



Southampton City Council Air Quality Action Plan 2023-2028

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management



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Executive Summary

Poor air quality remains the greatest environmental health risk in the UK. Air pollution is associated with a number of adverse health impacts which typically affect those most vulnerable in our society most ^{1,2}.

In the UK, the annual health cost to society of the impacts of particulate matter pollution alone is estimated to be around £16 billion³. By improving air quality, we can reduce the unnecessary burden that poor air quality has on the residents of Southampton.

Southampton City Council has done a lot to improve the city's air quality. The City's first Air Quality Action Plan (AQAP) which was first adopted in 2008 and later updated delivered:

- Shore-side electric facilities
- Personal travel planning service for residents
- Air pollution forecasting and alert service
- Air quality integrated as a key element of the Local Transport Plan
- Air quality planning guidance
- School travel plans
- Council fleet improvement
- Rail gauge enhancements
- Millbrook roundabout improvements
- Bus quality partnership

Southampton City Council has also since implemented a Local NO₂ Plan (a non-charging Clean Air Zone) as required by central government. Measures in the plan included:

- A Clean Bus Retrofit programme
 - Retrofitting 145 buses to Euro VI equivalent compliance
 - All buses in the Southampton fleet now met Euro VI equivalent standards
- The Low Emission Taxi Incentive scheme

¹ Environmental equity, air quality, socioeconomic status, and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

- Over 200 taxis have taken up the scheme and over 60% of Southampton's taxi and private hire fleet are now hybrid or electric vehicles
- Taxi licensing conditions
 - All Southampton taxis and private hire vehicles will need to meet Euro 6 compliance by 2023
 - Over 80% of the fleet currently meet Euro 6 standards
- Delivery and Service Plans and enhanced use of the Sustainable Distribution Centre for public authorities including the NHS
- Targeted active travel scheme behaviour change scheme
- Taxi telematics to help drivers understand how they can benefit from an electric taxi

Due to these measures and national improvements, we've seen air quality in the city gradually improve since monitoring began. It's The Council's ambition to continue this ongoing improvement for the benefit of the city's residents.

This AQAP is an update to the previous plan produced in 2008 as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Southampton between 2023-2028 to continue to improve air quality and reduce its burden on our residents.

We have identified 5 priority areas where new efforts under the action plan will be focussed:

1. **Empowering Communities**
2. **Supporting Businesses**
3. **Active and Sustainable Travel**
4. **Low Emission Vehicles**
5. **Planning and Monitoring**

We recognise that there are many effective measures which The Council cannot achieve alone. We will continue to work with external organisations including businesses, residents and central government on policies and issues beyond Southampton City Council's direct influence.

The key measures in the plan include:

- Wood burning public engagement programme
- Air quality school's engagement programme
- New high-tech air quality monitors
- Shore-side power for cruise ships docking at the Port of Southampton
- Enhanced air quality requirements in the planning process
- Electric taxi and light commercial vehicle try before you buy scheme including new chargers across the city

- Identify further opportunities for better pedestrian infrastructure including Active Travel Zones
- Supporting shared 'micromobility' by providing rental manual bikes, e-bikes, and cargo bikes for residents

This AQAP will be subject to an annual review including an appraisal of progress as part of Annual Status Reports (ASRs) produced by Southampton City Council as part of our statutory Local Air Quality Management duties. Progress will also be reported to the Green City Programme Board and relevant cabinet members as required. These reports include updates on measures presented in this plan.

If you have any comments on this AQAP, please send them to our air quality inbox at: airquality@southampton.gov.uk.

Contents

1. Introduction	8
1.1. The National Picture	8
1.2. Key Pollutants	10
1.3. Health Impacts	11
1.4. Impacts on The Environment.....	12
2. Summary of Current Air Quality in Southampton.....	13
2.5. Public Health Context.....	16
2.5.1. National and International Policy Context	17
2.5.2. Local Policy Context	17
2.5.3. Projects implemented to date	22
2.6. Reductions required and AQMAs	22
2.6.1. Air Quality Standards	22
2.6.2. Southampton's Air Quality Management Areas	24
2.6.3. Air Quality Monitoring.....	25
2.6.4. Improvements required	29
2.7 Key Priorities	29
3. Development and implementation of Southampton City Council's AQAP	31
3.1 Consultation and Stakeholder Engagement	31
3.1.1 Engagement Survey	31
3.1.2 Formal Consultation	32
3.1.3 Steering Group.....	33
3.1.4 Governance.....	34
4 AQAP Measures	35
4.1 AQAP tables.....	35
4.2 Ensuring Compliance and The Local NO ₂ Plan.....	47
Appendix 1: Source Apportionment Detail.....	48
Appendix 2: Shortlisting Process Diagram	51
Appendix 3: Response to Consultation	52
Appendix 4: Reasons for not pursuing measures	55
Glossary of Terms.....	60

List of Figures

Figure 1 Change in emissions of air pollutants, 1970-2016 (Defra Clean Air Strategy 2019)	9
Figure 2 NO _x contribution by source using a citywide verification factor. This data is taken for an average of all sites where source apportionment took place.	15
Figure 3: Responses from residents on the extent to which they think air quality is a problem in Southampton.....	15
Figure 4 Current locations of the Southampton's 10 Air Quality Management Areas.....	24
Figure 5 Annual average NO ₂ concentrations between 2012 and 2020 from diffusion tubes which record the highest concentrations in AQMAs which were installed from 2012. The dashed red line represents the statutory air quality standard for Nitrogen Dioxide.	25
Figure 6 Monthly average NO ₂ concentrations monitoring at the A33 monitoring station 2019-2022. Data until the end of August 2022 was only available at the time of writing.	27
Figure 7 Annual average concentrations of PM ₁₀ and PM _{2.5} monitored from the A33 and City Centre AURN automatic monitoring sites. The graph on the left illustrates PM ₁₀ monitoring and its objective, the graph on the right illustrates PM _{2.5} monitoring and its objective.....	Error! Bookmark not defined.
Figure 8 Percentage of positive, mixed, and negative comments for the most popular types of measure ...	32
Figure 9 Source apportionment at key sites for concentrations of NO _x in 2019 using a city-wide verification factor. Locations are provided in Figure 11.	48
Figure 10 Source apportionment for road vehicle types at key sites for concentrations of NO _x in 2019 using a city-wide verification factor.....	49
Figure 11 Source apportionment locations.....	50

List of Tables

Table 1 Improvements needed to achieve air quality objectives in 2019	29
Table 2 List of stakeholder engagement events	31
Table 3 Statutory consultees engaged	33
Table 4 Statutory consultee responses received	52
Table 5 Public consultee comments where changes were made to the plan	52

1. Introduction

This Air Quality Action Plan (AQAP) update outlines the measures that Southampton City Council will deliver between 2023-2028 to improve air quality in the city. The full list of measures is provided in section 3.1.

The plan been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 (and subsequent amendments) and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process. This Plan will be reviewed every five years at the latest and progress on measures set out within this Plan will be reported on annually within Southampton City Council's air quality Annual Status Report (ASR).

1.1. The National Picture

"Clean air is essential for life, health, the environment, and the economy.

While significant improvements have been achieved over recent decades, poor air quality remains the greatest environmental health risk in the UK, shortening lifespans and damaging quality of life for many people, with those most vulnerable suffering the most."

- Clean Air Strategy 2019

Air pollution has been a major issue in the UK for decades. The Great London Smog of 1952 was the single worst pollution ever in the UK, leading to the deaths of around 12,000 over the course just a few days. Since then, improvements in technology and new legislation has resulted in large reductions in emissions.

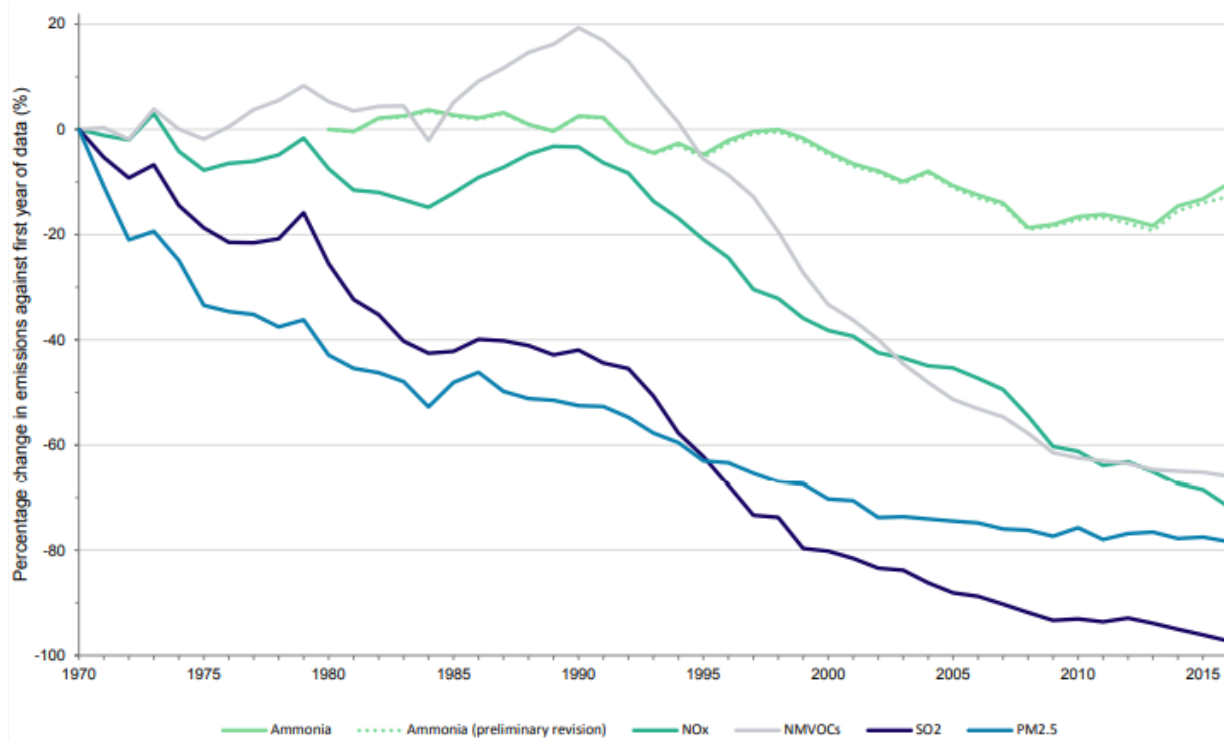


Figure 1 Change in emissions of air pollutants, 1970-2016 (Defra Clean Air Strategy 2019)

Despite these improvements, poor air quality remains the greatest environmental risk to health in the UK. Nitrogen Dioxides (NO₂), largely from road transport, and particulate matter (PM) emissions, from a variety of sources including domestic wood burning, industry, and transport, are the main pollutants of concern and continue to burden the health of UK residents.

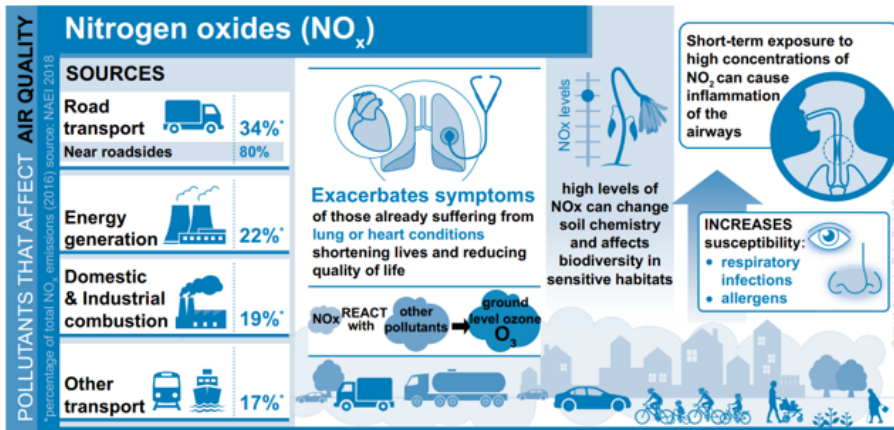
Taking action to improve air quality will reduce the burden of pollution on public health and the NHS while getting people back to work, learning, and leading an active life. In most cases these benefits far outweigh the cost of action.

Air pollution is also an issue of inequality, those who pollute the least typically suffer the most. Action to improve air quality should not only look at reducing emissions, but also address this inequality and focus in areas improving air quality worsens other factors of inequality.

1.2. Key Pollutants

While there are lots of different pollutants, the main pollutants of concern in the UK and Southampton are Nitrogen Oxides/ Nitrogen Dioxide (NO_x/ NO₂) and Particulate Matter (PM), notably PM_{2.5}.

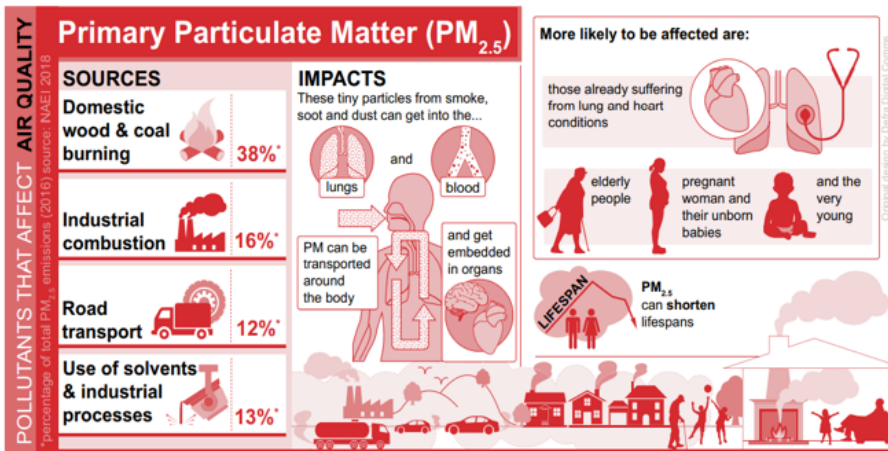
Nitrogen Oxides (NO_x)/ Nitrogen Dioxide (NO₂)



Sources
Around two thirds of NO_x is emitted from road transport, the greatest contributor of which in the UK being diesel cars.

NOTE
NO_x (Nitrogen Oxides) and NO₂ (Nitrogen Dioxide) can be used interchangeably. NO_x includes both NO₂ and NO (nitric oxide) which is not a pollutant.

Particulate Matter (PM_{2.5})



Sources
The greatest source of primary (directly emitted) particulate matter in the UK are domestic wood burners, followed by industrial burning and other processes and road transport. Lots of particulate matter is 'secondary' – meaning it comes from outside the country or is formed by reactions in the atmosphere.

NOTE
PM_{2.5} is one of several types of particulate matter. These are often referred to in the categories: PM₁₀, PM_{2.5} etc. The number represents the size of the particle. In general, the smaller a particle is, the more dangerous it can be to health as it can penetrate deeper into the body.

Particulate matter consists of liquids or solids suspended in the air. Ash, dust, black carbon from exhausts and a huge number of other substances are all classed as particulate matter.

1.3. Health Impacts

For most, short-term exposure to high levels of pollution will result in irritation and inflammation of airways. For those already suffering from lung or heart conditions, symptoms can be made much worse. Longer term exposure to air pollution can worsen and increase the risk of developing these conditions in the first place.

In the UK:

1. 28,000 – 36,000 deaths each year attributable to human-made air pollution in the UK. ⁴
2. An estimated 340,000 years of life are lost every year as a result of outdoor PM_{2.5} alone. ⁵
3. Impacts of air pollution are not felt equally. Those who live and work near busy roads and those that are more vulnerable due to age or existing medical conditions bear the brunt of impacts.
4. The total NHS and social care cost due to PM_{2.5} and NO₂ combined in 2017 was estimated to be £42.88 million. ⁶
5. Air pollution has been estimated to be responsible for total productivity losses of up to £2.7 billion in 2012⁷ as those made ill by poor air quality are less able to work effectively and are more likely to take days off.

Air pollution affects us throughout life but has the most impact on health when we're very young and very old.

⁴ Committee on the Medical effects of air pollutants. Mortality effects of long term exposure to particulate air pollution in the UK (2009). <https://www.gov.uk/government/publications/comeap-mortality-effects-of-long-term-exposure-to-particulate-air-pollution-in-the-uk>

⁵ [Air pollution main report WEB 1 0 0 \(2\).pdf](#) – Every breathe we take

⁶ [Air pollution: a tool to estimate healthcare costs - GOV.UK \(www.gov.uk\)](#)

⁷ Ricardo-AEA, 'Valuing the Impacts of Air Quality on Productivity' (2014), https://uk-air.defra.gov.uk/assets/documents/reports/cat19/1511251135_140610_Valuing_the_impacts_of_air_quality_on_productivity_Final_Report_3_0.pdf



1.4. Impacts on The Environment

Pollution can have a large impact on vulnerable habitats including salt marshes. This can make these areas less resilient to types of human disturbance, like water pollution.

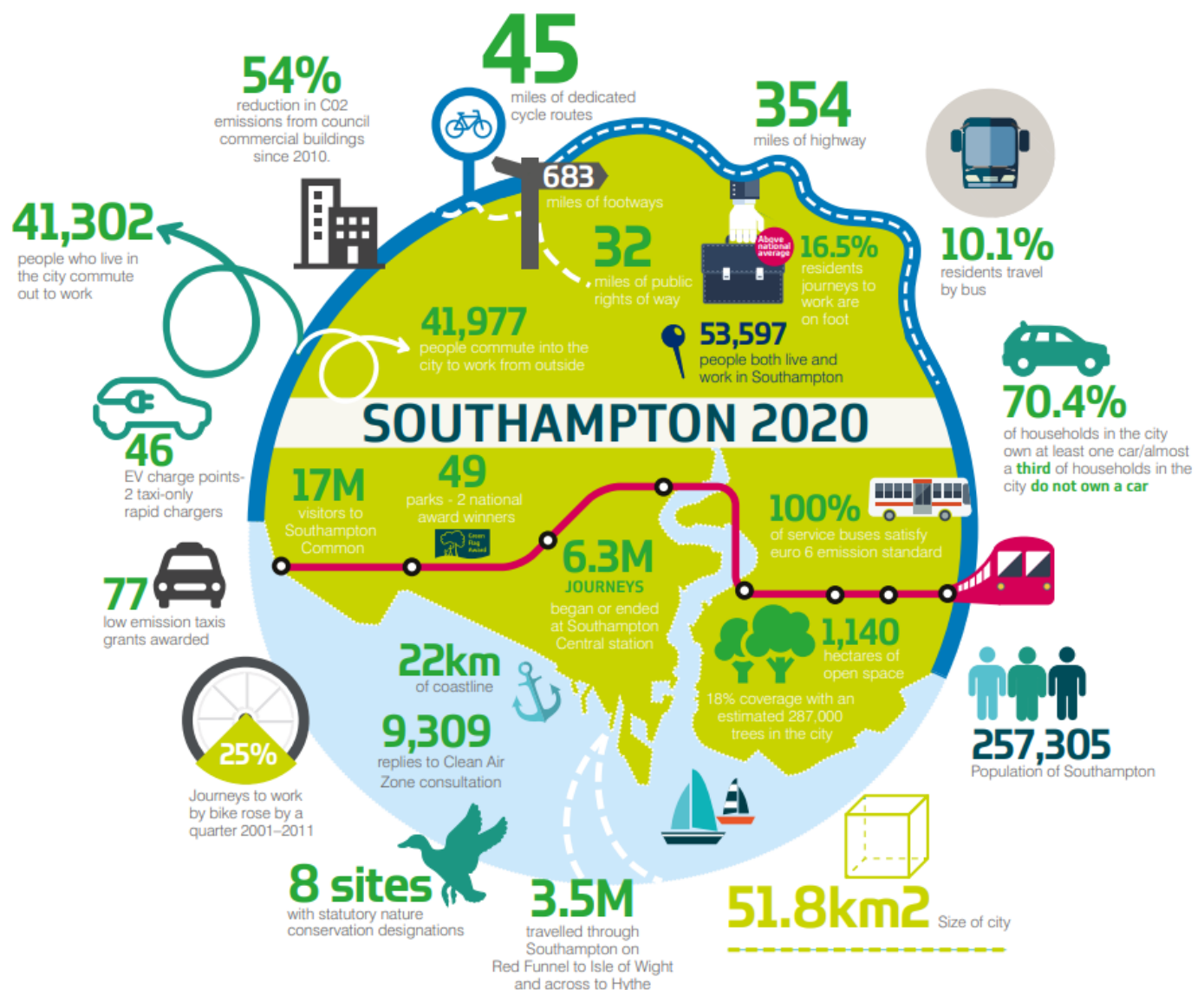
Air Pollution and Climate Change

Air quality and global climate change both present major challenges to human health and the environment. While they both have shared causes – mostly a result of burning fuels – the impacts are very different. Air pollution is a local issue where pollutants directly impact people nearby to sources like roads or industry. The impacts presented by climate change are global and much longer term.

While this action plan focuses on air quality, the measures presented have also been selected on the basis of their potential to mitigate climate change as is in alignment with our ambitions under Our Green City Charter. Likewise, SCC's upcoming Climate Change strategy will also seek measures which can deliver benefits for air quality as well as climate change, while those which have an adverse impact on air quality will be avoided.

2. Summary of Current Air Quality in Southampton

Southampton is the third most population dense city in England and the largest in Hampshire. The city is served by various major transport infrastructure links, including the M3 and M27 Motorways, a major cruise, container and vehicle port, a main line railway to London and along the south coast and a regional airport just outside the city's northern boundary.



Southampton is also a growing city:

- With the forecast for 42,000 homes and 472,000m² of employment space to be required in the City Region between 2016 and 2036. It is estimated that there could be 275,000 more trips being made each morning – 10% more than today.
- As the city grows, journey times could increase further with one main corridor forecast to see an increase in peak journey times of 127%.
- The Port of Southampton could be handling 95% more cruise passengers, 63% more containers and over 100% more automotive exports.
- Southampton Airport has plans to double the number of passengers and flights through it by 2037.

Like other major cities in the UK, Southampton experiences high levels of nitrogen dioxide pollution in several key areas where road transport traffic and congestion is high .

Most traffic in the city is funnelled into only a few key routes towards the city centre, these being the Western, Eastern and Northern Approaches. These are the areas where congestion is most intense, particularly during busy times of the day, and subsequently presenting the greatest challenge. Figure 2 below sets out the contributions of each key source in the city to NO_x levels.

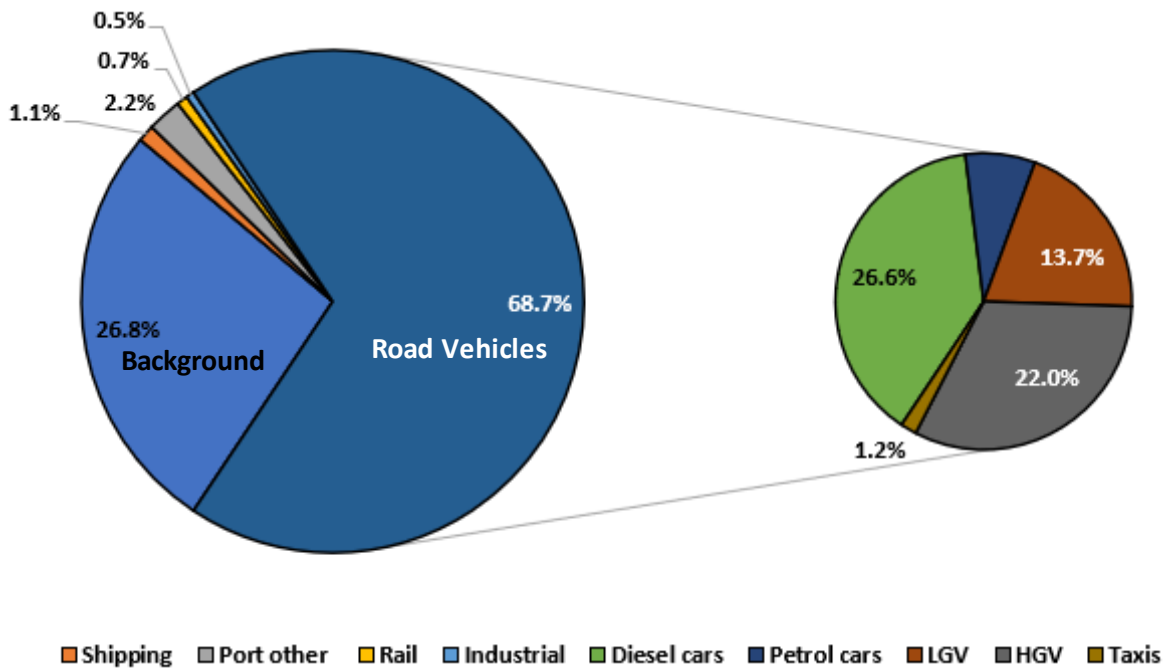


Figure 2 NO_x contribution by source using a citywide verification factor. This data is taken for an average of all sites where source apportionment took place.

Further detail on source apportionment is provided in Appendix 1. Southampton residents have a good awareness of the air quality challenge. Of a group of 282 residents surveyed, 88% consider poor air quality to be a fairly big or very big problem.

To what extent do you think air quality is a problem in Southampton?

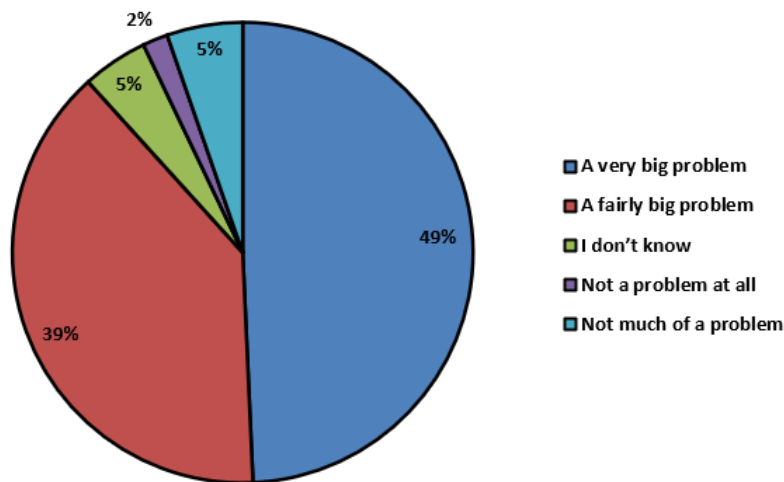


Figure 3: Responses from residents on the extent to which they think air quality is a problem in Southampton.

2.1 Public Health Context

Local Public Health impacts

Public Health England estimates that 5.9% of deaths in Southampton can be attributed to particulate matter pollution - higher than the Southeast England figure of 5.4%⁸.

Research by the Clean Air Fund indicates that if air pollution was cut by a fifth in the city, every year we could see:⁹

- 150 fewer children suffering with reduced lung function;
- 81 fewer children suffering with a chest infection and 69 fewer asthmatic children suffering with bronchitic symptoms (cough and phlegm);
- A decrease in the risk of coronary heart disease by around 4.2% which would result in 48 fewer cases a year; and
- A decrease in lung cancer cases by around 5.9%, which would result in 10 fewer cases every year.

Local Health Inequalities

The impact of air pollution is not felt evenly across the city. Certain factors, including age and medical history, can make certain residents more vulnerable.

Poor air quality can make health inequality worse. Residents living in areas of poor air quality may be more susceptible to other illnesses than those residents living in areas with cleaner air.

There are pockets of deprivation in the city with 11% of the population living in the top 10% of the most deprived in England. In the most deprived areas of Southampton compared to the least, asthma prevalence is approximately 1.46 times higher and emergency admissions for asthma is approximately 1.92 time higher ¹⁰.

⁸ [Public health profiles - OHID \(phe.org.uk\)](https://www.phe.org.uk/public-health-profiles)

⁹ [policy-brief-Southampton.pdf \(cleanairfund.org\)](https://www.cleanairfund.org/policy-brief-southampton.pdf)

¹⁰ [Health inequalities \(southampton.gov.uk\)](https://www.southampton.gov.uk/health-inequalities)

2.1.1 National and International Policy Context

UK Objectives

First established through The Environment Act in 1995. The Act requires local authorities to:

- Monitor local air quality and identify which areas don't meet national air quality objectives (listed in Table 1).
- Establish Air Quality Management Areas (AQMAs) where air quality objectives are not likely to be met.
- Establish an Air Quality Action Plan (AQAP) which sets out how the local authority will work to ensure compliance within the AQMAs
- Report on progress annually through an Annual Status Report (ASR)
- Update the Air Quality Action Plan regularly.

Almost all AQMAs in the UK are established for exceedances of the annual average objective for NO₂.

EU Limits

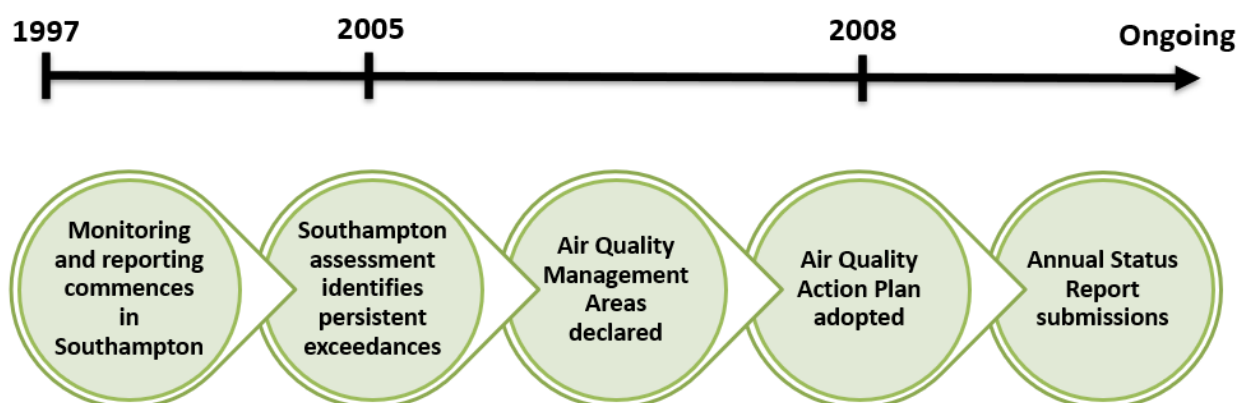
- Determined through the EU 2008 Ambient Air Quality Directive and transposed in UK law through the Air Quality Standards Regulations 2010.
- The UK government is required to meet these limits in the shortest possible time.
- Limits (listed in Table 1) closely reflect the UK objectives.
- In response, the UK published its plan for tackling roadside nitrogen dioxide concentrations. Over 60 local authorities, including Southampton, have been required by central government to establish 'NO₂ Plans' – which might involve the provision of charging 'Clean Air Zones' which are currently being established across the country.

2.1.2 Local Policy Context

SCC monitoring identified possible persistent exceedances for the UK objective of Nitrogen Dioxide in 2005. Following this, AQMAs were established and subsequently amended to capture the key areas for poor air quality in the city.

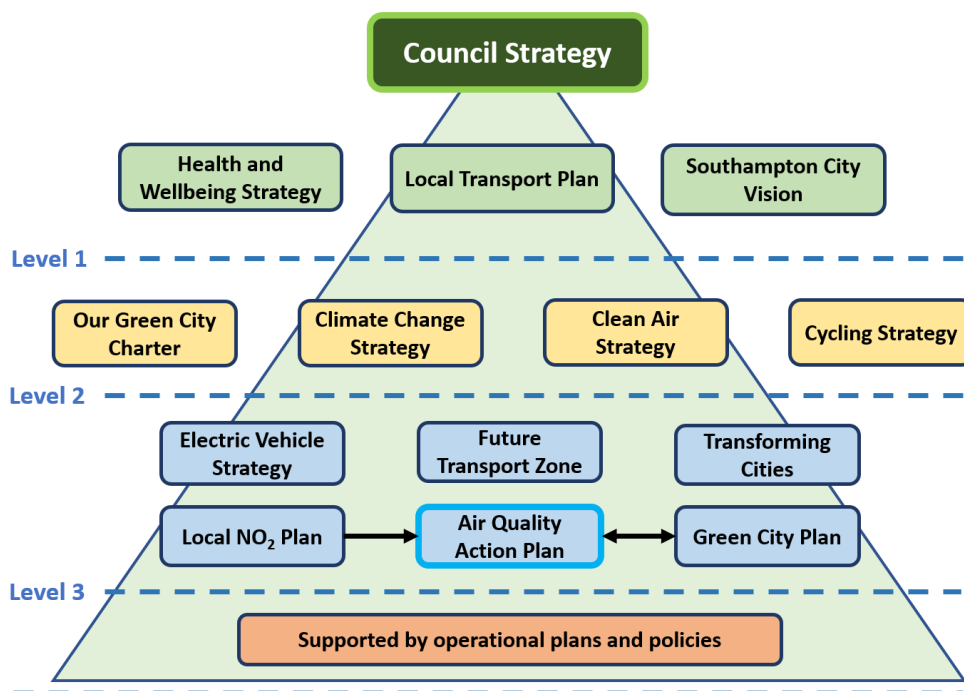
SCC's first AQAP was published in 2008 with further reviews in subsequent years.

Progress against the AQAP reporting of monitoring data is presented to Defra annually through Southampton City Council's Annual Status Reports. These are available using the following link: [Southampton's statutory air quality reports.](#)



Since the first AQAP was adopted, tackling air quality has risen on the local and national agenda. The following section sets out the policies and strategies the council already have in place, the action this has delivered, and how this links with this updated AQAP.

The diagram below sets out Southampton City Council policy relevant to this Air Quality Action Plan. The following pages provide more information on current key policy relevant to air quality.



Clean Air Strategy for Southampton 2019-25

- Our Clean Air Strategy was published in 2016 and updated in 2019 subsequent to The Local NO₂ Plan. It sets out our board approach to improving air quality in the city, including key principles, priority areas and commitments up to 2025.
- The four focus areas of the strategy are:
 - Improving air quality in the city
 - Supporting businesses and organisations
 - Collaborating with communities and residents
 - Promoting sustainability
- The measures we implement as part of this plan and others will be steered by the content of the Clean Air Strategy.

Air Quality Action Plan

- Since 1995 The Council has identified 10 AQMAs (located in section 2.2.2), all of which have been declared for Nitrogen Dioxide, principally a result of road vehicle congestion.
- Following the declaration of Southampton's first AQMAs, our first AQAP was published in 2008 which sets out The Council's commitment to working towards compliance with air quality objectives.
- This document represents the a wholesale update to Southampton City Council's AQAP - *it aims to restate and increase the commitment The Council has to achieve compliance with air quality standards, and work towards continual improvement in the city's air quality over the next 5 years.*
- This plan will be updated regularly to ensure it remains up to date and in line with The Council's priorities.
- Progress on the measures presented in action plans and monitoring data is reported on yearly through Annual Status Reports.

The Local NO₂ Plan / Non-charging Clean Air Zone

- SCC were one of the first five local authorities required by central government to assess whether a charging Clean Air Zone was required to meet the Nitrogen Dioxide air quality limit set by the EU 'Ambient Air Quality Directive'.
- An extensive feasibility study and consultation exercise was conducted which identified that a charging zone would not be needed to meet these limits.
- Instead, a series of non-charging measures ('The Local NO₂ Plan') were proposed and accepted by central government to ensure compliance, without the limitations posed by a charging scheme.
- Since the ministerial direction was received in March 2019, SCC has been implementing the measures in accordance with the plan.
- The Local NO₂ Plan is undergoing a process of evaluation to ensure the plan has delivered it's aims and that compliance with the directive can be maintained.
- More detail on the outcomes of the NO₂ Plan and what it means for compliance and this AQAP update is provided in section 4.2.

Local Transport Plan - Connected Southampton 2040

- Our third Local Transport Plan was published in March 2019 and sets out our high-level, long-term approach to improving transport in the city until 2040. One of the key goals aims to improve the quality of Southampton's planned space and environment. It highlights the need to make the city centre a liveable place, to encourage individuals to walk and cycle more often and to move Southampton towards becoming a zero-emission city.
- As per Defra guidance, the AQAP will continue to be integrated with the LTP as road traffic emissions remain the greatest source for pollutants of concern.

Our Green City Plan

Through the Green City Charter, The Council has set itself ambitious goals to work towards a cleaner, greener, healthier, and more sustainable city. In March 2020, The Council announced our Green City Plan which identifies the outcomes and activities we want to achieve in the next three years. One of the five themes is 'Delivering Clean Air' which builds on The Council's existing plans and strategies. A key commitment of this theme is to look beyond compliance with objectives and strive to achieve continual improvements in air quality for the benefit of public health.

- *"We want to be carbon neutral by 2030"*
- *"We will reduce emissions and aspire to satisfy World Health Organisation air quality guideline values. By 2025 we want to see nitrogen dioxide levels of 25 µg/m³ as the norm"*
- *"We will take actions that will improve quality of life in our city. We want the Healthy Life Expectancy Indicator to be the best amongst our peers and to remove the difference cities like Southampton experience with rural areas in terms of deaths attributed to air pollution"*

The Charter aims to understand and take advantages of benefits between different council initiatives. As a notable example, measures to reduce emissions of pollutants will almost always help reduce carbon emissions and The Council's contribution towards tackling climate change.

2.1.3 Projects implemented to date

National and local policy has shaped a large number of projects which has helped improve air quality in Southampton. A current list of these projects is available in second table of section 4.1.

This list of projects is updated yearly as part of SCC's Annual Status Reports which are publicly available at [Southampton's statutory air quality reports](#).

2.2 Reductions required and AQMAs

2.2.1 Air Quality Standards

Before the COVID19 pandemic, air quality in the city met all relevant air quality standards with the exception for the annual average concentration of NO₂ where exceedances persisted in AQMAs.

There are two types of air quality standard we need to meet:

- Limit and target values under the Ambient Air Quality Directive
- UK National Air Quality Objectives

Levels in the city are compliant with all objective and limit values, other than the annual average level for Nitrogen Dioxide (NO₂)

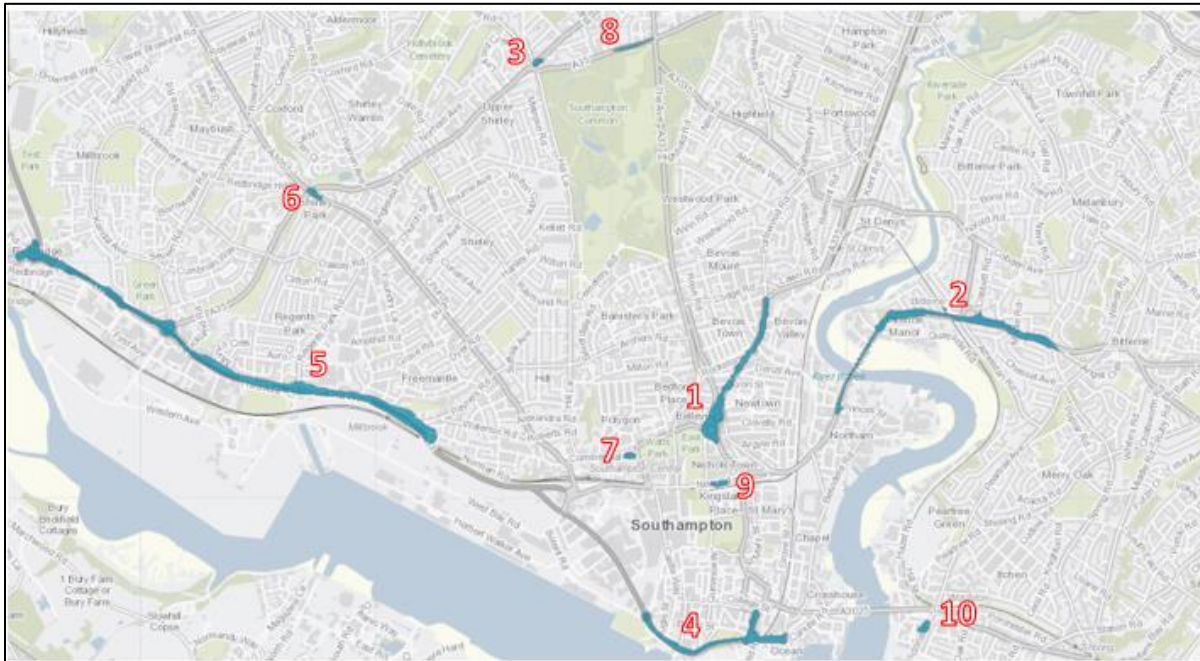
The World Health Organisation also provides guideline values. These are not levels which government are required to meet. They instead guide where further action is needed.

Through its ambition to achieve continual improvements in local air quality, SCC is working towards these guidelines and continual improvement through actions presented in this AQAP on the basis that any improvements to air quality will benefit public health.

Pollutant	UK Objectives	EU Limits	2021 WHO guidelines	Average period
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times a year	50 µg/m ³ not to be exceeded more than 35 times a year	45ug/m ³	24 hour average
	40 µg/m ³	40 µg/m ³	15ug/m ³	Annual average
PM _{2.5}	10 ug/m ³ by 2040	25 ug/m ³	5 ug/m ³	Annual average
	N/A	N/A	15 ug/m ³	24 hour average
NO ₂	200 µg/m ³ not to be exceeded more than 18 times a year	200 µg/m ³ not to be exceeded more than 18 times a year	N/A	1 hour average
	40 ug/m ³	40 ug/m ³	10 ug/m ³	Annual average
O ₃	100 µg/m ³ not to be exceeded more than 10 times a year	Target of 120 ug/m ³ not to be exceeded by more than 25 times a year averaged over 3 years	100 µg/m ³	8 hour average

2.2.2 Southampton's Air Quality Management Areas

Southampton has 10 AQMAs, all of which have are established for exceedances the pollutant Nitrogen Dioxide, principally as a consequence of queuing road vehicles.



AQMA Number	AQMA Name
1	Bevois Valley Road
2	Bitterne Road West
3	Winchester Road
4	Town Quay
5	Millbrook and Redbridge Road
6	Romsey Road
7	Commercial Road
8	Burgess Road
9	New Road
10	Victoria Road

Figure 4 Current locations of the Southampton's 10 Air Quality Management Areas

2.2.3 Air Quality Monitoring

The Council monitors air quality using a network of automatic monitoring stations and diffusion tubes which monitor a variety of pollutants across the city. More information on these monitors and data access is available at [Monitoring and reporting \(southampton.gov.uk\)](https://www.southampton.gov.uk).

Nitrogen dioxide

NO₂ data for these monitors in the AQMAs is presented below from 2012.

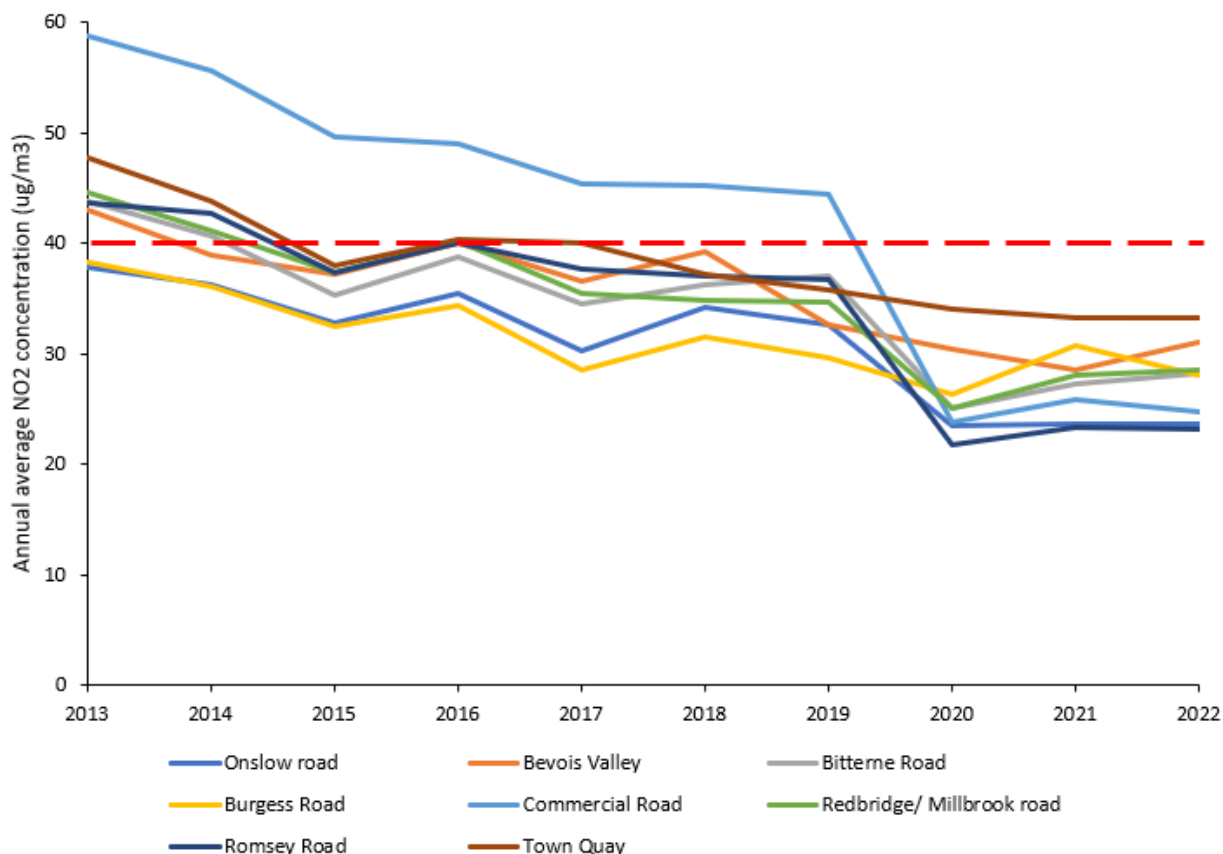


Figure 5 Annual average NO₂ concentrations between 2012 and 2022 from diffusion tubes which record the highest concentrations in AQMAs which were installed from 2012. The dashed red line represents the statutory air quality standard for Nitrogen Dioxide.

Figure 5 shows a steady improvement in air quality. Between 2012 and 2019 we've seen about a 14% reduction in concentrations of NO₂ in the key areas of the city. Following this improvement, air quality objectives have been achieved for several AQMAs.

Improvements monitored are a result of several factors, including positive impact from projects The Council has implemented as well as national improvements in vehicle standards.

There is a lot of variation in levels between years largely due to the influence of weather. In more windy years, pollution levels can be a lot lower as pollution is dispersed more easily compared to years with less wind.

Compliance in all AQMAs was achieved for the first time since monitoring began in 2020, largely a result of the response to the COVID19 pandemic which disrupted normal traffic patterns. Further information on the impact of COVID19 and early lockdowns on air quality is available at: [Air quality during lockdown \(southampton.gov.uk\)](https://www.southampton.gov.uk/air-quality-during-lockdown).

While The Council have monitored a steady improvement in air quality over the last decade and several AQMAs have met all air quality objectives for several years, it remains committed to implementing measures to ensure compliance is maintained and working towards continual improvement in the city's air quality.

No Air Quality Management Areas have been revoked thus far. If monitoring shows that these lower levels are likely to be maintained into the medium to long term following the COVID19 pandemic, this will be considered and carried out in line with Defra requirements and guidance.

Monthly average NO₂ data from the A33 automatic monitoring station is presented below. This illustrates the typical monthly variations in NO₂ levels, and how levels have changed over the last few years since COVID19 as a result of changes to the way people live and work.

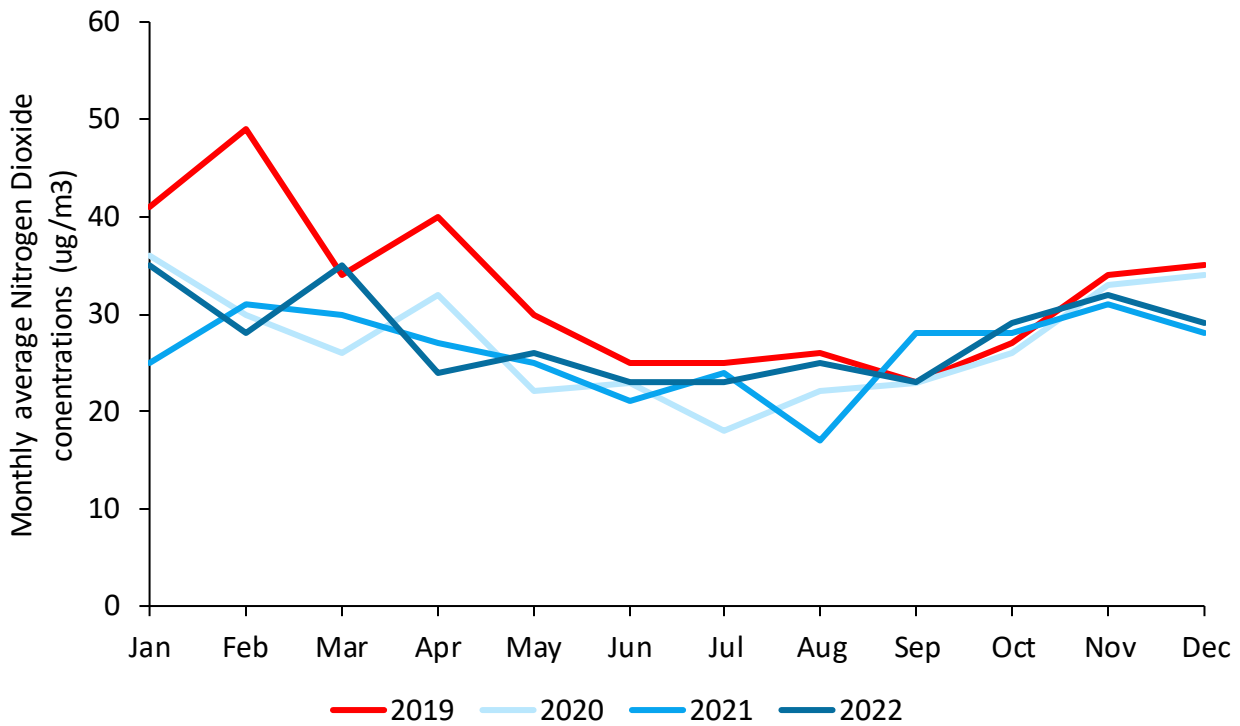


Figure 6 Monthly average NO₂ concentrations monitoring at the A33 monitoring station 2019-2022.

This graph demonstrates that concentrations of NO₂ reduced substantially from 2019 to 2020. While there is some variation, levels since 2020 have not re-bounded fully to 2019 concentrations up to 2022. Changes to working patterns including the widespread adoption of flexible and home working and subsequent reductions in rush hour traffic is likely to have contributed significantly to these improvements.

Particulate Matter

Particulate matter concentrations are monitored by two automatic monitoring stations in the city. Data from these monitors is presented below.

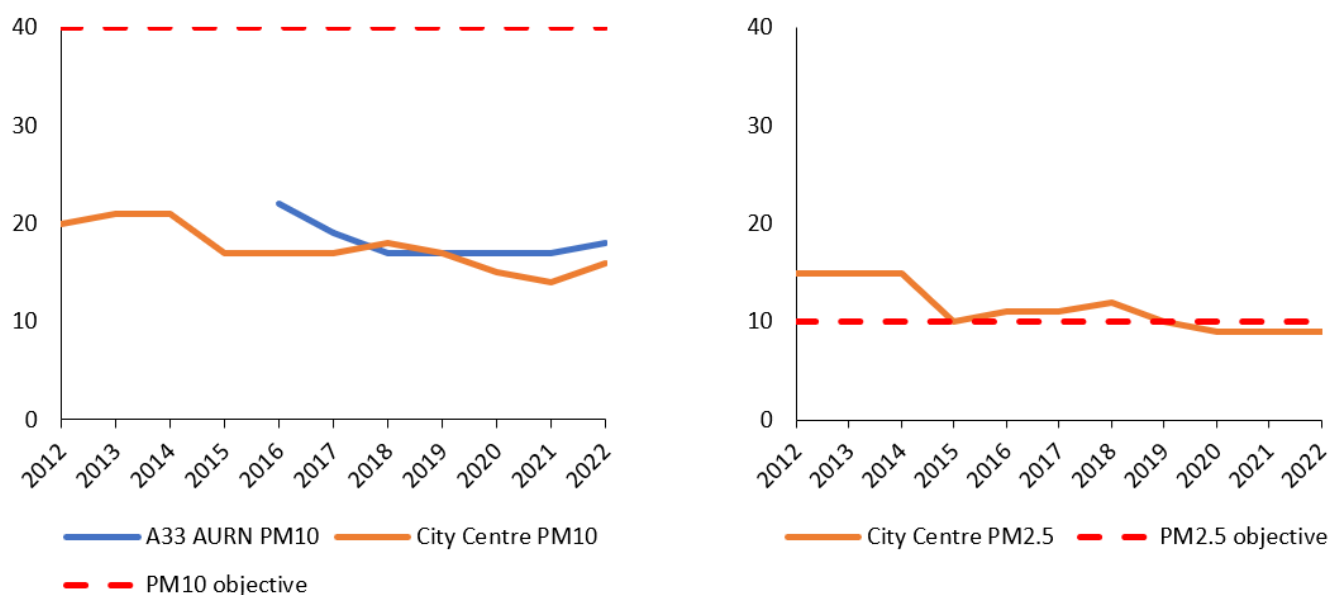


Figure 7 Annual average concentrations of PM₁₀ and PM_{2.5} monitored from the A33 and City Centre AURN automatic monitoring sites. The graph on the left illustrates PM₁₀ monitoring and its objective, the graph on the right illustrates PM_{2.5} monitoring and its new objective under the updated Environment Act to be met by 2040.

Statutory objectives for PM continue to be met in the city. This is why air quality management measures have focussed on sources of NO₂ as the pollutant of highest concern for compliance.

Despite this, the council recognises that PM fractions, particularly PM_{2.5} and finer, are the pollutants with the greatest potential for damaging human health. Through The Environment Act 2021, a new PM_{2.5} objective of 10µg/m³ has been set to be met by 2040.

Consequently, The Council is implementing measures which focus on key sources of PM, including the wood burning engagement campaign and introducing a series of new low cost monitors for PM with further measures planned. In addition, measures tackling transport will not only reduce NO₂ concentrations, but also PM as transport is also a key source for this pollutant.

2.2.4 Improvements required

Moderate air quality improvements were required to secure compliance in several AQMAs in 2019. While these have now been secured, partly due to the COVID19 pandemic, they are presented below to indicate where improvement is most needed.

Table 1 Improvements needed to achieve air quality objectives in 2019

AQMA number and name	Reductions needed to meet air quality objectives for NO₂ in 2019 (ug/m3)
AQMA 1 – Bevois Valley Road	6.5 (13.0%)
AQMA 2 – Bitterne Road West	0.7 (1.7%)
AQMA 3 – Winchester Road	Achieved in 2019
AQMA 4 – Town Quay	Achieved in 2019
AQMA 5 – Millbrook and Redbridge Road	0.1 (0.25%)
AQMA 6 – Romsey Road	Achieved in 2019
AQMA 7 – Commercial Road	4.5 (11.25%)
AQMA 8 – Burgess Road	Achieved in 2019
AQMA 9 – New Road	Achieved in 2019
AQMA 10 – Victoria Road	Achieved in 2019

2.7 Key Priorities

While a lot of work has been done to improve air quality to date, and we've seen concentrations steadily decline, The Council remains committed to seeing further improvements in air quality.

The Council has five key priority areas for where future work over the next five years will be focussed. These have been established with an understanding of key sources of pollution in the city, in line with our Clean Air Strategy and through engagement with residents and other stakeholders detailed in the following section.

Measures within these priority areas are mostly city-wide, strategic measures. These have the greatest potential to deliver improvements and benefit the greatest number of residents.

<p>1. Empowering Communities</p> <p>Local residents should be engaged with the air quality challenge and empowered to be a part of efforts to improve air quality and protect their health.</p> <p>The Council will aim to understand our community's concerns relating to air quality, and work with residents to address these.</p>	<p>2. Supporting Businesses</p> <p>The council understands that it can only do so much to improve local air quality on its own. Businesses have a large opportunity to help improve air quality by reducing emissions from their organisations.</p> <p>Key businesses in Southampton include ABP, West Quay, University Hospital Southampton, and The University of Southampton.</p> <p>The Council will encourage and incentivise cleaner business through this priority area.</p>
<p>3. Active and Sustainable Travel</p> <p>Shifting to active or sustainable modes of travel is the best way to reduce emissions. The Council maintains its commitment to providing and enhancing services and infrastructure to help people walking, cycling, or using public transport.</p> <p>The Council has already done a lot of work to increase rates of sustainable travel under other policy. Measures in this priority area will support and build on this work.</p>	<p>4. Low and Zero Emission Vehicles</p> <p>Improvements in technology have contributed to the large reductions in emission we've seen over previous years.</p> <p>The uptake of hybrid and electric vehicles in recent years has led to large reductions in emissions. The Council will continue to accelerate the shift towards these lower emission vehicles through the incentives and infrastructure it can provide.</p>
<p>5. Monitoring and Planning</p> <p>Improving our monitoring network and planning requirements to support other projects and ensure new developments align the aims of our action plan.</p>	

3 Development and implementation of Southampton City Council's AQAP

3.1 Consultation and Stakeholder Engagement

In developing this AQAP update we have worked with other local authorities, agencies, businesses, and the local community to ensure The Plan meets the expectations of these stakeholders and all options are considered. Schedule 11 of the Environment Act 1995 requires local authorities to consult a series of statutory consultees, listed in Table 3.

Table 2 sets out how we have engaged with different stakeholders to ensure the AQAP can align with the priorities of The Council and what further action residents want to see on air quality.

Table 2 List of stakeholder engagement events

Consultation	Stakeholders engaged	Duration
Internal consultation	SCC relevant officers including Steering Group	25 th May 2021 - 11 th June 2021 (2 weeks)
Engagement survey	Southampton residents and relevant public bodies	9 th September - 30 th September 2021 (3 weeks)
Councillor workshop	Cabinet Member for Environment and Cabinet Member for Growth	18 th January 2022
Officer workshop	Key officers relevant to projects	25 th April 2022 – 3 rd June 2022 (5 weeks)
Formal consultation	Southampton residents, consultees listed in Table 4.1.	June 16 th – 28 th July 2022 (6 weeks)

3.1.1 Engagement Survey

Results from the engagement survey with residents shaped where we will prioritise efforts to improve air quality.

Residents were most supportive of measures which would reduce emissions from the port, taxis, and freight, those which encourage active travel, and those which involve the planning process.

Groups of possible measures were presented to residents who were offered the opportunity to respond openly. Planning, active travel, cleaner buses, parking, and freight measures received the highest number of positive comments.

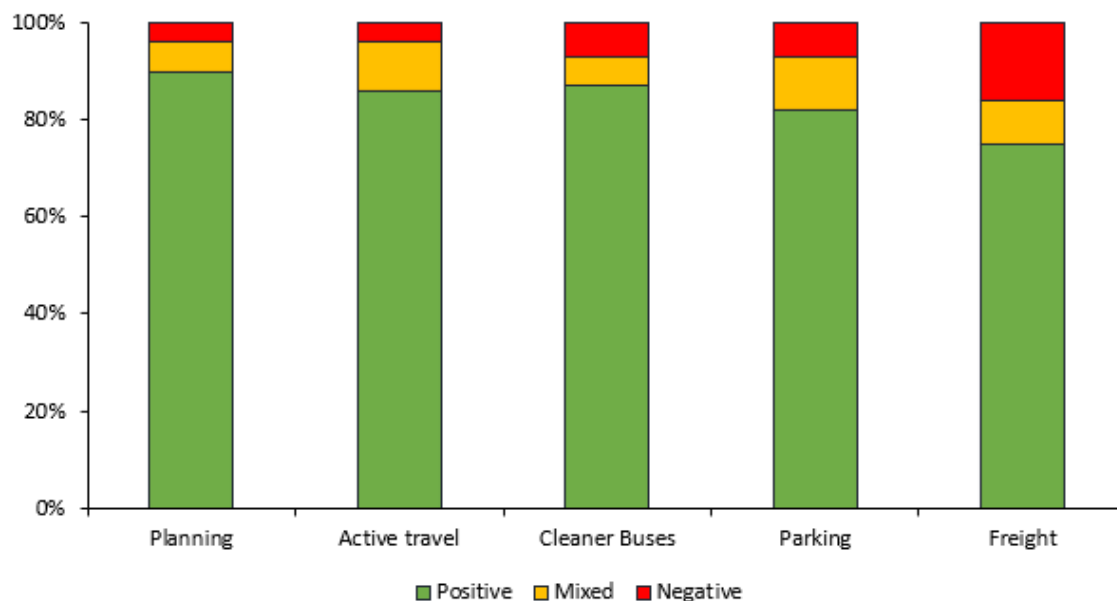


Figure 8 Percentage of positive, mixed, and negative comments for the most popular types of measure

New suggestions from residents were added to the final short list if they were identified as being cost-effective and feasible. The measures that residents were more supportive of were also prioritised in the shortlisting process.

3.1.2 Formal Consultation

The Council received responses from 128 residents through our statutory consultation culminating in 260 comments providing feedback on the proposed measures as well as suggestions for new ones. Responses largely centred around EV infrastructure, public transport, congestion, and cycling infrastructure. Members of the public were generally supportive of the plan with 78% of responders expressing their support.

The response to our formal 6-week public consultation engagement is given in Appendix 3 which provides a breakdown of suggestions from residents that have contributed to new and amended measures in the AQAP.

In addition, statutory consultees including Defra and The Environment Agency were engaged and feedback was incorporated into the final plan. Detail on this response is provided in Appendix 3.

Table 3 Statutory consultees engaged

Yes/No	Consultee
Yes	the Secretary of State
Yes	the Environment Agency
Yes	the highways authority
Yes	all neighbouring local authorities
Yes	other public authorities as appropriate, such as Public Health officials
Yes	bodies representing local business interests and other organisations as appropriate

3.1.3 Steering Group

A steering group of relevant council officers was established in the early stages of the development of this AQAP. This group was comprised of representative from the following SCC departments:

- Environmental Health
- Planning and planning policy
- Transport policy
- Economic development
- Sustainable transport
- Green City
- Public health

Three Steering group meetings were held over the course of the AQAP’s development. Through these meetings we were able to establish the key priority areas for the plan, ideas for new measures which weren’t previously captured in the long list, and the method of shortlisting measures presented in the long list.

Steering group members and other relevant officers also provided input on the draft shortlist through a series of officer workshops prior to the consultation on the draft AQAP.

This engagement helped ensure the priorities and measures proposed in the plan aligned with existing policy and projects in the council, and that existing projects which improve air quality are incorporated into the plan. This also helped ensure co-benefits across Council priority areas were identified and considered in prioritisation. These include health and wellbeing, access to active travel and decarbonisation.

As well as the formal consultation, external consultees, including neighbouring local authorities and relevant public authorities, were also encouraged to complete the engagement survey.

3.1.4 Governance

The progress towards the implementation of projects under the Air Quality Action Plan will be overseen by members of the Green City Programme and Project Boards on a regular basis. Major risks and issues will be raised at these boards and escalated where needed to director and councillor level if necessary.

4 AQAP Measures

4.1 AQAP tables

The following table presents the new measures SCC plans to explore and implement over the next 5 years.

Measures have been shortlisted based on:

- Source apportionment data which provides an understanding of the main sources of pollution and where efforts should be focussed.
- Consultation with residents through an initial public engagement exercise the results of which are set out in section 1.8.1.
- The response from the full consultation from residents, businesses, and statutory consultees the breakdown to which is presented in Appendix 3.
- The potential for air quality measures to deliver co-benefits for other environmental agendas including climate change and nature, and other socio-economic factors including potential to alleviate deprivation.

The full shortlisting method is presented in Appendix 2.

The following table provides an effectiveness score for each measure. These indicate the potential of the measure to reduce the impact of air pollution on residents. Measures with an effectiveness score of 1 are likely to have no or a slight positive impact on air quality, 2 is moderate and 3 is substantial potential to positively impact air quality.

The 'Social and environmental co-benefits' column also provides an indication of how these measures deliver benefits across other agendas. These include:

- CO₂ – The measure has the potential to reduce emissions of CO₂, helping mitigate the impacts of climate change.
- Noise – The measure has the potential to reduce the impact of noise, by reducing the creation of noise (e.g. encouraging electric vehicles), or by reducing exposure to noise (e.g. encouraging residents to avoid main roads).

- Health inequalities – The measure has the potential to help alleviate health inequalities by targeting improvements in areas or demographics who are more at risk of the impacts of air pollution, or other co-morbidities.
- Active travel – The measure encourages walking and cycling, improving health and wellbeing of residents.
- Biodiversity – The measure has the potential to help support the city’s green spaces and protected species.

The most cost-effective and feasible projects, and those with high potential for delivering co-benefits, will be prioritised when choosing which projects to deliver with any existing funding, and when applying for future grants.

NB: Please see future ASRs for regular annual updates on implementation of these measures, as well as measures which are already underway.

Measure no.	Measure	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Effectiveness score (1-3)	Social and environmental co-benefits	Progress to Date
Empowering communities											
1	Air Quality Schools Engagement Programme to reduce the impact of pollution on pupils	2023	2025	SCC, schools	Defra air quality grant funding	Funded	100k - 500k	Implementation	2	Health inequalities, noise, active travel	Grant received and beginning implementation.
2	Indoor air quality engagement programme	2023	2024	SCC, Public Health	Internal existing funding	Funded	<10k	Planning	1	Health inequalities, noise	Planning phase
3	Public health campaign in collaboration with healthcare professionals focussing on vulnerable individuals	2024	2026	SCC	Internal existing funding	Funded	<10k	Planning	1	Health inequalities, noise	Planning phase
4	Encourage UHS and GPs to incorporate air quality information into advice to patients	2023	Ongoing	SCC, UHS	Internal existing funding	Funded	<10k	Planning	1	Health inequalities, noise	Planning phase
5	Enhanced public outreach and engagement in National Clean Air Days	2023	Ongoing	SCC, Global Action Plan	Internal existing funding	Funded	<10k	Planning	1	CO ₂ , active travel	Planning phase
6	Further integrate air quality considerations in workplace and schools travel planning	2023	Ongoing	SCC, Schools, Workplaces	Internal existing funding	Funded	<10k	Implementation	1	CO ₂ , active travel	Underway as part of workplace travel planners network.
7	Implement an SCC staff engagement programme	2023	2023	SCC	Internal existing funding	Funded	<10k	Planning	1	CO ₂ , active travel	Planning phase
8	Use public health data to assess vulnerability to air quality issues	2023	Ongoing	SCC, Public Health	To be determined	Not yet funded	10k - 50k	Planning	1	Health inequalities	Planning phase
9	Map local concerns for air quality onto air quality monitoring and modelling data	2024	Ongoing	SCC, community groups	Defra Air Quality Grant	Funded	10k-50k	Planning	1	Health inequalities	Planning phase
10	Support residents in making their homes more energy efficient	2022	2025	SCC, The Environment Centre	Healthy Homes funding	Funded	>1m	Implementation	1	CO ₂	Healthy homes scheme operational in Southampton
11	Extend and enhance the wood burning engagement project	2024	2025	SCC, The Environment Centre	Defra Air Quality Grant, Local NO ₂ Plan funding	Funded	10k-50k	Planning	1	CO ₂	Planning phase
12	No-idling campaign and signage	2023	2023	SCC	Defra Air Quality Grant	Funded	10k-50k	Implementation	1	CO ₂	Signage to be installed early 2023
13	Work with University Hospital Southampton to support their new 'Green Plan'	2023	Ongoing	SCC, UHS	Internal existing funding	Funded	<10k	Planning	1	CO ₂ , health inequalities	Planning phase
Supporting Businesses											
14	Investigate implementing a freight quality partnership for key operators as part of a wider Green City programme	2024	Ongoing	SCC, partnership members	To be determined	No yet funded	<10k	Planning	2	CO ₂	Planning phase
15	Continue to support The Port of Southampton in delivering their Cleaner Air for Southampton strategy, including investigating more opportunities for shore-side power.	2023	Ongoing	SCC, ABP	Internal existing funding	Funded	10k - 50k	Implementation	2	CO ₂	The Port of Southampton currently has two operational shore-side power connections and is investigating options for future connections.

16	Explore opportunities to enhance the industrial pollution permitting process	2023	2024	SCC, Environment Agency	Internal existing funding	Funded	<10k	Planning	2	-	Planning phase
17	Enhance port based booking system to encourage lower emission lorries into the port	2023	Ongoing	SCC, DPworld	To be determined	Not yet funded	10k-50k	Planning	2	-	Planning phase
18	Enhance the Sustainable Distribution Centre, providing further support for organisations to make their deliveries cleaner more efficient	2023	2025	SCC	Defra Air Quality Grant, Local NO ₂ Plan funding	Not yet funded	500k - 1m	Planning	2	CO ₂	Planning phase
19	Promote benefits of flexible and home working within SCC and partner organisations	2023	Ongoing	SCC	Internal existing funding	Funded	<10k	Implementation	1	CO ₂	Underway as part of workplace travel planners network.
20	Promote the use of train lines for freight and advocate for further electric rail infrastructure through on Southampton lines	2023	Ongoing	SCC, National Rail	Internal existing funding	Funded	<10k	Planning	1	CO ₂	Planning phase
21	Identify and enforce routes for lorries to improve efficiency of journeys and reduce impacts on residential areas	2023	Ongoing	SCC	To be determined	Not yet funded	10k-50k	Planning	1	CO ₂ , noise	Planning phase
22	Implement additional air quality requirements in SCC's procurement policy	2023	2023	SCC	Internal existing funding	Funded	<10k	Planning	1	CO ₂	Planning phase
Active and Sustainable Travel											
23	Identify further opportunities for better pedestrian infrastructure including Active Travel Zones	2023	2025	SCC	To be determined	Not yet funded	50k - 100k	Planning	2	CO ₂ , active travel	Planning phase
24	Advocate for more frequent train services through Southampton and work with National Rail to encourage more travel within the city	2024	2027	SCC, National Rail	To be determined	Not yet funded	<10k	Planning	2	CO ₂	Planning phase
25	Supporting shared micromobility by providing rental manual bikes, e-bikes, and cargo bikes for residents	2022	2025	SCC	Future Transport Zones	Funded	>1m	Implementation	2	CO ₂ , noise, active travel	Scheme launched in Southampton for a long-term trial
26	Identify and promote cleaner walking routes for residents in travel planning and communications	2023	Ongoing	SCC, MyJourney	To be determined	No yet funded	<10k	Planning	1	Noise	Planning phase
27	Investigate increased availability of the park and ride for key events	2022	2024	SCC	To be determined	Not yet funded	100k - 500k	Planning	1	CO ₂	Planning phase
28	Encourage lift sharing schemes for workplaces	2022	Ongoing	SCC	Internal existing funding	Funded	<10k	Implementation	1	CO ₂	Underway as part of workplace travel planners network.
29	Explore offering subsidised public transport during match days or busy cruise days	2024	2024	SCC	To be determined	Not yet funded	100k - 500k	Planning	1	CO ₂	Planning phase

30	Support implementation of a regional mobility app to help people make sustainable multi-modal journeys	2022	Ongoing	SCC, Future Transport Zone partners	Future Transport Zones	Funded	100k - 500k	Implementation	1	CO ₂ , noise, active travel	Early access app available for public access in 2023
31	Work with bus operators to identify where cleaner buses can be re-routed through areas with poorer air quality	2023	2027	SCC, bus operators	Internal existing funding	Funded	<10k	Planning	1	-	Planning phase
Low Emission Vehicles											
32	Enter a partnership or concessions arrangement with a provider to deliver a step change in EV infrastructure in the city	2023	Ongoing	SCC, partner organisation	Internal funds, LEVI funding	Partly funded	500k - 1m	Planning	3	CO ₂ , noise	Planning phase
33	Further develop long term plans for mass transit in the city	2027	Ongoing	SCC	To be determined	Not funded	>1m	Planning	3	CO ₂	Planning phase
34	Investigate implementing a low emission zone in the city centre	2024	2025	SCC	Capability Fund	Not yet funded	500k - 1m	Planning	3	CO ₂ , noise	Planning phase
35	Develop planning guidance and requirements for electric vehicle charging in new developments	2023	2024	SCC	Internal existing funding	Funded	<10k	Implementation	2	CO ₂ , noise	Currently in development.
36	Explore further opportunities for incentivising taxi drivers to switch to a cleaner vehicle	2023	2024	SCC	To be determined	Not yet funded	100k - 500k	Planning	2	CO ₂ , noise	Planning phase
37	Intelligent traffic and emissions management systems which respond to air quality and traffic data including messaging	2024	2025	SCC	Defra air quality grant funding	Funded	100k - 500k	Planning	2	CO ₂ , noise	Planning phase
38	Investigate parking incentives for lower emission vehicles	2023	2025	SCC	Internal existing funding	Not yet funded	10k - 50k	Planning	2	CO ₂ , noise	Planning phase
39	Install on-street chargers and more chargers outside of the city centre.	2023	2026	SCC	Internal existing funding	Partially Funded	100k - 500k	Planning	2	CO ₂ , noise	Planning phase
40	Electric Vehicle strategy for the city setting out how future demand for EVs will be met	2023	2023	SCC	Internal funds	Funded	<10k	Planning	2	CO ₂	Planning phase
41	Discounted electric taxi and van leasing scheme including rapid chargers and driver support	2022	2025	SCC, Hampshire Local Authorities, Electric Blue Charging	ERDF funding	Partly funded	>1m	Implementation	2	CO ₂ , noise	Scheme launched. In current state due to close Spring 2023
42	Investigate launching an 'ECO Stars' taxi recognition scheme or quality partnership for taxis	2024	2025	SCC	To be determined	Not yet funded	10k - 50k	Planning	1	CO ₂ , noise	Planning phase
43	Investigate a fleet accreditation scheme to improve the efficiency of SCC's HGV fleet	2023	2025	SCC	To be determined	Not yet funded	10k - 50k	Planning	1	CO ₂ , noise	Planning phase
44	Procure more Electric Vehicles in the SCC fleet and charging infrastructure	2023	Ongoing	SCC	Internal existing funding	Partially Funded	500k - 1m	Implementation	1	CO ₂ , noise	Southampton Council has installed around 29 chargers for its fleet of 40 EV vans

45	Use bus lane restrictions to stimulate further improvements in taxis and private hire vehicle emissions	2024	2025	SCC	Internal existing funding	Not yet funded	<10k	Planning	1	CO ₂ , noise	Planning phase
46	Encourage uptake of electric cars clubs in SCC and the wider city	2024	2026	SCC	To be determined	Not yet funded	10k - 50k	Planning	1	CO ₂ , noise	Planning phase
Planning and Monitoring											
47	Review opportunities for enhanced air quality planning requirements in pollution hotspots	2023	2024	SCC	Internal existing funding	Funded	<10k	Planning	3	CO ₂ , noise, health inequalities	Planning phase
48	New requirements for non-road mobile machinery and stationary generators in planning policy	2023	2024	SCC	Internal existing funding	Funded	<10k	Planning	2	CO ₂	Planning phase
49	Require air quality assessments for major council transport projects	2024	Ongoing	SCC	Internal existing funding	Not yet funded	10k - 50k	Planning	2	CO ₂	Planning phase
50	Assess opportunities to improve the layout of Shirley Highstreet to reduce congestion and improve air quality	2025	2027	SCC	To be determined	Not yet funded	500k - 1m	Planning	2	CO ₂	Planning phase
51	Strict requirements for indoor air quality standards in new developments	2025	Ongoing	SCC	None required	N/A	<10k	Planning	2	CO ₂ , noise	Consultation on new indoor air quality standards as part of The Local Plan process
52	Locate green infrastructure including hedges and green walls where it can reduce exposure to air quality	2023	Ongoing	SCC	Internal existing funding	Funded	<10k	Planning	1	Biodiversity, CO ₂ , noise	Planning phase
53	Ensure relevant council decisions and policy are in line with AQAP and Clean Air Strategy priorities	2023	Ongoing	SCC	Internal existing funding	Funded	<10k	Planning	1	CO ₂	Planning phase
54	Implement further air quality monitoring in and around University Hospital Southampton	2022	2025	SCC, UHS	Defra air quality grant funding	Funded	10k - 50k	Implementation	1	-	Low cost monitors being procured.
55	Investigate options for requiring more funding for air quality projects from developers through Section 106 agreements	2023	2024	SCC	Internal existing funding	Funded	<10k	Planning	1	CO ₂	Planning phase
56	Enhance enforcement of Smoke Control Areas	2023	2024	SCC	Internal existing funding	Partially Funded	10k - 50k	Planning	1	CO ₂	Planning phase
57	High-tech, low-cost monitors and modelling to better understand local air quality issues	2022	2024	SCC	Defra air quality grant funding	Funded	100k - 500k	Implementation	1	-	Funding receive and monitors procured.
58	Investigate potential for restricted parking and waiting zones	2025	2025	SCC	To be determined	Not yet funded	10k - 50k	Planning	1	CO ₂ , noise	Planning phase
59	Explore opportunities for more air quality monitoring stations	2026	Ongoing	SCC, Defra	To be determined	Not yet funded	500k - 1m	Planning	1	-	Planning phase

60	Continue to work with the city's universities to integrate expertise and new research into measures	2023	Ongoing	SCC, UoS	None required	N/A	<10k	Implementation	1	-	Engaging relevant contacts at the universities on upcoming projects including schools engagement
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The following table presents measures which have been implemented or are currently being implemented which the new AQAP actions set out in the previous table build upon. These include measures delivered through the previous AQAP, Local NO₂ Plan and Local Transport Plan.

Measure no.	Measure	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Effectiveness score (1-3)	Social and environmental co-benefits	Progress to Date
Empowering communities											
1	Wood Burning Engagement Programme	2021	2021	SCC, the environment centre	Defra AQ fund	Fully funded	50k-100k	Implementation	2	CO ₂	Wood burning campaign launched in 2020 and has since been successful in engaging residents across Hampshire and helping them burn less and better.
2	National Clean Air Day	2018	Ongoing	SCC, Global Action Plan	Internal, Defra grant	Fully funded	100k-300k	Complete	1	CO ₂ , active travel	SCC continues to promote clean air action annually through national clean air day.
3	airAlert	2010	Ongoing	SCC	Internal	Fully funded	10k-50k	Implementation	1	-	Air quality alerts continuing to be delivered through 'Southampton Air' monitoring website.
4	No-idling campaign	2018	2018, 2022	SCC	Defra AQ fund, Internal	Fully funded	10k-50k	Implementation	1	CO ₂	Campaign held in February - May 2018. Campaign to be renewed in 2022 and to be supported by anti-idling signage.
6	Website and other council communications	2017	Ongoing	SCC	Internal	Fully funded	N/A	Complete	1	-	Ongoing website updates and promotion
Supporting Businesses											
7	Sustainable Consolidation Centre	2014	2022-2029 (dependent on funding)	SCC, JAQU	Implementation Fund	Fully funded	100k-500k	Implementation	2	CO ₂	Freight consolidation, delivery and service planning and fleet accreditation measures implemented under Local NO ₂ Plan. Planning stages of freight consolidation centres and 5 delivery and service plans underway. Sustainable Distribution Centre contract in place with Meachers Global Logistics.
8	Shore-side power for cruise ships	2019	2020-21	SCC, ABP	Solent Local Enterprise Partnership	Fully funded	>1m	Implementation	2	CO ₂	Two shore side connections installed and operational for cruise ships, one at Horizon cruise terminal and another at Mayflower cruise terminal.
9	Port booking scheme to incentivise low emission trucks	2020	Ongoing	ABP, DP world	N/A	None required	N/A	Implementation	2	CO ₂	Port booking system established including ANPR cameras, charging more polluting vehicles more for delivery slots.
10	Delivery and Service Plans for key public authorities	2017	2018-21	SCC	Future Transport Zones fund	Partially funded	100k-500k	Implementation	2	CO ₂	Funding received for DSPs as part of The Local NO ₂ Plan. 9 DSPs delivered to organisations including the city's universities and the port demonstrating how deliveries can be made more efficient.

11	Workplace and School Travel Planning	2010	Ongoing	SCC	Active travel Fund, Access Fund, Internal	Fully funded	100k-500k	Implementation	2	CO ₂ , active travel	89 organisations engaged including over 140,000 staff in review of Travel Action Plan (TAP) and delivering projects to encourage active and sustainable commutes. Workplace surveys show that the proportion of those using active travel (walking & f) for commuting has increased to 22.3% in 2020.
12	Support ABP's 'Cleaner Air for Southampton' strategy	2023	2023	Associated British Ports Southampton	Internal	Fully funded	N/A	Implementation	1	CO ₂	ABP supported in developing a port emissions inventory for the Clean Air Zone feasibility study. ABP have published their own Clean Air Strategy listing 19 measures that they aspire to implement by 2023.
13	Clean Air Network'	2018	Ongoing	SCC, key city businesses and communities	Internal	Fully funded	N/A	Complete	1	CO ₂	Clean Air Network launched during Local NO ₂ Plan development to encourage collaboration between businesses.
14	Taxi telematics scheme	2019	2019-21	SCC	Implementation Fund	Fully funded	10k-50k	Complete	1	CO ₂	52 taxis installed with telematics devices and reports produced highlighting benefits of switching to an EV and where chargers are needed.
Active and Sustainable Travel											
15	Transforming Cities	2020	2025	SCC, Hampshire County Council	Transforming Cities Fund	Fully funded	>1m	Implementation	3	CO ₂ , noise, active travel	£5.7m awarded in January 2019 as part of Tranche 1 and a further £57m in March 2020 in Tranche 2 to deliver a series of ambitious large scale transport projects to ease congestion and improve active and sustainable travel in the city.
16	Future Transport Zone	2021	2024	SCC and Solent Transport, Funded by DfT	Future Transport Zones	Fully funded	>1m	Implementation	3	CO ₂ , noise	Bid successful for £28m of funding across the wider Solent region to invest in innovative transport projects to tackle congestion.
17	E-Scooter hire scheme	2021	2022	SCC and Solent Transport, Funded by DfT	Future Transport Zones	Fully funded	>1m	Implementation	3	CO ₂ , noise	E-Scooter hire scheme established. Between March 2021 - November 2022 : 1300 scooters available across 200 parking zones, 40,000 unique users identified, ~126t CO ₂ e saved
18	MyJourney	2017	2021	DfT, SCC, Hampshire County Council, Portsmouth City Council, Eastleigh Borough Council	Active Travel Fund, Access Fund, Transforming Cities Fund	Fully funded to date	100k-500k	Implementation	3	CO ₂ , active travel, noise	MyJourney as an ongoing programme continues to engage with hundreds of residents, helping them shift to active and sustainable modes of travel.
19	Southampton Cycle Network	2013	2027	SCC	Early Measures Funding, Active Travel Funding	Partially funded	>1m	Implementation	3	CO ₂ , active travel, noise	SCC has committed to building 9 Southampton Cycle Network (SCN) routes providing a comprehensive network across Southampton.

20	Millbrook Roundabout A33/ A35 Capacity	2017	Complete.	SCC, DfT	DfT Maintenance Challenge Fund	Fully funded	>1m	Complete	2	CO ₂	Scheme to improve capacity at A33/A35 Millbrook roundabout at the Redbridge Road/Millbrook Road AQMA on the Western Approach with anticipated benefits for air quality was completed in April 2019.
21	Bus Priority measures	2015	2021	SCC	Transforming Cities Fund	Fully funded	10k-50k	Implementation	2	CO ₂	Bus priority programme in progress with 42 junction improvements identified continue to be delivered. Junction improvements and virtual priority measures along A3024 between Botley Road and Bitterne Road East were complete December 2019. Measures along Portswood Road to be developed as part of multi-modal study in 2020.
22	Port Rail terminal extension	2019	2021	Network Rail, ABP	National Rail funds	Fully funded	>1m	Complete	2	CO ₂	New sidings track installed to increase speed limit and improve efficiency allowing more freight to be transported by rail and not on lorries.
23	Active Travel Zones'	2020	2022	SCC	Transforming Cities Fund, Active Travel Fund	Fully funded	>1m	Implementation	2	CO ₂ , active travel, noise	Implementation underway in first ATZ in St Denys. Consultation on St Mark's school ATZ now underway. Further planning for future zones dependent on outcomes of previous.
24	M27/M3 Travel Demand Management Project	2019	2021/22	SCC, Portsmouth City Council, Hampshire County Council, Highways England	Highways England contribution	Fully funded	>1m	Implementation	2	CO ₂ , active travel, noise	£1.7 m funding awarded by Highways England to SCC and other partners to mitigate impacts of smart motorways on congestion by encouraging residents to use alternative modes of travel.
Low Emission Vehicles											
25	Low Emission Taxi Incentive Scheme	2016	2021	SCC, Eastleigh Borough Council, Defra AQ Grant	Clean Air fund, Defra AQ Grant	Fully funded	100k-500k	Completed	3	CO ₂ , noise	Over 200 grants provided to Southampton taxi and private hire drivers to upgrade older vehicles to hybrids and electric. Largely thanks to this scheme, over 52% of the fleet in Southampton are hybrid or electric.
26	Bus retrofit programme	2019	2020	SCC, DfT/JAQU	Clean Bus Technology Fund	Fully funded	>1m	Complete	3	-	Clean Bus Technology Fund bid successful. All 145 non-Euro VI buses retrofitted to Euro VI equivalence - all buses in the city now meet the standard.

27	Local NO2 Plan	2019	2023	SCC, Defra, JAQU, DfT, New Forest District Council.	Clean Air Fund and Implementation Fund	Funded	>1m	Implementation	3	CO ₂ , noise, active travel	Feasibility study and consultation complete. Full Business Case approved by Defra to implement a non-charging CAZ, also known as the Local NO ₂ Plan valued in total at £1.8m. The plan is currently being finalised for close in 2022, having been delivered largely to specification, in line with central government's expectations. SCC is currently working with central government to evaluate the effectiveness of the plan.
28	Quality bus partnership agreement and minimum emission standards for buses	2020	2021	SCC, Local bus operators, DfT	Implementation Fund, Transforming Cities Fund	Funded	>10k	Planning	2	CO ₂	The Quality bus partnership agreement will require vehicles to meet Euro VI equivalent diesel standards in order to use the bus priority network in the city. The agreement will be adopted and funded through SCC and Hampshire County Council's Transforming Cities work.
29	Electric Vehicle Action Plan (EVAP)	2017	2019/20	SCC, DfT	Internal	Partially funded	100k-500k	Implementation	2	CO ₂ , noise	Through the plan, SCC has installed over 50 publicly accessible electric vehicle recharging points. Including two rapids and 4 on street charge points.
30	Taxi licensing conditions	2019	2019/20 (phase 1), 2022/23 (phase 2)	SCC	Internal	Fully funded	N/A	Implementation	2	CO ₂	Newly licensed vehicles must meet Euro 6 diesel/4 petrol by 2020 and relicensed vehicles will need to meet this standard from 2022. By 2023 all vehicles will meet the standard.
31	Eastern Access Highway Scheme	2020	Q4 2022	SCC, DfT, Highways England	National Productivity Investment Fund	Fully funded	>1m	Complete	2	CO ₂	Package of junction improvement measures to ease congestion and encourage active travel delivered.
32	Low emission vehicles in Council and partner fleets	2017	Ongoing	SCC	Internal	Partially funded	10k-1m	Implementation	2	CO ₂ , noise	SCC continuing to procure electric vans across different service areas with an aim for 90% of the fleet will be zero-emission by 2030
33	Autonomous and electric distribution vehicles	2023-5	2026	SCC and Solent Transport, Funded by DfT	Future Transport Zones	Partly funded	>1m	Planning	2	CO ₂ , noise	Early exploratory research through Future Transport Zones.
34	Hybrid and electric straddle carriers	2021	Complete	SCC	Defra Grant	Fully funded	50k - 100k	Complete	1	CO ₂	Study complete highlighting emission reductions from hybrid straddle carriers. 12 hybrid straddle carriers purchased following this with plans for new electric carriers.
35	M271 Redbridge junction capacity work	2019	Complete	Highways England	Government's Roads Investment Strategy 2014	Fully funded	>1m	Complete	1	CO ₂	Scheme complete improving flows at this key junction.
36	EV parking discounts	2018	Ongoing	SCC	Internal	None required	N/A	Complete	1	CO ₂ , noise	Discounts on season tickets launched in 2018.
37	Itchen Toll EV Concessions	2018	Ongoing	SCC	Internal	None required	N/A	Complete	1	CO ₂ , noise	107 smart cards were issued in 2021 for EVs to cross the bridge for free.

38	EV car clubs	2017	2019/20	SCC	To be determined	Partially funded	500k-1m	Planning	1	CO ₂ , noise	Discussion with Enterprise Car Rentals over the deployment of EV's as part of the existing car club fleet continue. SCC seeking opportunities to align EV car club with internal car rental requirements for staff.
39	Eco Driver Training and telematics for Council Fleet	2017	2023	SCC	Internal	Fully funded	100k-500k	Planning	1	CO ₂	Eco driving measure to be delivered in 2022 as part of fleet modernisation plan.
40	City Car Club	2015	Ongoing	SCC	Active Travel Fund	Fully funded	N/A	Implementation	1	CO ₂	Over the course of the My Journey programme, 3 separate direct mail promotional campaigns advertising the Car Club and offering discounted membership have been run. Workplace travel officer is working to promote car club to employers
41	Taxi rapid chargers	2019	2021	SCC	Implementation Fund	Fully funded	50k-100k	Complete	1	CO ₂ , noise	Two rapid chargers currently available for taxi and private hire drivers in Southampton.
Planning and monitoring											
42	Local planning policies	2017	2020/21	SCC	Internal	None required	N/A	Implementation	3	CO ₂ , noise, active travel	Funding received to implement. Draft air quality planning document complete. Upcoming 'Local Plan' to formalise guidance and include new requirements from developments.
43	Green City Charter (GCC) and Green City Plan	2020	2030	SCC, Green City signatories	Internal	Fully funded	>1m	Implementation	2	CO ₂ , noise, active travel, biodiversity, waste, water	Green City Charter adopted and Green City Plan entering third year. Programme largely on track delivering activities supporting the council's wider sustainability goals including ongoing improvements in local air quality and realising co-benefits associated with carbon reduction measures.
44	Cleaner Air Strategy publication	2016	2019	SCC	Internal	Fully funded	N/A	Complete	1	CO ₂ , health inequalities	Clean Air Strategy adopted in November 2016 and published on the council website. Later updated in 2019 to align with The Local NO ₂ Plan.
45	City-wide fleet composition survey	2016	Complete	SCC	Implementation Fund, internal	Fully funded	50k-100k	Complete	1	-	ANPR surveys complete in 2017, 2019 and 2021 to support monitoring and modelling work.
46	Air quality monitoring network	2003	Ongoing	SCC, Defra	Internal, Defra funding	Fully funded	100k-500k	Implementation	1	-	4 automatic monitoring stations monitoring a variety of pollutants and over 80 diffusion tubes across the city installed and continuing to be maintained.
47	Low cost monitor trial bid	2021	2024	SCC, delivery partner, partnering local authorities	Defra AQ grant	Not funded	100k-500k	Planning	1	-	Bid successful to secure funding for 8 low cost monitors and modelling capabilities in Southampton. Monitors model PM, O ₃ , NO ₂ and SO ₂ and will be used to support the wood burning programme.

4.2 Ensuring Compliance and The Local NO₂ Plan

As previously discussed, Southampton City Council were one of the first five local authorities required to assess the need for a charging clean air zone to ensure compliance with air quality standards in the shortest possible time.

Through a comprehensive feasibility study and consultation exercise, The Council was able to demonstrate to central government that a set of non-charging measures could achieve compliance in the shortest possible time. These measures have now been implemented with support from the government's Joint Air Quality Unit (JAQU) and has helped deliver the improvements in air quality in the city.

The Council are now working with JAQU to evaluate the effectiveness of The Plan and confirm that compliance will be maintained in the next few years through a detailed modelling exercise which has yet to be completed.

While The Council understand that Defra would prefer the emission and concentration reductions to be calculated and modelled, the NO₂ plan re-evaluation process is deemed sufficient to cover this requirement in terms of ensuring compliance with air quality standards. The results of this exercise will be presented in the next AQAP update which will be reviewed following on from any updates to The Local NO₂ Plan.

The Council view The Local NO₂ Plan process suitable for assessing and ensuring compliance in the shortest possible time, while the AQAP is for delivering broader, longer-term improvements for the whole city. As such, the measures presented in this AQAP update are largely city-wide and many are strategic. These measures have the greatest potential to deliver benefits for the whole city and maximise deliver social and environmental co-benefits.

Appendix 1: Source Apportionment Detail

The AQAP measures presented in this report are intended to target the predominant sources of emissions within Southampton City Council's area.

A source apportionment exercise was carried out by Southampton City Council in 2021. This identified that in key areas of the city, the percentage source contributions were as follows:

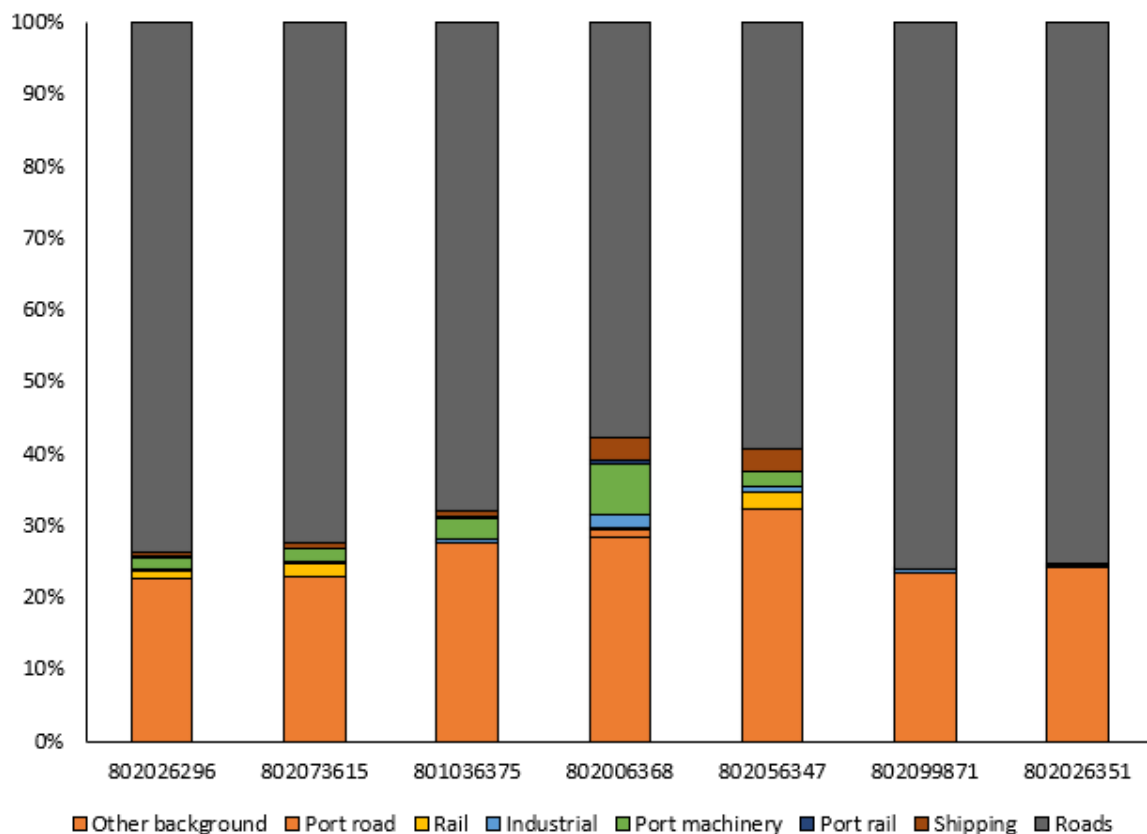


Figure 9 Source apportionment at key sites for concentrations of NO_x in 2019 using a city-wide verification factor. Locations are provided in Figure 11.

Background sources of emissions are those from outside of the city's boundaries which then enter the city including those from neighbouring areas, as well as internationally.

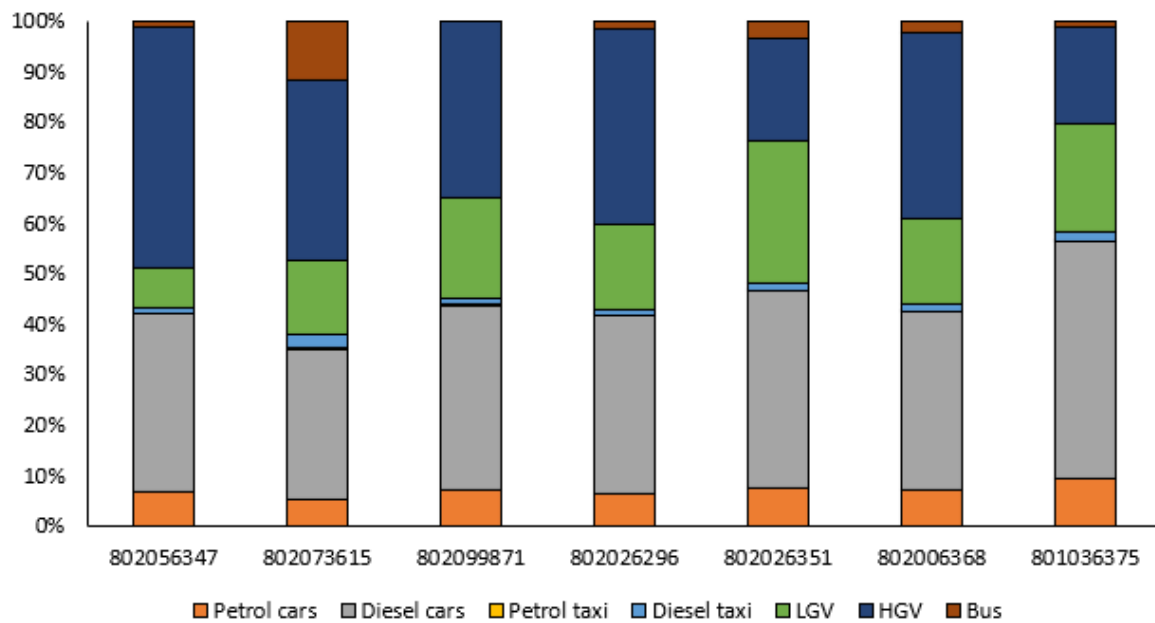


Figure 10 Source apportionment for road vehicle types at key sites for concentrations of NO_x in 2019 using a city-wide verification factor.

The locations source apportionment took place are presented below which correspond to the above location codes.

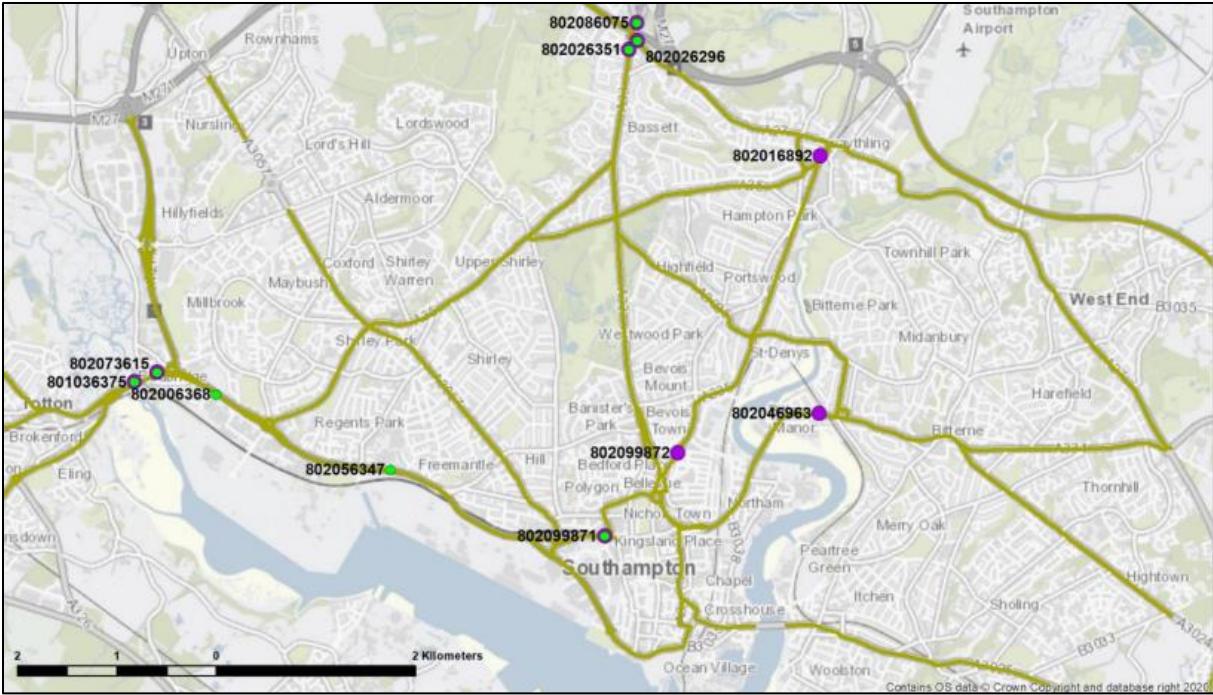
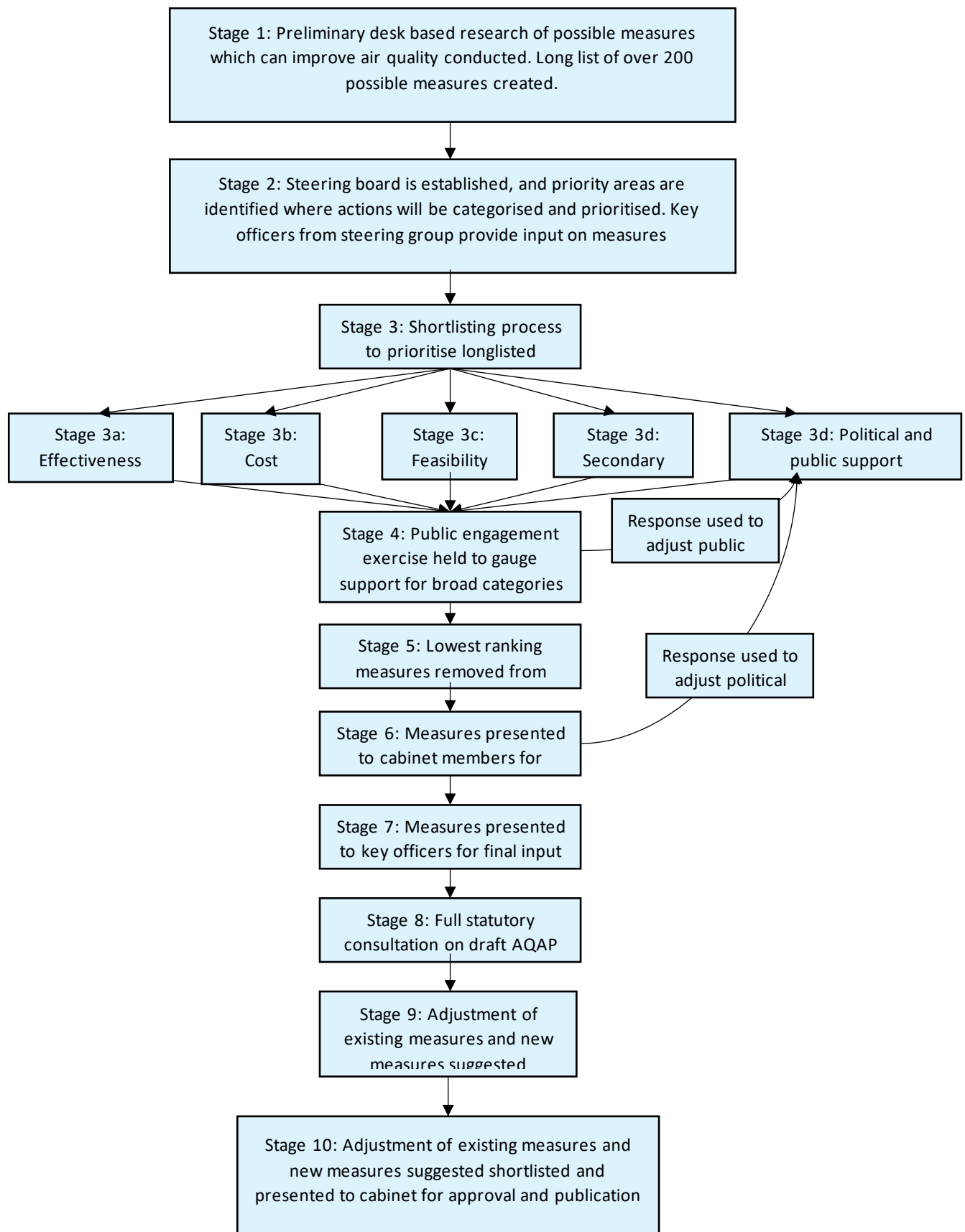


Figure 11 Source apportionment locations

Appendix 2: Shortlisting Process Diagram



Appendix 3: Response to Consultation

Table 4 Statutory consultee responses received

Consultee	Response	Outcome
Environment Agency	Support the aspirations of the plan and suggest more weight given to nature based solutions which can deliver air quality and other co-benefits including detail on what this might involve	Recommendations will be integrated into the existing 'Green Grid' action which aims to utilise nature based solutions to a variety of environmental challenges.
Defra	Approval of draft AQAP subject to minor amendments.	Inclusion of Local NO ₂ Plan and compliance section. Further emphasis on PM monitoring. Further information on governance and steering group arrangements added.

Measures suggested through the statutory consultation have been assessed for inclusion in the AQAP using the previously discussed shortlisting method. On this basis, suggestions have either resulted in no change (discussed in appendix 5), and amendment to a similar existing measure, or a new measure entirely. These new measures are presented in the below table and are included in the final AQAP table where applicable.

Table 5 Public consultee comments where changes were made to the plan

Consultation Responses (verbatim)	New AQAP Measure
<i>Exclusion of vehicles from areas where people walk, sit in cafes etc - eg. Portswood Broadway, Bedford Place and similar.</i>	'Identify further opportunities for better pedestrian infrastructure including Active Travel Zones'.
<i>Shirley residential roads closed to through traffic. More green spaces.</i>	
<i>More space converted to pedestrianised zones with trees and plants.</i>	

<i>More pedestrianisation and exclusion of vehicles from places where people gather, e.g. to shop</i>	
<i>Enforcement of pedestrian and cycle priority at junctions, more shared spaces, more pedestrian zones, pedestrian crossing phases at the junction of Lodge Road and Portswood Road, and the junction of Bevois Hill and Thomas Lewis Way</i>	
<i>Low traffic neighborhoods and support to make cars less dominant on our roads, such as creating parklets in parking spaces.</i>	
<i>A reduction in the number of rat runs in the inner avenue.</i>	
<i>more work with neighborhoods to reduce car use through low traffic areas.</i>	
<i>Stop closing walking routes. 2 that I know of have been closed recently. One across the M271. The other along the railway line from the station. Open these up again please.</i>	
<i>Closing off of local high streets to make them people friendly and not car-through streets wherever possible (eg Portswood, Bitterne Park Triangle and others - like has been done in Woolston) or at least restricting traffic and hours (eg deliveries). This would boost the local shopping economy and on-street cafes etc</i>	
<i>I would like to see heavy commercial vehicle kept away from residential streets. Keep them on the main arterial and keep the traffic flowing</i>	'Identify and enforce routes for lorries to improve efficiency of journeys and reduce impacts on residential areas'.
<i>Restricted routes for very large HGVs avoiding residential areas</i>	
<i>7.5 ton vehicular limit on Thornhill Park Road is not monitored or implemented</i>	
<i>Even large polluting lorries cut through from Lodge Road through Padwell Road to avoid the traffic lights at Stag Gates. There's a lot of young children walking to Bevois Town school breathing in those fumes.</i>	
<i>The cruise ships and associated traffic cause a lot of pollution, as do the lorries coming to the port. These are critical areas to address.</i>	'Enhance port-based booking system to encourage lower emission lorries into the port'.
<i>Focus more on alternatives to private vehicles. Would like to see regular local electric bike demonstrations and support with purchasing</i>	'Supporting shared micromobility by providing rental manual bikes, e-bikes and cargo bikes for residents'
<i>Have park and ride schemes for the north and east of Southampton with free parking and subsidised bus travel to encourage people to use them especially if you are thinking of banning high emission vehicles in the city centre.</i>	'Investigate increased availability of the park and ride including for key events'.
<i>Park and ride outside city</i>	
<i>Park and ride scheme to Sports Centre</i>	

<i>Park and ride. Something to stop 4000 cars per cruise ship coming into town centre.</i>	
<i>Hospital park and ride</i>	'Work with University Hospital Southampton to support their new 'Green Plan''.
<i>Incentives in the form of grants for investment into green technologies that save fossil energy and improved insulation. Best as starter pack upon investment, rather than something like feed-in tariffs. This could be for solar panels, fully electric vehicles, groups or air source heat pumps inclusive optimised radiators or underfloor heating, external house insulation, sun capture via conservatories, small wind turbines in gardens/on roof, energy storage e.g. in batteries or via hot-water boilers. Many of these ideas can be put into houses but they are often very expensive for individual home owners.</i>	'Support residents in making their homes more efficient'.
<i>It would be good to know how 'engagement' around log burners will be achieved. In Bitterne Park, we are starting to get smog on winter days. This cannot be done quickly enough, and building regulations staff should visit and check that a compliant wood burner has been fitted. Further, businesses in the city selling wood burners should be prevented from selling the most polluting ones.</i>	'Extend and enhance wood burning engagement project'.
<i>More education about just how bad woodburners are (I know how appealing they are but the scientific evidence for the harmful effects is just increasing).</i>	
<i>Specific action to assess and address the impact of wood burning stoves, and what actions may be taken e.g. raising public awareness.</i>	
<i>Last year my next door neighbour had a wood burner installed without requiring any form of planning permission. Several other houses on our estate now have wood burners. A recent Government report concluded that wood burners are a major contributor to particle pollution. What does the City Council plan to do about the growth in wood burners?</i>	
<i>Far too little on citizen involvement & action eg re greening gardens etc . Camden has put in a new air quality monitor system which allows us all to see what is happening, & take action</i>	'Map local concerns for air quality onto air quality monitoring and modelling data'.
<i>You identified University of Southampton as a key business. There are multiple air pollution researchers based there (myself included), and yet at no point in the measures have you considered engaging with them .</i>	'Continue to work with the city's universities to integrate expertise and new research into measures'.
<i>More air quality monitoring stations across the city.</i>	'Explore opportunities for more air quality monitoring stations'.
<i>With regard to the expansion of Southampton Airport we need comprehensive air quality monitoring stations across residential areas to the south of the airport</i>	

Appendix 4: Reasons for not pursuing measures

Source	Measure description/ name	Reason action is not being pursued
Statutory consultation	<i>Introduce a scheme for public transport with a uniform pay structure. Not three tickets for three bus routes/companies. It could be like the Oyster card (London) or Opal card (Sydney) and should include train, bus and tram, possibly even voi. E.g. I would like to be able to change buses (routes and companies) when going to Southampton central, to get a train to Millbrook and maybe use a voi to final destination.</i>	Southampton City Council do not own bus companies which operate in the city which makes it difficult to require consistent fares across operators. The Council does however continue to work with all operators in the city to require high standards of operation
	<i>Recognition of the impact of ammonia on air pollution and public health, the sources of this and considering what action can be taken to address this issue.</i>	As a principally agricultural pollutant, ammonia pollution isn't considered a large issue in Southampton. The levels that we do have come from sources outside our boundaries which we cannot control. As such it's considered non-cost-effective to manage.
	<i>Frequent "no car" days in the city centre, such as those pioneered by European cities.</i>	While the short term impact of a car-free day may be large, preventing access of cars into the city is currently considered un-feasible.
	<i>Unify charging connections for cars, avoiding different plug types (as was done with tablet and smartphone charging!) via legal requirements.</i>	The Council aims to ensure that all EV charge points it installs have the same compatibility with vehicles. To do this, SCC is planning to enter a partnership arrangement with a provider in 2023. The Council cannot control the type of chargers other organisations or individuals install.

	<p><i>Grants for fully electric vehicles only, ideally together with a photovoltaic and storage solution.</i></p>	<p>Local authorities are not able to provide individual's funding to purchase electric vehicles. The Office for Zero Emission Vehicles (OZEV) provides various grants, such as the Plug-in Car Grant (PICG) the EV charge point grant for members of the public to access.</p>
	<p><i>Southampton City Council had plans to build some giant wind turbines about 15 years ago, but got cold feet (www.dailyecho.co.uk/news/3820056.southamptons-giant-turbines-plan-blown-out/). Perhaps this project could be reactivated now that the public seem less opposed to wind turbines and there will be the incentive of lower energy bills. Liverpool docks have had wind turbines for over a decade. Wind conditions in Southampton and Liverpool are very similar.</i></p>	<p>Central government do not permit the development of large on-shore wind turbines. As such this measure is considered unfeasible. Feasibility of smaller turbines is being considered, however.</p>
	<p><i>Banning barbeques and improving rubbish collection arrangements, so that residents do not resort to bonfires</i></p>	<p>It's currently unfeasible for The Council to ban barbeques and all bonfires. The Council is currently working on a waste improvement strategy to improve waste collection to reduce the need for bonfires and has implemented a ban on allotment burning, however. The 'Wood Burning Engagement Project' is being implemented and will be developed further under this plan to continue to educate residents on how to burn less and burn better.</p>

	<p><i>The council should implement an immediate ban on bonfires. The combined pollution from domestic bonfires must heavily outweigh vehicle emissions and the nuisance it causes neighbours should be addressed.</i></p>	
	<p><i>A ban on burning household (or building rubbish as I suspect it often is) and the resources to have people who can come out, see it for themselves and enforce the ban. I know there are people burning it rather than taking it to the tip (probably because they'll be charged) and they don't care what they're burning - aside from the stench, I dread to think what toxins are being released and that we're all breathing in. A business wouldn't be allowed to do it. (This needs joined up thinking - e.g. remove charges for taking building rubbish to the tip and people may not be as likely to burn it).</i></p>	<p>A complete ban on bonfires is considered unfeasible.</p>

	<i>An overflight tax and greater contribution from the airport for the environmental damage (Enforce to the latest CAEP standard) and seek recompense for the damage they are causing. Make the airport publish the real figures for CO2 which include the emissions from the aeroplanes themselves so those flying are not led to believe that their journey is carbon neutral.</i>	Southampton Airport is located in Eastleigh Borough Council's boundaries who have oversight of the airport. As such, an overflight tax implemented by Southampton City Council is considered unfeasible.
Shortlisting exercise	Extend Low Emission Taxi Incentive Scheme. Enhanced benefit for electric taxis	Replaced with 'Discounted electric taxi and van leasing scheme including rapid chargers and driver support
	Electric HGVs for use in Sustainable Distribution Centre	To be pursued through Future Transport Zones work
	Further drone delivery opportunities	Low effectiveness score
	Investigate hydrogen bus trial	Low effectiveness score
	New taxi only rapid charge points	Replaced with 'Discounted electric taxi and van leasing scheme including rapid chargers and driver support
	Encouraging lift sharing schemes for workplaces	Currently being pursued through 'MyJourney' workplace travel planners network.
	Active travel plans/ schemes for major employers	
	Staff rail warrant	Low feasibility and effectiveness scores
	Investigate effectiveness of car free lanes in reducing exposure	Low perception score
	Research using designated delivery bays	Low effectiveness score
	Passenger access to port from dock gate 10	Low effectiveness and feasibility scores
	Requirements for tighter NRMM standards in port	Low feasibility score
	Further support for delivery and service planning	Low effectiveness and cost scores

	Anti-idling train engagement	Low feasibility and effectiveness scores
	Low NOx/Electric boiler implementation in schools and other council properties	Low feasibility and cost scores
	Reduced parking provision in SCC car parks	Low feasibility and perception scores
	Gas and hydrogen refuelling infrastructure.	Low effectiveness, feasibility, and cost scores
	City centre Zero Emission Zone	Low feasibility and perception scores
	Parking permits scrappage	Low feasibility and perception scores
	New Taxi licensing conditions for ULEVs	Low feasibility score
	St Marys Stadium Train Station	Low feasibility score within AQAP timescales
	Open fire and stove scrappage scheme	Low feasibility score
	Workplace Parking Levy	Low feasibility and perception scores

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
JAQU	Joint Air Quality Unit
EU	European Union
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less