



Department  
for Environment  
Food & Rural Affairs



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for Transport

# Air Quality Plan for tackling roadside nitrogen dioxide concentrations in Liverpool Urban Area (UK0006)

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## Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	This document . . . . .	3
1.2	Context . . . . .	3
1.3	Zone status . . . . .	3
1.4	Plan structure . . . . .	4
<b>2</b>	<b>General Information About the Zone</b>	<b>4</b>
2.1	Administrative information . . . . .	4
2.2	Assessment details . . . . .	6
2.3	Air quality reporting . . . . .	8
<b>3</b>	<b>Overall Picture for 2015 Reference Year</b>	<b>8</b>
3.1	Introduction . . . . .	8
3.2	Reference year: NO <sub>2</sub> _UK0006_Annual_1 . . . . .	8
<b>4</b>	<b>Measures</b>	<b>13</b>
4.1	Introduction . . . . .	13
4.2	Source apportionment . . . . .	13
4.3	Measures . . . . .	13
4.4	Measures timescales . . . . .	14
<b>5</b>	<b>Baseline Model Projections</b>	<b>14</b>
5.1	Overview of model projections . . . . .	14
5.2	Baseline projections: NO <sub>2</sub> _UK0006_Annual_1 . . . . .	15
	<b>Annexes</b>	<b>20</b>
A	References . . . . .	20
B	Source apportionment graphs . . . . .	21
C	Tables of measures . . . . .	23

# 1 Introduction

## 1.1 This document

This document is the Liverpool Urban Area agglomeration zone (UK0006) updated air quality plan for tackling roadside nitrogen dioxide (NO<sub>2</sub>) concentrations. This is an update to the air quality plan published in December 2015 (<https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015>).

This plan presents the following information:

- General information regarding the Liverpool Urban Area agglomeration zone
- Details of NO<sub>2</sub> exceedance situation within the Liverpool Urban Area agglomeration zone
- Details of local air quality measures that have been implemented, will be implemented or are being considered for implementation in this agglomeration zone

This air quality plan for the Liverpool Urban Area agglomeration zone should be read in conjunction with the separate UK Air Quality Plan for tackling roadside nitrogen dioxide concentrations (hereafter referred to as the overview document) which sets out, amongst other things, the authorities responsible for delivering air quality improvements and the list of UK and national measures that are applied in some or all UK zones. The measures presented in this zone plan, and the accompanying UK overview document show how the UK will ensure that compliance with the NO<sub>2</sub> limit values is achieved in the shortest possible time.

This plan should also be read in conjunction with the supporting UK Technical Report which presents information on assessment methods, input data and emissions inventories used in the analysis presented in this plan.

## 1.2 Context

Two NO<sub>2</sub> limit values for the protection of human health have been set in the Air Quality Directive (2008/50/EC). These are:

- The annual mean limit value: an annual mean concentration of no more than 40  $\mu\text{g m}^{-3}$
- The hourly limit value: no more than 18 exceedances of 200  $\mu\text{g m}^{-3}$  in a calendar year

The Air Quality Directive stipulates that compliance with the NO<sub>2</sub> limit values will be achieved by 01/01/2010.

## 1.3 Zone status

The assessment undertaken for the Liverpool Urban Area agglomeration zone indicates that the annual limit value was exceeded in 2015 but is likely to be achieved by 2020 through the introduction of measures included in the baseline.

## 1.4 Plan structure

General administrative information regarding this agglomeration zone is presented in Section 2.

Section 3 then presents the overall picture with respect to NO<sub>2</sub> levels in this agglomeration zone for the 2015 reference year of this air quality plan. This includes a declaration of exceedance situations within the agglomeration zone and presentation of a detailed source apportionment for each exceedance situation.

An overview of the measures already taken and to be taken within the agglomeration zone both before and after 2015 is given in Section 4.

Baseline modelled projections for each year from 2017 to 2030 for each exceedance situation are presented in Section 5. The baseline projections presented here include, where possible, the impact of measures that have already been taken and measures for which the relevant authority has made a firm commitment to implement. However, it has not been possible to quantify the impact of all the measures. This section therefore also explains which measures have been quantified, and hence included in the model projections, and which measures have not been quantified.

# 2 General Information About the Zone

## 2.1 Administrative information

Zone name: Liverpool Urban Area

Zone code: UK0006

Type of zone: agglomeration zone

Reference year: 2015

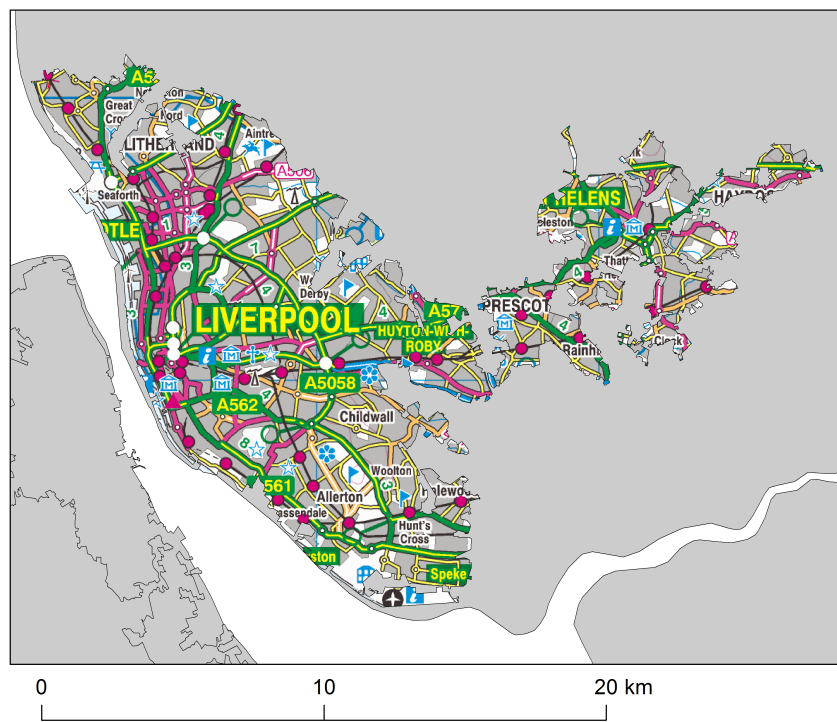
Extent of zone: Figure 1 shows the area covered by the Liverpool Urban Area agglomeration zone.

Local Authorities within the zone: Figure 2 shows the location of Local Authorities within the agglomeration zone. A list of these Local Authorities is also given below. The numbers in the list correspond to the numbers in Figure 2.

1. Knowsley Metropolitan Borough Council
2. Liverpool City Council
3. Sefton Metropolitan Borough Council
4. St Helens Metropolitan Borough Council

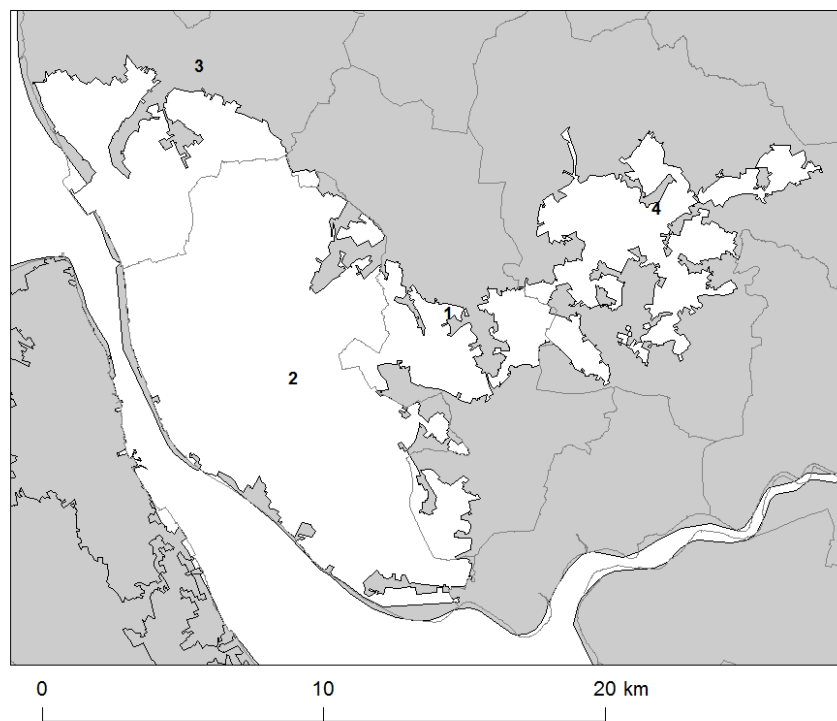
(Note: Local Authority boundaries do not necessarily coincide with zone boundaries. Hence Local Authorities may be listed within more than one zone plan.)

**Figure 1: Map showing the extent of the Liverpool Urban Area agglomeration zone (UK0006).**



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**Figure 2: Map showing Local Authorities within the Liverpool Urban Area agglomeration zone (UK0006).**



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## 2.2 Assessment details

### Measurements

NO<sub>2</sub> measurements in this zone were available in 2015 from the following national network monitoring stations (NO<sub>2</sub> data capture<sup>1</sup> for each station in 2015 shown in brackets):

1. Liverpool Queen's Drive Roadside GB0922A (96%)
2. Liverpool Speke GB0777A (98%)

Full details of monitoring stations within the Liverpool Urban Area agglomeration zone are available from <http://uk-air.defra.gov.uk/networks/network-info?view=aurn>.

### Modelling

Modelling for the 2015 reference year has been carried out for the whole of the UK. This modelling covers the following extent within this zone:

- Total background area within zone (approx): 198 km<sup>2</sup>
- Total population within zone (approx): 744,225 people

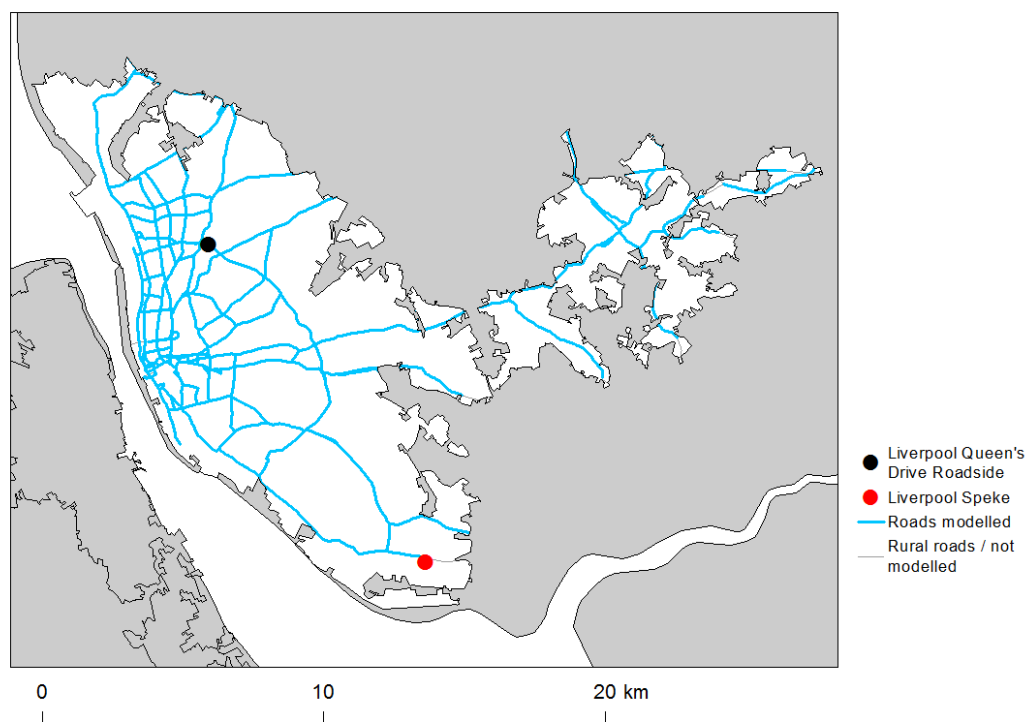
### Zone maps

Figure 3 presents the location of the NO<sub>2</sub> monitoring stations within this zone for 2015 and the roads for which NO<sub>2</sub> concentrations have been modelled. NO<sub>2</sub> concentrations at background locations have been modelled across the entire zone at a 1 km x 1 km resolution.

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<sup>1</sup>Annual data capture is the proportion of hours in a year for which there are valid measurements at a monitoring station, expressed in this document as a percentage. The Implementing Provisions on Reporting (IPR) guidance requires that a minimum data capture of 85% is required for compliance reporting (that is 90% valid data, plus a 5% allowance for data loss due to planned maintenance and calibration). Monitoring stations with at least 75% data capture have been included in the modelling analysis to ensure that a greater number of operational monitoring sites have been used for model calibration and verification purposes. For more information on compliance reporting under European Directives see Section 2.3.

**Figure 3: Map showing the location of the NO<sub>2</sub> monitoring stations with valid data in 2015 and roads where concentrations have been modelled within the Liverpool Urban Area (UK0006) agglomeration zone.**



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## 2.3 Air quality reporting

From 2001 to 2012 the UK has reported annually on air quality concentrations using a standard Excel questionnaire (Decision 2004/461/EC). These questionnaires are available online from <http://cdr.eionet.europa.eu/gb/eu/annualair>. Since 2013 reporting has been via an e-reporting system (Decision 2011/850/EU) <http://cdr.eionet.europa.eu/gb/eu/>.

In addition, the UK has reported on air quality plans and programmes (Decision 2004/224/EC) since 2003. The most recent previous UK air quality plan for nitrogen dioxide was published in 2015. The plan and supporting documents are available at <https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015> and the submission of this plan via e-reporting is published at <http://cdr.eionet.europa.eu/gb/eu/aqd/h/envvryhbq/>. Historic plans and programmes are available on <http://cdr.eionet.europa.eu/gb/eu/aqpp>.

# 3 Overall Picture for 2015 Reference Year

## 3.1 Introduction

There are two limit values for the protection of health for NO<sub>2</sub>. These are:

- The annual limit value (annual mean concentration of no more than 40  $\mu\text{gm}^{-3}$ )
- The hourly limit value (no more than 18 hourly exceedances of 200  $\mu\text{gm}^{-3}$  in a calendar year)

Within the Liverpool Urban Area agglomeration zone the annual limit value was exceeded in 2015. Hence, one exceedance situation for this zone has been defined, NO<sub>2</sub>\_UK0006\_Annual\_1, which covers exceedances of the annual limit value. This exceedance situation is described below.

## 3.2 Reference year: NO<sub>2</sub>\_UK0006\_Annual\_1

The NO<sub>2</sub>\_UK0006\_Annual\_1 exceedance situation covers all exceedances of the annual mean limit value in the Liverpool Urban Area agglomeration zone in 2015.

Compliance with the annual limit value in this exceedance situation has been assessed using a combination of air quality measurements and modelling. Table 1 presents measured annual concentrations at national network stations in this exceedance situation since the 1st Daughter Directive (1999/30/EC) came into force in 2001. This shows that there were no measured exceedances of the annual limit value in this zone in 2015. Table 2 summarises modelled annual mean NO<sub>2</sub> concentrations in this exceedance situation for the same time period. This table shows that, in 2015, 25.3 km of road length was modelled to exceed the annual limit value. There were no modelled background exceedances of the annual limit value. The maximum measured concentration in the zone varies due to changes in emissions and varying meteorology in different years. However, the models are also updated each year to take into account the most up-to-date science, so the modelled results for different years may not be directly comparable. Maps showing the modelled annual mean NO<sub>2</sub> concentrations for 2015 at background and at roadside locations are presented in Figures 4 and 5 respectively. All modelled exceedances of the annual limit value are coloured orange or red in the maps.

The modelling carried out for this exceedance situation has also been used to determine the annual mean NO<sub>x</sub> source apportionment for all modelled locations. Emissions to air are regulated in terms of oxides of nitrogen

(NO<sub>x</sub>), which is the term used to describe the sum of nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO). Ambient NO<sub>2</sub> concentrations include contributions from both directly emitted primary NO<sub>2</sub> and secondary NO<sub>2</sub> formed in the atmosphere by the oxidation of NO. As such, it is not possible to calculate an unambiguous source apportionment specifically for NO<sub>2</sub> concentrations; therefore the source apportionment in this plan is presented for NO<sub>x</sub>, rather than for NO<sub>2</sub> (for further details please see the UK Technical Report). Table 3 summarises the modelled NO<sub>x</sub> source apportionment for the section of road with the highest NO<sub>2</sub> concentration in this exceedance situation in 2015. This is important information because it shows which sources need to be tackled at the location with the largest compliance gap in the exceedance situation.

Figure B.1 in Annex B presents the annual mean NO<sub>x</sub> source apportionment for each section of road within the NO<sub>2</sub>\_UK0006\_Annual\_1 exceedance situation (i.e. the source apportionment for all exceeding roads only) in 2015.

**Table 1: Measured annual mean NO<sub>2</sub> concentrations at national network stations in NO<sub>2</sub>\_UK0006\_Annual\_1 for 2001 onwards,  $\mu\text{gm}^{-3}$  (a). Data capture shown in brackets.**

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Liverpool Centre (GB0594A)	38 (93)	36 (68)													
Liverpool Queen's Drive Roadside (GB0922A)								40 (100)	38 (99)	37 (99)	35 (99)	30 (56)	34 (64)	34 (99)	34 (96)
Liverpool Speke (GB0777A)			27 (57)	23 (98)	24 (98)	22 (92)	24 (96)	22 (95)	22 (94)	30 (94)	24 (97)	25 (86)	23 (95)	25 (91)	22 (98)

(a) Annual Mean Limit Value =  $40 \mu\text{gm}^{-3}$

**Table 2: Annual mean NO<sub>2</sub> model results in NO<sub>2</sub>\_UK0006\_Annual\_1 for 2001 onwards.**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Road length exceeding (km)	175.1	65.9	155.8	120.1	121.0	120.9	129.9	72.3	67.3	100.5	64.5	60.3	38.6	33.6	25.3
Background exceeding (km <sup>2</sup> )	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Maximum modelled concentration ( $\mu\text{gm}^{-3}$ ) (a)	63.2	53.3	63.3	67.9	84.1	76.2	87.4	81.7	78.3	88.0	79	80	57	54	50

(a) Annual Mean Limit Value =  $40 \mu\text{gm}^{-3}$

**Table 3: Modelled annual mean NO<sub>x</sub> source apportionment at the location with the highest NO<sub>2</sub> concentration in 2015 in NO2\_UK0006\_Annual\_1 (µgm<sup>-3</sup>) traffic count point 37905 on the A57; OS grid (m): 334400, 390600) .**

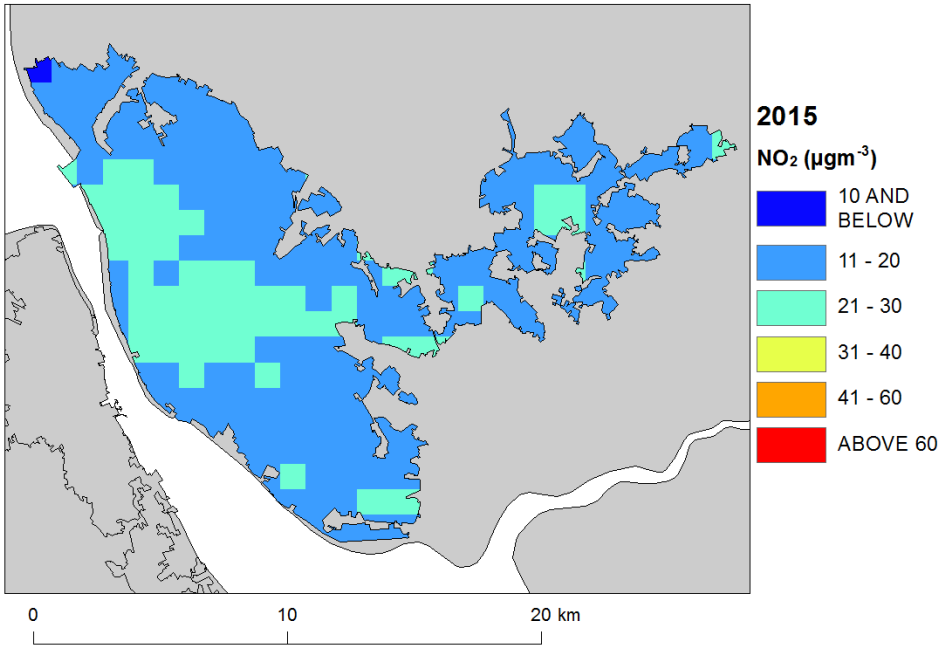
Spatial scale	Component	Concentration at highest road link (a)
Regional background sources NO <sub>x</sub> (i.e. contributions from distant sources of > 30 km from the receptor).	Total	4.2
	From within the UK	2.2
	From transboundary sources (includes shipping and other EU member states)	2.1
Urban background sources NO <sub>x</sub> (i.e. sources located within 0.3 - 30 km from the receptor).	Total	40.1
	From road traffic sources	25.8
	From industry (including heat and power generation)	2.4
	From agriculture	NA
	From commercial/residential sources	8.4
	From shipping	1.5
	From off road mobile machinery	1.8
	From natural sources	NA
	From transboundary sources	NA
	From other urban background sources	0.2
Local sources NO <sub>x</sub> (i.e. contributions from sources < 0.3 km from the receptor).	Total	95.3
	From petrol cars	3.1
	From diesel cars	13.6
	From HGV rigid (b)	5.7
	From HGV articulated (b)	0.1
	From buses	63.0
	From petrol LGVs (c)	0.0
	From diesel LGVs (c)	9.9
	From motorcycles	0.0
	From London taxis	0.0
Total NO <sub>x</sub> (i.e. regional background + urban background + local components)		139.6
Total NO <sub>2</sub> (i.e. regional background + urban background + local components)		50

(a) Components are listed with NO<sub>x</sub> concentration of NA when there is no source from this sector.

(b) HGV = heavy goods vehicle

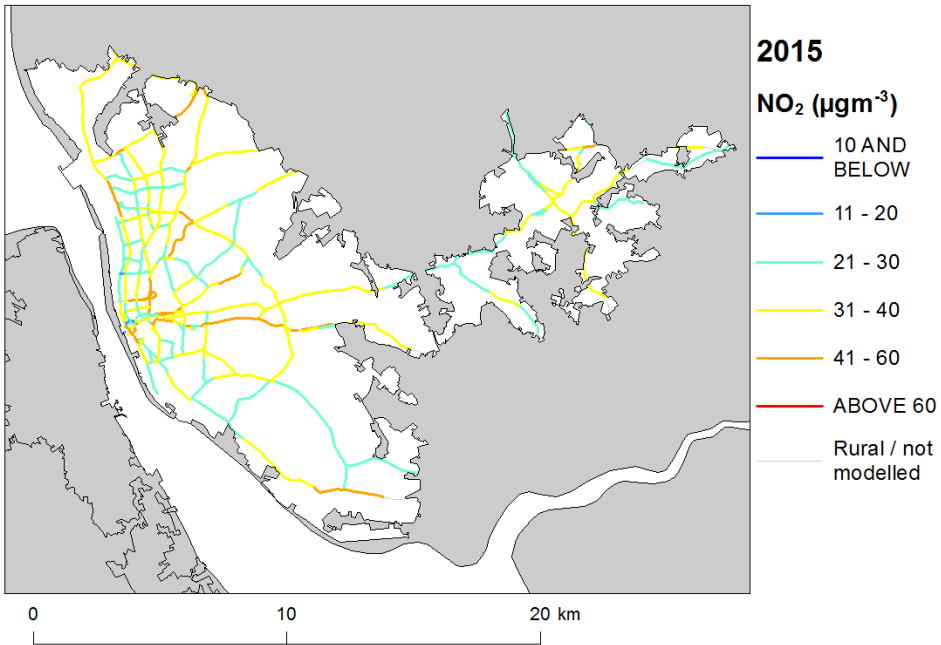
(c) LGV = light goods vehicle

**Figure 4: Map of modelled background annual mean NO<sub>2</sub> concentrations 2015. Modelled exceedances of the annual limit value are shown in orange and red.**



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**Figure 5: Map of modelled roadside annual mean NO<sub>2</sub> concentrations 2015. Modelled exceedances of the annual limit value are shown in orange and red.**



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## 4 Measures

### 4.1 Introduction

This section gives details of measures that address exceedances of the NO<sub>2</sub> limit values within Liverpool Urban Area agglomeration zone. This includes both measures that have already been taken and measures for which there is a firm commitment that they will be taken.

Section 5 then explains the extent to which it has been possible to incorporate the impacts of these measures into the baseline modelling carried out for this assessment.

### 4.2 Source apportionment

It is important to understand which sources are responsible for causing the exceedance in order to most effectively tailor measures to address the NO<sub>2</sub> exceedance situation described in Section 3 above. This can be achieved by considering the source apportionment for the exceedance situation, also presented in Section 3. A summary of what the source apportionment shows and the implications for which measures would therefore be appropriate is given here.

Local road traffic was the dominant source in this exceedance location in the reference year. The largest contribution was from buses at the location of maximum exceedance with a contribution of 63  $\mu\text{gm}^{-3}$  of NO<sub>x</sub> out of a total of 139.6  $\mu\text{gm}^{-3}$  of NO<sub>x</sub>. Diesel cars and diesel LGVs were important sources on the motorway roads with the highest concentrations in this exceedance situation. Diesel cars, diesel LGVs and on some roads HGVs or buses were important sources on the primary roads with the highest concentrations. Articulated HGVs, diesel cars, diesel LGVs and rigid HGVs were important sources on the trunk roads with the highest concentrations.

This indicates that appropriate measures should impact on local road traffic sources in this zone. Other measures to address the urban background sources may also be beneficial.

### 4.3 Measures

Measures potentially affecting NO<sub>2</sub> in this agglomeration zone have been taken and/or are planned at a range of administrative levels. These are:

- European Union
- National (i.e. England, Scotland, Wales, Northern Ireland or whole UK)
- Local (i.e. UK Local Authorities)

Details of European Union measures (e.g. Euro Standards, Fuel Quality Directives, Integrated Pollution Prevention and Control) can be found on the European Commission's website ([http://ec.europa.eu/environment/air/index\\_en.htm](http://ec.europa.eu/environment/air/index_en.htm)). Details of national measures are given in the UK overview document.

Relevant Local Authority measures within this exceedance situation are listed in Table C.1 (see Annex C). Table C.1 lists measures which a local authority has carried out or is in the process of carrying out, plus additional measures which the local authority is committed to carrying out or is investigating with the expectation of carrying out in the future.

Measures by local authorities in the Liverpool Urban Area include, for example, a low emission strategy that includes policies on reducing congestion and pollution. The intention is to encourage a shift away from using cars e.g. to cycling and walking for travelling to work or school. There is action underway to improve the emission standard of buses via voluntary bus quality partnerships. Freight and taxi quality partnership initiatives are also in place. Traffic planning has also been utilised to improve traffic flow.

Between 2013 and 2016 the Liverpool City Region (LCR) has been awarded £1.35 million through the clean Bus Technology Fund whereby 130 buses have had retrofits to bring them up to Euro VI standard.

Funding for Recharging Points was secured from the Office for Low Emission Vehicles (OLEV) to install a network of electric vehicle charging points across the LCR. Phase 2 of the scheme is now underway, funded by the Local Growth Deal funding. The LCR also secured funding from OLEV to introduce 23 ultra-low emission vehicles (ULEV's) into local authority fleets across the City Region.

The City Council launched a city bike hire scheme in 2014. This has had 170,000 hires in the first two years of operation.

The Local Transport Plan for the area also promotes the implementation of a low emissions strategy. The aim is to improve air quality and health and provide a stimulus to the creation of new technologies in support of a Regional low carbon economy.

## 4.4 Measures timescales

Timescales for national measures are given in the UK overview document.

Local Authorities report on progress with the implementation of their action plans annually and review action plan measures regularly. Information on local measures was collected in February/March 2015. Local authorities were asked to review and, where necessary, provide updates to measures in March/April 2017. Hence, any Local Authority action plans and measures adopted by Local Authorities after this time have not been included in this air quality plan, unless additional information was provided during the consultation process.

The reference year for this air quality plan is 2015. Where measures started and finished before 2015, then the improvement in air quality resulting from these measures will have already taken place before the reference year and the impact of these measures will have been included in the assessment where the measure has had an impact on the statistics used to compile the emission inventory. Many measures started before the reference year and will continue to have a beneficial impact on air quality well beyond the reference year. Measures with a start date before 2015 and an end date after 2015 may have an impact on concentrations in the reference year and a further impact in subsequent years. Where the Status column in Annex C is 'Implementation', this shows that this measure is already underway or that there is a commitment for this measure to go ahead. Where the Status is 'Planning', 'Preparation' or 'Other' the level of commitment is less clear and it is possible some of these measures may not go ahead.

# 5 Baseline Model Projections

## 5.1 Overview of model projections

Model projections for each year from 2017 to 2030, starting from the 2015 reference year described in Section 3, have been calculated in order to determine when compliance with the NO<sub>2</sub> limit values is likely to be achieved on the basis of EU, regional and local measures currently planned. Details of the methods used for the baseline emissions and projections modelling are provided in the UK technical report.

For national measures, it has not been possible to quantify the impact of all measures on emissions and ambient concentrations. The impact for all quantifiable measures has been included in the baseline projections.

The impacts of the individual Local Authority measures have not been explicitly included in the baseline model projections. However, measures may have been included implicitly if they have influenced the traffic counts for 2015 (used as a basis for the compilation of the emission inventory) or in the traffic activity projections to 2020 and beyond (used to calculate the emissions projections). It should be recognised that these measures will have a beneficial impact on air quality, even if it has not been possible to quantify this impact here.

## 5.2 Baseline projections: NO<sub>2</sub>\_UK0006\_Annual\_1

Table 4 presents summary results for the baseline model projections for each year from 2017 to 2030 for the NO<sub>2</sub>\_UK0006\_Annual\_1 exceedance situation. This shows that the maximum modelled annual mean NO<sub>2</sub> concentration predicted for 2020 in this exceedance situation is 40  $\mu\text{gm}^{-3}$ . Hence, the model results suggest that compliance with the NO<sub>2</sub> annual limit value is likely to be achieved by 2020 under baseline conditions.

Figure 6 and 7 presents maps of projected annual mean NO<sub>2</sub> concentrations at background and roadside locations respectively in 2020, the year at which compliance is achieved. For reference Figures 8 and 9 show maps of projected annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030 for background and roadside locations respectively.

It should be noted that the baseline projections presented here include the impacts of some measures, where they can be quantified, that have already been or will be implemented.



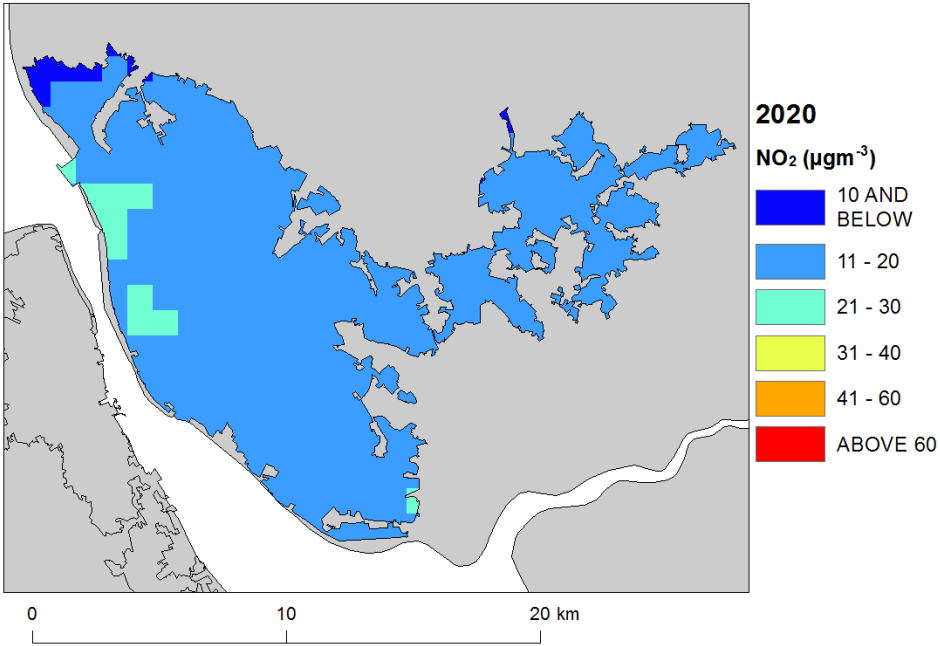
Table 4: Annual mean NO<sub>2</sub> model results in NO<sub>2</sub>\_UK0006\_Annual\_1.

	2015	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Road length exceeding (km)	25.3	12.1	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background exceeding (km <sup>2</sup> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum modelled concentration NO <sub>2</sub> (μgm <sup>-3</sup> ) (a)	50	46	44	42	40	38	36	34	32	30	29	28	26	26	25
Corresponding modelled concentration NO <sub>x</sub> (μgm <sup>-3</sup> ) (b)	140	112	105	99	92	85	79	73	68	64	60	57	54	52	49

(a) Annual Mean Limit Value = 40 μgm<sup>-3</sup>

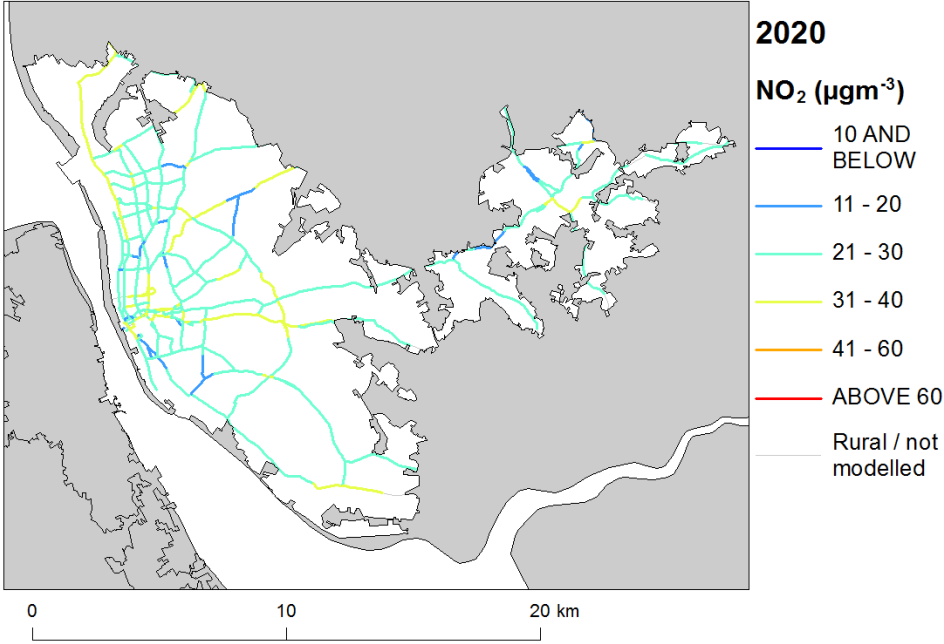
(b) NO<sub>x</sub> is recorded here for comparison with the NO<sub>x</sub> source apportionment graphs for 2015 presented in Annex B of this plan. Limit values for EU directive purposes are based on NO<sub>2</sub>.

**Figure 6: Background baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, the year at which compliance is achieved under baseline conditions. Modelled exceedances of the annual limit value are shown in orange and red.**



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**Figure 7: Roadside baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, the year at which compliance is achieved under baseline conditions. Modelled exceedances of the annual limit value are shown in orange and red.**



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Figure 8: Background baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030. 2015 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.

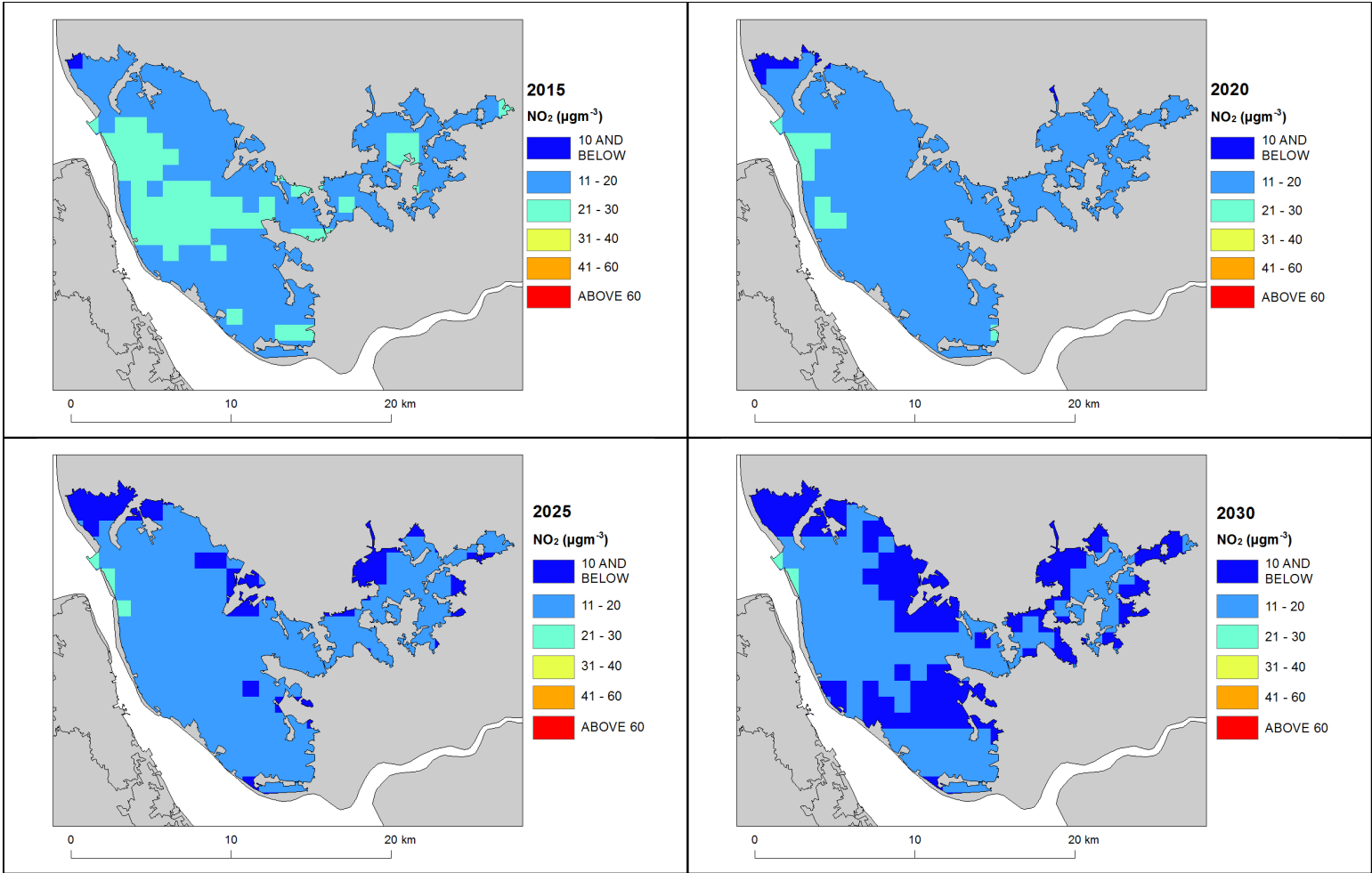
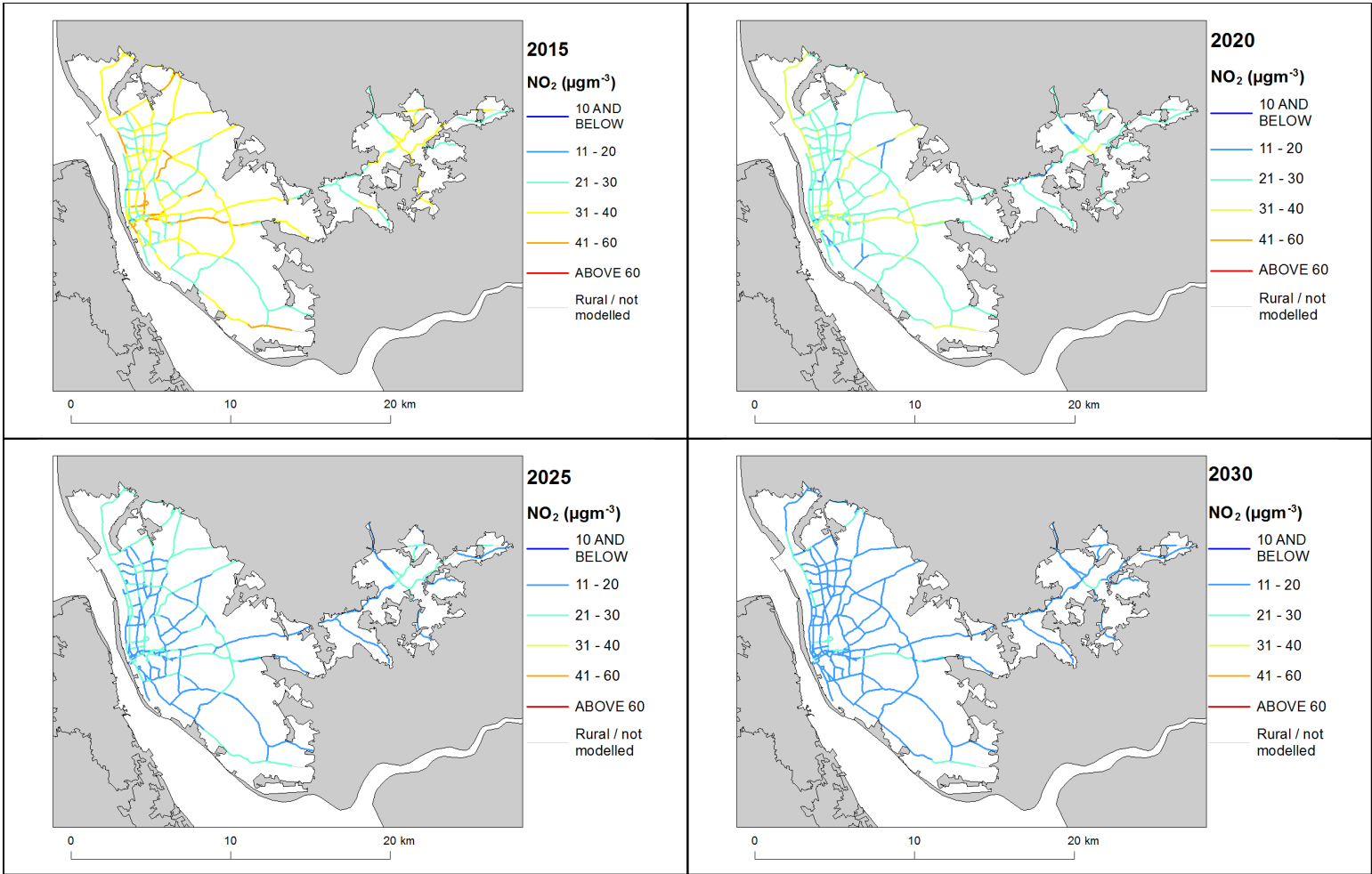


Figure 9: Roadside baseline projections of annual mean NO<sub>2</sub> concentrations in 2020, 2025 and 2030. 2015 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.



# Annexes

## A References

1st Daughter Directive 1999/30/EC. Council Directive 1999/30/EC, of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (The First Daughter Directive). From the Official Journal of the European Communities, 29.6.1999, En Series, L163/41.

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Decision 2004/461/EC. Commission Decision of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council. From the Official Journal of the European Union, 30.4.2004, En Series, L156/78

Decision 2011/850/EU. Commission Implementing Decision of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality. From the Official Journal of the European Union, 17.12.2011, En Series, L335/86

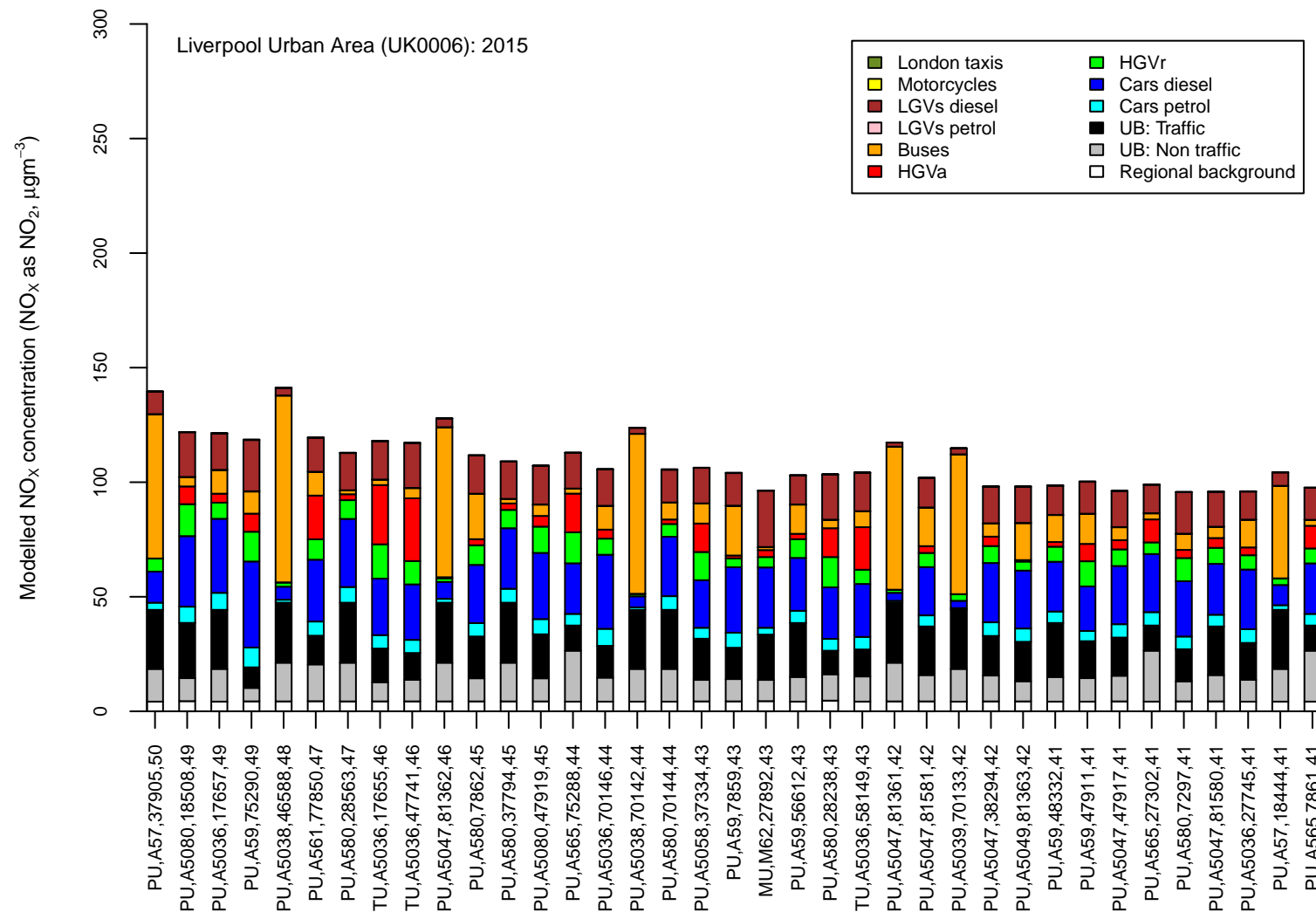
IPR 2013. Guidance on the Commission Implementing Decision laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air (Decision 2011/850/EU). [http://ec.europa.eu/environment/air/quality/legislation/pdf/IPR\\_guidance1.pdf](http://ec.europa.eu/environment/air/quality/legislation/pdf/IPR_guidance1.pdf)

UK Air Quality Plan for tackling roadside nitrogen dioxide concentrations and the UK technical report are available at: <http://www.gov.uk/defra>.

## B Source apportionment graphs

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Figure B.1: Annual mean roadside NO<sub>x</sub> source apportionment plots for all roads exceeding the annual mean NO<sub>2</sub> limit value in 2015.



Road class (MU = motorway, PU = primary road, TU = trunk road), road number, census id 15 and modelled NO<sub>2</sub> concentration ( $\mu\text{gm}^{-3}$ )

# C Tables of measures

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**Table C.1 Relevant Local Authority measures within Liverpool Urban Area (UK0006)**

Measure code	Description	Focus	Classification	Status	Other information
Liverpool City Council_1.1	Voluntary Bus Quality Partnership (VQBP)	Five corridors will come under the VBQP, but the first one will be Route 10. Agreed conditions will apply to bus operators, Mersey travel and LCC	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2013 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: Number of Voluntary BQP Target emissions reduction: Once the corridors are fully compliant, expected emission reduction has the potential to be significant.
Liverpool City Council_1.2	Improve Euro Standard Buses	The Euro Standard for new buses will be a condition within the VBQP	Public procurement: New vehicles, including low emission vehicles	Implementation	Start date: 2013 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: % of compliant buses on the corridors Target emissions reduction: Emission reduction will be within that estimated above
Liverpool City Council_1.3	Signal enhancement	Signal enhancement at junctions along bus corridors to include enhanced phasing, selective vehicle detection and in some cases new signals	Traffic planning and management: Other measure	Implementation	Start date: 2009 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Number of junctions upgraded Target emissions reduction: Emission reduction will be within that estimated above
Liverpool City Council_1.4	Enforcement of vehicle idling regulations	Council officers will be asked to enforce the vehicle idling regulations focusing on buses and taxis.	Traffic planning and management: Other measure	Implementation	Start date: 2008 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Number of enforcement interventions Target emissions reduction: Depends on scale of enforcement activity, but could reduce NOx concentrations by a few micrograms at areas where idling is a problem.

Measure code	Description	Focus	Classification	Status	Other information
Liverpool City Council_2.1	Trial of MOTE system	A trial will be carried out to assess using real time Mote sensor systems to feed air pollution data into Liverpool's traffic management systems. The systems will use this information to develop strategies to manage congestion and avoid peaks in concentrations.	Traffic planning and management: Other measure	Implementation	Start date: 2006 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Congestion data from trial junctions Target emissions reduction: The system is being trialled in Liverpool and indications are that it could reduce concentrations of NOx by several micrograms.
Liverpool City Council_2.2	Continual development of UTMC/SCOOT systems	Maximise efficiency of network utilisation and therefore manage congestion by upgrading systems on an ongoing basis.	Traffic planning and management: Other measure	Implementation	Start date: 2006 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Congestion data from key junctions Target emissions reduction: Will vary by location and type of improvement.
Liverpool City Council_2.3	Day to day operation of UTMC/SCOOT centre	High levels of investment has led to significant work being done in the past few years and Liverpool's advanced systems are preventing congestion and therefore reducing polluting emissions now.	Traffic planning and management: Other measure	Implementation	Start date: 2006 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Congestion data from key junctions Target emissions reduction: May not directly improve air quality outside of the interventions listed above, but is central to preventing air quality from getting appreciably worse in Liverpool in the context of growing traffic levels.
Liverpool City Council_3.1	Travel Plans in workplaces, schools, new developments	TravelWise offer advice to organisations in Liverpool on implementing Travel Plans.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2005 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Number of organisations/individuals actively engaged in travel planning. Target emissions reduction: It is not possible to quantify for a city wide AQMA as data will first have to be generated for the city wide activity of current and future Travel Plans, not merely the number that have been developed.

Measure code	Description	Focus	Classification	Status	Other information
Liverpool City Council_3.2	Walking	The Merseyside Local Transport Plan partners are working to make walking around Merseyside easier and more enjoyable. This includes improvements to public spaces and pavements as well as signposts and better provision for disabled people.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2005 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Improvements to existing infrastructure and facilities Target emissions reduction: It is not possible to quantify for a city wide AQMA as data will first have to be generated for city wide mode shifts to walking.
Liverpool City Council_3.3	Cycling	An agreement between Liverpool Primary Care Trust and Merseyside Transport Partnership sets out to generate a 10% increase in trips made by bike before the end of March 2011, compared to journeys in 2006.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Improvements to existing infrastructure and facilities Target emissions reduction: The share of journeys taken by bicycle is still very small in Liverpool, and a 10% increase will not impact measurably on ambient air quality, though some estimate of emission savings could be undertaken when robust activity data is available.
Liverpool City Council_4.1	Enhanced design of Live Air website	To redesign the website including a strong educational element to the site to increase usage and public awareness	Public information and Education: Internet	Preparation	Start date: 2008 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Relaunch of site, number of hits on the site per month Target emissions reduction: This is likely to have negligible impact in the short term but over the longer term it will encourage sustainable travel options
Liverpool City Council_4.2	Airtex Alert system	A three year trial, whereby registered members receive a text when pollution levels are high	Public information and Education: Other mechanisms	Implementation	Start date: 2008 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Launch of the service, number of registered members Target emissions reduction: Aim is to provide a health warning to susceptible people when pollution is high. No impact on reducing emissions

Measure code	Description	Focus	Classification	Status	Other information
Liverpool City Council_5.1	Enhance design of air quality monitoring network	There are currently several schemes aimed at reducing congestion the current monitoring network is not optimised to track the air quality effects of these schemes.	Traffic planning and management: Other measure	Other	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Monitoring data from key corridors and junctions Target emissions reduction: No reduction will be invoked directly but a better understanding of policy effects on air quality would be gained.
Sefton Metropolitan Borough Council_AQMA 1 No 1	A565 RMS Action Plan	Reduce emissions by measures in the A565 Route Management Strategy Action Plan to ease congestion	Traffic planning and management: Other measure	Implementation	Start date: 2009 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: Compliance with the PM10 air quality Objectives. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 2 No 1	Port booking system	Reduce emissions using efficient HGV booking system	Traffic planning and management: Other measure	Implementation	Start date: 2009 Expected end date: 2009 Spatial scale: Local Source affected: Transport Indicator: Feedback on effectiveness of booking system via Port liaison meetings. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 2 No 2	Port mitigation	Offset emissions from HGVs due to port expansion	Traffic planning and management: Other measure	Planning	Start date: 2016 Expected end date: 2022 Spatial scale: Local Source affected: Transport Indicator: Compliance with the NO2 air quality Objectives. Measure implemented to timescale. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 2 No 3	EcoStars fleet recognition	Reduce emissions from HGVs using port access routes	Other measure: Other measure	Implementation	Start date: 2013 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Number of operators recruited to scheme Target emissions reduction: Difficult to estimate no target set

Measure code	Description	Focus	Classification	Status	Other information
Sefton Metropolitan Borough Council_AQMA 3 No 1	Hurry Call	Reduce emissions by facilitating HGVs passage through traffic lights on incline at Millers Bridge	Traffic planning and management: Other measure	Implementation	Start date: 2011 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: Number of activations of hurry call outside peak hours Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 3 No 2	Regulatory control Port Industry	Reduce dust emissions from Port Industrial processes	Permit systems and economic instruments: Other measure	Implementation	Start date: 2011 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: Compliance results from Local Authority and Environment Agency site inspection visits to permitted industrial sites within the Port of Liverpool and the number of exceedances of the PM10 daily mean standard when predominantly north westerly winds. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 4 No 1	A565 RMS Action Plan	Reduce emissions by measures in A565 Route Management Strategy Action Plan to ease congestion	Traffic planning and management: Other measure	Implementation	Start date: 2009 Expected end date: 2016 Spatial scale: Local Source affected: Transport Indicator: Compliance with the NO2 air quality Objectives. RMS actions implemented to timescale. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 5 No 1	Port mitigation	Offset emissions from HGVs due to Port expansion	Traffic planning and management: Other measure	Planning	Start date: 2016 Expected end date: 2022 Spatial scale: Local Source affected: Transport Indicator: Compliance with the NO2 air quality Objectives. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 5 No 2	EcoStars fleet recognition	Reduce emissions from HGVs using Port access routes	Other measure: Other measure	Implementation	Start date: 2013 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Number of operators recruited to scheme Target emissions reduction: Difficult to estimate no target set

Measure code	Description	Focus	Classification	Status	Other information
Sefton Metropolitan Borough Council_GM1	Optimisation of SCOOT	Reduce emissions by optimising SCOOT system	Traffic planning and management: Other measure	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Optimisation of SCOOT Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM2	AQ information using VMS	Reduce emissions using message boards to ease congestion	Public information and Education: Other mechanisms	Implementation	Start date: 2013 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: Ensure system operating effectively Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM3	Work place travel plans	Reduce emissions through travel plans	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Number of work place travel plans implemented Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM4	School travel plans	Reduce emissions through travel plans	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Percentage of schools in Sefton with a travel plan. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM5	Encourage walking & cycling	Reduce emissions by encouraging cycling and walking	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Increase in participation. Target emissions reduction: Difficult to estimate no target set

Measure code	Description	Focus	Classification	Status	Other information
Sefton Metropolitan Borough Council_GM6	Land use planning system	Mitigate emissions through planning system	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Other, please specify Indicator: Percentage of planning permissions granted where the submitted air quality assessment shows no action was required or the air quality impact of a development was mitigated. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM7	Low Emission Strategy measures	Mitigate/reduce emissions through low emissions strategies	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Number of LES measures implemented Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM8	Tree planting	Reduce emissions by planting trees	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Number of trees planted within AQMA. Compliance with the PM10 air quality Objectives Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM9	AQ awareness	Reduce emissions through awareness information & education	Public information and Education: Internet	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Maintenance of Sefton Council air quality website. Number of AQ awareness events held. Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_GM10	Freight Quality Partnership	Reduce emissions from freight	Traffic planning and management: Freight transport measure	Implementation	Start date: 2010 Expected end date: 2010 Spatial scale: Local Source affected: Transport Indicator: Number of meetings held. Number of AQ initiatives undertaken Target emissions reduction: Difficult to estimate no target set

Measure code	Description	Focus	Classification	Status	Other information
Sefton Metropolitan Borough Council_GM11	Taxi Quality Partnership	Reduce emissions from taxis	Permit systems and economic instruments: Introduction/increase of environment taxes	Implementation	Start date: 2013 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: Number of operators participating Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 1 No 2	Intensive road cleaning/pavement washing	Reduce dust resuspension	Traffic planning and management: Other measure	Implementation	Start date: 2011 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: Comparison of ratio of PM10 levels at site within AQMA to background site Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_AQMA 2 No 4	ANPR study	Gain information on HGV fleet using A5036 to inform action plan	Traffic planning and management: Other measure	Implementation	Start date: 2012 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: Analysis of information and interpretation of data to further inform Action Plan. Target emissions reduction: Information gathering exercise
Sefton Metropolitan Borough Council_AQMA 3 No 3	Intensive road cleaning/pavement washing	Reduce dust resuspension	Traffic planning and management: Other measure	Implementation	Start date: 2010 Expected end date: 2013 Spatial scale: Local Source affected: Industry including heat and power production Indicator: Comparison of ratio of PM10 levels at site within AQMA to background site Target emissions reduction: Difficult to estimate no target set
Sefton Metropolitan Borough Council_1	Feasibility Study for Natural Gas and other alternative fuels refuelling facilities in the Liverpool City Region	Reducing emissions from HGVs on Port access routes	Traffic planning and management: Freight transport measure	Preparation	Start date: 2015 Expected end date: 2015 Spatial scale: Whole agglomeration Source affected: Transport Indicator: Recommendations will be made by consultant in study report Target emissions reduction: Not estimated but savings greater than 80% NOx & PM10 emissions savings by HGVs running on LNG compared to diesel



Measure code	Description	Focus	Classification	Status	Other information
St Helens Metropolitan Borough Council_1	Acoustic Barrier	N/A	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Monitored results Target emissions reduction: Medium
St Helens Metropolitan Borough Council_2	Use of hard shoulder running	N/A	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2014 Spatial scale: Whole agglomeration Source affected: Transport Indicator: Monitored results Target emissions reduction: Medium
St Helens Metropolitan Borough Council_3	Traffic Regulation Order	N/A	Traffic planning and management: Other measure	Other	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Monitored results Target emissions reduction: N/A
St Helens Metropolitan Borough Council_4	Vehicle Idling	N/A	Public information and Education: Leaflets	Preparation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Monitored results Target emissions reduction: Low
St Helens Metropolitan Borough Council_5	Optimise flow on key routes	N/A	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2012 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: Monitored results Target emissions reduction: Low
St Helens Metropolitan Borough Council_6	Travel awareness campaign	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2012 Expected end date: 2014 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake Target emissions reduction: Low
St Helens Metropolitan Borough Council_7	Freight quality partnership	N/A	Traffic planning and management: Freight transport measure	Implementation	Start date: 2013 Expected end date: 2016 Spatial scale: National Source affected: Transport Indicator: Uptake and monitored results Target emissions reduction: Low
St Helens Metropolitan Borough Council_8	Green Council fleet	N/A	Other measure: Other measure	Implementation	Start date: 2012 Expected end date: 2014 Spatial scale: Whole town or city Source affected: Transport Indicator: Annual fuel records Target emissions reduction: Low

Measure code	Description	Focus	Classification	Status	Other information
St Helens Metropolitan Borough Council_9	Green taxi fleet	N/A	Other measure: Other measure	Planning	Start date: 2016 Expected end date: 2024 Spatial scale: Whole town or city Source affected: Transport Indicator: Calculated Target emissions reduction: Low
St Helens Metropolitan Borough Council_10	Supplementary planning guidance	N/A	Other measure: Other measure	Preparation	Start date: 2016 Expected end date: 2016 Spatial scale: Whole town or city Source affected: Other, please specify Indicator: Monitored results Target emissions reduction: Medium
St Helens Metropolitan Borough Council_11	Raise awareness of AQ issues	N/A	Public information and Education: Other mechanisms	Implementation	Start date: 2012 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Other, please specify Indicator: Monitored results Target emissions reduction: Low