2014 Air Quality Progress Report for Newcastle City Council

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

October 2014

Local Authority Officer	Ed Foster, Michael Terry
Department	Environment and Safety Team
Address	Public Safety and Regulation, Assistant Chief Executives, Newcastle City Council, Civic Centre, Newcastle upon Tyne NE1 8QH
Telephone	0191 2116132/6147
e-mail	edwin.t.foster@newcastle.gov.uk, michael.terry@newcastle.go.uk
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Executive Summary

This Updating and Screening Assessment has been compiled by the Public Safety and Regulation Division of Newcastle City Council to comply with Part IV of the Environment Act 1995.

The report will identify any exceedences in National Air Quality Objectives that may have occurred since the Council produced its Updating and Screening Assessment (dated July 2012). The report will also identify trends displayed in air quality monitoring data and provide an update on progress made.

Analysis of our monitoring data in preparation for this Progress Report shows the following:

- **Nitrogen dioxide** – Automatic monitoring data shows that the NO_2 annual mean concentration limit is still being exceeded within the City centre Air Quality Management Area (AQMA).

  Automatic monitoring data for the Gosforth AQMA shows that the NO_2 annual mean concentration is not being exceeded.

  Non-automatic data, ie diffusion tube results, for the City centre AQMA shows there have been numerous exceedences of the NO_2 annual mean concentration.

  Non-automatic monitoring results for the Gosforth AQMA show three out of eleven tubes have exceeded the NO_2 annual mean concentration.

  The reasons for the exceedences will be explored within the report.

- **Carbon monoxide** is no longer monitored in Newcastle.

- **Particulate PM_{10}**. Monitoring data indicates compliance with PM_{10} objectives in the City.

- **Lead and Benzene**. Benzene was shown to be present in very small concentrations, and compliance with the relevant objectives is expected.

- **1,3-Butadiene.** No industrial sources of this pollutant were found therefore there is no need to further review and assess this pollutant.

- **Sulphur dioxide.** Monitoring of sulphur dioxide at the Newcastle AURN site ceased in August 2013.

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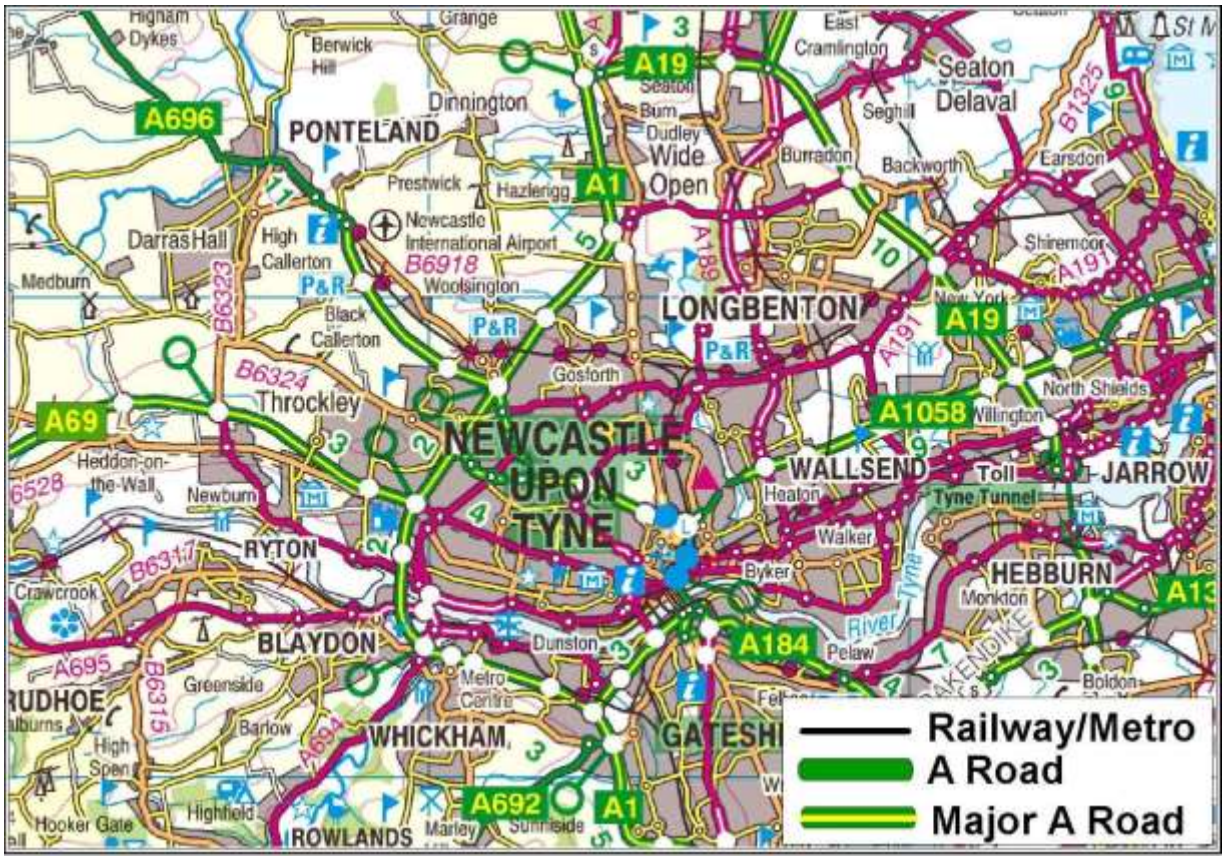
1 Introduction

1.1 Description of Local Authority Area

Newcastle upon Tyne is a largely urban conurbation within the Tyne and Wear (Newcastle, Gateshead, North Tyneside, South Tyneside and Sunderland) County covering an area of 112km^2 and with a population of approximately 278,000. The City has a substantial road and rail network incorporating a number of major roads, for example, the A1, and the main East Coast railway line. See **Figure 1**, a map showing major roads and the East Coast railway line.

Fig. 1. Map showing major roads and the East Coast railway line.



The City also benefits from a comprehensive public transport network which includes the Tyne and Wear Metro, a light railway network connecting the City with its

neighbouring urban centres, and Newcastle International Airport situated approximately 5 miles northwest of the City.

Cars continue to form the greatest pressure on the City's roads, followed by passenger carrying vehicles, commercial and heavy goods vehicles. The A1 and A167 continue to be heavily used as crossing points over the River Tyne, which forms the southern boundary of the City. The A69 and A167 tend to be the main routes used to the West with the A1058 being heavily used to access the East of the City and the North Sea coast.

Newcastle has a total of 72 processes (on March 31 2014) authorised under Part 1 of the Environmental Permitting (England and Wales) Regulations 2010; 69 being regulated by the City Council and 3 regulated by the Environment Agency. **Figure 2** is a map showing authorized processes regulated by the Council and **Figure 3** is a map showing authorized processes regulated by the Environment Agency.

Fig. 2. Map showing authorised processes regulated by the Council (excluding reduced fee processes)

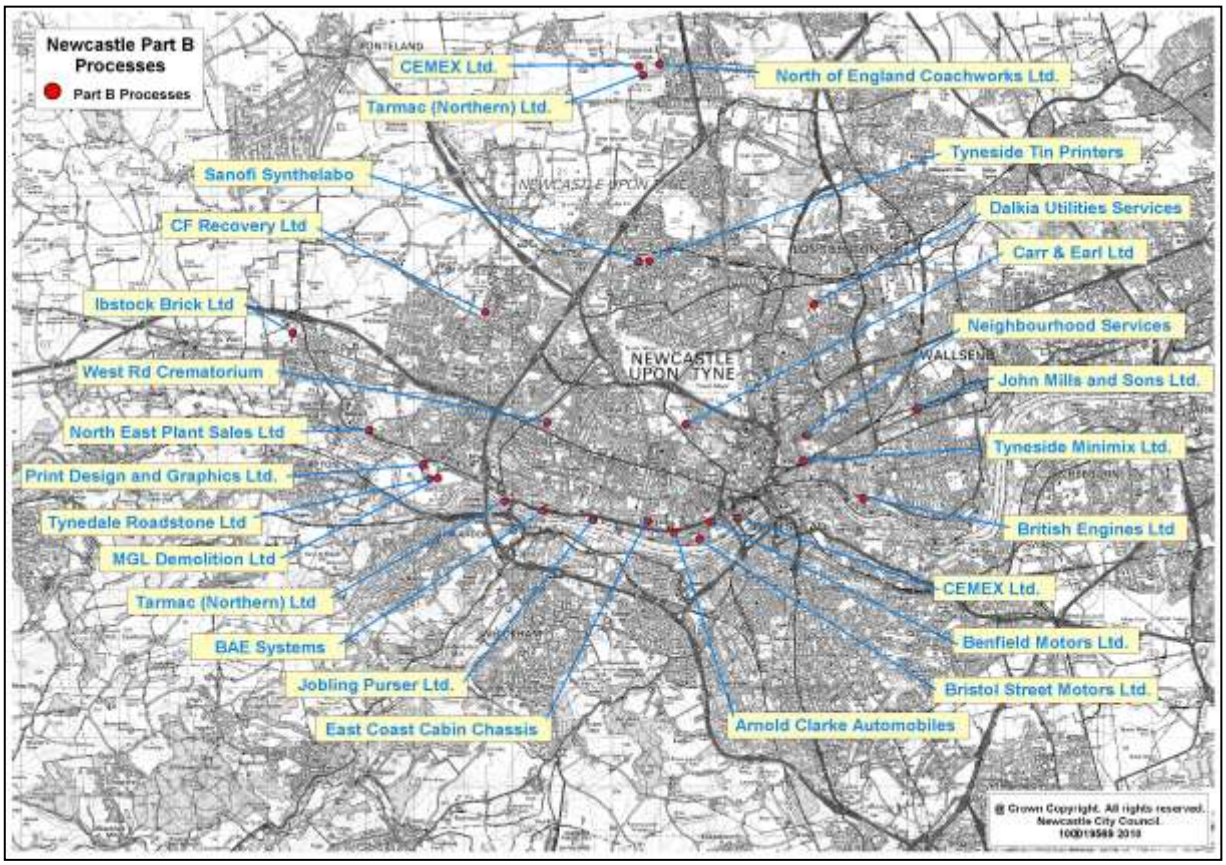
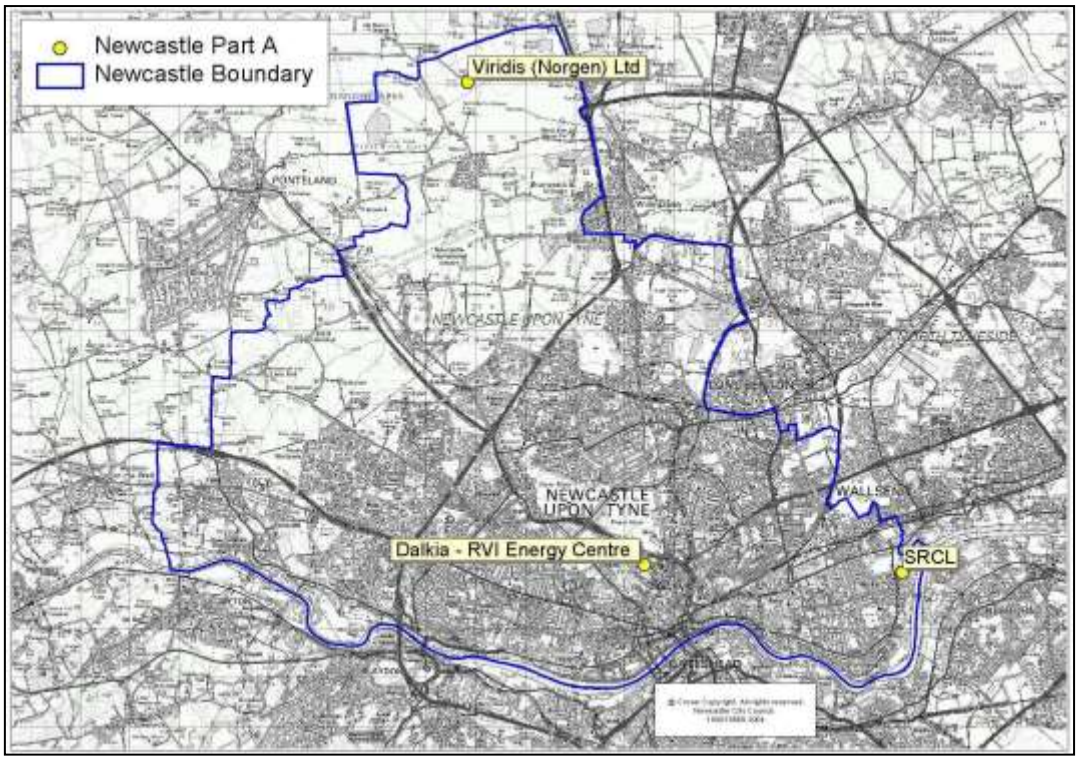


Fig. 3. Map showing authorised processes regulated by the Environment Agency



To the north of the City are two ongoing large developments, both of which have been referred to in previous reports. Newcastle Great Park, a 1200 acre site approx. three miles from the City centre, comprises a business centre and 550 residential dwellings. And work on the eleven year surface mine, approx. eight miles to the north of the city, which is well under way and to date has caused no dust complaints.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in **Table 1**. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

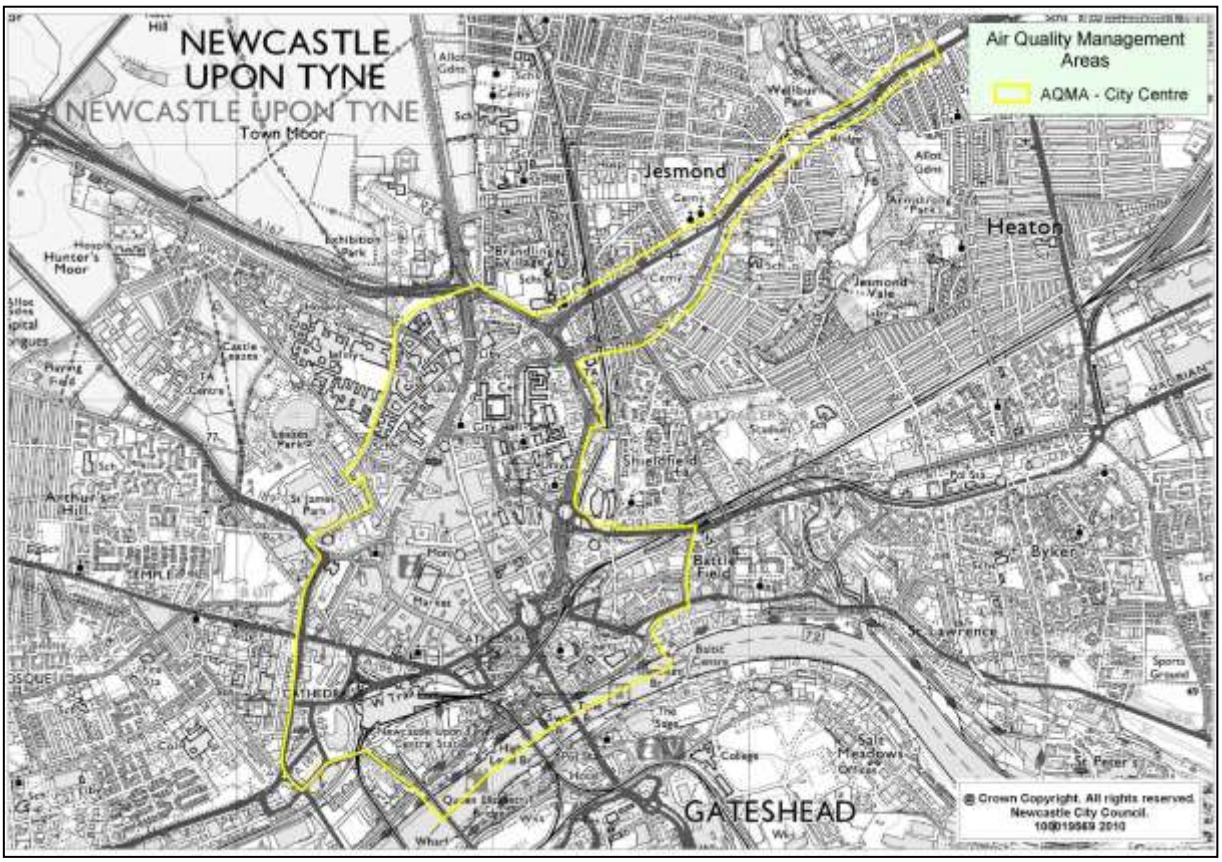
Table 1. Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

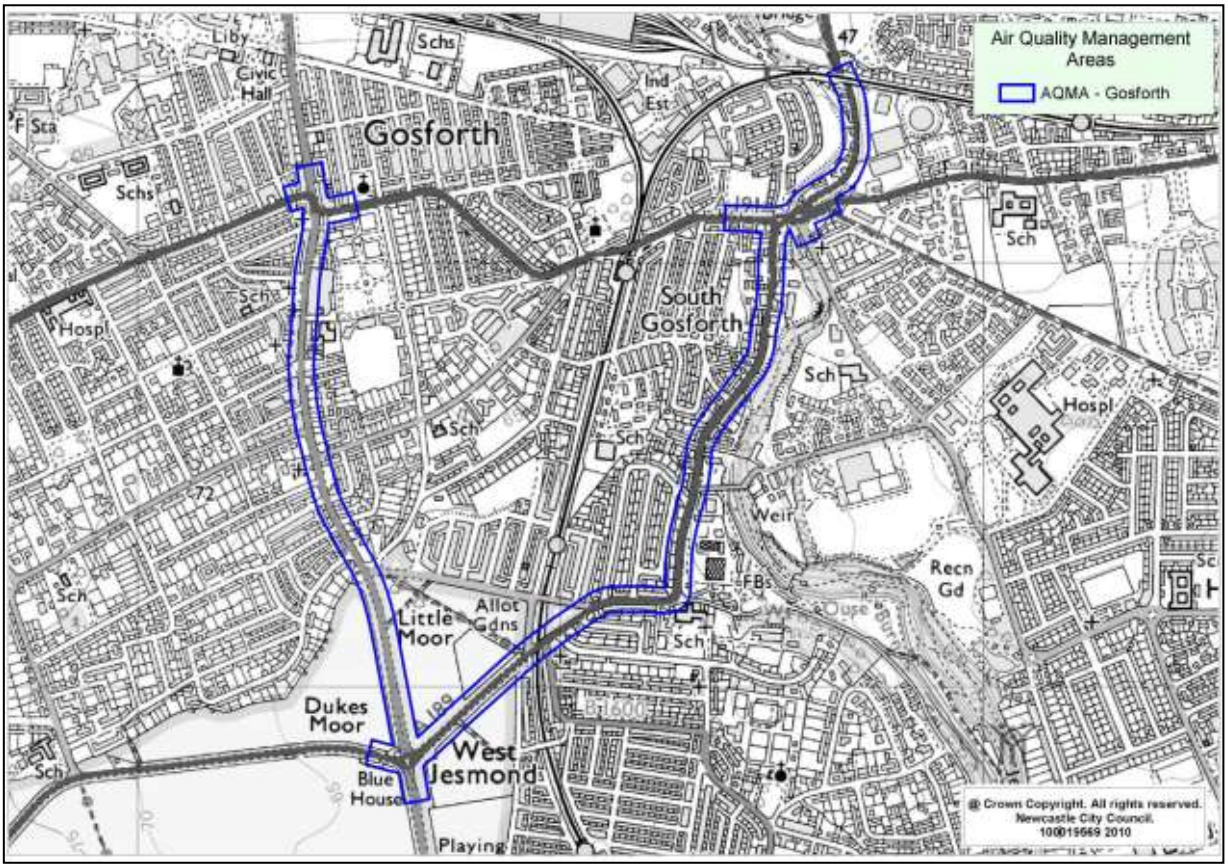
On 1 April 2008 the Council declared two AQMAs. This followed a Further Assessment in 2006, which identified three City centre AQMAs were very closely linked and that the geographical extent of the exceedence area for the annual nitrogen dioxide objective was likely to cover the City centre and one of its main distributor roads. In April 2008 these areas were consolidated into one larger AQMA. See **Figure 4**, City Centre AQMA.

Fig. 4. City Centre AQMA



In 2007, further review and assessment confirmed modelling results that two main roads (the A189 and the B1318) fanning north of the City centre towards Gosforth were exceeding the 40µg/m^3 nitrogen dioxide limit value. The roads in question converged upon an existing AQMA at Blue House roundabout. The Council therefore decided to extend the Blue House Roundabout AQMA so as to incorporate the aforementioned roads. See **Figure 5**, Gosforth AQMA.

Fig. 5. Gosforth AQMA



Both AQMAs, whilst not named specifically, are considered within the Tyne and Wear LTP Strategy and are progressed through the Tyne and Wear Air Pollution Group. The target for the Strategy is to have no AQMAs in the Tyne and Wear area.

Monitoring data shows that the nitrogen dioxide 1 hour mean of 200μg/m^3 objective continues to be complied with throughout the City. However, the nitrogen dioxide annual mean concentration of 40μg/m^3 objective is continuing to be exceeded in the existing AQMAs.

All stages of previous rounds of Review and Assessment are complete

All other pollutants remain below their respective Air Quality Objective.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

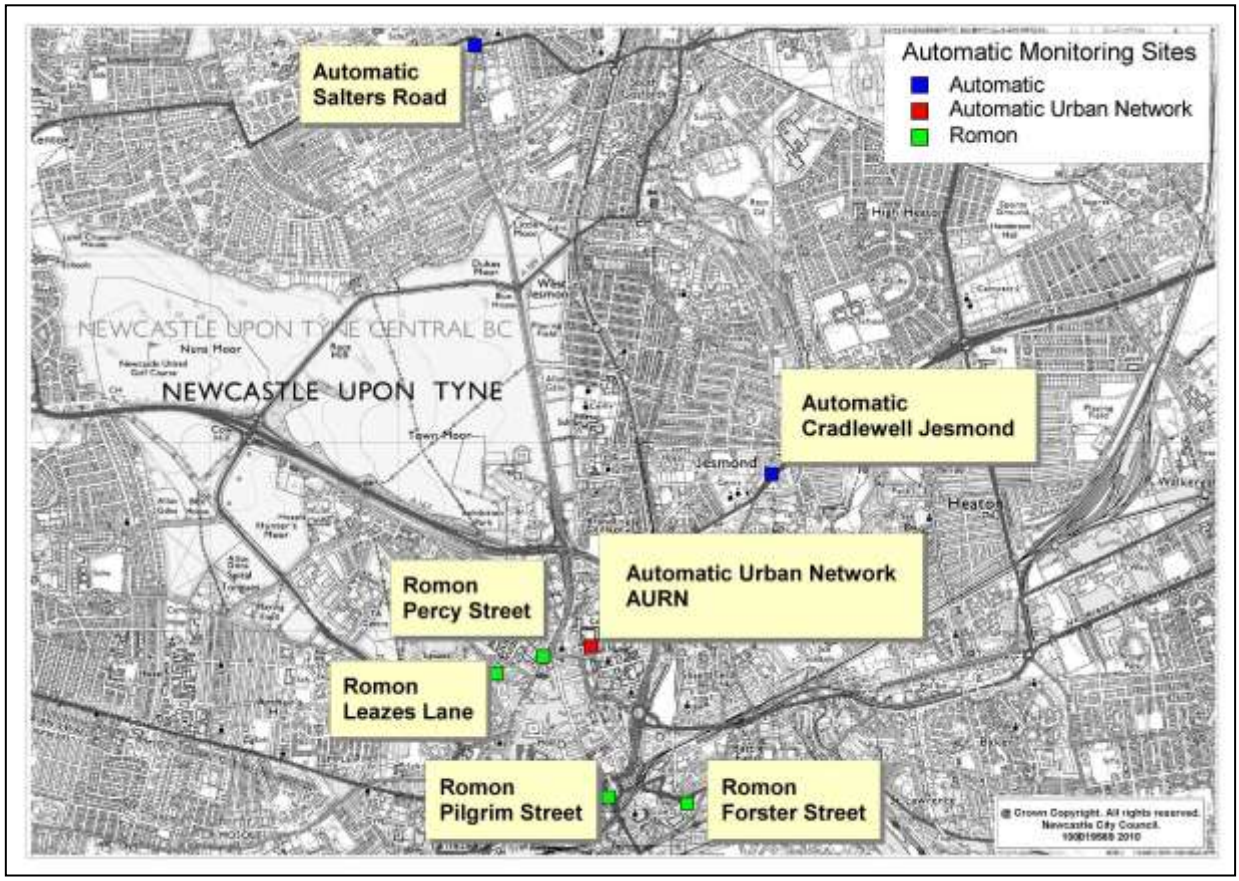
The Council's automatic air quality monitoring network comprises two "Groundhog" units with the capacity to monitor PM_{10}, NO, NO_x, NO_2 and O_3, and three "Romon 300" units monitoring NO, NO_x and NO_2. In addition, DEFRA run an Automatic Urban and Rural Network (AURN) background monitoring site close to the City Centre. **Table 2** shows details of the automatic monitoring sites. Also see **Figure 6**, a map showing location of automatic monitoring sites.

Table 2. Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
	St. Mary's Place (AURN)	Urban B'gnd	425 029	564 916	**2.5**	CO, NO, NOX, NO2, PM10, PM2.5, O3, SO2	Y (CC)	IR absorption, Chemilumine-scence, TEOM-FDMS, UV absorption, UV florescence	N 30	20	N
	Jesmond Road, Cradlewell (G'hog)	Road-side	425 992	565 831	**2.5**	NO2, PM10, O3	Y (CC)	Chemilumine-scence, TEOM, UV absorption	Y 7	3	Y
	Percy Street (Romon)	Road-side	424 776	564 861	**1.8**	NO2	Y (CC)	Chemilumine-scence	Y 20	3	Y
	Swan House, Pilgrim Street (Romon)	Road-side	425 124	564 112	**1.8**	NO2	Y (CC)	Chemilumine-scence	Y 10	2	Y
	Leazes Lane (Romon)	Road-side	424 525	564 770	**1.8**	NO2	Y (CC)	Chemilumine-scence	Y 6	7	N
	High Street, Gosforth (G'hog)	Road-side	424 411	568 115	**2.5**	NO2, PM10	Y (G)	Chemilumine-scence, TEOM	Y 37	3	Y

*CC = City Centre AQMA, G = Gosforth AQMA

Fig. 6. Map of Automatic Monitoring Sites



Note: The Romon unit at Forster Street is no longer monitoring

Both Groundhog units and the three Romon 300 units are attended by the Council's officers every fortnight to be calibrated and have their filters changed as required. At present the Council have a service, maintenance and data ratification contract with Supporting U.

The Council has Licensed Site Operators (LSOs) for the AURN and has adopted DEFRA's quality control procedures. Officers have been trained by DEFRA in the operation and maintenance of the AURN air quality monitoring equipment and adhere to AEA Technology's Site Operator's Manual for the AURN. The AURN is calibrated on a monthly basis by LSOs and serviced at six monthly intervals by Ricardo-AEA. Data from the AURN is quality controlled and ratified by Bureau Veritas.

2.1.2 Non-Automatic Monitoring Sites

Nitrogen Dioxide

Newcastle City Council continues to use diffusion tubes to provide and characterize the background concentrations of nitrogen dioxide. Harwell Scientifics provide and analyse the tubes which are prepared using triethanolamine in a 50/50 column with acetone.

In order to calibrate the diffusion tube results, three diffusion tubes have been co-located alongside the St. Mary's Place AURN background monitoring site. The bias for 2013 has been calculated to be 0.89.

The Council expose 62 tubes per month.

See **Figure 7**, a map showing the location of all NO_2 diffusion tubes.

Fig. 7. Map of Non-Automatic Monitoring Sites

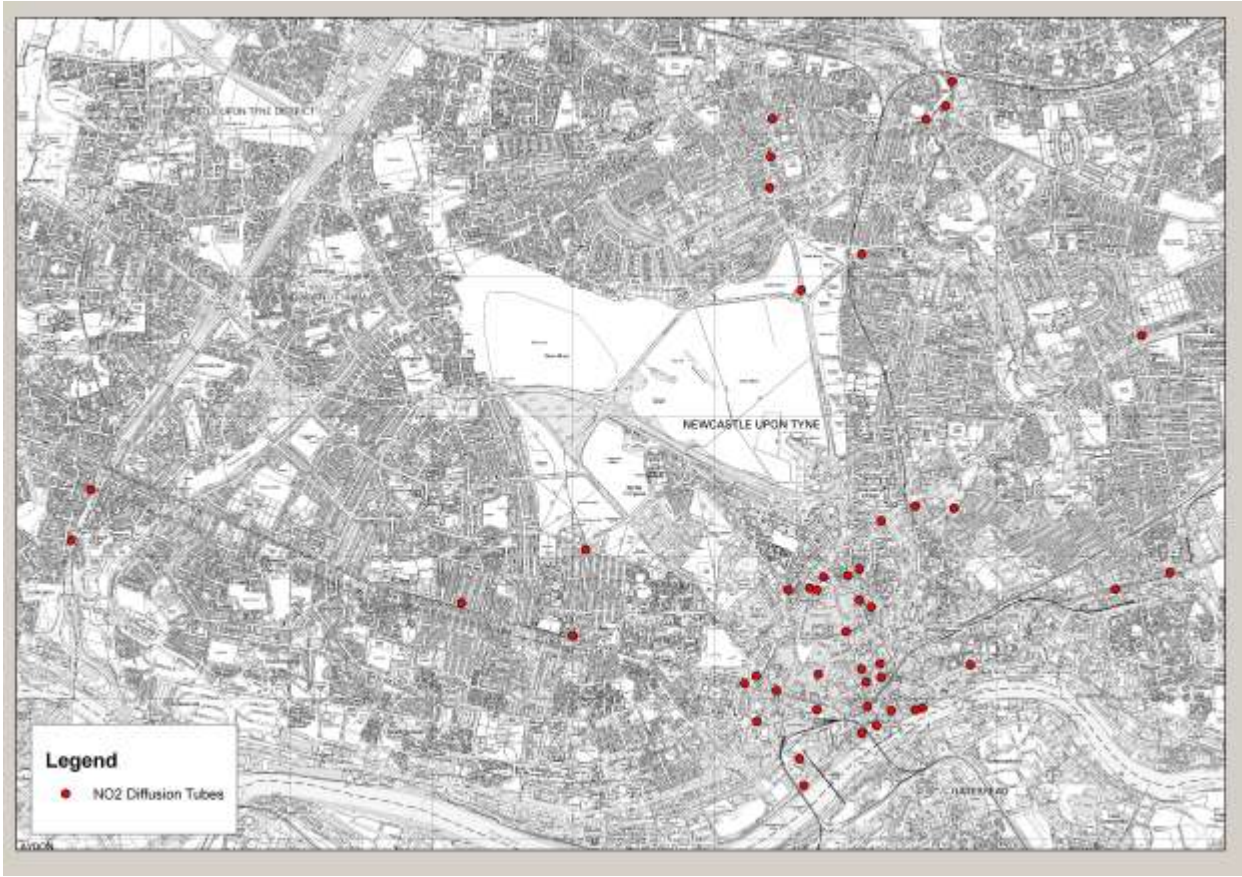


Table 3 lists diffusion tube sites within the City

Table 3. Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
								N	Y (1m)	3.5	Y
2	Newcastle AURN 1	Urban back ground	425 029	564 916	3	NO_2	Y	Y	N	20	N
3	Newcastle AURN 2	Urban back ground	425 029	564 916	3	NO_2	Y	Y	N	20	N
4	Newcastle AURN 3	Urban back ground	425 029	564 916	3	NO_2	Y	Y	N	20	N
5	St Marys Place / John Dobson Street	Road-side	424 948	564 870	3	NO_2	Y	N	Y	2	Y
6	John Dobson St / North Street	Road-side	425 027	564 695	3	NO_2	Y	N	Y	2	Y
7	Blackett Street/ Northumberland Street	Road-side	424 934	564 474	3	NO_2	Y	N	Y	2	Y
8	10 Market Street	Road-side	425 429	563 918	3	NO_2	Y	N	Y	2	Y
9	98 - 100 Pilgrim Street	Road-side	425 045	564 208	3	NO_2	Y	N	Y	4	Y
10	Pilgrim Street / Swan House roundabout	Road-side	425 175	564 246	3	NO_2	Y	N	Y	2	Y
11	Swan House / City Road	Road-side	425 186	564 147	3	NO_2	Y	N	Y	2	Y
12	8 Mosley Street	Road-side	425 077	564 116	3	NO_2	Y	N	Y	2	Y
13	Neville Street / Westgate Road	Road-side	424 729	563 922	3	NO_2	Y	N	Y	2	Y
14	Waterloo Street / Westmorland Road	Road-side	424 302	563 837	3	NO_2	Y	N	Y	2	Y
15	176 Westgate Road	Road-side	424 215	564 105	3	NO_2	Y	N	Y	3	Y
16	Nexus House, 3 St James Boulevard	Road-side	424 299	564 158	3	NO_2	Y	N	Y	4	Y
17	96 - 98 Westgate Road / Cross Street	Road-side	424 441	564 055	3	NO_2	Y	N	Y	2	Y
18	Gallowgate / St Andrews Street	Road-side	425 049	563 753	3	NO_2	Y	N	Y	2	Y
19	Gallowgate / Percy Street	Road-side	425 255	563 913	3	NO_2	Y	N	Y	2	Y

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
20	Newgate Street / Grainger Street	Road-side	424 737	564 171	3	NO_2	Y	N	Y	3	Y
21	115 - 119 Grainger Street / Market Street	Road-side	425 478	563 930	3	NO_2	Y	N	Y	2	Y
22	Leazes Lane Romon 1	Road-side	424 525	564 770	3	NO_2	Y	Y	Y	3	Y
23	Leazes Lane Romon 2	Road-side	424 525	564 770	3	NO_2	Y	Y	Y	3	Y
24	Leazes Lane Romon 3	Road-side	424 525	564 770	3	NO_2	Y	Y	Y	3	Y
25	Strawberry Place	Road-side	424 729	563 922	3	NO_2	Y	N	Y	3	Y
26	Leazes Lane / Percy Street	Road-side	424 726	564 768	3	NO_2	Y	N	Y	2	Y
27	3 St Thomas Street	Road-side	424 676	564 783	3	NO_2	Y	N	Y	4	Y
28	101 Percy Street / St Thomas Street	Road-side	424 726	564 768	3	NO_2	Y	N	Y	3	Y
29	Percy Street Romon 1	Road-side	424 776	564 861	3	NO_2	Y	Y	Y	1	Y
30	Percy Street Romon 2	Road-side	424 776	564 861	3	NO_2	Y	Y	Y	1	Y
31	Percy Street Romon 3	Road-side	424 776	564 861	3	NO_2	Y	Y	Y	1	Y
32	City Road	Road-side	425 819	564 237	3	NO_2	Y	N	Y	2	Y
33	Quayside / Broad Chare	Road-side	425 478	563 930	3	NO_2	Y	N	Y	2	Y
34	Trinity Chambers / Flynns, Quayside	Road-side	425 428	563 917	3	NO_2	Y	N	Y	2	Y
35	Queen Street / Lombard Street	Road-side	425 255	563 913	3	NO_2	Y	N	Y	2	Y
36	The Side / Dean Street	Road-side	425 085	563 942	3	NO_2	Y	N	Y	2	Y
37	Sandhill / Swing Bridge	Road-side	425 151	563 807	3	NO_2	Y	N	Y	3	Y
38	32 Close	Road-side	425 048	563 752	3	NO_2	Y	N	Y	2	Y
39	Forth Street/ Skinnerburn Road	Road-side	424 603	563 570	3	NO_2	Y	N	Y	2	Y

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
40	Forth Banks / Pottery Lane	Road-side	424 635	563 380	3	NO_2	Y	N	Y	2	Y
41	Blue House Roundabout (East)	Road-side	425 113	564 648	3	NO_2	Y	N	Y	4	Y
42	Blue House Roundabout (North)	Road-side	424 616	566 899	3	NO_2	Y	N	Y	4	Y
43	53 High Street, Gosforth	Road-side	424 394	567 625	3	NO_2	Y	N	Y	3	Y
44	102 - 104 High Street, Gosforth	Road-side	424 401	567 844	3	NO_2	Y	N	Y	4	Y
45	Gosforth Hog 1	Road-side	424 411	568 115	3	NO_2	Y	Y	Y	4	Y
46	Gosforth Hog 2	Road-side	424 411	568 115	3	NO_2	Y	Y	Y	4	Y
47	Gosforth Hog 3	Road-side	424 411	568 115	3	NO_2	Y	Y	Y	4	Y
48	Dene Park House, Killingworth Road	Road-side	425 641	568 204	3	NO_2	Y	N	Y	2	Y
49	1 Killingworth Road	Road-side	425 687	568 377	3	NO_2	Y	N	Y	2	Y
50	84 Station Road	Road-side	425 503	568 109	3	NO_2	Y	N	Y	3	Y
51	16 Jesmond Dene Road	Road-side	425 046	567 154	3	NO_2	Y	N	Y	4	Y
52	2 - 4 Victoria Square	Road-side	425 183	565 261	3	NO_2	N	N	Y	2	Y
53	2 - 3 Osborne Terrace	Road-side	425 425	565 364	3	NO_2	Y	N	Y	4	Y
54	178 Sandyford Road	Road-side	425 701	565 350	3	NO_2	Y	N	Y	2	Y
55	9 - 11 Coast Road	Road-side	427 031	566 575	3	NO_2	N	N	Y	4	Y
56	263 Shields Road	Road-side	427 234	564 893	3	NO_2	N	N	Y	3	Y
57	124 Shields Road	Road-side	426 843	564 775	3	NO_2	N	N	Y	3	Y
58	7 Studley Terrace / 129 Brighton Grove	Road-side	423 089	565 056	3	NO_2	N	N	Y	2	Y
59	2 Brighton Grove	Road-side	422 997	564 444	3	NO_2	N	N	Y	3	Y

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Site Height (m)	Pollutants Monitored	In AQMA ?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
60	5 Middleton Avenue	Road-side	422 210	564 678	3	NO_2	N	N	Y	3	Y
61	26 West Copperas Lane	Road-side	419 581	565 481	3	NO_2	N	N	Y	3	Y
62	5 Birchfield Gardens	Road-side	419 441	565 124	3	NO_2	N	N	Y	2	Y

The Council use Harwell Scientifics to supply and analyse all NO_2 diffusion tubes. Harwell Scientifics prepare diffusion tubes using triethanolamine in a 50/50 column with acetone.

Harwell Scientifics officially follow laboratory procedures set out in the Harmonisation Practical Guidance and are part of the WASP scheme.

The Council participates in a co-location study at the AURN site. The data collected is ratified by Supporting U and Bureau Veritas.

2013's data has been ratified and a bias adjustment factor of 0.89 applied. The bias adjustment factor was calculated from results collected from the AURN chemiluminesence analyser and the analysis of diffusion tubes by Harwell Scientifics. See **Appendix A QA:QC Data**.

Benzene

The Council no longer expose benzene diffusion tubes.

Pumped benzene monitoring continues to take place and the City centre's AUN site.

2.2 Comparison of Monitoring Results with Air Quality Objectives

Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

The Council have five real time chemiluminesent analyser units measuring NO_2. The AURN, St Mary's Place is owned by DEFRA. See **Table 4**.

Table 4. Details of the six real time chemiluminesent analyser units**.**

Location	Type of Site
AURN, St Mary's Place	Urban Background inside City Centre AQMA
Percy Street	Roadside in City Centre AQMA
Pilgrim Street, Swan House	Roadside in City Centre AQMA
Jesmond Road, Cradlewell	Roadside in City Centre AQMA
Leazes Lane	Roadside in City Centre AQMA
High Street, Gosforth	Roadside in Gosforth AQMA

Long term monitoring data has also been obtained from the AURN background monitoring site on St. Mary's Place.

The Council can confirm that the annual mean concentration is greater than 40µg/m^3 at three of its sites; Percy Street, Swan House (Pilgrim Street) and Cradlewell (Jesmond Road). All five Council owned sites are within an AQMA.

Analysis of the automatic monitoring sites can be seen below in **Tables 5** and **6**.

Table 5. Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Annual Mean Concentration (µg/m^3)					
					2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]	2013 [c]
AURN, St Mary's Place	Urban back ground	Y			35.0	34.0	31.9	32.6	29.5	29.1
Percy Street	Road-side	Y	100	99.2	**41.1**	**56.2**	**55.7**	**62.0**	**56**	**47.7**
Swan House, Pilgrim St	Road-side	Y	100	98.5	**48.5**	**49.6**	**48.9**	**52.0**	**53.7**	**52.7**
Jesmond Road, Cradlewell	Road-side	Y	100	97.1	**45.8**	**42.4**	**41.0**	**47.2**	39.8	**45.7**
Leazes Lane	Road-side	Y	100	98.8	28.7	28.1	33.1	33.5	32.8	32.5
High Street, Gosforth	Road-side	Y	100	96.6	-	-	25.9	26.0	20.9	22.2

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Table 6. Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Number of Hourly Means > 200µg/m^3					
					2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]	2013 [c]
AURN, St Mary's Place	Urban back ground	Y			0	0	NA	NA	NA	NA
Percy Street	Road-side	Y		99.2	0	0	2	0	0	0
Swan House, Pilgrim St	Road-side	Y		98.5	0	0	1	0	1	0
Jesmond Road, Cradlewell	Road-side	Y		97.1	0	0	5	1	0	14
Leazes Lane	Road-side	Y		98.8	0	0	1	0	0	0
High Street, Gosforth	Road-side	Y		96.6	-	-	0	0	0	0

In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

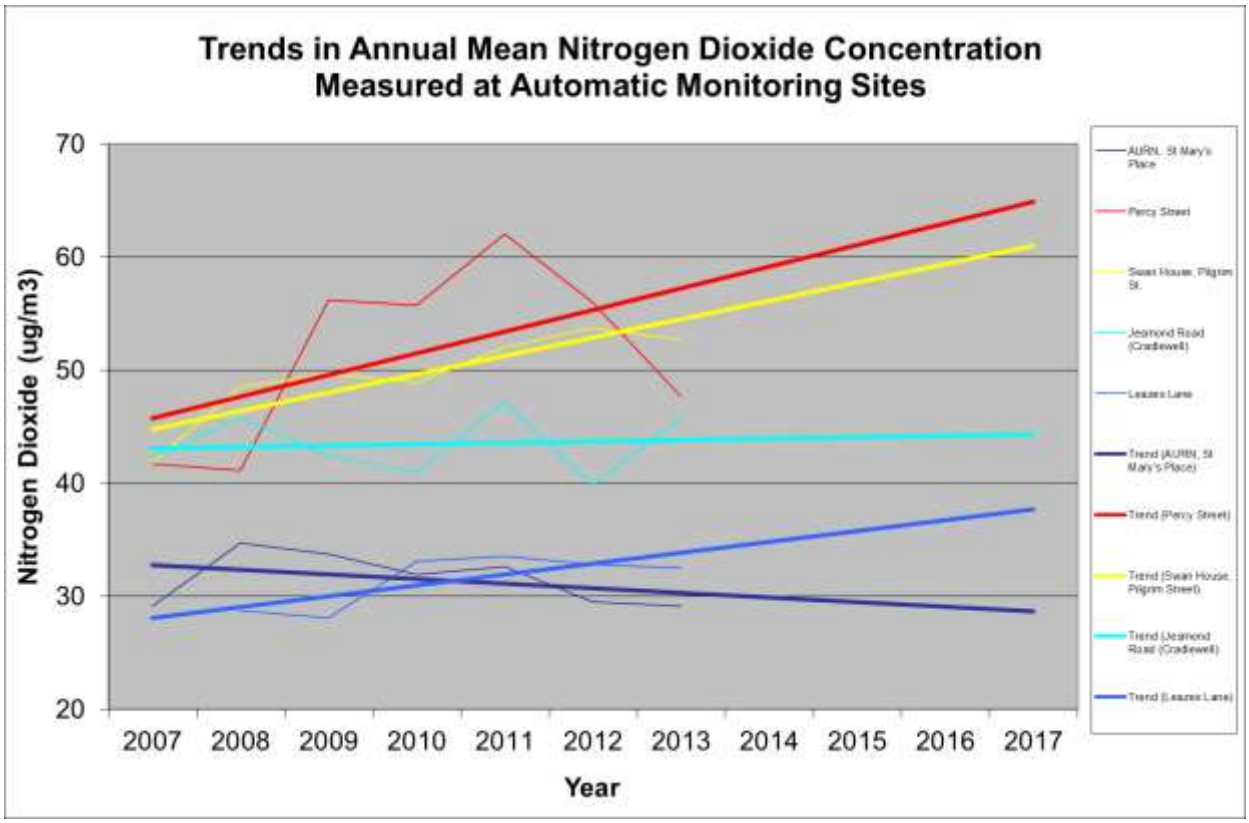
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

* Number of exceedences for previous years is optional

Figure 8 shows that the nitrogen dioxide annual mean concentration objective is still being exceeded at two of the five automatic monitoring locations within the City centre AQMA. All sites except for Pilgrim Street show a decrease in NO_2 levels.

Fig. 8. Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

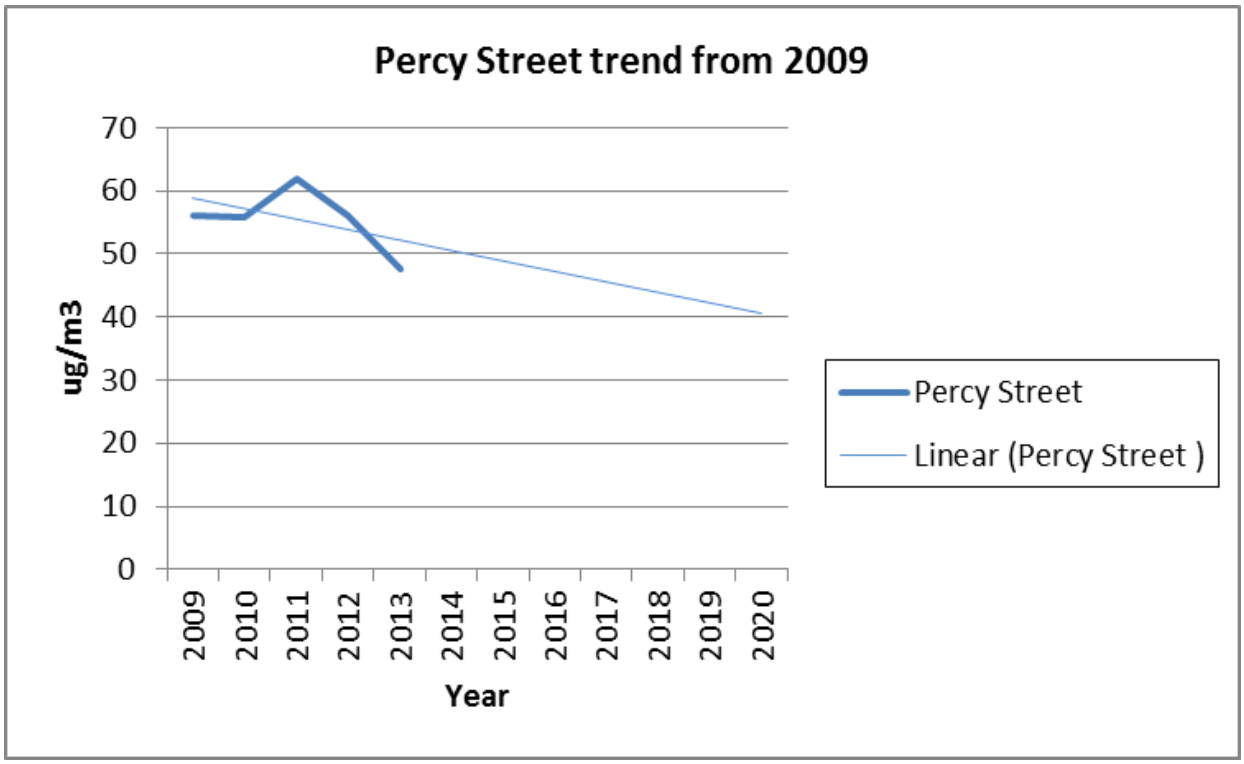


Pilgrim Street remains an area of concern. Whilst there was a small dip in NO_2 levels for 2013 the trend is for NO_2 levels continue to rise. The roundabout on this street receives a large amount of traffic as it is one the major crossing points over the River Tyne. It is difficult to see the NO_2 level decreasing on this street as all types of vehicles use this area at all times of the day and night.

Percy Street showed a significant decrease in NO_2 levels for the second year running. It is hoped that the trend line for Percy Street when taken from 2007 is a misrepresentation of the current situation and that the trend line seen in **Figure 9.**, ie

since 2009, is more representative as to how the air quality on Percy Street is improving.

Fig. 9. Trends in Annual Mean NO_2 Concentrations Since 2009 Measured at Percy Street.



In 2008 Percy Street was closed at one end to domestic vehicles. It could therefore be argued that the pollution on this street is caused, in the main, by commercial vehicles. It is hoped that an improvement in the quality of air on this street will be seen over coming years as commercial vehicle emissions, in particular from buses, are improved.

In 2013's Progress Report it was reported that Newcastle and Gateshead Councils had recently been successful in a joint bid to secure funds to upgrade approximately 21 buses to cleaner emission technology. The buses have since been upgraded and their emissions are now being monitored to measure the improvement this technology has made to air quality.

Newcastle, in partnership with Gateshead, North Tyneside, South Tyneside, Sunderland and Northumberland Councils were successful with a fresh bid in 2014 to

fund further research and development into clean vehicle technology. At the time of writing work has yet to begin on this project.

It was reported last year that Leazes Lane could exceed the NO_2 annual mean objective by 2014. This year's result has altered that prediction but it could still be argued that this street will exceed the NO_2 annual mean objective by 2016-17. This is due to drivers, who once used Percy Street to access the west of the City now using Leazes Lane to do so. The alternative is a 3 mile addition to their trip to get to the same location.

Whilst the NO_2 levels for Jesmond Road have been variable over recent years, the trend line continues to be above the annual mean concentration limit indicating that NO_2 levels along this street and unlikely to fall below the Objective limits in coming years.

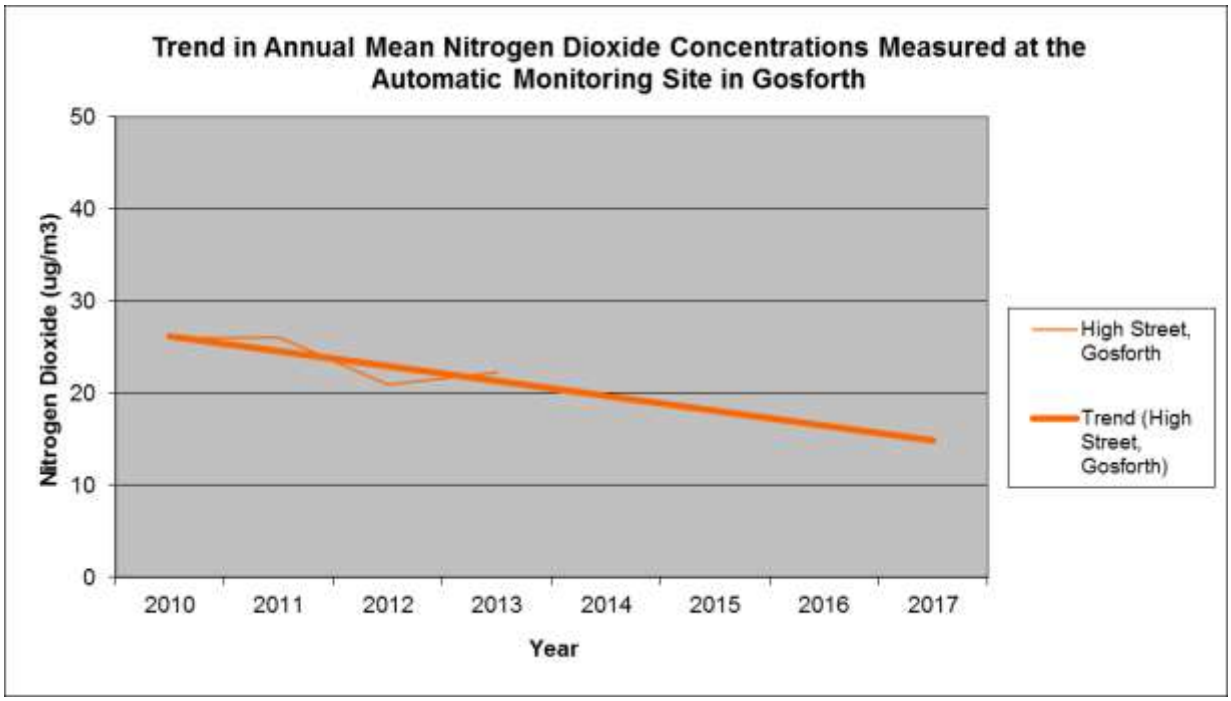
Although the AURN is deemed to be an urban background site, it is positioned only 20 metres from a busy single carriageway. The NO_2 annual mean concentration at this site continues to be below the limit and the trend suggests this will remain the case for the foreseeable future.

Gosforth AQMA

There has been a NO_x analyser located on High Street, within the Gosforth AQMA, since 2009. 2010 was the first full year's worth of results recorded at this site. The results suggest NO_2 levels along High Street have not breached the annual mean concentration since monitoring commenced at this location, see **Figure 10**.

The High Street automatic monitoring station has co-located diffusion tubes on its roof. These tubes recorded a NO_2 annual mean concentration of 28.3µg/m^3 for 2012, this being slightly above the 20.93µg/m^3, but still remained far below the objective limit.

Fig. 10. Trend in Annual Mean Nitrogen Dioxide Concentrations measured at the Automatic Monitoring site in Gosforth



Outside the AQMAs

There is no automatic monitoring carried out outside the AQMAs.

Diffusion Tube Monitoring Data

Analysis of individual diffusion tube results for 2013 suggest that the NO_2 annual mean concentration is still being exceeded within the two AQMAs. There have been no exceedences of the annual mean objective outside the AQMAs.

Whilst the NAQ objective continues to be exceeded within the AQMAs, analysis of the trend for all diffusion tubes suggests that the NO_2 annual mean concentration is continuing to fall.

Table 7 lists the results for the Nitrogen Dioxide Diffusion Tubes for 2013 whilst **Table 8** shows all the results from 2008 to 2013.

Table 7. Results of NO_2 Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months) [a]	2013 Annual Mean Concentration ($\mu g/m^3$) - Bias Adjustment factor = 0.89 [b]
2	Newcastle AURN 1	Roadside	Y	Y	11.0	28.7
3	Newcastle AURN 2	Roadside	Y	Y	12.0	29.1
4	Newcastle AURN 3	Roadside	Y	Y	12.0	28.7
5	St Marys Place / John Dobson Street	Roadside	Y	N	6.0	**49.7**
6	John Dobson St / North Street	Roadside	Y	N	8.0	34.4
7	Blackett Street/ Northumberland St	Roadside	Y	N	4.0	**48.2**
8	10 Market Street	Roadside	Y	N	9.0	**50.6**
9	98 - 100 Pilgrim Street	Roadside	Y	N	9.0	**41.4**
10	Pilgrim Street / Swan House roundabout	Roadside	Y	N	9.0	**51.6**
11	Swan House / City Road	Roadside	Y	N	9.0	38.4
12	8 Mosley Street	Roadside	Y	N	7.0	**64.9**
13	Neville Street / Westgate Road	Roadside	Y	N	6.0	**52.2**
14	Waterloo Street / Westmorland Road	Roadside	Y	N	8.0	**42.9**
15	176 Westgate Road	Roadside	Y	N	5.0	32.1
16	Nexus House, 3 St James Boulevard	Roadside	Y	N	8.0	**42.4**
17	96 - 98 Westgate Road / Cross Street	Roadside	Y	N	11.0	36.3
18	Gallowgate / St Andrews Street	Roadside	Y	N	9.0	37.5
19	Gallowgate / Percy Street	Roadside	Y	N	9.0	**43.6**
20	Newgate Street / Grainger Street	Roadside	Y	N	10.0	**48.8**
21	115 - 119 Grainger Street / Market Street	Roadside	Y	N	6.0	**44.9**

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.89 [b]
22	Leazes Lane Romon 1	Roadside	Y	Y	12.0	29.6
23	Leazes Lane Romon 2	Roadside	Y	Y	12.0	30.8
24	Leazes Lane Romon 3	Roadside	Y	Y	12.0	30.5
25	Strawberry Place	Roadside	Y	N	11.0	37.7
26	Leazes Lane / Percy Street	Roadside	Y	N	11.0	**48.8**
27	3 St Thomas Street	Roadside	Y	N	11.0	29.2
28	101 Percy Street / St Thomas Street	Roadside	Y	N	12.0	**40.4**
29	Percy Street Romon 1	Roadside	Y	Y	12.0	**53.9**
30	Percy Street Romon 2	Roadside	Y	Y	12.0	**54.5**
31	Percy Street Romon 3	Roadside	Y	Y	12.0	**53.5**
32	City Road	Roadside	Y	N	12.0	**44.1**
33	Quayside / Broad Chare	Roadside	Y	N	10.0	36.0
34	Trinity C'mbers / Flynns, Quayside	Roadside	Y	N	9.0	**41**
35	Queen Street / Lombard Street	Roadside	Y	N	10.0	32.4
36	The Side / Dean Street	Roadside	Y	N	11.0	34.7
37	Sandhill / Swing Bridge	Roadside	Y	N	7.0	39.3
38	32 Close	Roadside	Y	N	10.0	35.5
39	Forth Street/ Skinnerburn Road	Roadside	Y	N	11.0	29.3
40	Forth Banks / Pottery Lane	Roadside	Y	N	10.0	36.2
41	Blue House Roundabout (East)	Roadside	Y	N	11.0	37.4

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.89 [b]
42	Blue House Roundabout (North)	Roadside	Y	N	10.0	33.4
43	53 High Street, Gosforth	Roadside	Y	N	12.0	**41.8**
44	102 - 104 High Street, Gosforth	Roadside	Y	N	12.0	39.1
45	Gosforth Hog 1	Roadside	Y	Y	12.0	28.5
46	Gosforth Hog 2	Roadside	Y	Y	12.0	27.9
47	Gosforth Hog 3	Roadside	Y	Y	12.0	29.9
48	Dene Park House, Killingworth Rd	Roadside	Y	N	12.0	**47.2**
49	1 Killingworth Road	Roadside	Y	N	12.0	26.6
50	84 Station Road	Roadside	Y	N	12.0	**44.8**
51	16 Jesmond Dene Road	Roadside	Y	N	10.0	32.2
52	2 - 4 Victoria Square	Roadside	Y	N	10.0	38.1
53	2 - 3 Osborne Terrace	Roadside	Y	N	6.0	**41.1**
54	178 Sandyford Road	Roadside	Y	N	7.0	33.4
55	9 - 11 Coast Road	Roadside	N	N	9.0	30.3
56	263 Shields Road	Roadside	N	N	12.0	36.3
57	124 Shields Road	Roadside	N	N	12.0	37.6
58	7 Studley Terrace / 129 Brighton Grove	Roadside	N	N	9.0	32.8
59	2 Brighton Grove	Roadside	N	N	11.0	34.1
60	5 Middleton Avenue	Roadside	N	N	10.0	22.5
61	26 West Copperas Lane	Roadside	N	N	9.0	36.8

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months) [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.89 [b]
62	5 Birchfield Gardens	Roadside	N	N	9.0	39

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3
Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective
[a] Means should be "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%
[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30)

Table 8. Results of NO_2 Diffusion Tubes (2008 to 2013)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]					
			2008 (Bias Adjustment Factor = 0.89)	2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.89)	2011 (Bias Adjustment Factor = 0.9)	2012 (Bias Adjustment Factor = 0.82)	2013 (Bias Adjustment Factor = 0.89)
2	Newcastle AURN 1	Roadside	33.8	32.7	30.2	32.1	30.4	28.7
3	Newcastle AURN 2	Roadside	33.9	34.8	29.9	31.5	29.6	29.1
4	Newcastle AURN 3	Roadside	33.3	33.5	**57.9**	34.3	29.8	28.7
5	St Marys Place / John Dobson Street	Roadside	**57.8**	**52.7**	**55.8**	**52.7**	**51.8**	**49.7**
6	John Dobson St / North Street	Roadside	**49.2**	38.8	37.3	37.6	33.1	34.4
7	Blackett Street/ Northumberland St	Roadside	**56.3**	**56.3**	**56.6**	**56.5**	**53.9**	**48.2**
8	10 Market Street	Roadside	**49.2**	**54.3**	**57.7**	**51.4**	**47.7**	**50.6**
9	98 - 100 Pilgrim Street	Roadside	**48.2**	**48.0**	**50.2**	**46.6**	**44.4**	**41.4**
10	Pilgrim Street / Swan House roundabout	Roadside	**75.1**	**72.9**	**64.5**	**63.9**	**53.5**	**51.6**
11	Swan House / City Road	Roadside	**48.1**	NA	**44.2**	38.4	**44.0**	38.4
12	8 Mosley Street	Roadside	**68.0**	**68.5**	**66.5**	**64.4**	**63.7**	**64.9**
13	Neville Street / Westgate Road	Roadside	**49.9**	**57.6**	**57.1**	**61.4**	**51.7**	**52.2**
14	Waterloo Street / Westmorland Road	Roadside	**40.3**	**48.1**	**53.2**	**49.7**	**47.3**	**42.9**
15	176 Westgate Road	Roadside	**42.5**	34.3	39.2	32.2	32.7	32.1
16	Nexus House, 3 St James Boulevard	Roadside	**45.1**	**41.8**	**44.2**	36.6	**40.0**	**42.4**
17	96 - 98 Westgate Road / Cross Street	Roadside	**47.8**	39.8	39.8	39.0	38.3	36.3
18	Gallowgate / St Andrews Street	Roadside	37.3	37.6	36.7	37.9	31.7	37.5
19	Gallowgate / Percy Street	Roadside	36.9	**45.1**	**52.8**	**53.5**	**48.1**	**43.6**
20	Newgate Street / Grainger Street	Roadside	**54.7**	**47.5**	**53.4**	**52.7**	**48.2**	**48.8**
21	115 - 119 Grainger Street / Market Street	Roadside	**56.8**	**57.5**	**55.2**	**53.0**	**50.3**	**44.9**

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]					
			2008 (Bias Adjustment Factor = 0.89)	2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.89)	2011 (Bias Adjustment Factor = 0.9)	2012 (Bias Adjustment Factor = 0.82)	2013 (Bias Adjustment Factor = 0.89)
22	Leazes Lane Romon 1	Roadside			33.7	33.5	27.5	29.6
23	Leazes Lane Romon 2	Roadside			33.6	32.9	27.0	30.8
24	Leazes Lane Romon 3	Roadside			33.9	33.3	27.3	30.5
25	Strawberry Place	Roadside	**43.0**	**41.6**	**49.1**	**43.6**	**40.0**	37.7
26	Leazes Lane / Percy Street	Roadside	**46.3**	**42.2**	**43.4**	**40.7**	39.0	**48.8**
27	3 St Thomas Street	Roadside	34.9	35.3	36.5	34.8	27.4	29.2
28	101 Percy Street / St Thomas Street	Roadside	**42.2**	**45.0**	**43.5**	**43.8**	**42.3**	**40.4**
29	Percy Street Romon 1	Roadside	**46.2**	**55.8**	**65.8**	**67.7**	**60.8**	**53.9**
30	Percy Street Romon 2	Roadside	**46.7**	**55.0**	**69.7**	**68.7**	**56.8**	**54.5**
31	Percy Street Romon 3	Roadside	**47.3**	**57.7**	**68.2**	**68.5**	**57.3**	**53.5**
32	City Road	Roadside	**51.8**	**46.3**	**48.8**	**45.7**	**43.5**	**44.1**
33	Quayside / Broad Chare	Roadside	**41.7**	37.3	37.6	37.6	33.6	36.0
34	Trinity C'mbers / Flynns, Quayside	Roadside	**44.6**	**42.7**	39.8	**44.6**	37.1	**41**
35	Queen Street / Lombard Street	Roadside	**41.4**	37.2	37.8	32.1	32.6	32.4
36	The Side / Dean Street	Roadside	**54.4**	**40.6**	**43.7**	**40.8**	**40.8**	34.7
37	Sandhill / Swing Bridge	Roadside	**53.0**	**43.9**	**47.2**	**45.7**	**41.7**	39.3
38	32 Close	Roadside	**47.0**	37.3	39.9	36.1	34.4	35.5
39	Forth Street/ Skinnerburn Road	Roadside	38.0	36.2	37.5	32.3	29.7	29.3
40	Forth Banks / Pottery Lane	Roadside	31.3	32.4	**44.5**	33.2	34.9	36.2
41	Blue House Roundabout (East)	Roadside	**52.8**	**41.5**	**43.8**	**45.3**	**40.5**	37.4

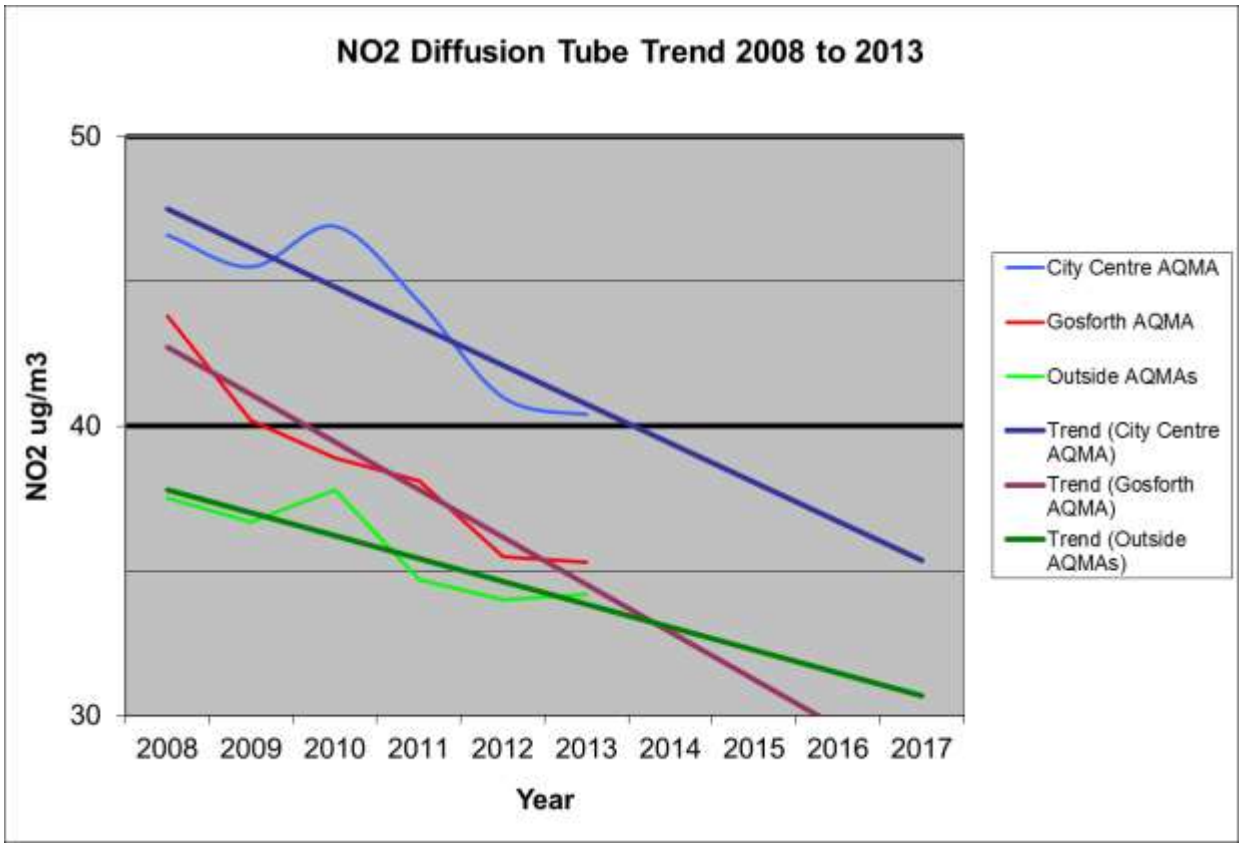
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]					
			2008 (Bias Adjustment Factor = 0.89)	2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.89)	2011 (Bias Adjustment Factor = 0.9)	2012 (Bias Adjustment Factor = 0.82)	2013 (Bias Adjustment Factor = 0.89)
42	Blue House Roundabout (North)	Roadside	39.0	36.9	37.6	37.3	36.2	33.4
43	53 High Street, Gosforth	Roadside	**44.0**	**47.7**	**49.4**	**45.8**	**41.8**	**41.8**
44	102 - 104 High Street, Gosforth	Roadside	**43.5**	36.8	**44.4**	**40.8**	36.5	39.1
45	Gosforth Hog 1	Roadside			33.3	30.5	27.9	28.5
46	Gosforth Hog 2	Roadside			32.0	30.8	28.3	27.9
47	Gosforth Hog 3	Roadside			31.7	31.9	28.5	29.9
48	Dene Park House, Killingworth Rd	Roadside	**58.6**	**54.8**	NA	**53.3**	**48.0**	**47.2**
49	1 Killingworth Road	Roadside	29.6	26.8	NA	28.2	25.8	26.6
50	84 Station Road	Roadside	**46.9**	**43.4**	NA	**42.5**	**45.4**	**44.8**
51	16 Jesmond Dene Road	Roadside	35.7	33.8	NA	33.1	31.6	32.2
52	2 - 4 Victoria Square	Roadside	**40.5**	36.8	**43.0**	37.4	37.8	38.1
53	2 - 3 Osborne Terrace	Roadside	**46.0**	**44.0**	**45.1**	**40.2**	39.5	**41.1**
54	178 Sandyford Road	Roadside	**52.1**	**51.5**	39.9	37.1	37.5	33.4
55	9 - 11 Coast Road	Roadside	35.6	32.2	35.0	34.6	33.8	30.3
56	263 Shields Road	Roadside	39.3	**40.5**	**42.1**	35.6	37.0	36.3
57	124 Shields Road	Roadside	**40.9**	**41.0**	**40.6**	**40.3**	38.8	37.6
58	7 Studley Terrace / 129 Brighton Grove	Roadside	38.4	39.4	36.1	33.1	32.7	32.8
59	2 Brighton Grove	Roadside	32.8	32.5	34.2	34.6	31.1	34.1
60	5 Middleton Avenue	Roadside	28.1	30.6	27.4	27.3	23.0	22.5
61	26 West Copperas Lane	Roadside	32.3	30.8	31.7	30.7	32.6	36.8

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]					
			2008 (Bias Adjustment Factor = 0.89)	2009 (Bias Adjustment Factor = 0.9)	2010 (Bias Adjustment Factor = 0.89)	2011 (Bias Adjustment Factor = 0.9)	2012 (Bias Adjustment Factor = 0.82)	2013 (Bias Adjustment Factor = 0.89)
62	5 Birchfield Gardens	Roadside	**49.7**	**46.6**	**50.5**	38.9	38.8	39

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3
Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective
[a] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

Figure 11 displays the trend in the annual mean nitrogen dioxide concentrations measured at NO_2 diffusion tube monitoring sites across the City. The data has been derived by averaging the results for the tubes within three areas; City centre AQMA, Gosforth AQMA and outside the AQMAs.

Fig. 11. Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



It is noticeable that all three areas show a fall in the annual mean NO_2 concentration since 2008, particularly within the Gosforth AQMA. As discussed in previous reports this could be due to factors such as:

- further investment within the public transport system, and
- an improvement with emissions from vehicles.

City Centre AQMA

NO_2 diffusion tube data for the City centre AQMA shows that levels have continued to fall since 2008. Whilst the diffusion tube data indicates the NO_2 levels continue to be breached it is notable that over half the tubes show a reduction in the NO_2 level since 2012. Mosley Street continues to present high NO_2 levels and has not shown any real improvement since 2008.

Figure 12 shows the trend since 2008 for the automatic monitoring sites against the trend for the diffusion tubes. With the trend for automatic monitoring going up, it is unlikely that diffusion tube results will show the City centre falling below the 40µg/m^3 within the next few years.

Fig. 12. Trend in Annual Mean Nitrogen Dioxide Concentrations measured at the City centre automatic monitoring sites against the trend for the diffusion tubes

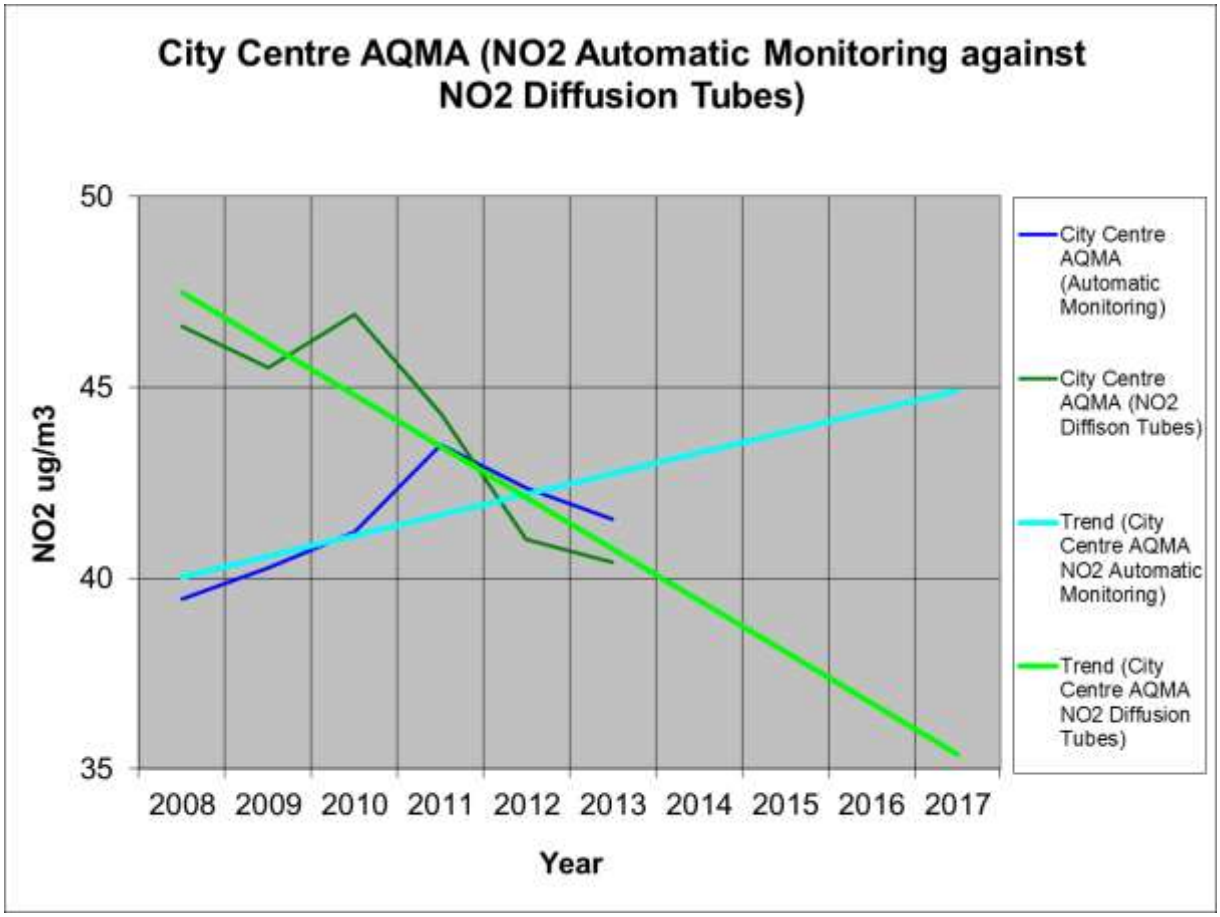
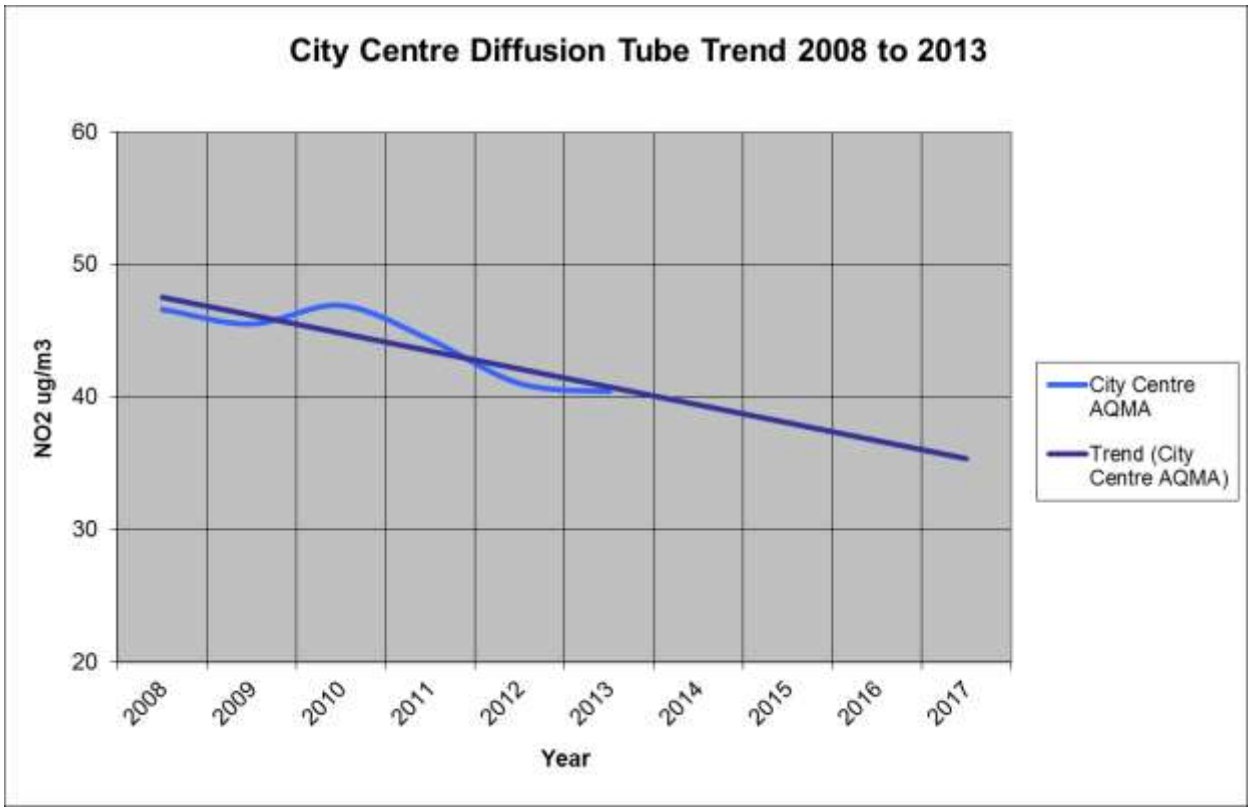


Figure 13 shows the NO_2 annual mean concentration continuing to fall with the trend indicating that the City centre AQMA could be below the NO_2 limit by 2014-15. However, it should be noted that whilst the overall trend might indicate a fall below the NO_2 limit there will, most likely, remain areas where the limit continues to be exceeded, for example, Mosley Street, Neville Street, Percy Street and Pilgrim Street.

Fig. 13. Trend in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites within the City centre AQMA



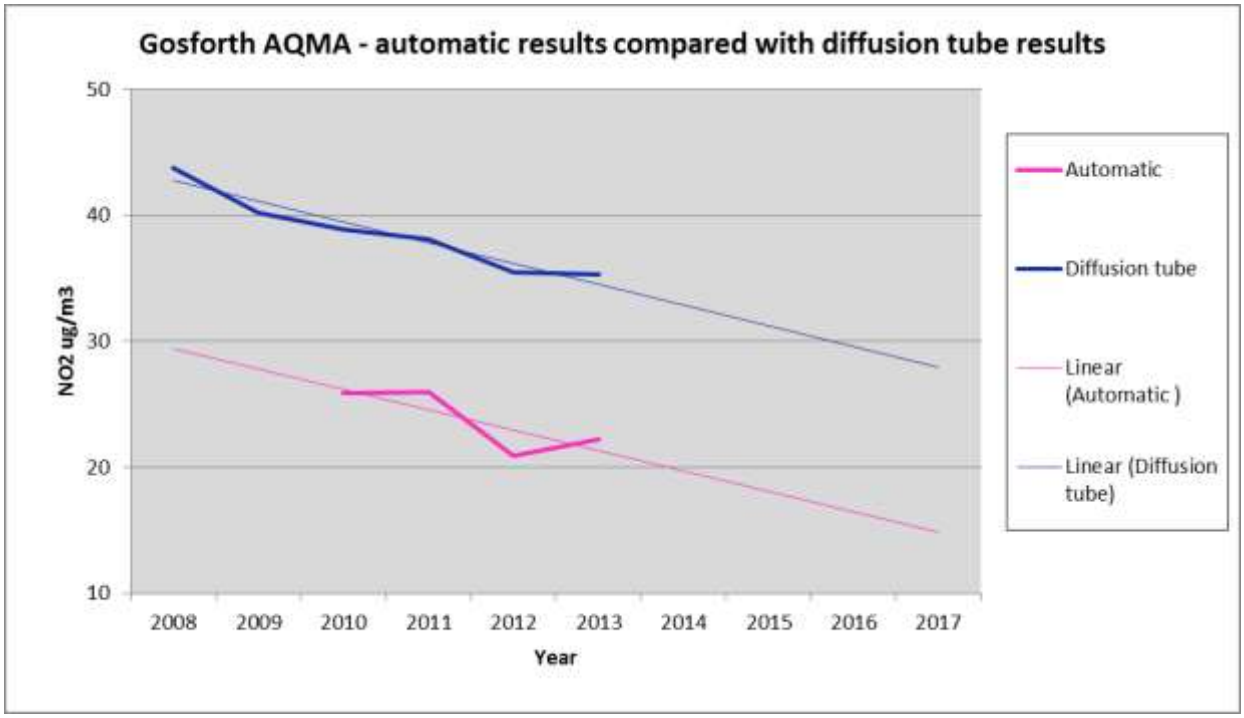
Gosforth AQMA

Figure 14 below indicates that Gosforth AQMA continues to fall beneath the 40µg/m^3 limit. Last year it was reported that in 2012 four diffusion tubes (eleven in total) in the Gosforth AQMA were still showing NO_2 levels above the annual mean objective limit. The results for 2013 show that 3 of the same 4 diffusion tubes remain above the limit but that the diffusion tube at Blue House Roundabout, which has consistently been above the limit, is now showing a result below the limit. There have been no modifications to this roundabout in recent years so it is hoped that this is a true reflection of the situation and that NO_2 levels are falling in this area.

Figure 14 also shows a comparison between the non automatic and automatic monitoring results for the Gosforth AQMA. Both automatic monitoring data and diffusion

tube results are following a very similar tend but diffusion tube results continue present a level approximately 10µg/m^3 above the automatic monitoring data.

Fig. 14. Gosforth AQMA – automatic monitoring results compared with diffusion tube results



Outside the AQMAs

2013 saw no diffusion tubes outside the AQMAs exceeded the NO_2 annual mean concentration limit.

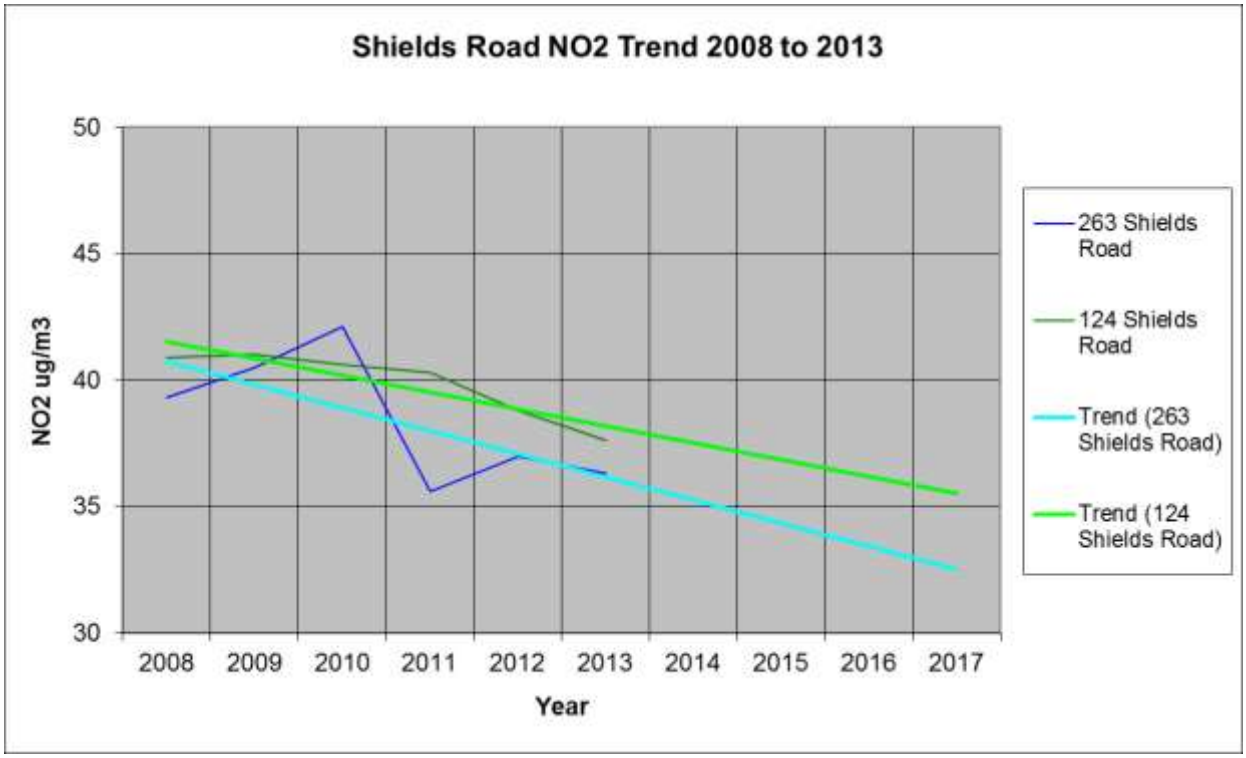
In previous reports Shields Road has been 'flagged' as being an area of concern. However, as reported last year, the NO_2 level measured at the 2 tubes on Shields Road continues to follow the trend with both tubes giving lower results than in 2012. See **Figure 15**.

Shields Road is by-passed by an adjacent dual carriageway hence the traffic tends to be dominated by commercial vehicles, particularly buses. Due to the high proportion of

buses on Shields Road it could argued that the improvement in air quality is due to an improvement in emissions from buses rather than any traffic management scheme.

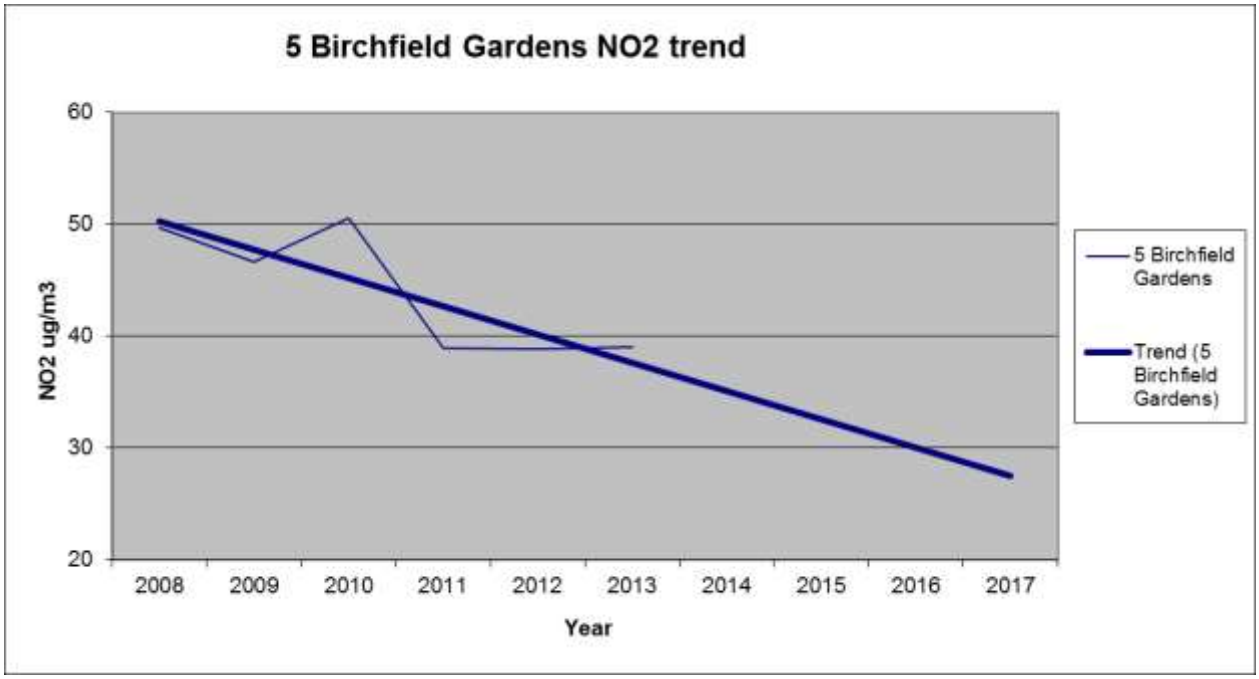
In 2011 Stagecoach North East brought 26 new hybrid electric buses into service. The buses have been placed on routes across the City, including Shields Road. The hybrid electric buses are used on Route 39 and 40 which travel along Shields Road up to once every five minutes.

Fig. 15. Trend in Annual Mean Nitrogen Dioxide Concentrations measured at the Shields Road diffusion tubes



Birchfield Gardens continues to show NO_2 annual mean concentrations close to the limit. This tube is positioned approx. 11 metres from the edge of the A1 with a slip road adjoining the A1 within 3 metres. In 2009 and 2010 this site exceeded the limit but since 2011 it has fallen below the limit. It is difficult to say with any certainty why this has happened but the trend, **see Figure 16**, for this site indicates the site could stay below the limit.

Fig. 16. Birchfield Gardens NO_2 Trend



2.2.1 Particulate Matter (PM_{10})

There are three PM_{10} automatic monitors within the City; two located within the City Centre AQMA and one within the Gosforth AQMA, see **Table 9** for the details of the three real time PM_{10} monitors.

Table 9. Details of the three real time PM_{10} monitors.

Location	Type of Site
AURN, St. Mary's Place	Urban Background
Jesmond Road (Cradlewell)	Roadside in AQMA
High Street, Gosforth (since December 2009)	Roadside in AQMA

Analysis of the automatic monitoring sites can be seen below in **Table 10** and **Table 11**.

Table 10. Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)					
						2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]	2013 [c]
St. Mary's Place (AURN)	Urban back ground	Y				17.3	15.2	14.9	19.6	15.6	12.7
Jesmond Road, Cradlewell (G'hog)	Road side	Y	100	99.5	Y	19.8	20.4	19.8	25.4	20.9	20.6
High Street Gosforth (G'hog)	Road side	Y	100	86.8	Y			16.6	19.3	15.4	15.4

In bold, exceedence of the PM_{10} annual mean AQS objective of 40µg/m^3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

Table 11. Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3					
						2008* [c]	2009* [c]	2010* [c]	2011* [c]	2012 [c]	2013 [c]
St. Mary's Place (AURN)	Urban back ground	Y				5	4				
Jesmond Road, Cradlewell (G'hog)	Road side	Y	100	99.5	Y	4	5	4	20	11	4
High Street Gosforth (G'hog)	Road side	Y	100	86.8	Y			1	4	0	3

In bold, exceedence of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] if data capture for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets

The Council can confirm the following:

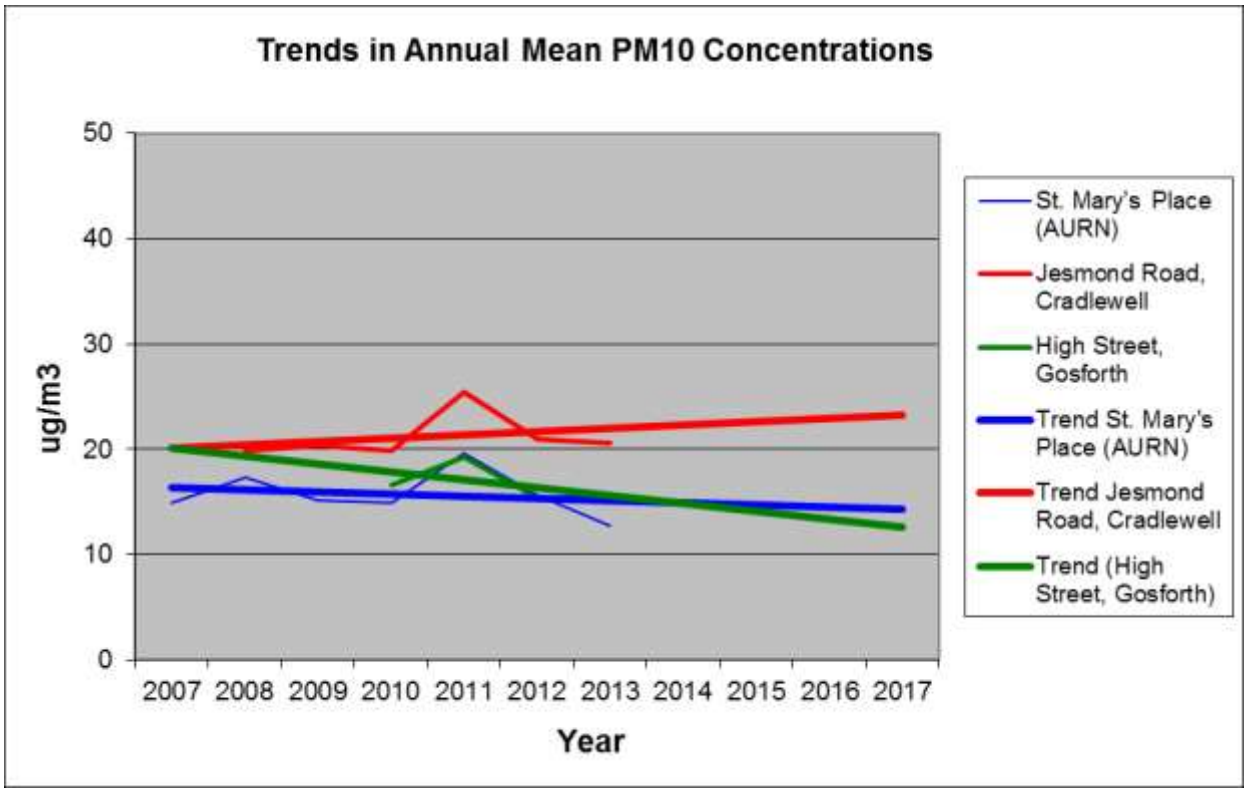
- The annual mean concentration did not exceed 40µg/m^3 and that the 24-hour mean (50µg/m^3) was not been exceeded more than 35 times in 2013 at any of its sites.
- The AURN at St. Mary's Place is not representative of relevant public exposure.
- The site at Jesmond Road (Cradlwell) and High Street (Gosforth) are considered representative, both being kerbside and 7 metres and 37 metres from residential properties respectively.

Figure 17 shows the annual mean PM_{10} concentration trend for the three automatic monitoring sites in Newcastle.

The St. Mary's Place AUN and Jesmond Road (Cradlewell) sites, located within the City centre AQMA, display trends that suggest PM_{10} levels are on the increase. This increase is only slight and it can be said with some certainty that PM_{10} levels will not exceed the annual mean concentration limit with the next five years.

The site located on High Street in Gosforth has now been monitoring for 4 years. The trend at present for this site is that PM_{10} levels are below the annual mean concentration and will continue fall over the next five years.

Fig. 17. Trends in Annual Mean PM_{10} Concentrations



2.2.2 Sulphur Dioxide (SO_2)

The Council no longer monitor SO_2 levels.

The AURN, located at St. Mary's Place, ceased monitoring SO_2 in August 2012.

The data from the AURN until 15 August 2012 is accessible through DEFRA's web site at the following link: http://uk-air.defra.gov.uk/data/

2.2.3 Benzene

The Council has ceased to monitor Benzene leaving the AURN, located at St. Mary's Place, as the only real time monitoring data available

The data from the AURN, St Mary's Place, is accessible through DEFRA's web site at the following link: http://uk-air.defra.gov.uk/data/

2.2.4 Other Pollutants Monitored

Carbon Monoxide

Newcastle City Council no longer monitor CO.

The AURN, located at St. Mary's Place, ceased monitoring CO in August 2012.

The data from the AURN until 15 August 2012 is accessible through DEFRA's web site at the following link: http://uk-air.defra.gov.uk/data/

1,3-Butadiene

There are no industrial processes within the City likely to emit 1,3 Butadiene therefore no assessment of 1,3 Butadiene has been made.

Lead

There are no longer any industrial sources of lead within the City and therefore the objective is being met. There are no new sources of lead within the City.

Ozone

Ozone continues to be monitored at our Jesmond Road, Cradlewell, automatic monitoring site. The results show there were no exceedences of the 8 hour objective in 2013.

See **Table 12**, Ozone (µg/m^3) Jesmond Road (Cradlewell) Air Quality Monitoring Station.

Table 12. Ozone (µg/m^3) Jesmond Road (Cradlewell) Air Quality Monitoring Station

Year	No. of exceedences of 8-hour objective (100 µg/m^3)	Mean	Data Capture %
2013	0	39.2	98.4

2.2.5 Summary of Compliance with AQS Objectives

Newcastle City Council has examined the results from monitoring in the district.

Concentrations within the AQMA still exceed the annual mean objective for nitrogen dioxide with both the City centre and Gosforth AQMA and the AQMAs should remain.

Concentrations outside of the AQMAs are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Newcastle City Council confirms that there are no new or newly identified road traffic sources of pollution which may have an impact on air quality within the Local Authority area.

3.2 Other Transport Sources

Newcastle City Council confirms that there are no new or newly identified road transport sources of pollution which may have an impact on air quality within the Local Authority area.

3.3 Industrial Sources

Newcastle City Council confirms that there are no new or newly identified industrial sources of pollution which may have an impact on air quality within the Local Authority area.

3.4 Commercial and Domestic Sources

There have been no newly identified commercial and domestic sources of pollution since the Updating and Screening Assessment in 2012.

Newcastle City Council confirms that there are no new or newly identified commercial and domestic sources of pollution which may have an impact on air quality within the Local Authority area.

3.5 New Developments with Fugitive or Uncontrolled Sources

Newcastle City Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Newcastle City Council confirms that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

City Centre AQAP

In January 2006 the Council produced a City centre AQMA AQAP which included:

- quantification of the source contributions to the predicted exceedences of the objectives, to allow the action plan measures to be effectively targeted;
- evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility;
- how the local authority will use its powers and also work in conjunction with other organisations in pursuit of the air quality objectives;
- clear timescales in which the local authority and other organisations and agencies propose to implement measures within the action plan;
- quantification of the expected impacts of the proposed measures and, where appropriate, an indication as to whether the measures will be sufficient to meet the air quality objectives;
- how the local authority intends to monitor and evaluate the effectiveness of the action plan.

The report set out a 2004/05 baseline and listed numerous measures that would directly or indirectly benefit air quality. These measures were assessed in terms their Effect, Cost and Feasibility. Within Feasibility a time scale was assigned to each measure. Short term measures were expected to be implemented within one to two years, with medium term measures given three to five years and long term measures six plus years. By 2013 many of these initiatives should have been implemented.

Given the availability of funds it could be said that some of the initiatives have taken longer to implement than first expected but it should be noted that most schemes are underway or have been completed. See Pages 72 to 92.

The Newcastle City Centre AQAP identified 21 key receptor points within the City centre AQMA. Since 2011 the number of diffusion tubes has been reduced with two being removed from the original 21 Key receptor points; Queen Victoria Road/St

Thomas Street (LAQM 20) and Haymarket/Barras Bridge (LAQM 21). The results from the 19 key receptor points is reported to the LTP Team (see **Table 13,** 21 Key Receptors referred to in the City centre AQAP and **Figure 18**, Progress towards Newcastle City centre AQMA Targets).

Table 13. 21 Key Receptors referred to in the City centre AQAP

	Predicted Result µg/m3 2005	Monitored Result µg/m3 2007	Monitored Result µg/m3 2008	Monitored Result µg/m3 2009	Monitored Result µg/m3 2010	Monitored Result µg/m3 2011	Monitored Result µg/m3 2012	Monitored Result µg/m3 2013
St Marys Place / John Dobson Street (LAQM 01)	20-40	57.8	57.8	52.7	55.8	52.7	51.8	49.7
John Dobson St / North Street (LAQM 02)	40-60	37.3	49.2	38.8	37.3	37.6	33.1	34.4
98 - 100 Pilgrim Street (LAQM 03)	>60	48.9	48.2	48	50.2	46.6	44.4	41.4
Swan House / City Road (LAQM 04)	>60	51.1	48.1	54.2	44.3	38.4	44	38.4
City Road (LAQM 05)	no exc'd	51.6	51.8	46.3	48.8	45.7	43.5	44.1
Quayside / Broad Chare (LAQM 06)	no exc'd	40.6	37.3	37.6	37.6	37.6	33.6	36.0
Trinity Chambers / Flynns, Quayside (LAQM 07)	no exc'd	40.2	44.6	42.7	39.8	44.6	37.1	41.0
Queen Street / Lombard Street (LAQM 08)	>60	44.1	41.4	37.2	37.8	32.1	32.6	32.4
32 Close (LAQM 09)	40-60	44.4	47	37.3	39.9	36.1	34.4	35.5
Forth Street/ Skinnerburn Road (LAQM 10)		38.6	38	36.2	37.5	32.3	29.7	29.3
8 Mosley Street (LAQM 11)	40-60	55.2	68	68.5	66.5	64.4	63.7	64.9
Neville Street / Westgate Road (LAQM 12)	20-40	57	49.9	57.6	57.1	61.4	51.7	52.2
Waterloo Street / Westmorland Road (LAQM 13)	40-60	50.3	40.3	48.1	53.2	49.7	47.3	42.9
96 - 98 Westgate Road / Cross Street (LAQM 14)	>60	41.6	47.8	39.8	39.8	39	38.3	36.3
Newgate Street / Grainger Street (LAQM 15)	40-60	50.4	54.7	47.5	53.4	52.7	48.2	48.8
115 - 119 Grainger Street / Market Street (LAQM 16)	40-60	50.2	56.8	57.5	55.2	53	50.3	44.9
10 Market Street (LAQM 17)	40-60	57.1	49.2	54.3	57.7	51.4	47.7	50.6
Gallowgate / Percy Street (LAQM 18)	>60	54.3	36.9	45.1	52.8	53.5	48.1	43.6
Gallowgate / St Andrews Street (LAQM 19)	>60	46.3	37.3	37.6	36.7	37.9	31.7	37.5
Queen Victoria Rd/St Thomas St (LAQM 20)	0-20	34.2	37.3	37.3	35.4			
Haymarket/Barras Bridge (LAQM 21)	20-40	38.5	42.2	45	45.1			
		47.1	**46.8**	**46.2**	**46.8**	**45.6**	**42.7**	**42.3**

Fig. 18. Progress towards Newcastle City centre AQAP Targets

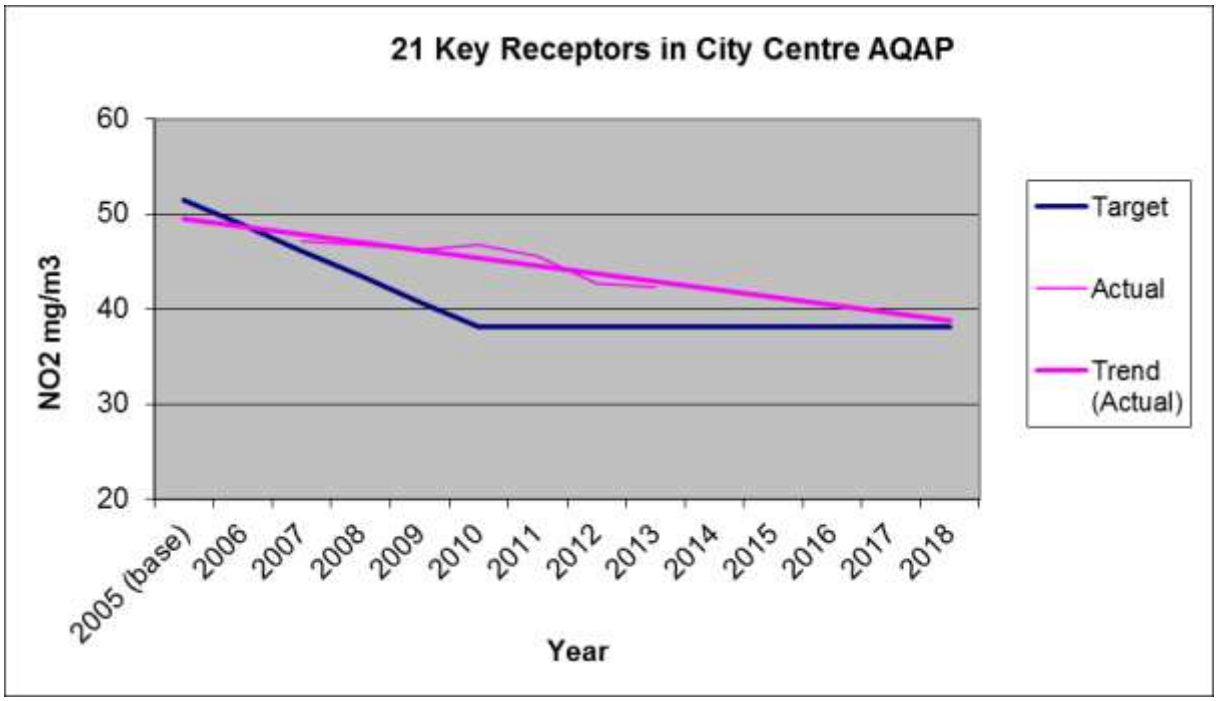


Table 13 and Figure 18 show that the target is not being met. However, the trend is encouraging as it has continued to fall since 2011and is now at its lowest level in recent years

Furthermore, the trend reported in 2011 showed little progress towards the NO_2 annual mean objective. However, once 2011 and 2012's results are added it is encouraging to see the trend indicating the Newcastle City centre AQMA Targets could possibly be met with four to five years.

Gosforth AQAP

In 2011 the Council produced an AQAP for the Gosforth AQMA. The report describes the situation and sets out the measures that will be implemented, or investigated further, to deliver improvements to air quality within the Gosforth AQMA.

The AQAP also analysed and evaluated the measures to be implemented, provided an indication as to the improvements that might be expected from these measures and the time scales necessary for implementation. It also identifies the ambitious measures that will be required to achieve an improvement in air quality in this area.

The Highways and Transport Report 2013 details service reports and ward programmes that demonstrate the diverse range of service provision in highways and transportation. Section 3.6, Policy Transportation and Development provides an overview as to how the local authority is implementing and progressing measures such as the creation of a cycle friendly city, improvement of public transport, development of the electric vehicle infrastructure, travel planning, implementation of major schemes and LTP3.

The report rarely refers to air quality but it is recognized that the air quality across the City should help improve air quality.

The Highways and Transport Report 2013 can be viewed at the following web link: http://www.newcastle.gov.uk/parking-roads-and-transport/roads-highways-and-pavements/roads-and-highways-management/highways-report-and-asset-management-plan

Be Air Aware Campaign

In April 2009 the Tyne and Wear LTP Partners, in close relationship with DEFRA, launched a local social marketing campaign for improved air quality - Be Air Aware. The campaign worked closely with local schools and school travel planners to promote initiatives and projects that promoted sustainable travel modes that have a beneficial effect on air quality.

With the introduction of LTP3 in April 2011, 'Be Air Aware' ceased being used to promote measures to improve air quality. That said, the measures continue to be promoted and implemented through LTP3 but without specific reference to the benefits these measures bring in terms of air quality.

DEFRA Funded Air Quality Campaign

To help redress this imbalance the Environment and Safety Section of the City Council made an application in 2012 to DEFRA for funding to run an air quality awareness campaign. The application was successful and the Council are now working with a local charity, Groundwork North East, to deliver the campaign.

The aim of the campaign is to raise awareness and engage local communities in Newcastle on issues relating to local air quality management. The campaign aims to enable communities understand how their lives are affected by poor air quality and to understand the choices they can make that will influence air quality emissions reduction. The campaign will support communities in making transport choices that will impact positively on their health and well- being and reduce their personal air quality impact.

The objectives of the campaign are as follows:

- To engage communities on the issue of air quality to improve awareness of how air quality relates to health and well-being and the quality of the local environment.
- To develop and facilitate a scheme whereby community members monitor air quality in their local area.
- To recruit and up-skill community air quality mentors to ensure campaign sustainability and mainstreaming.
- To conduct baseline surveys within the targeted communities of current behaviours with regard to local travel.
- To identify with individuals journeys they can make without the use of the private car. Identify a personal air quality emissions reduction plan and to monitor the impact this has on them over the year in terms of positive health outcomes and reduction in car usage and increased sustainable transport uptake.
- To provide a green travel plan report to each community of the local transport options available and the benefits of sustainable transport options. The report will communicate the positive outcomes of the campaign and Identify barriers to sustainable travel and air quality improvement at a localised level.
- The campaign supports the air quality action plan in that it both promotes the air quality message at a very localized level and engages people in reducing their travel via car and informing communities about local air quality.

The benefits of the campaign are considered to be as follows:

- Provision of data to the Local Authority relating to current transport trends and attitudes towards transport across Newcastle.
- Increased community knowledge and understanding of air quality across Newcastle.
- Provide communities with air quality monitoring data for their community.
- Provide evidence base for local decision makers surrounding air quality and transport.
- Involve local communities in the process of air quality monitoring to provide a greater understanding and awareness of how air quality relates to health and well-being and provide information for those communities to allow greater uptake of sustainable transport options to the benefit of their health and well-being. To monitor the impact of behaviour change in the local community.
- Establish a network of community air quality mentors across Newcastle to provide campaign sustainability.
- Provide a framework for communicating the relationship between air quality and health and well-being.
- Working closely with communities to build financial capacity and build resilience to rising fuel prices and poor air quality.
- Linking up local communities and promoting social inclusion.
- Provide awareness of air quality and sustainable transport to local businesses.
- Engaging with communities, groups, organizations and businesses is essential to the success of this campaign. This is to be achieved over the duration of the campaign as follows.
- By recruiting and providing training for 26 community air quality mentors. Mentors are to support other members of the community that have engaged with the campaign. It was hoped that members of the community would host 130 diffusion tubes that are to be provided as method of involving people and allowing them to measure the air quality where they live. Due to the popularity of this aspect of the campaign there are currently 180 diffusion tubes located around the City.
- Marketing is to be carried out within supermarkets, sports centres, student unions, public thoroughfares, libraries etc.

- A website has been developed to facilitate social marketing (see http://www.change4air.co.uk/).
- Media coverage, for example, press releases, articles in local media
- Monthly newsletter to help raise awareness for the campaign and keep members of the community informed as to how the campaign is progressing.
- A report at the end of campaign to establish its success and whether there has been a change is the public's attitude and behaviour towards sustainable modes of transport.
- The campaign is to finish with a celebration sustainable travel day
- A green travel plan report is to be provided to each community with local transport options available and the benefits of sustainable transport options. The report shall communicate the positive outcomes of the project and Identify barriers to sustainable travel and air quality improvement at a localized level.

Go Smarter

Go Smarter is a programme of schemes in Tyne and Wear aimed at encouraging more people to choose sustainable transport, helping reduce congestion and meet environmental targets.

Go Smarter comprises different partners, these being the Tyne and Wear Integrated Transport Authority, Nexus, the five Tyne and Wear local authorities (Newcastle, Gateshead, Sunderland, North Tyneside and South Tyneside), Sustrans and Living Streets.

At present the project supports two programmes:

- Schools Go Smarter
- Go Smarter to work

Schools Go Smarter runs from 2011 to 2015 and encourages children, parents and teachers to use alternative transport to the car for travelling to school.

Go Smarter to Work began in 2012 and finishes in 2015 with its main focus being on businesses. The scheme seeks to promote sustainable transport across Tyne and Wear, in particular around the A1 Western Bypass.

Clean Bus/Vehicle Technology Funds

Newcastle and Gateshead Councils have encouraged bus operators to invest in newer clean emission fleets through the Clean Vehicle Technology fund which has seen over £7 million invested in new electric diesel hybrid buses across the country. In 2012 the Councils received a £346,500 grant from the Department of Transport Clean Emission fund to retrofit nitrogen dioxide abatement equipment to 24 older buses operating in the City Centre to improve their exhaust emissions to the standard of a new vehicle.

Initial 'Millbrook' Tests exceeded the target and gave results showing a reduction in the order of 96.7% for NO_2 and 95% for NO_x. This work is nearing completion and a programme of monitoring the improvements whilst the buses are in service is to be implemented using wireless sensing technology (called motes).

Earlier this year the Tyne and Wear authorities made a further joint bid to DEFRA for funding into Clean Vehicle Technology. The bid was successful and will help fund modifications to approximately 30 buses.

The technology being developed, GyroDrive, increases the efficiency of each bus hence using less fuel. This equates to a reduction in NO_2 by at least 25%. The vehicles will operate from Newcastle city centre to Blyth in the North and Sunderland in the south.

Go-Ahead reported the bid as follows:

"The Go-Ahead Group and GKN plc have agreed a deal that will help reduce emissions in cities with the supply of electric flywheel systems to 500 buses over the next two years.

The innovative GKN system is based on Formula One race technology developed in the UK. It will help increase the efficiency of every bus to which it is fitted by using less fuel and therefore reducing carbon emissions. This same technology helped Audi's R18 e-tron win at Le Mans last month.

Go-Ahead has placed an order for GKN Hybrid Power to supply 500 of its Gyrodrive systems to the transport operator. The Gyrodrive system uses a high speed flywheel made of carbon fibre to store the energy generated by a bus as it slows down to stop. It then uses the stored energy to power an electric motor which helps accelerate the bus back up to speed, generating fuel savings of more than 20% at a significantly lower cost than battery hybrid alternatives.

The agreement covers the supply of the complete Gyrodrive system, including the innovative GKN Hybrid Power flywheel as well as GKN's advanced EVO electric motor, a GKN designed and manufactured gearbox, and installation. The system is designed to last for the life of the bus eliminating the need for any battery changes. Following successful trials on buses in London, Go-Ahead intends to utilise the technology in cities it serves across the UK, initially in London and Oxford.

Philip Swash, CEO GKN Land Systems, said: 'This is an important milestone for GKN Hybrid Power. We've worked in close partnership with Go-Ahead throughout the development of this innovative technology and it's very exciting to move into the production phase.

The fact that we are using the same groundbreaking technology that helped Audi win at Le Mans for the past three years to improve fuel efficiency in the public transport sector also shows what great innovation there is in the UK's engineering sector.'

CEO of Go-Ahead, David Brown, added: 'Our collaboration with GKN has been a most constructive one. We have a strong record in continually reducing our carbon emissions and flywheel technology will help us make buses an even more environmentally responsible choice and encourage more people to travel by public transport.

The flywheel technology helps us to reduce our fuel consumption and C02 emissions so improving air quality for all those living, working and visiting the city.'

GKN Hybrid Power is based in Oxfordshire, with final assembly taking place in a new facility at GKN's site in Telford. The Gyrodrive technology is being further developed for other mass transit markets including trams, construction and agricultural equipment. Earlier this year GKN announced the acquisition of Williams Hybrid Power from Williams Grand Prix Engineering Limited to form GKN Hybrid Power, which is focused on delivering complete hybrid solutions across multiple vehicle, power and industrial markets."

5 Planning Applications

Whilst there were numerous planning applications made in 2013 that required an air quality assessment, there were no large planning applications received or granted that have given concern in terms of air pollution.

6 Air Quality Planning Policies

The “The Validation of Planning Applications in Tyne & Wear - 2013” can be found via the following link:
http://www.newcastle.gov.uk/planning-and-buildings/planning/applications-forms-validation-checklists-and-guidance-notes?opendocument=
and then accessed via “View Validation Checklist’. Air Quality Assessment can be found under Chapter 11.

The document is supported by the Tyne and Wear authorities so as to provide consistency for customers whilst allowing for local variances in individual circumstances.

7 Local Transport Plans and Strategies

The Highways and Transport Report 2013 details service reports and ward programmes that demonstrate the diverse range of service provision in highways and transportation. Section 3.6 Policy Transportation and Development provides an overview as to how the local authority is implementing and progressing measures such as the creation of a cycle friendly city, improvement of public transport, development of the electric vehicle infrastructure, travel planning, implementation of major schemes and LTP3.

The report rarely refers to air quality but it is recognized that the aforementioned measures being implemented across the City will help improve air quality.

The Highways and Transport Report 2013 can be viewed at the following web link: http://www.newcastle.gov.uk/parking-roads-and-transport/roads-highways-and-pavements/highways-and-transportation-report

In March 2011 the Tyne and Wear Integrated Transport Authority (TWITA), a partnership made up of six LTP Partners – the five local authorities in Tyne and Wear (Gateshead, Newcastle, North Tyneside, South Tyneside and Sunderland) plus Nexus, the local Passenger Transport Executive, produced the third Local Transport Plan (LTP3) for Tyne and Wear. It comprises a ten-year strategy (2011 – 2021) covering all forms of transport in Tyne and Wear, supported by the first in a series of three-year delivery plans (2011 – 2014) setting out how the strategy will be put into effect at a local level. The Strategy and Delivery Plan can be accessed via the following link: http://www.tyneandwearltp.gov.uk/documents/ltp3/

- The Strategy adopted five goals (objectives) to help achieve its ambition:
- To support the economic development, regeneration and competitiveness of Tyne and Wear, improving the efficiency, reliability and integration of transport networks across all modes

- To reduce carbon emissions produced by local transport movements, and to strengthen our networks against the effects of climate change and extreme weather events
- To contribute to healthier and safer communities in Tyne and Wear, with higher levels of physical activity and personal security
- To create a fairer Tyne and Wear, providing everyone with the opportunity to achieve their full potential and access a wide range of employment, training, facilities and services
- To protect, preserve and enhance our natural and built environments, improving quality of life and creating high quality public places
- The Strategy identifies one of its main policies as being Air Quality; its key challenges being:
- Emissions management: to continue work to promote and improve the efficiency of vehicles and reduce their emissions both in terms of air quality and carbon;
- To continue to work with bus and fleet managers to encourage the uptake of low emission vehicles;
- Ensuring, through co-ordinated working with planning colleagues, that future development will only take place in suitable sustainable locations. Housing should be close to existing services and amenities, where there is already good transport infrastructure, while the type of development in a locality should not create a large increase in the need to travel by motor vehicle;
- Making the most efficient use of the existing highway network and ensure that air quality and carbon emissions are considered in all highway proposals;
- Promoting and enhancing the quality of alternative modes of transport to the private motor car, such as walking, cycling, and public transport so that their use is significantly increased;
- Educating all transport users on how their choice of transport impacts on emissions and how using more sustainable forms of transport can help improve air quality, health and the quality of life; and
- To improve air quality, especially in the designated AQMA areas.

As stated, the Strategy is accompanied by a three-year Delivery Plan (2011 – 2014) which identifies that AQMAs have been declared based on NO_2 levels across the Tyne

and Wear area (Gateshead Council, Newcastle City Council and South Tyneside Council)

The Delivery Plan also identifies trends across the Tyne and Wear area and states that in Newcastle City centre air quality is worsening.

In producing the Strategy TWITA commissioned various assessments, one being entitled, 'Tyne and Wear Joint Transport: Working Group: Local Transport Plan 3: Strategic Environmental Assessment: Environmental Report'. The report states, "Road transport is the main source of air pollution in Tyne and Wear, which is reflected in the designation of six Air Quality Management Areas (AQMAs)".

The Delivery Plan aims to achieve reductions in NO_2 in each of the AQMAs with the target being to have all AQMA orders revoked in the Tyne and Wear area.

Traffic emissions are the main reason why the AQMAs were declared consequently transport planning has a major impact on air quality. Local Transport Plans are therefore essential if an improvement in air quality is to be seen across the Tyne and Wear area with Strategic Planning and Development Management giving material consideration to air quality when determining planning applications.

Whilst the Strategy does not incorporate the Council's Air Quality Actions Plans (City Centre AQAP dated January 2006 and Gosforth AQAP dated March 2011) the AQAPs are progressed through Air Quality Steering Group which meets on quarterly year basis and feeds directly into TWITA.

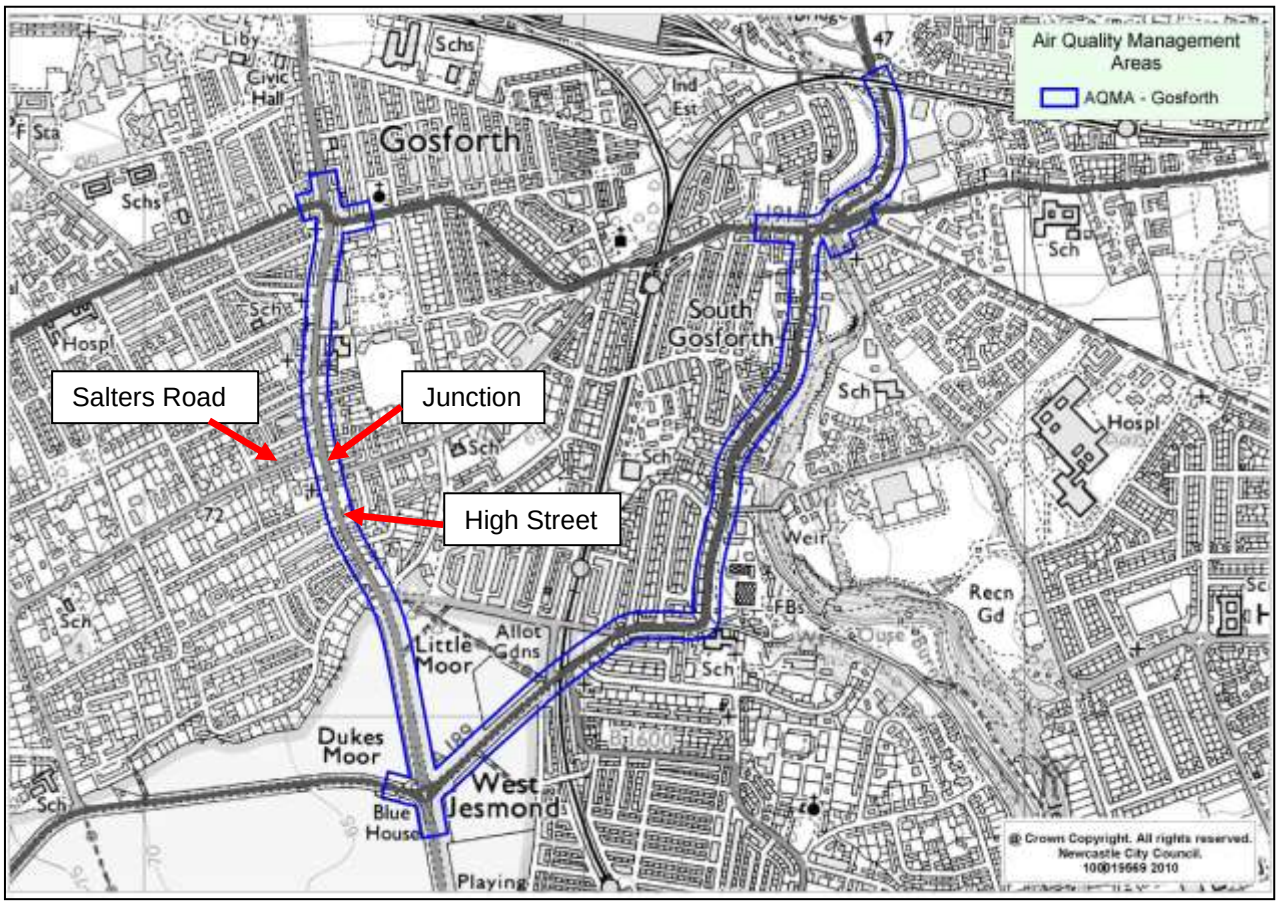
Gosforth Transport Scheme

In 2009 the City Council's Executive approved a public transport scheme for the High Street and Salters Road corridor for submission to the Regional Transport Board which included the remodelling of the Salters Road/High Street junction, **see Figure 19**. The scheme was not taken forward at that time due to external funding not being made available.

This scheme is in the middle of the Gosforth AQMA, the aims of the proposal being to retain the vibrancy of Gosforth's High Street, making it safer for shoppers and cyclists to get around whilst improving traffic flows and reducing pollution and noise.

In September 2014 the scheme was resubmitted and gained approval from Cabinet.
The changes included the introduction of a red route along Gosforth's High Street to prevent indiscriminate stopping of vehicles which cause traffic jams and delayed journeys on one of the main routes into the city centre.

Fig 19. Salters Road/High Street Junction



8 Climate Change Strategies

During 2010 the Newcastle Climate Change Partnership sent out a document for consultation entitled, “Citywide Climate Change Strategy and Action Plan 2010-2020: Delivering Newcastle’s Sustainable Community Strategy”. This document received Executive approval in October 2010 and can be accessed via the following link: http://www.newcastle.gov.uk/environment/environment/climate-change

The Strategy provides an overall programme for tackling climate change and sets out a series of action plans on how to deliver carbon emissions reductions from Newcastle.

It is recognised that air quality and climate change are interrelated. Reducing the emission of pollutants will help the achieve climate change objective and in turn reducing the warming effect of pollutants will help air quality.

The City Council’s Air quality officers and Climate Change officers continue to work together to achieve a common goal.

9 Implementation of Action Plans

The Council has two Air Quality Action Plans:

- City Centre AQAP, dated January 2006
- Gosforth AQAP, dated May 2011

In 2007 the Council commissioned an Air Quality Action Plan Progress Report. This report included a table showing fifty nine measures that were aimed at improving air quality in the City centre (see **Pages 72 to 92**, the 59 measures identified in the 2007 City centre AQAP aimed at improving air quality). This table has subsequently been updated and included within the Council's USAs and PRs over the last few years.

The aim is to keep a track on the AQAP's progress through the updating of these measures on a regular basis.

The Council's 2006 USA included a Table that predicted the affect LTP2 would have on NO_2 levels for 21 receptors within the City centre. The table gave 2005 measured concentrations and put them against NO_2 concentrations for 2010 with and without the affect of LTP2. The Table has been updated (see **Table 14**, NO_2 measured 2005, predicted 2010 with LTP, predicted 2010 without LTP, measured 2010 and measured 2012) to include the 2012 measured NO_2 concentration levels.

It is evident, looking at the average concentration level, that the predictions have not been met. However, it is encouraging to see that the trend is downwards. In 2010 only four locations achieved the level predicted to be achieved with LTP intervention. Two years later this figure has double to eight leaving just over half not achieving the predicted level.

Table 14. NO_2 measured 2005, predicted 2010 with LTP, predicted 2010 without LTP, measured 2010 and measured 2013

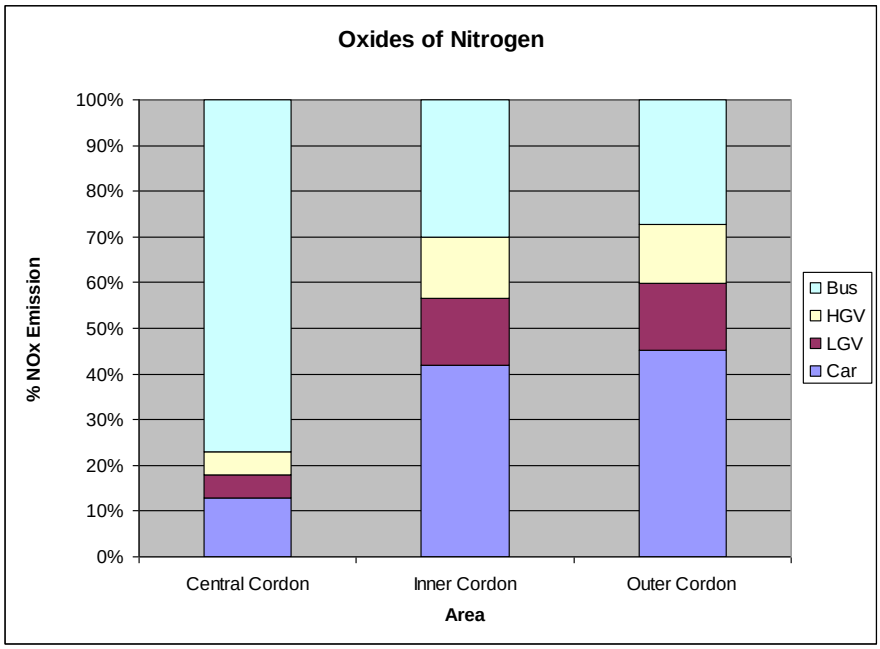
Receptor	Cordon	Nitrogen Dioxide conc 2005 (ug/m3)	Nitrogen Dioxide conc 2010 with LTP (ug/m3)	Nitrogen Dioxide conc 2010 no LTP (ug/m3)	Nitrogen Dioxide conc 2010 measured (ug/m3)	Monitored Result µg/m3 2013
St Marys Place / John Dobson Street (LAQM 01)	**inner**	**51.5**	39.1	**41.9**	**55.8**	**49.7**
John Dobson St / North Street (LAQM 02)	**inner**	**54.1**	**40.5**	**40.8**	37.3	34.4
98 - 100 Pilgrim Street (LAQM 03)	**central**	**41.6**	30.7	34.7	**50.2**	**41.4**
Swan House / City Road (LAQM 04)	**central**	**45.7**	33.5	35.4	**44.3**	38.4
City Road (LAQM 05)	**central**	**50.4**	36.5	36.8	**48.8**	**44.1**
Quayside / Broad Chare (LAQM 06)	**central**	**48.5**	35.4	39.3	37.6	36.0
Trinity Chambers / Flynns, Quayside (LAQM 07)	**central**	**60.8**	**43.7**	37.6	39.8	**41.0**
Queen Street / Lombard Street (LAQM 08)	**central**	**60.9**	**43.7**	37.3	37.8	32.4
32 Close (LAQM 09)	**central**	**53.4**	38.9	**44.1**	39.9	35.5
Forth Street/ Skinnerburn Road (LAQM 10)	**central**	**50.8**	37.2	**41.8**	37.5	29.3
8 Mosley Street (LAQM 11)	**inner**	**54.3**	**40.6**	**45.1**	**66.5**	**64.9**
Neville Street / Westgate Road (LAQM 12)	**inner**	**57.5**	**42.8**	**48.0**	**57.1**	**52.2**
Waterloo Street / Westmorland Road (LAQM 13)	**central**	**71.3**	**51.1**	**60.5**	**53.2**	**42.9**
96 - 98 Westgate Road / Cross Street (LAQM 14)	**inner**	**63.3**	**47.0**	**52.4**	39.8	36.3
Newgate Street / Grainger Street (LAQM 15)	**inner**	**52.5**	39.4	**44.0**	**53.4**	**48.8**
115 - 119 Grainger Street / Market Street (LAQM 16)	**inner**	**47.2**	36.0	39.3	**55.2**	**44.9**
10 Market Street (LAQM 17)	**inner**	**45.7**	34.5	37.8	**57.7**	**50.6**
Gallowgate / Percy Street (LAQM 18)	**inner**	**53.8**	**40.2**	**44.7**	**52.8**	**43.6**
Gallowgate / St Andrews Street (LAQM 19)	**inner**	37.6	28.8	31.2	36.7	37.5
Queen Victoria Rd/St Thomas St (LAQM 20)	**inner**	38.6	29.4	31.7	35.4	
Haymarket/Barras Bridge (LAQM 21)	**inner**	**41.5**	31.5	34.3	**45.1**	
Averages		51.5	38.1	40.9	46.8	42.3

It is accepted that pollution from traffic is causing the Air Quality Objectives to be breached. That said, the City centre has roads that are breaching the Objectives but have very little domestic vehicles using them. This points towards the problems being

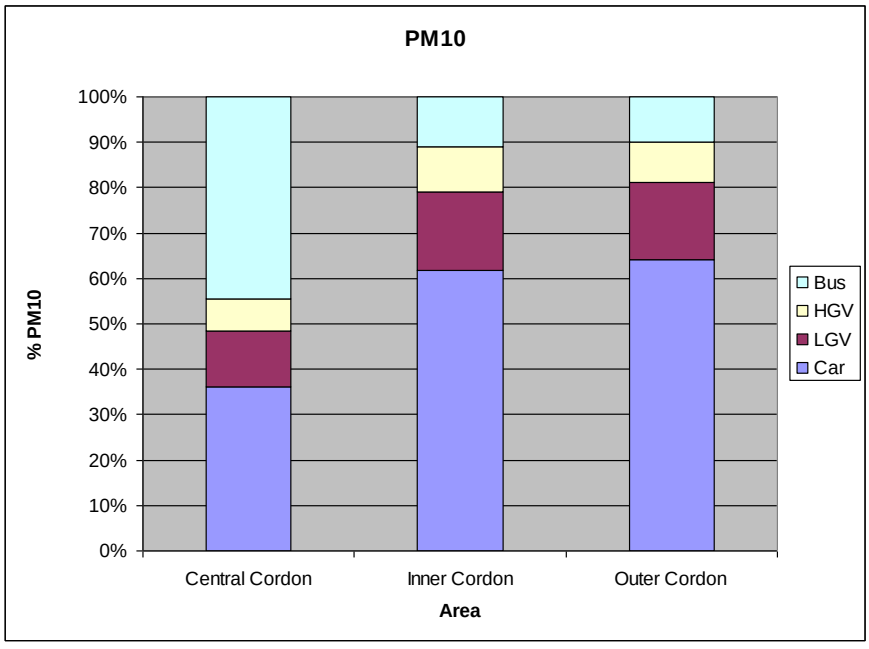
caused by other vehicles which has led the Council to investigate this further by carrying out source apportionment work.

Source apportionment work carried out in 2011 identified busses, taxis, heavy and light goods vehicles are the largest contributors to pollution levels across the City and in particular the City centre.

Cordon Count NO_x Emission Data



Cordon Count PM_{10} Emission Data



In 2009/2010 approximately 80% of the bus fleet achieved EURO IV standard compliance. However, this did not translated into improvement in air quality.

This is because the EURO emission data for EURO IV vehicles does not reflect the in-service efficiency of the engine; this being a nationally recognised problem. However, local bus operators have moved towards using EURO V emission standards as demonstrated by Stagecoach North East who, in 2011, invested £7 million in a fleet of hybrid electric buses for Newcastle.

AQAP Measures/Progress.

THEME 1: MANAGING THE HIGHWAY NETWORK						
Option	**Original timescale**	**Status of Measure**	**Funding available**	**AQ Impact ***	**Outcomes and Priority**	**Comments**
1. Residents parking permits	Implemented	18,000 residents/visitor parking permits issued. • These are located in close proximity to major employment sites outside of the city to discourage commuter parking. • Where these schemes are close to the city centre, they are predominantly in areas with low daytime population, which indicates that these are not the final destination on the trips. They are in areas of high car ownership • Permit numbers are capped to reduce congestion and low emissions discounts are available to encourage use of more environmentally friendly vehicles	Cost neutral	This has had low – medium air quality impact in the area, although it has had a high impact on more efficient enforcement.	18,000 parking permits have been issued to date, making parking enforcement easier to grip. Continuation of this so far successful scheme has **HIGH PRIORITY.**	

2. Specific Bus Corridors including Bus Lanes, or segregation of buses.	Ongoing	St. Mary's Place bus corridor scheme implemented. Consideration in now being given to Sandyford Road Corridor.	Yes	This initiative will have low- medium impact for air quality, although very successful in encouraging use of public transport as an attractive and quick alternative to car use.	This initiative has **HIGH PRIORITY**, given the benefits on modal shift potentially achieved by quicker and more convenient public transport.	Urban Traffic Management Centre (UTMC) is to be operational from July 2011 to enhance this. The other bus priority lanes are implemented in full
3.Increase public transport priority	Through LTP3	Urban Core Area Action Plan out for consultation 2011	Consideration of Scoping Plan. Consultation.	This initiative is likely to have a high air quality impact.	Options have been prepared to limit traffic around the City Centre, in particular through traffic and it is of **HIGH PRIORITY** to continue implementations of preferred options stemming from the Consultation.	The latest Urban Core Action Plan is about to go out to consultation, and this features an array of traffic management measures
4.Higher priority for pedestrians and cyclists (in terms of highway space)	Through LTP3	Urban Core Area Action Plan out for consultation 2011	Consideration of Scoping Plan	This initiative is likely to have a high air quality impact.	Options have been prepared to reallocate roadspace in the city centre, and to develop a range of measures to encourage people to walk and cycle – modes which serve to limit climate change Newcastle and Gateshead City Councils have also been working with Walk It, a small company who has launched the walkit.com website which provides advice on the shortest, easiest and most scenic walking routes in various regions, NewcastleGateshead	

					being one.	
5.Decriminalized parking enforcement	Implemented	Introduced on 15 April 2009. The transfer of enforcement powers from the police to the council to help reduce congestion and improve road safety.	Cost neutral	This initiative is having a low overall impact on air quality, although enforcement can be targeted to problematic areas to alleviate congestion and keep traffic flowing across a busy highway network.	This initiative is of **MEDIUM PRIORITY**.	
6.UTMC	Throughout LTP3	In process of implementation	To be determined	This is anticipated to have medium impact on air quality	UTMC allows us to control traffic flow through the use of changing of signals, impacting on bus priority and management of special events. It is largely geared towards alleviation of congestion, but there will be knock on impacts upon air quality through this. UTMC can also provide details of which car parks have spaces available, and consequently can direct drivers to the most appropriate site, reducing the amount of time driving around looking for a space.	See also 3 above

THEME 2: EMISSION MAMAGEMENT						
Option	**Original Timescale**	**Status of Measure**	**Funding available**	**AQ Impact ***	**Outcomes and Priority**	**Comments**
7.Encourage low emission/ zero emission vehicles	Ongoing	1. Diesel electric hybrid buses are operating on Quaylink Quayside/ City Centre Route.	Implemented 2006	This initiative is likely to have/ has had medium impact for air quality.	Ongoing work with bus operators to encourage uptake of lower emission vehicles. The consideration of only allowing buses with certain emission standards into the urban core is being considered within the area action plan, but this is a long term aspiration	The Local Transport Bill also provides more powers for local authorities to influence the operation of bus fleets, assuring that environmentally friendly fleets are becoming more commonplace.
		2. Upgrade of Leyland Olympian bus to Euro IV standard.				Adherence to the Disability Discrimination Act is another driver for bus operators to renew their fleet
8.Enforcing idling engines legislation	Already implemented	All staff within RSPP are authorised to issue fixed penalty notices, and periodic enforcement is currently carried out. Legislation is flawed by requirement to instruct driver to turn off engine before issue of notice, thus making it impossible to issue notice and actually carry out enforcement.	Cost neutral	This initiative is likely to have a low impact on air quality.	Enforcement is frequently being carried out, although this rarely results in issued notices due to weak legislation.	The Tyne and Wear Air Quality Delivery Plan sets out the possibility for stronger enforcement by funding RSPP's enforcement officers at certain times. Outcomes of this spending profile will be known in the near future.
					Improved enforcement mechanisms is therefore of **LOW PRIORITY**, as all RSPP's officers are already authorised to issue penalty notices, although restrictions in the legislation makes this difficult.	

9.Delivery times outside peak hour	Ongoing minor schemes throughout 2006 -11. Including major scheme at new City centre shopping complex.	A freight consolidation centre is to be operational in Newburn from July 2011. Buy in to this will mean that the hours of freight delivery will be co-ordinated around quieter times, in lower emission vehicles	LTP3	This initiative is likely to have a medium impact on air quality.	This initiative is to be completed in July 2011**,** and will be promoted through the existing Freight Quality Partnership, which has enjoyed a high level of success	The award winning Tyne and Wear Freight Quality Partnership has had great success in providing alternative route maps and information points for HGV drivers, and published information from this Partnership also provides advice on favourable delivery times outside peak hour as well alternative routes to avoid congestion and unnecessary emissions. Freight consolidation will build upon this success by introducing an extra facility attractive to businesses enabling the impact of the end part of the journey to be mitigated
10.Taxi emissions	Euro IV vehicle requirement 2011 through licensing system	When the Taxi licensing strategy is reviewed in 2011 an emission standard will be gradually introduced.	Taxi trade investment programme	This initiative is predicted to have a low impact on air quality.	This measure has got **LOW PRIORITY**, and is currently being pursued through channels such as the Tyne and Wear taxi forum as well as through national licensing systems.	Taxi fleet composition at September 2010: 2 EURO I 70 EURO II 871 EURO III 660 EURO IV 184 EURO V

						943 of the Newcastle taxi fleet are EURO I –III and would need to be brought up to EURO IV
11.Use of low emission delivery vehicles/ times of delivery	Under consideration	To be considered as part of freight consolidation	LTP3	This measure is predicted to have a low impact on air quality.	This measure has got **MEDIUM PRIORITY**	See part 13, above. The introduction of electric vehicles
12.Low emission zone	Decision made	Part of Urban Core Area Action Plan (see 10)	Funded through DEFRA grant	This measure was anticipated to have a medium impact on air quality	This measure had **MEDIUM PRIORITY**	Report concluded that most benefit will be gained through the introduction of Euro 6/VI and that the introduction of a LEZ across Newcastle and Gateshead would only bring about a marginal improvement by 2021. The model for the feasibility study assumed the effectiveness of Euro 6/VI. However, should Euro 6/VI prove not to be as effective as the model assumed then the introduction of a LEZ would have a greater impact depending on the effectiveness of Euro 6/VI. Given the findings of the feasibility study there are no plans at this time to implement a LEZ across The City.

13.Speed Restrictions	Complete	The speed restriction scheme “’20’s Plenty” has been rolled out across large parts of the Gosforth area of Newcastle and is an advisory scheme to encourage people to reduce their speed on selected streets and roads across Newcastle.	LTP block funded programme £200K per annum	This measure will have low impact on air quality	The main thrust of this scheme is based around road safety, although there are residual benefits in terms of air quality.	The “20’s Plenty” scheme has proven to be a success. The scheme is complete, but there will be future marketing work to encourage driver behaviour change to enforce this.
14.Upgrade of Urban Traffic Control (UTC) and Scoot	Ongoing	Signal coordination currently being upgraded as part of the UTMC project.	Yes	This measure is anticipated to have a medium impact on air quality	The improvement of this system will have the added benefit of improving partnership working with the joint Plan Partners, as well as aid the implementation of other air quality related projects undertaken by Newcastle University such as UTMC and the ‘Message’ project aimed at producing sensors for moving cars, recording levels of air quality. This measure, also has the potential to feed into future air quality modelling and monitoring data systems such as the Airviro model, and as such has **HIGH PRIORITY**	The LTP Core Team is currently working in partnership with Newcastle University who are facilitating the improvement of SCOOT systems in Tyne and Wear. The Tyne and Wear Air Quality Delivery Report has recently been completed by the Team, and this focuses some of its actions on the implementation of an improved SCOOT system. It is therefore a priority for the Team to facilitate the development of this system.

THEME 3: PROMOTION AND PROVISION OF ALTERNATIVES						
Option	**Original Timescale**	**Status of Measure**	**Funding available**	**AQ Impact ***	**Outcomes and Priority**	**Comments**
15.Park and Ride	Ongoing	To be implemented through both bus and Metro.	Through LTP3	This measure is anticipated to have a low impact on air quality.	Traditionally the conurbation has concentrated on the development of park and ride sites associated with the Metro system. This has led to the provision of approximately 2300 spaces across 27 stations.	Gateshead are also pushing forward park and ride sites through the Core Strategy – these will impact upon Newcastle.
					For Newcastle United matches, a number of park and ride schemes are in place, and it is planned to continue to promote this as a mode to limit matchday congestion	
		A park and ride site is operational at Great Park, and another potential site was identified, but this is currently on hold				For park and ride to be successful, the strategy needs to interface with city centre car parking charges to make it a competitive mode of choice for those considering using it

16.Promotion of Cycling	Over the 10 years of LTP3	To be implemented through the cycle strategy	Capital Programme incorporates funding for City centre cycle links, improved cycle parking facilities and hubs, and development of North East cycleway	This is anticipated to have a low impact on air quality	Newcastle City Council appointed a dedicated cycling officer in October 2008, which illustrates the priority which cycling is given within the transport toolkit. This measure has got **HIGH PROIRITY**, as demonstrated through the appointment of a dedicated officer to promote this. We will also continue to promote cycling through giving out free cycle maps of the area to demonstrate how easily cycling can be undertaken.	Cycling trips are already on the increase based around our existing monitoring tools and travel plans.
17.Annual Travel Card discount	Implemented	This has been rolled out to Newcastle Council staff, and major employers are being encouraged by Nexus to join the scheme.	Not available	Although designed to encourage more public transport users, this measure is expected to have a low air quality impact.	662 members of staff are currently accessing the Newcastle City Council annual travel card discount scheme; these figures are for a year. Future work on this scheme is of **LOW PRIORITY**.	The Tyne and Wear Air Quality Delivery Plan suggests the roll out of the Annual Travel Card discount scheme to all Tyne and Wear authorities. This action will be pursued through the Delivery Plans spending profile.
18.Quality bus contracts	Discussions ongoing alongside the Integrated Transport Authority (ITA)	Discussions are being undertaken between regional bus operators and local authorities on Quality bus partnerships. Part of this could be geared around higher quality vehicle emission standards	Bus Operator capital investment program	This is anticipated to have a medium effect on air quality	This measure is of **HIGH PRIORITY,** and several bus operators are also in the process of upgrading their own fleets, in part related to meeting Disability Discrimination Act criteria	This is to be reinforced with eco friendly driving courses for bus drivers to further limit emissions.

19.Travel Plans for businesses/ schools	Every school in Newcastle now has a travel plan. Workplace travel plans continue to be developed, with 80 currently in place	Developing programmes from LTP1 and LTP2	Through LTP3	This measure is anticipated to have a medium impact on air quality, and would especially improve pollution levels (as well as journey times) during the morning and evening peak hours.	Monitoring of travel plans is integral to this especially with school travel plans – we are clear on where we currently are but need coherent policies to take this forward. Generally, with workplace travel plans, the average modal shift effected where employers engage with the process and back this up with measures to encourage sustainable travel is 10% away from single car journeys. The promotion of further travel plans for businesses and schools has got **HIGH PRIORITY**	Reporting mechanisms for work place travel plans are currently fragile in Newcastle, as the Council Travel Plan Officer are informed of the development stage of each business but not necessarily the travel plan development within this business.
20. Altoonative Travel	Ongoing	Work is continuing with the football club and key stakeholders to implement a number of measures to mitigate the negative impacts of travel to St James Park	As part of agreement with Newcastle United Football Club	This measure will have a MEDIUM impact on air quality on matchdays	Matchdays at St James Park can see 60,000 people entering the city. Clearly this can be a major factor upon congestion, and consequently air quality on the roads into the city.	Measures introduced so far have included a website (www.altoonativetravel.com), a ‘soccerbus’ park and ride scheme, and promoting a ‘Magpie Mover’ ticket for cheap public transport to and from the match.

					As part of the travel plan arrangements with Newcastle United, altoonative travel has been developed as a brand, to offer a range of advice and alternatives for fans travelling to the match.	It is planned to develop this further over the following year with measures informed by thorough survey work that has been undertaken. This is likely to include consideration of measures for those travelling from outside Tyne and Wear to matches.
					This initiative has HIGH PRIORITY given the profile of the club within the city and the contributions made by the club	
21.Car Loan schemes	On-going	Pool car system currently on-going by some employers.	Newcastle City Council has implemented a car loan scheme for its employees operated through the Travel Office	This is anticipated to have a low impact on air quality.	This measure is of **LOW PRIORITY**	Being able to borrow a car during the day for business purposes takes away from the need for staff to have a car at work, and consequently the need to drive to work in the morning
22. Use of car parking charges to encourage alternatives.	Being considered as part of Core Strategy	Under investigation as part of the core strategy	N/a	This measure is anticipated to have a medium impact on air quality.	This measure is of **MEDIUM PRIORITY**, and is subject to joint discussions with Gateshead to ensure a coherent approach	Car parking revenue remains an important source of income for the Council, and as such major changes to reduce this are unlikely.

23. Car Clubs	Ongoing contract with Common Wheels to 2016	Car clubs are being developed and new cars added as demand arises for this	£20k from Newcastle City Council to support growth and develop bays. Also investment from Common Wheels	Medium impact	Evidence is through decoupling car ownership from car based trips, it is possible to reduce the overall number of trips. It is believed that car club patrons produce approximately 25% of the emissions of a standard car license holder. Common Wheels are the operator in partnership with Newcastle City Council who are growing a car club for Newcastle, and currently have 8 cars in operation, with 138 members of the car club	Trialling of an electric vehicle within the car club -
24.Home Zones	Throughout LTP3	Currently programmed as part of Plan Partners LTP schemes	£200K	This measure is likely to have a medium impact on air quality	There are several wards in Tyne and Wear with integrated Home Zones, as seen in map below	There are several case studies of successful Home Zones across Tyne and Wear, such as :
						1.The creation of the Home Zone in Tyne Park, Gateshead Council, has brought forward the Council's own programme of works on improving facilities for cyclists in the area. Management Company enforcement of parking commenced. Riverside cycle way commenced construction. Traffic and cycle counter equipment purchased and installation commenced.

						2. The Triangle is situated on the outskirts of North Shields. It is well linked to public transport and is near a Metro Station. Anecdotal evidence from residents is that the environment looks and feels cleaner and it certainly is a major improvement. The reduction in traffic and shared surface has certainly created a safer environment for children to play in. This has been confirmed from a number of discussions with local residents including children. Local properties are selling far quicker than last year with people enquiring into the availability of properties in the Home Zone. Extra funding from ERDF on the back of the Home Zone grant has resulted in some positive environmental improvements for the wider community.
						3. Cleadon Park Estate is situated to the south of South Shields. The Home Zone has created a more attractive type of street environment, which has set the standard for future projects. The reduced traffic speed allows more walking and cycling in safety.

					The continuation of this measure is of **HIGH PRIORITY**	
25. Electric Vehicle Recharging Infrastructure	47 charging points installed – this element completed	Implemented and now operational. They are being monitored to analyse future need, reliability etc	Secured via LTP. Funding also available for maintenance of these points	High (long term)	Makes infrastructure available for those who have purchased electric vehicles to enable them to be charged, thus rendering them a viable option	More charging infrastructure is planned for the future alongside key stakeholders, and as part of travel plans.
26. Electric Vehicles in NCC Fleet	Ongoing	25 electric vehicles already in fleet	Secured via grant funding	Medium	Enable us to review the uptake, utilisation and reliability and publicise electric vehicles as a viable option	
27. Switch EV Council Trial	6 months	Trialling	Via travel office	Medium	Trialling electric vehicles amongst existing council services along with new technologies	Help inform future procurement and investment decisions
28. Switch EV Public Trial	To 2013	Trialling	Via Technological Strategy Board	Medium	Increase public awareness of the viability of electric vehicles, and hence their future uptake	Trials are with individuals and businesses
29. Switch EV Car club trial	6 months	Trialling	As above	Medium	Trial electric vehicles and enable car club members to access them	Greater awareness of viability of car club as well as publicity for electric vehicles
30. Eco driving training	Already rolled out to all fleet drivers	Ongoing	LTP	Medium	Encouraging driving fleet vehicles in as sustainable manner as possible	Part of standard staff (driver) training.
31.Subsidise public transport	As from 1st April free	To be implemented by way of concessionary	Grant made available from	This measure is anticipated to have a low	This measure is already in place.	Work done on accessibility does suggest that high fares

	concessionary travel for OAP's was introduced on buses and Metro.	fares	Government.	impact on air quality.	Nexus has considered other subsidies of public transport, for example for 16-19 year olds in full time education, but lack of funding means that this is currently **LOW PRIORITY**	continue to be a major barrier to travel by public transport especially by younger people.
32.Create extra capacity on trains/ Metro/buses	Throughout LTP3.	Operator investment as deemed appropriate.	Work with DB as operator of Metro	This measure is like to have a low impact on air quality.	This measure is of **MEDIUM PRIORITY**	Extra capacity on the Metro is being investigates by Nexus as part of their Metro reinvigoration. Bus Network Development plan has secured the optimal distribution of subsidised bus services at the moment, rest is governed by free market
33.Flexible work times/ school hours/ home working	Part of LSTF bid	To be implemented as part of travel plan initiatives. NCC has already implemented this scheme.	Some funding available through LSTF initiatives	Flexible working hours is likely to have a medium effect on air quality.	This initiative has **MEDIUM PRIORITY,** as it will constitute part of travel plans for businesses.	This initiative will benefit congestion reduction as well as provide reduced journey times and improved levels of air quality, especially during peak hours in the morning and evening as these will not be as condensed.

THEME 4: INFORMATION AND EDUCATION						
Option	**Original Timescale**	**Status of Measure**	**Funding available**	**AQ Impact ***	**Outcomes and Priority**	**Comments**
34.Provision of Real Time Information (RTI) at bus stops	Over the time period of LTP3	This is currently under review by Nexus	Through ITA	This is anticipated to have a low impact on air quality	A customer survey conducted by Nexus shows that:	Expectations of real time information are growing across the UK as access to technology becomes more available. The information provision for journeys is now seen to involve both pre and during journeys, and as such Nexus are working to improve information, especially at bus stops.
					• overall the perceived average waiting time did not differ between RTI and non-RTI stops	
					• 85% of respondents want more Real Time displays.	However, how much of a barrier this is to actually using bus services is unclear, thus impact is likely to be low on air quality
					• 69% of 17-24 year olds want the displays in nearby buildings (48% overall)	
					• 23% would like RTI via mobile phone (66% of 17-24 year olds)	
					• Inter town/city routes were the most popular for RTI to be available on	

					• 82% found the displays easy to understand	
					• Only 34% felt the system was reliable although 90% had used it	
					• 77% of the 65+ age group felt safer at RTI stops (49% overall)	
					Due to the high demand for Real Time Information and the added safety perspective, this initiative is of **MEDIUM PRIORITY**	
35.Target schools and parents with information campaigns	Part of LSTF bid	To be implemented	Funding available from LSTF	This is anticipated to have a medium impact on air quality	The key components bid for the Local Sustainable Travel Fund was geared around school based travel. Integral to this is persuading parents to travel by sustainable modes, and in the long term, getting pupils into this habit can play a major impact upon travel horizons	
36.Health Promotion	Throughout 2006- 2011	To be led by PCT in liaison with Transport Policy staff	N/A	This initiative is anticipated to have a low impact on air quality	This initiative is of **MEDIUM PRIORITY**	Part of the Obesity Strategy for Newcastle upon Tyne is geared towards walking and cycling both as an intervention and a prevention measure. However, most of the prevention work is discussed elsewhere, and the intervention work will have a limited air quality impact.

37.One off events	Throughout the plan	To be implemented	variable	This is anticipated to have low impact on air quality	Within this financial year, Newcastle City Council has facilitated four one off events; Bike Week, World Environment Day, The Green Festival and In Town Without My Car Day. All of these events has been partly planned and funded by Newcastle, and has had Newcastle representation and involvement and have been extremely popular, attracting both the public as well as transport operators. One off events are however of **LOW PRIORITY**, as evidence has failed to show any significant long term benefits	We have also been involved in walking events with Change 4 Life as part of the Obesity Strategy (above)
38.Education regarding safety on Public Transport	Part of LSTF	LTP3 is committed to improve actual and perceived levels of security through proactive use of more staffing and CCTV.	Through LSTF	Low impact	The number of passengers using the Metro system in the evenings has risen, but there remains a number of individuals who cite personal safety as a reason not to use public transport. **LOW PRIORITY**	Experience of anti-social behaviour is still well below perceptions, so part of this is an educational campaign

39.Provision of information on 'High Pollution Days'	N/A	Not to be implemented in the short term, but may however be linked to future UTMC systems.	N/A	This measure would not impact air quality, but could change peoples' behaviour to reduce impact of poor air quality	This measure is of **LOW PROIRITY**	Those susceptible to high levels of pollution may benefit from such warnings as they could change their behaviour

THEME 5 : INFORMATION AND EDUCATION						
Option	**Original Timescale**	**Status of Measure**	**Funding available**	**AQ Impact***	**Outcomes and Priority**	**Comments**
40.Include cycle facilities in new developments	Ongoing	This is a standard requirement for a new development	Developer funds implementation	This is likely to have a low impact on air quality	This initiative will be taken forward as part of standard requirements for new developments and through developers funds, and is as such given predestined priority.	
41.Consideration of the location of essential services such as housing and employment	Ongoing through LDF process	Implementation as part of the new accessibility strategy and cross organisational working arrangements.	Cost neutral	This measure is likely to have a medium impact on air quality.	Transport Policy team is a key consultee when considering what mitigations are needed to ensure that development in a particular location is appropriate.	
42.Strengthen joint working between local authorities	Ongoing	Ongoing	No funding required	N/A	As part of the Tyne and Wear Air Quality Delivery Plan, a Tyne and Wear Air Quality Steering Group has been established and now meet regularly. This group has representation from all Tyne and Wear authorities and takes joint ownership of the Plan as well as other air quality issues. This measure is of **HIGH PRORITY,** as it is important not to treat air quality issues in isolation, given the relatively small geographical area of Tyne and Wear.	

43.Implement greater planning controls in AQMAs	Ongoing	Air quality is considered when it is a material issue, and consideration is given to planning controls.	No funding required	This is likely to have a medium impact on air quality	This is of **HIGH PRIORITY**	
44.Local Development Frameworks need to identify AQMAs	Ongoing	Local development framework has taken air quality into account	No funding required	This is likely to have a low impact on air quality	This is of **MEDIUM PRIORITY**	
45.Cap existing development sites	N/A	Economic redevelopment is essential to the regeneration of the City, and this should only be considered where that development cannot be facilitated	N/A	N/A	N/A	N/A
46.Encourage mixed use developments	Ongoing	This is already part of Newcastle City Councils sustainable development policy	No funding required	This is probable to have a medium impact on air quality.	This is of **MEDIUM PRIORITY**	Use of mixed developments is a clear priority for Newcastle, as well as for Tyne and Wear, evident through many new developments; such as Cobalt business park in North Tyneside.
47.Undertake air quality assessments of relevant new developments	Ongoing	Air quality is considered when it is a material issue, and consideration is given to planning controls	No funding required	This is likely to have a low impact on air quality	The Tyne and Wear Air Quality Delivery Plan strongly pushes for the implementation of action allowing local authorities to demand a fine from developers, should assessments show a decline in air quality as a direct result of a new development. This is of **HIGH PROIRITY**	

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The NO_2 Annual Mean Concentrations within both AQMAs are still being breached.

Outside the AQMAs monitoring has not identified any exceedences of the NO_2 Annual Mean Concentration.

10.2 Conclusions relating to New Local Developments

There are no new local developments that will require more detailed consideration in the next Updating and Screening Assessment

10.3 Other Conclusions

The City centre AQAP, now in its ninth year, continues to fail at delivering compliance with the National Air Quality Objectives.

Compliance with the National Air Quality Objectives is proving difficult but there are signs that of an improvement in the quality of the air within the City centre whilst at the same time seeing businesses and investment coming back into the City.

The Tyne and Wear Air Pollution Group are keeping air quality high on the agenda, the result of this being that air quality is recognized as being one of the main objectives in LTP3's Strategy.

The City council continues to work with LTP partners and bus/taxi/freight operators to bring about improvements in air quality.

The Gosforth AQAP (May 2011) identifies measures aimed to reduce concentrations of NO_2 in this area. However, it also identifies the hurdles that will have to be overcome to enable this to happen. It was hoped that a major restructuring of the road layout in the Gosforth area would bring about some improvement. Since

reporting last year the Gosforth transport restructuring programme has received approval from the City Council's Executive.

10.4 Proposed Actions

Whilst pollution levels across Newcastle have remained relatively stable since 2007 it is encouraging to see the trend starting to fall over the last few years.

This is most clearly demonstrated by the monitoring carried out on a busy stretch of Shields Road. The stretch in question is half a mile long, two miles east of the City centre, with a variety of business premises along it length. Buses account for a large percentage of the vehicles using this street due to there being a by-pass running parallel that takes most of the cars and goods vehicles. See **Figure 20** showing Shields Road and the by-pass road running parallel.

Fig 20. Map showing Shields Road and the by-pass

In 2011 Stagecoach North East brought 26 new hybrid electric buses into service. The buses have been placed on routes across the City, including Shields Road. The hybrid electric buses are used on Route 39 and 40 which travel along Shields Road up to once every five minutes.

In 2012 it was reported that the NO_2 annual mean objective was noticeably lower than in previous years. Furthermore the trend for this street, see **Figure 15**, continues to show a fall over coming years.

The Council are of the opinion that the introduction of the hybrid electric buses on Shields Road is having a positive effect in terms of reducing pollution levels. Improvement of the bus fleet across Newcastle and the region is seen as an important step towards improving the City's air quality, particularly in the City Centre.

Further to this, in 2012 Newcastle City Council, as part of a Tyne and Wear group, bid successfully for Department for Transport's Clean Bus Technology Fund. The Group engaged with Go-Ahead North East, part of the nationwide Go-Ahead Group, to retrospectively fit clean exhaust technology to 40 buses. Initial 'Millbrook' Tests exceeded the target and gave results showing a reduction in the order of 96.7% for NO_2 and 95% for NO_x.

Earlier this year the group made a further successful bid for DFT's Clean Vehicle Technology Fund. Once again the Group will be working with Go-Ahead NE but on this occasion to carryout research into electric flywheel technology. This technology is thought to reduce fuel consumption by approximately 20%.

Newcastle City Council is of the opinion that the grants from DFT will make a noticeable difference to pollution levels in our City centre. If local authorities continue to receive opportunity and investment on this scale there is little doubt that significant reductions in pollutions levels could be achieved.

Unfortunately, national air quality objectives continue to be breached inside the AQMAs. This situation is expected to continue in the short to medium term. However, it is considered that the introduction of Euro 6/VI, if as effective as reported, will go a considerable way to aiding compliance with the national air quality objectives.

The LEZ feasibility study suggested the introduction of Euro 6/VI will result in a 45% (~10-15 µg/m^3) reduction by 2021. In 2012 19 sites around the City Centre AQMA exceeded the NO_2 annual mean objective. If a reduction of 10 µg/m^3 is applied to these results only 7 sites would exceed the NO_2 annual mean objective in 2021. A similar reduction across the Gosforth AQMA would see all sites fall below the NO_2 annual mean objection and the AQMA revoked.

Whilst Euro 6/VI could bring about significant reductions in traffic borne pollution, it would be wrong to rely on this technology as the only way in which the air quality objectives will be met. The City Council are therefore pursing other measures which could help improve air quality, for example, traffic management and awareness campaigns. In addition to the measures being implemented it is important to promote and educate people on how they may help achieve this goal.

Changing people's behaviour is difficult as there a many factors leading to the decisions we make, for example, time constraints, safety issues, convenience. That said, the local authority is pursuing educational and promotional campaigns, for example, Newcastle's DEFRA funded Air Quality Campaign and Go Smarter.

To conclude Newcastle City Council do not intend to change the boundaries of the two AQMAs. Furthermore, the National Air Quality Objectives continue to be exceeded in both AQMAs hence there is no consideration being given to them being revoked.

It appears from 2013's results that the air pollution in the City is continuing to improve. Trends are improving although there are still a few locations that continue to show an upwards trend.

Pilgrim Street (aka Swan House roundabout) continues to be the area of most concern as it remains, and will for the foreseeable future, the main crossing point for City centre traffic that wishes to travel from Newcastle into Gateshead or vice versa.

The improvement in bus emissions is seen as an important step towards improving air quality in the City centre with grants from the DfT enabling us to make a noticeable difference to pollution levels in our City centre. If we continue to receive opportunity and investment on this scale there is little doubt that significant reductions in pollutions levels could be achieved.

11 References

DEFRA, Local Air Quality Management, Technical Guidance LAQM.TG(09), February 2009

Newcastle City Council, Further Assessment of Air Quality in Newcastle City Centre, The Quayside and Jesmond Road, October 2005

Newcastle City Council, Updating and Screening Assessment, June 2006

Newcastle City Council, Detailed Assessment of Air Quality, Gosforth, April 2007

Newcastle City Council, Newcastle Upon Tyne, Air Quality Progress Report 2008, May 2008

Newcastle City Council, Updating and Screening Assessment, April 2009

Newcastle City Council, Progress Report 2011

Tyne and Wear LTP2 Transport Plan 2006 – 2011

Tyne and Wear LTP, Air Quality Action Plan, 2008

Newcastle City Council, Gosforth Air Quality Action Plan, May 1011

EPUK, Air Quality and climate Change: Integrated Policy Within Local Authorities

Tyne and Wear Integrated Transport Authority, Keep Tyne and Wear Moving. LTP3: The Third Local Transport Plan for Tyne and Wear, Strategy 2011 – 2021, March 2011

Tyne and Wear Integrated Transport Authority, Keep Tyne and Wear Moving. LTP3: The Third Local Transport Plan for Tyne and Wear, Delivery Plan 2011 – 2014, March 2011

Newcastle City Council, Highways and Transport Report 2013

Appendices

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Newcastle City Council use a local co-location site to validate NO_2 diffusion tube results which are used to calculated the bias adjustment. This is done by comparison with the chemiluminesent analyser located at the AURN, St Mary's Place. The type of monitoring carried out will inevitably vary depending upon local circumstances. See table below showing ratified data and calculated bias adjustment factor for NO_2 diffusion tubes 2013.

Diffusion Tube Precision for the Period 2013.

2012	Date ON	Date OFF	Q.C.1	Q.C.2	Q.C.3	AVG.
January	07-Jan-13	01-Feb-13		33.8	43.9	**38.9**
February	01-Feb-13	06-Mar-13	41.2	42.0	33.4	**38.9**
March	06-Mar-13	12-Apr-13	31.2	29.9	28.8	**30.0**
April	12-Apr-13	24-Apr-13	31.0	33.8	34.1	**33.0**
May	24-Apr-13	29-May-13	25.7	26.2	20.0	**23.9**
June	29-May-13	01-Jul-13	20.8	24.7	23.9	**23.1**
July	01-Jul-13	01-Aug-13	23.2	22.4	24.1	**23.3**
August	01-Aug-13	30-Aug-13	30.4	29.2	29.8	**29.8**
September	30-Aug-13	25-Sep-13	30.9	28.4	31.2	**30.2**
October	25-Sep-13	20-Oct-13	47.8	47.4	48.6	**48.0**
November	20-Oct-13	29-Nov-13	28.3	29.9	29.5	**29.2**
December	29-Nov-13	06-Jan-14	44.4	44.3	40.1	**42.9**

Actual AUN analyser average (07/01/13 to 06/01/14) = **29.1**

	ug/m3
AVERAGE	**32.6**
MIN	**20.0**
MAX	**48.6**
ST.DEV	**8.0**
VARIANCE	**64.1**
BIAS (%)	**12.1%**
*** BIAS ADJUSTMENT FACTOR = 0.89**	

***** calculated as prescribed by LAQM.TG (09), using the mean measured continuously by the automatic analyser over the entire period rather than the average of the individual months

Harwell Scientifics provide and analyse the NO_2 diffusion tubes which are prepared using triethanolamine in a 50/50 column with acetone.

In order to calibrate the diffusion tube results, a diffusion tube monitoring site has been co-located alongside the St. Mary's Place AURN background monitoring site. The calculated 2013 bias is 0.89.

Discussion of Choice of Factor to Use

As stated above, Newcastle City Council have chosen to use a local co-location site which takes into account local trends.

PM Monitoring Adjustment

Newcastle City Council does not carry out any adjustments to particulate matter monitoring as this is already ratified by Bureau Veritas.

Short-term to Long-term Data adjustment

Newcastle City Council operate two long term PM_{10} monitoring sites, Jesmond Road, Cradlewell and High Street, Gosforth with 99.5% and 86.8% data capture respectively for 2013.

QA/QC of Automatic Monitoring

The 'Groundhog' and 'ROMON' units are attended every fortnight to calibrate and change filters as required and, at the time of writing, have service, maintenance and data ratification contracts with Supporting U. The Council have a data management contract with Supporting U who download and ratify the data from the automatic sites.

The Council have Local Site Operators (LSOs) for the AURN and Jesmond Road (Cradlewell) 'Groundhog' and has adopted DEFRA's quality control procedures. Operators have been trained by DEFRA in the operation and maintenance of the

AURN air quality monitoring equipment and adhere to AEA Technology's Site Operator's Manual for the AURN. The AURN is calibrated on a fortnightly basis by LSOs and serviced at six monthly intervals by Supporting U and Ricardo-AEA. Data from the AURN is quality controlled and ratified by Bureau Veritas.

QA/QC of Diffusion Tube Monitoring

The Council use Harwell Scientifics to supply and analyse all NO_2 diffusion tubes. Harwell Scientifics prepare diffusion tubes using triethanolamine in a 50/50 column with acetone.

The Council can confirm that since 1 January 2009 Harwell Scientifics have officially followed lab procedures set out in the Harmonisation Practical Guidance and are part of the WASP scheme.