THIRD WAVE LOCAL AUTHORITIES – TARGETED FEASIBILITY STUDY TO DELIVER NITROGEN DIOXIDE CONCENTRATION COMPLIANCE IN THE SHORTEST POSSIBLE TIME (2019)

Local authorities covered	Sefton Council

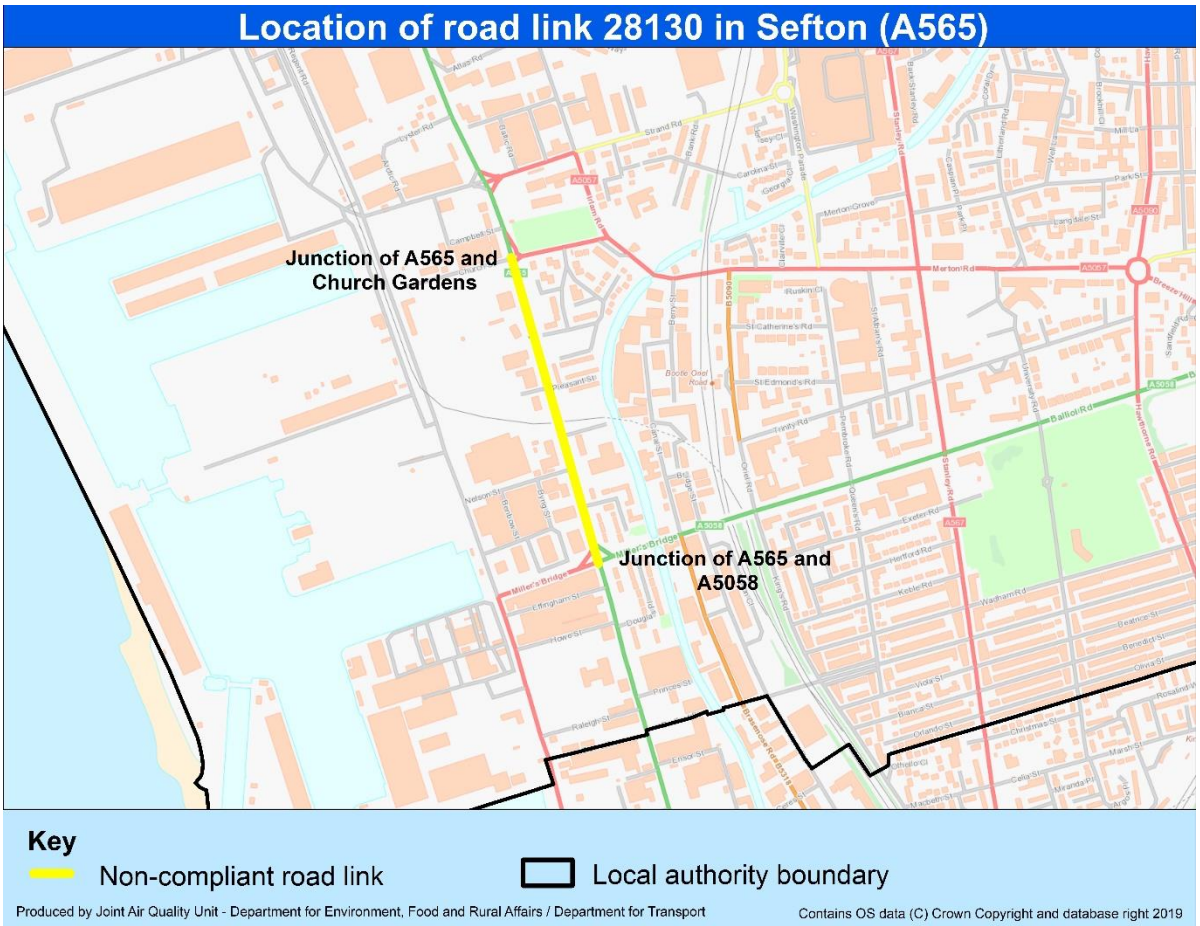
Part 1: Understanding the problem

This section should set out background on the information about the road links projected to have exceedances in the PCM national model, in combination with source apportionment data, to provide a description of the severity of the NO2 exceedance and its possible sources and causes. It should set out the scale of the problem and the case for change. Maps and local data should be included. ***Each road link should be addressed in turn.***

Background

2017 national PCM modelling projections for NO_2 have shown that a further road link within the Sefton Council area has a short term exceedance of the annual NO_2 legal limit of 40 µg/m^3.

The road link in question is identified as Census ID 28130 a 650m stretch of the A565 (Derby Road) -see map below:-



The link starts at the junction of the A565/A5058 (Miller's Bridge) moving north to the junction of the A565 with Church Gardens. The road link is a dual carriageway with commercial/industrial uses bounding the northbound carriageway and residential/commercial uses bordering the southbound carriageway. There are footways on both sides of the road.

The road link is part of the A565 which is a key strategic route in Sefton linking Southport and Liverpool, and which passes through Formby, Crosby and Bootle. The link is used in the main by commuters, and commercial HGV and LGV traffic. This stretch of the A565 on the whole is relatively free flowing but can be subject to moderate traffic congestion and queuing at a number of the traffic light junctions along the road during rush hour periods. The junction at Millers Bridge is the point at which most localised congestion occurs.

Source Apportionment

Regional Background	UB: Non traffic	UB: Traffic	Cars (Petrol)	Cars (Diesel)	HGVr (Diesel)	HGVa (Diesel)	Buses (Diesel)	LGVs (Petrol)	LGVs (Diesel)	Motorcycles (Petrol)	Taxis (Diesel)
4%	33%	7%	3%	18%	7%	9%	2%	0%	16%	0%	0%

We do not have any specific local data available to understand the source apportionment on this particular road link, and it will not be possible to collect this data in time to be considered as part of this study. To understand the nature of the problem on this road link we have therefore used the source apportionment data from the PCM model. The above table shows the contributions to the total NO_x on the road link in 2017.

From the data above Diesel cars, Diesel HGVs and Diesel LGVs all contribute a similar amount to levels of NO_x on the road link.

Projected NO_2 concentration for road link 28130

Table 1 below shows the nitrogen dioxide concentrations for the road link based on 2017 national projections.

Baseline roadside NO_2 concentration for projected years µg/m^3			
Year	2017	2019	2020
Concentration	45	42	40

Monitoring

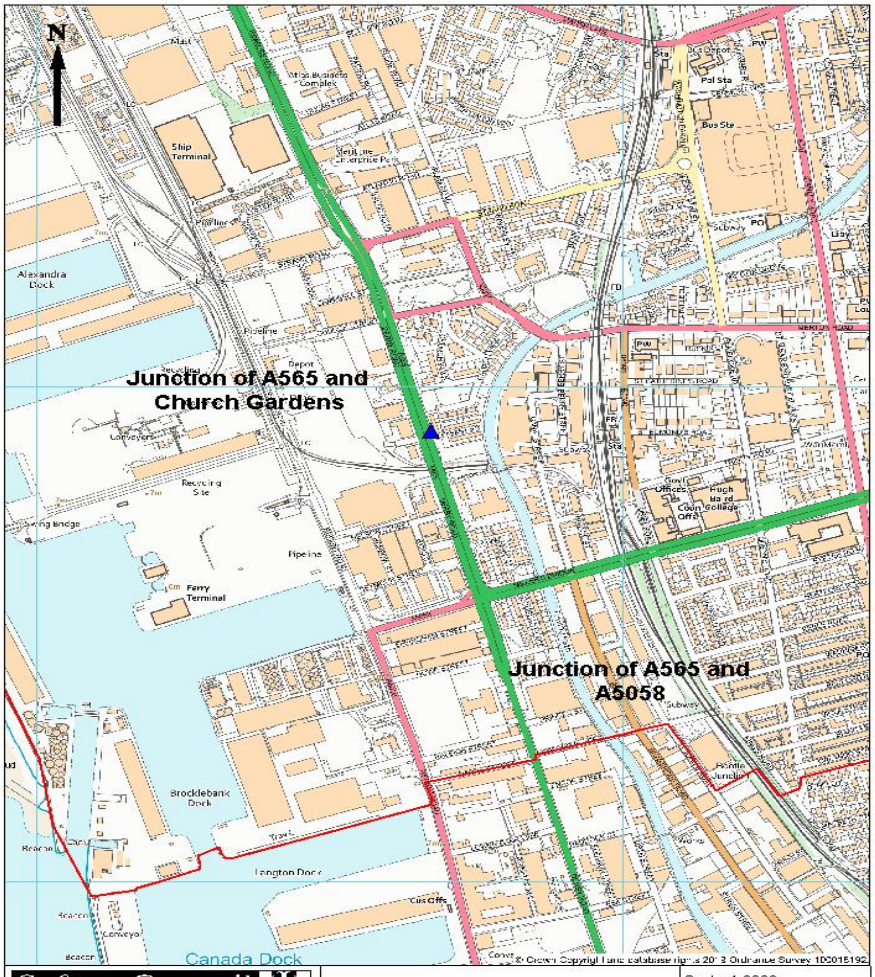
As part of Sefton's ongoing LAQM obligations, Sefton monitors air quality at a number of locations in the vicinity of road link ID 28130.

Following a review of the monitoring locations in the area against the requirements laid down in the Ambient Air Quality Directive one NO_2 diffusion tube monitoring location satisfies the AAQD siting requirements and is compliant with the guidelines for diffusion tube monitoring as laid out in TG 16. A Local Air Quality Monitoring checklist has been completed for this site and enclosed as Appendix 1.

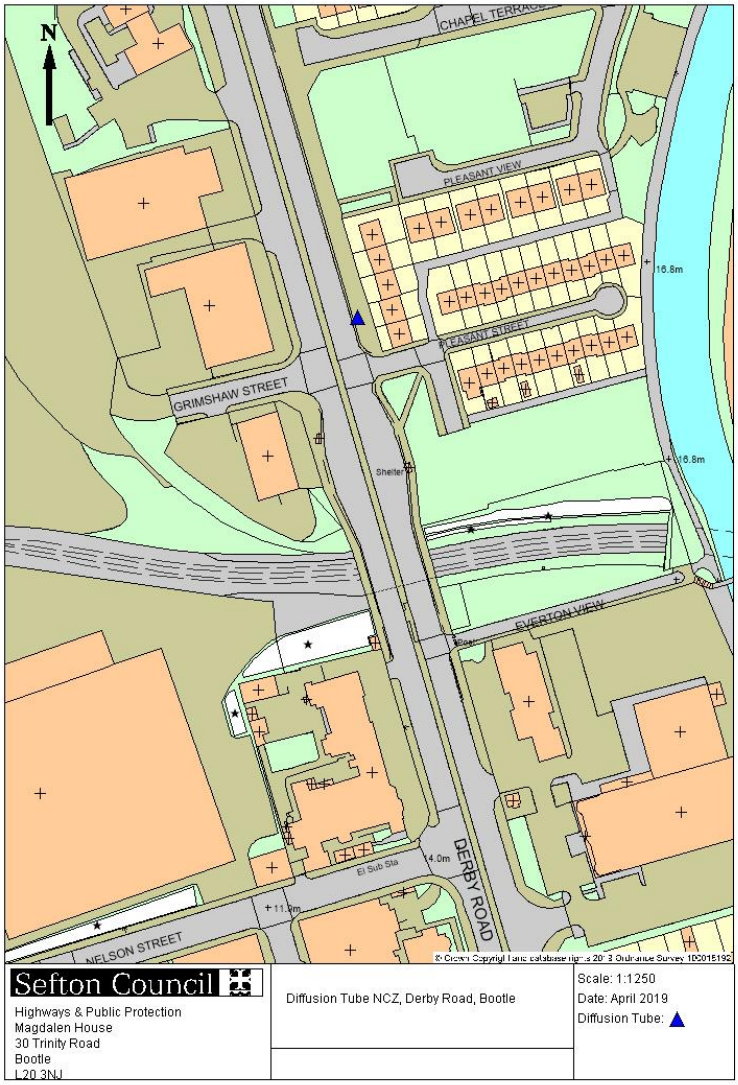
The monitoring check list has been reviewed by JAQU and their consultants and it has been determined that the required standards have been met.

A location Map A is provided below indicating the position of the diffusion tube on the road link along with a more detailed Map B showing its position in relation to the roadside.

Map A – Location of Diffusion tube NCZ on link 28130



Map B -Location of Diffusion tube NCZ



The diffusion tube monitoring data for 2017 at this site shows an annual mean NO_2 concentration of **42.987** µg/m^3. Thus when comparing actual monitoring data to modelled data, this indicates that monitored NO_2 levels in 2017 were in the region of 2 µg/m^3 less than modelled under the national PCM modelling. No data was available for 2018 at this location due to regular issues with missing tubes. Monitoring is continuing, however in 2019.

Future prediction of NO_2 levels using monitored data

The diffusion tube measurement indicates that the roadside NO_2 concentration for the road link was 42.987 (rounded up to 43) µg/m^3 in 2017. The Local Authority does not have any recent local traffic count data available, and the PCM model assumptions for this road link show that the HDV traffic flow is less than 10%.

The Local Air Quality Management (LAQM) support website outlines an approach for estimating roadside NO_2 concentrations in future years, based on historical monitoring data. This approach involves using an adjustment factor specific to the year being

projected, the year of measurement and the HDV traffic flow on the road link under consideration. A simplified version of these adjustment factors is shown in the table below:

Year	HDV traffic flow	
	=<10%	>10%
2015	1.000	1.000
2016	0.974	0.961
2017	0.947	0.921
2018	0.908	0.873
2019	0.870	0.828
2020	0.827	0.781
2021	0.781	0.733
2022	0.737	0.689
2023	0.701	0.653
2024	0.666	0.620
2025	0.634	0.591
2026	0.606	0.566
2027	0.580	0.544
2028	0.557	0.525
2029	0.537	0.510
2030	0.521	0.497

Following the approved NO_2 future projection guidance Sefton estimates projected NO_2 concentrations for this road link as follows:

Year	Adjustment factor calculation (relative to base year 2017)	NO_2 concentration (µg/m3)
2017	0.947/0.947 x 43	43
2018	0.908/0.947 x 43	41.2
2019	0.870/0.947 x 43	39.5
2020	0.827/0.947 x 43	37.6

As shown above the road link is projected to become compliant in 2019 without any additional measures being implemented.

Air Quality Improvement Actions already being implemented

The road link in question forms part of the A565 corridor and work has already commenced on improving traffic flow and reducing emissions along this key route as

detailed below

The North Liverpool Key Corridor (NLKC) project is a major joint scheme between Sefton Council and Liverpool City Council which will create a modern fully 'dualled' road link on the A565 Great Howard Street and Derby Road between Sefton and Liverpool.

New and improved cycling routes on Regent Road, reduced congestion, improved local access and better east-west movement will also strengthen the connections between Liverpool and Sefton.

The scheme will also support the development projects being undertaken as part of Liverpool Waters, North Liverpool Regeneration and the SuperPort.

As part of this project improvements are also to be made to the Millers Bridge junction which will improve traffic flow through this area.

It is anticipated that on completion of these works traffic flow along the road link in question will improve thus having a positive effect on reducing emissions of NO_X at the roadside. The scheme is likely to be completed by the end of 2019.

Conclusions

In view of the fact that local monitoring projections indicate this road link will become compliant by 2019 and the above improvement works ongoing as part of the North Liverpool Key Corridor scheme are likely to reduce emissions further, it is not considered any further interventions could be implemented to bring about compliance any sooner than forecast.

Appendix 1

Local Air Quality Monitoring Checklist (AQ1)

Diffusion Tube NCZ

		COLUMN 1	COLUMN 2
Ref	**Requirement**	**Local authority description (please provide details for each Requirement and enter "NA" if not applicable)**	**Please highlight where the approach differs from the Requirements**
A	**NO_2 measurements from roadside automatic chemiluminescence analysers**		
A 1	**Date and location details**		
A.1.1	Please provide the year(s) and/or month(s) in which the data was collected	NA	
A.1.2	What are the location coordinates (easting, northing) of the monitoring station?	NA	
A.1.3	Please provide the corresponding Census ID (if known) and road name/number on which the site is located	NA	

A.2	**Roadside automatic chemiluminescence analyser data quality - LAQM TG16 criteria**		
A.2.1	Please provide the following details on the analyser used: • Name/Code name • Is it part of any network e.g. AURN?[1] • Manufacturer • Model number • Year of manufacture • Serial number	NA	
A.2.2	Does the monitored data quality meet with the LAQM TG16 minimum requirements?		
	• Has the local authority attended the monitoring station at least every 2 or 4 weeks (depending on whether the location is experiencing high NO_2 concentrations or not, respectively) to change the filter and check the calibration of the instrument?	NA	
	• Is the instrument checked and maintained by an independent organisation accredited to perform a QA/QC audit to ISO 17025, every 6 months?	NA	
	• Has the instrument been serviced by the manufacturer or an approved service unit, every 6 months (within 3 weeks of the QA/QC audit)?	NA	
A.2.3	Details of data capture		
	• Does it have the minimum data capture of 75% for the year?NA	NA	
	• If not, was the monitoring data completed for at least 3 months? If so, has the data been annualised?	NA	

[1] If the site is part of the AURN the local authority should contact JAQU, as it may not be necessary to complete the monitoring checklist.

A2.4	**Summary of the data** Please set out the annual mean NO_2 concentrations recorded for each year. If you have data for *less than 12 months* please provide the monthly mean NO_2 concentrations and the annualised mean NO_2 concentrations:		
	2015	NA	
	2016	NA	
	2017	NA	
	2018	NA	
	Please also complete to siting requirements in part C of this table.		
B	**NO_2 measurements from roadside diffusion tubes**		
B.1	**Date and location details**		
B.1.1	Please provide the year(s) and/or month(s) in which the data was collected	2017	
B.1.2	What are the location coordinates (easting, northing) of the diffusion tube?	333656,394917	

B.1.3	Please provide the corresponding Census ID (if known) and road name/number on which the site is located	28130	
B.2	**Roadside diffusion tube data quality - LAQM TG16[2] criteria**		
B.2.1	Does the monitored data quality meet with the LAQM TG16 minimum requirements?		
	• Was a local collocation study conducted to validate the diffusion tube data? If so give details of the collocation study including site of the chemiluminescent analyser and the number of tubes at the site forming the collocation study (i.e. triplicate or single tubes). Does the collocation study meet the requirement for the tube and chemiluminescent analyser to sample the same air mass by being within 1 metre distance to each other?	No	
	• If a local collocation study has not been undertaken was a national bias adjustment factor applied to the data?	0.89	
	• What bias adjustment factor has been applied to the diffusion tube data? (Please state for each year if reporting multiple years).	0.89	
	• What Laboratory was used to analyse the diffusion tubes?	Gradko	
	• What preparation method has been used for the diffusion tube (e.g. 20% Triethanolamine in water)?	20% Triethanolamine in water	
	• Does the Laboratory participate in the UK-PT scheme, inter-comparison exercises or provision of quality control solutions?[3]	Yes	
B.2.2	Details of data capture		

[2] Local Air Quality Management (LAQM) Technical Guidance 2016 (TG16) can be found at https://laqm.defra.gov.uk/technical-guidance/
[3] More information participating laboratories can be found at https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

	• Was the monitoring data completed for at least 75% of the year (9 months)?	Yes	
	• If not, was the monitoring data completed for at least 3 months? If so, has the data been annualised?		
	• Have the diffusion tubes been changed on a monthly basis in accordance with the Diffusion Tube Calendar?	Yes	
B2.3	**Summary of the data** Please set out the annual mean NO_2 concentrations recorded for each year. If you have data for *less than 9 months* please provide the monthly mean NO_2 concentrations and the annualised mean NO_2 concentrations:		
	2015		
	2016		
	2017	**42.987**	
	2018		
	Please also complete to siting requirements in part C of this table.		

C	**Roadside Measurements Siting Criteria – must be completed for both automatic and diffusion tube NO_2 measurements**		
C.1	**Does the monitoring site comply with the macroscale siting requirements set out in Annex III of the AAQD[4]?**		
	• Is the air sampled representative of air quality for a street segment no less than 100 m length?	Yes	
C.2	Does the monitoring site comply with the microscale siting requirements set out in Annex III of the AAQD?		
	• Is it at least 25 m from the edge of major junctions?	Yes	
	• Is it no more than 10 m from the kerbside?	Yes	
	• Is the inlet of the sampling station between 1.5 m and 4 m above the ground?	Yes	
	• Is the flow around the inlet unrestricted without any obstructions affecting the airflow (e.g. buildings, balconies, trees)?	Yes	
	• Is the inlet at least 0.5 m from the nearest building?	Yes	

[4] The Ambient Air Quality Directive (2008) can be found at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0050-20150918