues and these LEP guidelines will be updated periodically to reflect learning. The Partnership welcomes feedback and examples to support this process (please send to info@lowemissionhub.org).

2 Scope

2.1 The scoping stage provides an opportunity to confirm the purpose, required work and expected outputs for the assessment. These aspects are formally determined by local policy and guidance, though those in turn may reference wider documents or standards, such as those identified here

2.2 It is useful, though not essential, to formally document the site specific assessment scope before proceeding to the specification stage. At the least, it is prudent to identify and raise any associated queries or uncertainties informally with the LPA, including with regards to:
- Policy aims, processes and decision making principles
- Performance metrics, indicators, benchmarks and targets
- The nature, scale and balance of anticipated emissions mitigation
- Standard or preferred datasets, technical methodologies and calculation tools
- Preferred format for presentation of results

2.3 The box below provides a standard scope for site emission assessment, which may be useful either:
- to a local authority, as a reference within its own local documents, or
- to a developer, as a starting point should local guidance provide less specific direction

Purpose	The aim of emission assessment is to inform the LPA's view as to whether the developers proposal, taking mitigation into account serves to ***'reduce the emissions harm generated by the site in an appropriate manner and to an acceptable level.'***
Work	Described as three distinct stages:
Specification	- Confirm relevant reporting metrics, indicators, benchmarks and targets - Specify assessment method including inputs, outputs and method variants - Establish initial list of mitigation options and specify appraisal approach - Identify main data sources, and/or assessment tools - Specify report content and format
Assessment	- Identify and describe main features of design, which are relevant to traffic/emissions - Establish the base fleet sub-structure and estimate impacts (without mitigation) - Describe proposed mitigation & estimate the associated benefits and cost - Consider financial contribution for further compensatory measures
Report	- Present summary results, supported by a technical commentary
Outputs	
Impacts	The assessment will provide a view of site emissions performance with and without proposed mitigation, including reporting quantitatively, on an agreed set of indicators.
Mitigation	The incorporated mitigation plan will propose mitigation that: - Is commensurate with the nature and scale of base fleet emissions - Reflects mitigation hierarchy (i.e. trip redn > on-site technology > off-site contribution) - Recognises any wider AQ benefits, not captured by quantitative assessment (see app E).

3 Specification

2.1 Detailed prior-specification of assessment work and outputs may be a requirement of local policy and guidance though is good practice even if not. Where it is a requirement, the developer will need to liaise with the LPA to gain associated prior approval before moving to the assessment stage.

2.2 The general aim for a specification document is to '*describe the detailed approach and methodology by which the assessment will be undertaken and reported'*. This should be presented in a simple concise format. The box below provides LEP checklist, standards and associated advice.

Indictors *Confirm reporting metrics, indicators, benchmarks and targets*

LEP Standards:*

NOX reduction	on-site reduction over base level	%mass
Monetised harm reduction	reduction of base monetised harm (total, trip/tech split)	%£
Residual monetised harm	residual monetised harm (after all on-site measures)	£value
Contribution	further compensatory (off-site) measures	£value
Total Mitigation Index	residual harm - contribution	£value

*Standard accumulation period for all indicators is the shorter of 5 years or the lifetime of the site

Method *Specify assessment method including inputs, outputs and method types*

- Section 4 explains the main stages of site assessment
- App's 1-2 layout standard inputs, outputs and associated method options/protocols

Mitigation *Establish initial list of mitigation options and specify appraisal approach*

Drawing on the broad scope of measures identified in the previous stage, an initial selection of measures should be identified and presented alongside specification of a suitable appraisal approach. These options form the *starting point* for mitigation design and benefit appraisal during the assessment stage (i.e. further iteration, extension or substitution may then be necessary in order to optimise the final package).

Data *Identify main data sources and assessment tools*

LEP Standards:*

- EFT: https://www.gov.uk/air-quality-economic-analysis
- IGCB: http://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
- LET: http://www.lowemissionstrategies.org/les_toolkit.html

*Sources and assumptions for any Type II data inputs/methods should also be provided

Reporting *Specify report content and format*

- Section 5 lays out important requirements for presentation of results.
- The LEP report book (EMA-RB) provides a template for summary tables

4 Assessment

4.1 Assessment is usefully considered in three parts (notes below provide a general approach for each):
- Base Design establishes the general site context
- Base Fleet projects associated traffic generation and emissions harm (without mitigation)
- Mitigation proposes measures and estimates the associated benefits and cost (with mitigation)

Base Design *Describe the main features of site design, which are relevant to traffic/emissions*

4.2 Provide a concise summary of the main features within the core/base design, which influence the nature and scale of traffic generation. These features should demonstrate good environmental design practice and seek to reduce traffic generation and associated emissions as far as possible (NB this includes standard provision and preparation for EV charging infrastructure). As a contributor to the base fleet, these features will not qualify as site mitigation.

Base Fleet *Establish the base fleet sub-structure & estimate site emissions harm*

4.3 The Base fleet should include all traffic attributable to the base design, comprising journeys undertaken by vehicles based on the site (origin trips) and onto or stimulated by it (destination trips).

4.4 Sub-fleets are defined as combinations of land-use type, vehicle categories (e.g. car, van, truck, bus) and journey type (e.g. resident, staff, public access, service, on-site managed fleet). Selecting an appropriate sub-fleet structure helps provide an informative description of base fleet activity, and also facilitates assessment of mitigation options (see appendix D for examples).

4.5 Fleet activity is estimated by the best available method, usually through the combination of average trip rates and trip distances at sub-fleet level. These are then combined with appropriate Fleet composition and emission factors to derive emission impacts, and then Damage cost factors to estimate monetised harm.

Mitigation *Define on-site mitigation & estimate the associated benefits and developer costs*
Consider financial contribution for further compensatory measures

4.6 Proposed on-site mitigation may by defined using the following structure:

Short title	concise header for easy identification and summary
Physical description	describes the practical intervention
Benefit description	describes the mechanism and scale of anticipated harm reduction
Impact factors	presents quantitative sub-fleet impact assumptions (see App D examples)
Costs	estimates marginal cost to the developer for implementation

4.7 Combination of mitigation Impact Factors with Base Fleet data enables calculation of associated emission benefits in both mass and monetised terms.

4.8 Calculation of the Residual Emissions and the associated Residual Monetised Harm, multiplied up over the agreed Benefits Period provides a basis for considering a financial contribution for further (off-site) compensatory measures.

4.9 Iteration of the cycle (i.e. para's 4.6-4.8) enables optimisation of the mitigation plan against the intended site performance defined through scoping and specification.

5 Report

Present summary results, supported by a technical commentary

5.1 Reporting should be tailored to any specific local requirements identified in the scoping stage and according to the format defined in the work specification. LEP Standard is summarised below.

5.2 The relatively simple and sequential nature of site emissions assessment supports transparency. It is important that reporting takes full advantage of this, enabling efficient review, query, iteration (where necessary) and ultimate decisions. The recommended format is a combination of summary tables, supported by a technical commentary.

5.3 The LEP emissions assessment report book (EMA-RB-1.1) provides a template to structure and present summary information, comprising individual tabs for: Base Design, Base Fleet, Mitigation (measures), Mitigation (sub fleets), Mitigation (site) and Site Headlines. Further guidance is provided within the document itself. Taken together, the tables provide a concise snapshot of the assessment overall. The headlines table is a particularly important submission.

5.4 The technical commentary, should *provide: 'all relevant information, inputs, assumptions, method detail and references both to underpin and explain the summary information and also, were it needed, tto replicate the assessment itself.'* Documentation from the scoping and specification stages can usefully provide a building block for its preparation.

5.5 The LPA will be able to advise on the detail of its own review and decision processes, however, standard considerations include whether:

(i) Approach reflects relevant guidance; and report is concise, transparent and of good quality.

(ii) Base design is well described and reflects good environmental design principles

(iii) Estimated fleet activity and impacts are based on reasonable and realistic assumptions

(iv) Appropriate effort has been made to identify, assess and propose mitigation

(v) The balance of mitigation reflects the mitigation hierarchy and also local site characteristics

(vi) Scale of mitigation (including any financial contribution) is commensurate to the emissions harm

Appendix A – Standard Inputs and Method Options

Input Parameter		Type I [Basic Assessment]	Type I+ [Simple Variants]	Type II+ [Tailored Assessment]
Site	Pollutants	NOx, PMex and PMnx[1]		CO2
	Base Year	First year of occupation / operation	break assessment into phases	
	Impact/Benefit period	5 years	site life time (if < 5yr)	
	Scope of Sub-Fleets	Staff, Public, Service, On-site Fleets	exclusion of negligible sub-fleets further sub-divisions (e.g. Taxis)	
	Scope of Vehicle Types	M-cycle, Cars, Van, Trucks, Bus	exclusion of negligible vehicle types further sub-divisions (e.g. Taxis)	
Traffic & Emissions	Trip Rates	LET defaults[2]	TA/TP derived data[3]	alternatively derived trip rates reductions for linked trips[3] reductions for grandfathered emissions[3]
	Trip Distance	LET defaults[2]		alternatively derived trip distance
	Vehicle Speed	Single speed (48 kph)	banded speeds (urban, rural, mixed)	alternative choice of vehicle speed
	Fleet Composition	EFT (fleet composition) with best available HGV% est		alternative fleet composition
	Emission Factors	EFT (emission factors)		
Damage	Damage Cost Factors	IGCB (national mid-range average)	IGCB (location adjusted values)	
	Damage cost accumulation	Base Year x Benefit Period (i.e. simple linear accumulation)		

Method options and protocols for method variation are as follows:

- Type I (basic assessment) provides a simple standard approach for site assessment
- Type I+ variants, provide adjustments for simple tuning
- Type II+ variants are more involved allowing for a more tailored assessment.
- The LPA may require specific type I and/or II variants to be adopted for all or for specific types of sites.
- Otherwise, the developer may choose the options they feel to be the most appropriate, providing:
  - (1) All variants are clearly flagged and justified within the assessment submission
  - (2) Type II variants are discussed with and approved by the LPA in advance
  - (3) A summary level basic type I calculation is also included as a reference point and aid to transparency

Table Notes

[1] PMnx = tyre, brake wear & abrasion

[2] See LET Report: http://www.lowemissionstrategies.org/downloads/Jan15/LET_MethodsDatav1.pdf

[3] See Appendix E for further discussion

Appendix B – Standard Indicators and Metrics

Indicator	Description	Metric[1,2,3]	Emissions (kg-cum)	Emissions (%base)	Damage (£-cum)	%base (%base)	Marginal Cost (£)	Marginal Cost (%base)
Base Harm	Site fleet under base design assumptions without mitigation	**Base Harm**	kg-base		£-base			
Site Mitigation	Benefits/costs of mitigation	**On-site Measures**						
	Benefits/costs from trip reduction	- Trip Reduction						
	Benefits/costs from tech measures	- Tech Improvement						
Residual Harm	[Base Harm] minus [On-Site Mitigation]	**Residual Harm**						
Contribution	Value of contribution for off-site measures	**Contribution**						
Total Mitigation	Contribution + Mitigation	**Total Mitigation**						

Table provides broad scope of standard indicators. Scope and specification stages will establish associated reporting requirements, which should include:
'an agreed headline set plus detailed supporting tables giving a break down by pollutants, sub-fleets and individual measures (or logical packages thereof)'.

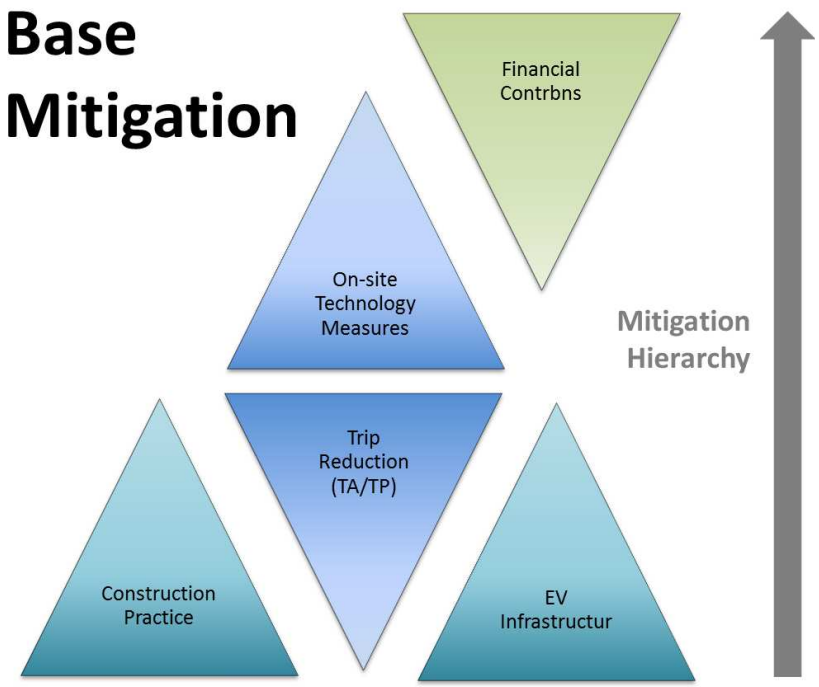
Table Notes

[1] Emission metrics to be broken down by specified pollutant.

[2] Damage metrics to be presented by pollutant and also as a combined sum.

[3] Further break down may also be required/presented in terms of: (i) vehicle types, (ii) sub-fleets and (ii) specific measures or packages

Appendix C – Standard Scope and Structure of Emissions Mitigation



Breakdown of Main Measures

Trip Reduction	Technology Measures	Financial Contributions
Active travel - footpaths, bridges, road crossing points - cycling infrastructure - cycle storage facilities - changing and drying facilities for cyclists - cycle hire schemes - Incentives to purchase bikes **Public Transport** - bus lanes, bus stops, bus information - incentives to use public transport** - new bus services - support / upgrading of existing services **Car use** - car clubs and /or car sharing schemes - restricted or zero parking standards **Communication & Management** - provision of travel advice & information - travel plan management & reporting	**Parking** - priority for low emission vehicles - graduated charges **Emission Standards** - access controls - service vehicles **Low Emission Vehicles** - buses to service the site - refuse collection vehicles - social transport - school minibuses **Car and Electric bikes** - low emission taxi ranks - low emission car clubs - electric bike charging facilities **Other** - Food waste segregation and used for use in anaerobic digestion	**Investment in Local Fleets** - buses - refuse collection vehicles - social transport - school transport **Investment in Local Infrastructure** - BM/CNG refuelling - strategic EV charging networks (including rapid charge) - freight transhipment / consolidation **Road network improvements** **Communication & Management** - Operation and maintenance of air quality monitoring equipment

Appendix D – Fleet Structure and Mitigation Impact factors

Fleet Structure

D1 Sub-fleets are defined as combinations of land-use type, vehicle categories (e.g. car, van, truck, bus) and journey type (e.g. resident, staff, public access, service, on-site managed fleet). Selecting an appropriate sub-fleet structure provides an informative description of base fleet activity, and also facilitates assessment of mitigation options.

The example below shows structure for a mixed used development comprising 9 principle sub-fleets:

ID	Landuse Component	Fleet Component	Journey Type
1	Residential (mixed housing)	Cars	Domestic
2	Employment (office)	Cars	Commuting staff
3	Employment (office)	Cars	Business
4	Employment (warehousing)	HGVs	Heavy fleet
5	Employment (warehousing)	Cars	Business
6	Health (nursing home)	Cars	Public access
7	Health (nursing home)	HGVs	Heavy fleet
8	Retail (Non-food)	HGVs	Heavy fleet
9	Retail (Food)	HGVs	Heavy fleet

Mitigation Impact Factors

D2 Mitigation Impact Factors presents quantitative sub-fleet impact assumptions.
Combination with Base Fleet Data enables calculation of associated emission benefits.

Dist%	I-Nox%	I-Pmex%	I-Pmnex%

Dist% Reduction in total distance travelled
I-NOx% NOX emission factor improvement
I-PMex% PMex emission factor improvement
I-PMnx% PMnx emission factor improvement

Example Calculation

NOx Reduction = Base NOx X (Dist% + I-NOx%)
NOx Residual = Base NOx – NOx Reduction

Appendix E – Method Development Notes

E1 The Low Emission Partnership continues work to capture evidence and strengthen the core methodology. Working topics and interim recommendations are listed below.

Site Performance Benchmarks

E2 The Partnership is collecting examples and evidence with a view to establishing performance benchmarks for a range of site types and locations, Once available these will help to supplement and refine the output criteria of section 2.

Trip Rate Adjustments

E3 Some local policies may make allowance for factoring prior use (i.e. grandfathered emission rights) and/or linked/diverted trips as an off-set to base fleet and base emission calculations. The LEP position on this is currently under review, however where such adjustments are supported by local policy, the following principles apply:

- Where grand-fathered emission rights are claimed for prior site use, the assumptions underpinning this subtraction must be transparent, including at least a summary level type I calculation for full site emissions, without deduction of grandfathered emissions.
- Similarly, where deductions are made to reflect linked or diverted trips , the assumptions underpinning this subtraction must be transparent , including at least a summary level type I calculation for fully allocated emissions without any linked/diverted trip adjustments.

Use of Data from Transport Assessment

E5 Transport assessment (TA) may provide useful site specific traffic data to support emissions assessment, particularly if this aim is built into the TA. Problems can arise however, for example if the TA concentrates on a worst case rather than best estimate traffic scenario. Therefore, where TA data is used, it is important to ensure that (i) it is appropriate to do so and (ii) full data sources/assumptions are included in the emissions assessment report.

Classifying trip and technology measures

E6 Measures should be grouped as 'broadly trip reduction' or 'broadly on-site technology' (however sub-fleet impact factors allow measures to achieve elements of both, so the distinction need not be absolute.

Credit for Wider AQ benefits

E4 The standard LEP methodology ensures that direct emission effects are taken into account – both in the base design and through mitigation. Some wider AQ benefits may however be missed, not least strategic interventions which encourage system or behaviour transformation over the longer term. The LEP position on how best to recognise and encourage such wider benefits is under review. For the meantime, the following principles apply:

- At the discretion of the planning authority mitigation credit may be awarded for wider AQ benefits not captured as part of the core methodology, *providing* the benefits are well described, realistic and clearly additional both to (i) good environmental design and (ii) the quantified mitigation benefits.

Low Emissions and Air Quality
Guidance for Development Management

Local planning decisions have important implications for local air quality and public health. This is because of their effect on the location, design, and intensity of emissions sources and receptors.

This Policy Note provides a development control tool to encourage developers and agents to support action through the planning system to help improve air quality and lower transport emissions. Guidance for consideration of stationary emission sources is provided elsewhere.

Contents

Appendices

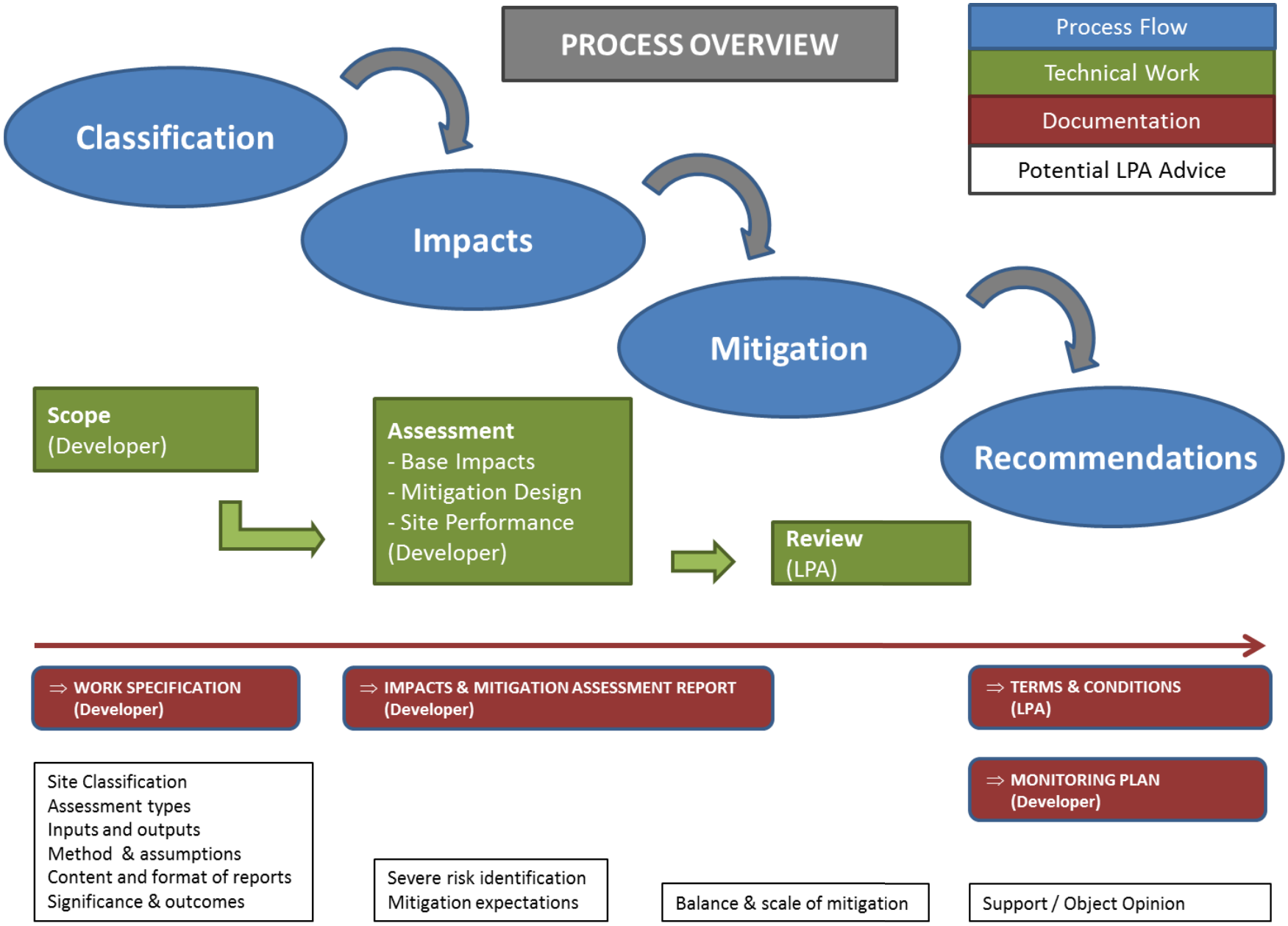


Figure 1: Process Overview

1 Introduction

Purpose

1.1 Air quality has a significant impact on public health, with an estimated 29,000 excess deaths each year attributed to poor air quality. Local authorities have a statutory duty to work towards compliance with the health based objectives set for seven key pollutants in the National Air Quality Strategy (NAQS). They also have duties relating to air quality under the Public health Outcomes Framework (PHOF).

1.2 Local planning decisions can significantly affect local air quality because of their effect on the design and location of emissions sources and receptors. Any air quality consideration that relates to land use and its development is capable of being a material planning consideration. The weight it is given relative to other considerations is context specific.

1.3 This Policy Note is intended to assist developers and Local Authority Officers in assessing the air quality impacts of a development and in reducing and mitigating any impacts that cannot be avoided as cost effectively as possible. It is a Development Control tool that seeks to encourage developers and agents to support action through the planning system to help improve air quality and lower transport emissions thereby improving health.

National Policy

1.4 The National Planning Policy Framework (NPPF) provides practice guidance on how planning can take account of the impact of new development on air quality. This replaces the guidance provided via the old system of National Planning and Policy statements.

1.5 The principles listed below are drawn out from the NPPF (see Appendix C1 for further detail):
- Prevention of and protection from air pollution
- Recognising and addressing cumulative and direct impacts
- Importance of Air Quality Objectives, Management Areas and Action Plans
- Sensitive to and supportive of Sustainable transport (including low emission fuels/technology)
- Specific guidance on the use of parking standards

Pollutants of Concern

1.7 The main pollutants of concern are nitrogen oxides and particles. Exceedance of nitrogen dioxide concentration objectives is a major national concern, as are efforts to reduce overall concentrations and the associated severe health implications of particle pollution.

1.8 Carbon dioxide is a third important atmospheric pollutant. Although, it is currently managed *via* alternative mechanisms within the planning process, linkages should be identified and utilised where this is possible.

1.9 Transport is a major source of pollutant emissions and forms the focus for this guidance. Other sources, including biomass boilers are dealt with in separate guidance.

Air Quality Risks

1.11 This guidance works to address three distinct risks relating to air quality:

Pollutant Emissions	bulk emissions, arising from development occupation and/or use of a development site, cumulatively loading and polluting the atmosphere.
Local Concentrations	*detectable* changes to ambient concentrations of air pollutants *directly* attributable to development occupation and/or use of a site.
Human Exposure	harm to individuals arising as a result of exposure to air pollutants through the occupation or use of the site.

Geography

1.12 Acute areas of poor air quality, where objectives are exceeded, are identified through the declaration of Air Quality Management Areas. See map in appendix D2 for details.

1.13 Polluting activity located within, or in close proximity to, an AQMA will be given particular attention within planning appraisal, as will any proposal which brings new population into an existing AQMA.

1.14 The guidance also sets out to reduce pollutant emissions across the entire LPA area, targeting background concentrations both within and beyond AQMAs helping to safe guard compliance with objectives and reduce particle levels, for which there is no known safe limit.

This Document

1.15 Figure 1 provides an outline of the overall process, comprising four parts: Classification, Assessment, Mitigation and Recommendations. Context and guiding principles are laid out in section 1. Section 2 provides a brief process description, supported by Figures 2 and 3, while more detailed notes are contained in section 3. Section 4 provides a summary of assessment and mitigation expectations by site type. Appendices provide detailed standards, guidelines and references on mitigation design, assessment methods and underpinning policy.

2 Overview

2.1 The guidance seeks to minimise pollutant emissions, avoid significant impacts on local concentrations and protect inhabitants from unacceptable exposure. In doing so, it tailors assessment and mitigation requirements according to the nature and scale of risk.

2.2 The process comprises four parts: Classification, Impacts, Mitigation and Recommendations:

Classification: an initial risk assessment enables broad classification of each development site, thereby tailoring and streamlining the assessment and mitigation requirements.

Impacts: depending on the site classification up to three types of impact assessment may be required: Emissions Assessment, Exposure Assessment and Concentration Assessment.

Mitigation: the type of site and the results of associated impact assessment determine the nature and scale of mitigation required to address and manage air quality risks.

Recommendations: findings and proposals generated by the preceding stages inform determination of the acceptability of a planning application *with regards to air quality and emissions*. In broad terms recommendations will be either: Support or Object (further details section 4.4) with support generally subject to certain terms and conditions.

2.3 Mitigation is no substitute for good environmental design, giving thought to location, layout, general features and site detail. This guidance assumes good design as the starting point and seeks to address the *remaining* impacts with *additional* interventions. Logically, features of base design are not normally considered part of site mitigation, so careful definition of the base site scenario is important both to ensure that it reflects positive design features and also to provide a firm reference point for identifying and responding to additional mitigation requirements.

2.4 For most sites, mitigation requirements are driven primarily by the need to minimise polluting emissions. This is called base mitigation. However, where concentration assessment indicates that a development is likely to directly cause or worsen an exceedence of a National Air Quality Strategy Objective or exposure screening indicates the possibility of new or additional public exposure to unacceptable levels of air pollution then base mitigation may require further adjustment or extension to ensure that it most appropriately addresses all relevant risk.

2.5 For a small number of proposals, the risks associated with the direct impact on local concentrations may be so severe as to make them unmanageable using standard mitigation options. Developers are encouraged to take steps to identify such 'potentially unmanageable risks', and discuss them and their implications with the LPA at the earliest opportunity. This helps establish site and situation specific expectations and avoids wasted effort on misdirected mitigation design and appraisal.

2.6 Base mitigation is intended to provide '*a balanced and proportionate level of emission reduction compared to the emission harm generated by the site*.' This mitigation is grouped into five broad types (ev infrastructure, construction practice, trip reduction, on-site technology measures and off-site contribution). Note however that a standard provision of EV infrastructure is expected as part of base design.

2.7 Selection of on-site mitigation should adhere to the established sustainable transport hierarchy:
- Reduce the number and distance of trips
- Shift journeys to more sustainable modes
- Improve the technology and efficiency of vehicles

2.8 Once the opportunity for on-site measures have been fully investigated, further credit may be gained (or required) by providing a contribution towards off-site measures (the responsibility for achieving and demonstrating associated good value emission reduction and management for which, then passes to the local authority).

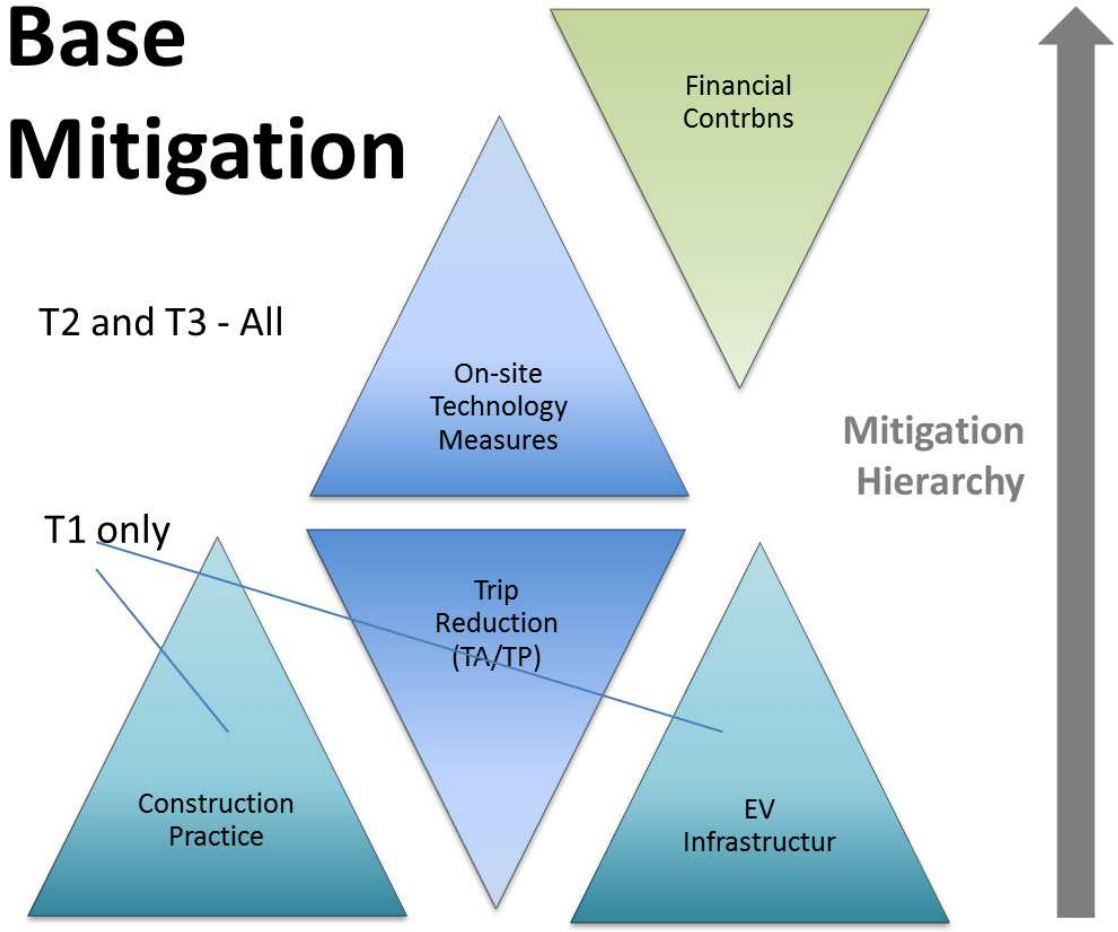


Figure 3: Broad Types of Base Mitigation

Notes

[1] In practice some physical measures may span both trip reduction and technology categories (eg low emission car club). The emission assessment method accommodates for this.

[2] A standard provision of EV infrastructure is considered as part of base design, so only considered as mitigation if provision extends beyond this.

3 Process

3.1 Classification

	Site Classification[1]	The highest qualifying classification applies
Type 1	All sites located within LPA territory Criteria: site located within boundary marked on Map (App C2)[2]	
Type 2	Development with potential to generate significant traffic and pollution Criteria: T2 traffic generation thresholds based on site land use and size (App C4)	
Type 3	Development with potential to show significant direct impact on local concentrations Criteria: Type 2 site in a pollution zone (App C2) meeting T3 traffic thresholds (App C5)[3]	
Type X	Development with potential to lead to a significant increase in exposure[4] Criteria: Exposure sensitive site (App C3)[5] located in a pollution zone (App C2)	
LPA	The classification principles laid out above provide a guide for typical assessment requirements. Due to the site specific nature of air quality, the LPA retains discretion to classify a given site differently if it decides this is more appropriate.	

Notes

[1] Grey box provides a summary of the classification approach. Appendix C1 provides a more detailed tabular description, which is supported by maps, tables and definitions in appendices C2-5

[2] Map in Appendix C2 identifies LPA territory, relevant pollution zones and grading of existing traffic levels on individual road links.

[3] Appendix C5 provides T3 traffic generation thresholds based on estimated increase in daily trips.

[4] Such sites are denoted Type 1X, 2X or 3X accordingly.

[5] Exposure sensitive sites comprise outdoor, non-occupational locations where members of the public are regularly present and are likely to be exposed for a period of time appropriate to the averaging time of the relevant AQ objective.

Averaging times for NO2 are annual (long term) and hourly (short term), corresponding sites reflect:
- short and long term exposure (e.g. housing, apartments, flats, schools, care homes, hospitals) or
- short term only (e.g. hotels, restaurants and cafes).

Exposure sensitive sites also include those, which would fall under the above criteria through exercising permitted development rights, for example: the permitted conversion of office space to residential.

3.2 Impacts

Site Impacts (and assessment requirements)
Site classification identified the types of risk that are of most concern and therefore the type(s) of assessment that are required.

Site Type	Main Risks	Assessment Requirements
Type 1	Low Risk Site	No Assessment Required
Type 2	Pollutant Emissions	Emissions Assessment[1]
Type 3	Pollutant Emissions Local Concentrations	Emissions Assessment[1] Concentration Assessment[2]
Type X	Human Exposure	Exposure Assessment[3]

Additional Assessment Requirements
Sites falling under other regulatory regimes, including IPPC, LAPPC, waste management licensing and EIA regulations may require alternative or additional assessments relating to air quality.

Discrete Assessment of Emissions, Concentrations and Exposure
Traditionally, the term 'Air Quality Impact Assessment' has referred to an assessment focusing primarily on concentrations, albeit potentially with elements of exposure and emission assessment included. The alternative terminology used here is intended to add clarity and precision in terms of expectations and requirements for assessment and reporting.

[1] Emissions Assessment: Used to quantify changes in bulk emissions as a result of the development and associated mitigation. Results are reported as tonnes of individual pollutants, and are also monetised as social damage (further details Appendix B3).

[2] Concentration Assessment: Concerned with assessing the change in ambient pollutant concentrations arising from development and the implications this has for meeting air quality objectives and managing additional human exposure to poor air quality (further details Appendix B4)

[3] Exposure Assessment: Used to determine if future occupants of a development are likely to be exposed to unacceptable levels of air pollutants. It is a simple screening exercise undertaken by reviewing local monitoring data, considering location of AQMAs and discussion with local air quality officer (further details Appendix B2).

Combined Assessment of Impacts and Mitigation
Appendices B1-4 provide supporting information on technical assessment. All comprise three stages:
(i) Estimation of site impacts without mitigation
(ii) Design of mitigation and estimation of the associated benefits/credit (see also section 3.3)
(iii) Optimisation of site performance, including mitigation, using iteration of (i)-(ii) as require

Combined Reporting
Results are bet presented in a combined impacts and mitigation report.

3.3 Mitigation

Pollutant Emissions
Base mitigation is required to address the bulk impact of emissions from development sites through construction, occupation and use. The broad nature of this mitigation is informed by site type as laid out below.

Site Type 1	Construction Management Plan[1] Provision of Electric Vehicle Infrastructure[2] (standard provision)
Site Types 2 and 3	Construction Management Plan[1] Provision of Electric Vehicle Infrastructure[2] Trip Reduction Plan[3], On Site Technology Measures[4] Financial Contribution for off-site measures[4]

Further Guidance on these measures is provided in Appendix A

Concentration Impacts & Human Exposure
Where concentration assessment indicates that a development is likely to directly cause or worsen an exceedence of a National Air Quality Strategy Objective; or exposure screening indicates unacceptable public exposure to air pollution, then base mitigation may require further adjustment, (i.e. refinement or extension) to ensure that it fully addresses all relevant risk. Adjustments are termed: base mitigation adjustment and exposure measures accordingly. Appendix B1 provide guidance on the criteria and tests against which final mitigation is assessed Appendix B2 provides guidance on exposure measures

Notes

[1] **Control of construction emissions**: Typically will require adoption of a 'construction environmental management plan' which covers issues such as construction vehicle emission standards, construction staff travel planning and delivery arrangements and control of fugitive dust emissions.

[2] **Electric Vehicle Infrastructure**: Aimed at encouraging the uptake of electric vehicles. Generally requires ground work for and/or installation of recharging infrastructure for electric vehicles (inside/outside, single/multiple users). Note that a standard level of provision is expected as part of basic site design and therefore is not considered part of base mitigation. Well targeted investment beyond the standard provision may however be considered part of base mitigation.

[3] **Trip reduction**: is the first element in the emission reduction hierarchy – it is important that sites minimise trips initially through good design and then through effective mitigation. Requirements are usually established *via* the separate transport assessment process and packaged in the form of a site travel plan. All proposed trip reduction measures, including those contained within a site travel plan, should be included under the heading Trip Reduction Plan (above). This is to ensure that the emissions assessment can take the associated emission benefits into account. (Note that in practice some measures may span both trip and tech categories, eg low emission car club, and the assessment method accommodates for this).

[3] **On Site Technology Measures**: Aimed at reducing emissions from individual vehicle trips that arise even after full trip reduction. Typically include measures to encourage emission reduction technologies for existing vehicles or by enabling and promoting the uptake of newer or alternatively fuelled ones.

[4] **Off Site Contribution**: Where the emission impact can't be fully mitigated by measures on, or in close proximity, to a development a financial contribution may be requested towards wider measures, typically including investment in local fleets, road networks or low emission infrastructure.

3.4 Recommendations

Recommendations
The following principles apply, when making recommendations regarding the acceptability of a planning application, with regards to air quality and emissions, taking all proposed mitigation into account.

Support Applications which:
- have taken appropriate steps to identify and minimise pollutant emisisons[1]
- are unlikely to cause significant local concentration impacts[2]
- do not pose unacceptable risk in terms of human exposure[3]

Object Applications for which <u>any one</u> of the following apply:
- fail to adequately identify and address pollutant emissions[1]
- are likely to cause significant local concentration impacts[2]
- pose unacceptable risk in terms of public exposure[3]

Notes

Procedure & Good Practice
Throughout the process, the applicant is responsible for maintaining checks on procedure and practice. Compliance with process guidelines is important both for efficiency and for quality assurance. The best outcomes also rely on professional practice, including a willingness to work to the spirit as well as the letter of policy and guidance. Failure to do so is likely to results in delays and potentially additional cost.

Evidence, Outcomes & Endeavour
In forming AQ recommendations, the authority considers each air quality risk independently, applying three tests for evidence, outcomes and endeavour.

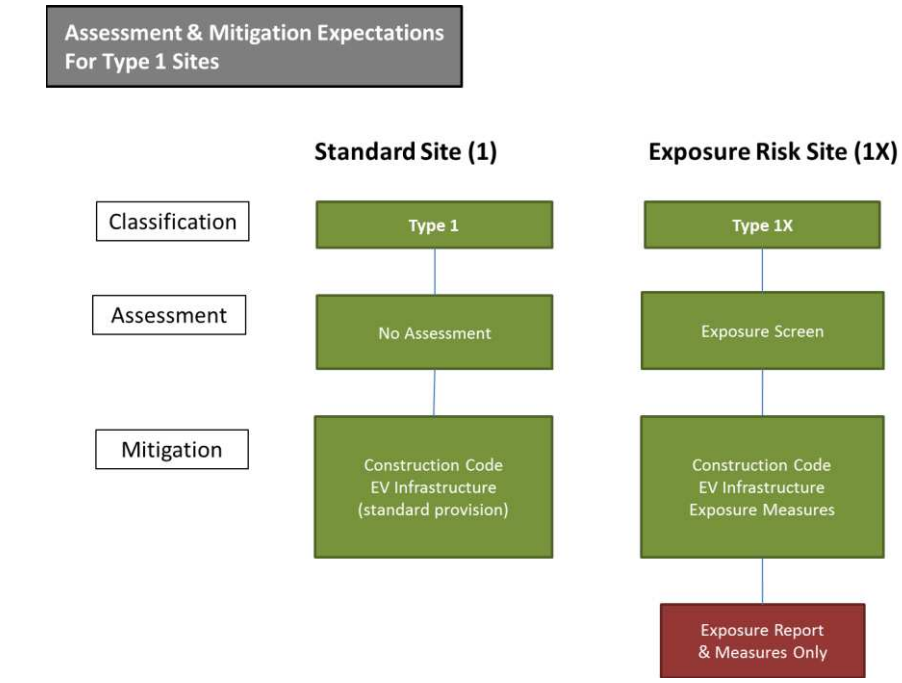
[1]	**Pollutant Emissions**	Good confidence in the impact assessment and evidence Mitigation is commensurate to the emission impacts Pollutant emissions have been reduced as far as reasonably possible
[2]	**Concentration Impacts**	Good confidence in the impact assessment and evidence Creation or worsening of AQO exceedance is considered unlikely Concentration impacts have been reduced as far as reasonably possible
[3]	**Public Exposure**	Good confidence in the impact assessment and evidence Unacceptable public exposure to air pollution is considered unlikely Exposure has been reduced as far as reasonably possible

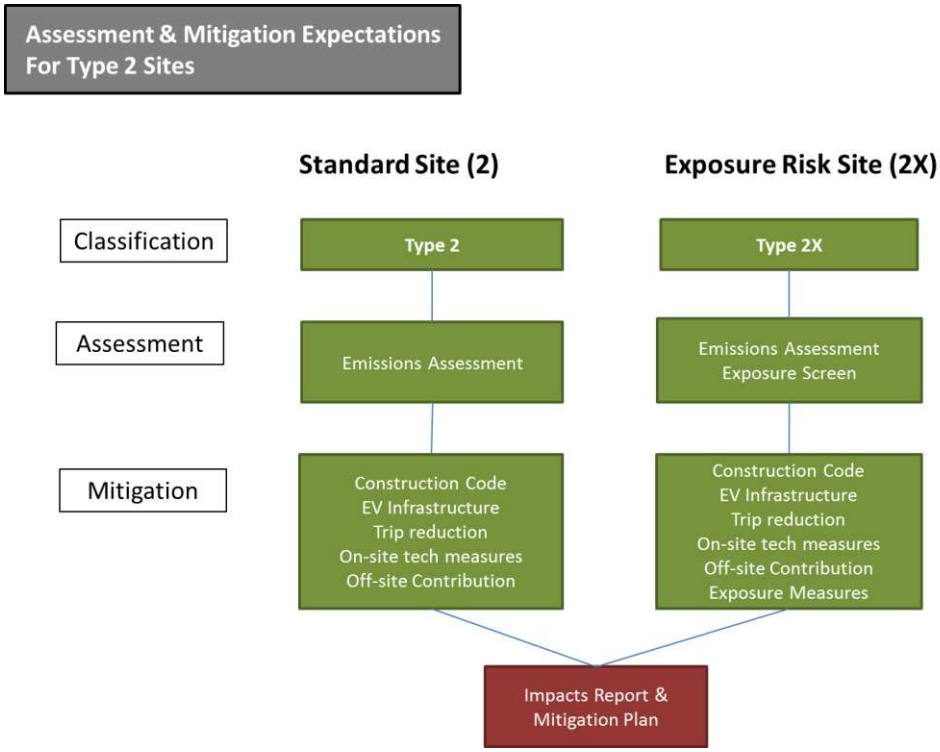
Interpretation
Good confidence in the evidence provided is a pre-requisite for forming any sort of view on outcomes and endeavour. The relative weighting of the latter two may then vary from site to site and by situation. However, in general, appraisal of outcomes is the priority, while the view on endeavour will have most influence where outcomes are not clear cut – though not necessarily in an overriding way.

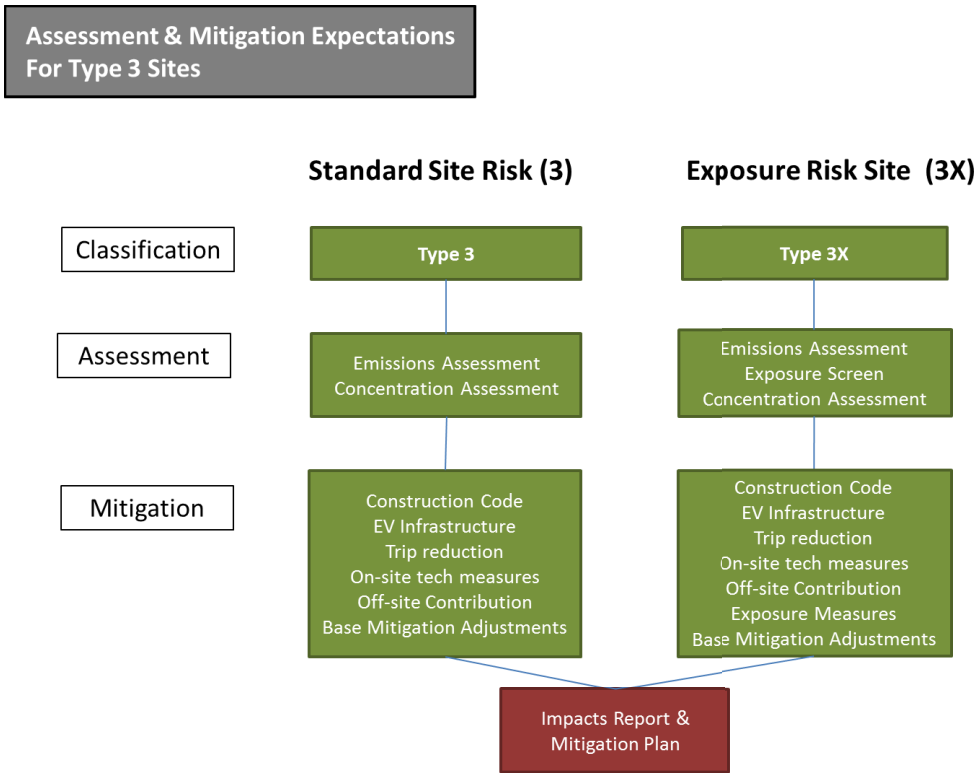
Further Guidance
Appendix B1 provides information as to how these tests and checks are applied by the LPA.
Appendices B2-4 provide information on the unpinning impact assessments.

4 Assessment, Mitigation & Reporting Expectations by Site Type

The diagrams and table in this section summarise expectations for the scope of assessment, mitigation and reporting by classified site type. (Note that where associated assessments are undertaken, the mitigation expectation is for '*due consideration of the indicated mitigation in light of the assessment results*').







Assessment, Mitigation & Reporting Expectations by Site Type		1	1X	2	2X	3	3X
Assessment	Emissions Assessment			x	x	x	x
	Concentration Assessment					x	x
	Exposure Assessment		x		x		x
Base Mitigation	Construction Code	x	x	x	x	x	x
	EV Infrastructure	x	x	x	x	x	x
	Trip Reduction			x	x	x	x
	On-site tech measures			x	x	x	x
	Off-site contributions			x	x	x	x
Mitigation Adjustment	Exposure Measures		x		x		x
	Base Mitigation Adjustments					x	x
Documentation	Exposure Report (only)		x				
	Impacts & Mitigation Report			x	x	x	x
	Monitoring Plan			x	x	x	x