NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Health and social care directorate

Quality standards and indicators

Briefing paper

Quality standard topic: Air pollution: outdoor air quality and health
Output: Prioritised quality improvement areas for development.
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Contents

1 Introduction

This briefing paper presents a structured overview of potential quality improvement areas for air pollution: outdoor air quality and health. It provides the committee with a basis for discussing and prioritising quality improvement areas for development into draft quality statements and measures for public consultation.

1.1 Structure

This briefing paper includes a brief description of the topic, a summary of each of the suggested quality improvement areas and supporting information.

If relevant, recommendations selected from the key development sources below are included to help the committee in considering potential statements and measures.

1.2 Development sources

The key development sources referenced in this briefing paper are:

Air pollution: outdoor air quality and health (2017) NICE guideline NG70.

Physical activity and the environment (2018) NICE guideline NG90.

Physical activity: walking and cycling (2012) NICE public health guideline PH41. This was checked in March 2016 and no new evidence that affects the recommendations was identified. Next review is not yet scheduled.

2 Overview

2.1 Focus of quality standard

This quality standard will cover road-traffic-related air pollution and its links to ill health.

2.2 Definition

Air pollution occurs when harmful or excessive quantities of substances including gases, particulates, and biological molecules are introduced into the air. Human activity (anthropogenic) and natural processes can both generate air pollution.

A variety of air pollutants have known or suspected harmful effects on human health and the environment. The pollutants which have the greatest impact on health at levels currently seen in the UK are particulate matter and nitrogen dioxide.

Particulate matter is produced by, among other things, combustion of fossil fuels or abrasion of tyres and brakes. It derives from both human-made and natural sources

(such as sea spray and Saharan dust). Particles are classified by size, described using the abbreviation PM with a suffix that gives the maximum particle size in micrometres. PM_{10} can penetrate and lodge deep inside the lungs, and fine particles ($PM_{2.5}$) can penetrate the lung barrier and enter the blood system. The mass concentration of particles is usually expressed in micrograms per m^3 of air.

All combustion processes in air produce oxides of nitrogen (NO_X). Nitrogen dioxide (NO_2) and nitric oxide (NO) are both oxides of nitrogen and together are referred to as NO_X. Road transport is the main source, followed by the electricity supply industry and other industrial and commercial sectors.

Road transport accounts for 31% of NO_x, 19.5% of $PM_{2.5}$ and 18% of PM_{10} UK emissions. It frequently accounts for more than 64% of air pollution at urban monitoring sites (Road traffic's contribution to air quality in European cities European Topic Centre on Air Pollution and Climate Change Mitigation). This comes from exhausts and other sources such as the wear of tyres, brakes and the road. Non-exhaust sources account for around 21% of $PM_{2.5}$ from vehicles. As exhaust emissions are reduced, the relative contribution from other sources becomes more significant.

2.3 Current legislation and limits

Maximum levels of outdoor air pollutants that affect health, such as particles (PM_{10} and $PM_{2.5}$) and NO_2, are set out in the 2008 Ambient Air Quality Directive (2008/50/EC) [EP2]. This was made law in England through the Air Quality Standards Regulations 2010, which sets targets and mandatory limits for levels of outdoor air pollutants.

Guideline values, including for $PM_{2.5}$, PM_{10} and NO_2, are also set out in the World Health Organization's Ambient (outdoor) air quality and health. The WHO limits are lower than current EU limits.

Tail-pipe emissions from vehicles are regulated under a series of European Directives for all types of vehicles. The standards currently extend from Euro 1 to Euro 6 for cars and vans, and from Euro I to Euro VI for heavy goods vehicles (HGVs), buses and coaches. The latest Euro standard requires manufacturers to adhere to tighter standards of emissions.

2.4 Incidence and prevalence

Short-term exposure (over hours or days) to elevated levels of air pollution can lead to:

- effects on lung function
- exacerbation of conditions such as asthma
- increase in hospital admissions and mortality.

Long-term exposure (over several years) can reduce life-expectancy, mainly because of increased risk of mortality from cardiovascular and respiratory causes and from lung cancer.

In 2008, the effect of anthropogenic particulate air pollution on mortality in the UK was estimated as equivalent to nearly 29,000 deaths at typical ages, and an associated loss of total life of 340,000 life years (COMEAP: mortality effects of long-term exposure to particulate air pollution in the United Kingdom Public Health England).

Public Health England has modelled the potential health burden and costs to the NHS and social care system arising due to diseases related to air pollution (Estimation of costs to the NHS and social care due to the health impacts of air pollution Public Health England). The model included non-communicable diseases where there is strong evidence of an association such as coronary heart disease, stroke, asthma, and lung cancer and other diseases where a robust association is weaker (chronic obstructive pulmonary disease) or emerging (diabetes, dementia and low birthweight).

- In 2017, total NHS and social care cost in England due to $PM_{2.5}$ was estimated to be £41.20 million for diseases where there is robust evidence, increasing to £76.10 million when diseases with less robust evidence are included.
- The total cost due to NO_2 was estimated to be £1.68 million for diseases where there is robust evidence, increasing to £81.06 million when diseases with less robust evidence are included.

Over recent decades air pollutant emissions have reduced. But in 2016, UK levels of NO_2 exceeded the EU directive annual mean limit in 37 of 43 geographical zones (Directive 2008/50/EC European Commission).

The way air pollution is distributed is not straightforward. Pollutant concentrations vary:

- The most deprived areas tend to have higher concentrations of NO_2 and PM_{10}.
- Regardless of socioeconomic status, urban areas tend to have higher pollutant levels than rural areas, which often have larger populations in the mid-range of deprivation.

The national trend shows high average concentrations in both the most and least deprived areas, and lower concentrations in the (predominantly rural) mid-range areas.

Children (14 and under) and older people (65 and older) are more susceptible to the effects of air pollution (Air quality and social deprivation in the UK: an environmental inequalities analysis Department of Environment, Food and Rural Affairs (Defra)).

2.5 Management

Local authorities have specific legal powers to tackle air pollution locally, where there is evidence that it exceeds legal limits. Strategic decisions taken by local government on transport, planning and public health also contribute to local air quality. There are a number of strategies and frameworks on air pollution that guide the approach taken in local authorities.

The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations identifies 28 local authorities in England that are required to develop local plans to address exceedances on their roads in the shortest possible time. It also set out the measures that the Mayor is taking forward in London. In March 2018, the government directed an additional 33 local authorities to conduct feasibility studies to identify measures that could bring forward NO_2 concentration compliance within the shortest possible time.

The Clean Air Zone framework sets out principles for local government to define an area where targeted action is taken to improve air quality, and resources are prioritised and coordinated in order to shape the urban environment in a way that delivers improved health benefits and supports economic growth.

Addressing air pollution by encouraging people to walk and cycle rather than drive, can help people to become fitter and healthier. Changing the way people travel can also help reduce emissions of greenhouse gases that contribute to climate change.

The Cycling and Walking Investment Strategy announced that £1.2 billion will be invested in cycling and walking from 2016-21 to double the level of cycling by 2025 and to reverse the decline in walking. In addition, the £1.7bn Transforming Cities Fund aims to tackle congestion through increased public transport in major cities, which will have an impact on exhaust and non-exhaust emissions.

The government is currently consulting on its Clean Air Strategy which sets out the approach to tackling 5 air pollutants – fine particulate matter, ammonia, nitrogen oxides, sulphur dioxide and non-methane volatile organic compounds.

3 Summary of suggestions

3.1 Responses

In total 14 stakeholders responded to the 2-week engagement exercise 8/5/18 to 29/5/18, 1 of which did not provide any areas for quality improvement.

Stakeholders were asked to suggest up to 5 areas for quality improvement. Specialist committee members were also invited to provide suggestions. The responses have been merged and summarised in table 1 for further consideration by the Committee.

Full details of all the suggestions provided are given in appendix 2 for information.

Table 1 Summary of suggested quality improvement areas

Suggested area for improvement	Stakeholders
Awareness raising	
• Air quality monitoring and communication	ALPHA, BHF, LIV, SCM
• Advice for vulnerable groups	ADPH, BHF, BTS, HFC, SCMs, UNI
Transport choice	
• Active travel	ADPH, HFC, LIV, RCGP, SCMs
• Public transport	ADPH, FIRST, RBKT
Planning and development	
• Strategic planning	RTPI, SCMs, TPS
• Planning and development of specific sites	ADPH, RBKT, RCGP, SCMs, TPS
Clean air zones	BHF, SCMs, TPS
Reducing vehicle emissions	
• Low-emission vehicles	ADPH, FIRST, HFC, RBKT, SCMs
• Transport management	ALPHA, ADPH, FIRST
• Driver training	SCM
Additional areas	
• Other sources of pollution	ALPHA, ADPH, HFC, RCGP, SCM, TDF

ADPH, Association of Directors of Public Health
ALPHA, Alphasense Ltd
BHF, British Heart Foundation
BTS, British Thoracic Society
FIRST, FirstGroup plc UK Bus Division
HFC, Hammersmith and Fulham Council
LIV, Living Streets
RBKT, Royal Borough of Kingston upon Thames
RCGP, Royal College of General Practitioners
RTPI, Royal Town Planning Institute
SCM, Specialist Committee Member
TDF, The Dirac Foundation
TPS, Transport Planning Society
UNI, Unicef

3.2 Identification of current practice evidence

Bibliographic databases were searched to identify examples of current practice in UK health and social care settings; 2306 papers were identified for air pollution: outdoor air quality and health. In addition, 70 papers were suggested by stakeholders at topic engagement and 81 papers internally at project scoping.

Of these papers, 13 have been included in this report and are included in the current practice sections where relevant. Appendix 1 outlines the search process.

4 Suggested improvement areas

4.1 Awareness raising

4.1.1 Summary of suggestions

Air quality monitoring and communication

Stakeholders suggested that there is a need to improve air quality monitoring at a local level to ensure accurate information is available. There was a concern that modelled data can be misleading. Improved monitoring will support assessment of the effectiveness of interventions and improve information available to the public.

It was also suggested that air pollution alerts and relevant limits need to be clearly communicated so that the public understand the impact on health and quality of life. This should include the link between air pollution and specific diseases.

Advice for vulnerable groups

The need for better targeting of air pollution information and engagement of specific vulnerable groups such as people with circulatory and respiratory conditions, children and pregnant women, and people living in areas with a high concentration of air pollution was highlighted as a priority. It was suggested that professionals working in hospitals, GP surgeries, pharmacies, social care and schools should have training and access to information on air pollution so that they can give consistent advice to people in vulnerable groups on when and how to reduce their exposure. It was suggested that providing information to people could help them to avoid the need to visit their GP and hospital admissions.

It was also suggested that there should be more focus on the impact of air pollution on people who work on roads such as professional drivers and road workers.

4.1.2 Selected recommendations from development source

Table 2 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 2 to help inform the committee's discussion.

Table 2 Specific areas for quality improvement

Suggested quality improvement area	Suggested source guidance recommendations
Air quality monitoring and communication	**Development management** NICE NG70 recommendation 1.2.2 **Awareness raising** NICE NG70 recommendations 1.7.3 and 1.7.4
Advice for vulnerable groups	**Awareness raising** NICE NG70 recommendation 1.7.2 **Vulnerable groups** NICE NG70 recommendation 1.7.7

Air quality monitoring and communication

Development management

NICE NG70 – Recommendation 1.2.2

In consultation with local communities, consider including air quality monitoring and measures to reduce road-traffic-related emissions in the Regulation 123 list of funding options for using the Community Infrastructure Levy (see the Planning Portal information on the Community Infrastructure Levy).

Awareness raising

NICE NG70 – Recommendation 1.7.3

Consider providing information on air quality (using the Department for Environment, Food and Rural Affairs' Daily Air Quality Index) with weather forecasts and the pollen index. This could be provided through local, national and social media.

NICE NG70 – Recommendation 1.7.4

Consider providing information on:

- How health is affected by exposure to air pollutants in the long term as well as during specific periods of poor air quality.

Advice for vulnerable groups

Awareness raising

NICE NG70 – Recommendation 1.7.2

Ensure healthcare professionals are aware that information on air quality is available, what it means for patients and what actions are recommended.

Vulnerable groups

NICE NG70 – Recommendation 1.7.7

Healthcare professionals should be aware of vulnerable groups who are particularly affected by poor outdoor air quality. When notified of poor outdoor air quality, during any contact with vulnerable groups healthcare professionals should give general advice on how to avoid contributing to levels of air pollution and raise awareness of how to minimise exposure. This could include advice to:

- Avoid or reduce strenuous activity outside, especially in highly polluted locations such as busy streets, and particularly if experiencing symptoms such as sore eyes, a cough or sore throat.
- Use an asthma reliever inhaler more often, as necessary.
- Close external doors and windows facing a busy street at times when traffic is heavy or congested to help stop highly polluted air getting in.

(See also the Department for Environment, Food and Rural Affairs' information about the Daily Air Quality Index.)

4.1.3 Current UK practice

Air quality monitoring and communication

The annual report of the Chief Medical Officer[1] indicated that the air quality monitoring data collected by local authorities is quality assured and comparable across cities and regions. Although these data are collected for compliance assessment, they are increasingly being used for public dissemination and information.

It is not a statutory obligation for local authorities in England to monitor $PM_{2.5}$. A Mayor of London report on actions taken by the London boroughs to improve air quality[2] concluded that monitoring data for PM_{10} is relatively limited in terms of spatial coverage and monitoring sites do not always represent 'worst-case' locations.

[1] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution - what do we know?
[2] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London

There is a significant variation in monitoring provision between London boroughs and results are not readily comparable. The report recommended that monitoring strategies should be reviewed (in line with the London Local Air Quality Management Technical Guidance (LLAQM:TG16)) to ensure effective monitoring around the air quality focus areas and at other key locations, where exceedances are likely.

A 2018 House of Commons report on improving air quality[3] found that there is disparity between local and national air quality data and suggested there is a need for more support to local authorities to acquire and use technology to monitor live emission levels. The report also indicated that more detailed information on the impacts of individual policy interventions is required to enable councils to tackle air quality as efficiently as possible. Similarly, improved oversight of local monitoring stations by the responsible bodies is also needed to ensure they are properly sited and functioning.

The report concluded that 'air pollution levels should be monitored at key spots within local communities–for example near schools, hospitals and care homes–and the results clearly communicated to local residents and service users. This will not only serve to reinforce the value of measures such as anti-idling campaigns, but will also provide the public with the information they need to press their elected representatives for further changes at a local authority level'. It also identified that although air pollution has a significant impact on health, the health community has not been sufficiently engaged in the air quality debate and suggested that information about air pollution and what to do about it should be more easily accessible in GP surgeries.

A 2017 briefing on air quality for Directors of Public Health[4] highlighted the East End Quality of Life Initiative community group which works with Sheffield City Council to run local monitoring using low cost diffusion tubes (a cheap and easy way to measure nitrogen dioxide). This has built local understanding of air pollution and engaged local communities in assessing and taking action on local issues. Similar programmes are underway in the City of London, Kings Lynn and elsewhere.

Advice for vulnerable groups

The briefing for Directors of Public Health highlighted the airTEXT, airALERT and 'Know and Respond' services as examples of successful implementation of health communication which enable local residents to make informed decisions on how to reduce their exposure and if required, to better manage their health conditions.

[3] Improving air quality: Fourth Report of the Environment, Food and Rural Affairs Committee, Fourth Report of the Environmental Audit Committee, Third Report of the Health and Social Care Committee, and Second Report of the Transport Committee of Session 2017–19 (2018) House of Commons
[4] Air Quality: A briefing for Directors of Public Health (2017) Local Government Association

- *air*TEXT is a free service for the public providing air quality alerts by SMS text message, email and voicemail and 3-day forecasts of air quality, pollen, UV and temperature across Greater London. *air*TEXT is an independent service, operated in partnership with a Consortium made up of representatives from all the member local authorities, the Greater London Authority, Public Health England and the Environment Agency.
- airAlert is a service that sends free messages direct to vulnerable people informing them about air pollution levels in their area and currently covers Surrey, Sussex, Hampshire and Sevenoaks. It is targeted at people with respiratory health problems who may be affected by air pollution and warns people the day before or on the day that elevated air pollution is expected to occur.
- Know and respond services operate in Wiltshire and Scotland and send registered users an alert message if air pollution in their area is forecast to be moderate, high or very high. It includes advice on action to take to minimise the effects of pollution episodes.

King's College London is currently working with the Mayor of London to deliver alerts for episodes of moderate and high pollution[5]. This includes directly notifying a wider group of London stakeholders who are most vulnerable to the impacts of poor air, including schools. Work is ongoing to roll out alerts more widely to include care homes and GP surgeries.

The Barts Health Cleaner Air for East London programme[6] included a 'train the trainer' approach to empower over 300 key clinicians and community health staff to give their vulnerable patients practical advice on how to access key information around daily pollution levels, reduce their exposure and take action to protect themselves. These messages were based around three key actions: know the forecast; take lower pollution routes; and travel outside rush hour. 5 hospitals and 4 GP surgeries participated in the programme. 2,994 patients were engaged by a trained clinician and given advice on how to protect themselves. Air quality maps were given out to help patients avoid the highest level of air pollution. In addition 95 pharmacists were trained and given 1,000 Cleaner Air packs (including information flyers and local maps showing local pollution levels and less polluted routes, as well as key actions which patients could take to protect themselves) to distribute to patients collecting certain medication.

A stakeholder suggested that there is a lack of standardised guidance available for healthcare professionals on advice to give people when pollution levels are high. It was suggested that many clinicians and vulnerable people are unaware of the guidance available from the Daily Air Quality Index[7].

[5] Monitoring pollution to inform the most vulnerable Londoners (2018) King's College London News Centre
[6] Cleaner air with Barts Health 2016 Global Action Plan
[7] Daily Air Quality Index Department of Environment, Food and Rural Affairs

4.1.4 Resource impact

The resource impact report for NG70 identified that recommendations 1.7.2 and 1.7.3 could have a resource impact. Costs and associated benefits will vary locally and a local resource impact template is available to help organisations assess their local resource impact.

4.2 Transport choice

4.2.1 Summary of suggestions

Active travel

Encouraging people to choose to walk or cycle instead of travelling by car was highlighted as a priority. Stakeholders suggested it is important to raise awareness that active travel will improve air quality by reducing emissions as well as improving health. Walking should be encouraged for short journeys and cycling for longer ones with good links to public transport. Stakeholders highlighted that there are currently mixed messages leading to confusion around the safety of cycling and walking where there is a risk of exposure to air pollution. There is also a lack of clarity on whether people are protected from air pollution when they are inside a vehicle which may lead them to avoid active travel.

Public transport

Stakeholders highlighted the importance of providing low pollution, integrated, accessible public transport in urban areas to encourage people not to use their car. Access to public transport is currently varied. It was suggested that local authorities should be implementing measures to ensure buses do not get delayed by congestion.

4.2.2 Selected recommendations from development source

Table 3 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 3 to help inform the committee's discussion.

Table 3 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Active travel	**Walking and cycling** NICE NG70 Recommendation 1.6.1 **Awareness raising** NICE NG70 Recommendation 1.7.4 **Local action** NICE PH41 Recommendations 3, 5 and 6 **Schools, workplaces and the NHS** NICE PH41 Recommendation 8 **Active travel** NICE NG90 recommendation 1.2.8
Public transport	**Clean air zones** NICE NG70 Recommendation 1.3.4 **Active travel** NICE NG90 Recommendation 1.2.2

Active travel

Walking and cycling

NICE NG70 Recommendation 1.6.1

Provide support for active travel (see NICE's guidelines on physical activity: walking and cycling and physical activity and the environment).

Awareness raising

NICE NG70 Recommendation 1.7.4

Consider providing information on:

- The impact of local pollution on air quality inside, as well as outside, a vehicle (levels of pollution are not always lower inside).

Local action

NICE PH41 Recommendation 3

- Develop coordinated, cross-sector programmes to promote walking and cycling for recreation as well as for transport purposes, based on a long-term vision of what is achievable and current best practice. Ensure the needs of all sections of the population are addressed. Incorporate public health goals to increase the prevalence of people cycling and walking, as well as the distance covered by those who already walk and cycle regularly.

- Ensure programmes include communications strategies to publicise the available facilities (such as walking or cycle routes) and to motivate people to use them. Include information that people with impairments will require, such as where dropped kerbs are located, the location and design of barriers at access points to cycle paths, and where public transport links and disabled toilets can be found.

NICE PH41 Recommendation 5

- Implement town-wide programmes to promote cycling for both transport and recreational purposes. These should be linked to existing national and local initiatives. (Note: 'town-wide' in this case could include cities or suburban areas.) Programmes could include:
    - provision of information, including maps and route signing
    - car-free events or days
    - intensive sessions in particular settings or aimed at particular groups, such as: 'Bike to work' weeks and workplace challenges; activities aimed at children and families (such as 'Bike it', 'Bike club' and other school programmes); and activities for people with impairments who may use specially adapted cycles
    - activities and campaigns to emphasise the benefits of cycling (including the health benefits, the reliability and ease of access to local facilities and services).
- Ensure travel by cycle and public transport is integrated to support longer journeys. This includes providing secure cycle parking at public transport sites as well as support to transport adapted cycles and tandems for people with disabilities.
- Ensure training is available for those who are interested in cycling, either as a form of transport or as a recreational activity. An example of a cycle training programme is the Department for Transport's Bikeability.

NICE PH41 Recommendation 6

Ensure walking routes are integrated with accessible public transport links to support longer journeys. Signage should give details of the distance and/or walking time, in both directions, between public transport facilities and key destinations.

Schools, workplaces and the NHS

NICE PH41 Recommendation 8

- Foster a culture that supports physically active travel for journeys to school (for all staff, parents and students) and during the school day. For example, promote the health benefits of cycling and walking and provide sufficient, secure cycle parking. Also ensure it is easy to get into the school grounds by foot or by bike. In addition, schools should provide suitable cycle and road safety training for all pupils.

- Develop and implement school travel plans that encourage children to walk or cycle all or part of the way to school, including children with limited mobility. Integrate these plans with those produced by other local schools and other travel plans available for the local community. Involve pupils in the development and implementation of plans.
- Map safe routes to school and to local play and leisure facilities, taking into account the views of pupils, parents and carers. Also consult with the local community, including people with expertise in accessibility issues (such as those with mobility difficulties or community groups that work with them).
- Develop programmes to ensure the local environment around schools and the nearby catchment area provide opportunities for all children to cycle or walk. This should include addressing motor vehicle speed, parking and dangerous driving practices.

Active travel

NICE NG90 Recommendation 1.2.8

Improve routes that children, young people and their families and carers use, or could use, for active travel to school, college and early years settings. Focus on improving safety, accessibility, connectivity, sustainability and appeal to users.

Public transport

Clean air zones

NICE NG70 Recommendation 1.3.4

Consider support for zero- and low-emission travel. This could include:

- Developing integrated public transport networks (including park and ride schemes) based on low-emission vehicles.

Active travel

NICE NG90 Recommendation 1.2.2

Increase physical activity associated with using public transport services. This includes encouraging use of these services by:

- Ensuring available services are reliable, particularly in rural areas where public transport may be more limited.
- Making information about public transport services accessible to people with visual and hearing impairments, for example provide spoken and visual announcements about destinations and stops on board services, and at stops and stations.

- Making public transport physically accessible to everyone (see the Department for Transport's guidance on inclusive mobility).

4.2.3 Current UK practice

Active travel

The Mayor of London report on local authority actions to improve air quality[8] concluded that travel awareness, 'walk to school', and cycling promotion are all widely supported throughout the London boroughs, often in conjunction with wider public awareness campaigns linking transport, air quality and health.

A 2016 Public Health England briefing for local authorities on the promotion of active travel[9] highlighted Bristol City Council as an example where public health involvement in a wide range of initiatives such as the roll out of 20mph zones, residents parking schemes around the city centre, the use of the WHO HEAT economic assessment tool as standard practice when developing all new pedestrian and cycle schemes, and developments using Cycling City and Local Sustainable Transport funding have been successful in promoting active travel. Commuting by car is no longer the norm in Bristol for those aged under 40 and more people in Bristol commute to work on foot or by bicycle than in any other local authority in England and Wales.

The 2018 draft Clean Air Strategy[10] highlights good practice examples as follows:

- The county-wide Surrey Air Alliance which is working to deliver a programme to primary and secondary schools across Surrey to raise awareness about the impacts of air quality, encourage behaviour change and reduce idling outside schools.
- The Sussex Air Quality Partnership will deliver a targeted schools and businesses campaign to reduce idling, increase walking and cycling and reduce emissions from plant (construction machinery).
- London Boroughs of Hackney, Islington and Tower Hamlets have established a Zero Emissions Network (ZEN), with residents and businesses committing to cleaner air. The ZEN is a free to join network that helps residents and businesses in London's City Fringe area save money, reduce emissions and improve air quality. The ZEN offers free advice and services to switch to low emission energy and travel options with the goal of making the City Fringe a better place to live, work and visit. Since it was established in 2012, the network has gained over

[8] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London
[9] Working Together to Promote Active Travel: A briefing for local authorities (2016) Public Health England
[10] Clean air strategy 2018 Department for Environment, Food and Rural Affairs

1,500 members from across Clerkenwell, Shoreditch and Spitalfields and has implemented over 600 emission reducing initiatives.

Public transport

The House of Commons report on air quality[11] indicated that their evidence suggested the government's 2017 Air Quality Plan had an 'insufficient emphasis on public transport' with reliance on technological improvements and new emissions standards to deliver gradual improvements. The report concluded that 'Defra and the Department for Transport must work closely with local authorities to ensure that councils introducing Clean Air Zones receive the support they need to implement complementary measures which encourage car drivers to switch to public transport, active travel or electric vehicles. This may involve granting local authorities greater powers, for example over lane rental schemes and new development.'

The draft Clean Air Strategy highlighted:

- the 2017 Bus Services Act which includes a range of measures to improve bus services through franchising and better partnership working
- the £1.7bn Transforming Cities Fund, which aims to improve public transport connectivity in some of England's largest cities including tackling congestion and emissions
- improvements in rail services and reductions in emissions.

4.2.4 Resource impact

The resource impact report for NG70 identified that recommendation 1.3.4 could have a resource impact. Costs and associated benefits will vary locally and a local resource impact template is available to help organisations assess their local resource impact.

The resource impact statement for NG90 stated that the guideline was not expected to lead to a significant impact on resources. While practice is anticipated to change, the recommendations reinforce what is covered and advocated by other existing national bodies (for example, the Department of Transport's Cycling and walking investment strategy and Public Health England's Obesity and the environment briefing: increasing physical activity and active travel), and are aligned with Acts of Parliament (for example, Bus Services Act 2017: new powers and opportunities), for which local authorities already provide funding.

[11] Improving air quality: Fourth Report of the Environment, Food and Rural Affairs Committee, Fourth Report of the Environmental Audit Committee, Third Report of the Health and Social Care Committee, and Second Report of the Transport Committee of Session 2017–19 (2018) House of Commons

4.3 Planning and development

4.3.1 Summary of suggestions

Strategic planning

The importance of local authorities taking air pollution into consideration when developing their Local Plan and other key strategies was emphasised. Stakeholders suggested that key stakeholders should work together in a coordinated way to address air quality and it should be a priority to evaluate specific interventions.

Stakeholders highlighted a variety of principles recommended for strategic planning of development in a local area including choice of location (brownfield sites or immediately around existing settlements), access to public transport, walkability, cycle networks and parking limits. Strategic planning can also help to improve the attractiveness of existing housing areas in order to limit overall traffic growth.

Planning and development of specific sites

Stakeholders suggested that planning and development of specific sites can reduce dependency on private cars by supporting compact, higher density, mixed-use developments with good walking and cycling facilities and access to public transport. There was some concern, however, that developments that increase the number of vehicle trips in areas with poor air quality or add more households in areas with poor air quality are being given consent based on mitigation measures such as travel plans and cycle schemes which may be insufficient to offset the impact of the development on air quality.

The importance of taking air pollution into account when designing buildings and streetscape was emphasised. A specific example of the potential for erecting a physical barrier next to a major road to reduce air pollution for people living in vulnerable locations was suggested.

4.3.2 Selected recommendations from development source

Table 4 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 4 to help inform the committee’s discussion.

Table 4 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Strategic planning	**Planning** NICE NG70 Recommendation 1.1.1 **Active travel** NICE NG90 Recommendation 1.2.1 **Policy and planning** NICE PH41 Recommendation 2
Planning and development of specific sites	**Planning** NICE NG70 Recommendation 1.1.2 **Development management** NICE NG70 Recommendation 1.2.1 **Strategies, policies and plans to increase physical activity in the local environment** NICE NG90 Recommendation 1.1.4 **Active travel** NICE NG90 Recommendations 1.2.3 and 1.2.5 **Local action** NICE PH41 Recommendation 6

Strategic planning

Planning

NICE NG70 Recommendation 1.1.1

Include air pollution in 'plan making' by all tiers of local government, in line with the Department for Communities and Local Government's National Planning Policy Framework. This includes county, district and unitary authorities, as well as regional bodies and transport authorities. The Local Plan and other strategic planning processes (such as the core strategy, local transport plan, environment and health and wellbeing strategies) should include zero- and low-emission travel, for example cycling and walking (see section 1.6 and NICE's guideline on physical activity: walking and cycling). Other strategies for zero- and low-emission travel could include:

- Providing charge points for electric vehicles in workplaces, commercial developments and residential areas.
- Supporting car sharing schemes or car clubs.

Active travel

NICE NG90 Recommendation 1.2.1

Identify and prioritise local areas where there is a high potential to increase travel on foot, by bicycle, or by other forms of active travel. Base this on demographic data, travel surveys, land use mix and other sources of local information. Take into account views identified through community engagement (see recommendation 1.1.2).

Policy and planning

NICE PH41 Recommendation 2

Ensure local, high-level strategic policies and plans support and encourage both walking and cycling. This includes a commitment to invest sufficient resources to ensure more walking and cycling – and a recognition that this will benefit individuals and the wider community. Relevant policies and plans include those on:

- air quality

Planning and development of specific sites

Planning

NICE NG70 Recommendation 1.1.2

When 'plan making' consider:

- siting and designing new buildings, facilities and estates to reduce the need for motorised travel
- minimising the exposure of vulnerable groups to air pollution by not siting buildings (such as schools, nurseries and care homes) in areas where pollution levels will be high
- siting living accommodation away from roadsides
- avoiding the creation of street and building configurations (such as deep street canyons) that encourage pollution to build up where people spend time
- including landscape features such as trees and vegetation in open spaces or as 'green' walls or roofs where this does not restrict ventilation
- including information in the plan about how structures such as buildings and other physical barriers will affect the distribution of air pollutants.

Development management

NICE NG70 Recommendation 1.2.1

Consider ways to mitigate road-traffic-related air pollution. This could include:

- Taking action to reduce the number of motorised trips. For instance, by:
    - incorporating air quality outcomes in travel plans
    - developing local parking plans
    - supporting car clubs
    - supporting active travel (see NICE's guideline on physical activity: walking and cycling).

Strategies, policies and plans to increase physical activity in the local environment

NICE NG90 Recommendation 1.1.4

Ensure planning permissions always prioritise the need for people (including people with limited mobility) to be physically active as a routine part of their daily life, for example ensuring access on foot to local services such as shops and public transport stops.

Active travel

NICE NG90 Recommendation 1.2.3

Ensure new and refurbished footways, footpaths and cycle routes link to existing routes and improve the connectivity of the network as a whole. Aim to make it as easy as possible for people to walk, cycle or use other forms of active travel rather than making short journeys by car. This includes journeys between residential areas and:

- public transport stops and stations
- places of work
- public open spaces
- schools, colleges and early years settings
- healthcare services
- shops, and leisure sites.

NICE NG90 Recommendation 1.2.5

Ensure pedestrians, cyclists and users of other modes of transport that involve physical activity are given the highest priority when developing or maintaining streets and roads. (This includes people with limited mobility.) Use 1 or more of the following methods:

- Re-allocate road space to support physically active modes of transport (for example, by widening footways and introducing cycle lanes). For more detail on designing these routes, see the recommendations on walking and cycling in NICE's guideline on air pollution: outdoor air quality and health, and the

Department for Transport's guidance on Shared use routes for pedestrians and cyclists.

- Restrict motor vehicle access (for example, by closing or narrowing roads to reduce capacity).
- Introduce road-user charging schemes. For more detail on charging schemes, see the recommendations on clean air zones in NICE's guideline on air pollution: outdoor air quality and health.
- Introduce traffic-calming schemes to restrict vehicle speeds (using signage and changes to highway design). For more detail on traffic calming, see the recommendations on smooth driving and speed reduction in NICE's guideline on air pollution: outdoor air quality and health, recommendations on measures to reduce speed in NICE's guideline on unintentional injuries on the road, and the Department for Transport's guidance on Traffic calming.

Local action

NICE PH41 Recommendation 6

Address infrastructure issues that may discourage people from walking, for example, motor traffic volume and speed, lack of convenient road crossings, poorly maintained footways or lack of dropped kerbs, where needed. Take into account NICE's recommendations on physical activity and the environment and on road design.

4.3.3 Current UK practice

Strategic planning

The House of Commons report on improving air quality[12] suggested that there are potential knowledge and capacity gaps among some local authorities regarding the most effective ways to tackle air pollution and concluded that more support is needed. The report also indicated that greater inter-disciplinary involvement in urban planning and collaboration across local authorities is needed to ensure that air pollution, congestion, obesity and a range of public health issues are tackled through joined-up initiatives. The report concluded that more robust air quality policies should be included in all Local Plans.

The Mayor of London report on local authority actions to improve air quality[13] indicated that Central London was the only sub-region where all boroughs had produced new/revised air quality action plans within the past 5 years. In the other sub-regions a significant proportion of boroughs were in the process of revising their

[12] Improving air quality: Fourth Report of the Environment, Food and Rural Affairs Committee, Fourth Report of the Environmental Audit Committee, Third Report of the Health and Social Care Committee, and Second Report of the Transport Committee of Session 2017–19 (2018) House of Commons
[13] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London

action plans. A number of boroughs had integrated air quality action plan measures into local transport plans and Local Implementation Plans. Some boroughs had incorporated air quality measures into local planning policy, which had enabled them to achieve a higher standard of air quality mitigation at scheme design phase and/or provided additional funding for community sustainable transport schemes through S106 agreements. The Mayor's Air Quality Fund has been used to encourage more partnership working across boroughs.

Stakeholders highlighted the Healthy Streets approach that is being used in London[14] to help partners think about issues that affect the experience of using and spending time on a street and consider what changes could be made to improve the experience of being on a street. It encourages assessment of local areas on a number of criteria including air quality. There was, however, some concern from other stakeholders that this approach could underplay the importance of air quality and may result in improvements being made to one area that worsen air quality in other areas.

Planning and development of specific sites

The 2017 annual report of the Chief Medical Officer[15] highlighted York City Council's holistic approach to reducing pollution which includes ensuring that planning applications are reviewed for contaminated land, air quality, noise and other pollution to mitigate the impact of new developments on people's health and environment. The Council's contaminated land and low emission planning policies have been adopted by others to help developers to reduce pollution.

In collaboration with the Low Emission Partnership, Lancaster City Council[16] has developed Draft Planning Guidance for management of emissions and air quality at development sites. Building on this work, the Partnership has developed design options and templates for other local authorities wishing to adopt a similar approach.

The Mayor of London report on local authority activities[17] identified projects to develop 'green corridors' and improvements to public spaces to encourage modal shift to walking/cycling and the introduction of 20mph speed limits on some non-Transport for London roads. There were also some examples of collaboration between boroughs and Transport for London to identify and implement traffic management improvements at key road junctions. The report highlighted an experiment to close school related roads in two to three locations to address air quality, congestion and safety issues associated with the school run in Hackney. A

[14] Healthy streets for London Transport for London
[15] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution - what do we know?
[16] Lancaster guidance and templates (AQ planning guidance) (2017) Lancaster City Council
[17] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London

number of boroughs have also undertaken improvements to the urban realm to encourage active travel and facilitate walking on cleaner routes.

The Mayor of London has audited 50 primary schools in the city's most polluted areas[18]. The audits have made recommendations to reduce emissions and exposure. The Mayor is encouraging London boroughs to audit every school within an area of high pollution. The school audit toolkit can be used by schools, nurseries, workplaces, hospitals and other organisations. Recommendations include:

- moving school entrances and play areas away from busy roads
- 'no engine idling' schemes to reduce emissions from the school run
- local road changes including better road layouts, restricting the most polluting vehicles around schools and pedestrianisation by school entrances
- adding green infrastructure like 'barrier bushes' along busy roads and in playgrounds to help filter fumes.

In 2015 the City of Edinburgh Council[19] took the decision to limit traffic in the street directly outside schools at key times, meaning that parents will not be able to park right at the gates to drop their children off. The aim was to create a safer, more pleasant environment and the scheme promotes active travel to school by walking and cycling, in turn reducing congestion and pollution in the area. The chosen locations had been experiencing road safety issues due to the number of drivers bringing cars too close to school gates.

4.3.4 Resource impact

The resource impact report for NG70 identified that recommendations 1.1.1 and 1.2.1 could have a resource impact. Costs and associated benefits will vary locally and a local resource impact template is available to help organisations assess their local resource impact.

The resource impact statement for NG90 stated that the guideline was not expected to lead to a significant impact on resources. While practice is anticipated to change, the recommendations reinforce what is covered and advocated by other existing national bodies (for example, the Department of Transport's Cycling and Walking investment strategy and Public Health England's Obesity and the environment briefing: increasing physical activity and active travel), and are aligned with Acts of Parliament (for example, Bus Services Act 2017: new powers and opportunities), for which local authorities already provide funding.

[18] The Mayor's school air quality audit programme London Assembly
[19] Streets ahead: road safety in Edinburgh Edinburgh Council

4.4 Clean air zones

4.4.1 Summary of suggestions

Stakeholders suggested that clean air zones should be introduced to reduce air pollution as quickly as possible by restricting traffic in areas where there is the greatest risk to health. It was acknowledged that a variety of approaches can be effective at managing traffic and encouraging a shift away from cars including restrictions on types of vehicles, parking policy and travel planning. Some stakeholders felt that charging in clean air zones will be necessary. It was suggested that monitoring of the impact of the measures adopted is a priority to ensure air pollution is reduced.

4.4.2 Selected recommendations from development source

Table 5 below highlights recommendations that have been provisionally selected from the development source that may support potential statement development. These are presented in full after table 5 to help inform the committee's discussion.

Table 5 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Clean air zones	**Clean air zones** NICE NG70 Recommendations 1.3.1, 1.3.2, 1.3.6 and 1.3.7

NICE NG70 Recommendation 1.3.1

Consider introducing a clean air zone that:

- includes restrictions or charges on certain classes of vehicle
- supports zero- and low-emission travel (including active travel)
- includes targets to progressively reduce pollutant levels below EU limits and aim to meet World Health Organization air quality guidelines
- aims to reduce exposure to air pollution across the whole zone rather than focusing on air pollution hotspots.

NICE NG70 Recommendation 1.3.2

Identify which classes of vehicles to restrict or charge in a clean air zone (see recommendation 1.3.1) based on an understanding of local conditions (such as local sources of road-traffic-related pollution and factors influencing dispersion). Use nationally recognised vehicle types (such as the Euro classification for diesel and petrol vehicles).

NICE NG70 Recommendation 1.3.6

Where traffic congestion is contributing to poor air quality, consider incorporating a congestion charging zone within the clean air zone.

NICE NG70 Recommendation 1.3.7

Consider monitoring outside the zone to identify whether its implementation is causing problems in terms of traffic composition and flow. If so, address any issues identified. For instance, by changing the boundaries to address increased pollution at the margins of the zone or problems caused by diversion of traffic.

4.4.3 Current UK practice

The Clean Air Zone (CAZ) framework sets out principles for local government to define an area where targeted action is taken to improve air quality, and resources are prioritised and coordinated in order to shape the urban environment in a way that delivers improved health benefits and supports economic growth. The draft Clean Air Strategy[20] identifies that CAZ are available to all local authorities and may address all sources of pollution, including particulate matter, to reduce public exposure using a range of measures appropriate to the particular location. The strategy highlights that awareness of the potential of the CAZ framework within local authorities is low. 28 of the 353 local authorities in England have been directed by the government to produce local plans to reduce NO_2 levels in the shortest time possible by December 2018, which includes consideration of the possible introduction of a Clean Air Zone, where this is appropriate.

The UK Plan for tackling roadside NO_2 concentrations[21] states that if a local authority can identify measures other than charging zones that are at least as effective at reducing NO_2 and are at the same or lower cost, those measures should be preferred as long as the local authority can demonstrate that this will deliver compliance as quickly as a charging CAZ.

4.4.4 Resource impact

The resource impact report for NG70 identified that recommendations 1.3.1, 1.3.2, 1.3.6 and 1.3.7 could have a resource impact. Costs and associated benefits will vary locally and a local resource impact template is available to help organisations assess their local resource impact.

[20] Clean air strategy 2018 Department for Environment, Food and Rural Affairs
[21] UK Plan for tackling roadside nitrogen dioxide concentrations: Technical report Department of Environment, Food and Rural Affairs/Department for Transport

4.5 Reducing vehicle emissions

4.5.1 Summary of suggestions

Low-emission vehicles

Stakeholders suggested that public sector fleets and bus operators should be encouraged to switch to low-emission vehicles. The public sector can also influence other local businesses through use of the Social Value Act (which requires those who commission public services to think about how they can also secure wider social, economic and environmental benefits) to ensure suppliers address their impact on sustainability. Advice should be provided to businesses and the public on how they can have an impact on air pollution when buying vehicles. It was highlighted that it will be important to address the barriers to adopting low/zero emission vehicles such as limitations to the charging infrastructure for electric vehicles, vehicle type availability and confidence that transport needs can be met.

Transport management

It was suggested that the public sector has an important role in influencing traffic and travel patterns which can help to reduce air pollution by, for example:

- consolidating and sharing vehicles to ensure efficient use
- encouraging staff and visitors to use public transport by offering assistance with season ticket purchase and reducing parking provision
- using technology to help manage bus and taxi traffic.

Driver training

The potential for efficient driving to reduce emissions was highlighted and it was suggested that the number of drivers taking up efficient driving techniques in fleets, including local authorities and health, could be measured via fuel savings.

It was also suggested that implementation and enforcement of anti-idling measures at sensitive locations such as schools, hospitals and care homes could help to reduce emissions.

4.5.2 Selected recommendations from development source

Table 6 below highlights recommendations that have been provisionally selected from the development sources that may support potential statement development. These are presented in full after table 6 to help inform the committee's discussion.

Table 6 Specific areas for quality improvement

Suggested quality improvement area	Selected source guidance recommendations
Low-emission vehicles	**Clean air zones** NICE NG70 Recommendation 1.3.4 **Reducing emissions from public sector transport services and vehicle fleets** NICE NG70 Recommendation 1.4.6
Transport management	**Clean air zones** NICE NG70 Recommendation 1.3.5 **Raising awareness** NICE NG70 Recommendation 1.7.6
Driver training	**Clean air zones** NICE NG70 Recommendation 1.3.5 **Reducing emissions from public sector transport services and vehicle fleets** NICE NG70 Recommendation 1.4.2 and 1.4.5

Low-emission vehicles

Clean air zones

NICE NG70 Recommendation 1.3.4

Consider support for zero- and low-emission travel. This could include:

- Encouraging uptake of zero- and low-emission vehicles, for instance:
    - Providing electric charging points.
    - Encouraging public and private sector organisations to use zero- or low-emission vehicles for deliveries to retail, office, residential or other sites in the zone, particularly for the last mile of deliveries in city centres.

Reducing emissions from public sector transport services and vehicle fleets

NICE NG70 Recommendation 1.4.6

Consider making low vehicle emissions (nitrogen oxides and particles) one of the criteria when making routine procurement decisions. This could include selecting low-emission vehicles, including electric vehicles.

Transport management

Clean air zones

NICE NG70 Recommendation 1.3.5

Consider taking action to reduce emissions within the clean air zone. For instance:

- Action to minimise congestion caused by delivery schedules.
- Using a fleet recognition scheme (such schemes help fleet operators improve efficiency by reducing fuel consumption and emissions: the system recognises operators who meet best operational standards).
- Addressing emissions from public sector transport activities (see section 1.4).
- Specifying emission standards for private hire and other licensed vehicles.

Awareness raising

NICE NG70 Recommendation 1.7.6

Consider giving businesses information on how they can reduce road-traffic-related air pollution and improve fuel efficiency. For example, they could:

- schedule deliveries to minimise congestion
- encourage employees to cycle to work (see NICE's guideline on physical activity: walking and cycling).

Driver training

Clean air zones

NICE NG70 Recommendation 1.3.5

Consider taking action to reduce emissions within the clean air zone. For instance:

- Introducing fuel-efficient driving initiatives including:
    - Bylaws and other action to support 'no vehicle idling' areas, particularly where vulnerable groups congregate (such as outside schools, hospitals and care homes) and in areas where exposure to road-traffic-related air pollution is high

Reducing emissions from public sector transport services and vehicle fleets

NICE NG70 Recommendation 1.4.2

Consider training staff drivers to reduce their vehicle emissions. This could include:

- reducing rapid accelerations and decelerations, and correct gear selection to improve fuel consumption
- switching off engines, if practical and safe, when parked by the roadside and when dropping off people or deliveries
- vehicle maintenance, including pumping up tyres to the recommended pressure
- emphasising that lower vehicle emissions will reduce both fuel costs and air pollution.

NICE NG70 Recommendation 1.4.5

Consider monitoring the fleet's fuel consumption and evaluating the local effect on air pollutant emissions to demonstrate the benefits of training on fuel use and air quality.

4.5.3 Current UK practice

Low-emission vehicles

A House of Commons report[22] indicated that in 2016 only 0.4% of new cars were pure electric, and 1% partial electric, while 4% of new buses in the UK were totally electric. The report noted that data on the proportion of the current UK bus fleet that has been retrofitted to Euro VI-equivalent emissions standard is not currently available because funding streams do not set outcomes in terms of Euro standards equivalence. The report concluded that more needs to be done to encourage public bodies to increase the proportion of electric vehicles in their fleets.

Additional funding of £40 million via the Clean Bus Technology Fund was announced by the government[23] in 2018 to be awarded to 20 local authorities to enable older buses to meet minimum emission standards by retrofitting technology to reduce tailpipe emissions of NO_2.

The House of Commons report also highlighted the inadequate provision of electric vehicle charging infrastructure. In January 2018 just five councils in the UK had taken advantage of the On-Street Residential Chargepoint Scheme, which offers local authorities funding of up to 75% of the cost procuring and installing charging points. The Mayor of London indicated that in some cases the roll-out of charging infrastructure was hampered by the refusal of planning committees to accept charging installations, following pressure from residents.

The Mayor of London report on local authority activities[24] highlighted examples of boroughs expanding their public electric vehicle charging infrastructure beyond the 'Source London' network and indicated an increase in the number of low emission car clubs (enabling users to book and use low emission vehicles). It also highlighted a diesel ban on council fleets in Camden and the City of London which has meant that officers have not been able to purchase or lease diesel vehicles unless there is an absolute operational necessity.

[22] Improving air quality: Fourth Report of the Environment, Food and Rural Affairs Committee, Fourth Report of the Environmental Audit Committee, Third Report of the Health and Social Care Committee, and Second Report of the Transport Committee of Session 2017–19 (2018) House of Commons
[23] Government funding boost for bus industry in drive to improve air quality (2018) News story from Department for Environment, Food and Rural Affairs and Department for Transport
[24] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London

York City Councils[25] extensive Pay As You Go electric vehicle charging network, funded by grants and a green charity, meant York was an early adopter of electric vehicles. A taxi incentive scheme coupled with an emission based taxi licensing policy has resulted in 15% of York's taxis being low emission (petrol hybrids). The Council[26] is also retrofitting all the sightseeing buses from diesel to electric to improve air quality and reduce fuel costs and has paid for the retrofit of some passenger service buses as part of its Low Emissions Strategy.

The draft Clean Air Strategy[27] highlights that City of Bradford Council has been leading work in collaboration with other West Yorkshire local authorities and Public Health England to develop a regional Low Emissions Strategy; it includes measures to tackle transport emissions to deliver significant and rapid improvements, encouraging uptake of ultra-low emission vehicles, including development of an air quality and planning technical guidance and a low emissions procurement guide.

Transport management

The Mayor of London report on local authority activities[28] highlighted a low emissions logistics project led by Lambeth which aimed to reduce vehicle trips and deliveries to council buildings across south London.

The Barts Health Cleaner Air for East London programme[29] encouraged staff at five main sites to think about how they travel to and from work, and between hospital sites, and were encouraged to switch their trips by walking, cycling or car sharing. 130 participants switched 771 journeys, of which 104 were from single car use. Emissions of pollutants were reduced by 1.45kg NO_2, the equivalent of 1,036 miles driven by an average passenger vehicle.

Sussex Community NHS Foundation Trust[30] delivers care in homes and across over 70 sites spanning 1,000 square miles and employing almost 5,000 people. The Trust aimed to reduce travel to its lowest possible level, while also encouraging take up of low/zero emission, low carbon and active travel alternatives. Firstly, they set up a travel bureau to support staff in making fewer, cleaner journeys. The travel bureau offered local public transport guidance, season ticket loans, a cycle to work scheme and route planning for drivers. Secondly, they introduced a low emission pool car and lease scheme for staff, and electric bikes. The programme has cut the grey fleet

[25] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution - what do we know?
[26] Air Quality: A briefing for Directors of Public Health (2017) Local Government Association
[27] Clean air strategy 2018 Department for Environment, Food and Rural Affairs
[28] Local Authorities and Air Quality: A summary of action taken by London boroughs to improve air quality (2017) Mayor of London
[29] Cleaner air with Barts Health 2016 Global Action Plan
[30] [30] Annual Report of the Chief Medical Officer 2017, Health Impacts of All Pollution - what do we know?

mileage (staff using their own cars for Trust work) by 826,000 miles and helped to reduce local air pollution.

The Plymouth Hospital Travel Plan[31] resulted in a reduction in staff arriving by car (from 90% to 54%). The plan included restricted and charged parking permit allocation, supplemented with improved public transport services, discounted public transport tickets and promotion of car sharing.

Driver training

Each year Barts Health transports approximately 858,000 patients over 815,868 miles through 286,000 journeys across London, and beyond. To tackle this, the Barts Health Cleaner Air for East London programme[32] used Eco Driving Simulators to train drivers from ERS Medical, the hospital's transport providers, to reduce the impact of their driving on local air pollution. Using telematics data to evidence the impact it showed a 63% improvement across four behaviours in the first month of engagement: 85% improvement in harsh acceleration; 75% improvement in over revolutions per minute; 66% improvement in harsh cornering; 25% improvement in harsh breaking.

4.5.4 Resource impact

The resource impact report for NG70 identified that recommendations 1.3.4, 1.3.5. 1.4.2, 1.4.6 and 1.7.6 could have a resource impact. Costs and associated benefits will vary locally and a local resource impact template is available to help organisations assess their local resource impact.

[31] Plymouth Hospitals (Travel Plan) (2014) Plymouth City Council
[32] Cleaner air with Barts Health 2016 Global Action Plan

4.6 Additional areas

Summary of suggestions

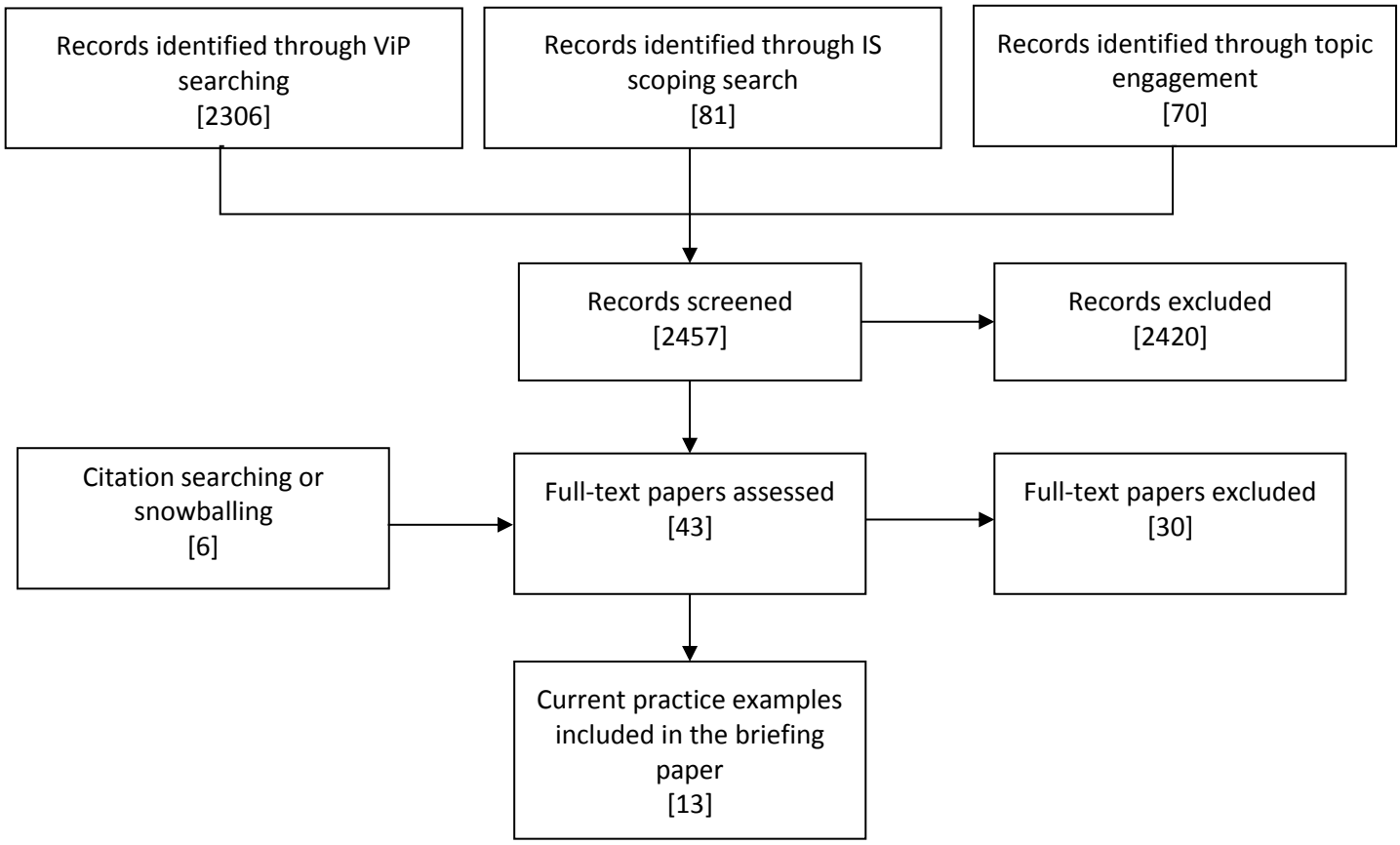
The improvement area below was suggested as part of the stakeholder engagement exercise. However it was felt to be either unsuitable for development as quality statements, outside the remit of this particular quality standard referral or to require further discussion by the committee to establish potential for statement development.

There will be an opportunity for the committee to discuss this area at the end of the session on 10th July 2018.

Other sources of pollution

Stakeholders suggested that other sources of pollution, particularly those that have an impact on indoor air quality such as wood burning stoves, also need to be addressed. Other sources of pollution are beyond the scope of this quality standard. There is a separate quality standard referral for internal air: health effects.

Appendix 1: Review flowchart



Appendix 2: Suggestions from stakeholder engagement exercise – registered stakeholders

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
Awareness raising – Air quality monitoring and communication					
1	Alphasense Ltd		Encourage high density urban air quality networks with good spatial and temporal resolution to better locate pollution hotspots in cities using source apportionment.		
2	Alphasense Ltd		Encourage citizen scientists to measure their local air quality and form communities of like-minded persons.		
3	Alphasense Ltd		Focus on ultrafine particulates, rather than $PM_{2.5}$. Kings College has studied London underground particulates and the toxicological dangers are in particulates less than 1 um diameter, able to pass the blood barrier to the brain.		
4	British Heart Foundation	Improving the quality and coverage of air pollution monitoring: There is full and consistent monitoring of particulate matter to ensure accurate information is provided to the public and	Accurate and wide-spread air quality monitoring is vital to ensuring both that progress against air quality targets and that population-level exposure to air pollutants can be measured, particularly in areas where the most vulnerable people are likely to be (schools, hospitals, care homes etc.). This is essential to ensuring that the risks to the population's health can be communicated to so that people are able to protect themselves in the short-term, and that effective policy measures	Both the Chief Medical Officer's annual report[1] and the Joint Committee's report on Improving air quality[2] highlighted the need for better air quality monitoring and surveillance and the disparity between local and national air quality data. Moreover, there is often significant uncertainty in modelled air pollution values, as highlighted by Public Health England's Public Health Outcomes Indicator Definition and Supporting Information[3], and most recently demonstrated in the World Health Organisation's (WHO) publication of	[1]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/690846/CMO_Annual_Report_2017_Health_Impacts_of_All_Pollution_what_do_we_know.pdf [2]https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/433/433.pdf [3] Please see the 'Caveats' section at: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/6/gid/1000043/pat/6/par/E12000004/ati/102/are/E06000015 [4]http://www.who.int/airpollution/data/cities/en/

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
		progress can be monitored	aimed at reducing exposure and protecting the nation's health in the long term can be introduced.	their 2016 air quality database[4]. This initially used modelled data for Port Talbot which indicated that the area was breaching WHO guideline limits for $PM_{2.5}$. A subsequent correction to include locally measured data revealed that the actual annual average value was 9.6 µg/m3, hence within WHO guideline limits[5]. There are only 78 DEFRA-owned monitors for $PM_{2.5}$ nationwide[6], and it is not a statutory obligation for local authorities in England to monitor $PM_{2.5}$. Information about and data from local monitors is also not held centrally, so it is difficult to assess the consistency with which authorities are monitoring $PM_{2.5}$ and evaluating the potential harm to health in their area. However, the Government's draft Clean Air Strategy makes a pledge to bring together these data sets[7], which would be a welcome initiative. Overall, inconsistent air quality monitoring and lack of joined-up, easily accessible data sources impedes assessment of the effectiveness of local or national interventions on air quality, and the provision of high quality, accurate information to vulnerable groups.	[5]http://www.scottishairquality.co.uk/assets/documents/technical%20guidance/LAQM-TG16-April-16-v1.pdf [6]https://uk-air.defra.gov.uk/interactive-map [7]https://consult.defra.gov.uk/environmental-quality/clean-air-strategy-consultation/
5	British Heart Foundation	Improving the availability of data	Increased reporting is also necessary in terms of health	The Public Health Outcomes Framework (PHOF) Indicator 3.01 details the	[1]https://fingertips.phe.org.uk/profile/public-health-outcomes-

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
		on the impact of air pollution on quality of life: The public and healthcare professionals have accurate, quantifiable information on the impact of air pollution on morbidity as well as mortality	outcomes, so that the burden of disease, encompassing mortality and morbidity, is better understood. Clear understanding of outcomes at local and national level is essential to aiding understanding of the health impacts of air pollution and the vulnerable groups who are most at risk, as well as to informing policy measures aimed at reducing the burden of air pollution.	fraction of mortality attributable to particulate air pollution across England[1]. However, this indicator does not detail the specific cause of mortality (e.g. coronary heart disease, stroke). Moreover, all the indicators in the PHOF related to this standard (indictors 3.01, 4.042 and 4.073), and in the NHS Outcomes Framework (indictors 1.1 and 1.2)[4] detail only mortality, with no information on morbidity. The WHO uses models that enable deaths, disability-adjusted life years (DALYs) and years life lost (YLLs) related to ambient air pollution (specifically $PM_{2.5}$) to be evaluated and ascribed to specific indications, enabling assessment of the impact of air pollution on quality of life, and provide data for each country assessed, including the UK[5]. Joining up data of this kind with the PHOF and NHS Outcomes Indicator would provide a more comprehensive overview of the impact of air pollution on health.	framework/data#page/6/gid/1000043/pat/6/par/E12000004/ati/102/are/E06000015 [2]https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/6/gid/1000044/pat/15/par/E92000001/ati/6/are/E12000006/iid/40401/age/163/sex/4 [3]https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/6/gid/1000044/pat/15/par/E92000001/ati/6/are/E12000006/iid/40701/age/163/sex/4 [4]https://files.digital.nhs.uk/2B/8F23BC/NHSOF_Domain_1_S.pdf [5]http://apps.who.int/gho/data/node.main.BODAMBIENTAIR?lang=en
6	Living Streets	Understanding of harmful effects of air pollution	Air pollution is associated with 40,000 premature deaths every year. Air pollution contributes to a range of respiratory conditions, and is particularly harmful to children as it can stunt the healthy development of their lungs.		https://www.rcplondon.ac.uk/news/doctors-say-40000-deaths-year-linked-air-pollution

ID	Stakeholder	Suggested key area for quality improvement	Why is this important?	Why is this a key area for quality improvement?	Supporting information
7	SCM5	Key area for quality improvement 1: What it means to fail an EU Legal limit?	Limits, guidelines and indicator values are described within NICE guidance. Like many environmental pollutants, there is uncertainty over thresholds below which there are no adverse health effects for NO_2 and PM. There is currently no proper context given on what it means to exceed an EU objective.	Air quality is increasingly becoming a concern to the public and so it is important that people understand what it means to fail an air quality objective and how the different objectives should be applied. It is often overlooked that the levels of the calculated contribution of particulate matter to mortality through the Public Health Outcomes Framework are representative of levels that fall well below EU Legal Limits. There are a wide range of mortalities identified with the mean taken as the published result which may not be accurate and given the levels of uncertainty with public health outcomes (particularly over longer periods) and the assumptions used in studies, quoted figures are at best loose and potentially conservative estimates. The results are often used/understood to represent a death rate and it is difficult to explain to the public that the result is a best estimate of additive lives lost over a population. Professionals and the public need to understand what it means to fail an objective, what is the risk of a less vulnerable individual compared to someone who is more susceptible to air pollution and comparable risks (e.g. driving a car, drinking, etc.). There should also be estimates of how many people are likely to be effected acutely by air pollution each year and how many people will actually die from acute and	Legislation and frameworks already referred to within guidance. As an example of the type of information that would be necessary it is estimated that as a result of the 1952 smog 4000 people died as a direct result during the pollution event with a further estimated 8000 people dying in the following months.

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				chronic effects of air pollution. This information would help put air pollution in context.	
8	SCM5	Key area for quality improvement 2: WHO Guideline Values versus EU Legal Limits	The use and application of the WHO Guideline values is referred to within NICE guidance. Government and local authorities must legally work towards meeting EU Legal Limits. However, over the past year the Mayor of London and now DEFRA have stated that they will work towards meeting WHO Guideline values. Currently there is little context on what it means to meet tighter WHO standards compared to EU Legal Limits.	Air quality is increasingly becoming a concern to the public and so it is important that people understand what it means to meet and exceed EU Legal limits. The way this is often communicated is that there is no safe level for air pollutants like NO_2 and PM. However, this is often not balanced with the fact that living in a densely populated developed industrialised society will inevitably result in some level of air pollution and health risk. Similar to Key area 1 above, the impact of exceeding EU Legal limits and meeting WHO Guideline Values needs to be identified. Professionals and the public need to understand what it means to meet a WHO Guideline Value compared to meeting an EU Legal Limit, what is the impact on a less vulnerable individual compared to someone who is more susceptible to air pollution and comparable risks (e.g. driving a car, drinking, etc.). There should also be estimates of how many fewer people are likely to be effected acutely by air pollution each year and how many fewer people are likely to actually die from acute and chronic effects of air pollution as a result of tighter standards being met.	Legislation and frameworks already referred to within guidance.
Awareness raising – Advice for vulnerable groups					

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9	Association of Directors of Public Health	Raising awareness of how air pollution affects health, particularly those with lung, heart and respiratory diseases and how people can keep up to date with pollution forecasts and avoid polluted routes.	We need to ensure that stakeholders have the know-how and information to provide people with to reduce their risk. For example – we need to ensure people being discharged from hospitals with respiratory issues know how to check air pollution forecasts and what their least polluted walking routes are. Stakeholders requiring information/guidance in this area include GP surgeries, hospitals (including discharges), schools (including school nurses), and care homes. Educating children and parents about the impact of air pollution on their health, and their role in tackling it, will have the double effect of both helping to reduce pollution and helping people to understand the risks associated with exposure.	Communicating the impacts of air pollution to the population and alerting those considered more vulnerable of poor air quality days is extremely important and more innovative approaches are needed to make this messaging effective and useful. The awareness of key stakeholders must be raised so that they may best advise/manage vulnerable people on how to reduce their risk from air pollution while still encouraging them to participate in appropriate and safe activity levels.	
10	British Heart Foundation	Equipping the NHS to provide information and advice: Through interactions with the NHS, high risk individuals are provided with the information they need to know when and how to reduce their	Awareness-raising is recommended within NICE guidance (Air pollution: outdoor air quality and health, 1.7). The guidelines also state that healthcare professionals should be aware of how to advise vulnerable people on measures to protect themselves from poor air quality (section 1.7.7). Many people are unaware of the links between air pollution and	There is very little available evidence on the provision of information at local authority level. However, the Joint Committee report on Improving Air Quality cites evidence from Professor Holgate of the Royal College of Physicians, who "highlighted the need for better information provision about air pollution[…] in GPs surgeries," and recommends that a national public health awareness campaign be implemented by Public Health England	https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/433/433.pdf https://www.kcl.ac.uk/news/spotlight-article.aspx?id=8a942be6-4c46-4957-a0d0-8397e7af9593

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		exposure to high levels of air pollution	heart and circulatory disease, or other health impacts. Increasing the dissemination of information from sources such as the Daily Air Quality Index (DEFRA) via not just local, national and social media channels, but across the health and care sector (e.g. using display screens in GP practices and hospitals, encouraging patients to subscribe to email or text updates), would ensure that staff, clinicians and patients are aware of not only how to protect themselves, but when they need to do so. Provision of information could also help to influence people to change their behaviour to mitigate their contribution to poor air quality.	Current air quality reporting is generally aimed at an individual seeking to inform themselves via initiatives such as airTEXT and London Air, and there is little available formal evidence on the use of these or similar systems in the health system at local authority level. A group from King's College London is working in partnership with the Mayor of London to use the London Air Quality Network to deliver alerts to stakeholders across London, including schools, and in the future, GP practices[2]. This is currently only a London-based initiative, and we are not aware of any similar model being developed in other parts of the UK.	
11	British Thoracic Society	Key area for quality improvement 1 Written management plans for vulnerable groups with asthma and COPD.	There is evidence that respiratory patients with airway disease are more vulnerable to outdoor air pollution.	There is a lack of standardised guidance available for healthcare professionals to give to such patients, in terms of what to do when pollution levels are high. Better guidance in this area would help prevent asthma attacks and COPD exacerbation, benefiting patients and reducing NHS costs.	Some guidance is available from The Daily Air Quality Indicator (www.uk-ir.defra.gov.uk/air-pollution/daqi), but many patients and clinicians will be unaware of this. An example of a regional project that aimed to improve care is The Barts Health Cleaner Air Programme that is cited in the RCP Every breath we take report. In this project, 2 out of the 5 areas were clinical engagement (doctors and pharmacists), and protecting patients in high-risk groups (such as those with COPD). This

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					project provided patient leaflets called "3 easy ways to reduce your contact with air pollution" offering simple guidance.
12	Hammersmith & Fulham Council	KEY AREA 3 *Air pollution alerts and how to use them*: Raise awareness of how air pollution effects health, particularly those with lung and heart disease and how people can keep up to date with pollution forecasts and avoid polluted routes.	There are increasing numbers of resources out there to receive air pollution forecast/nowcast information which, for the most vulnerable, can be used to ensure exposure is reduced thus reducing the need to attend GP Surgeries and be admitted to hospital from heart and lung disease symptoms exacerbated by poor air quality	This is a key area because air pollution will not be improved over night and other than local sources, there are pollution events that come from sources beyond our control (i.e. Saharan dust). We need to ensure those vulnerable to poor air quality are aware of when they may need to change their behaviour to avoid exposure and the ways by which they can avoid exposure.	There are a number of programmes includes airTEXT and WalkIT which can serve as models. The Met Office app provides air pollution information as well.
13	Hammersmith & Fulham Council	KEY AREA 4 *Ensure frontline workers with vulnerable people can advise/signpost*: Raise awareness of key stakeholders so that they may best advise/manage vulnerable people: GP surgeries,	Although it is important for everyone to know about air pollution, when pollution is elevated and how to avoid it generally or during pollution incidents – it is of particular importance that those who are sensitive to air pollution or already have heart and lung disease which is exacerbated by it – need to be focused on to improve their health and keep them at home/work/school instead of at hospitals/GP Surgeries and needing treatment. Prevention should be the approach.	This is a key area because air pollution will not be improved over night and other than local sources, there are pollution events that come from sources beyond our control (i.e. Saharan dust). We need to ensure those vulnerable to poor air quality are aware of when they may need to change their behaviour to avoid exposure and the ways by which they can avoid exposure. The best way to do this is to ensure those who have direct contact with vulnerable people – GPs, nurses, hospital discharge teams, care home	

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		Hospitals (including discharges), Schools (inc. school nurses), Care Homes. Ensure they have the know-how and information/guidance to provide patients/student/residents. For example – ensure people being discharged from hospitals with respiratory issues know how to check air pollution forecasts and what their least polluted walking routes are.		providers, social workers, school nurses and teachers – know how to access this information and can identify who needs this information and provide them with the necessary tools and links to reduce their exposure in future.	
14	SCM1	Management of pollution exposure for affected individuals (especially in high risk groups) across their daily activity	The current approach for management of poor air quality is primarily geographically focused (ie measures to reduce pollution concentrations at identified properties). However, most people don't spend their life in one location, so there may be opportunities to support individuals to reduce their exposure over the course of their day.	For example, a child may live in a property near a busy road, and so potentially be exposed to high pollution levels when at home. The same child may attend a school also near a busy road, and so may also be exposed to high pollution levels during the school day. If that child is also walked to and from school along the busy road then they may also be exposed to high pollution levels on their journey. In	

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				supporting families, advice may enable them to make choices that reduce exposure (for example, seeking a school that is not exposed to high pollution levels, or identifying walking routes on minor side roads that have lower pollution levels). Interventions that might enable families to make choices include provision of information on the significance of poor AQ on health, and provision of information about AQ in their area, and measures they could take to reduce exposure	
15	SCM1	Action to protect professional drivers and road workers	The road environment is the work place for professional drivers and maintenance/construction workers. These people may be spending many hours per day exposed to high levels of pollution. Because they are within the road corridor, actual pollution levels may be significantly higher than indicated by roadside monitoring.	The current framework for tackling poor air quality is focused on communities and householders (which also includes generic actions that potentially provide a benefit everywhere, such as fleet electrification). To my knowledge, there is little focus on health impacts on people who work in the road environment, nor understanding of measures that might target support at this potentially overlooked group.	Potential contacts: Road Hauliers Association. Health & Safety Executive
16	SCM2	Awareness raising: Ensure healthcare professionals are aware that information on air quality is available, what it means for patients and what	Healthcare providers are trusted professionals who can help patients understand how air pollution affects their health and how they can reduce exposure to it.	The health impacts of poor air quality are not currently well represented in the health profession's education and training.	Recommendation 15 CMO report to ensure that the health impacts of air pollution are included in curricula for all clinicians in training Chief Medical Officer (2018) Annual report of the chief medical officer 2017: health impacts of all pollution-what do we know?

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		actions are recommended			https://consult.defra.gov.uk/environmental-quality/clean-air-strategy-consultation/user_uploads/clean-air-strategy-2018-consultation.pdf
17	SCM3	Key area for quality improvement 4 Advice given by clinicians to those who are most vulnerable to the impact of pollution	Support to those who are vulnerable to the impact of pollution is recommended within NICE guidance in order to avoid unnecessary stays in hospital	Guidance on how to remain healthy – by eating a healthy diet and exercising -taking medication on days of high pollution -avoiding the most polluted streets on high impact days	https://www.england.nhs.uk/2014/04/air-pollution/ https://www.imperial.ac.uk/news/172206/walking-cycling-cities-good-health-despite/
18	SCM5	Key area for quality improvement 4: Proportionate actions and advice for sensitive receptors (e.g. schools, surgeries, etc.)	The NICE guidance explores measures that may be taken to reduce air pollution. Many of these are strategic measures (such as LEZ, emissions reductions etc.) which are already proposed or being implemented by Government. There is no consistent guidance on what actions should be delivered or guidance provided locally to address air pollution at more vulnerable locations such as where an individual suffering from COPD lives or at local schools, surgeries, etc.	There is a plethora of guidance identifying what can be done to reduce air pollution at both a strategic and local level. When it comes to protecting specific vulnerable individuals such as those with a serious breathing disorder, schools or any individual living on a busy main road, usually it will be more localised and often lower cost measures that will meet cost limitations and practical needs. Minimum considerations and standard measures that should be applied for different types of sensitive receptor should be set out. This would provide a clear steer to regulators of minimum actions to be taken and help provide better consistency between areas.	This is largely based on common sense professional judgement and would build on some of the evidence presented in existing NICE guidance. School guidance from the Mayor of London is available at - https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/mayors-school-air-quality-audit-programme. This is generally good but flawed in places.
19	SCM5	Key area for quality improvement 5: Working together	NICE guidance recommends that health professionals should be offering general advice on how to avoid contributing to levels of air	Health care stakeholders might include carers, GPs, hospitals, residential homes, pharmacist, PHE, local authority Public Health, etc. (not exhaustive).	Based on experience.

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			pollution and to raise awareness on how to minimise exposure. Guidance is not available on minimum standards/levels of input and advice that should be provided by different health care stakeholders.	Currently communications by and between these individuals are very limited or non-existent. Where they do occur messages are not joined up. Clear guidance is needed on the role of each healthcare stakeholder, what each stakeholder should be doing, the messages they should be delivering (and to who) and how they should be working together to achieve the highest level of impact and cost benefit.	
20	Unicef	Provision of accessible, accurate and localised information and data on air pollution	Children and their families need access to **accurate, localised information on air pollution** so they can take steps to reduce their exposure and protect themselves from the health effects of air pollution. Accurate data and information on air pollution also builds a child's capacity to exercise other rights, including the rights to expression, association and participation. The **NICE guidelines on outdoor air pollution and Public Health England's (PHE) guidance to public health directors** both reinforce the importance and the need for public awareness campaigns and information dissemination to children and schools on air pollution. Schools, nurseries, children and their families require clear and tailored	Current information dissemination methods **don't reflect the way children and young people receive information**. **Children's awareness of air pollution and its effects considerably varies across the UK**. A Sustrans survey in 2018 found the number of children concerned about air pollution rose to over half (53%) in London, but was lower in other cities. This **geographical, ethnic and socio-economic variation in knowledge and understanding** is also illustrated by DEFRA's 2018 research into public attitudes to air quality. Worryingly, this research shows pregnant women and parents with young children have low levels of awareness and knowledge about air pollution and its health effects. Therefore, information should be	WHO database on outdoor air pollution (2018) - http://www.who.int/phe/health_topics/outdoorair/databases/cities/en/ Mayor of London's toolkit of measures to improve air quality at schools (May 2018) https://www.london.gov.uk/sites/default/files/school_aq_audits_-_toolkit_of_measures_dr_v3.3.pdf DEFRA (2018) Research to understand public attitudes to air quality - http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20106&FromSearch=Y&Publisher=1&SearchText=AQ1016&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

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			information in order to take steps to reduce children's exposure and protect their health. It is not clear if the recommendations in these guidelines have been embedded in policy making processes. The majority of **information disseminated on air pollution by policy makers is passive**, rather than actively targeted to people who need it. For instance, DEFRA's UK-AIR website holds air pollution forecasts and monitoring data which shows levels across the UK. This is the richest source of information on air pollution levels available to the general public. However, it is not in an accessible format and requires people to actively search for the information. A growing body of evidence shows more and more children are relying on **digital tools, platforms and services** to learn, engage, participate, play, innovate, work or socialise. These digital platforms should be used to effectively inform and engage children on air pollution issues. The NICE guidelines on behaviour change emphasise the need to **integrate health information into existing care pathways**, and the	targeted to this group through existing health pathways.	

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			value of health practitioners and trusted voices in delivering this information. Therefore, existing maternal health and paediatric pathways should be used to disseminate health information on air pollution to children, their families and pregnant women.		
21	Unicef	A child rights approach towards engagement and participation of children on air pollution	Unicef UK welcomes the opportunity to respond to this consultation. Air pollution is particularly dangerous for young children and pregnant women, therefore policy makers should prioritise engagement with these groups so they can take steps to reduce their exposure and protect their health. This response will set out key principles for effective engagement with children, including a child rights based approach to engagement and child-friendly information provision. Children's rights are directly impacted by the negative health effects of air pollution. All policy efforts to mitigate against these health impacts must take a child rights approach to ensure children's rights are upheld and respected. This approach will also ensure that key principles of effective engagement are embedded in policy making such as inclusion,	Children's rights obligations are not currently integrated in UK air quality policies or policy making processes, including in NICE guidelines on air quality, community engagement and behaviour change. As of mid-May 2017, only five government Bill-related child rights impact assessments (CRIAs), or papers which considered the Articles of the UNCRC, could be identified – four from the Department for Education (DfE), one from the Home Office. None are full CRIAs However, in some areas of government significant progress is being made. DfE officials are developing a CRIA template and considering whether additional guidance is necessary. They are also working with Civil Service Learning to develop a training package which aims to build a network of UNCRC and CRIA champions in each government department across Whitehall.	UN Convention on the Rights of the Child, in child friendly language - https://www.unicef.org/rightsite/files/uncrcchilldfriendlylanguage.pdf Unicef guide to incorporating children's rights into impact assessments - https://www.unicef.org/csr/css/Children_s_Rights_in_Impact_Assessments_Web_161213.pdf

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			empowerment and participation of children. The UK Government is a signatory to the UN Convention on the Rights of the Child (CRC) - the most widely ratified international human rights treaty. Article 24 of the CRC sets out the right of the child to the enjoyment of the highest attainable standard of health, and that States should take," into consideration the dangers and risks of environmental pollution." Fundamentally, air pollution violates a child's right to life, survival and development, set out in Article 6 of the Convention. Additionally, Article 17 states children have the right to receive information that is important to their health and well-being and Article 29 (1) on the aims of education provides that: "States Parties agree that the education of the child shall be directed to: […] the development of respect for the natural environment." In 2010, the UK Government committed to give due consideration to the UNCRC Articles when making new policy and legislation. This was supplemented by a more recent commitment to introduce a new		

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			core learning and development offer on the UNCRC through Civil Service Learning, and to work with the Joint Committee on Human Rights on how to promote and embed good practice, including through the use of child rights impact assessments (CRIAs).		
22	Unicef	Prioritised and effective involvement and participation of children	Involving local communities, **particularly disadvantaged groups,** is central to local and national strategies in England for promoting health and wellbeing and reducing health inequalities (Healthy lives, healthy people: our strategy for public health in England Department of Health; Fair society, healthy lives The Marmot Review). The NICE guidelines for community engagement outline the importance of not seeing local communities simply as recipients of health and wellbeing services but, rather, as **active participants with a vital contribution** to make to improving health and wellbeing, and reducing health inequalities. Several experts on child rights have echoed these sentiments – including the UN Special Rapporteur for Human Rights and the Environment, and the Committee on the Rights of	There is **little evidence showing a strategic, national approach** to effective involvement, engagement and communication with children on air pollution. However, there are examples of communication approaches being used by different local authorities and governments, for instance: • Mayor of London – cleaner air for primary schools toolkit • Various local authorities – schools clean air day toolkit	Child rights international network guidance on producing a child friendly document - https://www.crin.org/en/docs/FileManager/producing_child_friendly_documents.doc Unicef guide to incorporating children's rights into impact assessments - https://www.unicef.org/csr/css/Childrens_Rights_in_Impact_Assessments_Web_161213.pdf Unicef guide to effective communication with children - https://www.unicef.org/cwc/cwc_59849.html

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			the Child. They state it is essential this empowering approach is taken with children. That children are regarded as **agents of change and active citizens,** rather than a passive, vulnerable group. Engagement with children should **begin at the earliest stages of planning processes**, so they are able to effectively contribute to decision making and activity planning. This will ensure activity is designed in a way children are able to access and that mechanisms are put in place that enable their inclusion, for instance, dedicated children's steering groups. Realising **children's rights to education, information and participation** is therefore vital to equipping them with the skills and resources to reduce their exposure to air pollution and protect their health.		
23	Unicef	Child-friendly information provision and engagement	In order for children to engage with health promotion messaging and protect themselves from air pollution, information must be **understandable and appropriate to a child's age, educational, socio-economic and cultural background.** Information on air pollution exposure and behaviour	There is **little evidence showing a strategic, national approach** to effective involvement, engagement and communication with children on air pollution. However, there are examples of communication approaches being used	Child rights international network guidance on producing a child friendly document - https://www.crin.org/en/docs/FileManager/producing_child_friendly_documents.doc Unicef guide to incorporating children's rights into impact assessments -

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			change should be targeted to children, pregnant women and parents. Communities that are situated in pollution hotspots and deprived areas, should also be a focus and target for information dissemination. **Child-friendly principles** should be used to develop all information, health guidance and behaviour change advice on air pollution so that children can access information and act upon advice. Child-friendly principles will also make air pollution information more accessible for people across communities who may have other access challenges, such as language barriers or low literacy skills.	by different local authorities and governments, for instance: • Scottish Government – air pollution detectives website	https://www.unicef.org/csr/css/Children_s_Rights_in_Impact_Assessments_Web_161213.pdf Unicef guide to effective communication with children - https://www.unicef.org/cwc/cwc_59849.html
24	Unicef	Effective provision of tailored health guidance and behaviour change advice for children and their families	Studies on the provision of air pollution data and information found that **people often report feeling "powerless"** and unable to protect themselves if information about pollution exposure is not accompanied with tangible steps on how they can protect themselves. Therefore it's essential that children and their families **receive clear health guidance and behaviour change** advice alongside air pollution data and information.	**Children's health outcomes are not currently measured against air pollution exposure**, unlike health outcomes for adults in the Public Health Outcomes Framework. This makes any monitoring and evaluation of children's health and air pollution difficult for policy makers. There has been **limited evaluation of current data and information provision** and limited evidence around engagement with maternal health or paediatric practitioners.	PHE's Child and Maternal Health Outcomes Framework - A&E attendances (0-4 years) https://fingertips.phe.org.uk/profile-group/child-health/profile/child-health-overview/data#page/0/gid/1938132992/pat/6/par/E12000004/ati/102/are/E06000015 NHS Digital - Compendium - Emergency hospital admissions – admissions for children with asthma https://digital.nhs.uk/data-and-information/publications/clinical-

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			Reviews by NICE and the Kings Fund found good evidence **showing the effectiveness of mass media campaigns** in changing attitudes towards other health risks, such as smoking. However, these campaigns varied in effectiveness – they tended to be most **successful when a behaviour change approach** was taken, when multiple communication channels were used to reach individuals, and when messages were targeted to individuals and delivered by trusted voices such as health experts or charities. Currently there has been no such mass media campaign on air pollution by the government. The NICE guidelines on behaviour change emphasise the need for **full public engagement** in order to enable people to take steps to protect themselves or prevent harm to their health. The guidelines recommend policy makers should **ensure fair and equitable access to education, training and information.** Therefore, children and pregnant women need to be actively targeted and prioritised within health promotion activities so they can take steps to reduce their exposure and protect themselves.	Anecdotal evidence suggests where air pollution alerts are received and information is disseminated, this is often **not accompanied by targeted health guidance** and behaviour change advice.	indicators/compendium-of-population-health-indicators/compendium-hospital-care/current/emergency-admissions

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Transport choice – Active travel					
25	Association of Directors of Public Health	Raising awareness around the synergistic benefits of increasing active travel, thereby increasing physical activity and reducing emissions and exposure to pollution.	Encouraging people to change their choice of transport mode from motorised transport to active travel is a sustainable way to improve air quality because motorised road traffic is the source of most air pollution in urban areas. Improvements to both air quality and to the public's health can be achieved through making walking, cycling and use of public transport the preferred and accessible form of mobility. We should be encouraging active travel as it has clear 'co-benefits' to health. Prioritising initiatives that maximise the benefits to both population health and the environment represents best value for money for local authorities as well as having a greater positive impact overall.	In our 2016 policy survey, 82% of DsPH said that committing 10% of the local transport budget to walking and cycling was either in their top five priorities or important to them. It should be widely publicised that air pollution is highest inside cars, so walking should be encouraged for shorter journeys and cycling for longer ones.	The GLA publication on the Health Impacts of Cars in London has useful information here. A framework of policies at a street level, a network level and a strategic level are required to achieve this shift which is reflected in the Mayor's Health Streets approach. As urban areas grow or are redeveloped, sensitive planning for mixed-use developments with good active travel infrastructure, and high permeability and density could reduce dependency on private cars to reduce congestion and air pollution (helpful summary of effective strategies at https://www.sciencedirect.com/science/article/pii/S2214140516302730).
26	Association of Directors of Public Health	Consistent behaviour change advice.	Currently there mixed and inconsistent messages to the public about how they can reduce their exposure and avoid the harm caused by air pollution. For example, cycling is encouraged to reduce exposure to pollution, however vigorous activity is discouraged as it increases an individual's susceptibility to health problems from air pollution.	A lack of consistent advice makes it harder for people to minimise the health risks of their exposure to air pollution.	

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			To inform consistent and robust behaviour change advice, better evidence is needed to demonstrate the impact of public health interventions to tackle air pollution. More evidence is needed to identify high impact interventions which are likely to have the greatest co-benefits for both air quality and health. The research agenda needs to focus on how changes to the built environment can support uptake of active travel and public transport and the policies needed to achieve this.		
27	Hammersmith & Fulham Council	*KEY AREA 2 Physical activity and pollution reduction:* Raise awareness around the synergistic benefits of increasing active travel, thereby increasing physical activity, reducing pollution and exposure to pollution.	There are many synergies between active travel and health – some of which are directly related to cardiovascular health by reducing pollution and exposure – but also in terms of improving physical health and tackling obesity. Walking should be encouraged for shorter journeys and cycling for longer ones.	Increasing active travel directly reduces vehicle trips and therefore pollution. Also, increasing physical activity has a myriad of health benefits.	The GLA publication on the Health Impacts of Cars in London has useful information here.
28	Living Streets	Encouraging mode shift away from motor vehicles and	Motor traffic, especially diesel vehicles, is responsible for 80% of roadside NO_x concentrations	Getting more people travelling actively has numerous health benefits, one of which is reducing harmful pollutants emitted by motor traffic.	The government's plan for tackling roadside nitrogen dioxide states that 'road transport is responsible for some 80% of NOx concentrations at roadside, with diesel vehicles the

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		towards walking and cycling		Advice on physical activity, when recommending walking, typically focuses on going for a walk, rather than utility walking (such as the Couch 2 5k programme). Individuals taking part in leisure walking will gain the physical activity benefits, but only utility walking (e.g. walking to work, school or the shops) reduces air pollution from motor traffic. We would like to see activity guidance recommending utility walking for everyday journeys in the first instance, in order for everyone to reap the full range of health benefit from walking.	largest source in these local areas of greatest concern'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf
29	Living Streets	Understanding that travelling in the car does not protect occupants from harmful air pollution	There is no consensus within the scientific community as to whether air pollution is higher inside the car or on the pavement – part of this is because the measurements are so dependent on other factors. Travelling in the car therefore means that occupants may still suffer the harmful effects of air pollution, but are denied the beneficial effects of physical activity.	Evidence both that you are protected and unprotected from air pollution in the car is disputed. Our research shows that most people do not know that they are not or are not sure whether they are protected from air pollution in the car. This means that people may choose to drive to protect themselves from air pollution, instead of travelling actively and getting the physical activity benefits, which outweigh the pollution health disbenefits (see below).	An article published in Science of The Total Environment assessed a range of experiments showing that drivers inside vehicles are exposed to far higher levels of air pollution than those walking or cycling along the same urban routes. These results are conditional on a number of factors, including the other vehicles travelling in the street at the time, whether the windows are open or closed, and traffic speed. https://www.sciencedirect.com/science/article/pii/S004896971400713X In a survey commissioned by Living Streets in 2018, asking parents about their views on air pollution, just 54% of respondents knew that they were not

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					protected from air pollution inside the car.
30	Living Streets	Knowledge that the benefits of physical activity outweigh the disbenefits of exposure to air pollution	Despite the harmful effects of air pollution, active travel is still beneficial as the positive physical activity benefits outweigh the negative consequences of pollution (unless the activity.	Some people hold the misconception that high air pollution means they should avoid exercising outside altogether, despite evidence that it would take more walking and cycling than most people would ever do in a day to become more harmful than helpful due to air pollution. Advice to remain indoors on high air pollution days is common, yet unhelpful. Only those with the most severe lung conditions will be so adversely affected by air pollution that they should avoid walking and cycling outdoors. The best way to reduce the health dangers of air pollution is to increase the number of people walking everyday journeys. Warnings about air pollution should be aimed only at people with respiratory conditions, to avoid discouraging active travel for others.	Numerous studies showing exercise outweighs the harms of air pollution: https://healthsciences.ku.dk/news/news2015/exercise-can-outweigh-harmful-effects-of-air-pollution/ https://www.theguardian.com/environment/2016/may/05/benefits-cycling-walking-outweigh-air-pollution-risk-cities https://medicalxpress.com/news/2015-03-outweigh-effects-air-pollution.html But there is still frequently advice not to exercise outdoors on high air pollution days. See for example: https://www.theguardian.com/environment/2014/apr/02/air-pollution-youngsters-elderly-vulnerable-urged-to-stay-indoors https://www.theguardian.com/lifeandstyle/2012/aug/05/air-pollution-should-stop-you-exercising https://www.blf.org.uk/air-pollution-tips
31	Royal College of General Practitioners	Key area for quality improvement 1 Ability to exercise outside in a pleasant environment which does not	- Improvements in muscle strength (legs) and so less falls - Better CHD and respiratory health - Improvements in BMI/ obesity rates, osteomalacia rates, better diabetic and BP control.		Sustrans who collect data as a bicycle charity on air pollution Green peace who collect information on air pollution Rename DAQI to The Air Quality Index for Health (AQIH) as in Ireland and provide real time quality up to date

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		cause pollution harms.	- Improved socialisation for those with mobility issues		information for people to make choices about exercise outside http://www.epa.ie/air/quality/index/
32	Royal College of General Practitioners	Key area for quality improvement 3 Lack of particle and nitrogen burden	The benefits of supporting good access outside walking are profound in reducing respiratory or heart conditions and general benefits to health.		Ban the use of wood burning stoves in most polluted areas.
33	Royal College of General Practitioners	Key area for quality improvement 4 Improvement in mental well being in experience	Mental health in socialisation and exercise for psychotic patients with metabolic syndrome due to symptoms and medication. Improvements in loneliness and mental function.		
34	SCM4	Enabling modal shift	Shifting a proportion of ICE motor vehicle journeys to less polluting modes should reduce congestion and improve flow	England performs poorly at providing connected networks for cycling, and at integrating active and public transport modes.	
35	SCM5	Key area for quality improvement 3: Exposure to poor air quality versus active travel	The NICE guidance highlights the need to address both air pollution and active travel and also health impacts resulting from chronic and acute exposure to air pollutants. In many areas of the UK and particularly in more deprived areas, both child and adult obesity are amongst the highest priorities for local authorities. Current advice relating to activity during Pollution Episodes is set out within the Daily Air Quality Index.	There needs to be a more joined up discussion and firmer conclusions on advice for situations where the public are exposed to higher levels of air pollution, for example when walking or cycling along busier roads or during Pollution Episodes. This is particularly important as Public Health Teams and Learning Trusts struggle with publicising actions that may results in reduced attendance at school and reduced active travel. Transport Sections often struggle with communicating the benefits of schemes which will make air pollution in parts of the scheme area worse. The benefits of active travel need to be	

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				properly balanced against the dis-benefits of being exposed to air pollution. There are two aspects to this discussion: • Individual basis: consideration for an individual and the impact air pollution may have on him/her versus benefits from active travel. • Scheme basis: Often sustainable transport schemes will result in improvements in air quality along controlled routes, through for example reductions in road based vehicles, but will result in poorer air quality along main routes often used by the public or residents (i.e. main high streets and residential properties on busier roads). For the individual many professionals currently base their conclusions on chronic exposure and do not currently take in to account acute exposure when considering active travel. There are a variety of studies that professional pick and choose from to suite, most of which only address chronic impacts. Other studies provide the results of air quality monitoring for different road users (for example cyclist, walking, car, taxi and ambulance) to conclude which is the safest means of transport, without taking in to consideration the contribution of respiration rates.	

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				Many professionals struggle with justifying wider schemes on health and air quality grounds where air quality will be made worst in parts of a scheme area to the potential detriment of the public and residents. Better health based guidance setting out considerations and how to conclude at both an individual and scheme wide level is needed. Where possible clear conclusions are needed for both healthy and more vulnerable individuals.	
Transport choice – public transport					
36	Association of Directors of Public Health	Action to reduce vehicle emissions – this could include: • Provision of low pollution, integrated and accessible public transport in urban areas .	Public transport can reduce traffic congestion by taking up less road space per passenger on particularly busy routes (https://www.nber.org/papers/w18757). Availability of accessible public transport also has other public health benefits. It can reduce inequalities by enabling people to travel independently (https://www.jrf.org.uk/report/environment-and-equity-concerns-about-transport) and increase physical activity for people who use active travel modes for parts of journeys (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3407915/).	Access to public transport is varied across the UK.	
37	FirstGroup plc UK Bus Division	Increasing average operating speed for buses compared with	Health and life expectancy are adversely affected by poor air quality but buses can contribute positively by taking car trips off the	Bus services can be operated efficiently and be attractive to non-users only when the effects of congestion are minimised. Congestion prevents punctual operation	Greener Journeys has done much work into the value of the bus to society including the wider benefits such as those on health. It has also

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		overall average traffic speed – particularly at peak periods.	road. Congestion is slowing down the operating speeds of buses making bus use less attractive. Local authorities should be taking action to protect buses from the adverse effects of congestion and thereby improving service punctuality and attractiveness.	due to inconsistent journey times and requires longer journey times to be scheduled to minimise this effect – this also uses more resources causing fares to increase.	undertaken research on congestion and the adverse effects on bus service operation, and patronage, caused by this. https://greenerjourneys.com/wp-content/uploads/2017/06/TACKLING-POLLUTION-AND-CONGESTION-15-JUNE-2017-FINAL.pdf https://greenerjourneys.com/wp-content/uploads/2016/09/TTBusReport_Digital-FINAL-With-Changes-1.pdf
38	Royal Borough of Kingston upon Thames	Key area for quality improvement 2: Provision of low pollution integrated, accessible public transport in urban areas	Public transport can reduce traffic congestion by taking up less road space per passenger on particularly busy routes (https://www.nber.org/papers/w18757). Availability of accessible public transport also has other public health benefits. It can reduce inequalities by enabling people to travel independently (https://www.jrf.org.uk/report/environment-and-equity-concerns-about-transport) and increase physical activity for people who use active travel modes for parts of journeys (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3407915/).	Access to good quality public transport is variable around the UK.	**Key area for quality improvement 2:** Provision of low pollution integrated, accessible public transport in urban areas
Planning and development – Strategic planning					
39	Royal Town Planning Institute	Key area for quality improvement 1	There is good evidence that planning compact, higher density, mixed use and transit-oriented settlement patterns, combined with investment in urban regeneration	RTPI research describes spatial planning principles which can reduce the need to travel by car and promote sustainable modes of transport.	For more a more detailed description of this evidence and its impacts on air pollution please see Chapters 3 and 5 of our report on *Settlement Patterns, Urban Form and Sustainability*:

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		Improving the relationship between land use planning and transport planning, providing clear spatial principles which direct new development to locations which reduce the need for individual motorised travel, tackle congestion and improve air quality	and public/active transport infrastructure, helps to reduce overall traffic volumes by reducing the need to travel and encouraging sustainable modal shift.	New development should be concentrated in a small number of strategic locations, prioritising brownfield sites within large existing settlements or immediately around them, before expanding smaller towns and villages or permitting development in rural areas. Development outside of large existing settlements should be located alongside well-served bus corridors and in close proximity to rail stations and other transport interchanges, in order to encourage patronage and reduce the use of the strategic road network. Similarly, any new sustainable transport infrastructure, like rail and bus routes, should be located based on their potential to connect existing car-dependent settlements to major concentrations of jobs and services, and to support new public transport-oriented development patterns. To encourage sustainable mobility, housing needs to be located in close proximity to public transport nodes. A distance of between 250 to 300 metres is recommended for local bus services, rising to 500 metres for stops which provide high frequency services to centres of employment and key services.	http://rtpi.org.uk/media/2822766/settlementpatternsurbanformsustainability.pdf

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				This can also be considered in terms of housing density, with recommended average levels of 50-100 dwellings per hectare (dph) rising to 100-200 dph for developments located around important public transport nodes. In order to reduce the need to travel, developments should also contain a mixture of uses, including essential community facilities which are within walking distance of housing, and buildings which can support a range of different uses. At the neighbourhood scale, urban form can encourage sustainable travel through the design of fine-mesh grid networks, and by limiting the use of cul-de-sacs and other street layouts with poor levels of connectivity. When coupled with improvements to walkability and public transport accessibility, parking spaces should be set at a maximum of one per household, and ideally 0.6 or lower.	
40	SCM2	Recognisable air quality network of key stakeholders in local government. Key stakeholders in local government include (but not limited to) those	Action to reduce the impacts of air pollution at a local level requires coordinated effort from multiple partners. Actions to address the health impacts of air pollution can also play a critical role in supporting other local priorities	As noted in the House of Commons report on improving air quality: 'Greater inter-disciplinary involvement in urban planning and collaboration across local authorities is needed to ensure that air pollution, congestion, obesity and a range of public health issues are tackled through joined-up initiatives. We welcome efforts from local authorities to work collaboratively to address air pollution.'	House of Commons (2018) Improving air quality: Fourth Report of the Environment, Food and Rural Affairs Committee, Fourth Report of the Environmental Audit Committee, Third Report of the Health and Social Care Committee, and Second Report of the Transport Committee of Session 2017–19

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		from Planning, environmental health, transport, elected officials, communications teams, health and wellbeing boards and directors of public health.		Directors of public health can help ensure that annual status reports and action plans on air quality demonstrate a strategic public health focus. (Defra 2017)	https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/433/433313.htm#_idTextAnchor079 Defra (2017) Air quality: a briefing for directors of public health
41	SCM2	An evaluation strategy for air quality interventions	The NICE guidance highlighted the uncertain evidence on many of the proposed actions to improve air quality.	Many air quality interventions are put in place without incorporating a methodology to evaluate the effectiveness of the intervention. A stronger evidence base is required to make recommendations for effective air quality interventions	Air pollution: outdoor air quality and health (2017) NICE guideline NG70
42	SCM3	Key area for quality improvement 1 Planning applications that mitigate and adapt to poor air quality	Control of pollution through planning recommended within NICE guidance. Evidence form the newly published Air Quality Strategy is that whilst traffic contributes to 13% of poor air pollution it is as much as 80% at the roadside. Building and streetscape design should take this into account	It is not currently clear that local authorities are taking pollution into account when considering their masterplans.	An example of how this could be included - The New London Plan has started to address this with the healthy living streets indicators http://content.tfl.gov.uk/guide-to-the-healthy-streets-indicators.pdf

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43	SCM5	Additional developmental areas of emergent practice: Transport and Streetscene section of local authorities and government are increasingly taking 'healthy streets' approaches to local areas assessing the environment on a variety of factors rather than just air quality.	It is important to consider a variety of factors in relation to our environment. However this shouldn't be at the expense of health impacts arising from air quality, particularly for longer exposure times and vulnerable individuals.	Healthy Street approaches are likely to become more common to assess local area quality. This approach is important as it recognises that there are other issues that contribute towards a healthy environment. However, at the same time it is important that these approaches don't under play or conceal air quality issues. A closer look at this approach and guidance on the degree to which air quality should be addressed in context with Healthy Streets and when it is appropriate to take an air quality specific approach would be beneficial. As set out before there are situations where health streets might result in improvements at one location with a worsening of air quality on other main and minor routes.	http://content.tfl.gov.uk/improving-the-health-of-londoners-transport-action-plan.pdf https://healthystreets.com/ (including links to other policy)
44	Transport Planning Society	Taking action to reduce the number of motorised trips and support active travel in existing areas	Most of the locational choices leading to increased car-dependency arise from turnover of existing stock (~90%) rather than new development (~10%). This means that 'place-making' policies at a wider strategic level are likely to be at least as important as design of new development at site-level. The specific NPPF policies for development planning are focused primarily on the national aim of building more new homes. Decline	The serious local public health issues arising from growing transport emissions, as well as the overarching NPPF aim of 'sustainable development', require a more balanced approach. NICE guidelines should urge that Local Plans use the full range of local spatial policies that increase the attractiveness of existing housing areas, particularly priorities for local infrastructure, service provision and environmental improvements. In this context transport should be recognised as a major driver of patterns	

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			of existing neighbourhoods is a more important driver of traffic growth than numbers, location or design of new housing areas, but NPPF is limited (and in some respects damaging) in its approach to the existing stock.	of settlement, social interaction and economic activity and of regeneration, not merely an input to the development process. Its treatment under the other headings (1.2 Development management, 1.3 Clean Air Zones, etc) seems essentially reactive – fixing problems after they arise. The purpose of planning is to get upstream to the underlying cause (traffic growth).	
45	Transport Planning Society	Additional developmental areas of emergent practice: Better data on walking and cycling	The general lack of reliable data on spatial patterns of walking and cycling activity makes it difficult to identify where people on foot or bicycles are exposed to what levels of emissions. This in turn makes it difficult to identify and prioritise areas for intervention. The lack of spatial data also means that we have a relatively poor evidence base on some of the factors that could be used to support walking and cycling in existing and new developments.		The exposure problem relates not just to air quality but also to collision data. A recent paper describing the challenges of exposure calculation in the context of collision risk is: Aldred et al (2018) Cycling injury risk in London: A case-control study exploring the impact of cycle volumes, motor vehicle volumes, and road characteristics including speed limits. Accident Analysis and Prevention 117 (2018) 75–84
Planning and development – Planning and development of specific sites					
46	Royal Borough of Kingston upon Thames	Key area for quality improvement 1: Planning and development management to	Encouraging people to change their choice of transport mode from motorised transport to active travel is a sustainable way to improve air quality because motorised road traffic is the source of most air pollution in urban areas (source:	Clover leaf/cul-de-sac developments on the edges of towns are common in the UK. Developments like this (with low permeability for people who want to enter and leave on foot, few local facilities and limited public transport access) can create over-dependence on	**Key area for quality improvement 1:** Planning and development management to support walking and cycling

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		support walking and cycling	NAEI/LAEI). As urban areas grow or are redeveloped, sensitive planning for mixed-use developments with good active travel infrastructure, and high permeability and density could reduce dependency on private cars to reduce congestion and air pollution (helpful summary of effective strategies at https://www.sciencedirect.com/science/article/pii/S2214140516302730).	private cars for everyday journeys, contributing to congestion and air pollution locally and in town centres.	
47	Royal College of General Practitioners	Key area for quality improvement 5 Improvement in access to cycle or walk on roads All roadways and all parks			Use of nudge theory in design of transportation and taxation and subsidises to ensure better use of public transport, cycling and walking
48	SCM1	Local Planning Authority handling of development applications that either generate more vehicle trips in areas of poor AQ; or place new residential developments in areas of poor AQ.	There is evidence that local authorities are balancing economic development benefits against air pollution/health dis-benefits (forecast pollution levels over limit values) when making consent decisions on planning applications. Developers may be presenting relatively intangible measures (travel plans, cycling schemes) as robust hard mitigation to enable planning authorities to provide consent.	Enabling development has strong economic benefits for local communities and local authority areas. However, if this development adds vehicle trips in existing areas of poor AQ, or introduces new households within areas of poor AQ then it potentially results in increased human exposure to poor AQ, as well as placing extra demand on any wider mitigation measures being planned. Providing clear guidance for local authorities, on the standards of robust evidence necessary to understand whether mitigation (proposed by	DCLG Planning Portal

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				developers) is sufficient to compensate for adverse AQ impacts resulting from development, will support better development consent decisions.	
49	SCM1	Disrupting the tail-pipe to receptor transmission path	Given we have a legacy vehicle fleet that will produce emissions for a decade or more, and we're not likely to depopulate areas adjacent to busy roads, there remains a short to medium term need to consider options for disrupting the transmission of pollution from vehicles to sensitive receptors as a way of providing a degree of protection to affected people	Pollution monitoring behind a 9m high overhanging (cantilever), barrier next to a major road in Dordrecht, the Netherlands, indicates that it does reduce pollution concentrations at the flats behind it. Whist the circumstances where such a barrier could be used might be limited, the technique offers one of the few physical mitigation options that could be implemented to protect householders.	Highways England is developing an overhanging barrier programme at a limited number of locations around the strategic road network. The evidence for this technique is still emerging, including optimisation of barrier design – however it is an option for other road authorities.
50	Transport Planning Society	Siting and designing new buildings, facilities and estates to reduce the need for motorised travel	Changing patterns of land-use underlie about 70% of the increase since 1970 in transport emissions generated by motorised surface transport. The research referenced by TPS was originally done in the context of the Climate Change Commission concerns with CO_2, but applies equally to the more local air pollution from particulates and NO_x that impact health. Reducing car-dependency in individual sites relates to their location, their design and layout, and links to surrounding development, and thus whether real alternatives to car travel are provided.	TPS recently set out a priority list of measures for Local Plans as part of our NPPF response: • Quality public transport access should be mandatory in terms of the provision of quality infrastructure and financial arrangements for supporting services where necessary. • Demand management should be integral, with limits on parking, provision of access by sustainable modes, and support for a Travel Plan. • Travel Plans have historically been easiest to implement at workplaces, but they can also be implemented in housing areas through, for example, app-based car sharing schemes or app-based	TPS response to NPPF consultation https://tps.org.uk/news/mhclg-consultation-national-planning-policy-framew A Wenban-Smith (2017) *'Land-use drivers of transport emissions – revisited'* ICE Transport Journal, 170(2), London https://doi.org/10.1680/jtran.15.00097

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				provision of public transport information. • Reduced trip generation rates for private motorised transport should be specified and developers be required to demonstrate how these will be achieved and maintained. • Location of development is, of course, fundamental to achieving these aims	
51	Transport Planning Society	Supporting active travel in new developments	Successive annual TPS members' surveys have rated improved conditions for walking and cycling as the highest priority policy areas for transport planning in the UK. Connected, safe and attractive walking and cycling networks are the basic minimum required to ensure a choice of travel modes that fosters access for all, increased physical activity and reduced need for motorised travel.	TPS recently set out a priority list of measures for Local Plans as part of our NPPF response: • Developers should be required to include quality pedestrian and cycle accessibility to development sites • Quality pedestrian and cycle networks in the surrounding area, funded by the developer and built by the local authority under a S106 Agreement. • Providing easily accessible storage facilities for bicycles both in homes and elsewhere, and facilities for changing and showering at major attractors. Furthermore, many public health experts believe the terminology of 'supporting' active travel is too weak. Evidence shows that car ownership is the most powerful indicator of physical inactivity in urban areas. TPS supports a Healthy Streets approach where demand for car	Sarkar et al (2017) Association between adiposity outcomes and residential density: a full-data, cross-sectional analysis of 419 562 UK Biobank adult participants. Lancet Planet Health 2017;1: e277–288 Fairnie et al (2017) Active travel in London: The role of travel survey data in describing population physical activity. Journal ofTransport&Health3(2016)161–172

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				use is pro-actively managed using parking restraints, traffic management (e.g. filtered permeability) and price incentives.	
Clean air zones					
52	British Heart Foundation	Reducing public exposure to traffic related pollution: The public are protected from exposure to high air pollution concentrations through the mandatory introduction of a network of charging clean air zones.	It is well understood that road transport is a significant contributor to air pollution, with diesel vehicles in particular producing high levels of NO_2 and fine particulate matter ($PM_{2.5}$). Moreover, this vehicle-derived pollution has been specifically linked to cardiovascular health problems. For example, there is evidence of an increased risk of having a heart attack following short-term exposure to traffic-related air pollution[33]. Clean Air Zones (CAZs) have been reported by the UK Government to be the most effective way to reduce NO_2 levels in the shortest possible time[34]. As transport is a major source of both NO_2 and $PM_{2.5}$ emissions, CAZs are also likely to be an effective intervention to reduce population-level exposure to $PM_{2.5}$, and hence, the risk to health.	The Government's UK plan for tackling roadside NO_2 concentrations does not make charging Clean Air Zones mandatory for local authorities in breach of NO_2 levels, instead stating that, "if a local authority can identify measures other than charging zones that are at least as effective at reducing NO_2, those measures should be preferred[3]." In February 2018, the High Court ordered that 33 local authority areas in breach of pollution limits should produce plans to comply with the law as soon as possible. Mandated charging Clean Air Zones that allow only the least polluting vehicles in these areas would be the most effective way of reducing air pollution, thereby reducing population-level exposure to air pollution in affected authorities.	[1]Bhaskaran K *et al*, *The effects of hourly differences in air pollution on the risk of myocardial infarction: case crossover analysis of the MINAP database,* BMJ 2011; 343 :d5531. [2]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/632916/air-quality-plan-technical-report.pdf [3]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf
53	SCM3	Key area for quality improvement 2 Clean Air Zones	Control of pollution through clean air zones is recommended within NICE guidance. Evidence form the newly published Air Quality	It is important that monitoring indicates improvement towards safe limits of pollution.	https://www.gov.uk/government/consultations/air-quality-draft-clean-air-strategy-2018

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		Clean Air zones are meeting WHO limits for $PM_{2.5}$ as well as meeting EU limits for NO_2	Strategy is that whilst there is concern that our cities are not falling within NO_2 limits at the road side		
54	SCM4	Car parking policy and travel planning	Use of car parking policy, including pricing, and major employer travel planning to reduce car travel at times of peak congestion and to limit drivers circulating in search of car parking spots	These approaches are far less costly to implement than congestion charging zones. A combination of travel planning and dynamic car park pricing, with electronic signage ideally, can attempt to match traffic flows and available car parking, spreading the peak period. Some transfer to other modes also.	Eg low charges for early arrival/late departure commuter parking. Workplace car park charging, recognising the subsidy provided to drivers by free/cheap parking but not to other mode users.
55	SCM4	Clean Air Zones	There is clear evidence that clean air zones are likely to be the most effective means of achieving air quality standards in those areas where exceedances are significant and/or over a wide area (as opposed to localised hotspots)	Clean air zones are yet to be implemented in the UK, and government has suggested that charging clean air zones should be a last resort despite the evidence.	establishing Clean Air Zones would be "the most effective way to bring the UK into compliance with NO_2 concentration levels in the shortest possible time" The Institute of Air Quality Management highlighted that the requirement to exhaust 'non-charging measures' would involve similar methods to those taken under the existing Local Air Quality Management (LAQM) framework, Improving air quality which has "largely been ineffective at reducing NO_2 concentrations".
56	Transport Planning Society	Introduce Clean Air Zones that include restrictions or charges on certain classes of vehicle	Clean Air Zones are a priority measure because (a) they can reduce exposure to pollutants in dense urban areas where exposure is high, and (b) they can encourage travel by less polluting modes.	There is emerging evidence from London Low Emission Zone policies are successful over time in encouraging fleet operators to re-consider their vehicle mix, and in encouraging logistics operators to innovate with new business models.	

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			The resulting improved air quality also has numerous potential co-benefits such as road danger reduction, enhanced local accessibility, more physical activity, positive economic impacts and GHG emissions reduction.	There is also older evidence that policies to reduce traffic through vehicle restrictions (e.g. Cambridge city centre) or through pricing (e.g. London congestion charge) can encourage mode shift to cleaner modes while maintaining access for servicing and deliveries.	
Reducing vehicle emissions – low-emission vehicles					
57	Association of Directors of Public Health	Action to reduce vehicle emissions – this could include: • Reduction of emissions from public sector transports and fleets	The public sector includes many large institutions and employers (eg large NHS Trusts) which generate a lot of local journeys for staff, service users, visitors, deliveries and contractors. Fleets managed by the public sector should be encouraged to switch to more environmentally friendly fuels and technologies.	Addressing the contribution of the public sector to air pollution is important both because of the scale of its potential impact and because it can be used to influence other local businesses (e.g. through use of the Social Value Act to ensure suppliers also address their impact on sustainability).	
58	FirstGroup plc UK Bus Division	Increased proportion of Euro VI diesel buses	The latest Euro VI diesel buses emit up to 99.5% less NO_x emissions and 98% less PM emissions compared with buses purchased 10 years ago. Unlike Euro 6 cars, Euro VI buses have to deliver ultra-low emissions on the road not just in the test lab. Euro VI (unlike electric power) is mainstream technology without a significant cost premium and investment in such vehicles also improves the age profile of local bus fleets making services more attractive.	For large vehicles including buses these standards have to be met “on the road” not just under test conditions. It is possible to retrofit modern buses to achieve this Euro VI standard and the Department for Transport has run funding competitions for assistance with such fitment. But congestion also has to be tackled to achieve the full potential of any Euro VI vehicle. Recent tests comparing Euro VI bus emissions with real-world Euro 6 diesel car emissions found average NO_x emissions from buses of 165 mg/km, nearly one-third or better of the average emissions from	Low Carbon Vehicle Partnership has done a lot of work looking at the benefits of low emissions vehicles. Useful background information is available at: https://www.lowcvp.org.uk/projects/bus-working-group/delivery-OLEV-LEBscheme.htm The Energy Saving Trust accredited several retrofit solutions capable of achieving low emissions to the Euro VI standard:

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				Euro 6 cars (480-560 mg/km). Given that on average a bus is carrying 11.4 passengers and a car 1.5 persons, per capita bus emissions are at least 23x lower compared with the cleanest diesel car	http://www.energysavingtrust.org.uk/transport-travel/transport/clean-vehicle-retrofit-accreditation-scheme-cvras The comparative vehicle tests referred to are at: http://www.theicct.org/nox-europe-hdv-ldv-comparison-jan2017
59	Hammersmith & Fulham Council	Key Area 5 *Purchasing guidance to reduce pollution:* Provide guidance to the public including businesses on how to reduce the pollution they produce and their exposure. This would include advice on low emission vehicle purchase as well as best travel options (i.e. bus versus cab versus bicycle) and (if the standard is extended) boilers and other heating/energy plant purchases.	What individuals and businesses purchase, consume and support can be major contributors to air pollution. Guidance such as – what type of boiler is least polluting; what are the most sustainable goods delivery options; if someone is burning or want to burn fuel in my home – what is the impact on air pollution and how can this be minimised A key example is vehicle purchase. Emissions Analytics data shows that 86% of current Euro VI cars don't meet Euro VI emissions standards in real-world emissions tesing.	Individual choices, from what cars we buy to how we choose to have our goods delivered, can have a significant impact on ambient air pollution and health.	http://equaindex.com/euro-6-cars-entering-clean-air-zones/ http://equaindex.com/equa-air-quality-index/

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60	Royal Borough of Kingston upon Thames	Key area for quality improvement 3: Reducing emissions from public sector transport and fleets	The public sector includes many large institutions and employers (eg large NHS Trusts) which generate a lot of local journeys for staff, service users, visitors, deliveries and contractors.	Addressing the contribution of the public sector to air pollution is important both because of the scale of its potential impact and because it can be used to influence other local businesses (eg through use of the Social Value Act to ensure suppliers also address their impact on sustainability).	**Key area for quality improvement 3:** Reducing emissions from public sector transport and fleets
61	SCM1	Understanding barriers to adoption of low/zero emission vehicles (charging infrastructure and vehicle availability)	Clearly the ultimate answer to poor AQ from road transport sources is the conversion of the vehicle fleet to low/zero emission. However, there are barriers to achieving effective transition to electrification: 1, Restricted capacity of electricity supply in some locations may prevent/inhibit provision of rapid charging hubs. 2, Limited supply of certain vehicle types in low/zero emission form (most significantly LGVs) 3, Building confidence in vehicle operators/users that low/zero vehicles can meet their transport/operational needs (and ensuring infrastructure development keeps pace with demand, so that confidence isn't damaged).	These barriers (not necessarily an exhaustive list) need to be considered and addressed, in parallel, if rapid transition to low/zero emission vehicles is to be achieved. For example, it is known that many motorway service areas (MSAs) are fully using their electricity supply capacity, and if high capacity rapid charging hubs are to be provided then additional capacity supply will need to be provided, which is a very expensive operation (evidence – MSA disconnecting their vehicle charging facilities to provide additional electricity supply to catering outlets). Standards should promote a 'programme management' approach to low/zero emission vehicle transition, to ensure dependencies are recognised and are effectively managed in a co-ordinated plan.	
62	SCM4	Fleet management	Public sector employers operate fleets themselves, have significant grey fleet usage, and have regulatory and procurement roles for public transport fleets such as buses and taxis	The public sector should show leadership to the wider community in fleet management and in improving the composition of the fleet towards highest standards.	https://somersetairquality.wordpress.com/business/car-and-van-fleets/ https://www.gov.uk/government/publications/sustainable-procurement-the-

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					gbs-for-transport-vehicles/government-buying-standards-for-transport-2017 https://www.itravelyork.info/news/city-of-york-councils-newly-approved-taxi-licensing-policy-aims-to-cut-poll
Reducing vehicle emissions – Transport management					
63	Alphasense Ltd		Use network real time mapping to control bus and taxi use of combustion or electric power.		
64	Association of Directors of Public Health	Action to reduce vehicle emissions – this could include: • consolidation projects should be encouraged	The public sector includes many large institutions and employers (eg large NHS Trusts) which generate a lot of local journeys for staff, service users, visitors, deliveries and contractors. Collaborating to share transport resources can lead to a reduction in vehicle trips, as well as financial and environmental savings.	Addressing the contribution of the public sector to air pollution is important both because of the scale of its potential impact and because it can be used to influence other local businesses (e.g. through use of the Social Value Act to ensure suppliers also address their impact on sustainability). Consolidating transport has been shown to be highly effective in reducing the number of vehicles carrying freight entering a city by making sure their carrying capacity is fully used and has an impact on road safety for cyclists and pedestrians.	
65	FirstGroup plc UK Bus Division	Increased modal share for public transport trips to health care facilities	Public transport and active travel offer health benefits compared with car usage and contribute to better air quality. Health authorities and healthcare providers should be required to identify the % of staff, patients and visitors travelling by car, public transport, walking and cycling.	Not only can increased use of public transport and active modes yield health benefits but this can also free up poorly utilised land within existing healthcare properties by reducing the need for car parking. Healthcare providers should encourage the use of these modes over car by offering assistance with season	Some of the wider benefits of increased public transport use are highlighted in the following report. https://greenerjourneys.com/wp-content/uploads/2017/07/Greener-Journeys-Value-for-Money-Update-FINAL.pdf

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				ticket purchase and reducing parking provision.	The following provides some useful top level observations: https://greenerjourneys.com/wp-content/uploads/2016/10/The-Value-of-the-Bus-to-Society-FINAL.pdf
Reducing vehicle emissions – Driver training					
66	Association of Directors of Public Health	Action to reduce vehicle emissions – this could include: • Action on engine idling.	Anti-idling enforcement can also lead to reduced emissions.		The evidence of improved local air quality from initiatives such as engine idling enforcement - research conducted by Kings College found that on anti-idling action days emissions fall by 20%. There is a need to focus this activity around high-risk areas such as hospitals and schools.
67	SCM3	Key area for quality improvement 3 Number of drivers in fleets, particularly local authority and health authority fleets, taking up efficient driving techniques resulting in reporting fuel savings	Efficient driving is recommended within NICE guidance, and can result in measured fuel savings for fleet managers. Fuel efficiency correlates strongly with reduction in emissions.	Take up of fleets using efficient driving techniques – measured by telematics.	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/509972/efficient-driving-rapid-evidence-assessment.pdf
68	SCM4	Anti-idling campaigns/ enforcement	Anti-idling campaigns focused on sensitive locations	Schools, hospitals, old persons housing all contain sensitive populations. The intervention is both low cost and cost effective.	Use of timed school residential road closures, as in Edinburgh, to restrict traffic in the immediate environs of schools, also facilitates active travel
Additional areas – Other sources of pollution					

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69	Royal College of General Practitioners	Key area for quality improvement 2 Lack of litter	Mental wellbeing		
70	The Dirac Foundation	Consideration of long-term health effects of pollution from busy roads on residences as aggravated by air pollutants from other nearby sources.	It is understood that this particular quality standard will cover road-traffic-related air pollution and its links to ill health but it is I think important to ensure that outdoor air pollution considers chronic impact on residences including external gardens, patios, balconies, and yards etc. and most importantly along with potential aggregative effects of other sources of bad air quality, i.e. a cooperativity between pollutants for which there is a reasonable prior expectation of accumulative and even worse-than-additive effect on health. In addition, it is likely that long term exposure health effects of busy roads cannot be divorced from long term exposure effects indoors.	The committee is aware of the report in the Lancet Volume 389, No. 10070, p718–726, 2017 by H. Chen et al and of concern to the NICE was a decade-long study of 6.6 million people finding that one in 10 dementia deaths in people living within 50 metres of a busy road was attributable to fumes and noise, and there was a linear decline in deaths the further people lived away from heavy traffic. According to "NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE Guideline scope indoor air quality at home https://www.nice.org.uk/ guidance/gid-ng10022/documents/ final-scope-2, indoor air pollutants come from various sources including consumer products such as those used for cleaning, candles or diffusers, and from activities such as cooking and smoking, as also particularly intensive in restaurants and their extracted air. Nearby residences can be affected. According to "The air quality strategy for England, Scotland, Wales and Northern Ireland [volume 2], Department for Environment, Food and Rural Affairs", outdoor pollutants enter through windows or gaps in the building structure and are a significant contributor to indoor air quality.	According to the above air strategy report, poor air quality at home is associated with respiratory and other diseases and premature death, and children and people with respiratory conditions are susceptible to health problems caused by poor indoor air quality (Committee on the Medical Effects of Air Pollutants' guidance on the effects on health of indoor air pollutants Public Health England). According to "Air Quality A Briefing for Directors of Public Health, March 2017, Department or Environment, Food, and Rural Affairs, Public Health England, and Local Government Association", the pollutants concerned are strongly associated with crude (i.e. all-cause) mortality statistics. Particulate matter (PM) was of particular concern, and in addition to nitrogen dioxide and sulphur dioxide, carbon monoxide, particulate matter, biological agents and volatile organic compounds (VOCs) are mentioned as likely pollutants. As well as recognized likely air pollutants from cooking and cleaning in restaurants, a recent study has emphasized the air pollution including oil droplet formation that can be produced by preparing a single full

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					breakfast ("Out of the frying pan: Explosive droplet dynamic," at the *70th annual meeting of the American Physical Society*'s Division of Fluid Dynamics, November 2017, in Denver, Colorado). To the above may be added that ammonia, Non-Methane Volatile Organic Compounds (NMVOCs) and ozone as plausible urban contaminants due to cooking, cleaning and waste in some cases, and hydrogen sulphide from waste bins, disposal sites and landfill. Distinguishing health outcomes due to noise (such as might arise from busy roads, heavy duty restaurant expeller fans etc.) rather than from polluting materials is difficult but is in any event believed to have impact on health (e.g. Welch et al., Noise Health, 2013 15(65), p224-30).
71	Alphasense Ltd		Improve Building Management System software to include outdoor air quality, rather than just CO2 levels to optimise both energy efficiency and indoor air quality, which are often in conflict. This will improve indoor urban air quality- the Bloomburg building is an example.		
72	Association of Directors of Public Health	Going beyond traffic pollution to include all major sources of air pollution and how	Although vehicles create a great deal of air pollution, other sources of air pollution remain important. The increased use of wood and other fuel burning in homes	Other sources of pollution contribute to air pollution but the focus has tended to be on traffic. There is a need to increase the understanding of the impacts of and risks of other sources of air pollution, so	

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		the public can reduce the pollution they create and are exposed to.	(including so-called smokeless fuels or the use of approved appliances) contribute to $PM_{2.5}$ levels. Building and construction should not be overlooked and currently there is much less awareness of the significant contribution they make to air pollution. Domestic and commercial heating systems are another important source of air pollution within the UK. Improving the energy efficiency of homes and commercial buildings has the potential to contribute to reducing emissions as well as imparting multiple other co-benefits, such as reducing household energy bills, fuel poverty and excess winter deaths.	that the public can both act to reduce the level of pollution they create and reduce their exposure to it.	
73	Hammersmith & Fulham Council	*KEY AREA 1 Quality Standard for all Ambient Pollution:* This plan should go beyond traffic pollution and address all major air pollution sources and how the public can reduce the pollution they create and are exposed to	There has been a focus on vehicle pollution sources and there is a lot of work going into this, but less so in terms of the other major sources that individuals have control over and may have less knowledge about. The way we heat our homes and businesses for example.	If the focus continues to be on vehicular sources, other major sources will continue to be untouched and will likely increase. A key example is the increased use of wood and other fuel burning in homes (including so-called smokeless fuels or the use of approved appliances) which contribute to approximately 50% of PM2.5 in the London during the winter.	There is a lot of data on the other major sources including the National Atmospheric Emissions Inventory (and the London Atmospheric Emissions Inventory).

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74	SCM1	Additional developmental areas of emergent practice	Consideration needed of direct property protection (for example, provision of positive ventilation and air filtration/treatment may provide for cleaner air within properties even if outdoor air has high levels of pollution).		
General comments					
75	Royal College of Paediatrics and Child Health	Additional developmental areas of emergent practice	This document on air pollution covers many relevant aspects of this topic.		
76	SCM2	Additional evidence sources for consideration	Healthy Streets for London https://healthystreetscom.files.wordpress.com/2017/01/healthy-streets-for-london.pdf		
77	SCM5	Additional evidence sources for consideration		I've included a few examples of supporting information. However on the whole as a practical discipline when it comes to implementation and given that concerted actions are relatively new, there often isn't a great deal of guidance/evidence available and so much action at local authority level depends on professional judgement. As set out before I would probably say that many tend to pick and choose evidence to suit the situation and without full consideration. In recent years the GLA has become better at identifying what actions local authorities should be taking to address poor air quality. Please see https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-london-boroughs.	