

Report to:	Overview and Scrutiny Committee (Regulatory, Compliance and Corporate Services)	Date of Meeting:	Tuesday 28 February 2023
Subject:	Air Quality Update		
Report of:	Assistant Director of Place (Highways and Public Protection)	Wards Affected:	(All Wards);
Portfolio:	Regulatory, Compliance and Corporate Services		
Is this a Key Decision:	No	Included in Forward Plan:	No
Exempt / Confidential Report:	No		

Summary: To provide an update on local air quality management activities and air quality improvement actions in Sefton during 2022

Recommendation(s):

That the report be noted

Reasons for the Recommendation(s):

To provide an update to members on the ongoing Local Air Quality Management activities (Monitoring and improvement actions) underway in Sefton during 2022.

Alternative Options Considered and Rejected: N/A

What will it cost and how will it be financed?

(A) Revenue Costs

There are no direct revenue costs associated with the recommendations in this report.

(B) Capital Costs

There are no direct capital costs associated with the recommendations in this report.

Implications of the Proposals:

Resource Implications (Financial, IT, Staffing and Assets):	
None – update report only	
Legal Implications:	
None - update report only	
Equality Implications:	
There are no equality implications.	
Climate Emergency Implications:	
The recommendations within this report will	
Have a positive impact	Y
Have a neutral impact	N
Have a negative impact	N
The Author has undertaken the Climate Emergency training for report authors	Y

Contribution to the Council's Core Purpose:

<p>Protect the most vulnerable: Poor air quality can have a major impact on health particularly those already vulnerable e.g. young children, the elderly and those with existing respiratory problems. Measures being implemented to improve air quality therefore contribute to this core purpose</p>
<p>Facilitate confident and resilient communities: Interventions to improve air quality, taken by the Local Authority, partners, and the community, demonstrate that mitigation against poor air quality is possible and the interventions actively support making better choices and behavioural change. Improving air quality contributes to improved health, wellbeing, economic activity/productivity and increased personal and community resilience.</p>
<p>Commission, broker and provide core services: Local Air Quality Management is a statutory responsibility for the Council</p>
<p>Place – leadership and influencer: The management and improvement of air quality is a key aspect of place leadership and creating cleaner, greener and healthier places</p>
<p>Drivers of change and reform: N/A</p>
<p>Facilitate sustainable economic prosperity: There is an established link between poor air quality, poor health, the ability to work/remain economically active and productive. Improving air quality can therefore contribute to improved productivity and economic prosperity.</p>

Greater income for social investment:
N/A

Cleaner Greener:
Poor air quality is an indication of environmental damage and any mitigation measures reduce the impact of this damage.

What consultations have taken place on the proposals and when?

(A) Internal Consultations

The Executive Director of Corporate Resources and Customer Services (FD 7145) and the Chief Legal and Democratic Officer (LD 5345) have been consulted and any comments have been incorporated into the report.

(B) External Consultations

'not applicable'

Implementation Date for the Decision

Immediately following the committee meeting.

Contact Officer:	Greg Martin
Telephone Number:	0151 934 2098
Email Address:	greg.martin@sefton.gov.uk

Appendices:

There are no appendices to this report

Background Papers:

There are no background papers available for inspection.

Background

1. Ongoing evidence shows that air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas
2. The Environment Act 1995 places a **statutory duty** on all Local Authorities to regularly review and assess air quality in their areas, produce a yearly Air Quality Annual Status Report (ASR) which provides a detailed account of air quality in its area and implement actions to improve air quality.

3. The Air Quality Regulations made under the Act specify the pollutants that must be considered and set standards and objectives for each of the pollutants, which are referred to as National Air Quality Standard (NAQS) Objectives. These are detailed below with the 2 pollutants still of concern in Sefton shown in red text. The pollutants that have to be considered are shown in table 1 below:

Table 1 National Air Quality Standard Objectives

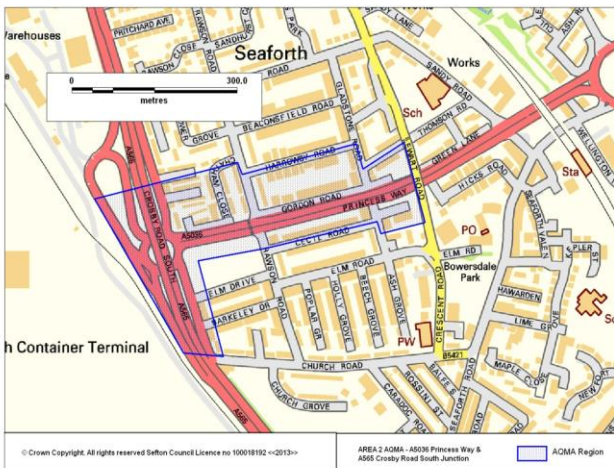
Pollutant	Description	National Air Quality Standard Objective (NAQS)
Benzene	An organic chemical compound emitted by some industrial processes and a constituent of petrol	5 µg/m³ (Annual Mean)
1,3 Butadiene	A Hydrocarbon based gas released from car exhausts	2.25µg/m ³ (Annual Mean)
Carbon Monoxide	An odourless colourless gas produced by incomplete combustion	10mg/m³ (8 hour mean)
Lead	A heavy metal emitted by certain industrial processes	0.25µg/m³ (Annual Mean)
Nitrogen Dioxide	A gas produced by internal combustion engines	200µg/m³ (1hr mean) not to exceeded more than 18 times per annum 40µg/m³ (Annual mean)
Particulate Matter PM ₁₀	Particulates less than 10µm in diameter produced by industry and road traffic.	50µg/m³ (24hr mean) not to be exceeded more than 35 times per annum 40µg/m³ (Annual mean)
Sulphur dioxide	A gas which can be produced when burning fossil fuel and or heavy fuel oil	266µg/m³ (15 min mean) Not to be exceeded more than 35 times a year 350µg/m³ (1hr mean) Not to be exceeded more than 24 times per year 125µg/m³ (24hr mean) Not to be exceeded more than 3 times a year

4. Through ongoing review and assessment it has been determined that for the following pollutants, Benzene, 1,3 Butadiene, Carbon Monoxide, Lead and Sulphur Dioxide, the NAQS objectives will **not** be exceeded in Sefton and as such, no Air Quality Management Areas (AQMAs) have been declared for these pollutants.
5. As a result of ongoing monitoring and assessment Air Quality in the majority of Sefton has been shown to be of a good standard and levels are well within the National Air Quality Standard Objectives given above. There are however areas in the South of the Borough, where due to high levels of traffic, and other localised sources, levels of NO₂ are above or close to the national standard.

Air Quality Management Areas (AQMAs)

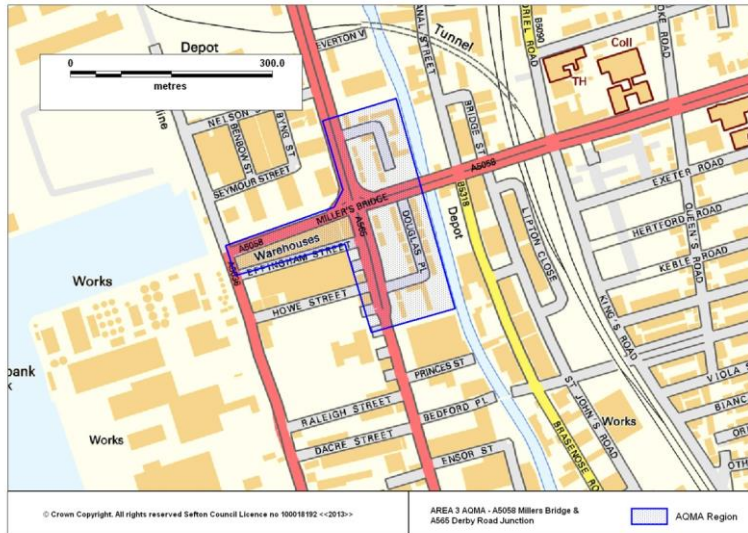
6. As reported previously where it is likely that levels of air pollution may exceed the NAQS, an Air Quality Management Area (AQMA) must be declared by the Local Authority. Through air pollution monitoring and modelling Four (4) localised areas in South Sefton have been identified where levels of Nitrogen Dioxide (NO₂) have exceeded or are close to the annual average standard of **40 µg/m³**. AQMA's have been declared in these locations and are discussed in more detail below.

AQMA 2-Princess Way, Seaforth.



7. AQMA 2 - Princess Way was identified for NO₂ exceedances. The main source of NO₂ in this AQMA is related to HGV traffic. The deep-water berth at the Port of Liverpool is now complete and HGV traffic is predicted to increase as a result. A major highways scheme is currently being considered by National Highways to accommodate the increase in road traffic because of the port expansion.
8. Several air quality actions have been implemented by Sefton to reduce levels of NO₂ in this area. These include assisting in the development of port booking systems, development of Sefton's ECOstars fleet recognition scheme, the redesigned 'hamburger' roundabout improvements and recent joint emissions enforcement work with the Driver and Vehicle Standards Agency (DVSA)
9. It is recognised, however, that dealing with road traffic related emissions in this area with the potential increase in HGV port traffic is extremely challenging and alternative/innovative measures need to be considered.

AQMA 3 Millers Bridge



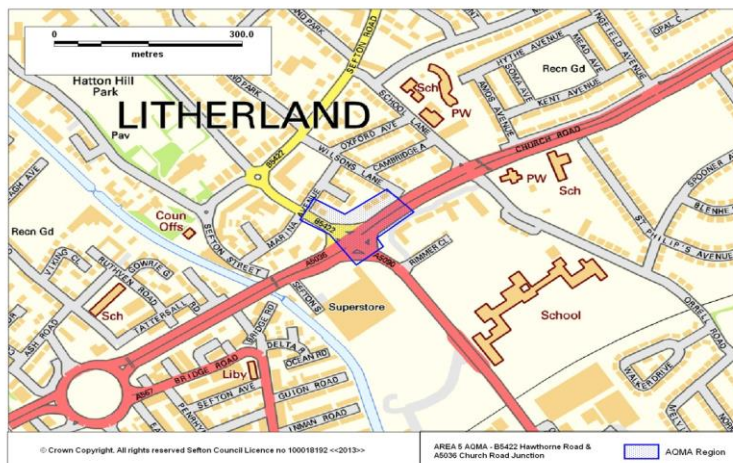
10. AQMA 3 - Millers Bridge - was identified for exceedances of the PM₁₀ and NO₂ NAQS objectives. The main contributors to the emissions in this area are HGVs and industrial processes in and around the dock estate.
11. Several successful measures have been implemented in this area as part of the action plan to reduce emissions. Officers continue to work jointly with the Environment Agency to ensure industrial emissions are monitored and controlled effectively in this area, a HGV hurry call system has also been introduced which gives priority to HGV's heading up Millers Bridge, reducing the need for stopping at the traffic lights thus reducing emissions. This major junction has also recently been redesigned as part of the North Liverpool Key Corridor Improvement Scheme to improve traffic flow and reduce waiting times at the traffic lights.
12. As a result of these measures the NAQS objective for PM₁₀ has consistently been met for a number of years. However, this will be kept under review as the port expands in the future.
13. With regard to NO₂ in this AQMA the results of monitoring continue to show some exceedances of the annual NAQS objective. Dealing with NO₂ exceedances in this location is again challenging due to the level of traffic that passes through the junction, physical characteristics of the area and proximity to the port. Any future increase in traffic resulting from the port expansion could also lead to additional exceedances in this area.

AQMA 4 Crosby Road North, South Road Waterloo



14. AQMA 4 was identified for exceedances of the NO₂ NAQS objective. As part the Action Plan to address this exceedance, improvements to the South Road and Haigh Road junction were agreed to improve traffic flow. The junction improvement works have now been completed and the ongoing effectiveness of these in terms of reducing levels of NO₂ in the AQMA is being monitored using diffusion tubes. The latest results show that levels of NO₂ in the AQMA have now reduced to below the national limit. Further monitoring will be undertaken to ensure consistent compliance with the NAQS before the decision to revoke this AQMA is made.

AQMA 5 Hawthorne Road, Church Road Junction Litherland



15. AQMA 5 was identified for NO₂ NAQS objective exceedances. The main source of the emissions at this location is road traffic. For the last 5 years this AQMA showed compliance with the annual NAQS objective for NO₂. However as with AQMA 2, this site may be affected by the increased emissions due to HGV traffic because of the port expansion and will remain in place.

Air Quality Monitoring

16. To provide accurate data on pollution levels in Sefton and as part of our ongoing duties, officers continue to undertake extensive air pollution monitoring using both DEFRA approved real time automatic monitoring systems and diffusion tubes which provide average annual levels.
17. Sefton is also currently trialling the use of lower cost air pollution sensors which although not approved by DEFRA do provide hourly air pollution data so we can better understand air pollution patterns/issues in a given area. Details of these trials are provided later in the report.
18. As Sefton has to comply with DEFRA's monitoring requirements the latest ratified monitoring results are for the year 2021. Monitoring for 2022 has only just been completed (last diffusion tube collected in January 2023) and as such this data is currently being checked and ratified.

Automatic Monitoring

19. Sefton monitors air pollution at 6 key locations using DEFRA approved automatic equipment. The location, justification for its siting and pollutants monitored are provided in the table below:

Table 2 Location of automatic monitoring stations

Monitor Location	Justification for Location	Pollutants Monitored
Waterloo Primary School, Crosby Road North, Waterloo.	Within previous AQMA1 Crosby Road North. Proximity to Road/Sensitive Receptor	PM ₁₀ NO ₂
Hawthorne Road opposite KFC, Litherland	Within AQMA 5 Church Road Junction- Proximity to Road Junction/Sensitive Receptor	NO ₂ , PM ₁₀
Lathom Close, Seaforth	Within AQMA 2. Proximity to Road/Docks/Sensitive Receptor	PM ₁₀ PM _{2.5} NO ₂
Millers Bridge, Bootle	Within AQMA 3. Proximity to Road Junction/ Docks and Sensitive Receptor.	PM ₁₀ PM _{2.5} NO ₂
A565, Crosby Road South previously located at St Joan of Arc School	Proximity to Road /Docks and Sensitive receptor.	NO ₂ SO ₂
Regent Road Crosby (installed summer 2020)	Background Particulate Levels in suburban area	PM ₁₀ PM _{2.5}

Diffusion tube monitoring

20. In addition to the real-time monitors, Sefton measures monthly NO₂ levels at 80 sites across the Borough using diffusion tubes. The diffusion tubes are located in

areas that have already been identified as AQMA's or are located in areas in close proximity to sensitive premises where additional data and monitoring is required to assess current/future NO₂ levels as part of the ongoing Review and Assessment process. The monthly results from these tubes are combined to enable comparison with the annual mean NAQS objective for NO₂.

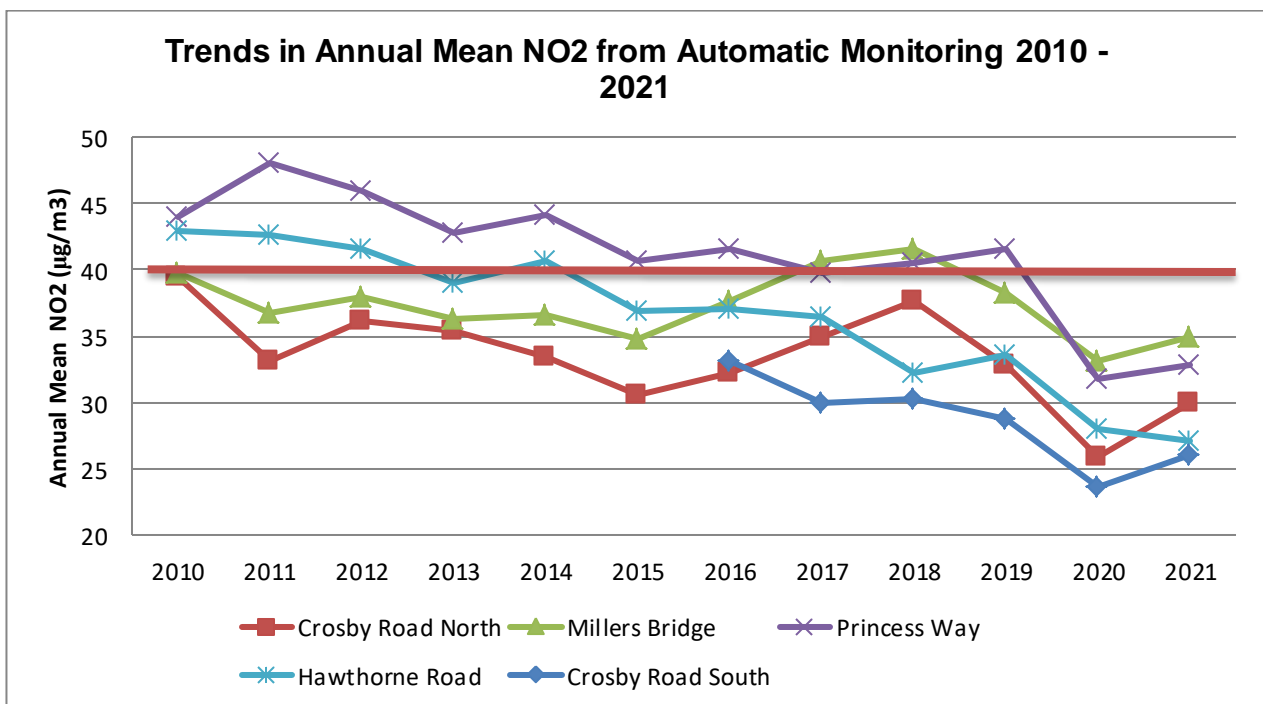
21. Several sites have also been added recently to assess the impact the port expansion will have on NO₂ levels. The location of these is reviewed annually to ensure all areas of concern are monitored.

NO₂ Automatic Monitoring Results

Table 3 - NO₂ Annual Mean results (limit 40 µg/m³)

Site	NO ₂ Annual Mean µg/m ³									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Crosby Road North	36.1	35.4	33.4	30.6	32.2	34.9	37.6	35.0	25.9	30.0
Millers Bridge	37.9	36.3	36.6	34.8	37.7	40.6	41.5	38.2	33.2	35.0
Princess Way	45.9	42.8	44.2	40.6	41.6	39.7	40.5	41.6	31.7	32.9
Hawthorne Road	41.5	39.0	40.7	36.9	37.1	36.5	32.2	33.6	28.0	27.1
Crosby Road South				34.6	33.2	29.6	30.2	28.8	23.6	26.0

The graph below shows the trends in Annual mean NO₂ levels between 2010 and 2021 at each of the continuous monitoring sites.



22. Following the substantial traffic reductions due to the various lockdowns and social restrictions associated with the Covid pandemic in 2020, levels of NO₂ at Sefton's automatic stations in 2021 have shown an increasing trend compared to 2020 as can be seen in the trend graph on the previous page. Notably they have not however, returned to pre-covid levels experienced in 2019. The ongoing impact of the pandemic has continued to have an effect on traffic levels and flows

certainly in the first part of 2021 as a number of restrictions and lockdowns remained.

23. levels of NO₂ at all of the 5 automatic monitoring sites again showed compliance with the NO₂ annual mean objective in 2021 (at the monitoring location) with the highest monitored level of 35 µg/m³ recorded at the Millers Bridge site.
24. As can be observed in 2021 4 out of the 5 sites showed an increase in levels following the 2020 pandemic. The site at Hawthorne did however show a further reduction in annual levels. All sites were well below the NAQS objective. During 2021 there were still ongoing impacts from the covid pandemic in terms of traffic levels and commuting habits. Monitoring will continue to enable future trends to be observed.
25. There were no exceedances of the NO₂ 1-hour mean objective at any of the automatic monitoring sites.

Diffusion tube NO₂ results

26. In line with the automatic monitoring results, the non-automatic diffusion tube monitoring sites showed an increase in NO₂ annual mean levels compared to 2020. Levels across these sites have not, however, returned to those observed pre-covid (2019)
27. In 2021 4 diffusion tube sites showed an exceedance of the NAQS objective at the monitoring location and are discussed below:
28. Diffusion tube Site ID: BR Derby Road, Bootle showed an exceedance of the NAQS objective in 2021 with an NO₂ annual mean of 46.0 µg/m³. As this site recorded a 2021 NO₂ annual mean concentration in exceedance of the air quality objective at a monitoring site which is not representative of public exposure, the concentration at the nearest receptor for this location was estimated using the distance correction via the Defra diffusion tube processing tool. This showed the estimated concentration of 42.7µg/m³ indicating an exceedance with the NO₂ annual mean objective at a relevant public exposure location in this area. **This is within AQMA 3 - Millers Bridge.**
29. Diffusion tube Site ID: GH A565 Derby Road, Seaforth, showed an exceedance of the NAQS objective in 2021 with an NO₂ annual mean of 40.6 µg/m³. As this site recorded a 2021 NO₂ annual mean concentration in exceedance of the air quality objective at a monitoring site which is not representative of public exposure, the concentration at the nearest receptor for this location was estimated using the distance correction via the Defra diffusion tube processing tool. This showed the estimated concentration of 32.1µg/m³ indicating compliance with the NO₂ annual mean objective at a relevant public exposure location in this area. Monitoring will continue in this area.
30. Diffusion tube Site ID: HB Breeze Hill, Bootle, showed an exceedance of the NAQS objective in 2021 with an NO₂ annual mean of 41.5 µg/m³. As this site recorded a 2021 NO₂ annual mean concentration in exceedance of the air quality objective at a monitoring site which is not representative of public exposure, the

concentration at the nearest receptor for this location was estimated using the distance correction via the Defra diffusion tube processing tool. This showed the estimated concentration of 33.2µg/m³ indicating compliance with the NO₂ annual mean objective at a relevant public exposure location in this area. Monitoring will continue in this area.

31. Diffusion tube Site ID: HC Breeze Hill Bootle, showed an exceedance of the NAQS objective in 2021 with an NO₂ annual mean of 40.2 µg/m³. This site is located in excess of 50 meters away from public exposure and as such as per TG/16 can't be corrected for fall off with distance. Given the distance between the tube and the nearest receptor we can assume the level at the receptor is well within the NAQS.

Particulate Matter Results

Table 4 PM₁₀ Annual Mean 2012-2021 (Limit 40 µg/m³)

Site	PM ₁₀ Annual Mean µg/m ³									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Crosby Road North	25.4	28.3	23.6	23.7	17.0	21.1	19.9	26.2	N/A	N/A
Millers Bridge	26.1	28.1	28.8	28.7	25.4	23.9	20.1	17.6	16.1	19.5
Princess Way	24.9	26.5	26.5	26.7	23.8	23.1	22.6	16.9	20.0	17.5
Hawthorne Road						23.9	21.2	23.7	20.3	18.7
Regent Road									13.2	9.5

32. The table above shows the measured levels of PM₁₀ at each of the continuous monitoring sites since 2012. The national limit is 40 µg/m³ and whilst the monitors are not located exactly at the receptor locations, they provide an accurate indicator of PM₁₀ levels in the locality.

33. All areas are now consistently compliant with the PM₁₀ NAQS objective with annual levels well within the standard. The number of daily exceedances is also consistently below the standard of 35 exceedances per year. Monitoring of PM₁₀ will however continue to assess the impact the port expansion may have on particulate emissions.

PM_{2.5} Monitoring

34. Although Sefton Council monitors PM₁₀ at several locations in the Borough, there is now clear evidence that even smaller particles with an aerodynamic diameter of 2.5µm or less, known as PM_{2.5}, have a greater impact on human health.
35. Unlike Nitrogen Dioxide particulate matter emissions are caused by a number of different sources, including the burning of domestic solid fuel, degradation of vehicle tyres and brakes and to a lesser degree combustion engines. As such tackling PM_{2.5} emissions is likely to be challenging.

36. To gather information on current PM_{2.5} levels in Sefton three dual PM₁₀ / PM_{2.5} monitors have now been installed in the Borough, the latest being at Princess way and was commissioned in Autumn 2022.

37. The current national standard for PM_{2.5} is **25 µg/m³**. The results below show that monitored levels in Sefton are well within the standard, however it is likely that this standard will reduce as a result of future planned changes to air quality legislation.

Table 5 PM_{2.5} monitoring results

Year	2017	2018	2019	2020	2021
Millers Bridge PM _{2.5} Annual Mean µg/m ³	7.1	8.9	10.0	7.8	9.6
Regentroad Crosby PM _{2.5} Annual Mean µg/m ³				7.3	5.9

38. The full details of these changes regarding PM_{2.5} are still being considered by Central Government, but it is likely that Local Authorities will be expected to implement measures to ensure compliance with any tighter standards. Further detail on these changes will be provided to members in due course.

Summary of monitoring results 2021

39. As reported in last year's update the NO₂ monitoring results for 2020 were significantly lower than previous years which was undoubtedly due to the impact of the Covid pandemic and associated lockdowns/social restrictions with much reduced traffic levels during the various lockdowns. Notably only one monitoring site in 2020 showed an exceedance of the NO₂ National Air Quality Standard (NAQS) objective the lowest number of exceedances recorded since monitoring began.

40. NO₂ levels in 2021 have increased overall compared to 2020 but have not returned to pre-covid levels as seen in 2019. The majority of monitoring locations in Sefton during 2021 have shown compliance with the NO₂ NAQS objective with only 4 monitoring sites exceeding the national limit.

41. Levels of Particulate Matter have increased slightly compared to 2020 but as in previous years all AQMA's show compliance with the PM₁₀ national air quality standard objective by some margin.

42. As we know 2020 was an exceptional year for air quality due to the Covid Pandemic. It does appear that its legacy has continued to have a positive effect on Sefton's air quality in 2021 as overall levels have still not returned to pre-pandemic levels.

Actions to Improve Air Quality

43. Notwithstanding the temporary improvements in air quality observed as a result of the covid pandemic the main on-going priority in Sefton for the coming years is to fully understand the effects that the predicted increase in HGVs due to port expansion will have on air quality and how this can be mitigated.
44. This is undoubtedly the most significant challenge for the Council in terms of air quality impact in the Borough at the present time, due to the scale of the expansion and the potential for this to impact on air quality in existing AQMAs and also impact on public exposure receptor residential locations on port access routes.
45. A number of possible air quality intervention options to deal with the predicted increase in emissions, including an HGV only Clean Air Zone (CAZ) are currently being considered by Sefton Council, as set out below.

Sefton Clean Air Plan (CAP)

CAP Outline Business Case (OBC) – Introduction

46. Following on from the Preliminary Clean Air Zone (CAZ) feasibility study, Cabinet gave approval for Officers to progress the development of a detailed Outline Business Case (OBC) for the creation of a Sefton Based CAZ, in line with the approach recommended by DEFRA. AECOM were commissioned in 2020 to undertake the additional air quality and transport modelling work needed and prepare a draft OBC in conjunction with Council officers.
47. The development of the CAP OBC forms part of the Council's wider AQ programme overseen by the AQ Cabinet Member Reference Group.
48. Sefton Council has prepared the Clean Air Plan (CAP) Outline Business Case (OBC) because there are locations within Sefton with persistent poor air quality, and this poor air quality has detrimental effects on public health and the wider environment. Some of the worst air quality in Sefton is concentrated within areas with existing high levels of health and income deprivation, meaning that the worst air quality is experienced by those most vulnerable to its effects.
49. HGV traffic associated with the Port of Liverpool makes a substantial contribution to road-source emissions and overall pollution levels in nearby areas. In addition, the emissions from the Port operation itself contribute to overall local background pollution, through industrial and shipping operations etc. Although the overall HGV fleet is improving as older vehicles are replaced, port expansion in the coming years will pose additional challenges, primarily through an increase in levels of HGV traffic and consequent congestion and increased emissions.
50. Without further action, increased emissions from HGVs due to the Port expansion and wider traffic growth could result in these areas not achieving compliance with national objectives under current conditions. In addition, new areas may become non-compliant.

51. The government (via the Joint Air Quality Unit – JAQU) has now instructed many local authorities across the UK to take quick action to reduce harmful NO₂. Although Sefton Council has not been mandated by JAQU to undertake a feasibility study (like many other local authorities), this does not indicate that there are no air quality issues which need to be addressed. In response to its local air quality management responsibilities, Sefton Council has undertaken further air quality modelling and has chosen to take additional steps to support local aspirations to improve air quality beyond just compliance with national standards, with a key objective being to protect the health of local residents. The additional work being carried out by the Council will also contribute to its commitments to tackle carbon emissions as part of the Climate Emergency declaration.
52. The Clean Air Plan OBC proposal, in the main, comprises a HGV Clean Air Zone scheme that aims to address persistent air quality issues identified within Sefton in the shortest time possible. The CAZ scheme preferred option (referred to as 'Option 2A') features a charging CAZ applied to non-compliant HGVs (Euro 5 and older) that cross into a designated section of the Sefton highway network. The preferred option HGV CAZ is focused on the A565 and A5036 corridors, incorporating all four of the existing Air Quality Management Areas (AQMAs). Incorporating the A5036 within the CAZ requires entry and exit signs and enforcement cameras to be installed on the National Highways network and would require a co-operative approach between Sefton Council and National Highways on this issue.
53. The Outline Business Case for the potential implementation of a HGV CAZ sets out the rationale for the whole project and provides more detail about the proposals, including clear strategic objectives for the proposals.

Outline Business Case – Project Objectives and Outcomes

54. The objective of the Clean Air Plan is to address persistent air quality issues within Sefton which occur in some of the most income/health deprived areas in the borough.
55. The key case for change is that the Government, and Local Authorities, in accordance with their local air quality management responsibilities, are required to meet air quality limit values in the shortest possible time. Within Sefton, this is also supported by a local desire to go further ('beyond compliance') to improve air quality and public health and well-being.
56. The strategic objectives of the Clean Air Plan are:
- To improve air quality in the shortest time possible in known hotspot areas in Sefton's four AQMAs and achieve compliance with national standards in the shortest time possible.
 - To promote improved air quality in the wider area (outside the four declared AQMAs) through more rapid switchover to vehicles with minimal exhaust emissions.
 - To reduce human exposure to air pollution, and thus improve public health, particularly for areas of Sefton with high levels of deprivation.
 - To reduce emissions relating to the A5036 for HGV vehicle traffic, particularly around high-density residential areas.

57. The Outline Business Case developed for the Clean Air Plan adopts the standard Treasury Green Book 5-Case Model as follows:

- Strategic Case
- Economic Case
- Financial Case
- Commercial Case
- Management Case

58. The proposed output is the potential implementation of the HGV CAZ scheme intervention, intended to achieve the following outcomes which support the strategic objectives listed above, providing a positive impact on the local environment, socio-economic factors and the health and well-being of residents and visitors:

- Significant air quality benefits (i.e. reduced Nitrogen Dioxide concentrations) within the CAZ boundary area (i.e. along key Port routes / within AQMAs) in addition to wider benefits across south Sefton; and
- An improvement in current disproportionate air quality impacts in some of Sefton's most health/economically deprived areas.

Outline Business Case – Delivery Approach

59. A project team of Council officers, supported by commissioned technical experts has carried out further appraisal and developed the OBC. The OBC sets out the basis for proceeding with the Clean Air Plan and identifies the preferred option for a charging HGV CAZ. Subject to the decision on the OBC, the next stage of the project would be to prepare a Full Business Case (FBC) setting out all the details of how the CAP will be implemented. The Council will continue to lead this process, with technical support commissioned as required.

60. A significant funding commitment will be required for implementation of the CAP and funding sources are yet to be identified for all elements of the CAZ scheme. A potential funding source for progression to a Full Business Case and implementation of a CAZ scheme is via central government's Joint Air Quality Unit (JAQU). Any funding exploration via JAQU will need to be supplemented with a request for agreement on the inclusion of the A5036 in the CAZ boundary, with support and liaison also needed with National Highways in this respect.

61. The FBC will also require a full understanding of the legal requirements with regards to powers and consents required for the implementation of a CAZ, and the legal requirement for formal statutory public consultation on the introduction of a CAZ.

Outline Business Case – Conclusions of CAP OBC

62. The OBC evidence-base indicates that significant air quality benefits within the CAZ Boundary area (Port Routes/AQMAs) and wider AQ improvements can potentially be achieved if the Council proceeds to the implementation of a HGV Corridor Charging CAZ, subject to the development of a Full Business Case (FBC). Furthermore, the air quality benefits of the Preferred HGV CAZ Option are

concentrated in areas with some of highest levels of income/health deprivation – locally and nationally i.e. parts of Bootle, Litherland, Seaforth.

63. The case for change is strong because the OBC evidence base indicates the persistence of poor air quality at discrete locations and future risks due to increased traffic, particularly associated with HGVs on key Port routes (A5036/A565). In addition, HGVs are disproportionately high emitters of both NO_x and PM and the Preferred HGV Charging CAZ which targets key Port routes (A565/A5036) provides the best value option when balanced against the option assessment criteria.
64. The estimated scheme costs (Capital and Operating) for the Preferred CAZ Option are provided within the OBC, but further work is required at FBC stage to develop the cost estimates, particularly through detailed design work and engagement with potential suppliers and contractors. In addition, funding for potential mitigation costs for financial support for businesses and scheme development and consultation costs require consideration.
65. Funding sources are yet to be identified for the progression of the OBC to FBC and/or any CAZ implementation. Key risks and measures to mitigate and manage those risks have been identified within the Management Case. Key stakeholders are identified, and consultation has been undertaken throughout the OBC development process, initially to share the high-level objectives, proposals and rationale for the CAZ scheme and more recently to share the outcomes of the OBC.

Outline Business Case – Aligned Communication & Engagement Strategy

66. An appropriate Communication and Engagement Strategy has been developed to support the CAZ OBC process.
67. Internal communication and engagement has focused on regular routine engagement with key internal stakeholders including Cabinet, Executive Leadership Team, Growth Board, Air Quality Member Reference Group and OSC (Regulatory, Compliance and Corporate Services).
68. External communication and engagement has focussed to date on key external stakeholders, as follows:
 - National Highways - given the implications of the proposals for the A5036 Strategic Road Network.
 - Liverpool City Council - given they are an adjoining local authority who were legally mandated by Government in 2018 to produce a Clean Air Plan to identify how Nitrogen Dioxide levels could be reduced in the shortest time possible.
 - Peel Ports - given the anticipated growth in port-related HGV traffic and the implications of the proposals for key port routes.
 - Joint Air Quality Unit (*oversight board for managing DEFRA's/DfT's NO₂ reduction programme*) – given the potential to explore any appropriate funding source for the Clean Air Plan implementation.

69. Public engagement is via a dedicated Information Page for Sefton's Clean Air Plan on Sefton's 'Your Sefton Your Say' online platform, available since June 2021. This is updated as and when required and features a wide range of relevant local Air Quality information and also introduces the wider Clean Air Plan Strategy and the development of the Clean Air Plan OBC for a potential Clean Air Zone.

Outline Business Case – Recommendations of CAP OBC

70. Through a structured Options Appraisal process, the CAP OBC has assessed four short-listed HGV Charging CAZ Boundary Options. The preferred CAZ boundary option (Option 2A) consists of a Charging HGV CAZ including both the A565 and A5036 corridors, thus including all of the existing AQMAs and focusing on areas of greatest concern. It was also recommended that a reserve option (Option 2B - A565 corridor only) is retained, subject to discussions with JAQU/National Highways regarding the proposal (under Option 2A) to include the A5036 (route managed by National Highways) within the CAZ.

71. The progression of the CAP scheme to the next stage, i.e. Full Business Case, will depend on a number of factors, which include key risks and constraints identified in the OBC work. The decision about whether to proceed to the FBC needs to take account of all these key issues. Additionally the delivery of the CAP has several key dependencies / interdependencies, including:

- The need to identify a funding source for the implementation of the scheme, including provision for mitigation – noting that any funding sourced via JAQU may result in a mandate and requirements may be specified which differ from the Council's priorities and objectives.
- Agreement with JAQU/National Highways is required for the inclusion of the A5036, approvals of the proposed CAZ scheme, powers and consents (including the requirement of a Charging Scheme Order under section 168 Transport Act 2000).
- The neighbouring Liverpool City Council Clean Air Plan, which may have direct impacts on any scheme implemented in Sefton, which must be understood and accounted for.

72. Ongoing monitoring and consideration of all these dependencies will be required should the scheme progress to FBC stage.

73. In addition to these key issues/dependencies/interdependencies, it is important to recognise that the implementation of a CAZ is not in itself an all-encompassing solution for air quality issues, either within or outside the CAZ. The modelling analysis for the preferred CAZ option suggests that even with the CAZ scheme in place some existing exceedances will remain at a small number of discrete locations. The ongoing expansion of the Port of Liverpool and changes in the commercial operations at the Port may result in changes in background concentrations of NO₂, which is particularly relevant to the A565 corridor which contains three of the AQMAs. The successful implementation of the CAP therefore requires synergy with ongoing Council policies and initiatives with respect to air quality, as well as the Port Air Quality Strategy, and collaboration

with key stakeholders such as the National Highways and neighbouring authorities within the city region.

Outline Business Case – Next Steps for the CAP OBC

74. Based on the OBC outcomes, a number of potential pathways have been identified. Table 6 below shows the different pathways available for Cabinet consideration, to determine the next steps for the CAP OBC.

75. The primary decision for Cabinet is whether to proceed to the preparation of a Full Business Case or not, but there are different approaches that can be taken depending on the primary decision and these are summarised below (Note – a funding source would need to be identified for Options 2 - 4).

Table 6 -Potential CAP OBC Pathways

A. Do not proceed to FBC for charging CAZ:		
1	Business As Usual (BAU) approach	Due to generally improving air quality situation and likely compliance with national thresholds within the next few years and the significant costs of implementing a charging CAZ - <i>Maintain current initiatives and monitoring.</i>
2	BAU <i>plus</i> Option 2A Corridor focussed measures <i>i.e. a Non-Charging CAZ (in AQ hotspots)</i>	Focus available resources on <i>additional and targeted measures to improve air quality in the proposed CAZ corridors</i> , for example supporting a vehicle upgrade programme.
2+	BAU <i>plus</i> Option 2A Corridor focussed measures <i>plus wider measures i.e. a Non-Charging CAZ (in AQ hotspots) plus wider area measures</i>	<i>As for 2 but allocate additional resources for wider measures</i> to improve air quality across south Sefton and expand to include carbon reduction initiatives targeted at the freight sector.
B. Proceed to FBC for a charging CAZ along the A565 and A5036:		
3	FBC for Charging CAZ (<i>if can gain JAQU/NH support</i>)	Only if JAQU support is gained through exploring/securing funding opportunities based on OBC outcomes i.e. <i>begin approach for JAQU liaison now</i> – understand current funding position / prepare submission.
4	FBC for Charging CAZ (Council funded)	Decision about submission to <i>JAQU to be made at a later date</i> i.e. Council fund FBC. <i>But also need to consider implementation/consultation/mitigation funding needed – recommend funding secured prior to proceeding to FBC.</i>

76. A two-staged approach to the Cabinet decision-making process on the progression of the CAP-OBC, is underway.

77. An ‘OBC information’ Report was presented to Cabinet in July 2022. The purpose of the report was:

- To advise Cabinet on outcomes of the CAP OBC,
- To seek approval of the OBC findings and recommendations
- To agree release of OBC into the public domain
- To agree further engagement with key stakeholders
- To share potential OBC pathway options for Cabinet to consider, as set out in **Table 6**.

78. An '**OBC Pathway Decision**' report is due to be prepared for consideration at Cabinet in Spring 2023, which will incorporate key stakeholder feedback (LCC, National Highways, Peel Ports, Joint Air Quality Unit) to inform the decision on the preferred pathway. The stakeholder engagement has been ongoing since Autumn 2022, to respond to and effectively communicate technical queries and considerations.

79. As well as the strategic high-level work underway as part of the Clean Air Plan detailed above Officers are continually looking at ways to further improve air quality and several actions are currently underway which are discussed in more detail below.

Joint Sefton/Driver and Vehicle Standards Agency (DVSA) Emissions Enforcement Project

80. Officers from Sefton working with DVSA inspectors have undertaken 2 joint vehicle emissions enforcement activities in Dec 2021 and recently in Sept 2022 to identify HGV's travelling along the A5036, A565 and motorway network which were emitting unacceptable levels of air pollution thus potentially indicating emission system control tampering and or faults.

81. During the most recent exercise last September sophisticated air pollution monitoring equipment was installed in DVSA stop cars and levels of NOx and PM were monitored in live traffic to detect suspect vehicles.

82. Exhaust plume emissions from around 150 vehicles were monitored with 11 vehicles being identified as emitting excessive emissions.

83. These vehicles were stopped at the switch Island DVSA inspection site and subject to further examination by DVSA inspectors.

84. Following the detailed examinations faults were found and 7 enforcement notices were issued to drivers by the DVSA requiring the faults to be rectified.

85. Further joint work is being considered potentially using roadside monitoring equipment to detect suspect vehicles.

Low-Cost Sensor co-location project Sefton/JMU

86. Sefton Council and John Moores University (JMU) are currently undertaking a joint air quality monitoring co-location study to determine how accurate lower cost air pollution sensors are, compared to Sefton's own DEFRA approved automatic monitoring equipment.

87. The study is underway at our Millers Bridge monitoring site and in collaboration with JMU, 3 lower cost sensors are currently being tested for accuracy. The 3 sensors being tested are:

- Libelium Smart Cities Plug & Sense (NO₂)
- Aeroqual AQY (NO₂, PM_{2.5} and PM₁₀)
- Earth Sense Zephyr (NO, NO₂, PM₁, PM_{2.5} and PM₁₀)

88. Comparison of NO/NO₂/PM₁₀/PM_{2.5} data has commenced with the Earth Sense Zephyr unit showing the most accuracy when compared with the DEFRA approved monitor.

DEFRA Grant funded educational behaviour change project

89. Officers from Sefton's Energy and Environmental Management Team supported by Environmental Health were successful in obtaining a DEFRA AQ grant of £122,500 to undertake an educational behaviour change project. The Project commenced in April 2021 and ran until December 2022. Evaluation of the project is currently underway

90. The project's overall aim was to raise awareness of Air Quality and in turn encourage behavioural changes that will have immediate and long-term positive impacts on Air Quality in Sefton.

91. The educational behaviour programme consisted of the following elements which have been successfully delivered:

- A Termly programme of AQ support and learning all linking to core national curriculum subjects. Including lesson plans, activity sheets, homework booklets, campaigns (walk to school, anti-idling), activities, how-to guides.
- Expansion and further development of the Clean Air Crew website, including also making it appeal to KS3/4 (Secondary schools)
- Development of higher level online AQ training course for parents/ teachers/ Sefton Staff/ residents
- Installation of a state of the art, digital technology immersive room at the Eco Centre and the development of 2 immersive experiences based on AQ. This has been accessed by both schools and the wider community.
- In addition schools in and around the AQMA areas will be provided with an AQ monitoring pack and training of how to use it (including 12 monthly NO₂ diffusion tubes that will provide localised AQ evidence of any immediate improvements).

Low cost AQ sensor Trial

92. Officers from Highways and Environmental Health are currently working on a joint air quality project as part of the School Streets and active travel agenda. Three low-cost air quality sensors (Earth Sense Zephyr) have been purchased to monitor air quality levels around 3 schools identified as part of the initial phases of the School Streets/active travel agenda.

93. The monitors were installed in June 2022 to enable Air Quality levels to be monitored before and after the School Street initiatives are implemented to assess any reductions in pollution as a result of the measures. Sensors will also be used to determine the different travel methods used (walk /cycle/car). In addition the use of further sensors is currently being considered as part of the expansion schools streets project.

Traffic signal upgrade/incorporation of AQ sensors

94. As part of a City Region traffic signal upgrade project, funding for 7 air quality sensors (EarthSense Zephyr) was secured which are now operational. The sensors are located at 7 key traffic light junctions in the Borough and integrated into Sefton's traffic signal control system (Stratos).

95. Real time air pollution data is now available from the sensors at these key locations, which can also be used to trigger specific traffic signal strategies to alleviate congestion if levels of localised pollution are of concern. Officers from Highways and Environmental Health are currently working together to develop potential traffic light strategies based on the sensor outputs.

Conclusions

96. Whilst air quality in the majority of the Borough is within NAQS objectives, the main on-going priority in Sefton for the coming years is to fully understand the effects that the predicted increase in HGVs due to port expansion will have on air quality and how this can be mitigated.

97. This is undoubtedly the most significant challenge for the Council in terms of air quality impact in the Borough at the present time, due to the scale of the expansion and the potential for this to impact on air quality in existing AQMAs and also impact on public exposure receptor residential locations on port access routes.

98. As detailed within this report the development of the Outline Business Case for a Sefton based CAZ under the overarching Clean Air Plan is complete and has demonstrated that a corridor HGV charging CAZ covering the A5036 and A565 could achieve significant air quality improvements within the CAZ boundary and wider borough. The progression of the CAP scheme to the next stage, i.e. Full Business Case, will depend on a number of factors, which include key risks and constraints identified in the OBC work along with identification of a funding source.

99. A number of potential CAP OBC pathways have been presented to Cabinet (Table 6) and key stakeholder engagement (LCC, National Highways, Peel Ports, Joint Air Quality Unit) is underway to help inform the decision on the preferred pathway. Once the engagement has been completed a OBC pathway decision report will be presented to Cabinet for their consideration. Further update reports specifically on the OBC will be provided in line with the communication and engagement strategy.