2012 Air Quality Updating and Screening Assessment for Greater Manchester

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

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Katherine King **Bolton Metropolitan Borough Council** Town Hall, Victoria Square, Bolton BL1 1RU Tel: 01204 333333 katherine.king@bolton.gov.uk	**Chris Horth** **Bury Metropolitan Borough Council** 3 Knowsley Place, Duke Street, Bury BL9 0EJ Tel: 0161 253 5000 c.horth@bury.gov.uk
Rebecca Twigg **Manchester City Council** 1 Hammerstone Road Gorton Manchester M18 8EQ Tel: 0161 234 1368 R.Twigg@manchester.gov.uk	**Caroline Greenen** **Oldham Council** Chadderton Town Hall Middleton Road, Chadderton Oldham OL9 6PD Tel: 0161 770 2244 Caroline.Greenen@oldham.gov.uk
Laura Hulse **Rochdale MBC** Number One Riverside, Smith Street, Rochdale, OL16 1XU Tel: 01706 924136 laura.hulse@rochdale.gov.uk	**Gerard Steadman** **Salford City Council** Environment Directorate Turnpike House, 631 Eccles New Road Salford, M50 1SW Tel: 0161 686 6204 ged.steadman@salford.gov.uk
Stephen Brown **Stockport MBC** Stopford House Piccadilly Stockport SK1 3XE Tel: 0161 474 4284 Stephen.brown@stockport.gov.uk	**Gary Mongan** **Tameside MBC** Environmental Services Council Offices Wellington Road, Ashton-Under-Lyne Lancashire, OL6 6DL Tel: 0161 342 3941 gary.mongan@tameside.gov.uk
Nasreen Ali **Trafford Borough Council** Trafford Town Hall, Talbot Road, Stretford Manchester, M32 0YJ Tel: 0161 912 4026 nasreen.ali@trafford.gov.uk	**Diana Bell** **Wigan Council** Environmental Protection PO Box 100 Wigan WN1 3DS Tel: 01942 244991 D.Bell@wigan.gov.uk

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Executive Summary

This is the first Updating and Screening Assessment for the Greater Manchester Combined Authority, which covers the following councils: Bolton, Bury, Rochdale, Oldham, Tameside, Stockport, Trafford and Wigan, and the cities of Manchester and Salford. It is the first report of the Combined Authority following its inception in 2011. All previous reports were prepared and submitted separately by the constituent authorities, although these authorities have successfully worked closely together throughout the history of Local Air Quality Management. All 10 Greater Manchester councils have existing AQMAs where modelled annual mean concentrations of nitrogen dioxide were likely to exceed 35 μg/m^3.

This document presents a screening assessment of recent monitoring data and also potentially significant sources of air pollution that have not previously been assessed.

The assessment of monitoring data shows that real time monitoring data for the nitrogen dioxide annual mean objective broadly confirms the existing AQMA boundaries. The exceptions were at the Stockport and Oldham stations (both now closed) which, although in AQMAs, recorded annual mean measurements of less than 35ug/m3.

Measurements from the Greater Manchester network of 300 diffusion tubes showed that approximately 25% of tubes marked as being inside the AQMA were measuring less than 35 μg/m^3. Around 5% of tubes measuring annual mean concentrations greater than or equal to 35 μg/m^3 are located outside the AQMA.

Real time monitoring data for particulate matter (less than 10 microns) shows that annual average objectives are not exceeded and are following a downward trend. No sites had more than 35 occurrences of the daily mean particulate objective and therefore this objective was met.

As with previous assessments, there were no exceedences for sulphur dioxide, carbon monoxide and benzene.

The assessment of sources indicated that there were a number road traffic links that could be significant and would require screening. However it was decided not to screen road links at this stage as Greater Manchester is currently carrying out Detailed Assessment modelling of all significant roads using the latest emissions factors and inventories. This exercise will provide information on concentrations of nitrogen dioxide and particulate matter at roadside locations for assessment against the air quality objectives.

Assessment of all other sources showed that there are no new or significantly changed sources that could lead to potential exceedences.

The conclusions of this report are that the monitoring data indicates that the existing boundaries of the AQMA may need adjustment and therefore Greater Manchester will complete a Detailed Assessment to identify likely exceedences of nitrogen dioxide objectives.

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1 Introduction

1.1 Description of Regional Pollution Group

The air quality working group works in partnership to co-ordinate local air quality management for the 10 districts, Association of Greater Manchester Authorities (AGMA) and the Combined Authority (CA).

AGMA consist of 10 districts and work together over a range of statutory and non-statutory duties where there is an opportunity to improve services across the region. The ten districts are Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, and Wigan. These are the main members of the Association of Greater Manchester Authorities (AGMA).

The Greater Manchester Combined Authority consists of the 10 AQMA authorities, with statutory powers for transport, regeneration and economic development across the city region. These powers include among other Local Air Quality Management (LAQM) under Sections 82 to 84 of the Environment Act 1995.

1.2 Description of Local Authority Areas

Greater Manchester has a population of over 2.5 million residents over an area of approximately 500 square miles. Within the conurbation there is a mix of high-density urban areas, suburbs, semi-rural and rural locations, and the area is characterised by the strong regional centre of Manchester, The Quays and Trafford Park.

Greater Manchester is the largest and strongest economic area in the North of the country, with over 40% of the North West's total productivity. However despite this, it contains some of the most deprived areas in the country.

There are over 9,000 km of roads, carrying annual traffic of 13,000 vehicle kilometres[1] on the motorways and A and B roads. Manchester Airport is the largest regional centre outside London. The M62 sits on the edge of the conurbation as it forms the East – West main serving Liverpool and Hull. The M60 orbital route

[1] GMTU Transport Statistics, 2009

encompasses Greater Manchester is over 36 miles in length, annual average weekday traffic flows are over 200,000 and the network is often congested at peak times. Other majors motorways include M6, M56,M61, and M66.

1.3 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.4 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 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 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 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.5 Summary of Previous Review and Assessments

This the first single report for the ten Greater Manchester districts; previously the local authorities submitted individual reports to DEFRA to fulfil their duties under the Environment Act 1995. However much of the underlying data used in our reports is held at the regional level by Transport for Greater Manchester (TfGM) and it therefore makes sense to write a joint report. This is consistent with the ethos and duties held by the Combined Authority and AGMA. TfGM[2] undertake transport statistics for the region, manage the **Em**issions **I**nventory for **G**reater **M**anchester (EMIGMA) and the regional model for the ten districts.

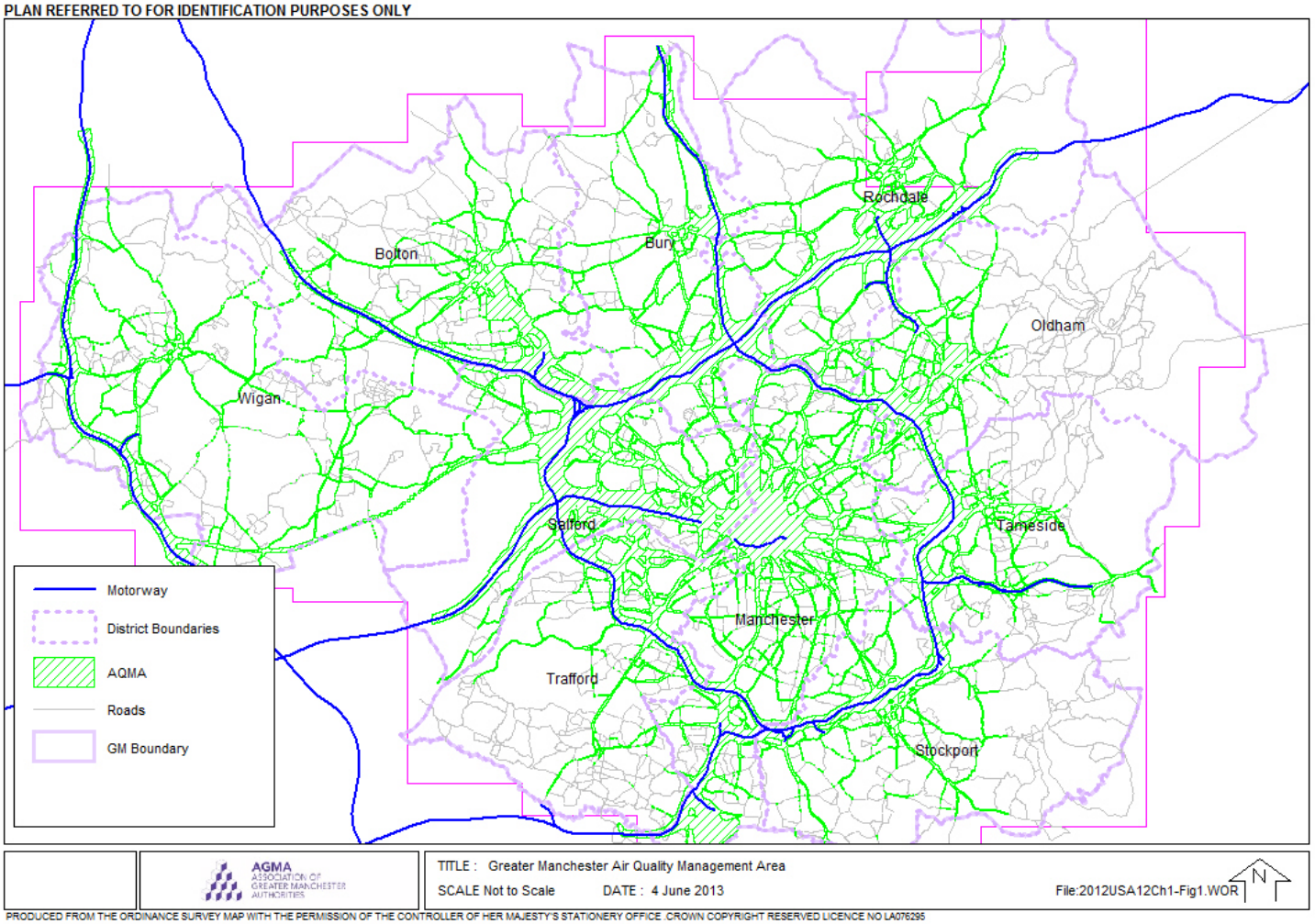
As this is the first report of this kind an overall summary of previous air quality work in Greater Manchester is provided as it is not possible to provide detailed information on individual local authority reports. Greater Manchester has undertaken two previous county wide modelling studies and is currently undertaking its third study and the results were used to define the air quality management areas. At the time no mechanism existed for declaration of Greater Manchester AQMA, and local authorities declared separate AQMA for their areas. Figure 1.1 indicates the Greater Manchester AQMA Boundaries.

A summary of Greater Manchester work is provided in the table below:

Date	Report / Stage	Outcome
	1st Detailed Assessment Modelling Round 2	Emissions inventory 1997. Declared AQMA for annual mean NO_2 including areas for daily PM10. AQMAs declared: 2001-2002.
2004	2nd Detailed assessment Modelling Round 2	Modelling Round 2 Base on emissions inventory for: 2001. AQMAs NO2 annual mean declared: 2005-2006. PM10 revoked.
2005-6		All LAs re-declared NO2 AQMA @ 35 µg/m^3 and revoked PM10.
2009	USA 2	Most districts recommended modelling work due to traffic emissions. Salford progressed to detailed assessment for railways, by monitoring and found to be below air quality standard.

[2] Previously now as Greater Manchester Transportation Unit (GMTU)

Figure 1.1 Greater Manchester AQMA Boundaries (nitrogen dioxide, annual mean)



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Local Authorities carry out air quality monitoring programmes as part of their local air quality management responsibilities under the Environment Act 1995. In addition DEFRA funds a network of air quality monitors as part of the Automatic and Urban Rural Network (AURN) and also partially funds some of the local authority sites by providing calibration and auditing services.

The Greater Manchester authorities have reviewed the automatic monitoring program to provide best value and help maintain key sites in the network. The review resulted in the decommissioning of a number of sulphur dioxide and carbon monoxide instruments.

DEFRA, as part of their services, provide QA/QC checks and data validation for full and partially affiliated sites. Local authority sites, except Bury Radcliffe and Bury Prestwich, have data management services provided by AEA's calibration club. The AEA cal club sites are regular audited to the same or similar standard as the national network and all published data undergoes a similar validation process. Casella have collected and scaled the data from the Bury's Radcliffe and Prestwich stations. The results for the automatic sites are based on the AEA's spreadsheet supplemented with Radcliffe and Prestwich data; a copy of the spreadsheet is available on our website: www.greatairmanchester.org.uk. Details of data management are provided in the QA/QC Appendix.

Table 2.1 and Figure 2.1 list the sites and locations in Greater Manchester. Figure 2.1 maps the automatic sites. Table 2.2 details closed monitoring sites.

Figure 2.1 Map of Automatic Monitoring Sites

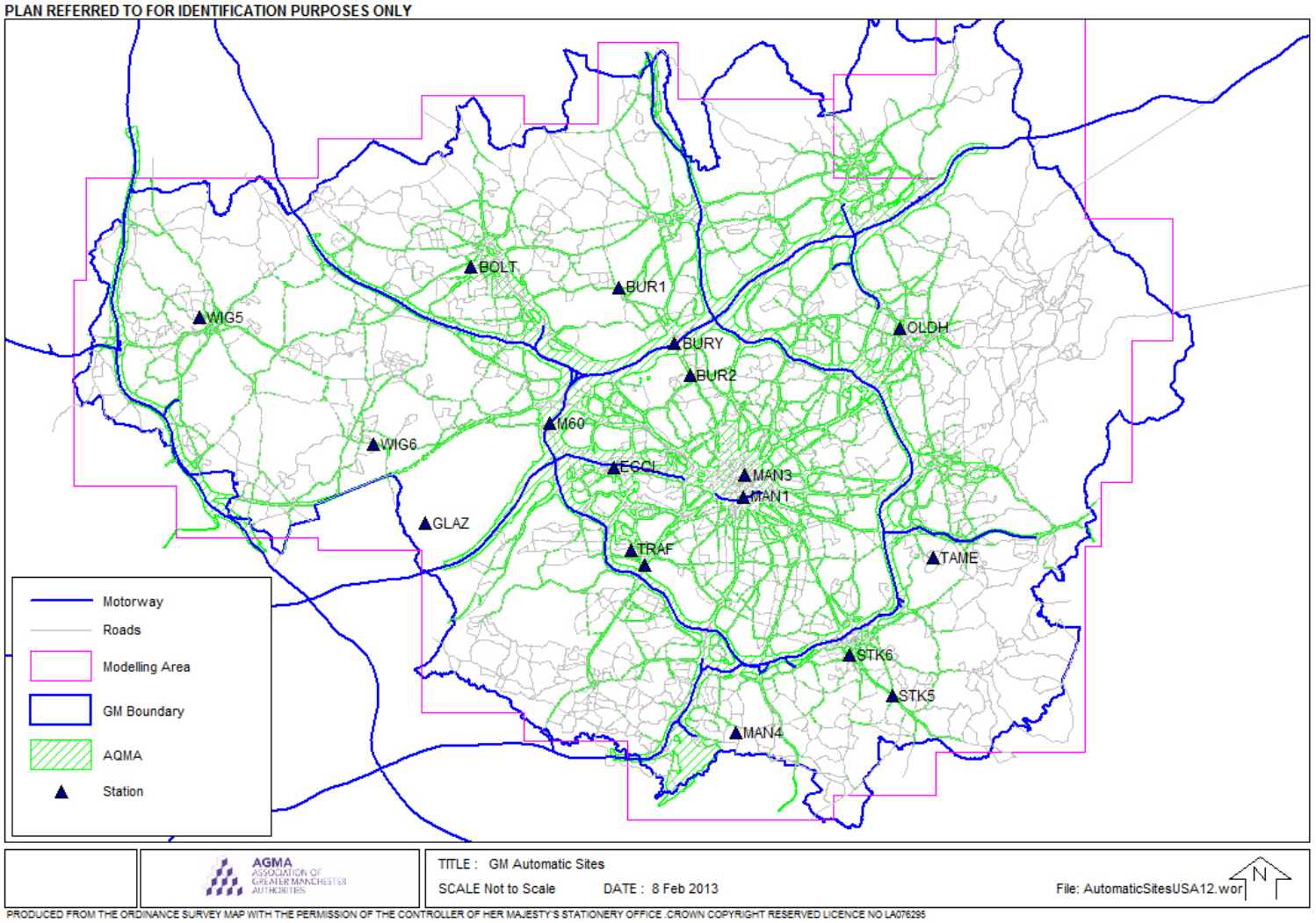


Table 2.1 Details of Automatic Monitoring Sites – operating to 2011

LA	Site Code	Site Name	Pollutants	Type	X(TFGM)	Y(tfgm)	AQMA
BO	BOLT	Bolton College*	CO NO2 O3 PM10 SO2	UB	371000	408496	
BU	BURY	Bury Roadside	CO NO2 PM10 PM25	RO	380906	404757	Y
BU	BUR2	Bury Prestwich	NO2 PM10	RO	381650	403222	Y
BU	BUR1	Bury Radcliffe	NO2 PM10	RO	378190	407480	Y
SA	GLAZ	Glazebury	NO2 O3	RU	368759	396028	
MA	MAN3 MAN7*	Manchester Piccadilly	NO2 O3 PM25 SO2 PM10*	UC	384310	398337	Y
MA	MAN4 MAN8	Manchester South	NO2 O3	SU	383904	385818	
			SO2	SU	383904	385818	
SA	ECCL	Salford Eccles	CO NO2 O3 PM10 PM25 SO2	UI	377926	398728	Y
WI	WIG5 WIG7	Wigan Centre Wigan Centre	NO2 O3 PM25, PM10	UB	357815	406022	
MA	MAN1	Manchester Oxford Road	NO2 PM10	KE	384233	397287	Y
OL	OLDH	Oldham West End House*	CO NO2 O3 PM10 SO2	UC	391860	405514	Y
SA	M60	Salford M60	CO NO2 O3 PM10	RO	374810	400855	Y
ST	STK5	Stockport Hazel Grove	NO2 PM10	RO	391481	387637	Y
ST	STK5	Stockport Shaw Health*	NO2 PM10	UB	389384	389605	Y
Ta	TAME	Tameside Two Trees School	NO2 O3 PM10	UB	393454	394330	
TR	TRAF	Trafford	NO2 PM10 SO2	UB	378783	394726	
TR	TRF2	Trafford A56	NO2 PM10	RO	379413	394014	Y
WI	WIG6	Wigan Leigh 2	NO2 PM10	UB	366290	399861	

UB: Urban Background; RO: Roadside; KE: Kerbside; UC Urban Centre; SU: Suburban; RU: Rural
Bu:Bury;Sa:Salford,Ma:Manchester;Wi:Wigan:St:Stockport;TR:Trafford; * Closed during 2011
Source: Based on: Gtr Manchester Summary_DM_May 2012_V2.xlsm (Site info)

Table 2.2 Details of Automatic Monitoring Sites – Closed

LA	NAME	Type	Monitored	Start- End
BO	Bolton College	UB	CO NO2 O3 PM10 SO2	Oct07 -- Mar11
OL	Oldham West End House	#N/A	CO NO2 O3 PM10 SO2	Dec98 -- Jul11
ST	Stockport Shaw Heath 2	UB	CO NO2 PM10 SO2	Oct07 -- Feb11
BO	Bolton	UB	CO NO2 O3 PM10 SO2	Feb97 -- Jun08
BU	Bury Town Centre	UC	CO NO2 O3 PM10 SO2	Jun03 -- Nov04
ST	Stockport Bredbury		NO2 PM10	Nov00 -- Nov07
WI	Wigan Deanery School	#N/A	CO NO2 O3 PM10 SO2	May04 -- Oct04
WI	Wigan Leigh (Cal Club)	UB	NO2 PM10 SO2	Dec98 -- Feb01

2.1.2 Non-Automatic Monitoring Sites

Details of Non-Automatic Monitoring Sites are listed in the following tables in this section and Appendix 1. Non automatic monitoring network consist of around 300 nitrogen dioxide tubes, 17 benzene diffusion tubes and other monitoring. The following information has been collated from the 10 districts using previous reports from their own data sets. Not all the results are reported for each monitoring type and therefore if required please contact the local authority directly for the information.

The site classification types are summarised using the DEFRA site criteria Roadside (Rs), Kerbside (Ks), Rural (RU), Urban Background (UB). Suburban (Su), and Urban Central (UC). This classification is very specific and some sites may not fully meet a particular criteria, for example a tube 20 m away from a motorway is not strictly a roadside site but neither does it meet other types e.g. suburban and is therefore assigned to a site that best matches the local environment i.e. roadside. Some local authority district sites use an older site classification system, U1-4 from LAQM TG.03 and these have been reassigned to the current system using a cross reference table to automatic re-assigned the sites. Further details are included in Appendix 1.

The location of diffusion tubes in 2011 are shown in Figure 2.2.

Table 2.3 Summary of Non-Automatic Diffusion Monitoring by Site Type & District

	Site Type							
District	**Ks**	**Rs**	**Ru**	**Su**	**UB**	**UC**	**NA**	**Total**
Bolton	2	8			16	2	1	29
Bury	2	2			3			7
MCC	9	6		2	9	4		30
Oldham	2	3			6			11
Rochdale		8	1		5	3		17
Salford	1	17			8			26
Stockport		8	2		16	1		27
Tameside MBC		24		3	6			33
Trafford	1	3	1		3	6		14
Wigan	1	90	1		3	3		98
Grand Total	**18**	**169**	**5**	**5**	**75**	**19**	**1**	**292**

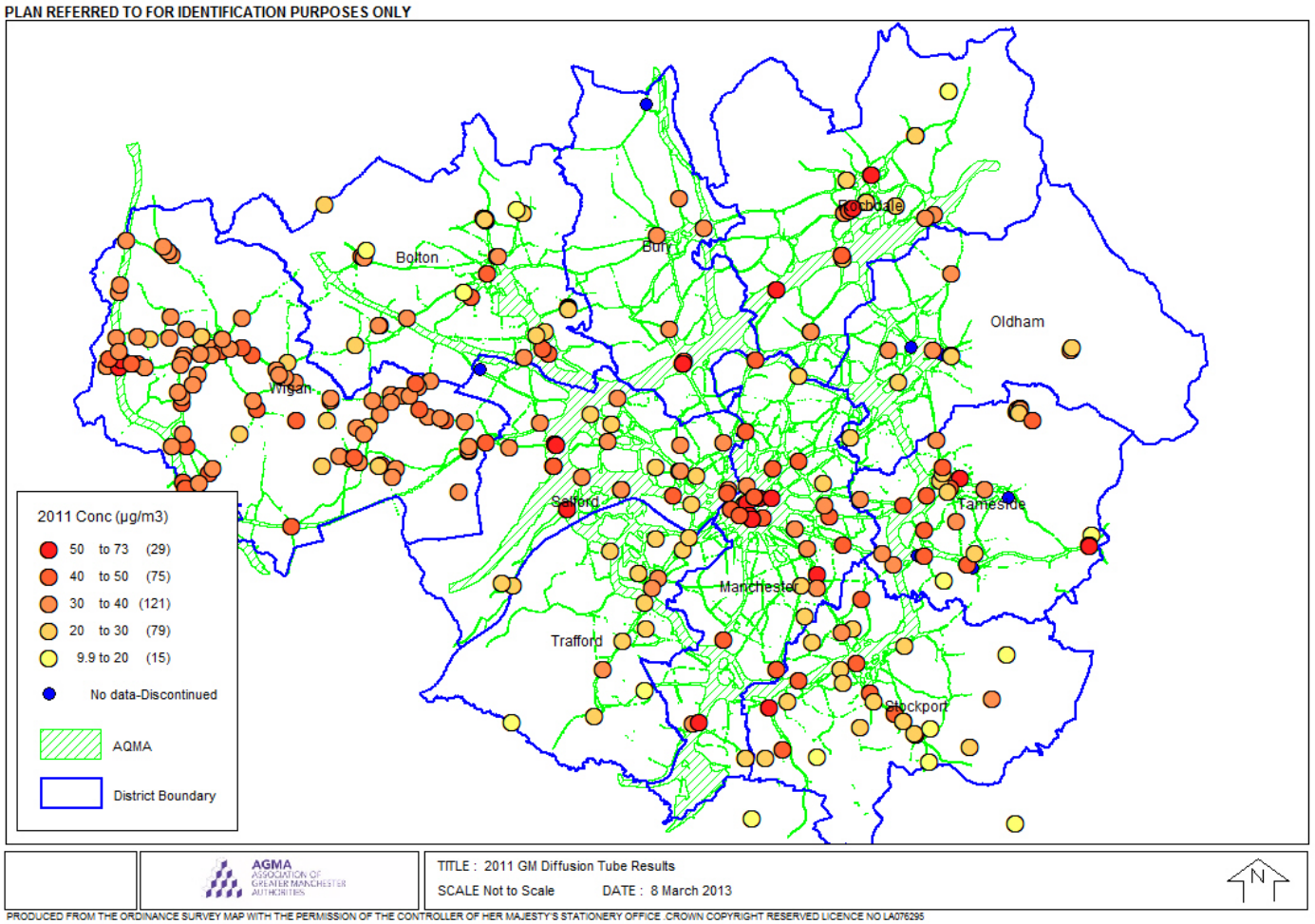
Notes
UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural
NA: Not available
Source: T26Grp.xlsm

Table 2.4 Summary of Non-Automatic Other Monitoring

District	**Benzene**	**Lead**	**TSP1**	**Total**
Bolton	4	2		6
Bury	1			1
Manchester CC	4		4	8
Oldham	4			4
Rochdale	4			4
Grand Total	**17**	**2**	**4**	**23**

TSP: Total suspended particulates

Figure 2.2 Map of Nitrogen Dioxide Diffusion Tube Monitoring Sites



2.2 Comparison of Monitoring Results with AQ Objectives

The following sections provide information on the results and key statistics.

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

A network of 16 monitoring stations is operated by the Greater Manchester authorities with DEFRA support on some sites. In 2011 (see Table 2.6), there were 14 sites with data capture above 50 %. Bolton, Stockport and Oldham sites closed in 2011. Table 2.5 shows the annual and range of concentrations at different site types in Greater Manchester. The automatic data is provided by AEA for all sites as part of Greater Manchester's membership of the calibration club. A copy of this spreadsheet is available on our GreatAir Manchester website:
http://www.greatairmanchester.org.uk/TellMeMore/history.aspx

Table 2.5 Summary of Automatic Monitoring Nitrogen Dioxide – annual mean (µg/m^3) and (Min – Max) Concentrations by Site type

Site Type	2007	2008	2009	2010	2011
Roadside (RO)	57 (42-65)	53 (30-69)	54 (31-72)	55 (36-69)	46 (24-71)
Rural (RU)	18 (18.3-18.3)	17 (17.3-17.3)	16 (16-16)	19 (19.4-19.4)	18 (18.3-18.3)
Suburban (SU)	21 (21-21)	24 (24-24)	24 (24-24)	28 (28-28)	23 (23-23)
Urban Background (UB)	27 (19-39)	26 (19-32)	26 (19-34)	29 (24-33)	28 (21-44)
Urban Central (UC)	36 (31-44)	37 (32-43)	37 (30-42)	40 (33-45)	37 (33-44)

Figure 2.3 shows the average trend by site and clearly shows that all site types have remained relative stable over the period 2007 to 2011. Overall concentrations have fallen compared to the slightly higher values seen in 2010. This is more evident at Eccles which dropped from 42 to 33 µg/m^3 and Trafford A56 from 46 to 41 µg/m^3. Roadside levels are the highest with consistent exceedences of the annual average at three roadside sites Bury (M60), Salford (M60), Manchester Oxford Road where concentrations are above 60 µg/m^3 in 2011. Manchester Piccadilly and Trafford A56 were slightly above the annual mean air quality objective. 10 sites in the suburban, urban background, urban centre and rural categories are below the air quality objective with concentration ranges from 18 to 33 µg/m^3.

The air quality management area was declared where modelled concentrations exceeded 35 µg/m^3. Eccles and Stockport's STK6 and STK5 have recorded one year between 2007 and 2011 where the concentrations are above the 35 µg/m^3. The Oldham site is in the AQMA with a concentrations range of 31 - 33 µg/m^3over the period 2007-11, but previous results from 2001 to 2003 were 34-35 µg/m^3 indicating that it was consistent with the for the declaration of the AQMA in 2005.

The NO_2 hourly objective is exceeded if there are more than 18 periods above the 200 µg/m^3. In 2011 (see Table 2.7), no sites exceeded the air quality objective. 2010, was an usually year, as nine sites had 2 or more periods above 200 µg/m^3 hourly limit with 23 at Bury. Other than Bury, no other site exceeded the hourly objective in 2010. The only sites with consistent periods over the hourly limit are the two motorway stations (Bury, M60) located on the M60.

The figures included in Section 2.2.1 illustrate the trends in annual mean NO2 diffusion tube concentrations across the AQMA.

Table 2.6 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

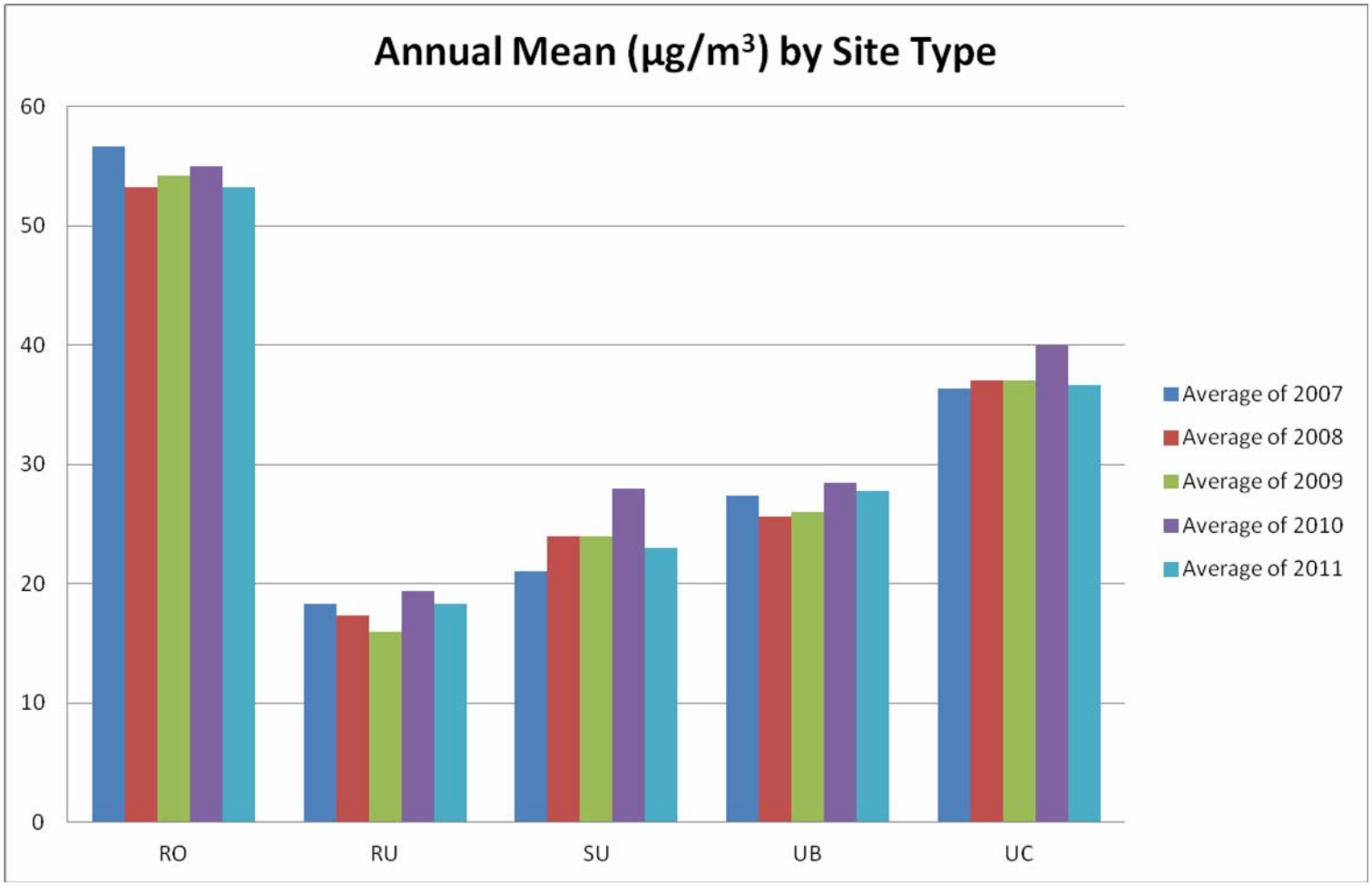
LA	AURN Site Code	Site ID	Site Type	In AQMA	Annual Mean Concentration[a] µg/m^3 Data Capture (%)									
					2007		2008		2009		2010		2011	
					Conc	%	Conc	%	Conc	%	Conc	%	Conc	%
Bolton	BOLT	**Bolton College**	UB		**-**	-	25	75	27	84	28	91	40	23
Bury	BURY	**Bury Roadside**	RO	Y	**65**	81	**69**	96	**72**	83	**69**	99	**71**	89
Bury	BUR2	**Bury Prestwich***	RO	Y									**46**	99
Bury	BUR1	**Bury Radcliffe***	RO	Y									30	99
Salford	GLAZ	**Glazebury**	SU		18	97	17	49	16	94	19	99	18	97
Manchester	MAN1	**Mcr Oxford Rd**	KE	Y	**-**	-	**-**	-	**-**	-	**64**	77	**66**	94
Manchester	MAN3	**Mcr Piccadilly**	UC	Y	**44**	96	**43**	78	**42**	92	**45**	95	**44**	97
Manchester	MAN8	**Mcr South**	SU		21	86	24	92	24	96	28	99	23	99
Oldham	OLDH	**Oldham West Endhouse**	UC	Y	31	99	32	89	30	98	33	89	33	50
Salford	ECCL	**Salford Eccles**	UI	Y	34	91	36	92	39	65	**42**	86	33	87
Salford	M60	**Salford M60**	RO	Y	**63**	96	**68**	70	**70**	97	**60**	98	**64**	99
Stockport	STK5	**Stockport Hazel Grove**	RO	Y	29	61	30	46	31	78	36	55	24	79
Stockport	STK6	**Stockport Shaw Heath 2**	UB	Y	39	24	28	98	27	99	31	93	**44**	10
Tameside	TAME	**Tameside Two Trees**	UB		19	94	19	95	19	89	24	68	21	90
Trafford	TRAF	**Trafford**	UB		30	100	32	81	34	98	33	99	26	99
Trafford	TRF2	**Trafford A56**	RO	Y	**42**	89	**46**	93	**44**	96	**46**	99	**41**	90
Wigan	WIG6	**Wigan Leigh 2**	UB		27	93	26	100	25	95	29	92	25	96
Wigan	WIG5	**Wigan Centre**	UB		22	96	24	99	24	99	26	99	23	98

Notes

a . The annual means have not been annualised where data capture falls below 50% see Box 3.2 TG(09). Closures : Stockport Shaw Health 6/2/11; Oldham 5/7/11

UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Sb: Suburban; Ru: Rural

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites



RO Roadside, RU Rural, SU Suburban, UB Urban Background, UC Urban centre

Table 2.7 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

LA	AURNSite Code	Site ID	Site Type	In AQMA	Valid Data Capture 2011 % [ab]	Number of Exceedences of Hourly Mean (200 μg/m^3) *[c]				
						2007	2008	2009	2010	2011
Bolton	BOLT	Bolton College	UB		23	-	0	0	0	
Bury	BURY	Bury Roadside	RO	Y	89	3	4	11	23	7
Bury	BUR2	Bury Prestwich	RO	Y	99					0
Bury	BUR1	Bury Radcliffe	RO	Y	99					0
Salford	GLAZ	Glazebury	RU		97	0	0	0	0	0
Manchester	MAN1	Manchester Oxford Rd	KE	Y	94	-	-	-	2	5
Manchester	MAN3	Manchester Piccadilly	UC	Y	97	0	12	0	0	0
Manchester	MAN8	Manchester South	SU		99	0	0	0	7	0
Oldham	OLDH	Oldham West Endhouse	UC	Y	50	0	0	0	0	0
Salford	ECCL	Salford Eccles	UI	Y	87	0	3	0	15	0
Salford	M60	Salford M60	RO	Y	99	47	65	106	13	13
Stockport	STK5	Stockport Hazel Grove	RO	Y	79	1	0	0	4	0
Stockport	STK6	Stockport Shaw Heath 2	UB	Y	10	0	1	0	5	
Tameside	TAME	Tameside Two Trees	UB		90	0	0	0	0	0
Trafford	TRAF	Trafford	UB		99	0	2	0	18	0
Trafford	TRF2	Trafford A56	RO	Y	90	0	2	0	12	0
Wigan	WIG6	Wigan Leigh 2	UB		96	0	0	0	0	0
Wigan	WIG5	Wigan Centre	UB		98	0	0	0	0	0

[a] i.e. data capture for other monitoring periods in annual results table.
[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 valid data is less than 90%, result not reported
UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural

Diffusion Tube Data

This is the first report where all of Greater Manchester's diffusion tube results are collated and reported together. The following tables list results for the years 2007 to 2011. A full copy of the data is provided in the appendices. Some site classifications were based on a previous system (U1 Kerbside, U2 Roadside etc) have been remapped to align the current national system used on LAQMTG(09). The new site classifications were automatic assigned using a lookup table in Appendix 1.

Full results of nitrogen dioxide diffusion tubes in 2011 are provided in Appendix 1. There over 300 tubes located at 292 locations in Greater Manchester representing a range of environments from rural to kerbside locations. The following tables show the average results for years' 2007 to 2011 by site type (Table 2.8 and Figure 2.5) and by district (Table 2.9 / Figure 2.6). A GM bias factor of 0.883, calculated from the national database spreadsheet V(3/12) was used to adjust all diffusion tubes. See Appendices for details of the bias factor.

2011 results show a similar pattern to the real time sites with a fall from the slightly higher concentrations experienced 2010, with average concentrations similar to those of 2009.

Table 2.8 Summary Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011) – annual mean (µg/m^3) and (Min – Max) Concentrations by Site type

Site Type	2007	2008	2009	2010	2011
Kerbside (Ks)	52 (81-31)	49 (79-30)	47 (71-31)	47 (72-30.5)	45 (70-27.6)
Roadside (RO)	41 (74-22.3)	42 (87-23)	38 (73.3-24)	40 (83-23.9)	39 (73-24.5)
Rural (RU)	18 (27-9)	17 (27-8)	13 (16.6-9)	19 (30-11)	20 (39-9.9)
Suburban (SU)	23 (26.9-18.9)	23 (29.1-15)	24 (28.8-17)	22 (27-19)	23 (29-17)
Urban Background (UB)	28 (50-14.9)	27 (45-13)	29 (66.4-15)	30 (53-16.5)	27 (43-15.1)
Urban Central (UC)	42 (53-28)	40 (51-30)	38 (48-27.1)	41 (52-31)	36 (47-23.9)
					Source: T26Grp.xlsm

Overall kerbside sites show the largest fall in the average concentrations from 52 µg/ m^3 in 2007 to 45 µg/ m^3 in 2011, with the maximum concentration decreasing from 81 µg/ m^3 to 70 µg/ m^3 over the same period. There is a smaller decline in minimum concentration for kerbside sites. Sites located further away from kerb show a smaller decrease in concentration from 2007 to 2011.

Of the 18 kerbside sites all except one have recorded exceedences of the annual mean objective in the period to 2007-2011. All are in the AQMA except OL 19 (High Street Upper Mill) which is a town\ village at the periphery of the GM conurbation, results typically range from 27 – 32 µg/m^3, and is therefore unlikely to be in AQMA.

Table 2.9 Summary Results of Annual Mean (µg/m^3) Nitrogen Dioxide Diffusion Tubes (2007 to 2011) by District

Annual Mean Diffusion Tube Results 2007 – 2011 (µg/m^3)					
District	**2007**	**2008**	**2009**	**2010**	**2011**
Bolton	39	41	42	39	41
Bury		51	53	59	47
MCC	60	54	49	53	49
Oldham	44	47	49	35	34
Rochdale		45	42	43	45
Salford	40	43	46	45	39
Stockport	43	39	41	46	42
Tameside MBC	38	41	40	37	41
Trafford	32	37	33	38	29
Wigan	41	41	33	38	38
Average (GM)	**42**	**43**	**39**	**41**	**40**
Source : USA_2012\GMDATA\Monitoring Data _files\Non automatic data _files\Tables\T26Grp.xlsm					

The following analysis uses a three year average from 2008 to 2011 to study long term trends to reduce year to year variances. There are 185[3] roadside and kerbside sites, 79 have a three year annual average over 40 µg/m^3, and 77 of these are located in the AQMA. 106 tubes are less than or equal to 40 µg/m^3, 78 are in the AQMA and 28 outside.

The AQMA was declared where modelled concentrations exceeded 35 µg/m^3. There are 155 tubes with a concentration exceeding 35 µg/m^3; 142 are in the AQMA and 13 outside the AQMA.

Figure 2.4 shows the distribution of the 3 year average concentration for the datasets in the AQMA (Yes) and outside (Out). The vertical line the indicates AQMA declaration value of 35 µg/m^3. It clearly shows that tubes outside the AQMA tend to have a concentration less that 35 µg/m^3. For the tubes in the AQMA, 142 are over

[3] Two sites had no results for 2009 to 2011

and 64 are less than the AQMA threshold of 35 µg/m^3. The mode (most frequently occurring values) falls near the AQMA threshold.

Studies have shown that where diffusion tubes are above 60 µg/m3, the 1-hour objective may be exceeded. There were five locations, Bury Roadside* (BU3a), Oxford Street* (29 A/B & 82), M60* (SA20/21/21), Kingsway (SK12) and Market Street Hollingworth (T 11), with a 3 year average exceeding 60 µg/m^3. Automatic monitoring station are at or close to some of the sites (marked with *) and are discussed above. A station is proposed for the A34 Kingsway.

The top ten sites are located in Manchester City Centre(Newton Street, 58 µg/m^3, Princess Street 56 µg/m$^{3)}$, Oxford Street, Salford and Bury by the M60 (59-73 µg/m^3), A34 Kingsway and Market Street Hollinworth. These locations are in central Manchester, or along the major arterial roads in the region.

Figure 2.4 Histogram of Annual Mean Nitrogen Dioxide diffusion Tube Concentrations (µg/m^3)

3 Year Average (2009-2012) concentration µg/m^3 Vertical line AQMA Threshold 34µg/m^3

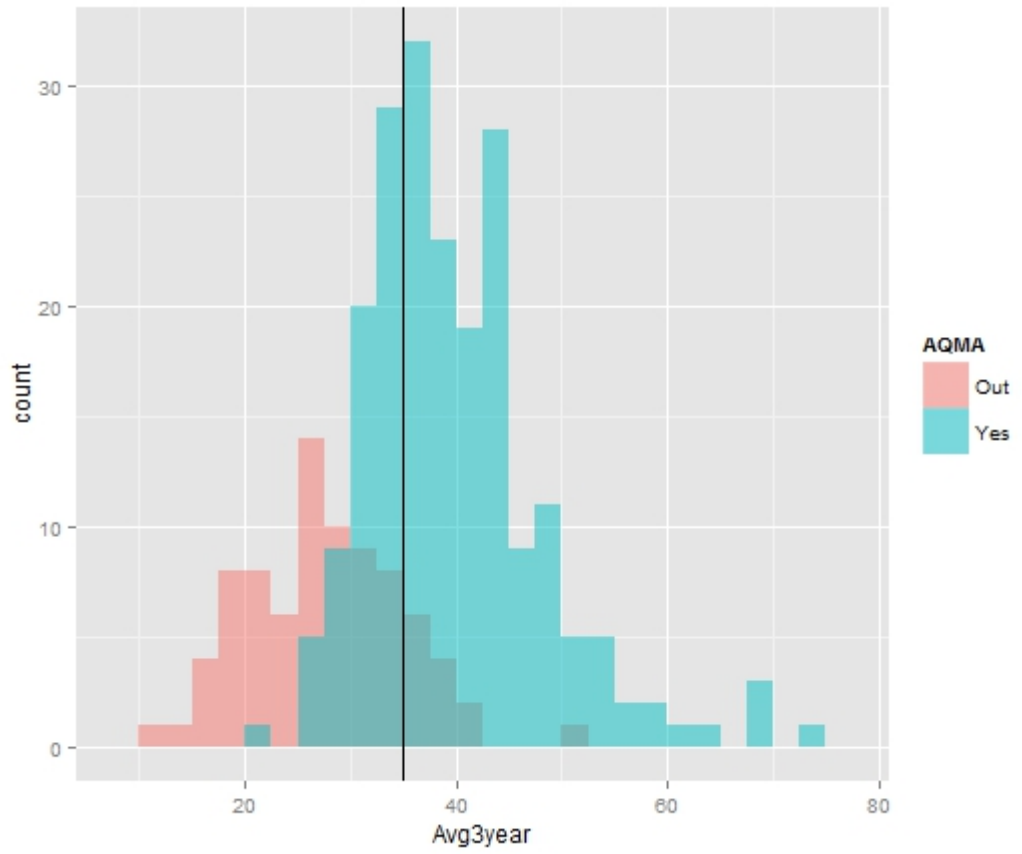


Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Diffusion Tube Concentrations (µg/m^3) by Site Type

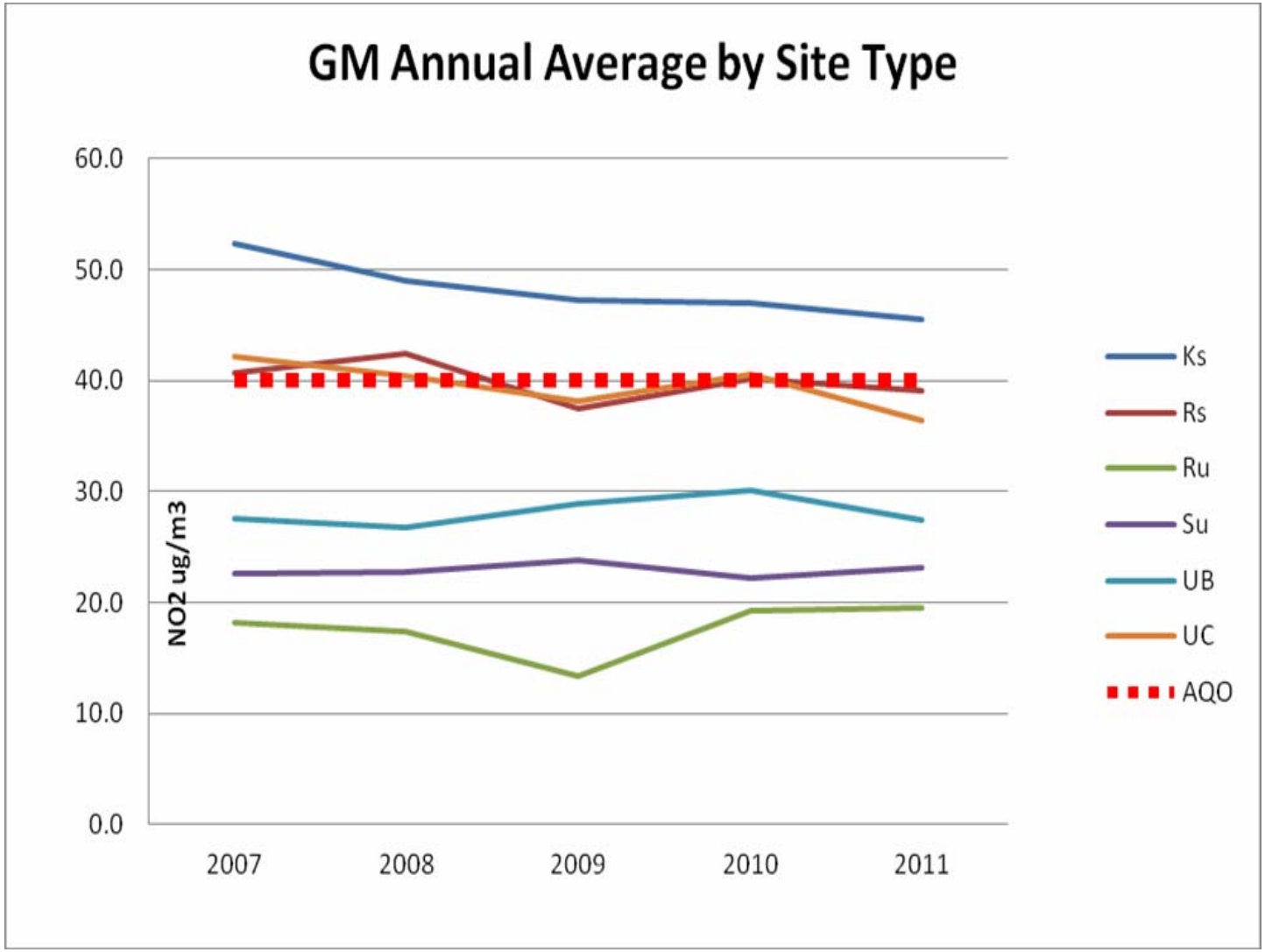
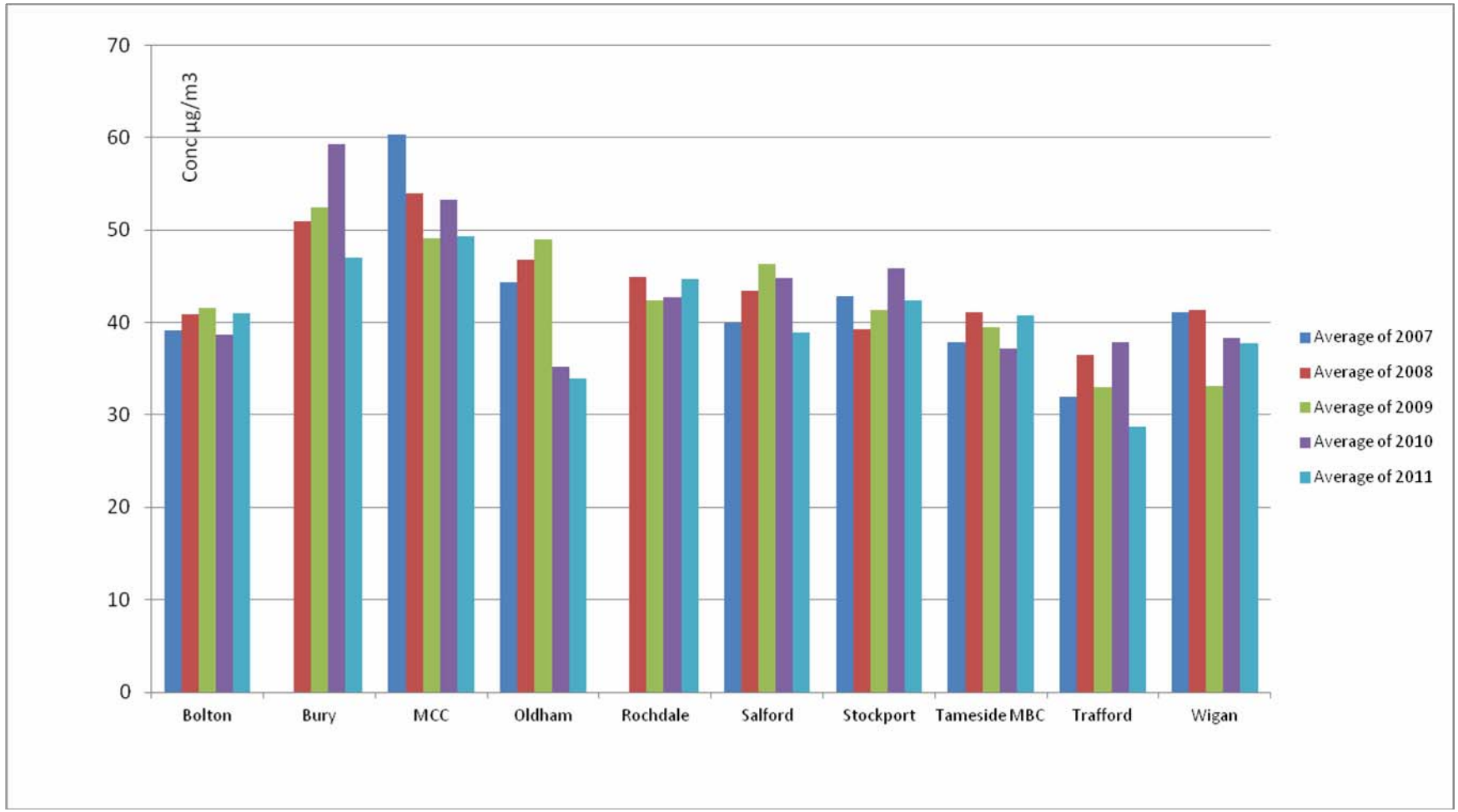


Figure 2.6 GM Trends in Annual Mean Nitrogen Dioxide Diffusion Tube Concentrations (µg/m^3) by Site Type

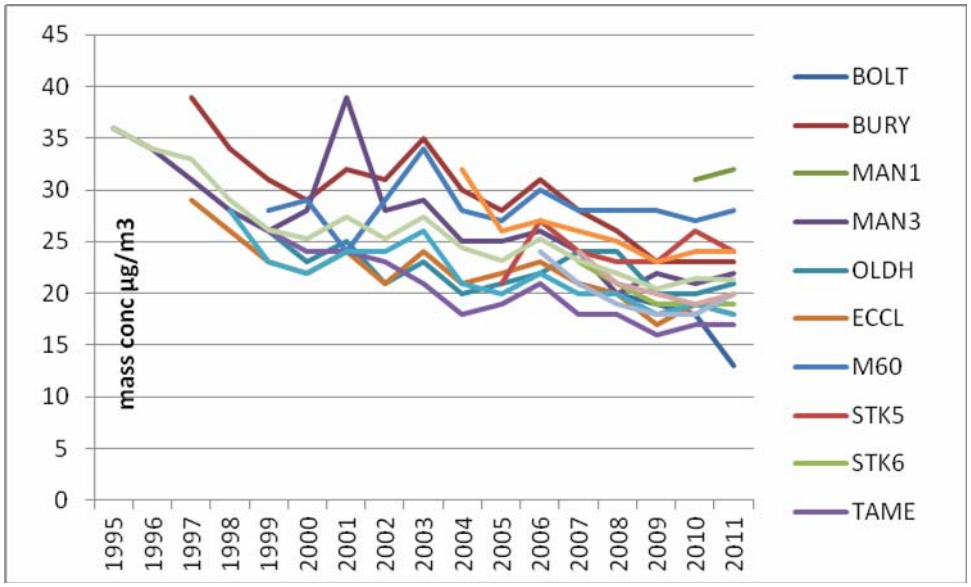


2.2.2 PM_{10}

The annual mean air quality objective for PM_{10} has not been exceeded at any of the GM stations since monitoring commenced in 1995, at the first station in Piccadilly Manchester. However medical evidence links higher PM_{10} concentrations with increased hospital admission and other respiratory illness, therefore reducing exposure with lower ambient concentrations is beneficial to securing a healthier environment. PM_{10} data is reported in gravimetric units, by applying 1.3 factor to Teom data. Manchester Oxford Rd and Piccadilly PM_{10} analysers are BAM 1020 with unheated inlets so the data has been corrected to gravimetric by a factor of 0.83333. The following tables 2.10, 2.11 and 2.12, and charts 2.7 and 2.8 provide information on PM_{10} concentrations and trends.

In 2011 the average PM_{10} concentration is 21 µg/m^3, marginally lower than the 2010. Average PM_{10} concentrations in Greater Manchester have decreased steady from the higher concentration of 35 – 40 µg/m^3 in 1995, however these have started to level off as can be seen from Figure 2.7.

Figure 2.7 GM Long Term Trend Annual Mean Objective



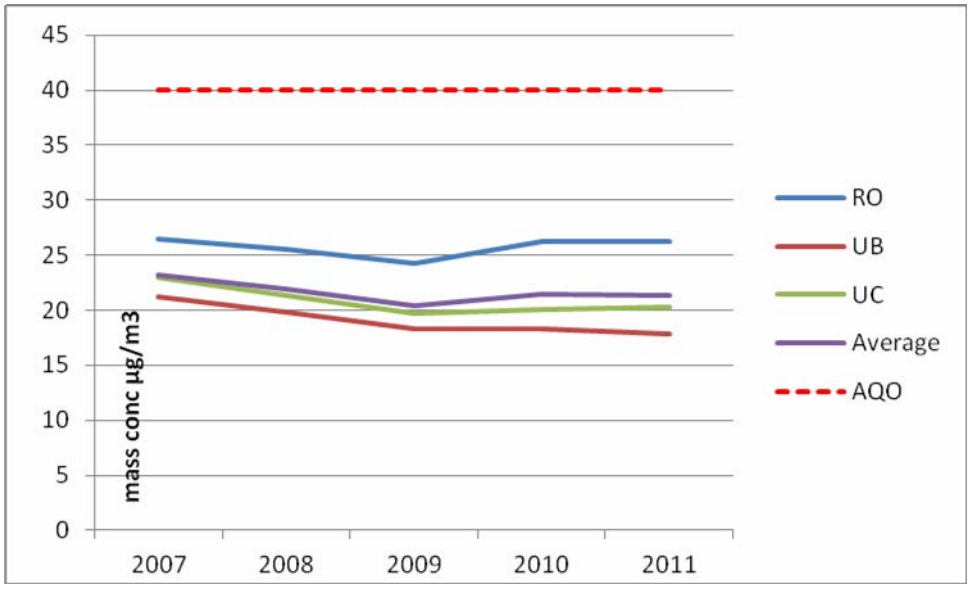
The highest concentrations are experienced at roadside locations with the station at Oxford Road in Manchester measuring an annual mean of 32 µg/m^3, which also has

the highest number of daily exceedences at 33 in 2011. Oxford road is widely credited with the title of "the busiest bus route in Europe" and is heavily congested during peak hours. The average roadside concentration is 26 µg/m^3.

Table 2.10 Summary of Automatic Monitoring of $PM_{10:\ by}$ site Type Comparison with Annual Mean Objective (µg/m^3)

	2007	2008	2009	2010	2011
RO	27	26	24	26	25
UB	21	20	18	18	18
UC	23	21	20	20	20
Average (all)	23	22	20	22	21
UB: Urban Background; Rs: Roadside; Ks: Kerbside; UC Urban Centre; Su: Suburban; Ru: Rural Source: \Gtr Manchester Summary_DM_May_2012_V2_teom.xlsm Tab:PM_Summ					

Figure 2.8 GM Trends in Annual Mean Objective Concentrations (µg/m3) by Site Type



Urban background particulate pollution mean concentration in 2011 was 18 µg/m^3 slightly lower than the national concentration of 20 µg/m^3. Urban Centre Sites in 2011 were 20 µg/m^3.

In GM and the UK the predominant method of measurement is the TEOM which does not meet the EU reference method for particulate measure. A model developed by Kings College London (KCL) and approved by DEFRA is available to convert TEOM data to meet the standard.

Use of the new volatile correction model (VCM), instead of the current 1.3 factor, to 'correct' TEOM measurements to gravimetric equivalent decreased the average annual mean by 4% but increased the number of daily exceedences at Trafford A56 (6 to 12), Salford M60 (12 to 16), Trafford cal club (6 to 11). Overall there was no change and no locations exceeded the air quality objective after applying the VCM factor.

Table 2.11 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective (µg/m^3 / % Data Capture)

LA	AURN Code	Site ID	Type	X(TFGM)	Y(TFGM)	AQMA	Method	2007	2008	2009	2010	2011	End Date
Bolton	BOLT	Bolton College	UB	371000	408496		T	21 (79.2%)	20 (67.1%)	19 (70.9%)	18 (91.1%)	13 (19%)	Mar-11
Bury	BURY	Bury Roadside	RO	380906	404757	Y	T /F	28 (77.7%)	26 (96.2%)	23 (95.9%)	23 (97.9%)	23 (92.8%)	
Bury	BUR2	Bury Prestwich*	RO			Y	T					25 (98.6%)	
Bury	BUR1	Bury Radcliffe*	RO			Y	T					22 (100%)	
Manchester	MAN1	Manchester Oxford Rd	RO	384233	397287	Y	B				31 (81.2%)	32 (99.2%)	
Manchester	MAN3	Manchester Piccadilly	UC	384310	398337	Y	T|F	24 (97.9%)	20 (99.1%)	22 (3.7%)	21 (92.8%)	22 (97.8%)	
Oldham	OLDH	Oldham West Endhouse	UC	391860	405514	Y	T	24 (89.9%)	24 (90.7%)	20 (98.4%)	20 (88.3%)	21 (27.5%)	Jul-11
Salford	ECCL	Salford Eccles	UC	377926	398728	Y	T\F	21 (90.1%)	20 (90.6%)	17 (97.6%)	19 (98.6%)	18 (93.6%)	
Salford	M60	Salford M60	RO	374810	400855	Y	T	28 (97%)	28 (89%)	28 (96.9%)	27 (98%)	28 (98.9%)	
Stockport	STK5	Stockport Hazel Grove	RO	391481	387637	Y	T	24 (79.7%)	23 (97.5%)	23 (94.7%)	26 (99.3%)	24 (97.8%)	
Stockport	STK6	Stockport Shaw Heath 2	UB	389384	389605	Y	T	23 (25%)	21 (99.4%)	19 (99.3%)	19 (97.3%)	19 (9.3%)	Feb-11
Tameside	TAME	Tameside Two Trees	UB	393454	394330		T	18 (91.4%)	18 (94.7%)	16 (88.2%)	17 (81.1%)	17 (96.2%)	
Trafford	TRAF	Trafford	UB	378783	394726		T	20 (96.2%)	20 (97.7%)	18 (99.3%)	19 (97.4%)	18 (98.1%)	
Trafford	TRF2	Trafford A56	RO	379413	394014	Y	T	26 (98.6%)	25 (98.2%)	23 (98.6%)	24 (97.4%)	24 (98.9%)	
Wigan	WIG6	Wigan Leigh 2	UB	366290	399861		T	21 (90.4%)	19 (92.1%)	18 (92.6%)	18 (87.8%)	20 (99.2%)	
Wigan	WIG5	Wigan Centre	UB	357815	406022		T	24 (24.3%)	21 (96.9%)	20 (89.3%)	19 (97.2%)	20 (92.1%)	

Bury:T (upto 6/5/09) F (from 7/5/09), MAN1 T (up to 14/3/07) F (from 15/3/07) F (from 15/3/07), Eccles: T (up to 25/2/09) F (from 26/2/09)
F:FDMS;T:TEOM, B:BAM

Source: \\ \Gtr Manchester Summary_DM_May 2012_V2_teom.xlsm

Table 2.12 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Number of Exceedences of 24-Hour Mean (50 µg/m^3)

LA	AURN Code	Site ID	Site Type	AQMA	Method	2007	2008	2009	2010	2011
Bolton	BOLT	Bolton College	UB		T	6	0	0	0	0
Bury	BURY	Bury Roadside	RO	Y	T/F	18	6	7	2	14
Bury	BUR2	Bury Prestwich	RO	Y	T					19
Bury	BUR1	Bury Radcliffe	RO	Y	T					15
Manchester	MAN1	Manchester Oxford Rd	RO	Y	B				17	33
Manchester	MAN3	Manchester Piccadilly	UC	Y	T/F	20	9	5	1	8
Oldham	OLDH	Oldham West Endhouse	UC	Y	T\F	7	3	1	1	0
Salford	ECCL	Salford Eccles	UC	Y	T/F	9	2	6	3	13
Salford	M60	Salford M60	RO	Y	T	21	11	10	8	12
Stockport	STK5	Stockport Hazel Grove	RO	Y	T	10	7	9	15	23
Stockport	STK6	Stockport Shaw Heath 2	UB	Y	T	2	7	3	0	0
Tameside	TAME	Tameside Two Trees	UB		T	4	1	1	0	2
Trafford	TRAF	Trafford	UB		T	8	4	2	3	2
Trafford	TRF2	Trafford A56	RO	Y	T	11	8	3	3	6
Wigan	WIG6	Wigan Leigh 2	UB		T	3	4	0	2	4
Wigan	WIG5	Wigan Centre	UB		T	0	5	1	2	3
Bury:T (upto 6/5/09)F (from 7/5/09); MAN1 T (up to 14/3/07) F (from 15/3/07): Eccles: T (up to 25/2/09) F (from 26/2/09)										

2.2.3 Sulphur Dioxide

The results presented here are results provided from the GM network stations and compiled by AEA. AEA at our request compiled the annual mean, data capture to compare against the UK air quality objectives.

For GM the annual average in 2011 was 2.4 µg/m^3, with an average data capture of 64%. Manchester Piccadilly, Manchester South, Salford Eccles and Trafford had data capture rates over 80%.

There were no exceedences of the three UK air quality objectives; annual mean, 15 minute not to exceed 266 µg/m^3 and one daily not to exceed 125 µg/m^3.

2.2.4 Benzene

Benzene is found in petrol and in vehicle emissions, therefore elevated levels may be expected at roadside locations. Background concentrations are less than 0.5 µg/ m^3 over much of the UK with slightly higher concentrations in urban areas.

Benzene is a recognised human genotoxic and therefore there is no absolutely safe threshold below which no adverse health effects are anticipated. A European limit value has been set, of 5 µg/m^3 as an annual mean, below this value, the risk of health effects is very small.

The 2011 average for roadside sites is 0.75 µg/m^3. There is a general decrease from 2009 to 2011 across of the 4 sites. GM is compliant with this limit value for roadside sites. Princess Parade is a service station where high level would be expected but as the limit value is set for non- occupational locations it does not apply here.

Results from the last 3 years for the network of benzene diffusion tubes across the city are shown in Table 2.13

Table 2.13 Results of Benzene Diffusion Tube Monitoring: Comparison with Annual Objectives

Monitoring site name	Site type	Within AQMA?	Annual mean benzene concentrations ($\mu g/m^3$) Adjusted for bias* *Data capture for the year is included in brackets*		
			2009	2010	2011
(M)Piccadilly Gardens	Urban Centre	Y	0.86 (100%)	0.89 (100%)	0.69 (100%)
(M)Cheetham Hill Road	Kerbside	Y	1.07 (100%)	1.14 (92%)	0.94 (100%)
(M)Princess Road	Roadside	Y	0.96 (100%)	1.10 (92%)	0.55 (92%)
(M) Princess Parade Service Station	Urban Industrial/ Roadside	Y	8.34 (100%)	6.63 (92%)	5.43 (92%)
Bury (AURN)	Roadside	Y			0.78 (100%)
Notes M= Manchester					

2.2.5 Other pollutants monitored (Carbon Monoxide and Ozone)

Analysis of automatic site data for carbon monoxide shows no exceedences of the air quality objective.

The UK Air Quality Strategy (Defra, 2007) confirmed an ozone air quality objective, which applied from the end of 2005, of 100 µg /m^3, measured as the daily maximum of a running 8-hour mean ozone concentration, not to be exceeded more than 10 times a year. The standard applies to UK and is not the responsibility of local authorities so is reported for information only. There were exceedences in Tameside and Manchester South, results are given in Table 2.14.

Table 2.14 Results Ozone, for daily maximum 8-hour running average > 100.0 µg m-3 (20'C 1013mb)

Site	Site Type	Number of exceedences	2011 µg/m³	Data Capture (%)
Bolton College	UB	0	36	*22
Glazebury	SU	8	42	99
Manchester Piccadilly	UC	1	30	99.1
Manchester South	SU	**11**	46	99.4
Oldham West End House		6	44	*50.3
Salford Eccles	UI	3	34	94
Salford M60	RO	0	28	*52.8
Tameside Two Trees School	U	**12**	46	99.7
Wigan Centre	UB	8	43	92.9
Wirral Tranmere	UB	9	46	99.4
*Sites closed or decommissioned Produced by AEA on: 27/07/2012 Automatic\Exceedance_Summay_for_1_1 - Summary list.xls Annual Average (mg m-3 (20'C 1013mb) 01/01/2011 to 31/12/2011)				

2.2.6 Summary of Compliance with AQS Objectives

Greater Manchester modelled air quality concentration in 2004\5 and each of the 10 districts declared air quality management areas shortly after that. The modelling was based on the 2001 inventory. Year to year changes in air quality concentration are monitored by our monitoring programme and the emissions inventory.

The automatic sites show good agreement with the air quality management area. Stockport Hazel Grove site, which is the AQMA, records the lowest concentration in the AQMA with a range of 24-31 µg/m^3, however the other sites are consistent with the AQMA boundary. The Hazel Grove site is currently part of a larger study to collect evidence relating traffic composition and flow using a matrix of remote sensors (emotes). Results from the study are due in 2013 and this will be used to improve future modelling

At roadside locations in Greater Manchester and in the built areas with a high density of roads, annual concentrations do exceed the UK air quality objective of 40 µg/m^3.

Away from busy roads (urban, suburban and rural), annual mean NO_2 concentrations are lower, typically 80% of diffusion tubes concentrations fall in the range 19-37 µg/m^3.

Analysis of tubes within the air quality management area show reasonable good statistical agreement with the 2004 modelling results, nonetheless over 30 % of tubes located in the AQMA are less that 35 µg/m^3 and over 25% are in the range 35-40 µg/m^3. Technical Guidance (LAQM TG (09)) states that overall uncertainty of diffusion tubes is +/- 20% and therefore overall the results support the current AQMA but there are some small changes consistent with new developments and or changes in traffic patterns have occurred.

There are a number of tube sites that require further investigation by the local authorities as regards to location and other site interferences. As discussed previously a large number of tubes while agreeing with the model are located in the

AQMA with concentrations less 40 µg/m^3. Broadly the monitoring results for NO_2 are consistent with current AQMA, however the diffusion tube data suggests that there are locations where the AQMA has changed and it should be revised. Air quality modelling is currently in progress which will use the latest emissions factors released in July 2012. The new vehicle emissions are more realistic at estimating the emissions under urban conditions.

Table 2.15 and the box below summarise Greater Manchester's outcomes against the AQS Objectives.

The Greater Manchester Combined Authority has reviewed the measurement data from NO2 automatic and non automatic sites and diffusion tube data indicates minor changes in the air quality management area. Greater Manchester is currently modelling air quality with revised emissions factors and inventory will remodel the area for NO_2 to update the AQMA.

Table 2.15 Summary of Compliance with AQS Objectives

Pollutant	General	New Exceedences identified?	Detailed Assessment Required	Objective	Comment \Description of Area
10 Greater Manchester Authorities.					
NO_2	Monitoring outside AQMAs	No	No	Annual Mean	No Detailed assessment required
	Monitoring inside AQMAs	No	No	Annual Mean	To revise the AQMA using the current modelling
	Monitoring inside \ outside AQMAs	No	No	Hourly Mean	
PM_{10}	monitoring outside \inside AQMAs	No	No	Annual Mean	No Detailed assessment required
	Monitoring inside AQMAs	No	No	Daily Mean	
Benzene, SO2,	Monitoring outside/inside AQMAs	No	No		No Detailed assessment required
	New monitoring inside AQMAs	N/A	N/A		

3 Road Traffic Sources

Each of the 10 Greater Manchester authorities committed to undertaking a detailed air quality review and assessment in relation to road traffic following the last updating and screening assessment in 2009. The dispersion modelling has been delayed due to difficulties in obtaining accurate emissions data, particularly for some point sources and also because new road transport emission factors were due to be published, which are expected to be more representative of the real world.

The last detailed dispersion modelling exercise was carried out in 2002 and used the emissions 2001 emissions inventory as summarised in section 1.5. Since that time there have been significant improvements to the Greater Manchester emissions inventory, including the traffic model changes described above as well as improvements in the collection of point and area source data. Transport for Greater Manchester (formerly the Greater Manchester Transportation Unit) has been commissioned to undertake dispersion modelling for the whole of Greater Manchester. The modelling will cover almost the whole of the conurbation, with the exception of some very limited outlying areas and will use intelligent gridding to ensure there is good coverage around roads and busy junctions.

Transport for Greater Manchester (TfGM) have used their transport model, the results of which have been considered by districts to identify locations which:

- have not been assessed during the earlier rounds,
- have experienced a significant change in traffic flows
- have a new development, or
- have new exposure that has not been assessed previously.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Air quality is often higher in locations where there is congestion along narrow streets, where there are buildings to reduce dispersion. Council's are asked to identify roads where the daily traffic Annual Average Daily Traffic (AADT) flow is greater than 5,000

vehicles per day and the average speed is less than about 25 kph (15 mph). Where these conditions exist and there are residential properties within 2 metres away from the edge of the kerb, with buildings both side of the road to reduce dispersion, a detailed assessment should be carried out for nitrogen dioxide unless the road has been considered previously.

Transport for Greater Manchester identified any roads with AADT flows greater than 5,000 and average speeds less than 25 kph. In total 1,243 links were found, of which 197 were outside the AQMA. The numbers of links identified in each district are shown in Table 3.1.

Table 3.1 Narrow congested streets outside the AQMA

District	Number of links
Bolton	22
Bury	3
Manchester	32
Oldham	22
Rochdale	1
Salford	10
Stockport	27
Tameside	24
Trafford	27
Wigan	32
Total	200
Note: Some links may lie in more than one district	

The roads are shown on a map in Figure 3.1 at the end of this chapter. Not all the roads identified will have residential properties close to the kerb and buildings either side of the road, which could restrict dispersion. There are a large number of roads that have been identified in the Greater Manchester area that would require a manual review to determine whether all the relevant criteria are met. This is considered an unnecessary step as county-wide dispersion modelling is currently being progressed that will take into account whether the relevant objectives are likely to be met.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

An assessment should be made to identify any new areas where individuals may spend 1-hour or more, for example streets with many shops and streets with outdoor

cafes and bars. This does not include locations where people would only be occupationally exposed as the air quality regulations only apply to non-residential exposure. The assessment only needs to consider nitrogen dioxide.

A busy street is regarded as one where the flow of traffic is greater than 10,000 vehicles per day, where individuals may be exposed within 5 metres of the kerb for 1-hour or more.

Transport for Greater Manchester has identified roads with two-way 2011 AADT flows greater than 10,000 vehicles per day. 4,855 links were found in total, of which 1,135 were outside the AQMA. Many of these links were identified in the 2009 USA, and have been previously assessed. However there may have been changes in traffic flows and other changes in respect to potential exposure such as new shops or increased population since then. Table 3.2 shows the number of identified road links outside the AQMA.

Table 3.2 Roads with two-way 2011 AADT flows greater than 10,000 vpd outside the AQMA

District	Number of links
Bolton	142
Bury	43
Manchester	200
Oldham	93
Rochdale	21
Salford	35
Stockport	199
Tameside	112
Trafford	146
Wigan	178
Total	1169
Note: Some links may lie in more than one district	

The roads are shown on a map in Figure 3.2 at the end of this chapter. It is not expected that many of the roads will have relevant exposure of people close to the road for an hour or more, however there are a large number of roads that have been identified in the Greater Manchester area that would require a manual review to determine whether all the relevant criteria is met. This is considered an unnecessary step as county-wide dispersion modelling is currently being progressed.

The dispersion modelling will be undertaken using ADMS and will identify annual mean NO2 concentrations. Following this work any busy streets outside the AQMA falling within the 60 µg/m3 annual mean contour line will be looked at to determine whether there is any relevant exposure, and therefore whether any additional work is required.

3.3 Roads with a High Flow of Buses and/or HGVs

There is a possibility that some street locations where traffic flows are not necessarily high (fewer than 20,000 vehicles per day), but there is an usually high proportion (greater than 20%) of buses and/or HGVs. If the flow of HDV vehicles is greater than 2,500 a detailed assessment should be completed. Where these conditions exist, an assessment for both NO2 and PM10 should be carried out.

Transport for Greater Manchester identified 507 roads with a two–way AADT flow less than 20,000 vpd and an HDV proportion greater than 20 percent. Of these, 27 links have an HDV flow greater than 2,500 vpd. All of these links are within the current AQMA and have been previously assessed. There is therefore no need to carry out any additional work in relation to roads with a high flow or buses and/or HGVs.

Figure 3.3, at the end of this chapter, shows the location of roads in Greater Manchester that meet the relevant criteria. Although these roads have already been assessed previously and there is therefore no need for a detailed assessment, they will be included in the county-wide dispersion modelling exercise.

3.4 Junctions

Concentrations are usually higher close to junctions, due to the combined impact of traffic emissions on two roads and to the higher emissions due to stop start driving. Any new junctions with flows greater than 10,000 vehicles per day where there is relevant exposure within 20 metres of the kerb should be assessed for both nitrogen dioxide and PM10.

Transport for Greater Manchester have identified a total of 62 junctions in Greater Manchester that have flows greater than 10,000 vpd and have not been assessed in previous years. Table 3.3 shows the number of identified junctions in each district.

Table 3.3 Junctions with AADT flows in 2011 greater than 10,000 vpd not previously assessed and outside the AQMA.

District	Number of junctions
Bolton	5
Bury	4
Manchester	6
Oldham	11
Rochdale	2
Salford	5
Stockport	1
Tameside	11
Trafford	11
Wigan	6
Total	62

The locations of the identified junctions are shown in Figure 3.4 at the end of this chapter. All the identified junctions are included in the county-wide dispersion modelling area, therefore DMRB assessments have not been undertaken as the work already underway will identify whether the relevant objectives will be met.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

Any new roads constructed or proposed since the last review and assessment should be assessed for nitrogen dioxide and PM10.

There are three new relevant roads in Greater Manchester that have been completed since the last air quality assessment. These are:

- Derby Way Link Road (Bury)
- Gibfield Park Avenue (Atherton, Wigan)
- Broadway Link Road (Coronet Way, Salford)

These roads are shown on Figure 3.5 at the end of this chapter. All the roads are included in the county-wide dispersion modelling exercise, which will identify whether the air quality objectives will be met in these areas. Salford City Council assessed the

Broadway link (Coronet Way) in their 2009 USA and found no new areas of exposure or exceedances of the NO2 and PM10 objectives.

3.6 Roads with Significantly Changed Traffic Flows

An assessment is required for both nitrogen dioxide and PM10 to identify roads with significantly changed traffic flows. Roads with flows over 10,000 vehicles per day, where there has been an increase in traffic greater than 25% should be assessed.

Transport for Greater Manchester have identified road links with a two-way 2011 AADT flow greater than 10,000 vpd, where there has been an increase in traffic flow between 2008 and 2011 greater than 25%. A total of 365 links have been found, of which 157 are either partly or entirely outside the AQMA. The number of roads in each district are shown in Table 3.4.

Table 3.4 Roads with a two way 2011 AADT greater than 10,000 with an increase in traffic greater than 25%

District	Number of links
Bolton	19 **(8)**
Bury	31 **(18)**
Manchester	59 **(19)**
Oldham	36 **(12)**
Rochdale	14 **(4)**
Salford	21 **(7)**
Stockport	31 **(17)**
Tameside	59 **(31)**
Trafford	66 **(29)**
Wigan	36 **(21)**
Total	371 **(163)**
Notes: Some links may lie in more than one district. The number in brackets is the number of links outside the AQMA.	

The roads with significantly changed traffic flows are shown in Figure 3.6 at the end of this chapter. All the identified roads, whether they are inside or outside of the AQMA are included in the county-wide dispersion modelling area. There is therefore no need to carry out DMRB assessments for these roads.

3.7 Bus and Coach Stations

Locations near to bus and/or coach stations that have not previously been considered in earlier air quality reviews should be assessed against the annual mean and the 1-hour NO2 objectives.

Each district in Greater Manchester has reviewed their area and have not identified any new bus or coach stations.

3.8 Summary

Table 3.5 below presents a summary of each identified road traffic source and any actions.

Table 3.5 Road Traffic Source Summary

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Narrow congested Streets with Residential Properties Close to the Kerb	All 10 Greater Manchester authorities	Yes	Yes	See Figure 3.1	NO2

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Busy Streets Where People May Spend 1 hour or More Close to Traffic	All 10 Greater Manchester authorities	Yes	Dispersion modelling using ADMS urban is to be carried out to identify annual mean NO2 concentrations. Following this work any busy streets outside the AQMA falling within the 60 ug/m3 annual mean contour line will be looked at to determine whether there is any relevant exposure.	See Figure 3.2	NO2 - hourly
Roads with a High Flow of Buses and/or HGVs	All 10 Greater Manchester Authorities	No	No	N/A	N/A
Junctions	All 10 Greater Manchester Authorities	Yes	Yes	See Figure 3.4	NO2 – annual average and PM_{10} – annual average
New Roads Constructed or Proposed Since the Last Round of Review and Assessment	Bolton, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Bury, , Wigan	Yes	Yes	See Figure 3.5	NO2 – annual average and PM_{10} – annual average
Roads with Significantly Changed Traffic Flows	All 10 Greater Manchester authorities	Yes	Yes	See Figure 3.6	NO2 – annual mean and hourly
Bus and Coach Stations	All 10 Greater Manchester authorities	No	No	N/A	N/A

N/A: not applicable

Figure 3.1 Roads with two-way flows greater than 5,000 vehicles per day (vpd) and speeds less than 25 kph

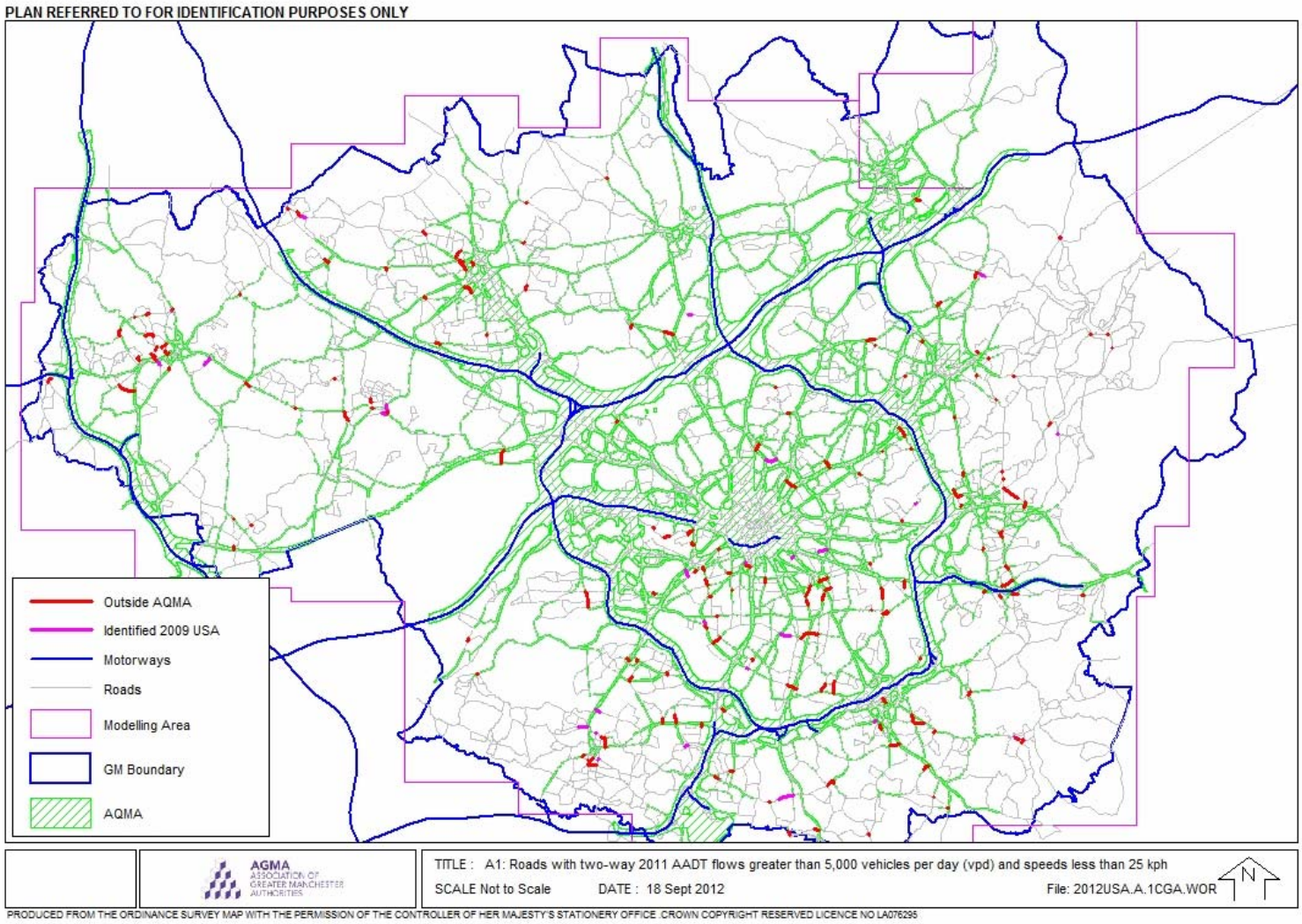


Figure 3.2 Roads with two-way AADT flows of greater than 10,000 vpd

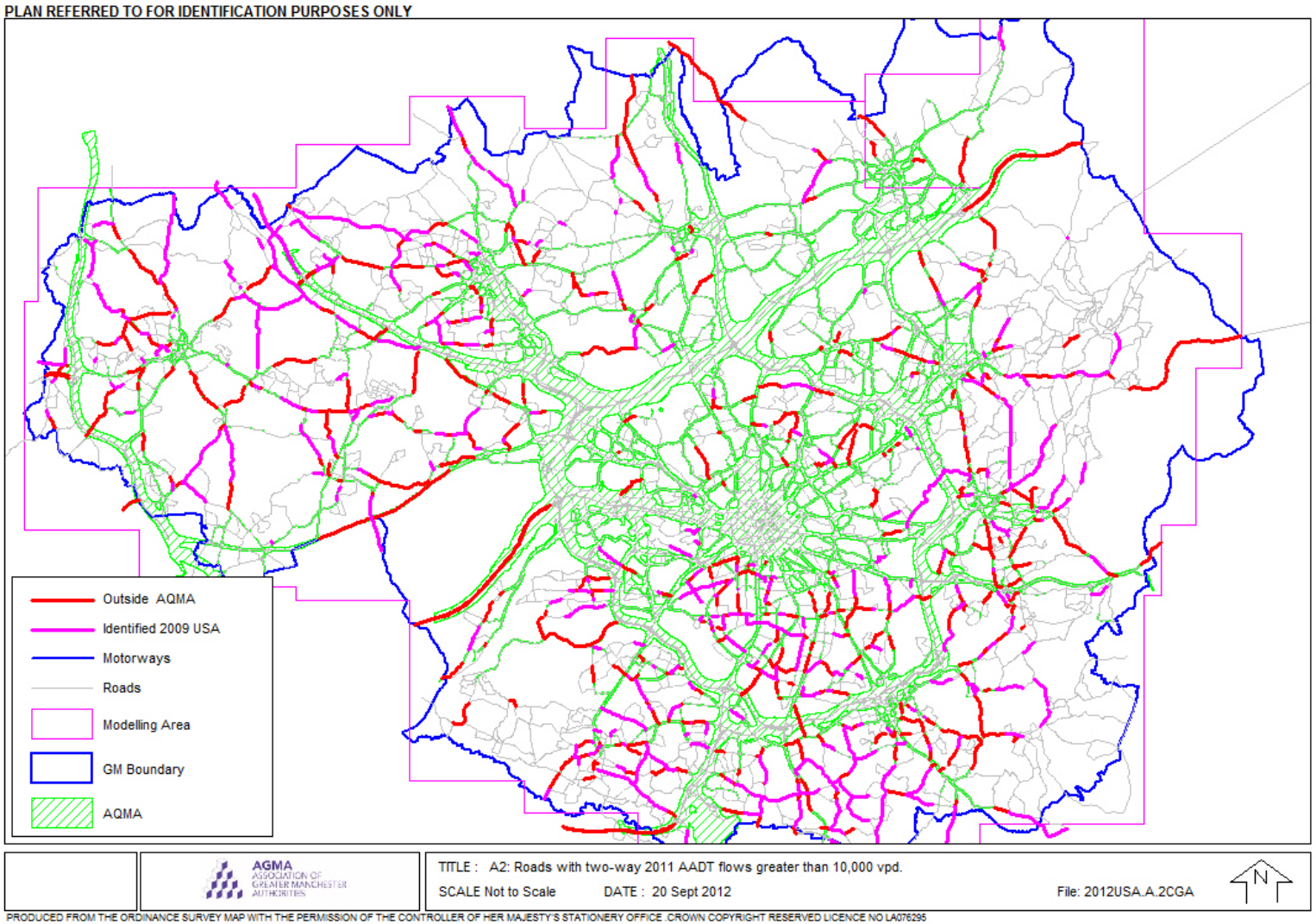


Figure 3.3 Roads with a two-way AADT flow less than 20,000 vpd and a HDV proportion greater than 20%

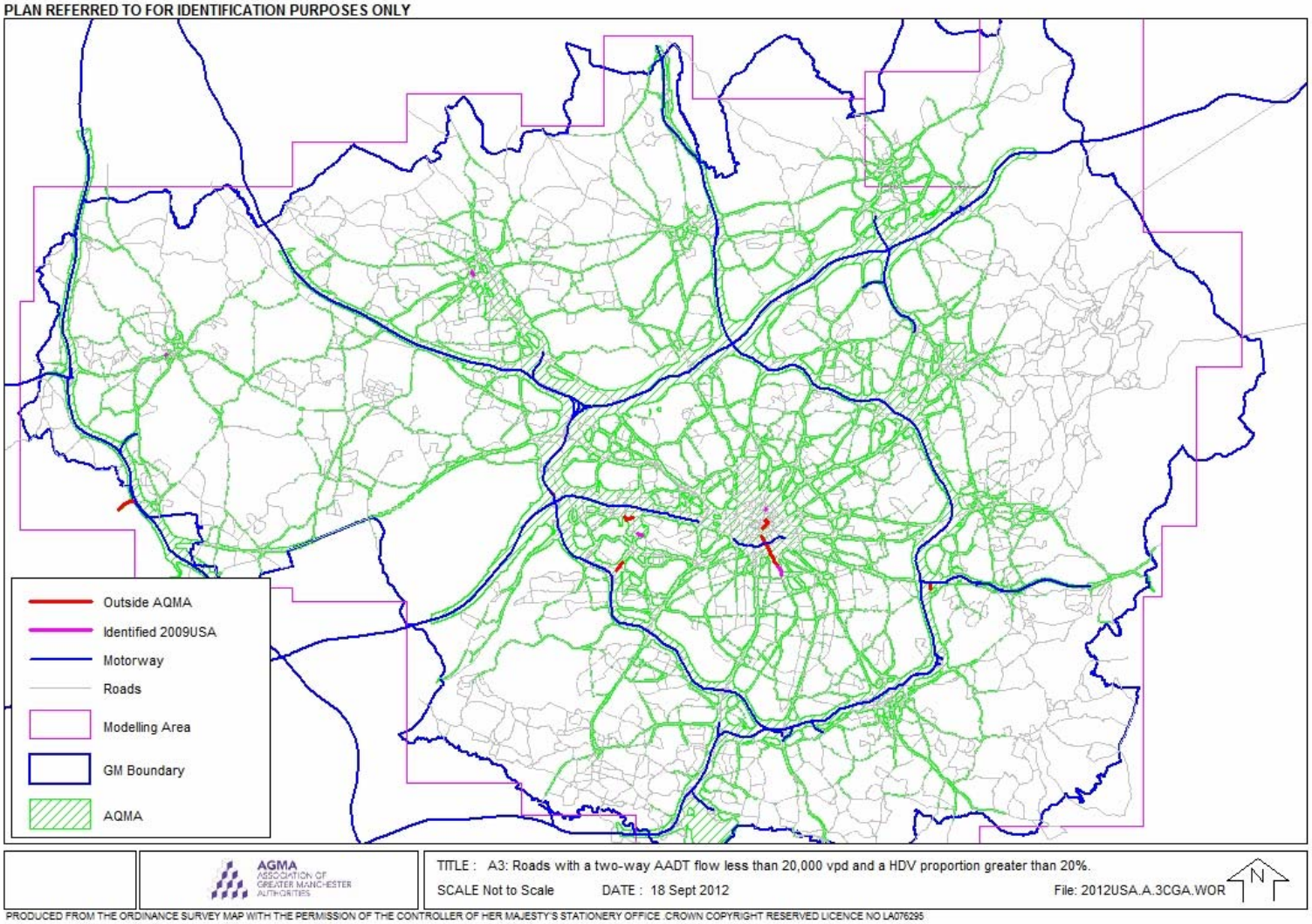


Figure 3.4 Junctions with 2011 AADT flows greater than 10,000 vpd

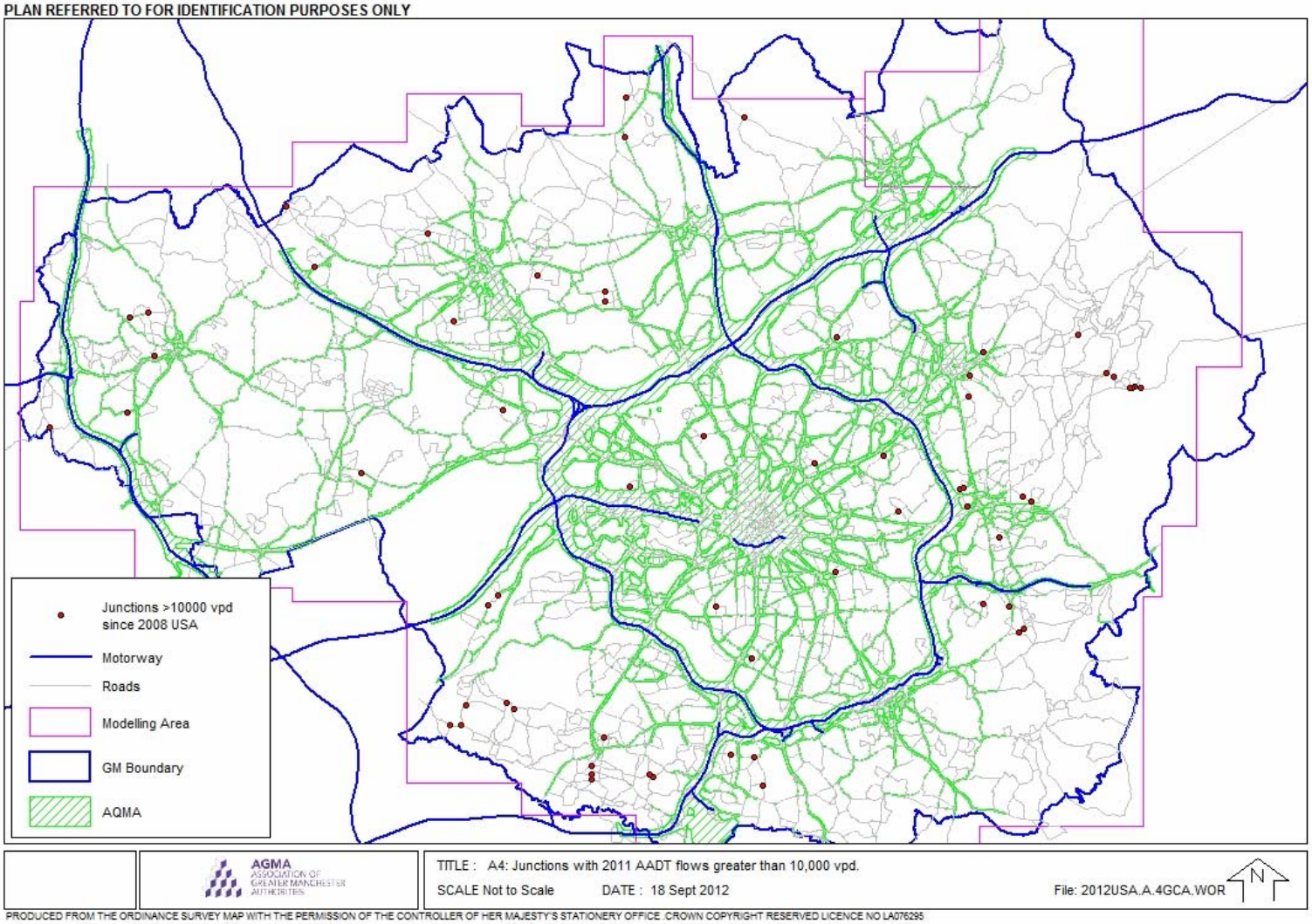


Figure 3.5 New Roads

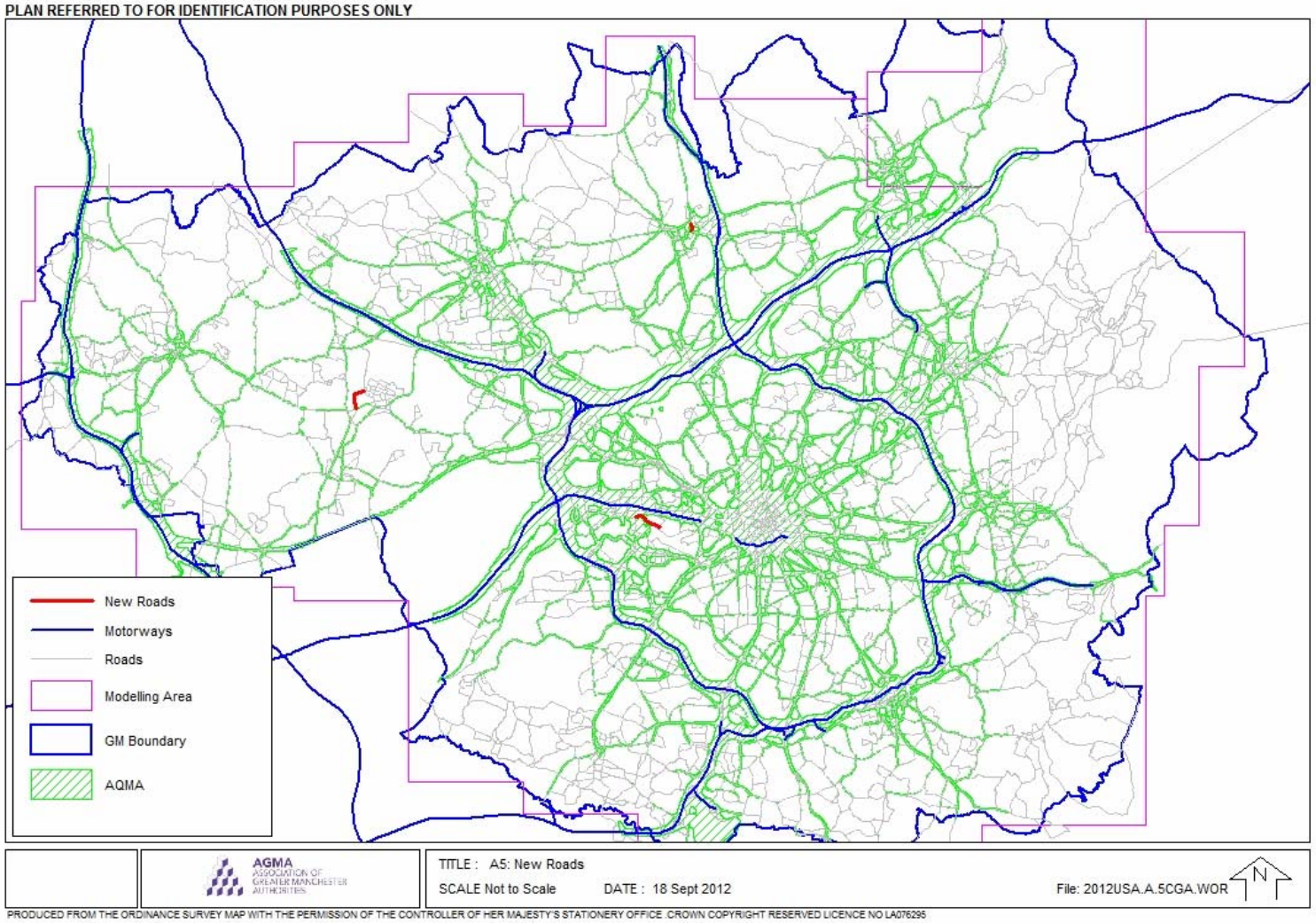
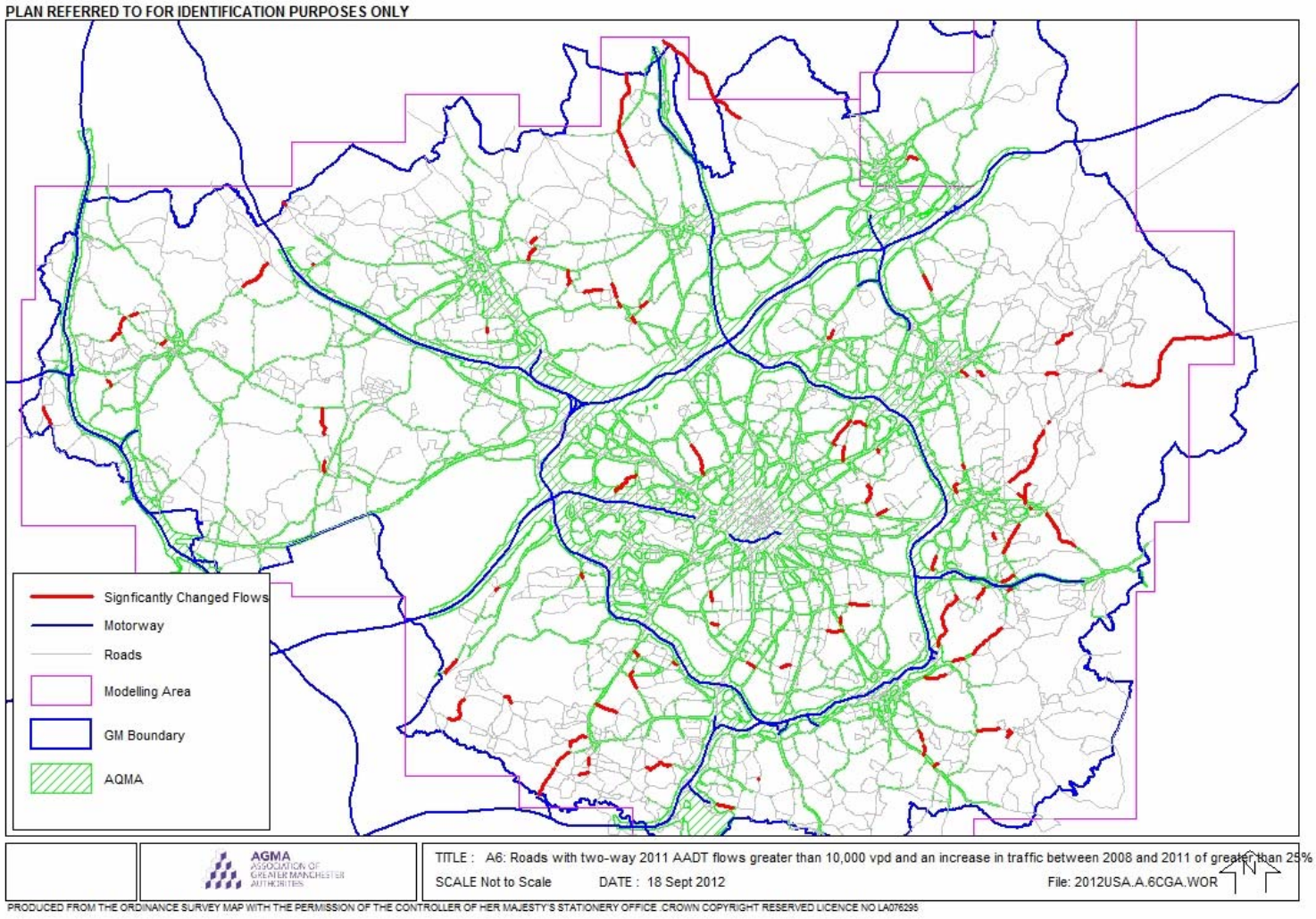


Figure 3.6 Roads with a two way 2011 AADT flows greater than 10,000 vpd and an increase in traffic between 2008 and 2011 greater than 25%



4 Other Transport Sources

4.1 Airports

Aircraft are potentially significant sources of nitrogen oxides (NOX) emissions, especially during takeoff. Airports should be considered in the review and assessment process to determine the likelihood of exceedances of the NO2 objectives.

Technical Guidance LAQM.TG (09) recommends using the following criteria:

- Relevant exposure within 1000 metres of the airport boundary.
- An equivalent passenger throughput greater than 10 million passengers per annum (mppa).
- An existing background NOX concentration of above 25 ug/m3.

If these criteria are met, it is necessary to proceed to a Detailed Assessment for nitrogen dioxide.

An assessment to identify airports within Greater Manchester has produced the results presented in the following table:

Table 4.1 Airports

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Airport	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no airports in the regional area that constitute new or previously not assessed sources.

4.2 Railways (Diesel and Steam Trains)

A requirement of the review and assessment process is to consider diesel and steam locomotives, mainly in stations and depots, and also alongside some busy lines that have high numbers of these types of train movements.

4.2.1 Stationary Trains

A Stationary locomotives (both diesel and coal fired), can give rise to high levels of SO2 close to the point of emission.

Technical Guidance LAQM.TG (09) recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for SO2 for certain locations (e.g. signals, goods loops, depots or stations):

- 3 or more occasions per day when there might be a diesel or coal fired locomotive stationary with its engine running for 15 minutes or more; and
- Potential for exposure of individuals for periods of 15-minutes or more within 15 metres of the stationary locomotives. The exposure needs to be 'outdoors' in the general sense of the word.

An assessment to identify stationary trains within Greater Manchester has produced the results presented in the following table:

Table 4.2 Stationary Trains

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Railways – Stationary Trains	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Recent evidence suggests that moving diesel locomotives in sufficient numbers can give rise to high NO2 concentrations close to the track, and the emissions can be equivalent to those from a busy road.

Technical Guidance LAQM.TG (09), Table 5.1, lists both the Manchester Piccadilly to Wigan and Manchester to Crewe lines as having a substantial number of diesel passenger trains per day, and recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for NO2 for certain locations:

- A background mean NO2 concentration of greater than 25 ug/m3; and
- Potential for long-term exposure (e.g. residential accommodation) within 30 metres of the edge of the track.

An assessment to identify moving trains within Greater Manchester has produced the results presented in the following table:

Table 4.3 Moving Trains

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Railways – Moving Trains	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

If there are significant movements of large ships that burn oils with a high sulphur content in a port, then there is a risk of exceedances of the 15-minute sulphur dioxide objective.

An assessment to identify shipping ports within Greater Manchester has produced the results presented in the following table:

Table 4.4 Shipping Ports

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Port	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no ports or shipping that meet the specified criteria within the regional area.

5 Industrial Sources

Industrial sources in England are controlled by the Environment Agency (EA) and by local authorities under the Pollution Prevention and Control regulations. Local authorities also have controls over smaller industrial and commercial sources, largely through the Clean Air Act, with its associated control of the stack heights. As a result of these controls, there are relatively few sources that may be relevant to local authorities under the Local Air Quality Management (LAQM) regime. Many of these sources will have been addressed during previous rounds of Review and Assessment. The focus should thus be on new installations and those with significantly changed emissions.

While the number of sources that may be significant is limited, there is a wider range of pollutants to be considered.

For the purpose of this Review and Assessment we will divide industrial sources into four sections:

- Industrial installations;
- Major fuel (petrol) storage depots;
- Petrol stations; and
- Poultry farms.

The latter is a new area for consideration which was introduced as a result of a small number of local authorities identifying potential exceedances of the PM10 objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl).

5.1 Industrial Installations

Industrial sources are unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives. The approach to the assessment will depend on whether an assessment has been carried out as part of the planning or permitting process. The assessment should consider all of the regulated pollutants although those most at risk of requiring further work are SO2, NO2, PM10 and benzene.

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

A review of industrial processes in Greater Manchester has produced the results presented in the following table:

Table 5.1 New or Proposed Installations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New / Proposed Installations with Air Quality Assessment)	Bury	No	No	N/A	N/A
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No (see below)	No	N/A	N/A
	Stockport	Yes (see below)	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No (see below)	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

Some GM local authorities identified new or previously not assessed sources but none of these sources are likely to release significant quantities of relevant pollutants to air and therefore a Detailed Assessment is not required.

Stockport, Salford and Trafford identified specific sources for which they provided further information which is relevant to this part of the report.

Stockport

Two household waste treatment plants both containing biodigesters have been commissioned in Stockport at Bredbury Parkway. They are both A2 processes. These will take waste from all over Greater Manchester. Air quality assessments were carried out at the time of planning application and in both cases it was not necessary to do detailed assessment, however detail of the processes has been inputted into the modelling currently being carried out by the Greater Manchester authorities.

Salford

There have been no major new industrial processes, granted a permit or planning permission in 2011. The following planning applications / environmental permit consultations remain in progress from previous years, having been assessed and objections raised.

Peel Energy have Barton Biomass while in Trafford MBC is located on the boundary with Salford and with the prevailing wind, Salford is downwind of the plume. The operator has applied for a permit to the Environment Agency application number EPR/SP23HY. A draft permit and decision document is currently been consulted on in Salford and Trafford. Salford will be submitting comments on the decision.

Site Name/ Address	Planning App Number / Permit No *	Fuel	Size	Approval Date
Peel Energy Barton Biomass 20 MW in Trafford	10/59758/ART10 Trafford Planning documents	Wood Waste	20MW	Refused, subject to appeal.
Worsley Eco Park Green Lane Salford	10/59093/OUTEIA	Food Waste	9 MW	Refused, subject to appeal

Trafford

Trafford Council included the following significant industrial sources in their previous Updating and Screening Assessment 2009. Theses sources have also been considered in the subsequent Progress report submitted to DEFRA. Both processes are in the process of being built.

SAICA Paper Mill in Partington

Trafford Council received a planning application for a Paper Mill in Partington. The application was for a plant producing 400,000 tonnes per annum of high quality, lightweight recycled paper for use in corrugated board manufacture. The application also included a CHP plant capable of generating 37MW of electrical power for use on site and for export to the national grid and a energy recovery boiler utilizing processing residues (with both boilers utilizing heating capacity in the paper process).

An assessment of the air quality impacts associated with the proposed Recycled Paper Mill has been undertaken. The assessment focused on the principal emissions to air, including:

- Dust emissions during the construction and operational phase;
- Odour emissions during the operational phase;
- Air Quality Strategy Pollutants from vehicles; and
- Air Quality Strategy and WID Pollutants from combustion point sources.

The assessment showed that there would not be any exceedances of the air quality objectives at relevant locations. As a result, the planning application was granted for the Paper Mill in Partington in December 2008.

Carrington Power Station

Carrington Power Station has been granted planning permission. Dispersion modelling was undertaken as part of the air quality assessment, which formed part of the EIA submitted in support of the planning application. The air quality assessment indicated that predicted process contributions of NO_2 within the Air Quality Management Areas of Greater Manchester are not considered to cause an unacceptable impact.

Barton Biomass Power Station

Trafford Council refused planning permission for the erection of a 20MW biomass fuelled renewable energy plant on the land to the south of the Manchester Ship

Canal and west of Barton Bridge, Davyhulme. The Council's decision is currently being appealed by the applicant.

The **Greater Manchester Combined Authority** has assessed any new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

The review and assessment process recommends that Local Authorities determine whether any industrial sources identified during previous rounds of review and assessment have either:

a) experienced substantially increased emissions (greater than 30%); or
b) received new relevant exposure in their vicinity.

A review of industrial process in Greater Manchester has produced the following table:

Table 5.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Reason	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial where Emissions have Increased Substantially or New Relevant Exposure has been	Bury	No	No	N/A	N/A	N/A
	Bolton	No	No	N/A	N/A	N/A
	Manchester	No	No	N/A	N/A	N/A
	Oldham	No	No	N/A	N/A	N/A
	Rochdale	No	No	N/A	N/A	N/A
	Salford	No	No	N/A	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Reason	Description of Area to be assessed	Pollutants and objectives to be assessed
Introduced	Stockport	No	No	N/A	N/A	N/A
	Tameside	No	No	N/A	N/A	N/A
	Trafford	No	No	N/A	N/A	N/A
	Wigan	No	No	N/A	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within their area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

A review of new or significantly changed installations in Greater Manchester with no previous air quality assessment has produced the results presented in the following table:

Table 5.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New Installation / Increased Emissions without Air Quality	Bury	No	No	N/A	N/A
	Bolton	Yes (see below)	No	N/A	N/A
	Manchester	Yes (see below)	No	N/A	N/A
	Oldham	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Assessment)	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	Yes (See below)	No	N/A	N/A

N/A: Not Applicable

Some local authorities identified new or previously not assessed sources but none of these sources are likely to release significant quantities of relevant pollutants to air and therefore a Detailed Assessment is not required.

The **Greater Manchester Combined Authority** has assessed any new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.2 Major Fuel (Petrol) Storage Depots

There is evidence to suggest that major fuel depots could emit benzene which may give rise to a local exceedence of the 2010 UK Air Quality Objective.

An assessment to identify any fuel depots within Greater Manchester has produced the results presented in the following table:

Table 5.4 Fuel Depots

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Major Fuel Storage Depot	Bury	No	No	N/A	N/A
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** confirms there are no major fuel (petrol) storage depots within their areas or new major fuel (petrol) petrol storage depots that have not been considered in previous reports.

5.3 Petrol Stations

There is some evidence that petrol stations could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads. To ascertain if a detailed Assessment is required local authorities are required to identify petrol stations with:-

- an annual throughput of more than 2000 m3 (2 million litres) of petrol.
- a nearby busy road that has traffic flows of greater than 30,000 vehicles per day.

- relevant exposure within 10 metres of the petrol pumps that have not been covered by previous review and assessments.

An assessment of appropriate petrol stations in Greater Manchester has produced the results presented in the following table:

Table 5.5 Petrol Stations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Petrol Stations	Bury	No	No	N/A	N/a
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Wigan	Yes (see below)	No	N/A	N/A

N/A: Not Applicable

Wigan

Two new petrol stations have opened since 2009 and have been issued with Environmental Permits.

The **Greater Manchester Combined Authority** confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

A small number of local authorities have identified potential exceedances of the PM10 objectives associated with emissions from poultry farms.

Technical Guidance LAQM.TG (09) recommends using the following criteria to determine if it will be necessary to proceed to a Detailed Assessment for PM10 for certain locations:

- Farms housing in excess of:
  a) 400,000 birds if mechanically ventilated; or
  b) 200,000 birds if naturally ventilated; or
  c) 100,000 birds for any turkey unit; and
- Relevant exposure within 100 metres of the poultry units.
- Farms not covered by previous review and assessments

An assessment of poultry farms in Greater Manchester has produced the results presented in the following table:

Table 5.6 Poultry farms

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Poultry Farms	Bury	No	No	N/A	N/a
	Bolton	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Trafford	No	No	N/A	N/A
	Wigan	Yes (see below)	No	N/A	N/A

N/A: Not Applicable

Wigan

New poultry farms have opened since 2009 but are relatively small scale and have not required Environmental Permits.

The **Greater Manchester Combined Authority** confirms that there are no poultry farms meeting the specified criteria**.**

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Biomass combustion is increasing across the Greater Manchester conurbation however this is from a very low base and many of the installations are in public buildings often providing only part of the heating load. It is normal practice in Greater Manchester that chimney height approval is sought and air quality issues are considered at that time, hence there is no need for further detailed assessment.

Tables 6.1 to 6.3 below set out the findings for Commercial and Domestic sources in Greater Manchester against the air quality objectives.

Table 6.1 Biomass Combustion - Individual

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Biomass Combustion (Individual)	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	NA
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

While there has been an increase in the use of Biomass across the whole of the Greater Manchester conurbation, this is from a very low base and at the present time there is not an issue with regards the combined effects of such appliances as they tend to be in separate locations. Work undertaken by Manchester City Council (district with highest concentration of commercial buildings) for previous assessments indicates that is unlikely to exceed the threshold emission density set out the monograph in Figure 5.22 of TG(09). Furthermore the Emissions Inventory for Greater Manchester (EMIGMA) records all points sources over 2 MW, aggregating emissions to a 1 km by 1 km grid and along with other emissions data is used in GMEDIS (the Greater Manchester Emission Dispersion model). It is therefore highly unlikely that accidences from biomass combustion are likely to occur.

Table 6.2 Biomass Combustion - Combined

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Biomass Combustion (Combined)	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

N/A: Not Applicable

The **Greater Manchester Combined Authority** has assessed the biomass combustion plant within its area, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

The use of solid fuels for domestic heating declined significantly with the introduction of the Clean Air Act in the 1950's, alternative fuels such as gas and electricity are now most commonly used. Almost all of Greater Manchester is now covered by smoke control areas, the only exceptions being some sparsely populated areas in the moorlands and rural areas on the periphery of the conurbation.

While there has been an increase in the use of solid fuel across the whole of the conurbation over recent times, due to the increasing popularity of 'real fires' in the majority of properties this is as a secondary source of heating, the increase is from a very low base and is more prevalent in the semi rural areas with less dense housing. Previous assessments have concluded that there is not an issue.

Table 6.3 Domestic Solid Fuel Burning

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Domestic Solid Fuel Burning	Bolton	No	No	N/A	N/A
	Bury	No	No	N/A	N/A
	Manchester	No	No	N/A	N/A
	Oldham	No	No	N/A	N/A
	Rochdale	No	No	N/A	N/A
	Tameside	No	No	N/A	N/A
	Trafford	No	No	N/A	N/A
	Salford	No	No	N/A	N/A
	Stockport	No	No	N/A	N/A
	Wigan	No	No	N/A	N/A

The **Greater Manchester Combined Authority** confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Dust emissions from a range of fugitive and uncontrolled sources can result in elevated PM10 concentrations. Such sources may include quarrying and mineral extraction, landfill sites, major construction works and waste management sites.

One potential fugitive dust source has been identified within the area. The source was assessed in accordance with the screening criteria detailed in LAQM.TG(09), Box 5.10, the results of which are presented in Table 7.1.

Table 7.1 Potential Fugitive Dust Sources

Local Authority	Source Location (grid ref)	Source Type	Relevant Exposure	Recent Complaints	Dust Emissions/dust tracked out of site onto public roads	Detailed Assessment Needed
Bolton	Armstrongs (364055, 410718)	Waste	yes	yes	yes	yes

Results of the screening exercise indicate potential for relevant exposure at the residential properties near to the source of the dust emissions. Additionally there have been recent dust complaints and there is evidence of dust tracked out onto the roads.

This process is no longer exempted from the requirement to have a permit under Environmental Permitting (England and Wales) Regulations 2010. The Environment Agency is currently processing the application to consolidate this activity into an environmental permit. The Environment Agency have carried out monitoring in the past and the need for future monitoring will be considered as part the permit conditions therefore a detailed assessment is not needed at this time.

Table 7.2 below presents Greater Manchester local authorities with no potential fugitive dust emissions.

Table 7.2 No Potential Fugitive Dust Emissions

Local Authority	Statement
Bury	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.
Manchester	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Oldham	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Rochdale	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Stockport	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Salford	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Tameside	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Trafford	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area
Wigan	Confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area

The **Greater Manchester Combined Authority** confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

There are nearly 300 nitrogen dioxide diffusion tubes sites in the Greater Manchester diffusion tube network that have been operating over a long period of time. Approximately 25% of tubes marked as being inside the AQMA are less than 35 µg/m^3, (the threshold for the AQMA). Around 5% of tubes greater than or equal to 35 µg/m^3 are located outside the AQMA.

Nitrogen dioxide measurements from the automatic stations broadly agree with their respective AQMA designation. Stockport and Oldham (now closed) stations are in the AQMA but had results less that 35 µg/m^3.

Diffusion tube data suggests that the current AQMA requires reviewing and Greater Manchester is undertaking dispersion modelling.

Particulate matter (less than 10 microns) annual averages are not exceeded and have a downward trend. No sites had more than 35 occurrences of the daily mean and therefore the air quality objective was met.

8.2 Conclusions from Assessment of Sources

Automatic assessment of roads by TfGM identified a large number potential links requiring assessment by DMRB. Many of these would have been previously assessed and eliminated in earlier reports, identifying these links is difficult and as dispersion modelling was in progress, deferred until then. Detailed dispersion modelling of Greater Manchester will provide information on concentrations of nitrogen dioxide and particulate matter at roadside locations for assessment against the air quality objectives.

There are no new or significantly changed sources that could lead to potential exceedences have been identified within Greater Manchester for Chapter 4: Other transport sources, Chapter 5: Industrial Sources, Chapter 6: Commercial and Industrial Sources, and Chapter7: Fugitive Sources. A detailed assessment for these is not required.

8.3 Proposed Actions

Greater Manchester will complete the air quality modelling to assess for exceedences nitrogen dioxide against the annual average and hourly air quality objectives. A Detailed Assessment will be submitted in April 2014.

9 References

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