Source Apportionment Study 2017

Air Quality in Portsmouth

Portsmouth City Council

August 2017

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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1. Introduction

AECOM was commissioned by Portsmouth City Council (PCC) to undertake a Source Apportionment Study of road traffic sources as part of the ongoing Local Air Quality Management Review and Assessment process.

Detailed dispersion modelling has been carried out in accordance with Defra's Technical Guidance LAQM.TG(16)[1], using the AAQuIRE detailed dispersion model, to identify geographical areas of the city where ambient pollutant concentrations exceed or are likely to exceed the relevant UK Air Quality Objectives (AQO). Source apportionment calculations have been carried out to quantify the contributions of different road vehicle types to ambient pollutant concentrations in the areas of likely exceedance, to determine the emissions reductions required to achieve compliance, and to identify the likely year of compliance.

The main pollutant of concern is nitrogen dioxide (NO_2) as monitored concentrations of this pollutant in recent years have exceeded the annual mean AQO at a number of locations throughout the city. PCC currently has five Air Quality Management Areas (AQMAs) declared on the grounds of monitored or modelled exceedances of the UK annual mean NO_2 AQO. Particulate matter (PM_{10} and $PM_{2.5}$) concentrations are considered to be well below the relevant UK Air Quality Objectives throughout the city. These pollutants have also been assessed as part of this study.

[1] Defra Local Air Quality Management Technical Guidance TG(16). https://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf

2. Policy and Legislation

2.1 UK Air Quality Strategy

The UK Air Quality Strategy identifies nine ambient air pollutants that have the potential to cause harm to human health. These pollutants are associated with local air quality problems, with the exception of ozone, which is instead considered to be a regional issue.

The Air Quality (Standards) Regulations 2010 set Air Quality Objectives (AQO) for the seven pollutants that are associated with local air quality, transposing the mandatory EU Limit Values, set out in EU Directives 2008/50/EC and 2004/107/EC on ambient air quality, into English law. The AQOs and EU Limit Values aim to reduce the health impacts of those pollutants to negligible levels.

The English Air Quality Strategy AQOs and EU Limit Values of relevance to this assessment can be found in Appendix A.

2.2 Portsmouth City Council Air Quality Action Plan (AQAP)

As part of the 2004 Detailed Assessment, PCC modelled NO_2 concentrations across Portsmouth. The results indicated that the annual mean NO_2 objective would be exceeded at 13 hotspot areas across the city. These findings led to the declaration of 13 AQMAs.

In 2007, PCC developed the first draft of their AQAP and although not formally adopted, many of the proposed actions were implemented as part of the Local Transport Plan (LTP) 1. In 2009, PCC undertook a Further Assessment, which indicated that air quality in Portsmouth had improved sufficiently to enable the revocation of 8 of the 13 AQMAs. The remaining five AQMAs are discussed in greater detail in Section 3.1.

In 2010, PCC reviewed the 2007 draft AQAP to target the remaining AQMAs. The revised AQAP set out measures in pursuit of achieving the national AQOs to deliver cleaner ambient air. Although aiming to deliver city wide improvements in air quality, the primary purpose of the AQAP was to explore measures which would combat the areas of poor air quality within Portsmouth's remaining five AQMAs. As part of the 2009 Further Assessment, a source apportionment study was undertaken. This concluded that:

- In 2007, the predominant source of NOx emissions was determined to be heavy goods vehicles (HGVs), closely followed by car emissions; and
- In 2010, the influence of cars and background concentrations was greater than those of 2007 but HGVs remained the highest polluter comparatively when considering the number of each type of vehicle.

The results of the source apportionment study enabled PCC to identify the sources that cause the highest level of pollution and those upon which the AQAP should focus and prioritise.

The following were considered to be priorities of the AQAP:

Priority 1: HGVs: In 2010, HGVs were predicted to contribute between 23.2% and 24.5% of the NO_X within AQMAs 6 and 11. Therefore, any percentage decrease in HGVs passing through these areas would have a significant beneficial impact upon local air quality. Another factor to address is the implications of HGVs' reduced speed, as the very lowest speeds are disproportionately more polluting. Congestion impairing HGV movement is therefore highly significant and needs to be reduced. Furthermore, HGVs contribute directly to the problem of congestion when making deliveries. This is particularly relevant on the London Road / Kingston Road / Fratton Road corridor (AQMA No. 6).

Measures:

- Applying a weight restriction to prevent HGV's entering London Road, south of Stubbington Road, to ensure that Stamshaw Avenue is not used as an alternative route by HGVs;
- Improving traffic light signals to speed traffic movement at the junction of Kingston Crescent and London Road. These would be more responsive to vehicle demand and be able to

immediately react to changing vehicle flows, reducing queuing and congestion and leading to an improvement in air quality;

- Removing the on-street parking bays to the north of the junction with Kingston Crescent to improve the movement of traffic; and
- Improving signage to car parks. Currently Stubbington Avenue car park is only operating at around 40%–50% capacity. A review of pricing policies, improve signage, lighting and security should be undertaken in order to increase take up of this underused facility.

Priority 2: Car traffic: In 2010, cars were predicted to contribute between 24.3% and 32.0% of NO_X emissions within AQMA No. 6 and No. 11. Reducing congestion across the road network is essential if air quality is to improve.

Measures:

- Introduction of new traffic management systems at key locations to reduce congestion and pollution, such as the use of MOVA (Microprocessor Optimised Vehicle Actuation);
- Junction improvements on the St Michael's Gyratory as during the afternoon peak hour, large queues form on Hampshire Terrace due to the large quantities of vehicles exiting Portsmouth and the pedestrian crossing signals. Traffic signal control should be introduced to improve traffic flow on Hampshire Terrace; and
- Introduction of a Park-and-Ride scheme and a review of parking charges.

Priority 3: Buses: In 2010, buses were predicted to contribute between 4.9% and 14.4% of the NO_X emissions within AQMA No. 6 and No. 11. The continued introduction of bus priority measures and introduction of improved bus exhaust technology therefore plays an important part in ensuring public transport can offer a realistic and sustainable alternative to the private car.

Measures:

- Targeted schemes to improve bus services, to increase usage and reduce emission levels in co-ordination with bus operators and partner authorities.

Priority 4: Domestic, commercial and background sources: As background concentrations are influenced by pollution generated from outside Portsmouth's boundaries, emissions are difficult to specify or control. The AQAP states that wherever possible, PCC needs to encourage a reduction of unnecessary discharges from residential and industrial premises and encourage the use of more efficient heating systems.

Priority 5: Shipping sources: The 2009 Further Assessment confirmed that the emissions from shipping did not exceed 10% of the total NO_X contribution in AQMA No. 11. This contribution is relatively small given the economic importance of shipping to Portsmouth.

Priority 6: Industrial sources: In 2007, industrial sources were found to contribute between 0.2% and 0.4% to the NO_X levels in AQMA No. 6 and No. 11.

Priority 7: Continuous improvement: Although the current legal limits on ambient air quality are now met across the majority of Portsmouth, the remaining NO_2 'hotspots' within the 5 AQMAs mean that exposure in these areas is still highly significant. However, even where the objectives have been achieved, effort is needed to maintain air quality given pressures from Portsmouth's increasing population and demands on transport and land use.

3. Local Air Quality in Portsmouth

3.1 Air Quality Management Areas (AQMAs)

The main pollutant of concern in Portsmouth is NO_2 and the main source of this pollutant is tailpipe emissions from road vehicles. In 2005, PCC declared 13 AQMAs for monitored and modelled exceedances of the annual mean NO_2 AQO. The 2009 Further Assessment indicated that air quality had improved sufficiently to permit the revocation of 8 of the 13 AQMAs. The 5 remaining AQMAs, which are still effective, are as follows:

- AQMA 6 extends north along Fratton Road from Fratton Bridge to Kingston Road, continuing into London Road until the roundabout junction with Stubbington Road and Gladys Avenue;
- AQMA 7 covers Hampshire Terrace and the St. Michael's Road gyratory;
- AQMA 9 covers the southernmost section of Eastern Road from Sword Sands Road south into Velder Avenue and its junction with Milton Road;
- AQMA 11 extends from Rudmore roundabout south to the Church Street roundabout; and
- AQMA 12: Encompassing the greater part of Queen Street from The Hard to St. James's Road.

A map showing the AQMA boundaries is included in Appendix B. Further information relating to the AQMAs in Portsmouth can be found at Defra's AQMA webpages[2].

3.2 Local Air Quality Monitoring

Continuous air quality monitoring is currently carried out at four automatic monitoring stations in Portsmouth:

- London Road;
- Gatcombe Park Primary School;
- Burrfields Road; and
- Mile End Road.

All of the continuous monitoring stations measure NO_2 and PM_{10}. The Gatcombe Park Primary School site additionally monitors $PM_{2.5}$ and ozone. Details of the monitoring stations are provided in Appendix B, including a map of the locations. Summaries of recent years' monitoring results, including annual mean concentrations and relevant short-term exceedance statistics, are shown in Table 1 to Table 3.

Annual mean NO_2 concentrations have been within the annual mean NO_2 AQO in recent years at all locations except London Road, where the AQO was exceeded in 2011, 2012 and 2014. The London Road monitoring station is situated within AQMA 6. The highest annual mean NO_2 concentration at London Road was 46.0 µg/m^3 in 2011. There has been no consistent upward or downward trend in annual mean NO_2 concentrations during the 2011 to 2015 period. London Road has been the only monitoring station to record exceedances of the 1-hour NO_2 standard. The greatest number of hourly exceedances was 7 hours in 2012; this is within the 18 permitted hours of exceedance for compliance with the AQO.

[2] Defra AQMA webpage for Portsmouth City Council. https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=198

Table 1 NO_2 Monitoring Results for Continuous Monitoring Stations in Portsmouth

Site ID	Site Name	AQMA	Annual Mean NO_2 Concentration (µg/m^3)				
			2011	2012	2013	2014	2015
C2	London Road	AQMA No. 6	**46.0** (0)	**43.9** (7)	39.7 (0)	**45.7** (1)	38.4 (0)
C4	Gatcombe Park Primary School	-	19.0 (0)	21.2 (0)	20.3 (0)	22.1 (0)	18.8 (0)
C6	Burrfields Road	-	31.5 (0)	36.1 (0)	33.5 (0)	35.9 (0)	32.8 (0)
C7	Mile End Road	AQMA No. 11	35.0 (0)	36.9 (0)	35.9 (0)	36.5 (0)	30.3 (0)

Note: Exceedances of the AQOs marked in bold. Numbers in brackets alongside annual mean NO_2 concentrations are the numbers of hours exceeding the 1-hour NO_2 standard of 200 µg/m^3. Data obtained from PCC's 2016 Annual Status Report[3]

Annual mean PM_{10} concentrations have been well below the annual mean PM_{10} AQO in recent years at all locations. The highest annual mean PM_{10} concentration was 34.4 µg/m^3 in 2015 at London Road. At roadside and kerbside monitoring locations there is evidence of increases in annual mean PM_{10} concentrations between 2012 and 2015. All monitoring sites have measured exceedances of the 24-hour mean PM_{10} standard of 50 µg/m^3 during the 2011 to 2015 period. The maximum number of daily exceedances was 9 days at Gatcombe Park Primary School in 2012; this is within the 35 permitted days of exceedance for compliance with the AQO.

Table 2 PM_{10} Monitoring Results for Continuous Monitoring Stations in Portsmouth

Site ID	Site Name	AQMA	Annual Mean PM_{10} Concentration (µg/m^3)				
			2011	2012	2013	2014	2015
C2	London Road	AQMA No. 6	27.3 (3)	22.1 (1)	30.7 (0)	32.4 (0)	34.4 (1)
C4	Gatcombe Park Primary School	-	18.0 (1)	18.0 (9)	18.2 (2)	18.5 (0)	16.2 (2)
C6	Burrfields Road	-	-	8.1 (1)	15.4 (0)	26.9 (7)	26.5 (4)
C7	Mile End Road	AQMA No. 11	21.1 (6)	14.7 (2)	16.3 (0)	17.5 (0)	23.5 (1)

Note: Exceedances of the AQOs marked in bold. Numbers in brackets alongside annual mean PM_{10} concentrations are the numbers of days exceeding the 24-hour PM_{10} standard of 50 µg/m^3

Gatcombe Park Primary School is the only monitoring station where $PM_{2.5}$ concentrations are monitored. Annual mean $PM_{2.5}$ concentrations have been well below the annual mean $PM_{2.5}$ AQO of 25 µg/m^3 in recent years at this location. The highest annual mean $PM_{2.5}$ concentration was 15.9 µg/m^3 in 2011.

Table 3 $PM_{2.5}$ Monitoring Results for Continuous Monitoring Stations in Portsmouth

Site ID	Site Name	AQMA	Annual Mean $PM_{2.5}$ Concentration (µg/m^3)				
			2011	2012	2013	2014	2015
C4	Gatcombe Park Primary School	-	15.9	13.6	14.1	14.3	10.5

Note: Exceedances of the AQOs marked in bold.

In addition to the continuous monitoring stations, PCC monitors concentrations of NO_2 across a network of diffusion tubes. Details of the monitoring locations are provided in Appendix B. Recent years' annual mean NO_2 concentrations at the diffusion tube monitoring sites are shown in Table 4.

The results illustrate that the annual mean NO_2 AQO has been exceeded or close to being exceeded at monitoring locations along the London Road – Kingston Road – Fratton Road corridor in all years between 2011 and 2015. In 2015, annual mean NO_2 concentrations exceeded the annual mean NO_2 AQO at 4 diffusion tube locations; the highest NO_2 concentration in 2015 (46.1 µg/m^3) was monitored at 88 Stanley Road. All of the monitoring sites exceeding the AQO in 2015 are within AQMAs.

[3] Portsmouth City Council 2015 Annual Status Report (2016). https://www.portsmouth.gov.uk/ext/documents-external/env-portsmouth-aqasr.pdf

Table 4 NO_2 Monitoring Results for Diffusion Tube Sites in Portsmouth

Site ID	Site Name	AQMA	Annual Mean NO_2 Concentration (µg/m^3)				
			2011	2012	2013	2014	2015
DT1	Lord Montgomery Way (FST)	AQMA No. 7	39.5	**42.5**	**41.9**	**42.6**	**44.3***
DT2	12 Chadderton Gardens (CG-12)	-	17.4	17.5	16.5	16.6	15.7
DT3	High Street (HS-121A)	AQMA No. 7	26.2	26.6	22.1	25.7	24.1
DT4	Queen Street (QS-Col 30)	AQMA No. 12	32.9	36.4	31.5	28.0	30.5*
DT5	119 Whale Island Way (WIW-119)	AQMA No. 11	28.9	28.6	27.5	28.9	27.5
DT6	88 Stanley Road (SR-88)	AQMA No. 11	34.8	35.6	38.3	34.9	**46.1***
DT7	138 Lower Derby Road (LDR-138)	-	27.2	29.8	30.0	26.5	26.1
DT8	492 Hawthorn Crescent (HC-492)	-	28.6	28.8	27.2	28.4	28.4
DT9	6 Northern Road (NR-6)	-	36.1	35.1	32.0	33.9	35.0
DT10	20 Stroudley Avenue (SA-20)	-	18.5	17.9	17.7	16.7	16.5
DT11	Anchorage Road (AR-Col6)	-	32.7	31.8	29.5	33.3	28.3*
DT12	2 Hobby Close (HC-2)	-	ND	ND	33.4	30.9	ND
DT14	4 Merlyn Drive (MD-4)	-	21.7	22.7	21.6	27.2	26.9
DT15	29 Milton Road (MR-29)	-	28.5	28.8	28.2	27.6	26.2
DT16	Parade Court, London Road (LR-PC)	-	35.0	36.4	34.0	32.3	32.0
DT18	4 Milton Road (MR-4)	-	27.8	29.5	27.8	28.9	26.9
DT19	7 Velder Avenue (VA-7)	AQMA No. 9	**44.7**	34.5	30.1	37.2	35.1
DT20	136 Eastney Rd (ER-136)	-	28.7	26.1	27.4	28.9	27.6
DT21	118 Albert Road (AR-116)	-	38.6	35.8	32.9	35.2	35.3
DT22	2 Victoria Road North (VRN-2)	-	29.0	31.6	28.7	30.8	28.1
DT23	106 Victoria Road North (VRN-106)	-	35.8	41.1	30.4	28.8	31.0*
DT24	221 Fratton Road (FR-221)	AQMA No. 6	38.3	39.1	**42.5**	**40.5**	36.3
DT25	117 Kingston Rd (KR-117)	AQMA No. 6	**41.4**	**44.6**	38.7	**52.2**	**41.8**
DT26	The Tap London Road (Tap)	AQMA No. 6	**48.8**	**50.5**	**50.9**	**40.8**	**43.1**
DT28	65 Kingston Crescent (KR-65)	AQMA No. 6	39.2	ND	ND	ND	ND
DT29	Estella Road (ER-74)	AQMA No. 11	31.1	ND	ND	ND	ND
DT30	Market Tavern (Mile End Rd) (MT)	AQMA No. 11	**43.2**	38.0	38.8	**44.1**	34.3
DT32	Larch Court, Church Rd (CR-Corner)	-	33.6	36.0	31.1	34.9	31.7
DT34	Sovereign Gate, Commercial Rd (UF)	AQMA No. 11	**40.2**	38.8	34.7	35.5	34.7
DT35	Hampshire Terrace (AM)	-	32.9	31.1	29.0	**41.4**	28.5
DT36	Elm Grove (EG-103)	-	32.1	32.8	30.3	34.8	29.0

Note: Exceedances of the Annual mean NO_2 AQO marked in bold. * Data capture in 2015 less than 75%. "ND" = No data

4. Methodology

This Source Apportionment Study has been carried out to build upon previous LAQM Review and Assessment work undertaken by PCC. Detailed dispersion modelling of NO_2, PM_{10} and $PM_{2.5}$ concentrations was performed using AAQuIRE. AAQuIRE uses the CALINE4 model for the dispersion of road-traffic emissions and has been validated and used extensively worldwide for local air quality modelling.

The following scenarios were modelled:

1. A base year (2015) scenario for the purpose of model verification and to examine current pollutant concentrations in the city
2. A future year scenario (2020) when it is anticipated that pollutant concentrations will be within the UK Air Quality Objectives at all locations of relevant exposure throughout the city
3. Scenario testing of intermediate years to determine the likely earliest year of compliance with the UK Air Quality Objectives

4.1 Study Area

The study area covers the main north-south route corridors and junctions that link the M27/A27 to Portsea Island, including:

- From Anglesea Road to M275, via Marketway, Commercial Road, and Mile End Road;
- From Victoria Road North to Portsbridge roundabout, via Fratton road, Kingston Road, and London Road;
- From Eastney Road to Norway Road, via Milton Road and Copnor Road;
- A3 Southampton Road/A397 Northern Road, Cosham, located to the north of the M27; and
- B2154 Elm Grove and B2154 Albert Road, Southsea.

The study area incorporates the five AQMAs, declared for exceedances of the annual mean NO_2 AQO.

4.2 Traffic Data

Traffic data for each modelled scenario were provided by PCC's Traffic team, combining information from Automatic Traffic Count (ATC) points and modelled traffic flows developed for the Optimisation of Road Traffic Management Control Systems (ORTMCS) project. Annual average daily traffic (AADT) flows and average vehicle speeds were provided for all major road links in the study area, along with the following breakdown of vehicle types:

- Cars and Taxis;
- Light Goods Vehicles (LGVs);
- Other Goods Vehicles Class 1 (OGV1) – rigid and articulated Heavy Goods Vehicles (HGVs) with 3 or fewer axles);
- Other Goods Vehicles Class 1 (OGV2) – rigid and articulated HGVs with more than 3 axles); and
- Public Service Vehicles (Buses).

Full details of the traffic data used in the study are provided in Appendix C. A map of the study area showing the modelled route corridors is presented in Appendix C.4.

To facilitate the source apportionment of road traffic sources according to vehicle type, each vehicle type was modelled independently in AAQuIRE. Section 4.9 describes the Source Apportionment process in more detail.

4.3 Modelled Receptors

Annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted at sensitive receptor locations across the study area. The receptor locations were chosen to be representative of human exposure (e.g. residential properties, care homes, schools) or worst-case conditions in a particular area, based on their proximity to busy road links and / or areas of congestion. A number of the receptors were chosen to represent worst-case locations within the AQMAs. Details of the modelled receptors are presented in Table 5, and a map of their locations is provided in Appendix D.1.

In addition to discrete receptor locations, NO_2 concentrations were predicted over a Cartesian grid of points within 200 metres of all modelled road links. This grid was used to create contour plots of NO_2 concentrations to illustrate patterns across the wider area and to identify the potential geographic extents of areas of exceedance. Concentrations were predicted at a height of 1.5 metres to represent typical human exposure.

Table 5 Modelled Sensitive Receptors

Receptor Number*	Receptor Name	AQMA	X (OS-GB)	Y (OS-GB)
1	133 Lower Derby Road	AQMA No. 11	464303	102242
2	57 Stanley Road	AQMA No. 11	464375	102164
3	St. John's Court	AQMA No. 11	464437	102106
4	Rudmore Court	AQMA No. 11	464472	102081
5	The Admiral PH	AQMA No. 11	464553	101940
6	Peninsular House	AQMA No. 11	464440	101912
7	162-189 Mile End Road	AQMA No. 11	464547	101764
8	The Air Balloon	AQMA No. 11	464545	101836
9	Ferry Lodge House	AQMA No. 11	464474	101464
10	72-126 Grafton Street	AQMA No. 11	464457	101376
11	373-375 Commercial Road	AQMA No. 11	464405	101147
12	239-241 Commercial Road	AQMA No. 11	464367	100805
13	Hallowell House	AQMA No. 11	464423	100864
14	St. Edmund House	-	463924	100502
15	Arts Lodge Park Cafe	-	463843	100417
16	Barham House	-	463881	100502
17	122-128 Lake Road	AQMA No. 11	464761	100906
18	314-316 Fratton Road	AQMA No. 6	465163	101064
19	Hale Court	AQMA No. 6	465150	101138
20	7 Fawcett Road	-	465186	99976
21	Priory School	-	465142	99951
22	Pounds Gate	AQMA No. 12	463535	100404
23	Priory View	-	465085	99971
24	Pink Court	AQMA No. 6	465141	100443
25	Jacob House	AQMA No. 6	465130	100930
26	48-50 Kingston Road	AQMA No. 6	465119	101338
27	89 Kingston Road	AQMA No. 6	465077	101482
28	156 Kingston Road	AQMA No. 6	464991	101644
29	192-194 Kingston Road	AQMA No. 6	464946	101744
30	Kingsbury Mansions	AQMA No. 6	464911	101899
31	61 Kingston Crescent	AQMA No. 6	464815	101931

Receptor Number*	Receptor Name	AQMA	X (OS-GB)	Y (OS-GB)
32	16 London Road	AQMA No. 6	464912	101967
33	Ross Apartments	AQMA No. 6	464942	102229
34	156 London Road	AQMA No. 6	465004	102492
35	589 London Road	-	465575	103748
36	60-62 Northern Road	-	465657	105574
37	84 Northern Road	-	465714	105694
38	Victoria House A3	AQMA No. 7	463848	99834
39	115 Eastern Road	AQMA No. 9	466878	100861
40	Lacey Road	AQMA No. 9	466761	100662
41	53 Velder Avenue	-	466589	100324
42[A]	7 Velder Avenue	AQMA No. 9	466392	100226
43	195-197 Milton Road	AQMA No. 9	466348	100190
44	233 Milton Road	AQMA No. 9	466388	100093
45	1 Goldsmith Avenue	-	466578	99587
46	Victoria House, Victoria Road North	-	464770	99287
47	Keyes Court	-	464893	99014
48	Brandon House	-	465185	98981
49	110-110A Albert Road	-	465196	98965
50	Craneswater School	-	465552	98940
51	109 Highland Road	-	465955	99024
52	St. Andrew's Court	AQMA No. 7	463849	99987
53	1-4 Charter House	AQMA No. 7	463941	99930
54	Mill Pond Apartments	-	463651	100410

* Corresponds to the labels used in the map of receptor locations (see Appendix D.1). [A] Receptor 42 (7 Velder Avenue) coincides with diffusion tube monitoring location DT19 (see Appendix B.2)

4.4 Pollutant Emission Rates

Vehicle pollutant emission rates used in the 2015 base year model were taken from Defra's Emission Factor Toolkit Version 7.0[4], which incorporates the latest NO_X, PM_{10} and $PM_{2.5}$ emission factors and vehicle fleet information.

The Emission Factors Toolkit was also used to generate PM_{10} and $PM_{2.5}$ emission rates for the future year (2020) assessment.

In the case of NO_X, future year emission rates were derived using Air Quality Consultants' "Calculator Using Realistic Emissions for Diesels" (CURED). Version 2A, released in August 2016 was used in this study. CURED is a spreadsheet-based tool that is designed to provide more realistic estimates of emissions from diesel vehicles by applying uplift factors to the NO_X emission rates that are calculated by Defra's Emission Factors Toolkit. For example, NO_X emission rates in 2020 are approximately 44% higher using CURED than using the Emission Factors Toolkit.

Further information on CURED is available at Air Quality Consultants' website[5].

[4] Defra Emission Factors Toolkit Version 7. https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
[5] Air Quality Consultants (2016). Calculator Using Realistic Emissions for Diesels (CURED) http://www.aqconsultants.co.uk/News/August-2016/Updated-CURED-to-V2A.aspx

4.5 Background Pollutant Concentrations

A large number of sources of air pollutants exist which individually may not be significant, but collectively, over a large area, need to be considered. The concentrations calculated by the model due to vehicle emissions can then be added to these background concentrations to give the total concentration.

Background NO_2, PM_{10} and $PM_{2.5}$ concentrations used in the modelling were derived from the Defra background mapping datasets[6]. The maps provide background pollutant concentrations for each 1km × 1km grid square across the UK for all years from the reference year of 2013 up to 2030.

The study area extends across thirty-one 1km grid squares. For both the discrete receptor and Cartesian grid modelling background concentrations were taken from the 1km grid square within which the receptor point / grid point was located. To avoid double-counting, background contributions from those sources explicitly modelled within each grid square (i.e. motorways and primary A-roads) were subtracted from the total background concentrations, in accordance with LAQM.TG(16) guidance, and adjusted background concentrations calculated.

Background pollutant concentrations were downloaded for each assessment year. Future year background PM_{10} and $PM_{2.5}$ concentrations were assumed to decrease as per the mapped projections. Adjusted base year (2015) and future year (2020) background NO_2 concentrations were calculated from the Defra mapped background values in accordance with Air Quality Consultants' CURED methodology[7].

The background NO_2, PM_{10} and $PM_{2.5}$ concentrations used in the Source Apportionment Study are included in Appendix D.2.

4.6 Meteorological Data

The meteorological dataset used in the study was derived from Thorney Island meteorological station for 2015. This meteorological station is located approximately 12 km away from Portsmouth and considered to be most representative of the meteorological conditions in Portsmouth.

The wind rose for this site and further details of the preparation of meteorological data for use in dispersion modelling are provided in Appendix D.3.

4.7 Conversion of NO_X to NO_2

The proportion of NO_2 in NO_X varies greatly with location and time according to a number of factors including the amount of ozone available and the distance from the emission source.

The NO_X to NO_2 Calculator spreadsheet tool[8] (Defra, July 2016b) provides a methodology for converting NO_X concentrations to NO_2 concentrations for any given year up to 2030. This conversion methodology has been used for the purpose of this study for all scenarios as the best representation of the NO_2/NO_X relationship for Portsmouth.

The latest version of the NO_X to NO_2 Calculator is v5.1 and is designed to be used in combination with the 2013-reference year background maps and Emission Factors Toolkit version 7.0. The local authority area used was 'Portsmouth' and the traffic mix used was the 'All other urban UK traffic' option.

4.8 Model Verification

For detailed dispersion modelling studies, it is necessary to consider and account for random errors in both the modelling and the monitoring data used. The modelling results discussed in this section were verified by a consideration of the errors associated with the modelling process and the model input data.

[6] Defra Background Concentration Maps of Air Pollutants https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2013
[7] Air Quality Consultants. "Deriving Background Concentrations of NO_X and NO_2 for Use with CURED V2A. September 2016. http://www.aqconsultants.co.uk/getattachment/Resources/Download-Reports/Adjusting-Background-NO2-Maps-for-CURED-September-2016.pdf.aspx
[8] Defra NO_X to NO_2 Calculator Version 5.1 https://laqm.defra.gov.uk/documents/no2tonox9_ja-forweb_june2016.xls

Systematic errors in modelling results can arise from many factors, such as uncertainties in vehicle flows, speeds and the composition of the vehicle fleet. Such errors can be addressed and corrected for by making comparisons with monitoring data. The accuracy of the future year modelling results is relative to the accuracy of the base year results; therefore greater confidence can be placed in the future year concentrations if good agreement is found for the base year.

Annual average NO_2 concentrations modelled using the AAQuIRE model were verified against monitored data collected by PCC in 2015. Modelled concentrations were compared with monitored concentrations for all roadside monitoring sites achieving at least 75% data capture and where reliable traffic data were available for nearby roads.

Initially, the AAQuIRE model under-predicted NO_2 concentrations at the monitoring locations by, on average, 18%. In accordance with the methodology set out in LAQM.TG(16) adjustment factors were calculated in order to adjust modelled concentrations and improve the agreement between modelled and monitored concentrations.

Preliminary inspection of the verification results revealed that the model performed differently at 5 of the monitoring locations to the remaining monitoring locations. A review of these 5 monitoring locations showed 4 of the 5 locations to be within street-canyons (118 Albert Road (AR-116), 221 Fratton Road (FR-221), 117 Kingston Rd (KR-117) and The Tap London Road (Tap)) where dispersion is likely to be restricted. The remaining monitoring location (7 Velder Avenue) is situated on the façade of a continuous row of terraced houses near to a busy junction where traffic flow tends to be stop-start. Consequently, adjustment factors for road contribution NO_X were calculated separately for general urban (Group 1) sites and the street-canyon like / stop-start traffic (Group 2) locations (see Figure 4.1).

The adjustment factors were used to adjust all modelled road NO_X contributions before conversion to NO_2 concentrations. The Group 2 adjustment factor was applied to all modelled receptor points within 200 metres of the road links identified as street canyons or experiencing stop-start traffic conditions; the general urban (Group 1) factor was applied elsewhere. To further improve the agreement between modelled and measured NO_2 concentrations, a second set of adjustment factors were calculated and applied to the adjusted modelled NO_2 concentrations.

A map showing the zones in which the Group 1 and Group 2 adjustment factors have been applied is provided in Appendix C.4. The extents of these zones where the Group 1 and Group 2 adjustment factors have been applied are based on professional judgement and local knowledge of road geometries and typical traffic conditions. The zoning also takes into consideration the presence of AQMAs to ensure that predicted pollutant concentrations within the AQMAs are not underestimated.

A summary of the comparison between monitored and modelled NO_2 concentrations (adjusted and unadjusted) is shown in Table 6. Adjustment factors are presented in Table 7. After the adjustment of the modelled road NO_X contributions and modelled NO_2 concentrations, there was found to be good agreement between modelled and measured NO_2 concentrations. At 16 of the 19 monitoring locations modelled concentrations were within 9% of monitored concentrations[9]. At the remaining 3 sites modelled concentrations were within 12% of monitored concentrations[10] (Table 6 and Figure 4.2).

In the absence of suitable continuous monitoring locations for the adjustment of PM_{10} and $PM_{2.5}$, the adjustment factors determined for NO_2 have been applied to modelled PM_{10} and $PM_{2.5}$ concentrations.

[9] Modelled concentrations at these locations are within the 10% threshold defined in LAQM.TG(16) as representing good model performance

[10] Modelled concentrations at these locations are well within the 25% threshold defined in LAQM.TG(16) as representing the minimum acceptable level of model performance.

Table 6 Summary of Model Verification for NO_2

Site ID	Site Name	Grid Reference (X, Y OS-GB)	AQMA	Adjustment Factor	Annual Mean NO_2 Concentration			% Difference (Monitored vs. Modelled (Adjusted))
					2015 Monitored	Modelled (Unadjusted)	Modelled (Adjusted)	
DT9	6 Northern Road (NR-6)	465621, 105528	-	Group 1	35.0	29.3	35.2	1
DT14	4 Merlyn Drive (MD-4)	466109, 103736	-	Group 1	26.9	27.7	29.8	11
DT15	29 Milton Road (MR-29)	466120, 101324	-	Group 1	26.2	22.8	25.5	-3
DT16	Parade Court, London Rd (LR-PC)	465474, 104205	-	Group 1	32.0	24.7	28.5	-11
DT18	4 Milton Road (MR-4)	466097, 101332	-	Group 1	26.9	22.1	24.5	-9
DT20	136 Eastney Rd (ER-136)	466712, 99415	-	Group 1	27.6	22.3	25.1	-9
DT22	2 Victoria Road North (VRN-2)	464778, 99306	-	Group 1	28.1	26.2	29.3	5
DT30	Market Tavern (Mile End Rd) (MT)	464478, 101457	AQMA No. 11	Group 1	34.3	29.3	34.4	0
DT32	Larch Court, Church Rd (CR-Corner)	464559, 100980	-	Group 1	31.7	27.5	31.0	-2
DT34	Sovereign Gate, Commercial Rd (UF)	464425, 100893	AQMA No. 11	Group 1	34.7	31.4	37.1	7
DT35	Hampshire Terrace (AM)	463837, 99759	-	Group 1	28.5	26.3	29.1	2
DT36	Elm Grove (EG-103)	464501, 99329	-	Group 1	29.0	25.2	27.6	-5
C6	Burrfields Road	466004, 102348	-	Group 1	32.8	26.7	30.5	-7
C7	Mile End Road	464397, 101270	AQMA No. 11	Group 1	30.3	28.9	33.8	12
DT19	7 Velder Avenue (VA-7)	466392, 100226	AQMA No. 9	Group 2	35.1	23.7	34.6	-1
DT21	118 Albert Road (AR-116)	465213, 98964	-	Group 2	35.3	23.2	34.0	-4
DT24	221 Fratton Road (FR-221)	465111, 100737	AQMA No. 6	Group 2	36.3	25.8	37.5	3
DT25	117 Kingston Rd (KR-117)	465036, 101547	AQMA No. 6	Group 2	41.8	28.1	41.5	-1
DT26	The Tap London Road (Tap)	464900, 101976	AQMA No. 6	Group 2	43.1	29.1	43.9	2
				RMSE	-	**7.39**	**1.87**	-
				Fractional Bias	-	**0.21**	**0.00**	-
				Correlation Coefficient	-	**0.46**	**0.93**	-

Table 7 Summary of Adjustment Factors Used in the Study

Area	Adjustment Factor 1	Adjustment Factor 2
Group 1	1.649	0.999
Group 2	2.935	1.010

Notes: Adjustment factor 1 is applied to modelled road NO_X contributions before conversion to NO_2 concentrations. Adjustment factor 2 is applied to the modelled NO_2 concentrations.

Figure 4.1 Model Verification for NO_2: Modelled Road NO_X Versus Monitored Road NO_X

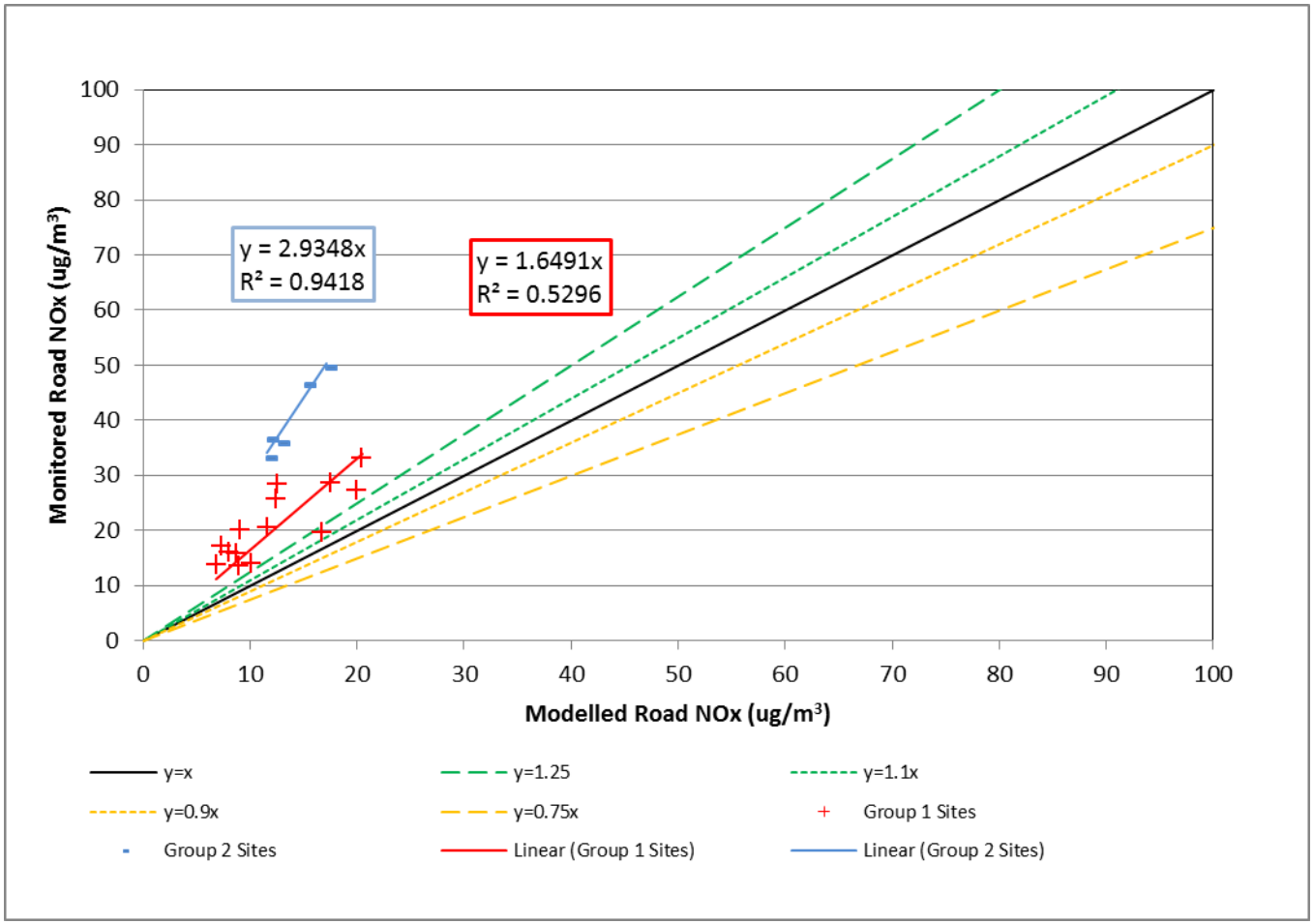
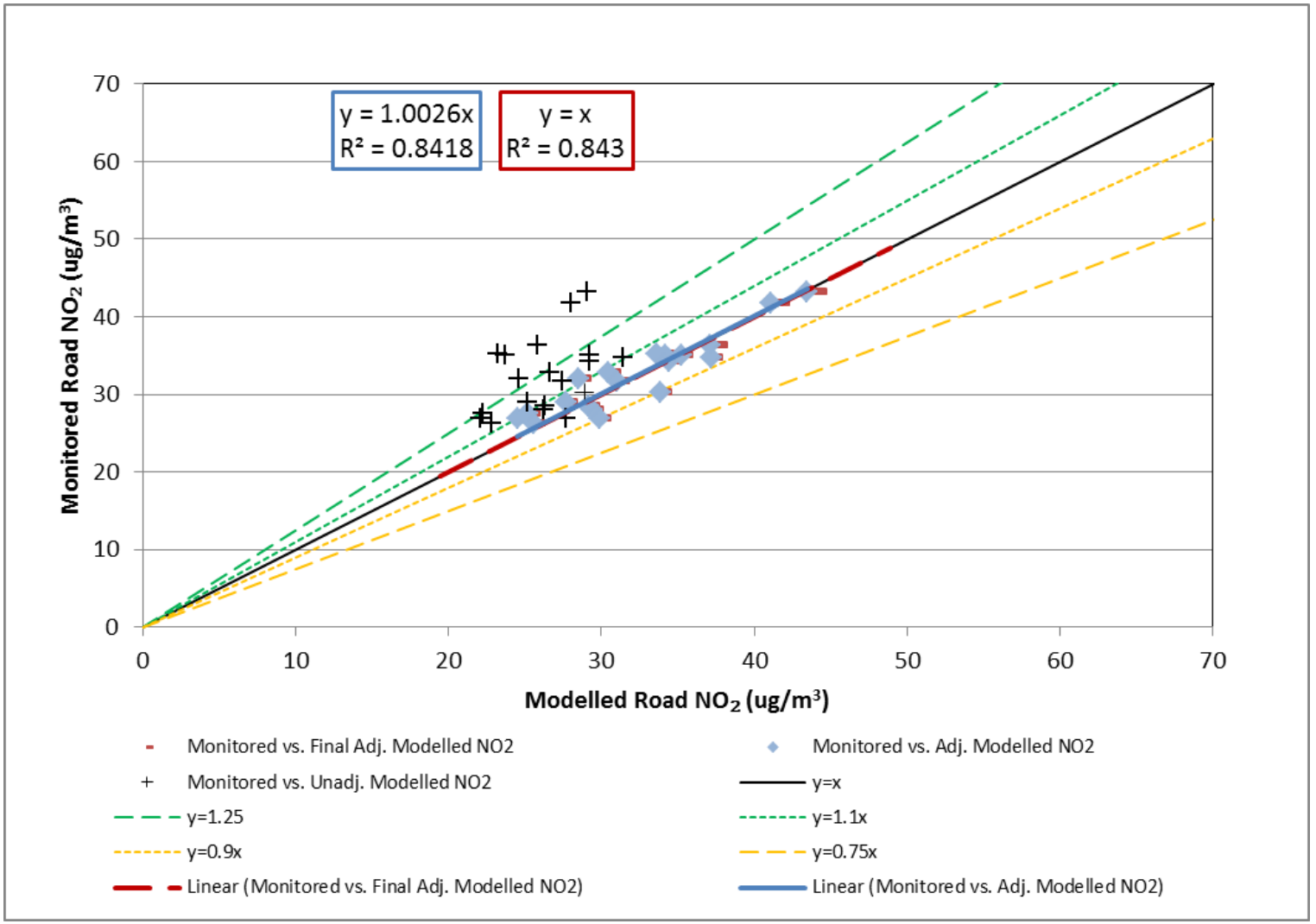


Figure 4.2 Model Verification for NO_2: Modelled Versus Monitored NO_2 Concentrations



4.9 Source Apportionment

Source apportionment of air pollution has been carried out in accordance with LAQM Technical Guidance to identify the predominant sources that contribute to exceedances of the AQOs in the 5 AQMAs and other areas where model predictions indicate elevated pollutant concentrations.

The relative contributions of the following categories were determined from the results of the detailed dispersion modelling:

- Regional Background sources;
- Local Background sources; and
- Local Sources.

The contributions of regional and local background sources were derived using Defra's background maps of air pollution. In the context of this study the Local Sources component is entirely associated with road traffic emissions, and was further broken down according to vehicle type:

- Cars and taxis;
- LGVs;
- OGV1;
- OGV2; and
- Buses.

For locations where model predictions indicated potential exceedances of the annual mean NO_2 AQO calculations were also carried out to determine the required reductions in road NO_X emissions in order to attain the AQO.

For full details of the Source Apportionment methodology and the calculation of required emission reductions the reader is referred to Chapter 7 of LAQM.TG(16). Box 7.5 of LAQM.TG(16) presents a worked example of source apportionment for NO_2 whilst Box 7.6 provides an example of the calculated required reduction in road NO_X emissions in order to attain the AQO.

5. Results

The results of the Source Apportionment Study are presented in the following sections. Section 5.1 presents the sensitive receptor modelling results and Section 5.2 presents aggregated results for the AQMAs.

5.1 Sensitive Receptors

Annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted at 54 sensitive receptor locations across the study area. The receptor locations were chosen to be representative of human exposure (e.g. residential properties, care homes, schools) or worst-case conditions in a particular area, based on their proximity to busy road links and / or areas of congestion. A number of the receptors were chosen to represent worst-case locations within the AQMAs.

5.1.1 NO_2 – 2015

Predicted annual mean NO_2 concentrations in the 2015 baseline year are shown in Table 8 along with the source contributions from regional and local background emissions sources and local traffic emissions.

5.1.1.1 Comparison with AQO

Predicted annual mean NO_2 concentrations in 2015 exceed the annual mean NO_2 AQO at 11 of the 54 modelled receptors (Table 8). Nine of these 11 receptors are located along the London Road / Kingston Road / Fratton Road route corridor and are within the existing AQMA No.6. The two remaining receptors (239-241 Commercial Road (Receptor 11) and 373-375 Commercial Road (Receptor 12)) are located within AQMA No. 11.

The highest predicted annual mean NO_2 concentration in 2015 is 48.9 µg/m^3 at 16 London Road (Receptor 32). The second and third highest concentrations are predicted at Kingsbury Mansions (Receptor 30; 48.3 µg/m^3) and 48-50 Kingston Road (Receptor 26; 47.7 µg/m^3).

Annual mean NO_2 concentrations within AQMAs No. 7, 9 and 12 are predicted to be below the annual mean NO_2 AQO at locations of relevant exposure in 2015. The predicted annual mean NO_2 concentrations at worst-case receptor locations within each of these AQMAs are as follows:

- AQMA No. 7: 35.4 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 35.8 µg/m^3 at 195-197 Milton Road (Receptor 43); and
- AQMA No. 12: 32.9 µg/m^3 at Pounds Gate (Receptor 22).

5.1.1.2 Source Apportionment

The contributions of local road traffic sources to annual mean NO_2 concentrations at sensitive receptor locations range between 7.7 µg/m^3 and 28.3 µg/m^3 (Table 8). Expressed as percentages, local traffic source contributions are predicted to account for 27% to 58% of annual mean NO_2 concentrations, with 42% to 73% attributable to background sources (regional and local; Table 9).

At the 11 sensitive receptor locations predicted to exceed the annual mean NO_2 AQO in 2015, the contributions of local road traffic sources to annual mean NO_2 concentrations range between 18.8 µg/m^3 and 28.3 µg/m^3 (Table 8). Expressed as percentages, local traffic source contributions are predicted to account for 46% to 58% of annual mean NO_2 concentrations, with 42% to 54% attributable to background sources (regional and local; Table 9). The largest local traffic source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

At the receptors where exceedance of the annual mean NO_2 AQO is predicted, cars and taxis are estimated to be the largest local source contributors, accounting for 8.0 µg/m^3 to 13.0 µg/m^3 (20% to 29%) of total annual mean NO_2 concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 14.0 µg/m^3; 27% of total annual mean NO_2);

- 373-375 Commercial Road (Receptor 11; 12.5 µg/m^3; 29% of total annual mean NO_2); and
- 314-316 Fratton Road (Receptor 18; 12.2 µg/m^3; 26% of total annual mean NO_2).

Buses are estimated to be the largest local source contributor after cars and taxis, accounting for between 2.7 µg/m^3 and 9.5 µg/m^3 (6% to 19%) of total annual mean NO_2 concentrations at those receptors where exceedance of the annual mean NO_2 AQO is predicted.

Light-goods vehicles (LGVs) are the third largest contributing vehicle type in areas of exceedance (2.4 µg/m^3 to 4.7 µg/m^3; 6% to 10%), whilst the Other Goods Vehicles classifications typically account for the smallest proportions of local source contributions.

5.1.1.3 Required Reductions to Achieve the AQO

Table 10 shows the calculation of the necessary reductions in road NO_X required to achieve the annual mean NO_2 AQO in 2015. The largest reductions required to meet the AQO are estimated at sensitive receptor locations along the London Road / Kingston Road / Fratton Road corridor within AQMA No. 6.

It is estimated that reductions in road NO_X emissions of up to 35% would be required in order to achieve the AQO at all modelled receptor locations within AQMA No. 6. Reductions in road NO_X emissions of around 14% are likely to be needed to attain the AQO at all receptor locations in AQMA No. 11 (Receptor 11, 239-241 Commercial Road and Receptor 12, 373-375 Commercial Road).

Table 8 Predicted Annual Mean NO_2 Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	28.2	20.4	5.5	14.9	4.1	1.6	0.7	0.7	0.5	7.7
2	57 Stanley Road	AQMA No. 11	28.7	20.4	5.5	14.9	4.4	1.7	0.8	0.8	0.6	8.3
3	St. John's Court	AQMA No. 11	28.7	20.4	5.5	14.9	4.3	1.7	0.8	0.8	0.7	8.2
4	Rudmore Court	AQMA No. 11	28.6	20.4	5.5	14.9	4.3	1.6	0.8	0.8	0.7	8.2
5	The Admiral PH	AQMA No. 11	34.0	20.7	5.5	15.1	6.9	2.5	1.3	1.2	1.3	13.3
6	Peninsular House	AQMA No. 11	32.7	20.7	5.5	15.1	5.6	2.0	1.3	1.9	1.2	12.1
7	162-189 Mile End Road	AQMA No. 11	30.8	20.7	5.5	15.1	5.1	1.9	0.9	1.0	1.1	10.1
8	The Air Balloon	AQMA No. 11	31.8	20.7	5.5	15.1	5.7	2.1	1.1	1.0	1.3	11.2
9	Ferry Lodge House	AQMA No. 11	34.9	20.7	5.5	15.1	7.9	2.7	1.3	0.7	1.6	14.3
10	72-126 Grafton Street	AQMA No. 11	31.3	20.7	5.5	15.1	5.8	2.0	1.0	0.5	1.3	10.7
11	373-375 Commercial Road	AQMA No. 11	**42.7**	20.7	5.5	15.1	12.5	3.8	2.2	0.8	2.7	22.1
12	239-241 Commercial Road	AQMA No. 11	**40.5**	21.7	5.5	16.2	9.0	2.4	1.7	0.6	5.2	18.8
13	Hallowell House	AQMA No. 11	36.7	21.7	5.5	16.2	7.8	2.1	1.4	0.5	3.2	15.0
14	St. Edmund House	-	39.4	23.0	5.4	17.6	9.0	2.4	1.6	0.6	2.7	16.4
15	Arts Lodge Park Cafe	-	39.0	23.0	5.4	17.6	7.8	2.0	1.6	0.7	3.9	16.0
16	Barham House	-	33.5	23.0	5.4	17.6	5.4	1.5	1.0	0.4	2.2	10.5
17	122-128 Lake Road	AQMA No. 11	35.1	21.7	5.5	16.2	6.1	1.8	0.7	0.3	4.6	13.4
18	314-316 Fratton Road	AQMA No. 6	**46.4**	20.6	5.7	14.8	12.2	4.1	1.7	0.5	7.4	25.8
19	Hale Court	AQMA No. 6	**40.0**	20.6	5.7	14.8	9.2	3.2	1.3	0.4	5.4	19.5
20	7 Fawcett Road	-	31.5	19.6	5.7	13.9	6.8	2.3	0.8	0.2	1.8	11.9
21	Priory School	-	31.3	19.6	5.7	13.9	6.7	2.3	0.8	0.2	1.8	11.7
22	Pounds Gate	AQMA No. 12	32.9	23.0	5.4	17.6	3.0	0.9	0.4	0.2	5.4	9.9
23	Priory View	-	28.9	19.6	5.7	13.9	5.3	1.8	0.6	0.2	1.4	9.3
24	Pink Court	AQMA No. 6	37.2	19.5	5.8	13.7	9.8	3.5	1.4	0.4	2.7	17.8

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	32.8	19.5	5.8	13.7	7.1	2.5	1.0	0.3	2.4	13.3
26	48-50 Kingston Road	AQMA No. 6	**47.7**	20.6	5.7	14.8	13.0	4.7	1.9	0.6	6.8	27.1
27	89 Kingston Road	AQMA No. 6	**40.8**	20.6	5.7	14.8	9.0	3.4	1.5	0.5	5.9	20.3
28	156 Kingston Road	AQMA No. 6	**42.4**	20.7	5.5	15.1	9.6	3.6	1.6	0.6	6.3	21.7
29	192-194 Kingston Road	AQMA No. 6	**43.9**	20.7	5.5	15.1	10.3	3.9	1.8	0.6	6.6	23.2
30	Kingsbury Mansions	AQMA No. 6	**48.3**	20.7	5.5	15.1	11.5	4.5	2.2	0.8	8.8	27.7
31	61 Kingston Crescent	AQMA No. 6	36.5	20.7	5.5	15.1	7.8	3.1	1.7	0.9	2.4	15.8
32	16 London Road	AQMA No. 6	**48.9**	20.7	5.5	15.1	11.4	4.4	2.2	0.8	9.5	28.3
33	Ross Apartments	AQMA No. 6	**40.1**	20.4	5.5	14.9	8.0	3.3	1.5	0.4	6.4	19.6
34	156 London Road	AQMA No. 6	36.3	21.2	5.7	15.5	6.2	2.7	1.6	0.6	4.2	15.2
35	589 London Road	-	33.8	20.1	5.7	14.4	5.9	2.7	1.6	0.6	2.9	13.7
36	60-62 Northern Road	-	35.9	19.2	5.8	13.4	7.9	2.7	1.2	0.3	4.6	16.7
37	84 Northern Road	-	34.0	19.2	5.8	13.4	7.3	2.5	1.3	0.6	3.1	14.8
38	Victoria House A3	AQMA No. 7	35.4	21.9	5.4	16.5	6.8	2.2	1.2	0.5	2.8	13.5
39	115 Eastern Road	AQMA No. 9	28.9	17.8	5.8	11.9	6.2	2.7	1.1	0.5	0.7	11.2
40	Lacey Road	AQMA No. 9	32.9	17.8	5.8	11.9	8.5	3.6	1.5	0.7	0.8	15.2
41	53 Velder Avenue	-	34.0	17.8	5.8	11.9	9.1	3.9	1.6	0.7	0.9	16.2
42	7 Velder Avenue	AQMA No. 9	34.6	17.8	5.8	11.9	9.9	3.7	1.5	0.7	1.1	16.8
43	195-197 Milton Road	AQMA No. 9	35.8	17.8	5.8	11.9	9.8	4.0	1.5	0.6	2.1	18.0
44	233 Milton Road	AQMA No. 9	32.9	17.8	5.8	11.9	8.4	3.3	1.2	0.5	1.9	15.2
45	1 Goldsmith Avenue	-	35.0	17.6	5.7	11.9	8.1	2.9	1.1	0.5	4.6	17.3
46	Victoria House, Victoria Road North	-	31.5	21.2	5.5	15.7	5.8	1.8	0.8	0.2	1.8	10.3
47	Keyes Court	-	30.3	21.2	5.5	15.7	4.7	1.6	0.6	0.2	2.0	9.2
48	Brandon House	-	33.3	17.3	5.8	11.6	8.3	3.0	1.1	0.3	3.3	15.9

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	37.0	17.3	5.8	11.6	9.8	3.5	1.2	0.3	4.8	19.6
50	Craneswater School	-	29.4	17.3	5.8	11.6	5.9	2.1	0.7	0.3	3.1	12.0
51	109 Highland Road	-	30.7	19.6	5.7	13.9	5.4	1.9	0.7	0.3	2.9	11.1
52	St. Andrew's Court	AQMA No. 7	34.3	21.9	5.4	16.5	6.3	2.0	1.3	0.6	2.3	12.4
53	1-4 Charter House	AQMA No. 7	32.7	21.9	5.4	16.5	5.0	1.6	1.0	0.4	2.8	10.8
54	Mill Pond Apartments	-	33.5	23.0	5.4	17.6	3.2	1.0	0.5	0.2	5.6	10.5

Table 9 Source Apportionment of Annual Mean NO_2 Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	28.2	20	53	73	15	6	2	3	2	27
2	57 Stanley Road	AQMA No. 11	28.7	19	52	71	15	6	3	3	2	29
3	St. John's Court	AQMA No. 11	28.7	19	52	71	15	6	3	3	2	29
4	Rudmore Court	AQMA No. 11	28.6	19	52	71	15	6	3	3	3	29
5	The Admiral PH	AQMA No. 11	34.0	16	45	61	20	7	4	4	4	39
6	Peninsular House	AQMA No. 11	32.7	17	46	63	17	6	4	6	4	37
7	162-189 Mile End Road	AQMA No. 11	30.8	18	49	67	17	6	3	3	4	33
8	The Air Balloon	AQMA No. 11	31.8	17	48	65	18	7	3	3	4	35
9	Ferry Lodge House	AQMA No. 11	34.9	16	43	59	23	8	4	2	5	41
10	72-126 Grafton Street	AQMA No. 11	31.3	18	48	66	19	6	3	2	4	34
11	373-375 Commercial Road	AQMA No. 11	**42.7**	13	35	48	29	9	5	2	6	52
12	239-241 Commercial Road	AQMA No. 11	**40.5**	14	40	54	22	6	4	1	13	46
13	Hallowell House	AQMA No. 11	36.7	15	44	59	21	6	4	1	9	41
14	St. Edmund House	-	39.4	14	45	58	23	6	4	2	7	42
15	Arts Lodge Park Cafe	-	39.0	14	45	59	20	5	4	2	10	41
16	Barham House	-	33.5	16	53	69	16	5	3	1	6	31
17	122-128 Lake Road	AQMA No. 11	35.1	16	46	62	17	5	2	1	13	38
18	314-316 Fratton Road	AQMA No. 6	**46.4**	12	32	44	26	9	4	1	16	56
19	Hale Court	AQMA No. 6	**40.0**	14	37	51	23	8	3	1	13	49
20	7 Fawcett Road	-	31.5	18	44	62	22	7	2	1	6	38
21	Priory School	-	31.3	18	44	63	21	7	2	1	6	37
22	Pounds Gate	AQMA No. 12	32.9	16	54	70	9	3	1	0	16	30
23	Priory View	-	28.9	20	48	68	18	6	2	1	5	32
24	Pink Court	AQMA No. 6	37.2	15	37	52	26	9	4	1	7	48

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	32.8	18	42	59	22	8	3	1	7	41
26	48-50 Kingston Road	AQMA No. 6	**47.7**	12	31	43	27	10	4	1	14	57
27	89 Kingston Road	AQMA No. 6	**40.8**	14	36	50	22	8	4	1	15	50
28	156 Kingston Road	AQMA No. 6	**42.4**	13	36	49	23	9	4	1	15	51
29	192-194 Kingston Road	AQMA No. 6	**43.9**	13	35	47	23	9	4	1	15	53
30	Kingsbury Mansions	AQMA No. 6	**48.3**	11	31	43	24	9	4	2	18	57
31	61 Kingston Crescent	AQMA No. 6	36.5	15	41	57	21	8	5	2	7	43
32	16 London Road	AQMA No. 6	**48.9**	11	31	42	23	9	4	2	19	58
33	Ross Apartments	AQMA No. 6	**40.1**	14	37	51	20	8	4	1	16	49
34	156 London Road	AQMA No. 6	36.3	16	43	58	17	7	4	2	11	42
35	589 London Road	-	33.8	17	43	59	17	8	5	2	9	41
36	60-62 Northern Road	-	35.9	16	37	53	22	8	3	1	13	47
37	84 Northern Road	-	34.0	17	39	57	22	7	4	2	9	43
38	Victoria House A3	AQMA No. 7	35.4	15	47	62	19	6	4	1	8	38
39	115 Eastern Road	AQMA No. 9	28.9	20	41	61	21	9	4	2	2	39
40	Lacey Road	AQMA No. 9	32.9	18	36	54	26	11	5	2	2	46
41	53 Velder Avenue	-	34.0	17	35	52	27	12	5	2	3	48
42	7 Velder Avenue	AQMA No. 9	34.6	17	35	51	29	11	4	2	3	49
43	195-197 Milton Road	AQMA No. 9	35.8	16	33	50	28	11	4	2	6	50
44	233 Milton Road	AQMA No. 9	32.9	18	36	54	25	10	4	1	6	46
45	1 Goldsmith Avenue	-	35.0	16	34	50	23	8	3	2	13	50
46	Victoria House, Victoria Road North	-	31.5	18	50	67	18	6	2	1	6	33
47	Keyes Court	-	30.3	18	52	70	16	5	2	1	6	30
48	Brandon House	-	33.3	17	35	52	25	9	3	1	10	48

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	37.0	16	31	47	27	9	3	1	13	53
50	Craneswater School	-	29.4	20	39	59	20	7	2	1	11	41
51	109 Highland Road	-	30.7	18	45	64	18	6	2	1	9	36
52	St. Andrew's Court	AQMA No. 7	34.3	16	48	64	18	6	4	2	7	36
53	1-4 Charter House	AQMA No. 7	32.7	17	50	67	15	5	3	1	9	33
54	Mill Pond Apartments	-	33.5	16	53	69	10	3	1	1	17	31

Table 10 Required Reductions in Road NO_X Emissions to Achieve the Annual Mean NO_2 AQO in 2015

Receptor Number	Receptor Name	AQMA	Annual Mean Concentrations (µg/m^3)				Reduction in Road NO_X to Achieve AQO	
			Total Modelled NO_2	Background NO_2	Total Modelled Road NO_X	Road NO_X at 40 µg/m^3 NO_2	µg/m^3	As % of Modelled Road NO_X
11	373-375 Commercial Road	AQMA No. 11	**42.7**	20.7	48.6	42.0	6.6	14
12	239-241 Commercial Road	AQMA No. 11	**40.5**	21.7	41.0	39.7	1.3	3
18	314-316 Fratton Road	AQMA No. 6	**46.4**	20.6	56.9	41.2	15.7	28
19	Hale Court	AQMA No. 6	**40.0**	20.6	41.3	41.2	0.1	<1
26	48-50 Kingston Road	AQMA No. 6	**47.7**	20.6	60.2	41.2	19.0	32
27	89 Kingston Road	AQMA No. 6	**40.8**	20.6	43.2	41.2	2.0	5
28	156 Kingston Road	AQMA No. 6	**42.4**	20.7	46.7	41.0	5.8	12
29	192-194 Kingston Road	AQMA No. 6	**43.9**	20.7	50.4	41.0	9.4	19
30	Kingsbury Mansions	AQMA No. 6	**48.3**	20.7	61.6	41.0	20.7	34
32	16 London Road	AQMA No. 6	**48.9**	20.7	63.2	41.0	22.3	35
33	Ross Apartments	AQMA No. 6	**40.1**	20.4	41.6	41.4	0.1	<1

5.1.2 NO_2 – 2020

Predicted annual mean NO_2 concentrations in 2020 are shown in Table 8 along with the source contributions from regional and local background emissions sources and local traffic emissions. It should be noted that road NO_X emission rates in 2020 have been calculated using Air Quality Consultants' CURED tool, which is considered to provide more realistic, conservative estimates of road NO_X emissions in 2020.

5.1.2.1 Comparison with AQO

Predicted annual mean NO_2 concentrations in 2020 exceed the annual mean NO_2 AQO at 4 of the 54 modelled receptors (Table 11). All of these receptors are located along the London Road / Kingston Road / Fratton Road route corridor and are within the existing AQMA No.6. The highest predicted annual mean NO_2 concentration in 2020 is 43.2 µg/m^3 at 16 London Road (Receptor 32). The second and third highest concentrations are predicted at Kingsbury Mansions (Receptor 30; 42.5 µg/m^3) and 48-50 Kingston Road (Receptor 26; 41.4 µg/m^3).

Annual mean NO_2 concentrations within AQMAs No. 7, 9, 11 and 12 are predicted to be below the annual mean NO_2 AQO at locations of relevant exposure in 2020. The predicted annual mean NO_2 concentrations at worst-case receptor locations within each of these AQMAs are as follows:

- AQMA No. 7: 31.8 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 31.4 µg/m^3 at 195-197 Milton Road (Receptor 43);
- AQMA No. 11: 38.0 µg/m^3 at 373-375 Commercial Road (Receptor 11); and
- AQMA No. 12: 29.3 µg/m^3 at Pounds Gate (Receptor 22).

5.1.2.2 Source Apportionment

The contributions of local road traffic sources to annual mean NO_2 concentrations range between 6.4 µg/m^3 and 23.7 µg/m^3 (Table 11). Expressed as percentages, local source contributions are predicted to account for 25% to 55% of annual mean NO_2 concentrations at those receptor locations predicted to exceed the annual mean AQO, with 45% to 75% attributable to background sources (regional and local; Table 12).

At the 4 sensitive receptor locations predicted to exceed the annual mean NO_2 AQO in 2020, the contributions of local road traffic sources to annual mean NO_2 concentrations range between 21.6 µg/m^3 and 23.7 µg/m^3 (Table 11). Expressed as percentages, local source contributions are predicted to account for 54% to 55% of annual mean NO_2 concentrations at those receptor locations predicted to exceed the annual mean AQO, with 45% to 46% attributable to background sources (regional and local; Table 12).

The largest local source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

At all receptors where exceedance of the annual mean NO_2 AQO is predicted, cars and taxis are estimated to be the largest local source contributors, accounting for 10.4 µg/m^3 to 12.0 µg/m^3 (24% to 29%) of total annual mean NO_2 concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 12.0 µg/m^3; 29% of total annual mean NO_2);
- 314-316 Fratton Road (Receptor 18; 11.2 µg/m^3; 28% of total annual mean NO_2); and
- Kingsbury Mansions (Receptor 30; 10.5 µg/m^3; 25% of total annual mean NO_2).

Buses are estimated to be the largest local source contributor after cars and taxis, accounting for between 5.0 µg/m^3 and 7.8 µg/m^3 (12% to 18%) of total annual mean NO_2 concentrations at those receptors where exceedance of the annual mean NO_2 AQO is predicted.

Light-goods vehicles (LGVs) are the third largest contributing vehicle type in areas of exceedance (3.7 µg/m^3 to 4.4 µg/m^3; 9% to 11%), whilst the Other Goods Vehicles classifications typically account for the smallest proportions of local source contributions.

5.1.2.3 Required Reductions to Achieve the AQO

Table 13 shows the calculation of the necessary reductions in road NO_X required to achieve the annual mean NO_2 AQO in 2020. The largest reductions required to meet the AQO are estimated at sensitive receptor locations along the London Road / Kingston Road / Fratton Road corridor within AQMA No. 6.

It is estimated that reductions in road NO_X emissions of up to 15% would be required in order to achieve the AQO at all modelled receptor locations within AQMA No. 6. Elsewhere annual mean NO_2 concentrations are predicted to be below the AQO and so reductions in road NO_X emissions would not be necessary to achieve AQO.

Table 11 Predicted Annual Mean NO_2 Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	25.8	19.4	4.5	14.9	3.6	1.5	0.4	0.4	0.4	6.4
2	57 Stanley Road	AQMA No. 11	26.3	19.4	4.5	14.9	3.9	1.6	0.5	0.4	0.5	6.9
3	St. John's Court	AQMA No. 11	26.2	19.4	4.5	14.9	3.8	1.6	0.4	0.4	0.5	6.8
4	Rudmore Court	AQMA No. 11	26.1	19.4	4.5	14.9	3.8	1.5	0.4	0.4	0.6	6.7
5	The Admiral PH	AQMA No. 11	30.2	19.5	4.5	14.9	6.2	2.4	0.7	0.5	1.0	10.7
6	Peninsular House	AQMA No. 11	28.8	19.5	4.5	14.9	5.1	1.9	0.7	0.8	0.9	9.4
7	162-189 Mile End Road	AQMA No. 11	27.7	19.5	4.5	14.9	4.6	1.8	0.5	0.5	0.9	8.2
8	The Air Balloon	AQMA No. 11	28.6	19.5	4.5	14.9	5.1	2.0	0.6	0.5	1.0	9.1
9	Ferry Lodge House	AQMA No. 11	31.5	19.5	4.5	14.9	7.1	2.6	0.7	0.4	1.2	12.0
10	72-126 Grafton Street	AQMA No. 11	28.3	19.5	4.5	14.9	5.2	1.9	0.5	0.2	1.0	8.9
11	373-375 Commercial Road	AQMA No. 11	38.0	19.5	4.5	14.9	11.5	3.5	1.1	0.3	2.1	18.5
12	239-241 Commercial Road	AQMA No. 11	35.4	20.1	4.6	15.6	8.3	2.2	0.8	0.2	3.8	15.3
13	Hallowell House	AQMA No. 11	32.4	20.1	4.6	15.6	7.1	1.9	0.7	0.2	2.4	12.3
14	St. Edmund House	-	35.0	21.5	4.4	17.1	8.3	2.2	0.8	0.2	2.0	13.5
15	Arts Lodge Park Cafe	-	34.5	21.5	4.4	17.1	7.1	1.9	0.8	0.3	2.9	12.9
16	Barham House	-	30.1	21.5	4.4	17.1	4.9	1.4	0.5	0.1	1.6	8.5
17	122-128 Lake Road	AQMA No. 11	31.1	20.1	4.6	15.6	5.5	1.6	0.3	0.1	3.4	11.0
18	314-316 Fratton Road	AQMA No. 6	**40.4**	18.8	4.8	14.0	11.2	3.7	0.9	0.2	5.7	21.6
19	Hale Court	AQMA No. 6	34.9	18.8	4.8	14.0	8.5	2.9	0.6	0.2	3.9	16.1
20	7 Fawcett Road	-	27.9	17.9	4.8	13.1	6.2	2.1	0.4	0.1	1.3	10.1
21	Priory School	-	27.8	17.9	4.8	13.1	6.1	2.1	0.4	0.1	1.3	9.9
22	Pounds Gate	AQMA No. 12	29.3	21.5	4.4	17.1	2.7	0.8	0.2	0.1	3.9	7.8
23	Priory View	-	25.7	17.9	4.8	13.1	4.8	1.6	0.3	0.1	1.0	7.8
24	Pink Court	AQMA No. 6	32.9	17.8	4.9	13.0	9.0	3.2	0.7	0.1	2.1	15.1

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	28.9	17.8	4.9	13.0	6.4	2.3	0.5	0.1	1.7	11.1
26	48-50 Kingston Road	AQMA No. 6	**41.4**	18.8	4.8	14.0	12.0	4.4	1.0	0.2	5.0	22.6
27	89 Kingston Road	AQMA No. 6	35.4	18.8	4.8	14.0	8.2	3.1	0.8	0.2	4.3	16.6
28	156 Kingston Road	AQMA No. 6	37.3	19.5	4.5	14.9	8.8	3.3	0.8	0.2	4.6	17.8
29	192-194 Kingston Road	AQMA No. 6	38.5	19.5	4.5	14.9	9.4	3.6	0.9	0.3	4.9	19.1
30	Kingsbury Mansions	AQMA No. 6	**42.5**	19.5	4.5	14.9	10.5	4.1	1.1	0.3	6.9	23.0
31	61 Kingston Crescent	AQMA No. 6	32.4	19.5	4.5	14.9	7.1	2.8	0.9	0.3	1.8	12.9
32	16 London Road	AQMA No. 6	**43.2**	19.5	4.5	14.9	10.4	4.1	1.2	0.3	7.8	23.7
33	Ross Apartments	AQMA No. 6	35.5	19.4	4.5	14.9	7.4	3.0	0.7	0.2	4.8	16.1
34	156 London Road	AQMA No. 6	31.6	19.4	4.8	14.6	5.7	2.4	0.8	0.2	3.0	12.2
35	589 London Road	-	29.5	18.5	4.8	13.7	5.4	2.5	0.8	0.2	2.1	11.0
36	60-62 Northern Road	-	31.2	17.3	4.8	12.6	7.3	2.5	0.6	0.1	3.4	13.9
37	84 Northern Road	-	29.5	17.3	4.8	12.6	6.7	2.3	0.6	0.2	2.4	12.2
38	Victoria House A3	AQMA No. 7	31.8	20.7	4.4	16.3	6.2	2.0	0.6	0.2	2.0	11.1
39	115 Eastern Road	AQMA No. 9	25.6	16.3	4.9	11.4	5.6	2.4	0.6	0.2	0.5	9.3
40	Lacey Road	AQMA No. 9	29.0	16.3	4.9	11.4	7.8	3.3	0.8	0.3	0.6	12.7
41	53 Velder Avenue	-	29.9	16.3	4.9	11.4	8.3	3.5	0.8	0.3	0.7	13.6
42	7 Velder Avenue	AQMA No. 9	30.0	16.3	4.9	11.4	8.3	3.5	0.8	0.3	0.9	13.7
43	195-197 Milton Road	AQMA No. 9	31.4	16.3	4.9	11.4	9.0	3.6	0.8	0.2	1.5	15.1
44	233 Milton Road	AQMA No. 9	29.1	16.3	4.9	11.4	7.7	3.0	0.6	0.2	1.4	12.7
45	1 Goldsmith Avenue	-	30.5	16.1	4.8	11.2	7.4	2.7	0.6	0.2	3.5	14.4
46	Victoria House, Victoria Road North	-	28.0	19.4	4.5	14.8	5.2	1.6	0.4	0.1	1.3	8.6
47	Keyes Court	-	26.9	19.4	4.5	14.8	4.3	1.5	0.3	0.1	1.5	7.6
48	Brandon House	-	29.3	15.8	4.9	10.9	7.3	2.7	0.6	0.1	2.8	13.5

Receptor Number	Receptor Name	AQMA	Annual Mean NO_2 Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	32.6	15.8	4.9	10.9	8.7	3.2	0.6	0.1	4.2	16.8
50	Craneswater School	-	25.9	15.8	4.9	10.9	5.3	1.8	0.3	0.1	2.5	10.1
51	109 Highland Road	-	27.2	17.9	4.8	13.1	4.9	1.7	0.3	0.1	2.3	9.4
52	St. Andrew's Court	AQMA No. 7	30.7	20.7	4.4	16.3	5.7	1.8	0.6	0.2	1.7	10.0
53	1-4 Charter House	AQMA No. 7	29.4	20.7	4.4	16.3	4.5	1.5	0.5	0.2	2.0	8.7
54	Mill Pond Apartments	-	29.8	21.5	4.4	17.1	2.9	0.9	0.2	0.1	4.1	8.2

Table 12 Source Apportionment of Annual Mean NO_2 Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	25.8	18	58	75	14	6	2	2	2	25
2	57 Stanley Road	AQMA No. 11	26.3	17	57	74	15	6	2	2	2	26
3	St. John's Court	AQMA No. 11	26.2	17	57	74	15	6	2	2	2	26
4	Rudmore Court	AQMA No. 11	26.1	17	57	74	14	6	2	2	2	26
5	The Admiral PH	AQMA No. 11	30.2	15	49	64	21	8	2	2	3	36
6	Peninsular House	AQMA No. 11	28.8	16	52	68	18	7	2	3	3	32
7	162-189 Mile End Road	AQMA No. 11	27.7	16	54	70	16	6	2	2	3	30
8	The Air Balloon	AQMA No. 11	28.6	16	52	68	18	7	2	2	3	32
9	Ferry Lodge House	AQMA No. 11	31.5	14	47	62	23	8	2	1	4	38
10	72-126 Grafton Street	AQMA No. 11	28.3	16	53	69	18	7	2	1	3	31
11	373-375 Commercial Road	AQMA No. 11	38.0	12	39	51	30	9	3	1	6	49
12	239-241 Commercial Road	AQMA No. 11	35.4	13	44	57	23	6	2	1	11	43
13	Hallowell House	AQMA No. 11	32.4	14	48	62	22	6	2	1	7	38
14	St. Edmund House	-	35.0	13	49	62	24	6	2	1	6	38
15	Arts Lodge Park Cafe	-	34.5	13	50	62	21	5	2	1	8	38
16	Barham House	-	30.1	15	57	72	16	5	2	0	5	28
17	122-128 Lake Road	AQMA No. 11	31.1	15	50	65	18	5	1	0	11	35
18	314-316 Fratton Road	AQMA No. 6	**40.4**	12	35	46	28	9	2	0	14	54
19	Hale Court	AQMA No. 6	34.9	14	40	54	24	8	2	0	11	46
20	7 Fawcett Road	-	27.9	17	47	64	22	8	1	0	5	36
21	Priory School	-	27.8	17	47	64	22	7	1	0	5	36
22	Pounds Gate	AQMA No. 12	29.3	15	58	74	9	3	1	0	13	26
23	Priory View	-	25.7	19	51	70	19	6	1	0	4	30
24	Pink Court	AQMA No. 6	32.9	15	39	54	27	10	2	0	6	46

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	28.9	17	45	62	22	8	2	0	6	38
26	48-50 Kingston Road	AQMA No. 6	**41.4**	12	34	45	29	11	2	1	12	55
27	89 Kingston Road	AQMA No. 6	35.4	14	39	53	23	9	2	1	12	47
28	156 Kingston Road	AQMA No. 6	37.3	12	40	52	24	9	2	1	12	48
29	192-194 Kingston Road	AQMA No. 6	38.5	12	39	51	24	9	2	1	13	49
30	Kingsbury Mansions	AQMA No. 6	**42.5**	11	35	46	25	10	3	1	16	54
31	61 Kingston Crescent	AQMA No. 6	32.4	14	46	60	22	9	3	1	6	40
32	16 London Road	AQMA No. 6	**43.2**	11	35	45	24	9	3	1	18	55
33	Ross Apartments	AQMA No. 6	35.5	13	42	55	21	9	2	1	14	45
34	156 London Road	AQMA No. 6	31.6	15	46	61	18	8	2	1	10	39
35	589 London Road	-	29.5	16	46	63	18	8	3	1	7	37
36	60-62 Northern Road	-	31.2	15	40	56	23	8	2	0	11	44
37	84 Northern Road	-	29.5	16	43	59	23	8	2	1	8	41
38	Victoria House A3	AQMA No. 7	31.8	14	51	65	20	6	2	1	6	35
39	115 Eastern Road	AQMA No. 9	25.6	19	44	64	22	9	2	1	2	36
40	Lacey Road	AQMA No. 9	29.0	17	39	56	27	11	3	1	2	44
41	53 Velder Avenue	-	29.9	16	38	55	28	12	3	1	2	45
42	7 Velder Avenue	AQMA No. 9	30.0	16	38	54	28	12	3	1	3	46
43	195-197 Milton Road	AQMA No. 9	31.4	16	36	52	29	11	2	1	5	48
44	233 Milton Road	AQMA No. 9	29.1	17	39	56	26	10	2	1	5	44
45	1 Goldsmith Avenue	-	30.5	16	37	53	24	9	2	1	12	47
46	Victoria House, Victoria Road North	-	28.0	16	53	69	19	6	1	0	5	31
47	Keyes Court	-	26.9	17	55	72	16	5	1	0	5	28
48	Brandon House	-	29.3	17	37	54	25	9	2	0	9	46

Receptor Number	Receptor Name	AQMA	Total Modelled NO_2	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	32.6	15	33	48	27	10	2	0	13	52
50	Craneswater School	-	25.9	19	42	61	21	7	1	0	10	39
51	109 Highland Road	-	27.2	18	48	66	18	6	1	0	8	34
52	St. Andrew's Court	AQMA No. 7	30.7	14	53	67	18	6	2	1	5	33
53	1-4 Charter House	AQMA No. 7	29.4	15	55	70	15	5	2	1	7	30
54	Mill Pond Apartments	-	29.8	15	57	72	10	3	1	0	14	28

Table 13 Required Reductions in Road NO_X Emissions to Achieve the Annual Mean NO_2 AQO in 2020

Receptor Number	Receptor Name	AQMA	Annual Mean Concentrations ($\mu g/m^3$)				Reduction in Road NO_X to Achieve AQO	
			Total Modelled NO_2	Background NO_2	Total Modelled Road NO_X	Road NO_X at 40 $\mu g/m^3$ NO_2	$\mu g/m^3$	As % of Modelled Road NO_X
18	314-316 Fratton Road	AQMA No. 6	**40.4**	18.8	45.2	44.2	1.0	2
26	48-50 Kingston Road	AQMA No. 6	**41.4**	18.8	47.6	44.2	3.4	7
30	Kingsbury Mansions	AQMA No. 6	**42.5**	19.5	48.6	42.7	5.8	12
32	16 London Road	AQMA No. 6	**43.2**	19.5	50.3	42.7	7.6	15

5.1.3 PM_{10} – 2015

Predicted annual mean PM_{10} concentrations in the 2015 baseline year are shown in Table 14 along with the source contributions from regional and local background emissions sources and local traffic emissions.

5.1.3.1 Comparison with AQO

Predicted annual mean PM_{10} concentrations in 2015 are predicted to be well below the annual mean PM_{10} AQO at all modelled receptor locations (Table 14). The highest predicted annual mean PM_{10} concentration in 2015 is 20.4 µg/m^3 at St. Edmund House (Receptor 14). This receptor is situated alongside A3 Alfred Road and does not lie within any of the AQMAs. The second highest concentration is predicted at 48-50 Kingston Road (Receptor 26; 20.3 µg/m^3), whilst an annual mean PM_{10} concentration of 20.1 µg/m^3 is predicted at two receptor locations (Receptor 30, Kingsbury Mansions and Receptor 32, 16 London Road).

The predicted annual mean PM_{10} concentrations at worst-case receptor locations within each of the AQMAs are as follows:

- AQMA No. 6: 20.3 µg/m^3 at 48-50 Kingston Road (Receptor 26);
- AQMA No. 7: 17.3 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 18.8 µg/m^3 at 195-197 Milton Road (Receptor 43);
- AQMA No. 11: 19.9 µg/m^3 at 373-375 Commercial Road (Receptor 11); and
- AQMA No. 12: 19.0 µg/m^3 at Pounds Gate (Receptor 22).

5.1.3.2 Source Apportionment

Local road traffic source contributions are predicted to account for up to 4.1 µg/m^3 of total modelled PM_{10} concentrations (Table 14). Expressed as percentages, local source contributions are predicted to account for 6% to 20% of annual mean PM_{10} concentrations at modelled receptor locations, with 80% to 94% attributable to background sources (regional and local; Table 15). The largest local source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

On average, cars and taxis are estimated to be the largest local source contributors, accounting for 0.6 µg/m^3 to 2.7 µg/m^3 (3% to 13%) of total annual mean PM_{10} concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 2.7 µg/m^3; 13% of total annual mean PM_{10});
- 373-375 Commercial Road (Receptor 11; 2.5 µg/m^3; 12% of total annual mean PM_{10}); and
- 314-316 Fratton Road (Receptor 18; 2.3 µg/m^3; 12% of total annual mean PM_{10}).

LGVs are estimated to be the largest local source contributor after cars and taxis, accounting for between 0.1 µg/m^3 and 0.7 µg/m^3 (1% to 4%) of total annual mean PM_{10} concentrations at modelled receptor locations. Buses are the third largest contributing vehicle type, accounting for up to 0.5 µg/m^3 (3%) of total modelled PM_{10} concentrations. OGV1 and OGV2 are the smallest local contributors, accounting for less than 1% of total PM_{10} concentrations.

5.1.3.3 Required Reductions to Achieve the AQO

Annual mean PM_{10} concentrations in 2015 are predicted to be well below the annual mean PM_{10} AQO at all locations throughout Portsmouth and so reductions to attain the AQO are not required.

Table 14 Predicted Annual Mean PM_{10} Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	18.1	16.7	8.1	8.6	1.0	0.2	0.1	0.1	0.0	1.4
2	57 Stanley Road	AQMA No. 11	18.2	16.7	8.1	8.6	1.0	0.3	0.1	0.1	0.0	1.5
3	St. John's Court	AQMA No. 11	18.2	16.7	8.1	8.6	1.0	0.2	0.1	0.1	0.0	1.5
4	Rudmore Court	AQMA No. 11	18.1	16.7	8.1	8.6	1.0	0.2	0.1	0.1	0.1	1.4
5	The Admiral PH	AQMA No. 11	18.6	16.4	7.7	8.7	1.4	0.4	0.1	0.1	0.1	2.1
6	Peninsular House	AQMA No. 11	18.3	16.4	7.7	8.7	1.2	0.3	0.1	0.2	0.1	1.9
7	162-189 Mile End Road	AQMA No. 11	18.2	16.4	7.7	8.7	1.2	0.3	0.1	0.1	0.1	1.7
8	The Air Balloon	AQMA No. 11	18.4	16.4	7.7	8.7	1.3	0.3	0.1	0.1	0.1	1.9
9	Ferry Lodge House	AQMA No. 11	19.0	16.4	7.7	8.7	1.8	0.4	0.1	0.1	0.1	2.5
10	72-126 Grafton Street	AQMA No. 11	18.2	16.4	7.7	8.7	1.2	0.3	0.1	0.1	0.1	1.8
11	373-375 Commercial Road	AQMA No. 11	19.9	16.4	7.7	8.7	2.5	0.6	0.2	0.1	0.2	3.5
12	239-241 Commercial Road	AQMA No. 11	19.3	16.7	7.5	9.2	1.7	0.4	0.1	0.0	0.3	2.6
13	Hallowell House	AQMA No. 11	18.9	16.7	7.5	9.2	1.5	0.3	0.1	0.0	0.2	2.1
14	St. Edmund House	-	20.4	17.9	7.2	10.7	1.8	0.4	0.1	0.1	0.2	2.5
15	Arts Lodge Park Cafe	-	20.0	17.9	7.2	10.7	1.4	0.3	0.1	0.0	0.2	2.1
16	Barham House	-	19.4	17.9	7.2	10.7	1.0	0.2	0.1	0.0	0.1	1.5
17	122-128 Lake Road	AQMA No. 11	18.4	16.7	7.5	9.2	1.1	0.2	0.1	0.0	0.3	1.7
18	314-316 Fratton Road	AQMA No. 6	19.8	16.2	7.6	8.6	2.3	0.6	0.1	0.0	0.4	3.6
19	Hale Court	AQMA No. 6	19.1	16.2	7.6	8.6	1.9	0.5	0.1	0.0	0.3	2.9
20	7 Fawcett Road	-	17.5	15.8	7.7	8.1	1.3	0.3	0.1	0.0	0.1	1.8
21	Priory School	-	17.5	15.8	7.7	8.1	1.3	0.3	0.1	0.0	0.1	1.8
22	Pounds Gate	AQMA No. 12	19.0	17.9	7.2	10.7	0.6	0.1	0.0	0.0	0.4	1.1
23	Priory View	-	17.1	15.8	7.7	8.1	1.0	0.2	0.0	0.0	0.1	1.4
24	Pink Court	AQMA No. 6	18.8	16.0	7.6	8.4	2.0	0.5	0.1	0.0	0.2	2.8

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	18.0	16.0	7.6	8.4	1.4	0.4	0.1	0.0	0.2	2.0
26	48-50 Kingston Road	AQMA No. 6	20.3	16.2	7.6	8.6	2.7	0.7	0.2	0.1	0.5	4.1
27	89 Kingston Road	AQMA No. 6	19.1	16.2	7.6	8.6	1.8	0.5	0.1	0.0	0.4	2.9
28	156 Kingston Road	AQMA No. 6	19.5	16.4	7.7	8.7	2.0	0.6	0.1	0.1	0.4	3.1
29	192-194 Kingston Road	AQMA No. 6	19.8	16.4	7.7	8.7	2.1	0.6	0.2	0.1	0.4	3.4
30	Kingsbury Mansions	AQMA No. 6	20.1	16.4	7.7	8.7	2.3	0.7	0.2	0.1	0.5	3.7
31	61 Kingston Crescent	AQMA No. 6	18.8	16.4	7.7	8.7	1.6	0.5	0.1	0.1	0.1	2.4
32	16 London Road	AQMA No. 6	20.1	16.4	7.7	8.7	2.2	0.7	0.2	0.1	0.5	3.6
33	Ross Apartments	AQMA No. 6	19.5	16.7	8.1	8.6	1.7	0.5	0.1	0.0	0.4	2.8
34	156 London Road	AQMA No. 6	18.8	16.6	7.7	8.9	1.3	0.4	0.1	0.1	0.3	2.2
35	589 London Road	-	19.0	16.9	8.0	8.9	1.2	0.4	0.1	0.1	0.2	2.0
36	60-62 Northern Road	-	18.5	16.1	7.7	8.4	1.6	0.4	0.1	0.0	0.3	2.4
37	84 Northern Road	-	18.1	16.1	7.7	8.4	1.4	0.3	0.1	0.0	0.2	2.0
38	Victoria House A3	AQMA No. 7	17.3	15.4	7.3	8.1	1.3	0.3	0.1	0.0	0.2	1.9
39	115 Eastern Road	AQMA No. 9	17.8	16.0	7.5	8.5	1.3	0.4	0.1	0.0	0.0	1.8
40	Lacey Road	AQMA No. 9	18.5	16.0	7.5	8.5	1.7	0.5	0.1	0.1	0.1	2.5
41	53 Velder Avenue	-	18.7	16.0	7.5	8.5	1.8	0.6	0.1	0.1	0.1	2.7
42	7 Velder Avenue	AQMA No. 9	18.6	16.0	7.5	8.5	1.8	0.6	0.1	0.1	0.1	2.7
43	195-197 Milton Road	AQMA No. 9	18.8	16.0	7.5	8.5	1.9	0.6	0.1	0.1	0.1	2.8
44	233 Milton Road	AQMA No. 9	18.4	16.0	7.5	8.5	1.7	0.5	0.1	0.0	0.1	2.4
45	1 Goldsmith Avenue	-	18.0	15.5	7.7	7.8	1.6	0.4	0.1	0.0	0.3	2.5
46	Victoria House, Victoria Road North	-	17.1	15.7	7.6	8.1	1.0	0.2	0.1	0.0	0.1	1.4
47	Keyes Court	-	17.0	15.7	7.6	8.1	0.9	0.2	0.0	0.0	0.1	1.3
48	Brandon House	-	16.4	14.4	7.1	7.3	1.4	0.4	0.1	0.0	0.2	2.1

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	16.8	14.4	7.1	7.3	1.7	0.5	0.1	0.0	0.2	2.5
50	Craneswater School	-	16.0	14.4	7.1	7.3	1.1	0.3	0.1	0.0	0.2	1.6
51	109 Highland Road	-	17.3	15.8	7.7	8.1	1.0	0.3	0.1	0.0	0.2	1.6
52	St. Andrew's Court	AQMA No. 7	17.1	15.4	7.3	8.1	1.2	0.3	0.1	0.0	0.1	1.7
53	1-4 Charter House	AQMA No. 7	16.8	15.4	7.3	8.1	0.9	0.2	0.1	0.0	0.2	1.5
54	Mill Pond Apartments	-	19.1	17.9	7.2	10.7	0.6	0.1	0.0	0.0	0.4	1.2

Table 15 Source Apportionment of Annual Mean PM_{10} Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	18.1	45	47	92	5	1	0	1	0	8
2	57 Stanley Road	AQMA No. 11	18.2	45	47	92	6	1	0	1	0	8
3	St. John's Court	AQMA No. 11	18.2	45	47	92	5	1	0	1	0	8
4	Rudmore Court	AQMA No. 11	18.1	45	47	92	5	1	0	0	0	8
5	The Admiral PH	AQMA No. 11	18.6	41	47	89	8	2	1	1	0	11
6	Peninsular House	AQMA No. 11	18.3	42	48	90	7	2	1	1	0	10
7	162-189 Mile End Road	AQMA No. 11	18.2	42	48	90	6	2	1	1	0	10
8	The Air Balloon	AQMA No. 11	18.4	42	48	89	7	2	1	1	1	11
9	Ferry Lodge House	AQMA No. 11	19.0	41	46	87	9	2	1	0	1	13
10	72-126 Grafton Street	AQMA No. 11	18.2	42	48	90	7	2	1	0	1	10
11	373-375 Commercial Road	AQMA No. 11	19.9	39	44	83	12	3	1	0	1	17
12	239-241 Commercial Road	AQMA No. 11	19.3	39	48	87	9	2	1	0	2	13
13	Hallowell House	AQMA No. 11	18.9	40	49	89	8	2	1	0	1	11
14	St. Edmund House	-	20.4	35	53	88	9	2	1	0	1	12
15	Arts Lodge Park Cafe	-	20.0	36	54	89	7	1	1	0	1	11
16	Barham House	-	19.4	37	55	92	5	1	0	0	1	8
17	122-128 Lake Road	AQMA No. 11	18.4	41	50	91	6	1	0	0	1	9
18	314-316 Fratton Road	AQMA No. 6	19.8	39	44	82	12	3	1	0	2	18
19	Hale Court	AQMA No. 6	19.1	40	45	85	10	3	1	0	2	15
20	7 Fawcett Road	-	17.5	44	46	90	7	2	0	0	1	10
21	Priory School	-	17.5	44	46	90	7	2	0	0	1	10
22	Pounds Gate	AQMA No. 12	19.0	38	56	94	3	1	0	0	2	6
23	Priory View	-	17.1	45	47	92	6	1	0	0	1	8
24	Pink Court	AQMA No. 6	18.8	40	45	85	10	3	1	0	1	15

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	18.0	42	47	89	8	2	0	0	1	11
26	48-50 Kingston Road	AQMA No. 6	20.3	38	42	80	13	4	1	0	2	20
27	89 Kingston Road	AQMA No. 6	19.1	40	45	85	9	3	1	0	2	15
28	156 Kingston Road	AQMA No. 6	19.5	39	45	84	10	3	1	0	2	16
29	192-194 Kingston Road	AQMA No. 6	19.8	39	44	83	11	3	1	0	2	17
30	Kingsbury Mansions	AQMA No. 6	20.1	38	43	82	11	3	1	0	2	18
31	61 Kingston Crescent	AQMA No. 6	18.8	41	46	87	8	2	1	0	1	13
32	16 London Road	AQMA No. 6	20.1	38	44	82	11	3	1	0	3	18
33	Ross Apartments	AQMA No. 6	19.5	42	44	86	9	3	1	0	2	14
34	156 London Road	AQMA No. 6	18.8	41	47	88	7	2	1	0	2	12
35	589 London Road	-	19.0	42	47	89	6	2	1	0	1	11
36	60-62 Northern Road	-	18.5	41	45	87	9	2	1	0	2	13
37	84 Northern Road	-	18.1	42	46	89	8	2	1	0	1	11
38	Victoria House A3	AQMA No. 7	17.3	42	47	89	7	2	1	0	1	11
39	115 Eastern Road	AQMA No. 9	17.8	42	47	90	7	2	1	0	0	10
40	Lacey Road	AQMA No. 9	18.5	41	46	86	9	3	1	0	0	14
41	53 Velder Avenue	-	18.7	40	45	86	10	3	1	0	0	14
42	7 Velder Avenue	AQMA No. 9	18.6	40	45	86	10	3	1	0	0	14
43	195-197 Milton Road	AQMA No. 9	18.8	40	45	85	10	3	1	0	1	15
44	233 Milton Road	AQMA No. 9	18.4	41	46	87	9	3	1	0	1	13
45	1 Goldsmith Avenue	-	18.0	43	43	86	9	2	1	0	2	14
46	Victoria House, Victoria Road North	-	17.1	44	48	92	6	1	0	0	1	8
47	Keyes Court	-	17.0	44	48	92	5	1	0	0	1	8
48	Brandon House	-	16.4	43	44	88	8	2	0	0	1	13

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	16.8	42	43	85	10	3	0	0	1	15
50	Craneswater School	-	16.0	44	45	90	7	2	0	0	1	10
51	109 Highland Road	-	17.3	44	47	91	6	2	0	0	1	9
52	St. Andrew's Court	AQMA No. 7	17.1	43	47	90	7	2	1	0	1	10
53	1-4 Charter House	AQMA No. 7	16.8	43	48	91	6	1	0	0	1	9
54	Mill Pond Apartments	-	19.1	38	56	94	3	1	0	0	2	6

5.1.4 PM_{10} – 2020

Predicted annual mean PM_{10} concentrations in 2020 are shown in Table 16 along with the source contributions from regional and local background emissions sources and local traffic emissions.

5.1.4.1 Comparison with AQO

Predicted annual mean PM_{10} concentrations in 2020 are predicted to be well below the annual mean PM_{10} AQO at all modelled receptor locations (Table 16). The highest predicted annual mean PM_{10} concentration in 2020 is 19.4 µg/m^3 at St. Edmund House (Receptor 14). This receptor is situated alongside A3 Alfred Road and does not lie within any of the AQMAs. The second highest annual mean PM_{10} concentration (19.1 µg/m^3) is predicted at 48-50 Kingston Road (Receptor 26). An annual mean PM_{10} concentration of 19.0 µg/m^3 is predicted at two receptors (Receptor 15, Arts Lodge Park Café and Receptor 30, Kingsbury Mansions).

The predicted annual mean PM_{10} concentrations at worst-case receptor locations within each of the AQMAs are as follows:

- AQMA No. 6: 19.1 µg/m^3 at 48-50 Kingston Road (Receptor 26);
- AQMA No. 7: 16.4 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 17.8 µg/m^3 at 195-197 Milton Road (Receptor 43);
- AQMA No. 11: 18.9 µg/m^3 at 373-375 Commercial Road (Receptor 11); and
- AQMA No. 12: 18.1 µg/m^3 at Pounds Gate (Receptor 22).

5.1.4.2 Source Apportionment

Local road traffic sources to annual mean PM_{10} concentrations are predicted to account for up to 3.6 µg/m^3 to total modelled PM_{10} concentrations (Table 16). Expressed as percentages, local source contributions are predicted to account for 5% to 19% of annual mean PM_{10} concentrations at modelled receptor locations, with 81% to 95% attributable to background sources (regional and local; Table 17).

The largest local source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

On average, cars and taxis are estimated to be the largest local source contributors, accounting for 0.5 µg/m^3 to 2.5 µg/m^3 (3% to 13%) of total annual mean PM_{10} concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 2.5 µg/m^3; 13% of total annual mean PM_{10})
- 373-375 Commercial Road (Receptor 11; 2.3 µg/m^3; 12% of total annual mean PM_{10})
- 314-316 Fratton Road (Receptor 18; 2.2 µg/m^3; 12% of total annual mean PM_{10})

LGVs are estimated to be the largest local source contributor after cars and taxis, accounting for between 0.1 µg/m^3 and 0.6 µg/m^3 (1% to 3%) of total annual mean PM_{10} concentrations at modelled receptor locations. Buses are the third largest contributing vehicle type, accounting for up to 0.4 µg/m^3 (2%) of total modelled PM_{10} concentrations. OGV1 and OGV2 are the smallest local contributors, accounting for less than 1% of total PM_{10} concentrations.

5.1.4.3 Required Reductions to Achieve the AQO

Annual mean PM_{10} concentrations in 2020 are predicted to be well below the annual mean PM_{10} AQO at all locations throughout Portsmouth and so reductions to attain the AQO are not required.

Table 16 Predicted Annual Mean PM_{10} Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	17.4	16.1	8.1	8.0	0.9	0.2	0.1	0.1	0.0	1.3
2	57 Stanley Road	AQMA No. 11	17.5	16.1	8.1	8.0	1.0	0.2	0.1	0.1	0.0	1.4
3	St. John's Court	AQMA No. 11	17.4	16.1	8.1	8.0	0.9	0.2	0.1	0.1	0.0	1.3
4	Rudmore Court	AQMA No. 11	17.4	16.1	8.1	8.0	0.9	0.2	0.1	0.1	0.0	1.3
5	The Admiral PH	AQMA No. 11	17.7	15.8	7.7	8.1	1.3	0.3	0.1	0.1	0.1	1.9
6	Peninsular House	AQMA No. 11	17.5	15.8	7.7	8.1	1.1	0.2	0.1	0.1	0.1	1.7
7	162-189 Mile End Road	AQMA No. 11	17.4	15.8	7.7	8.1	1.1	0.2	0.1	0.1	0.1	1.6
8	The Air Balloon	AQMA No. 11	17.5	15.8	7.7	8.1	1.2	0.3	0.1	0.1	0.1	1.7
9	Ferry Lodge House	AQMA No. 11	18.1	15.8	7.7	8.1	1.7	0.3	0.1	0.1	0.1	2.3
10	72-126 Grafton Street	AQMA No. 11	17.4	15.8	7.7	8.1	1.2	0.2	0.1	0.0	0.1	1.6
11	373-375 Commercial Road	AQMA No. 11	18.9	15.8	7.7	8.1	2.3	0.5	0.1	0.1	0.1	3.1
12	239-241 Commercial Road	AQMA No. 11	18.3	16.0	7.5	8.5	1.6	0.3	0.1	0.0	0.2	2.3
13	Hallowell House	AQMA No. 11	17.9	16.0	7.5	8.5	1.3	0.2	0.1	0.0	0.1	1.9
14	St. Edmund House	-	19.4	17.2	7.2	10.1	1.6	0.3	0.1	0.0	0.1	2.2
15	Arts Lodge Park Cafe	-	19.0	17.2	7.2	10.1	1.3	0.2	0.1	0.0	0.2	1.8
16	Barham House	-	18.5	17.2	7.2	10.1	0.9	0.2	0.1	0.0	0.1	1.3
17	122-128 Lake Road	AQMA No. 11	17.5	16.0	7.5	8.5	1.0	0.2	0.0	0.0	0.2	1.5
18	314-316 Fratton Road	AQMA No. 6	18.6	15.6	7.6	8.0	2.2	0.5	0.1	0.0	0.3	3.1
19	Hale Court	AQMA No. 6	18.1	15.6	7.6	8.0	1.7	0.4	0.1	0.0	0.3	2.5
20	7 Fawcett Road	-	16.7	15.1	7.6	7.5	1.2	0.3	0.0	0.0	0.1	1.6
21	Priory School	-	16.7	15.1	7.6	7.5	1.2	0.3	0.0	0.0	0.1	1.6
22	Pounds Gate	AQMA No. 12	18.1	17.2	7.2	10.1	0.5	0.1	0.0	0.0	0.3	0.9
23	Priory View	-	16.3	15.1	7.6	7.5	0.9	0.2	0.0	0.0	0.1	1.2
24	Pink Court	AQMA No. 6	17.8	15.3	7.5	7.8	1.8	0.4	0.1	0.0	0.1	2.5

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	17.1	15.3	7.5	7.8	1.3	0.3	0.1	0.0	0.1	1.8
26	48-50 Kingston Road	AQMA No. 6	19.1	15.6	7.6	8.0	2.5	0.6	0.1	0.0	0.3	3.6
27	89 Kingston Road	AQMA No. 6	18.1	15.6	7.6	8.0	1.7	0.4	0.1	0.0	0.3	2.5
28	156 Kingston Road	AQMA No. 6	18.5	15.8	7.7	8.1	1.8	0.5	0.1	0.0	0.3	2.7
29	192-194 Kingston Road	AQMA No. 6	18.7	15.8	7.7	8.1	2.0	0.5	0.1	0.0	0.3	2.9
30	Kingsbury Mansions	AQMA No. 6	19.0	15.8	7.7	8.1	2.1	0.5	0.1	0.1	0.3	3.2
31	61 Kingston Crescent	AQMA No. 6	17.9	15.8	7.7	8.1	1.5	0.4	0.1	0.1	0.1	2.1
32	16 London Road	AQMA No. 6	18.9	15.8	7.7	8.1	2.0	0.5	0.1	0.1	0.4	3.1
33	Ross Apartments	AQMA No. 6	18.5	16.1	8.1	8.0	1.6	0.4	0.1	0.0	0.3	2.4
34	156 London Road	AQMA No. 6	17.8	15.9	7.7	8.2	1.2	0.3	0.1	0.0	0.2	1.9
35	589 London Road	-	18.1	16.3	8.0	8.3	1.1	0.3	0.1	0.0	0.2	1.8
36	60-62 Northern Road	-	17.5	15.4	7.6	7.7	1.5	0.3	0.1	0.0	0.2	2.2
37	84 Northern Road	-	17.2	15.4	7.6	7.7	1.3	0.3	0.1	0.0	0.1	1.8
38	Victoria House A3	AQMA No. 7	16.4	14.7	7.3	7.5	1.2	0.3	0.1	0.0	0.1	1.7
39	115 Eastern Road	AQMA No. 9	17.0	15.3	7.5	7.8	1.2	0.3	0.1	0.0	0.0	1.7
40	Lacey Road	AQMA No. 9	17.6	15.3	7.5	7.8	1.6	0.5	0.1	0.0	0.0	2.3
41	53 Velder Avenue	-	17.7	15.3	7.5	7.8	1.7	0.5	0.1	0.1	0.0	2.4
42	7 Velder Avenue	AQMA No. 9	17.7	15.3	7.5	7.8	1.7	0.5	0.1	0.0	0.1	2.4
43	195-197 Milton Road	AQMA No. 9	17.8	15.3	7.5	7.8	1.8	0.5	0.1	0.0	0.1	2.5
44	233 Milton Road	AQMA No. 9	17.5	15.3	7.5	7.8	1.6	0.4	0.1	0.0	0.1	2.2
45	1 Goldsmith Avenue	-	17.1	14.9	7.6	7.2	1.5	0.4	0.1	0.0	0.2	2.2
46	Victoria House, Victoria Road North	-	16.2	15.0	7.5	7.5	0.9	0.2	0.0	0.0	0.1	1.2
47	Keyes Court	-	16.2	15.0	7.5	7.5	0.8	0.2	0.0	0.0	0.1	1.2
48	Brandon House	-	15.5	13.7	7.1	6.7	1.3	0.3	0.0	0.0	0.1	1.8

Receptor Number	Receptor Name	AQMA	Annual Mean PM_{10} Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	15.9	13.7	7.1	6.7	1.5	0.4	0.1	0.0	0.2	2.1
50	Craneswater School	-	15.2	13.7	7.1	6.7	1.0	0.2	0.0	0.0	0.1	1.5
51	109 Highland Road	-	16.5	15.1	7.6	7.5	1.0	0.2	0.0	0.0	0.1	1.4
52	St. Andrew's Court	AQMA No. 7	16.3	14.7	7.3	7.5	1.1	0.2	0.1	0.0	0.1	1.5
53	1-4 Charter House	AQMA No. 7	16.0	14.7	7.3	7.5	0.9	0.2	0.1	0.0	0.1	1.3
54	Mill Pond Apartments	-	18.2	17.2	7.2	10.1	0.6	0.1	0.0	0.0	0.3	1.0

Table 17 Source Apportionment of Annual Mean PM_{10} Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	17.4	47	46	93	5	1	0	0	0	7
2	57 Stanley Road	AQMA No. 11	17.5	46	46	92	6	1	0	0	0	8
3	St. John's Court	AQMA No. 11	17.4	47	46	92	5	1	0	0	0	8
4	Rudmore Court	AQMA No. 11	17.4	47	46	93	5	1	0	0	0	7
5	The Admiral PH	AQMA No. 11	17.7	43	46	89	8	2	1	1	0	11
6	Peninsular House	AQMA No. 11	17.5	44	46	90	7	1	1	1	0	10
7	162-189 Mile End Road	AQMA No. 11	17.4	44	47	91	6	1	0	0	0	9
8	The Air Balloon	AQMA No. 11	17.5	44	46	90	7	1	1	1	0	10
9	Ferry Lodge House	AQMA No. 11	18.1	42	45	87	9	2	1	0	1	13
10	72-126 Grafton Street	AQMA No. 11	17.4	44	47	91	7	1	0	0	0	9
11	373-375 Commercial Road	AQMA No. 11	18.9	41	43	84	12	2	1	0	1	16
12	239-241 Commercial Road	AQMA No. 11	18.3	41	47	88	9	2	1	0	1	12
13	Hallowell House	AQMA No. 11	17.9	42	48	90	8	1	0	0	1	10
14	St. Edmund House	-	19.4	37	52	89	8	2	1	0	1	11
15	Arts Lodge Park Cafe	-	19.0	38	53	90	7	1	0	0	1	10
16	Barham House	-	18.5	39	54	93	5	1	0	0	1	7
17	122-128 Lake Road	AQMA No. 11	17.5	43	49	92	6	1	0	0	1	8
18	314-316 Fratton Road	AQMA No. 6	18.6	41	43	83	12	3	1	0	2	17
19	Hale Court	AQMA No. 6	18.1	42	44	86	10	2	0	0	1	14
20	7 Fawcett Road	-	16.7	46	45	91	7	2	0	0	0	9
21	Priory School	-	16.7	46	45	91	7	2	0	0	0	9
22	Pounds Gate	AQMA No. 12	18.1	39	55	95	3	1	0	0	1	5
23	Priory View	-	16.3	47	46	93	6	1	0	0	0	7
24	Pink Court	AQMA No. 6	17.8	42	44	86	10	2	1	0	1	14

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	17.1	44	45	90	8	2	0	0	1	10
26	48-50 Kingston Road	AQMA No. 6	19.1	40	42	81	13	3	1	0	2	19
27	89 Kingston Road	AQMA No. 6	18.1	42	44	86	9	2	1	0	2	14
28	156 Kingston Road	AQMA No. 6	18.5	41	44	85	10	2	1	0	2	15
29	192-194 Kingston Road	AQMA No. 6	18.7	41	43	84	10	3	1	0	2	16
30	Kingsbury Mansions	AQMA No. 6	19.0	40	43	83	11	3	1	0	2	17
31	61 Kingston Crescent	AQMA No. 6	17.9	43	45	88	8	2	1	0	1	12
32	16 London Road	AQMA No. 6	18.9	41	43	84	11	3	1	0	2	16
33	Ross Apartments	AQMA No. 6	18.5	44	43	87	8	2	1	0	2	13
34	156 London Road	AQMA No. 6	17.8	43	46	89	7	2	1	0	1	11
35	589 London Road	-	18.1	44	46	90	6	2	1	0	1	10
36	60-62 Northern Road	-	17.5	44	44	88	8	2	0	0	1	12
37	84 Northern Road	-	17.2	44	45	90	7	2	0	0	1	10
38	Victoria House A3	AQMA No. 7	16.4	44	45	90	7	2	0	0	1	10
39	115 Eastern Road	AQMA No. 9	17.0	44	46	90	7	2	0	0	0	10
40	Lacey Road	AQMA No. 9	17.6	43	45	87	9	3	1	0	0	13
41	53 Velder Avenue	-	17.7	42	44	86	10	3	1	0	0	14
42	7 Velder Avenue	AQMA No. 9	17.7	42	44	87	10	3	1	0	0	13
43	195-197 Milton Road	AQMA No. 9	17.8	42	44	86	10	3	1	0	1	14
44	233 Milton Road	AQMA No. 9	17.5	43	45	88	9	2	0	0	1	12
45	1 Goldsmith Avenue	-	17.1	45	42	87	9	2	0	0	1	13
46	Victoria House, Victoria Road North	-	16.2	46	46	92	6	1	0	0	0	8
47	Keyes Court	-	16.2	46	46	93	5	1	0	0	1	7
48	Brandon House	-	15.5	45	43	89	8	2	0	0	1	11

Receptor Number	Receptor Name	AQMA	Total Modelled PM_{10}	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	15.9	44	42	87	10	2	0	0	1	13
50	Craneswater School	-	15.2	46	44	90	7	2	0	0	1	10
51	109 Highland Road	-	16.5	46	45	92	6	1	0	0	1	8
52	St. Andrew's Court	AQMA No. 7	16.3	45	46	91	7	1	0	0	1	9
53	1-4 Charter House	AQMA No. 7	16.0	45	47	92	5	1	0	0	1	8
54	Mill Pond Apartments	-	18.2	39	55	94	3	1	0	0	2	6

5.1.5 $PM_{2.5}$ – 2015

Predicted annual mean $PM_{2.5}$ concentrations in the 2015 baseline year are shown in Table 18 along with the source contributions from regional and local background emissions sources and local traffic emissions.

5.1.5.1 Comparison with EU Limit Value

Predicted annual mean $PM_{2.5}$ concentrations in 2015 are predicted to be well below the annual mean $PM_{2.5}$ EU Limit Value at all modelled receptor locations (Table 18). The highest predicted annual mean $PM_{2.5}$ concentration in 2015 is 14.1 µg/m^3 at 48-50 Kingston Road (Receptor 26). An annual mean $PM_{2.5}$ concentration of 13.9 µg/m^3 is predicted at two receptor locations (Receptor 30, Kingsbury Mansions and Receptor 32, 16 London Road).

The predicted annual mean $PM_{2.5}$ concentrations at worst-case receptor locations within each of the AQMAs are as follows:

- AQMA No. 6: 14.1 µg/m^3 at 48-50 Kingston Road (Receptor 26);
- AQMA No. 7: 12.1 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 13.0 µg/m^3 at 195-197 Milton Road (Receptor 43);
- AQMA No. 11: 13.7 µg/m^3 at 373-375 Commercial Road (Receptor 11); and
- AQMA No. 12: 12.9 µg/m^3 at Pounds Gate (Receptor 22).

5.1.5.2 Source Apportionment

Local road traffic sources to annual mean $PM_{2.5}$ concentrations are predicted to account for up to 2.6 µg/m^3 of total modelled $PM_{2.5}$ concentrations (Table 18). Expressed as percentages, local source contributions are predicted to account for 5% to 18% of annual mean $PM_{2.5}$ concentrations at modelled receptor locations, with 82% to 95% attributable to background sources (regional and local; Table 19).

The largest local source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

On average, cars and taxis are estimated to be the largest local source contributors, accounting for 0.3 µg/m^3 to 1.6 µg/m^3 (3% to 12%) of total annual mean $PM_{2.5}$ concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 1.6 µg/m^3; 12% of total annual mean $PM_{2.5}$);
- 373-375 Commercial Road (Receptor 11; 1.5 µg/m^3; 11% of total annual mean $PM_{2.5}$); and
- 314-316 Fratton Road (Receptor 18; 1.4 µg/m^3; 10% of total annual mean $PM_{2.5}$).

LGVs are estimated to be the largest local source contributor after cars and taxis, accounting for between 0.1 µg/m^3 and 0.5 µg/m^3 (1% to 3%) of total annual mean $PM_{2.5}$ concentrations at modelled receptor locations. Buses are the third largest contributing vehicle type, accounting for up to 0.4 µg/m^3 (3%) of total modelled $PM_{2.5}$ concentrations. OGV1 and OGV2 are the smallest local contributors, accounting for less than 1% of total $PM_{2.5}$ concentrations.

5.1.5.3 Required Reductions to Achieve the EU Limit Value

Annual mean $PM_{2.5}$ concentrations in 2015 are predicted to be well below the annual mean $PM_{2.5}$ EU Limit at all locations throughout Portsmouth and so reductions to attain the Limit Value are not required.

Table 18 Predicted Annual Mean $PM_{2.5}$ Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	12.6	11.7	4.6	7.1	0.6	0.1	0.1	0.1	0.0	0.9
2	57 Stanley Road	AQMA No. 11	12.6	11.7	4.6	7.1	0.6	0.2	0.1	0.1	0.0	0.9
3	St. John's Court	AQMA No. 11	12.6	11.7	4.6	7.1	0.6	0.2	0.1	0.1	0.0	0.9
4	Rudmore Court	AQMA No. 11	12.6	11.7	4.6	7.1	0.6	0.1	0.1	0.1	0.0	0.9
5	The Admiral PH	AQMA No. 11	12.9	11.6	4.4	7.1	0.9	0.2	0.1	0.1	0.1	1.3
6	Peninsular House	AQMA No. 11	12.7	11.6	4.4	7.1	0.7	0.2	0.1	0.1	0.1	1.2
7	162-189 Mile End Road	AQMA No. 11	12.6	11.6	4.4	7.1	0.7	0.2	0.1	0.1	0.1	1.1
8	The Air Balloon	AQMA No. 11	12.7	11.6	4.4	7.1	0.8	0.2	0.1	0.1	0.1	1.2
9	Ferry Lodge House	AQMA No. 11	13.1	11.6	4.4	7.1	1.1	0.3	0.1	0.1	0.1	1.5
10	72-126 Grafton Street	AQMA No. 11	12.6	11.6	4.4	7.1	0.7	0.2	0.1	0.0	0.1	1.1
11	373-375 Commercial Road	AQMA No. 11	13.7	11.6	4.4	7.1	1.5	0.4	0.1	0.0	0.1	2.2
12	239-241 Commercial Road	AQMA No. 11	13.5	11.8	4.3	7.5	1.0	0.2	0.1	0.0	0.2	1.6
13	Hallowell House	AQMA No. 11	13.1	11.8	4.3	7.5	0.9	0.2	0.1	0.0	0.1	1.3
14	St. Edmund House	-	13.8	12.2	4.2	8.1	1.1	0.2	0.1	0.0	0.1	1.5
15	Arts Lodge Park Cafe	-	13.6	12.2	4.2	8.1	0.9	0.2	0.1	0.0	0.2	1.3
16	Barham House	-	13.2	12.2	4.2	8.1	0.6	0.1	0.0	0.0	0.1	0.9
17	122-128 Lake Road	AQMA No. 11	12.9	11.8	4.3	7.5	0.7	0.2	0.0	0.0	0.2	1.1
18	314-316 Fratton Road	AQMA No. 6	13.8	11.5	4.4	7.2	1.4	0.4	0.1	0.0	0.3	2.3
19	Hale Court	AQMA No. 6	13.3	11.5	4.4	7.2	1.1	0.3	0.1	0.0	0.2	1.8
20	7 Fawcett Road	-	12.3	11.2	4.4	6.8	0.8	0.2	0.0	0.0	0.1	1.1
21	Priory School	-	12.2	11.2	4.4	6.8	0.8	0.2	0.0	0.0	0.1	1.1
22	Pounds Gate	AQMA No. 12	12.9	12.2	4.2	8.1	0.3	0.1	0.0	0.0	0.2	0.7
23	Priory View	-	12.0	11.2	4.4	6.8	0.6	0.2	0.0	0.0	0.1	0.9
24	Pink Court	AQMA No. 6	13.1	11.3	4.4	7.0	1.2	0.3	0.1	0.0	0.1	1.8

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	12.6	11.3	4.4	7.0	0.9	0.2	0.1	0.0	0.1	1.3
26	48-50 Kingston Road	AQMA No. 6	14.1	11.5	4.4	7.2	1.6	0.5	0.1	0.0	0.3	2.6
27	89 Kingston Road	AQMA No. 6	13.4	11.5	4.4	7.2	1.1	0.3	0.1	0.0	0.3	1.8
28	156 Kingston Road	AQMA No. 6	13.5	11.6	4.4	7.1	1.2	0.4	0.1	0.0	0.3	2.0
29	192-194 Kingston Road	AQMA No. 6	13.7	11.6	4.4	7.1	1.3	0.4	0.1	0.0	0.3	2.1
30	Kingsbury Mansions	AQMA No. 6	13.9	11.6	4.4	7.1	1.4	0.5	0.1	0.0	0.4	2.4
31	61 Kingston Crescent	AQMA No. 6	13.1	11.6	4.4	7.1	1.0	0.3	0.1	0.1	0.1	1.5
32	16 London Road	AQMA No. 6	13.9	11.6	4.4	7.1	1.4	0.4	0.1	0.0	0.4	2.3
33	Ross Apartments	AQMA No. 6	13.5	11.7	4.6	7.1	1.0	0.3	0.1	0.0	0.3	1.8
34	156 London Road	AQMA No. 6	13.1	11.7	4.4	7.3	0.8	0.3	0.1	0.0	0.2	1.4
35	589 London Road	-	13.1	11.8	4.6	7.3	0.8	0.3	0.1	0.0	0.1	1.3
36	60-62 Northern Road	-	12.9	11.4	4.4	7.0	1.0	0.3	0.1	0.0	0.2	1.5
37	84 Northern Road	-	12.7	11.4	4.4	7.0	0.8	0.2	0.1	0.0	0.1	1.3
38	Victoria House A3	AQMA No. 7	12.1	10.9	4.2	6.7	0.8	0.2	0.1	0.0	0.1	1.2
39	115 Eastern Road	AQMA No. 9	12.4	11.3	4.3	7.0	0.8	0.3	0.1	0.0	0.0	1.2
40	Lacey Road	AQMA No. 9	12.8	11.3	4.3	7.0	1.0	0.4	0.1	0.0	0.0	1.6
41	53 Velder Avenue	-	12.9	11.3	4.3	7.0	1.1	0.4	0.1	0.0	0.0	1.7
42	7 Velder Avenue	AQMA No. 9	12.9	11.3	4.3	7.0	1.1	0.4	0.1	0.0	0.1	1.7
43	195-197 Milton Road	AQMA No. 9	13.0	11.3	4.3	7.0	1.2	0.4	0.1	0.0	0.1	1.8
44	233 Milton Road	AQMA No. 9	12.8	11.3	4.3	7.0	1.0	0.3	0.1	0.0	0.1	1.5
45	1 Goldsmith Avenue	-	12.5	10.9	4.4	6.5	1.0	0.3	0.1	0.0	0.2	1.6
46	Victoria House, Victoria Road North	-	12.0	11.1	4.3	6.8	0.6	0.2	0.0	0.0	0.1	0.9
47	Keyes Court	-	12.0	11.1	4.3	6.8	0.6	0.2	0.0	0.0	0.1	0.9
48	Brandon House	-	11.5	10.2	4.1	6.1	0.9	0.3	0.0	0.0	0.1	1.3

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	11.8	10.2	4.1	6.1	1.0	0.3	0.1	0.0	0.2	1.6
50	Craneswater School	-	11.3	10.2	4.1	6.1	0.7	0.2	0.0	0.0	0.1	1.0
51	109 Highland Road	-	12.1	11.2	4.4	6.8	0.6	0.2	0.0	0.0	0.1	1.0
52	St. Andrew's Court	AQMA No. 7	12.0	10.9	4.2	6.7	0.7	0.2	0.1	0.0	0.1	1.1
53	1-4 Charter House	AQMA No. 7	11.8	10.9	4.2	6.7	0.6	0.1	0.1	0.0	0.1	0.9
54	Mill Pond Apartments	-	13.0	12.2	4.2	8.1	0.4	0.1	0.0	0.0	0.2	0.8

Table 19 Source Apportionment of Annual Mean $PM_{2.5}$ Concentrations at Modelled Receptor Locations in 2015

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	12.6	37	56	93	5	1	0	0	0	7
2	57 Stanley Road	AQMA No. 11	12.6	37	56	93	5	1	0	0	0	7
3	St. John's Court	AQMA No. 11	12.6	37	56	93	5	1	0	0	0	7
4	Rudmore Court	AQMA No. 11	12.6	37	56	93	4	1	0	0	0	7
5	The Admiral PH	AQMA No. 11	12.9	34	55	90	7	2	1	1	0	10
6	Peninsular House	AQMA No. 11	12.7	35	56	91	6	1	1	1	0	9
7	162-189 Mile End Road	AQMA No. 11	12.6	35	57	92	6	1	1	1	0	8
8	The Air Balloon	AQMA No. 11	12.7	35	56	91	6	2	1	1	1	9
9	Ferry Lodge House	AQMA No. 11	13.1	34	55	88	8	2	1	0	1	12
10	72-126 Grafton Street	AQMA No. 11	12.6	35	56	91	6	1	0	0	0	9
11	373-375 Commercial Road	AQMA No. 11	13.7	32	52	84	11	3	1	0	1	16
12	239-241 Commercial Road	AQMA No. 11	13.5	32	56	88	8	2	1	0	2	12
13	Hallowell House	AQMA No. 11	13.1	33	57	90	7	1	1	0	1	10
14	St. Edmund House	-	13.8	30	59	89	8	2	1	0	1	11
15	Arts Lodge Park Cafe	-	13.6	31	60	90	6	1	1	0	1	10
16	Barham House	-	13.2	32	62	93	5	1	0	0	1	7
17	122-128 Lake Road	AQMA No. 11	12.9	34	58	92	5	1	0	0	1	8
18	314-316 Fratton Road	AQMA No. 6	13.8	32	52	84	10	3	1	0	2	16
19	Hale Court	AQMA No. 6	13.3	33	54	86	9	2	1	0	2	14
20	7 Fawcett Road	-	12.3	36	55	91	6	2	0	0	1	9
21	Priory School	-	12.2	36	55	91	6	2	0	0	1	9
22	Pounds Gate	AQMA No. 12	12.9	32	63	95	3	1	0	0	2	5
23	Priory View	-	12.0	37	56	93	5	1	0	0	1	7
24	Pink Court	AQMA No. 6	13.1	33	53	86	9	3	1	0	1	14

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	12.6	34	55	90	7	2	0	0	1	10
26	48-50 Kingston Road	AQMA No. 6	14.1	31	51	82	12	3	1	0	2	18
27	89 Kingston Road	AQMA No. 6	13.4	33	54	86	8	3	1	0	2	14
28	156 Kingston Road	AQMA No. 6	13.5	33	53	85	9	3	1	0	2	15
29	192-194 Kingston Road	AQMA No. 6	13.7	32	52	85	9	3	1	0	2	15
30	Kingsbury Mansions	AQMA No. 6	13.9	32	51	83	10	3	1	0	3	17
31	61 Kingston Crescent	AQMA No. 6	13.1	34	55	88	7	2	1	0	1	12
32	16 London Road	AQMA No. 6	13.9	32	51	83	10	3	1	0	3	17
33	Ross Apartments	AQMA No. 6	13.5	34	53	87	8	2	1	0	2	13
34	156 London Road	AQMA No. 6	13.1	34	56	89	6	2	1	0	2	11
35	589 London Road	-	13.1	35	55	90	6	2	1	0	1	10
36	60-62 Northern Road	-	12.9	34	54	88	7	2	1	0	2	12
37	84 Northern Road	-	12.7	35	55	90	7	2	0	0	1	10
38	Victoria House A3	AQMA No. 7	12.1	35	55	90	7	2	1	0	1	10
39	115 Eastern Road	AQMA No. 9	12.4	35	56	91	6	2	0	0	0	9
40	Lacey Road	AQMA No. 9	12.8	34	54	88	8	3	1	0	0	12
41	53 Velder Avenue	-	12.9	33	54	87	9	3	1	0	0	13
42	7 Velder Avenue	AQMA No. 9	12.9	33	54	87	9	3	1	0	0	13
43	195-197 Milton Road	AQMA No. 9	13.0	33	53	86	9	3	1	0	1	14
44	233 Milton Road	AQMA No. 9	12.8	34	54	88	8	2	1	0	1	12
45	1 Goldsmith Avenue	-	12.5	35	52	87	8	2	0	0	2	13
46	Victoria House, Victoria Road North	-	12.0	36	57	93	5	1	0	0	1	7
47	Keyes Court	-	12.0	36	57	93	5	1	0	0	1	7
48	Brandon House	-	11.5	35	53	89	7	2	0	0	1	11

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	11.8	35	52	87	9	3	0	0	2	13
50	Craneswater School	-	11.3	36	54	91	6	2	0	0	1	9
51	109 Highland Road	-	12.1	36	56	92	5	2	0	0	1	8
52	St. Andrew's Court	AQMA No. 7	12.0	35	56	91	6	2	1	0	1	9
53	1-4 Charter House	AQMA No. 7	11.8	36	57	92	5	1	0	0	1	8
54	Mill Pond Apartments	-	13.0	32	62	94	3	1	0	0	2	6

5.1.6 $PM_{2.5}$ – 2020

Predicted annual mean $PM_{2.5}$ concentrations in 2020 are shown in Table 20 along with the source contributions from regional and local background emissions sources and local traffic emissions.

5.1.6.1 Comparison with EU Limit Value

Predicted annual mean $PM_{2.5}$ concentrations in 2020 are predicted to be well below the annual mean $PM_{2.5}$ EU Limit Value at all modelled receptor locations (Table 20). The highest predicted annual mean $PM_{2.5}$ concentration in 2020 is 13.0 µg/m^3 at 48-50 Kingston Road (Receptor 26). An annual mean $PM_{2.5}$ concentration of 12.8 µg/m^3 is predicted at three receptor locations (Receptor 14, St. Edmund House; Receptor 30, Kingsbury Mansions and Receptor 32, 16 London Road).

The predicted annual mean $PM_{2.5}$ concentrations at worst-case receptor locations within each of the AQMAs are as follows:

- AQMA No. 6: 13.0 µg/m^3 at 48-50 Kingston Road (Receptor 26);
- AQMA No. 7: 11.2 µg/m^3 at Victoria House A3 (Receptor 38);
- AQMA No. 9: 12.1 µg/m^3 at 195-197 Milton Road (Receptor 43);
- AQMA No. 11: 12.7 µg/m^3 at 373-375 Commercial Road (Receptor 11); and
- AQMA No. 12: 12.1 µg/m^3 at Pounds Gate (Receptor 22).

5.1.6.2 Source Apportionment

Local road traffic sources to annual mean $PM_{2.5}$ concentrations are predicted to account for up to 2.1 µg/m^3 of total modelled $PM_{2.5}$ concentrations (Table 20). Expressed as percentages, local source contributions are predicted to account for 4% to 16% of annual mean $PM_{2.5}$ concentrations at modelled receptor locations, with 84% to 96% attributable to background sources (regional and local; Table 21).

The largest local source contributions are predicted at receptors located within AQMA No. 6 along the London Road / Kingston Road / Fratton Road route corridor.

On average, cars and taxis are estimated to be the largest local source contributors, accounting for 0.3 µg/m^3 to 1.4 µg/m^3 (2% to 11%) of total annual mean $PM_{2.5}$ concentrations. The largest contributions due to cars and taxis are:

- 48-50 Kingston Road (Receptor 26; 1.4 µg/m^3; 11% of total annual mean $PM_{2.5}$)
- 373-375 Commercial Road (Receptor 11; 1.3 µg/m^3; 10% of total annual mean $PM_{2.5}$)
- 314-316 Fratton Road (Receptor 18; 1.3 µg/m^3; 10% of total annual mean $PM_{2.5}$)

LGVs are estimated to be the largest local source contributor after cars and taxis, accounting for up to 0.3 µg/m^3 (3%) of total annual mean $PM_{2.5}$ concentrations at modelled receptor locations. Buses are the third largest contributing vehicle type, accounting for up to 0.2 µg/m^3 (2%) of total modelled $PM_{2.5}$ concentrations. OGV1 and OGV2 are the smallest local contributors, accounting for less than 1% of total $PM_{2.5}$ concentrations.

5.1.6.3 Required Reductions to Achieve the EU Limit Value

Annual mean PM_{10} concentrations in 2020 are predicted to be well below the annual mean $PM_{2.5}$ EU Limit Value at all locations throughout Portsmouth and so reductions to attain the EU Limit Value are not required.

Table 20 Predicted Annual Mean $PM_{2.5}$ Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	11.8	11.1	4.6	6.5	0.5	0.1	0.0	0.0	0.0	0.7
2	57 Stanley Road	AQMA No. 11	11.9	11.1	4.6	6.5	0.5	0.1	0.0	0.0	0.0	0.8
3	St. John's Court	AQMA No. 11	11.9	11.1	4.6	6.5	0.5	0.1	0.0	0.0	0.0	0.7
4	Rudmore Court	AQMA No. 11	11.8	11.1	4.6	6.5	0.5	0.1	0.0	0.0	0.0	0.7
5	The Admiral PH	AQMA No. 11	12.0	10.9	4.4	6.5	0.8	0.2	0.1	0.1	0.0	1.1
6	Peninsular House	AQMA No. 11	11.9	10.9	4.4	6.5	0.6	0.1	0.1	0.1	0.0	1.0
7	162-189 Mile End Road	AQMA No. 11	11.8	10.9	4.4	6.5	0.6	0.1	0.0	0.0	0.0	0.9
8	The Air Balloon	AQMA No. 11	11.9	10.9	4.4	6.5	0.7	0.1	0.1	0.0	0.0	1.0
9	Ferry Lodge House	AQMA No. 11	12.2	10.9	4.4	6.5	0.9	0.2	0.1	0.0	0.1	1.3
10	72-126 Grafton Street	AQMA No. 11	11.8	10.9	4.4	6.5	0.6	0.1	0.0	0.0	0.0	0.9
11	373-375 Commercial Road	AQMA No. 11	12.7	10.9	4.4	6.5	1.3	0.3	0.1	0.0	0.1	1.8
12	239-241 Commercial Road	AQMA No. 11	12.4	11.1	4.3	6.8	0.9	0.2	0.1	0.0	0.1	1.3
13	Hallowell House	AQMA No. 11	12.2	11.1	4.3	6.8	0.8	0.1	0.0	0.0	0.1	1.1
14	St. Edmund House	-	12.8	11.5	4.1	7.4	0.9	0.2	0.1	0.0	0.1	1.3
15	Arts Lodge Park Cafe	-	12.6	11.5	4.1	7.4	0.8	0.1	0.0	0.0	0.1	1.1
16	Barham House	-	12.3	11.5	4.1	7.4	0.5	0.1	0.0	0.0	0.1	0.7
17	122-128 Lake Road	AQMA No. 11	11.9	11.1	4.3	6.8	0.6	0.1	0.0	0.0	0.1	0.8
18	314-316 Fratton Road	AQMA No. 6	12.7	10.9	4.3	6.5	1.3	0.3	0.1	0.0	0.2	1.8
19	Hale Court	AQMA No. 6	12.3	10.9	4.3	6.5	1.0	0.2	0.0	0.0	0.2	1.5
20	7 Fawcett Road	-	11.4	10.5	4.4	6.2	0.7	0.1	0.0	0.0	0.0	0.9
21	Priory School	-	11.4	10.5	4.4	6.2	0.7	0.1	0.0	0.0	0.0	0.9
22	Pounds Gate	AQMA No. 12	12.1	11.5	4.1	7.4	0.3	0.1	0.0	0.0	0.2	0.5
23	Priory View	-	11.2	10.5	4.4	6.2	0.5	0.1	0.0	0.0	0.0	0.7
24	Pink Court	AQMA No. 6	12.2	10.7	4.3	6.4	1.1	0.2	0.1	0.0	0.1	1.5

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations ($\mu g/m^3$)					Local Source Contributions ($\mu g/m^3$)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	11.7	10.7	4.3	6.4	0.7	0.2	0.0	0.0	0.1	1.0
26	48-50 Kingston Road	AQMA No. 6	13.0	10.9	4.3	6.5	1.4	0.3	0.1	0.0	0.2	2.1
27	89 Kingston Road	AQMA No. 6	12.4	10.9	4.3	6.5	1.0	0.2	0.1	0.0	0.2	1.5
28	156 Kingston Road	AQMA No. 6	12.5	10.9	4.4	6.5	1.1	0.3	0.1	0.0	0.2	1.6
29	192-194 Kingston Road	AQMA No. 6	12.6	10.9	4.4	6.5	1.1	0.3	0.1	0.0	0.2	1.7
30	Kingsbury Mansions	AQMA No. 6	12.8	10.9	4.4	6.5	1.2	0.3	0.1	0.0	0.2	1.9
31	61 Kingston Crescent	AQMA No. 6	12.2	10.9	4.4	6.5	0.9	0.2	0.1	0.0	0.1	1.2
32	16 London Road	AQMA No. 6	12.8	10.9	4.4	6.5	1.2	0.3	0.1	0.0	0.2	1.8
33	Ross Apartments	AQMA No. 6	12.5	11.1	4.6	6.5	0.9	0.2	0.1	0.0	0.2	1.4
34	156 London Road	AQMA No. 6	12.2	11.1	4.4	6.7	0.7	0.2	0.1	0.0	0.1	1.1
35	589 London Road	-	12.3	11.2	4.5	6.7	0.7	0.2	0.1	0.0	0.1	1.1
36	60-62 Northern Road	-	12.0	10.7	4.4	6.4	0.8	0.2	0.0	0.0	0.1	1.2
37	84 Northern Road	-	11.8	10.7	4.4	6.4	0.7	0.2	0.0	0.0	0.1	1.0
38	Victoria House A3	AQMA No. 7	11.2	10.2	4.2	6.1	0.7	0.1	0.0	0.0	0.1	1.0
39	115 Eastern Road	AQMA No. 9	11.6	10.7	4.3	6.4	0.7	0.2	0.0	0.0	0.0	1.0
40	Lacey Road	AQMA No. 9	12.0	10.7	4.3	6.4	0.9	0.3	0.1	0.0	0.0	1.3
41	53 Velder Avenue	-	12.0	10.7	4.3	6.4	1.0	0.3	0.1	0.0	0.0	1.4
42	7 Velder Avenue	AQMA No. 9	12.0	10.7	4.3	6.4	1.0	0.3	0.1	0.0	0.0	1.4
43	195-197 Milton Road	AQMA No. 9	12.1	10.7	4.3	6.4	1.0	0.3	0.1	0.0	0.1	1.4
44	233 Milton Road	AQMA No. 9	11.9	10.7	4.3	6.4	0.9	0.2	0.0	0.0	0.1	1.3
45	1 Goldsmith Avenue	-	11.6	10.3	4.4	6.0	0.9	0.2	0.0	0.0	0.1	1.3
46	Victoria House, Victoria Road North	-	11.1	10.4	4.3	6.1	0.5	0.1	0.0	0.0	0.0	0.7
47	Keyes Court	-	11.1	10.4	4.3	6.1	0.5	0.1	0.0	0.0	0.1	0.7
48	Brandon House	-	10.7	9.6	4.1	5.6	0.8	0.2	0.0	0.0	0.1	1.1

Receptor Number	Receptor Name	AQMA	Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)					Local Source Contributions (µg/m^3)				
			Total Modelled	Total Back-ground	Regional Back-ground	Local Back-ground	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	10.9	9.6	4.1	5.6	0.9	0.2	0.0	0.0	0.1	1.3
50	Craneswater School	-	10.5	9.6	4.1	5.6	0.6	0.1	0.0	0.0	0.1	0.9
51	109 Highland Road	-	11.3	10.5	4.4	6.2	0.6	0.1	0.0	0.0	0.1	0.8
52	St. Andrew's Court	AQMA No. 7	11.1	10.2	4.2	6.1	0.6	0.1	0.0	0.0	0.1	0.9
53	1-4 Charter House	AQMA No. 7	11.0	10.2	4.2	6.1	0.5	0.1	0.0	0.0	0.1	0.7
54	Mill Pond Apartments	-	12.1	11.5	4.1	7.4	0.3	0.1	0.0	0.0	0.2	0.6

Table 21 Source Apportionment of Annual Mean $PM_{2.5}$ Concentrations at Modelled Receptor Locations in 2020

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
1	133 Lower Derby Road	AQMA No. 11	11.8	39	55	94	4	1	0	0	0	6
2	57 Stanley Road	AQMA No. 11	11.9	39	55	94	5	1	0	0	0	6
3	St. John's Court	AQMA No. 11	11.9	39	55	94	4	1	0	0	0	6
4	Rudmore Court	AQMA No. 11	11.8	39	55	94	4	1	0	0	0	6
5	The Admiral PH	AQMA No. 11	12.0	37	55	91	6	1	0	0	0	9
6	Peninsular House	AQMA No. 11	11.9	37	55	92	5	1	0	1	0	8
7	162-189 Mile End Road	AQMA No. 11	11.8	37	55	93	5	1	0	0	0	7
8	The Air Balloon	AQMA No. 11	11.9	37	55	92	6	1	0	0	0	8
9	Ferry Lodge House	AQMA No. 11	12.2	36	54	89	8	2	1	0	0	11
10	72-126 Grafton Street	AQMA No. 11	11.8	37	55	92	5	1	0	0	0	8
11	373-375 Commercial Road	AQMA No. 11	12.7	35	51	86	10	2	1	0	1	14
12	239-241 Commercial Road	AQMA No. 11	12.4	35	55	90	7	1	0	0	1	10
13	Hallowell House	AQMA No. 11	12.2	35	56	91	6	1	0	0	1	9
14	St. Edmund House	-	12.8	32	58	90	7	1	0	0	1	10
15	Arts Lodge Park Cafe	-	12.6	33	59	92	6	1	0	0	1	8
16	Barham House	-	12.3	34	60	94	4	1	0	0	0	6
17	122-128 Lake Road	AQMA No. 11	11.9	36	57	93	5	1	0	0	1	7
18	314-316 Fratton Road	AQMA No. 6	12.7	34	52	86	10	2	0	0	2	14
19	Hale Court	AQMA No. 6	12.3	35	53	88	8	2	0	0	1	12
20	7 Fawcett Road	-	11.4	38	54	92	6	1	0	0	0	8
21	Priory School	-	11.4	38	54	92	6	1	0	0	0	8
22	Pounds Gate	AQMA No. 12	12.1	34	61	96	2	1	0	0	1	4
23	Priory View	-	11.2	39	55	94	5	1	0	0	0	6
24	Pink Court	AQMA No. 6	12.2	36	52	88	9	2	0	0	1	12

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
25	Jacob House	AQMA No. 6	11.7	37	54	91	6	1	0	0	1	9
26	48-50 Kingston Road	AQMA No. 6	13.0	34	51	84	11	3	1	0	2	16
27	89 Kingston Road	AQMA No. 6	12.4	35	53	88	8	2	0	0	1	12
28	156 Kingston Road	AQMA No. 6	12.5	35	52	87	8	2	0	0	1	13
29	192-194 Kingston Road	AQMA No. 6	12.6	35	52	86	9	2	0	0	2	14
30	Kingsbury Mansions	AQMA No. 6	12.8	34	51	85	10	2	1	0	2	15
31	61 Kingston Crescent	AQMA No. 6	12.2	36	54	90	7	2	0	0	1	10
32	16 London Road	AQMA No. 6	12.8	34	51	86	9	2	1	0	2	14
33	Ross Apartments	AQMA No. 6	12.5	37	52	89	7	2	0	0	2	11
34	156 London Road	AQMA No. 6	12.2	36	55	91	6	2	0	0	1	9
35	589 London Road	-	12.3	37	54	91	5	2	0	0	1	9
36	60-62 Northern Road	-	12.0	37	53	90	7	2	0	0	1	10
37	84 Northern Road	-	11.8	37	54	91	6	1	0	0	1	9
38	Victoria House A3	AQMA No. 7	11.2	37	54	91	6	1	0	0	1	9
39	115 Eastern Road	AQMA No. 9	11.6	37	55	92	6	2	0	0	0	8
40	Lacey Road	AQMA No. 9	12.0	36	53	89	8	2	0	0	0	11
41	53 Velder Avenue	-	12.0	36	53	88	8	2	1	0	0	12
42	7 Velder Avenue	AQMA No. 9	12.0	36	53	89	8	2	0	0	0	11
43	195-197 Milton Road	AQMA No. 9	12.1	35	53	88	8	2	0	0	0	12
44	233 Milton Road	AQMA No. 9	11.9	36	53	90	8	2	0	0	0	10
45	1 Goldsmith Avenue	-	11.6	38	52	89	7	2	0	0	1	11
46	Victoria House, Victoria Road North	-	11.1	39	55	94	5	1	0	0	0	6
47	Keyes Court	-	11.1	39	55	94	4	1	0	0	0	6
48	Brandon House	-	10.7	38	52	90	7	2	0	0	1	10

Receptor Number	Receptor Name	AQMA	Total Modelled $PM_{2.5}$	Background Contributions (%)			Local Source Contributions (%)					
				Regional	Local	Total Background Sources	Cars / Taxis	LGV	OGV1	OGV2	Buses	Total Local Sources
49	110-110A Albert Road	-	10.9	37	51	88	8	2	0	0	1	12
50	Craneswater School	-	10.5	39	53	92	6	1	0	0	1	8
51	109 Highland Road	-	11.3	38	54	93	5	1	0	0	1	7
52	St. Andrew's Court	AQMA No. 7	11.1	38	55	92	6	1	0	0	1	8
53	1-4 Charter House	AQMA No. 7	11.0	38	55	93	5	1	0	0	1	7
54	Mill Pond Apartments	-	12.1	34	61	95	3	1	0	0	1	5

5.2 Contour Plots and AQMA Aggregated Source Apportionment

Contour plots of annual mean NO_2 concentrations in 2015 and 2020 have been produced to illustrate the wider spatial patterns in pollutant concentrations in Portsmouth and to provide an indication of areas that are likely to exceed the annual mean NO_2 AQO. In addition to the contour plots, maps have been produced to display the source apportionment of local traffic sources in each of the five AQMAs.

5.2.1 NO_2 – 2015

Figure D.2 displays annual mean NO_2 concentrations across the study area in 2015. The highest annual mean NO_2 concentrations (up to 52 µg/m^3) are predicted along the London Road / Kingston Road corridor. Elevated levels are also predicted along the M275 / A3 route between the Rudmore and Church Street roundabouts.

Areas of exceedance of the annual mean NO_2 AQO along London Road / Kingston Road are predicted to be confined to within a few metres of either side of the road between the junction with Lake Road and the junction with Laburnum Grove. These areas are within the existing boundary of AQMA No. 6.

Areas of exceedance along the M275 / A3 are predicted to cover properties in the immediate vicinity of the Church Street roundabout, and between the junction with Princess Royal Road and the Rudmore roundabout. These areas are within the existing boundary of AQMA No. 11.

There are not predicted to be any areas of exceedance of the annual mean NO_2 AQO within AQMA No. 7, AQMA No. 9 or AQMA No. 12 in 2015.

Figure D.4 shows the aggregated apportionment of 2015 NO_2 concentrations in each of the AQMAs according to vehicle type. The values alongside each pie chart represent the contribution of each vehicle type to local source (i.e. road traffic) NO_2 concentrations in %. With the exception of AQMA No. 12, the largest local contributions to NO_2 concentrations are attributable to cars and taxis. These vehicles are predicted to contribute between 29.1% and 57.0% to NO_2 concentrations in the AQMAs. Within AQMA No. 12 buses are predicted to be the largest contributing local source accounting for 56.6% of the local NO_2 concentration. Buses are predicted to be the second largest contributing local source to NO_2 concentrations in AQMA No. 6 and AQMA No. 7. Cars and taxis are the most significant local contributor to NO_2 concentrations within AQMA No. 9 followed by LGVs.

5.2.2 NO_2 – 2020

Figure D.3 displays annual mean NO_2 concentrations across the study area in 2020. The highest annual mean NO_2 concentrations (up to 45 µg/m^3) are predicted along the London Road / Kingston Road corridor. Elevated levels are also predicted along the M275 / A3 near to the Church Street roundabout and Princess Royal Road.

The predicted areas of exceedance of the annual mean NO_2 AQO in 2020 display a similar pattern to those of 2015 but covering smaller extents. The key areas are along the London Road / Kingston Road and M275 / A3 corridors.

Areas of exceedance along London Road / Kingston Road are predicted to be confined to within a few metres of either side of the road between the junction with Clydebank Road and Heathfield Path. There are also small predicted areas of exceedance around the Kingston Road / New Road junction and Kingston Road / Lake Road junction. These areas are within the existing boundary of AQMA No. 6.

Areas of exceedance along the M275 / A3 are predicted to cover properties in the immediate vicinity of the Church Street roundabout, and a short section of the M275 north of the junction with Princess Royal Road. These areas are within the existing boundary of AQMA No. 11.

There are not predicted to be any areas of exceedance of the annual mean NO_2 AQO within AQMA No. 7, AQMA No. 9 or AQMA No. 12 in 2020.

Figure D.5 shows the aggregated apportionment of 2015 NO_2 concentrations in each of the AQMAs according to vehicle type. The values alongside each pie chart represent the contribution of each vehicle type to local source (i.e. road traffic) NO_2 concentrations in %. With the exception of AQMA No. 12, the largest local contributions to NO_2 concentrations are attributable to cars and taxis. These vehicles are predicted to contribute between 36.3% and 61.4% to NO_2 concentrations in the AQMAs. Within AQMA No. 12 buses are predicted to be the largest contributing local source accounting for 48.4% of the local NO_2 concentration. Buses are predicted to be the second largest contributing local source to annual mean NO_2 concentrations in AQMA No. 6 and AQMA No. 7. Cars and taxis are the most significant local contributor to NO_2 concentrations within AQMA No. 9 followed by LGVs.

6. Conclusions

A Source Apportionment Study has been carried out to determine the relative contributions of local road traffic to ambient concentrations of NO_2, PM_{10} and $PM_{2.5}$ in the city of Portsmouth. Geographical areas of the city where ambient pollutant concentrations exceed or are likely to exceed the relevant UK Air Quality Objectives (AQO) have been identified and the emissions reductions required to achieve compliance have been calculated. Source apportionment calculations have been carried out to quantify the contributions of different road vehicle types to ambient pollutant concentrations in the areas of likely exceedance.

6.1 Nitrogen Dioxide

6.1.1 2015

Local authority monitoring data for 2015 has shown that annual mean NO_2 concentrations exceeded the annual mean NO_2 AQO of 40 µg/m^3 at 4 locations within the city. The monitored exceedances are within the boundaries of the existing AQMAs.

The results of the detailed dispersion modelling for 2015 are consistent with the monitoring data with areas predicted to exceed the annual mean NO_2 AQO being confined to the London Road / Kingston Road / Fratton Road route corridor and the M275 / A3 corridor.

Exceedances of the annual mean NO_2 AQO are predicted at 11 sensitive receptor locations in 2015. All of the predicted exceedances are at locations within the existing AQMA boundaries. The highest predicted annual mean NO_2 concentration in 2015 at modelled receptor locations is 48.9 µg/m^3 at 16 London Road (Receptor 32). This receptor is located within AQMA No. 6. Exceedances are predicted at 8 other receptor locations along the London Road / Kingston Road / Fratton Road corridor within AQMA No. 6. The annual mean NO_2 AQO is also predicted to be exceeded at 2 receptors within AQMA No. 11, located alongside Commercial Road (Receptor 11, 373-375 Commercial Road and Receptor 12, 239-241 Commercial Road). Annual mean NO_2 concentrations at receptor locations within AQMA No. 7, AQMA No. 9 and AQMA No. 12 are predicted to be below the annual mean NO_2 AQO in 2015.

Source apportionment calculations indicate that at those receptors predicted to exceed the AQO, local traffic sources are estimated to account for 46% to 58% of total NO_2 concentrations. Cars and taxis are, on average, the most significant contributor to annual mean NO_2 concentrations at those receptors where NO_2 concentrations are predicted to exceed the AQO, accounting for 20% to 29% of annual mean NO_2 concentrations. Buses are estimated to account for 6% to 19% of annual mean NO_2 whilst LGVs account for 6% to 10%. Heavy goods vehicles (OGV1 and OGV2) are estimated to contribute up to 7% of annual mean NO_2 concentrations at receptors predicted to exceed the AQO.

In order to achieve the annual mean NO_2 AQO at all modelled receptor locations within AQMA No. 6 in 2015, reductions in NO_2 concentrations of up to 8.9 µg/m^3 are required. This corresponds to reductions in road NO_X emissions of up to 35%. Reductions in road NO_X emissions of around 14% are likely to be needed to attain the AQO at all receptor locations in AQMA No. 11. Since the AQO is expected to be achieved within AQMA NO. 7, AQMA No. 9 and AQMA No. 12, no reductions in road NO_X emissions are required in these areas in order to attain the AQO in 2015.

6.1.2 2020

In the 2020 scenario, exceedances of the annual mean NO_2 AQO are predicted at 4 sensitive receptor locations. All of the predicted exceedances are at locations within AQMA No. 6 along the London Road / Kingston Road / Fratton Road corridor. The highest predicted annual mean NO_2 concentration in 2020 at modelled receptor locations is 43.2 µg/m^3 at 16 London Road (Receptor 32). Annual mean NO_2 concentrations at receptor locations within AQMA No. 7, AQMA No. 9, AQMA No. 11 and AQMA No. 12 are predicted to be below the annual mean NO_2 AQO in 2020.

Source apportionment calculations indicate that at those receptors predicted to exceed the AQO local traffic sources are estimated to account for 54% to 55% of total NO_2 concentrations. Cars and taxis are, on average, the most significant contributor to annual mean NO_2 concentrations at those receptors where NO_2 concentrations are predicted to exceed the AQO, accounting for 24% to 29% of

annual mean NO_2 concentrations. Buses are estimated to account for 12% to 18% of annual mean NO_2 whilst LGVs account for 9% to 11%. Heavy goods vehicles (OGV1 and OGV2) are estimated to contribute up to 4% of annual mean NO_2 concentrations at receptors predicted to exceed the AQO.

In order to achieve the annual mean NO_2 AQO at all modelled receptor locations within AQMA No. 6 in 2020, reductions in NO_2 concentrations of up to 3.2 µg/m^3 are required. This corresponds to reductions in road NO_X emissions of up to 15%. Since the AQO is expected to be achieved within AQMA NO. 7, AQMA No. 9, AQMA No. 11 and AQMA No. 12, no further reductions in road NO_X emissions are required in these areas in order to attain the AQO in 2020.

6.1.3 Compliance with the Annual Mean NO_2 AQO

The results of the detailed dispersion modelling of annual mean NO_2 concentrations in Portsmouth indicates that exceedances of the annual mean NO_2 AQO are likely to remain in a few small areas in 2020 if no additional action is taken to improve local air quality.

Making the simplifying assumption that reductions in road NO_X between 2015 and 2020 continue beyond 2020 at the same rate it would be expected that all areas of Portsmouth will achieve compliance with the AQO by 2022.

6.2 Particulate Matter (PM_{10} and $PM_{2.5}$)

6.2.1 2015

Local authority monitoring of PM_{10} and $PM_{2.5}$ has shown that the annual mean UK AQO (PM_{10}) and EU Limit Value ($PM_{2.5}$) have been achieved in Portsmouth in recent years and exceedances are unlikely to occur anywhere within the city.

The results of the detailed dispersion modelling for 2015 are consistent with the monitoring data. Annual mean PM_{10} concentrations in 2015 are predicted to be 22 µg/m^3 and less at all modelled locations within the study area. The highest annual mean PM_{10} concentration at specific receptor locations in 2015 is 20.4 µg/m^3 at St. Edmund House (Receptor 14), which is located alongside Alfred Road to the north of the junction between Alfred Road, Queen Street and Anglesea Road.

Source apportionment calculations indicate that background sources are the largest contributors to annual mean PM_{10} concentrations at modelled receptor locations. Local traffic sources account for 6% to 20% of annual mean PM_{10} concentrations at modelled receptor locations, with cars and taxis the most significant contributing vehicle type (3% to 13%). LGVs (1% to 4%) and buses (up to 3%) are the next largest contributing local traffic sources.

Annual mean $PM_{2.5}$ concentrations in 2015 are predicted to be 15 µg/m^3 and less at all modelled locations within the study area. The highest annual mean $PM_{2.5}$ concentration at specific receptor locations in 2015 is 14.1 µg/m^3 at 48-50 Kingston Road (Receptor 26).

Source apportionment calculations indicate that background sources are the largest contributors to annual mean $PM_{2.5}$ concentrations at modelled receptor locations. Local traffic sources account for 5% to 18% of annual mean $PM_{2.5}$ concentrations at modelled receptor locations, with cars and taxis the most significant contributing vehicle type (3% to 12%). LGVs (1% to 3%) and buses (up to 3%) are the next largest contributing local traffic sources to annual mean $PM_{2.5}$ concentrations.

6.2.2 2020

Annual mean PM_{10} concentrations in 2020 are predicted to be 21 µg/m^3 and less at all modelled locations within the study area. The highest annual mean PM_{10} concentration at specific receptor locations in 2020 is 19.4 µg/m^3 at St. Edmund House (Receptor 14), which is located alongside Alfred Road to the north of the junction between Alfred Road, Queen Street and Anglesea Road.

Source apportionment calculations indicate that background sources are the largest contributors to annual mean PM_{10} concentrations at modelled receptor locations. Local traffic sources account for 5% to 19% of annual mean PM_{10} concentrations at modelled receptor locations, with cars and taxis the most significant contributing vehicle type (3% to 13%). LGVs (1% to 4%) and buses (up to 2%) are the next largest contributing local traffic sources.

Annual mean $PM_{2.5}$ concentrations in 2020 are predicted to be 14 µg/m^3 and less at all modelled locations within the study area. The highest annual mean $PM_{2.5}$ concentration at modelled receptor locations in 2020 is 13.0 µg/m^3 at 48-50 Kingston Road (Receptor 26).

Source apportionment calculations indicate that background sources are the largest contributors to annual mean $PM_{2.5}$ concentrations at modelled receptor locations. Local traffic sources account for 4% to 16% of annual mean $PM_{2.5}$ concentrations at modelled receptor locations, with cars and taxis the most significant contributing vehicle type (2% to 11%). LGVs (1% to 3%) and buses (up to 2%) are the next largest contributing local traffic sources to annual mean $PM_{2.5}$ concentrations.

Appendix A UK Air Quality Objectives and EU Limit Values

Pollutant	Criterion	Date to be achieved by and maintained thereafter	
		UK Air Quality Objective	EU Limit Value
NO_2	1-hour mean concentration not to exceed 200 µg/m^3 more than 18 times per year	31.12.2005	01.01.2010
	Annual mean concentration not to exceed 40 µg/m^3	31.12.2005	01.01.2010
Particulate Matter (PM_{10})	24-hour mean concentration not to exceed 50 µg/m^3 more than 35 times per year	31.12.2004	01.01.2005
	Annual mean concentration not to exceed 40 µg/m^3	31.12.2004	01.01.2005
Particulate Matter ($PM_{2.5}$)	Annual mean concentration not to exceed 25 µg/m^3	-	01.01.2015

Appendix B Air Quality Monitoring in Portsmouth

B.1 Continuous Monitoring Stations Operated by PCC

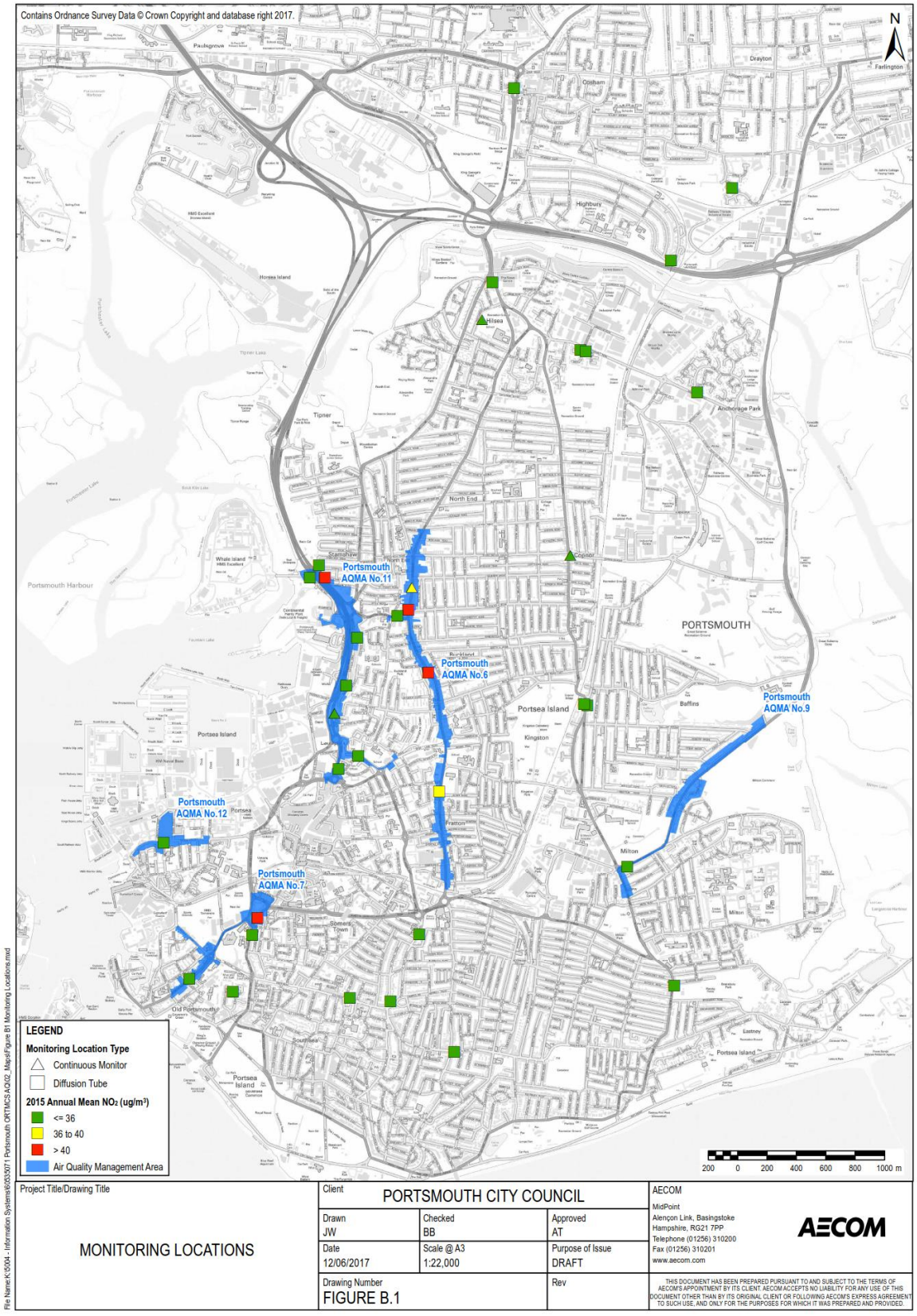
Site ID	Site Name	AQMA	Site Type	X (OS-GB)	Y (OS-GB)
C2	London Road	AQMA No. 6	Kerbside	464925	102129
C4	Gatcombe Park Primary School	-	Urban Background	465403	103952
C6	Burrfields Road	-	Roadside	466004	102348
C7	Mile End Road	AQMA No. 11	Roadside	464397	101270

B.2 NO_2 Diffusion Tube Monitoring Sites Operated by PCC

Site ID	Site Name	AQMA	Site Type	X (OS-GB)	Y (OS-GB)
DT1	Lord Montgomery Way (FST)	AQMA No. 7	Roadside	463872	99874
DT2	12 Chadderton Gardens (CG-12)	-	Urban background	463705	99371
DT3	High Street (HS-121A)	AQMA No. 7	Roadside	463408	99460
DT4	Queen Street (QS-Col 30)	AQMA No. 12	Roadside	463232	100390
DT5	119 Whale Island Way (WIW-119)	AQMA No. 11	Roadside	464230	102194
DT6	88 Stanley Road (SR-88)	AQMA No. 11	Roadside	464331	102197
DT7	138 Lower Derby Road (LDR-138)	-	Urban background	464291	102279
DT8	492 Hawthorn Crescent (HC-492)	-	Urban background	466690	104355
DT9	6 Northern Road (NR-6)	-	Roadside	465621	105528
DT10	20 Stroudley Avenue (SA-20)	-	Urban background	467107	104850
DT11	Anchorage Road (AR-Col6)	-	Roadside	466869	103457
DT12	2 Hobby Close (HC-2)	-	Roadside	466074	103747
DT14	4 Merlyn Drive (MD-4)	-	Roadside	466109	103736
DT15	29 Milton Road (MR-29)	-	Roadside	466120	101324
DT16	Parade Court, London Rd (LR-PC)	-	Roadside	465474	104205
DT18	4 Milton Road (MR-4)	-	Roadside	466097	101332
DT19	7 Velder Avenue (VA-7)	AQMA No. 9	Roadside	466392	100226
DT20	136 Eastney Rd (ER-136)	-	Roadside	466712	99415
DT21	118 Albert Road (AR-116)	-	Roadside	465213	98964
DT22	2 Victoria Road North (VRN-2)	-	Roadside	464778	99306
DT23	106 Victoria Road North (VRN-106)	-	Roadside	464974	99766
DT24	221 Fratton Road (FR-221)	AQMA No. 6	Roadside	465111	100737
DT25	117 Kingston Rd (KR-117)	AQMA No. 6	Roadside	465036	101547
DT26	The Tap London Road (Tap)	AQMA No. 6	Kerbside	464900	101976
DT28	65 Kingston Crescent (KR-65)	AQMA No. 6	Roadside	464825	101933
DT29	Estella Road (ER-74)	AQMA No. 11	Roadside	464551	101787
DT30	Market Tavern (Mile End Rd) (MT)	AQMA No. 11	Roadside	464478	101457
DT32	Larch Court, Church Rd (CR-Corner)	-	Roadside	464559	100980
DT34	Sovereign Gate, Commercial Rd (UF)	AQMA No. 11	Roadside	464425	100893

DT35	Hampshire Terrace (AM)	-	Roadside	463837	99759
DT36	Elm Grove (EG-103)	-	Roadside	464501	99329

B.3 Map of PCC Monitoring Locations and AQMAs



Appendix C Traffic Data

C.1 2015 Annual Average Daily Traffic By Vehicle Type

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J1-NSLIPNB	9,178	1,427	202	364	89	11,261
J1-NSLIPSB	7,953	1,414	185	384	57	9,993
J1-ETAvNB	7,745	1,230	108	6	96	9,186
J1-ESRdSB	7,955	1,165	86	3	86	9,296
J1-EEB	6,751	1,296	100	24	37	8,207
J1-EWB	6,492	1,123	90	25	3	7,733
J1-EKC	12,813	2,383	186	51	64	15,497
J1-EB&T	151	24	1	0	23	199
J1-SSLIPSB	7,031	912	76	10	169	8,198
J1-Flyover	47,240	5,985	767	428	198	54,619
J1-Flyover-SB	23,620	2,993	383	214	99	27,309
J1-Flyover-NB	23,620	2,993	383	214	99	27,309
J1-SSLIPNB	7,454	1,042	109	57	220	8,882
J1-WCFP	6,034	662	283	732	128	7,840
J1-RBT-1	16,513	2,476	309	410	258	19,966
J1-RBT-2	15,981	2,616	327	424	209	19,557
J1-RBT-3	16,638	2,583	295	415	189	20,120
J1-RBT-4	16,326	2,436	277	393	144	19,576
J1-RBT-5	16,966	2,543	304	431	269	20,512
J2-NNB	32,187	4,170	488	330	329	37,504
J2-SNB	29,505	4,002	443	171	306	34,427
J2-SSB	27,110	3,686	395	95	289	31,576
J2-W	7,453	1,154	135	244	42	9,029
J2-NWB	29,533	4,093	460	151	297	34,534
J3-NSB	28,653	3,900	407	102	295	33,357
J3-S	27,030	3,274	390	105	366	31,164
J3-E	11,055	1,691	78	8	2	12,834
J3-W	15,297	2,077	276	90	181	17,923
J3-NNB	23,658	3,233	356	136	248	27,631
J3-RBT-1	38,035	5,142	535	130	373	44,215
J3-RBT-2	30,705	4,013	470	124	371	35,683
J3-RBT-3	17,033	2,200	224	60	190	19,706
J3-RBT-4	32,330	4,275	495	144	362	37,607
J4-N	28,261	3,222	384	114	369	32,350
J4-S	116	12	1	0	335	464
J4-EEB	5,216	647	49	21	510	6,444
J4-EWB	5,322	684	65	32	229	6,332
J4-WEB	3,883	406	31	5	304	4,628
J4-WWB	19,807	2,313	307	63	500	22,991
J4-EEB2	10,538	1,332	114	53	739	12,776
J4-RBT-1	15,193	1,729	199	58	550	17,729

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J4-RBT-2	16,507	1,943	231	74	320	19,075
J4-RBT-3	16,623	1,955	232	74	655	19,540
J4-RBT-4	6,156	693	56	20	560	7,485
J5-NNB	11,435	1,520	170	79	56	13,259
J5-NSB	9,450	1,338	123	52	39	11,002
J5-KRRD	12,974	1,918	215	88	269	15,464
J5-EEB	3,665	537	97	18	202	4,519
J5-EWB	4,848	747	102	13	268	5,979
J5-ESN	14,158	2,128	220	83	335	16,924
J5-ST P RD	1,615	241	9	1	0	1,865
J5-SNW	15,761	2,366	229	84	335	18,776
J5-S	11,713	1,657	165	30	119	13,683
J5-WS	14,573	2,261	250	84	298	17,466
J5-W	9,542	1,114	141	101	509	11,408
J5-WN	16,438	2,357	295	116	314	19,520
J6-SNB	14,685	1,794	235	100	51	16,865
J6-SSB	12,036	1,255	159	65	46	13,562
J6-E	305	7	3	0	1,053	1,367
J6-W	8,749	1,220	104	5	1,212	11,291
J6-NNB	18,614	2,357	280	102	132	21,485
J6-NSB	15,891	1,742	206	67	122	18,027
J7-N	21,976	2,563	167	21	6	24,733
J7-S	17,224	2,302	142	24	156	19,848
J7-EEB	9,848	1,418	84	9	142	11,502
J7-WEB	6,214	859	80	12	211	7,375
J7-WWB	7,186	945	85	17	220	8,453
J7-NSLIP	1,336	159	23	2	0	1,521
J7-RBT-1	17,603	2,261	152	21	241	20,278
J7-RBT-2	15,693	1,955	161	30	295	18,134
J7-RBT-3	16,676	2,132	162	29	242	19,243
J7-RBT-4	15,867	2,108	164	24	244	18,407
J8-N	15,903	2,619	157	28	132	18,839
J8-E	19,380	2,968	163	39	352	22,902
J8-WEB	10,294	1,573	89	10	147	12,113
J8-WWB	11,975	1,736	101	16	156	13,984
J8-S	12,318	1,842	77	37	60	14,334
J8-RBT-1	16,822	2,630	144	28	191	19,815
J8-RBT-2	17,536	2,714	148	32	226	20,657
J8-RBT-3	16,983	2,609	142	35	213	19,982
J8-RBT-4	16,916	2,631	142	28	212	19,929
J9-N	16,288	2,649	199	42	286	19,464
J9-S	13,985	2,494	170	34	130	16,813
J9-E	297	48	3	0	0	348
J9W	6,748	709	81	22	277	7,837
J10-N	15,471	2,659	157	32	124	18,442

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J10-S	16,209	2,643	202	32	281	19,367
J10-E	13,018	1,691	110	2	158	14,980
J11-N	18,634	3,042	192	43	618	22,528
J11-S	15,937	2,751	161	34	126	19,009
J11-W	12,149	1,560	79	19	492	14,298
J12-N	18,184	3,255	233	36	692	22,400
J12-S	19,667	3,476	244	36	759	24,181
J12-E	8,127	1,308	70	3	67	9,575
J13-N	14,991	2,951	222	22	823	19,010
J13-S	17,460	3,284	214	48	692	21,699
J13-E	3,083	499	32	2	58	3,675
J13-W	8,933	1,693	161	42	62	10,891
J13-EW	14,127	2,679	191	20	620	17,637
J14-N	23,385	5,136	604	266	658	30,049
J14-EEB	12,970	2,941	395	174	332	16,811
J14-EEBE	16,724	3,904	548	245	138	21,560
J14-ENOR RD	12,295	3,318	515	239	139	16,507
J14-COP RD	14,290	2,806	198	32	267	17,593
J14-SB	13,463	2,739	264	103	315	16,884
J14-S	11,138	2,310	257	80	496	14,280
J14-NS	12,623	2,756	276	99	327	16,082
J15-N	10,778	2,083	132	17	245	13,256
J15-S	14,353	2,945	187	15	246	17,747
J15-ESLIP	3,367	711	5	0	0	4,083
J15-W	3,519	619	40	1	12	4,191
J15-MAIN	6,376	1,748	165	12	5	8,306
J16-NNB	7,011	1,273	75	0	137	8,494
J16-S	11,749	2,050	97	4	188	14,087
J16-E	2,159	356	14	1	7	2,536
J16-W	12,092	1,839	109	4	143	14,187
J16-NSB	7,066	1,273	66	7	139	8,550
J16-N	14,076	2,545	141	7	275	17,045
J16-RBT-1	10,525	1,796	92	9	170	12,592
J16-RBT-2	10,102	1,725	89	8	168	12,092
J16-RBT-3	9,905	1,697	86	5	155	11,849
J16-RBT-4	9,808	1,617	86	2	135	11,649
J17-N	13,604	2,398	98	6	238	16,344
J17-S	19,644	3,433	215	62	217	23,571
J17-E	18,636	3,746	295	109	53	22,839
J17-W	11,807	2,682	178	54	22	14,744
J17-WS	375	114	5	1	0	495
J18-N	15,198	2,485	171	64	371	18,288
J18-S	13,403	2,263	164	68	378	16,275
J18-W	6,093	936	58	8	297	7,393
J19-NNB	15,836	3,108	277	91	471	19,783

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J19-NSB	18,750	3,714	426	179	506	23,575
J19-SSB	12,135	2,673	366	174	338	15,686
J19-SNB	10,720	2,382	222	88	307	13,719
J19-W	10,923	1,671	112	9	223	12,938
J20-N	18,668	2,835	267	92	393	22,255
J20-S	24,161	3,517	293	41	901	28,913
J20-E	14,300	2,171	174	82	160	16,887
J20-W	22,880	3,501	262	146	396	27,186
J20-RBT-1	20,129	3,035	253	93	417	23,927
J20-RBT-2	19,146	2,891	241	87	377	22,742
J20-RBT-3	20,083	2,997	250	80	541	23,952
J20-RBT-4	20,603	3,098	251	98	479	24,528
J21-N	23,284	3,396	282	35	873	27,870
J21-S	15,680	2,490	246	34	873	19,324
J21-E	10,108	1,022	98	9	87	11,324
J21-W	5,228	1,061	58	1	23	6,372
J21-RBT-1	15,068	2,200	184	21	481	17,955
J21-RBT-2	13,737	2,021	167	19	447	16,391
J21-RBT-3	13,063	1,967	172	20	469	15,691
J21-RBT-4	12,056	1,784	160	19	459	14,478
J22-N	722	142	3	0	0	867
J22-S	4,020	407	41	3	289	4,759
J22-E	9,113	1,117	79	16	102	10,427
J22-W	8,969	1,102	86	13	273	10,443
J23-N	14,181	2,161	145	16	190	16,692
J23-S	14,279	1,976	148	16	187	16,606
J23-E	4,096	495	18	0	87	4,696
J23-W	8,884	1,126	75	13	102	10,201
J24-N	5,327	983	47	0	1	6,359
J24-S	4,415	762	33	0	72	5,283
J24-E	8,713	1,441	77	3	248	10,481
J24-W	8,173	1,362	79	3	174	9,791
J19-21	34,587	6,821	704	270	977	43,358
J4-11	10,538	1,332	114	53	739	12,776
J4-6	38,421	4,670	587	165	632	44,475
J1-13	12,813	2,383	186	51	64	15,497
J16-17	11,749	2,050	97	4	188	14,087
J8 to 18	19,380	2,968	163	39	352	22,902
J5-7	8,513	1,284	199	32	471	10,498
J5-22	11,713	1,657	165	30	119	13,683
J7-3	21,976	2,563	167	21	6	24,733
J8 to 24	5,327	983	47	0	1	6,359

C.2 2020 Annual Average Daily Traffic By Vehicle Type

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J1-NSLIPNB	9,372	1,457	206	372	91	11,499
J1-NSLIPSB	8,121	1,444	189	392	58	10,204
J1-ETAvNB	7,909	1,256	110	6	98	9,380
J1-ESRdSB	8,123	1,190	88	3	87	9,492
J1-EEB	6,893	1,324	102	25	37	8,381
J1-EWB	6,629	1,147	92	26	3	7,897
J1-EKC	13,083	2,434	190	52	66	15,824
J1-EB&T	154	25	1	0	23	203
J1-SSLIPSB	7,179	931	78	10	172	8,371
J1-Flyover	48,238	6,112	783	437	202	55,772
J1-Flyover-SB	24,119	3,056	391	219	101	27,886
J1-Flyover-NB	24,119	3,056	391	219	101	27,886
J1-SSLIPNB	7,611	1,064	111	58	225	9,069
J1-WCFP	6,161	676	289	748	131	8,005
J1-RBT-1	16,861	2,529	315	419	263	20,387
J1-RBT-2	16,318	2,671	334	433	214	19,970
J1-RBT-3	16,989	2,638	301	423	193	20,545
J1-RBT-4	16,671	2,487	282	401	147	19,989
J1-RBT-5	17,324	2,596	311	440	274	20,945
J2-NNB	32,867	4,258	498	337	335	38,296
J2-SNB	30,128	4,086	452	174	312	35,154
J2-SSB	27,683	3,764	404	97	295	32,243
J2-W	7,611	1,178	138	249	43	9,219
J2-NWB	30,156	4,180	469	154	303	35,263
J3-NSB	29,258	3,983	415	104	301	34,062
J3-S	27,600	3,343	398	107	374	31,822
J3-E	11,288	1,727	80	8	2	13,105
J3-W	15,620	2,121	282	92	185	18,301
J3-NNB	24,157	3,301	364	139	253	28,214
J3-RBT-1	38,838	5,251	547	133	381	45,149
J3-RBT-2	31,353	4,098	480	127	379	36,436
J3-RBT-3	17,392	2,247	229	62	194	20,122
J3-RBT-4	33,012	4,365	506	147	370	38,401
J4-N	28,858	3,290	393	116	376	33,033
J4-S	119	12	1	0	342	474
J4-EEB	5,327	661	50	22	520	6,580
J4-EWB	5,434	699	66	32	234	6,466
J4-WEB	3,964	414	31	5	310	4,725
J4-WWB	20,225	2,362	314	65	510	23,476
J4-EEB2	10,761	1,360	117	54	754	13,045
J4-RBT-1	15,514	1,765	203	60	562	18,104
J4-RBT-2	16,855	1,984	235	76	327	19,478
J4-RBT-3	16,974	1,997	237	76	669	19,952

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J4-RBT-4	6,286	707	57	20	572	7,643
J5-NNB	11,676	1,552	173	81	57	13,539
J5-NSB	9,649	1,366	126	53	40	11,234
J5-KRRD	13,248	1,959	220	90	274	15,791
J5-EEB	3,742	549	99	19	207	4,615
J5-EWB	4,951	763	104	14	274	6,105
J5-ESN	14,457	2,173	225	85	342	17,282
J5-ST P RD	1,649	246	9	1	0	1,905
J5-SNW	16,094	2,416	234	86	342	19,172
J5-S	11,961	1,692	168	30	121	13,972
J5-WS	14,881	2,309	255	86	304	17,835
J5-W	9,743	1,137	144	103	520	11,649
J5-WN	16,785	2,407	301	119	321	19,933
J6-SNB	14,995	1,832	240	103	52	17,221
J6-SSB	12,290	1,282	163	67	47	13,849
J6-E	311	7	3	0	1,075	1,396
J6-W	8,934	1,246	107	5	1,238	11,529
J6-NNB	19,007	2,407	286	104	135	21,938
J6-NSB	16,227	1,778	210	68	124	18,408
J7-N	22,440	2,617	170	21	7	25,255
J7-S	17,588	2,350	145	25	159	20,267
J7-EEB	10,056	1,448	86	10	145	11,745
J7-WEB	6,345	877	82	12	215	7,531
J7-WWB	7,338	964	87	18	224	8,631
J7-NSLIP	1,364	163	24	2	0	1,553
J7-RBT-1	17,975	2,308	156	21	246	20,706
J7-RBT-2	16,024	1,997	164	30	302	18,517
J7-RBT-3	17,028	2,177	166	30	248	19,649
J7-RBT-4	16,202	2,153	167	24	250	18,796
J8-N	16,239	2,674	161	29	134	19,237
J8-E	19,789	3,031	166	39	359	23,385
J8-WEB	10,511	1,607	91	10	150	12,369
J8-WWB	12,228	1,773	103	17	159	14,279
J8-S	12,578	1,881	79	37	62	14,637
J8-RBT-1	17,177	2,685	147	29	195	20,233
J8-RBT-2	17,906	2,772	151	33	231	21,093
J8-RBT-3	17,342	2,664	145	35	218	20,404
J8-RBT-4	17,273	2,687	145	28	216	20,350
J9-N	16,632	2,704	203	43	292	19,875
J9-S	14,281	2,547	173	34	133	17,168
J9-E	303	49	3	0	0	355
J9W	6,891	724	83	22	283	8,002
J10-N	15,797	2,715	160	33	126	18,832
J10-S	16,551	2,698	207	33	287	19,776
J10-E	13,293	1,727	113	2	161	15,296

Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J11-N	19,027	3,106	196	44	631	23,004
J11-S	16,273	2,809	165	35	129	19,410
J11-W	12,405	1,593	80	20	502	14,600
J12-N	18,568	3,324	238	37	707	22,873
J12-S	20,082	3,549	249	37	775	24,691
J12-E	8,298	1,336	72	3	68	9,777
J13-N	15,307	3,014	227	23	841	19,412
J13-S	17,829	3,353	219	49	707	22,157
J13-E	3,148	510	33	2	59	3,752
J13-W	9,122	1,729	164	43	64	11,121
J13-EW	14,425	2,736	195	20	633	18,009
J14-N	23,879	5,245	616	271	672	30,683
J14-EEB	13,243	3,003	403	177	339	17,166
J14-EEBE	17,077	3,987	560	251	141	22,015
J14-ENOR RD	12,555	3,388	526	244	142	16,856
J14-COP RD	14,592	2,865	202	32	273	17,964
J14-SB	13,747	2,797	269	106	321	17,240
J14-S	11,373	2,359	262	81	506	14,582
J14-NS	12,890	2,815	282	101	334	16,421
J15-N	11,005	2,127	135	18	251	13,536
J15-S	14,656	3,008	191	16	251	18,121
J15-ESLIP	3,438	726	5	0	0	4,169
J15-W	3,593	632	41	1	12	4,279
J15-MAIN	6,511	1,785	168	12	5	8,482
J16-NNB	7,159	1,299	76	0	140	8,674
J16-S	11,997	2,093	99	4	192	14,384
J16-E	2,205	363	14	1	7	2,590
J16-W	12,348	1,878	111	4	146	14,487
J16-NSB	7,215	1,300	68	7	142	8,731
J16-N	14,373	2,599	144	7	281	17,405
J16-RBT-1	10,747	1,834	94	9	174	12,858
J16-RBT-2	10,315	1,761	91	8	172	12,347
J16-RBT-3	10,114	1,733	88	5	158	12,099
J16-RBT-4	10,015	1,651	88	2	138	11,895
J17-N	13,891	2,448	100	6	243	16,689
J17-S	20,058	3,506	220	63	222	24,069
J17-E	19,029	3,825	301	111	54	23,321
J17-W	12,057	2,739	182	56	23	15,055
J17-WS	383	117	5	1	0	506
J18-N	15,518	2,537	174	65	379	18,674
J18-S	13,686	2,311	168	69	386	16,619
J18-W	6,222	956	60	8	304	7,549
J19-NNB	16,171	3,173	283	93	481	20,201
J19-NSB	19,146	3,792	435	183	517	24,073
J19-SSB	12,391	2,729	374	178	345	16,017

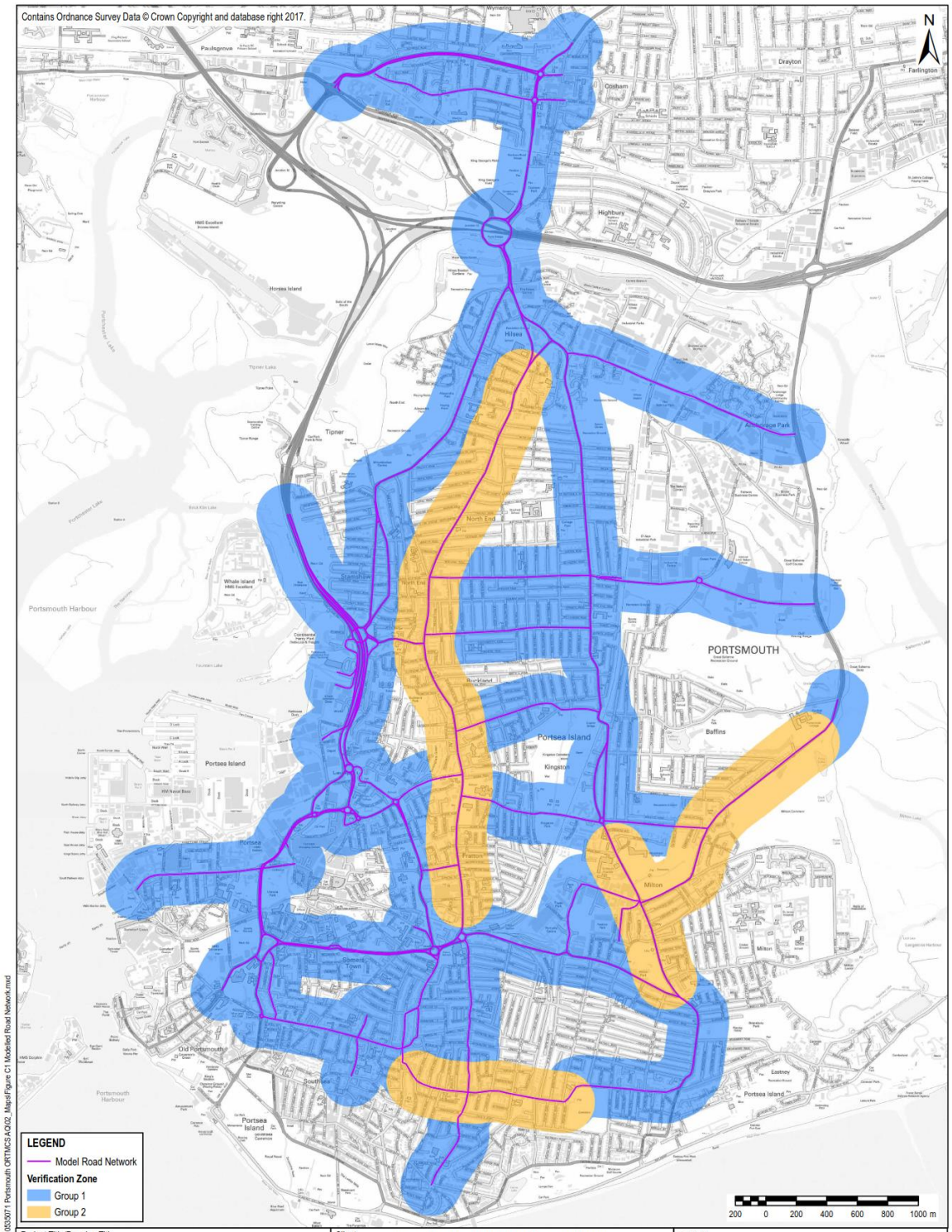
Link	Cars/Taxis	LGVs	OGV1	OGV2	Buses	AADT
J19-SNB	10,946	2,433	227	90	313	14,008
J19-W	11,154	1,707	114	9	228	13,211
J20-N	19,063	2,895	273	94	401	22,725
J20-S	24,671	3,592	299	42	920	29,523
J20-E	14,602	2,217	177	83	163	17,243
J20-W	23,363	3,575	267	149	404	27,760
J20-RBT-1	20,554	3,099	258	95	426	24,432
J20-RBT-2	19,551	2,952	246	89	385	23,222
J20-RBT-3	20,507	3,060	256	82	553	24,458
J20-RBT-4	21,038	3,163	256	100	489	25,046
J21-N	23,776	3,468	288	36	891	28,458
J21-S	16,012	2,543	252	34	891	19,732
J21-E	10,321	1,044	100	9	89	11,564
J21-W	5,338	1,084	59	1	24	6,506
J21-RBT-1	15,386	2,247	188	22	491	18,334
J21-RBT-2	14,027	2,064	171	19	456	16,737
J21-RBT-3	13,339	2,009	176	20	479	16,022
J21-RBT-4	12,310	1,822	163	20	469	14,784
J22-N	738	145	3	0	0	885
J22-S	4,105	415	42	3	295	4,860
J22-E	9,305	1,141	81	16	104	10,647
J22-W	9,158	1,125	88	14	279	10,664
J23-N	14,480	2,206	148	17	194	17,045
J23-S	14,581	2,018	151	17	191	16,957
J23-E	4,183	505	19	0	89	4,795
J23-W	9,072	1,150	76	14	104	10,416
J24-N	5,440	1,004	48	0	1	6,493
J24-S	4,508	779	34	0	74	5,394
J24-E	8,897	1,471	78	3	253	10,702
J24-W	8,346	1,391	80	3	178	9,998
J19-21	35,317	6,965	719	275	997	44,274
J4-11	10,761	1,360	117	54	754	13,045
J4-6	39,233	4,768	600	169	645	45,414
J1-13	13,083	2,434	190	52	66	15,824
J16-17	11,997	2,093	99	4	192	14,384
J8 to 18	19,789	3,031	166	39	359	23,385
J5-7	8,693	1,311	203	32	481	10,720
J5-22	11,961	1,692	168	30	121	13,972
J7-3	22,440	2,617	170	21	7	25,255
J8 to 24	5,440	1,004	48	0	1	6,493

C.3 Traffic Growth Factors

All traffic flow data used in the Source Apportionment Study were provided by PCC's Traffic and Network Team. The baseline (2015) traffic dataset was established based on automatic and manual traffic count data from count points across Portsmouth during 2013 and 2015.

The 2015 traffic flows were scaled forwards to 2020 and 2025 using English and Welsh Regional Traffic Growth and Speed Forecasts (RTFs) and calibrated with local growth factors from TEMPRO 7.2.

C.4 Modelled Road Network and Verification Zones

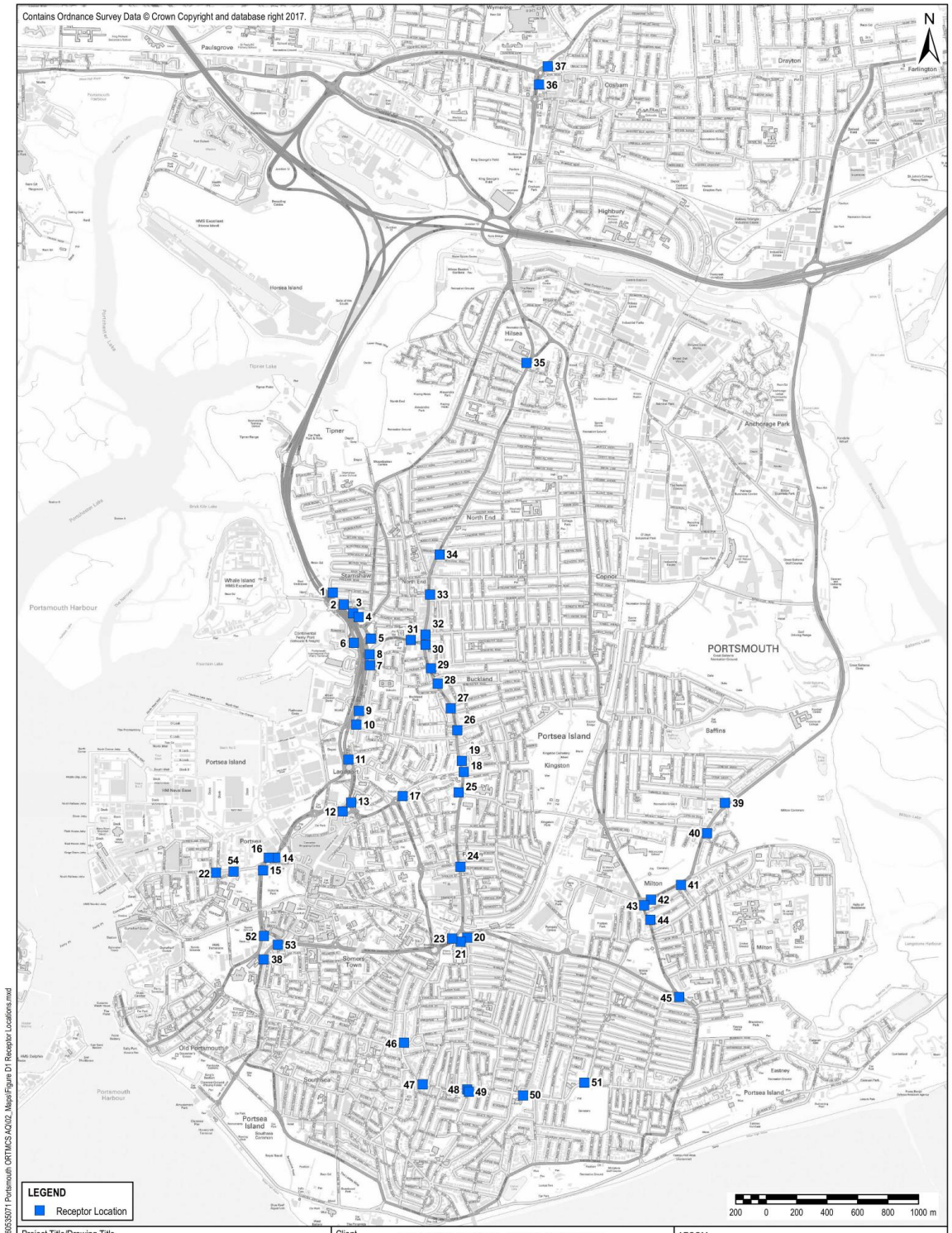


Project Title/Drawing Title: MODELLED ROAD NETWORK	Client: PORTSMOUTH CITY COUNCIL		AECOM, MidPoint, Alençon Link, Basingstoke, Hampshire, RG21 7PP, Telephone (01256) 310200, Fax (01256) 310201, www.aecom.com
	Drawn: JW	Checked: BB	Approved: AT
	Date: 12/06/2017	Scale @ A3: 1:22,000	Purpose of Issue: DRAFT
	Drawing Number: FIGURE C.1		Rev

File Name:K:\5004 - Information Systems\60353071 Portsmouth CRTM\CS\AQ\02_Maps\Figure C1 Modelled Road Network.mxd

Appendix D Dispersion Modelling

D.1 Map of Modelled Sensitive Receptors



D.2 Defra Mapped Background Pollutant Concentrations

Grid Square Centre (X,Y OS-GB)	Mapped Background NO_2 Concentration (µg/m^3)		Adjusted Background NO_2 Concentration (µg/m^3)	
	2015	2020	2015	2020
462500, 100500	25.7	24.3	25.7	24.9
463500, 99500	23.0	20.5	21.9	20.7
463500, 100500	23.9	21.2	23.0	21.5
463500, 102500	23.2	21.4	23.2	22.1
464500, 98500	19.4	17.0	19.1	17.6
464500, 99500	21.6	18.5	21.2	19.4
464500, 100500	23.3	19.8	21.7	20.1
464500, 101500	23.4	20.0	20.7	19.5
464500, 102500	24.2	20.4	20.4	19.4
464500, 103500	20.8	17.4	17.7	16.6
464500, 105500	20.5	16.7	18.0	16.5
465500, 98500	17.6	15.1	17.3	15.8
465500, 99500	20.3	17.1	19.6	17.9
465500, 100500	20.3	17.2	19.5	17.8
465500, 101500	21.0	17.9	20.6	18.8
465500, 102500	22.1	18.6	21.2	19.4
465500, 103500	22.4	18.4	20.1	18.5
465500, 104500	24.7	19.7	18.4	17.6
465500, 105500	20.8	16.9	19.2	17.3
465500, 106500	16.3	13.4	16.3	14.3
466500, 98500	15.2	13.0	14.7	13.4
466500, 99500	18.9	15.7	17.6	16.1
466500, 100500	19.4	16.2	17.8	16.3
466500, 101500	18.8	16.0	18.4	16.8
466500, 102500	20.5	17.9	20.5	18.9
466500, 103500	24.4	21.2	24.4	22.2
466500, 105500	19.2	15.8	19.2	17.0
467500, 100500	14.9	12.7	14.8	13.3
467500, 101500	16.0	13.5	14.7	13.5
467500, 102500	16.9	14.6	15.8	14.7
467500, 103500	19.5	16.8	18.6	17.2

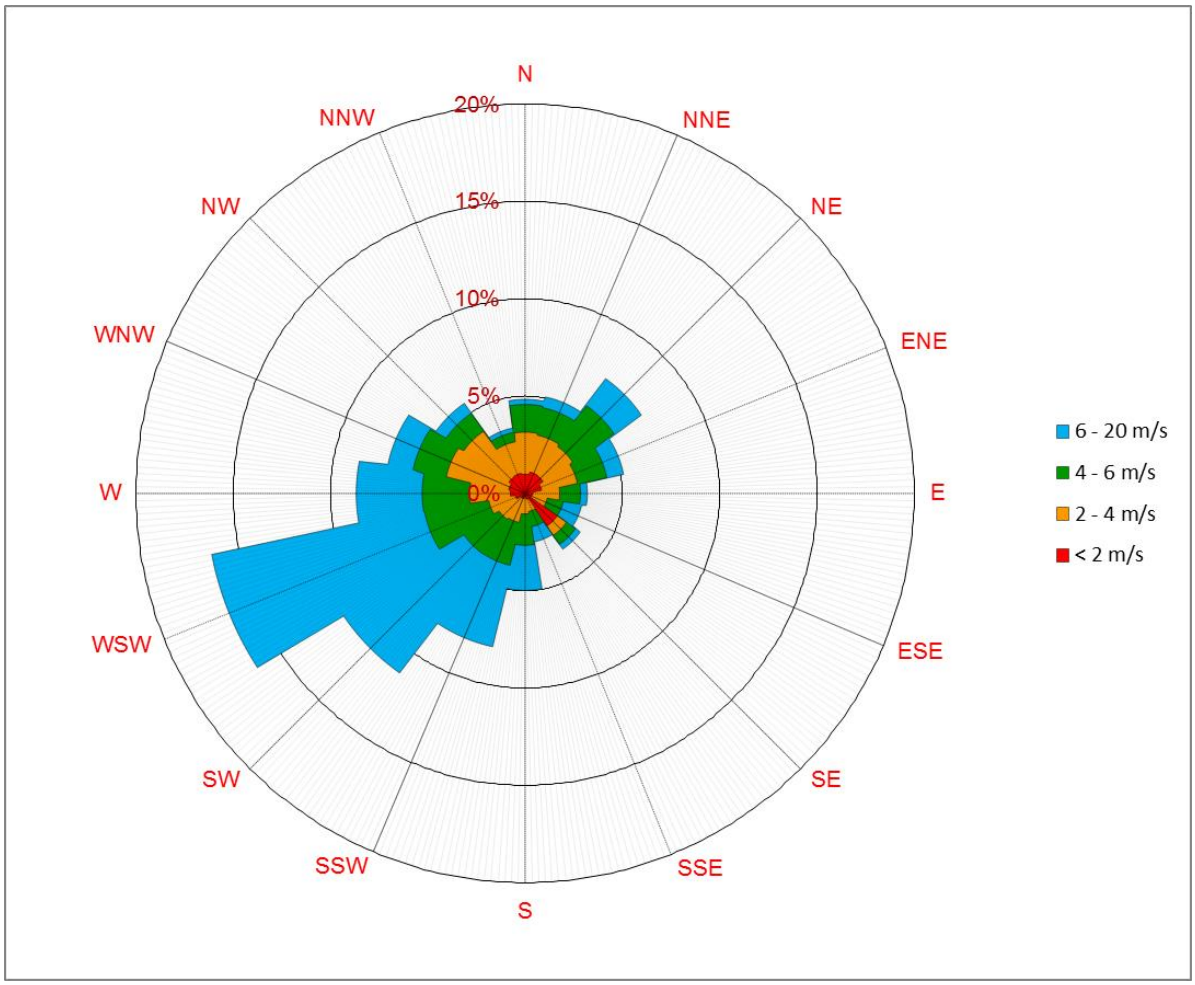
Note: Adjusted background NO_2 concentrations for 2015 and 2020 have been adjusted in accordance with Air Quality Consultants' CURED methodology.

Grid Square Centre (X,Y OS-GB)	Mapped Background PM_{10} Concentration ($\mu g/m^3$)		Adjusted Background PM_{10} Concentration ($\mu g/m^3$)	
	2015	2020	2015	2020
462500, 100500	15.1	14.4	15.1	14.4
463500, 99500	15.4	14.7	15.4	14.7
463500, 100500	17.9	17.2	17.9	17.2
463500, 102500	14.7	14.1	14.7	14.1
464500, 98500	14.5	13.9	14.5	13.9
464500, 99500	15.7	15.0	15.7	15.0
464500, 100500	16.8	16.0	16.7	16.0
464500, 101500	16.5	15.8	16.4	15.8
464500, 102500	16.9	16.1	16.7	16.1
464500, 103500	15.9	15.2	15.8	15.2
464500, 105500	16.5	15.8	16.4	15.8
465500, 98500	14.4	13.8	14.4	13.7
465500, 99500	15.8	15.1	15.8	15.1
465500, 100500	16.0	15.3	16.0	15.3
465500, 101500	16.2	15.6	16.2	15.6
465500, 102500	16.6	15.9	16.6	15.9
465500, 103500	17.0	16.3	16.9	16.3
465500, 104500	18.4	17.6	18.1	17.5
465500, 105500	16.2	15.4	16.1	15.4
465500, 106500	15.6	14.9	15.6	14.9
466500, 98500	13.9	13.3	13.9	13.3
466500, 99500	15.5	14.9	15.5	14.9
466500, 100500	16.0	15.4	16.0	15.3
466500, 101500	15.5	14.9	15.5	14.9
466500, 102500	15.8	15.5	15.8	15.5
466500, 103500	19.5	18.6	19.5	18.6
466500, 105500	15.8	15.1	15.8	15.1
467500, 100500	14.3	13.7	14.3	13.7
467500, 101500	14.6	14.0	14.5	14.0
467500, 102500	14.9	14.3	14.8	14.3
467500, 103500	16.3	15.7	16.3	15.6

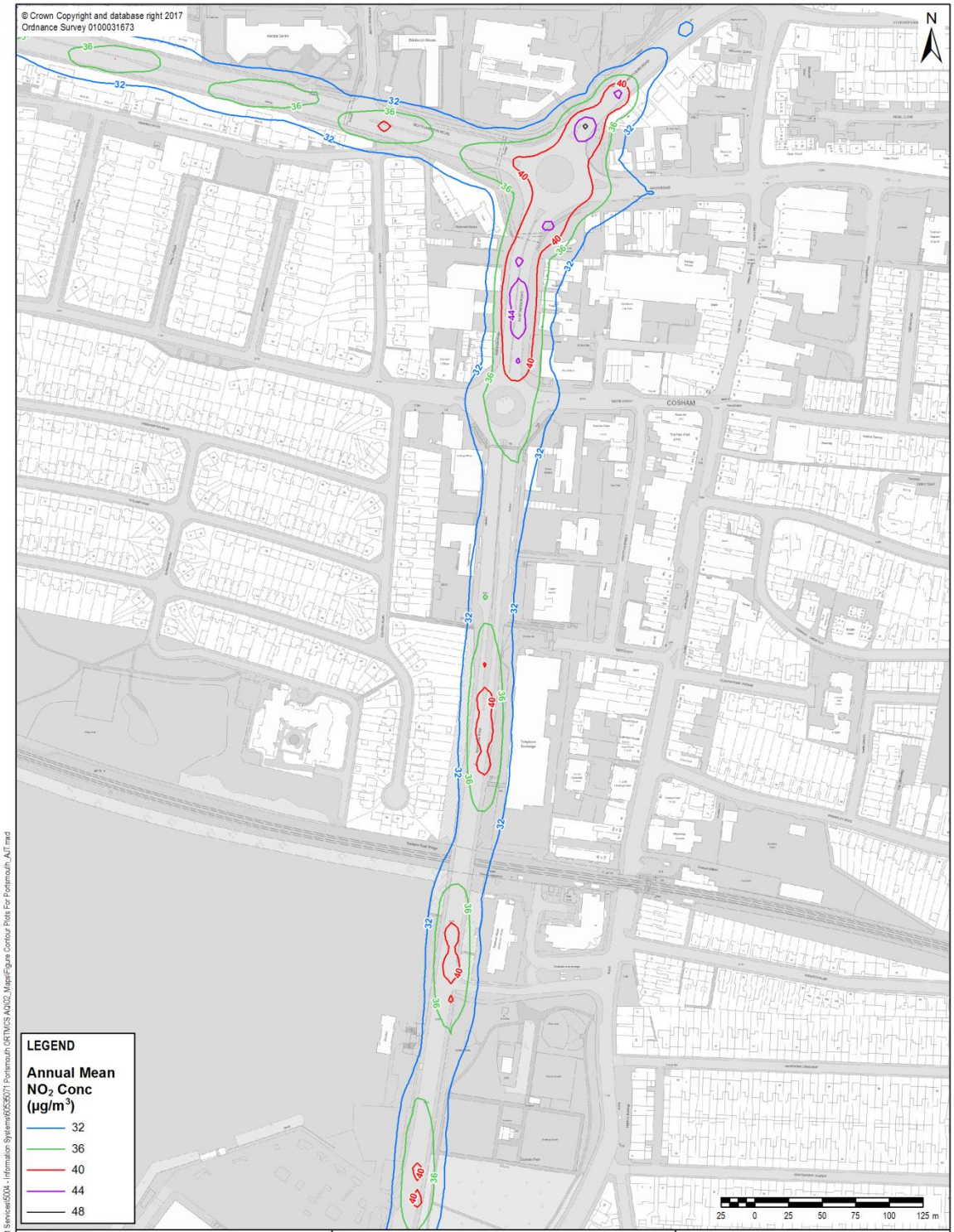
Grid Square Centre (X,Y OS-GB)	Mapped Background $PM_{2.5}$ Concentration (µg/m^3)		Adjusted Background $PM_{2.5}$ Concentration (µg/m^3)	
	2015	2020	2015	2020
462500, 100500	11.0	10.3	11.0	10.3
463500, 99500	10.9	10.2	10.9	10.2
463500, 100500	12.3	11.6	12.2	11.5
463500, 102500	10.7	10.0	10.7	10.0
464500, 98500	10.4	9.7	10.3	9.7
464500, 99500	11.1	10.5	11.1	10.4
464500, 100500	11.9	11.1	11.8	11.1
464500, 101500	11.7	11.0	11.6	10.9
464500, 102500	11.9	11.2	11.7	11.1
464500, 103500	11.2	10.6	11.1	10.5
464500, 105500	11.5	10.9	11.4	10.8
465500, 98500	10.2	9.7	10.2	9.6
465500, 99500	11.2	10.5	11.2	10.5
465500, 100500	11.4	10.7	11.3	10.7
465500, 101500	11.5	10.9	11.5	10.9
465500, 102500	11.8	11.1	11.7	11.1
465500, 103500	11.9	11.2	11.8	11.2
465500, 104500	12.6	11.9	12.4	11.8
465500, 105500	11.5	10.8	11.4	10.7
465500, 106500	11.0	10.4	11.0	10.4
466500, 98500	9.9	9.3	9.8	9.3
466500, 99500	11.0	10.3	10.9	10.3
466500, 100500	11.3	10.7	11.3	10.7
466500, 101500	11.1	10.5	11.1	10.5
466500, 102500	11.2	11.0	11.2	11.0
466500, 103500	13.1	12.4	13.1	12.4
466500, 105500	11.3	10.6	11.3	10.6
467500, 100500	10.2	9.7	10.2	9.7
467500, 101500	10.4	9.9	10.3	9.8
467500, 102500	10.6	10.0	10.5	10.0
467500, 103500	11.4	10.8	11.3	10.8

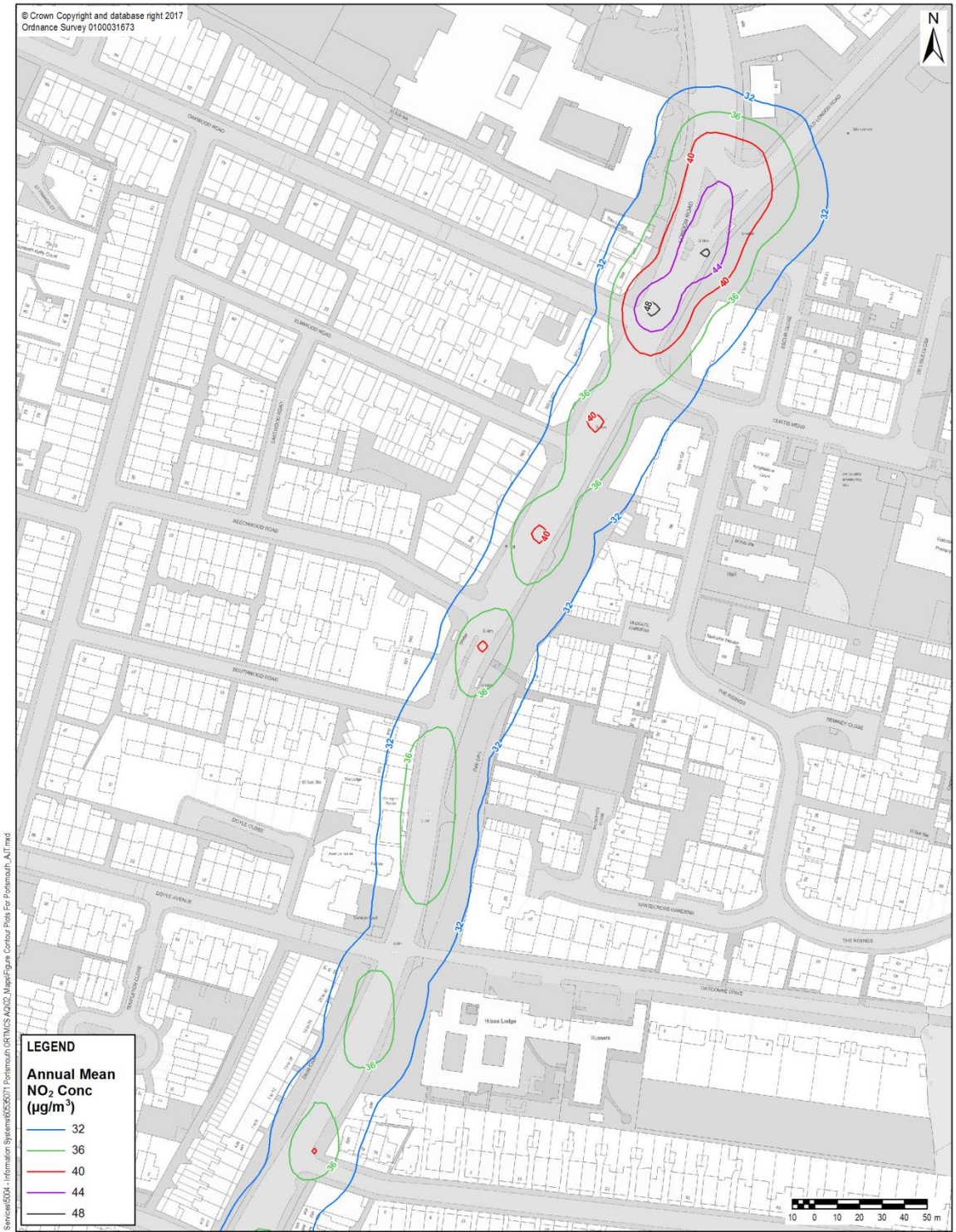
D.3 Meteorological Data

Meteorological data measured at Thorney Island from 2015 were used for this modelling study. The data consisted of the frequencies of occurrence of wind speed, wind direction and Pasquill stability classes. Pasquill stability classes categorise the stability of the atmosphere from A (very unstable) through D (neutral) to G (very stable). The windrose for the Thorney Island meteorological dataset is shown below. Each windrose bar is designed to illustrate three wind properties: the direction the wind is coming from; the relative number of hours the wind is from this direction; and the magnitude of the wind speeds.



D.4 Contour Plots and Source Apportionment Plots





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Project Title/Drawing Title: 2015 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS LONDON ROAD BETWEEN COPNOR ROAD AND AMBERLEY ROAD	Client: PORTSMOUTH CITY COUNCIL		
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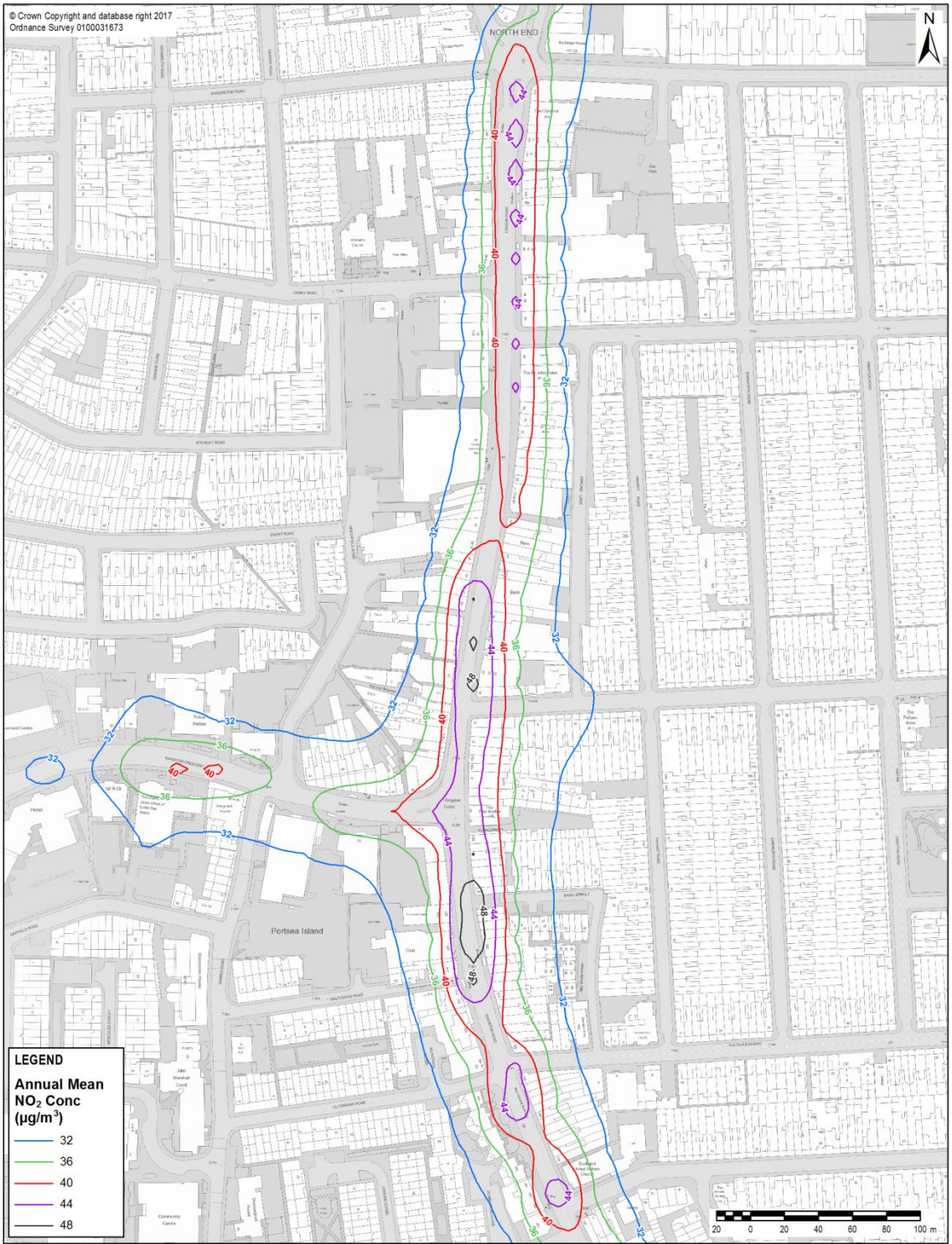

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Project Title/Drawing Title: 2015 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS LONDON ROAD BETWEEN STUBBINGTON ROAD AND QUEEN'S ROAD	Client: PORTSMOUTH CITY COUNCIL		
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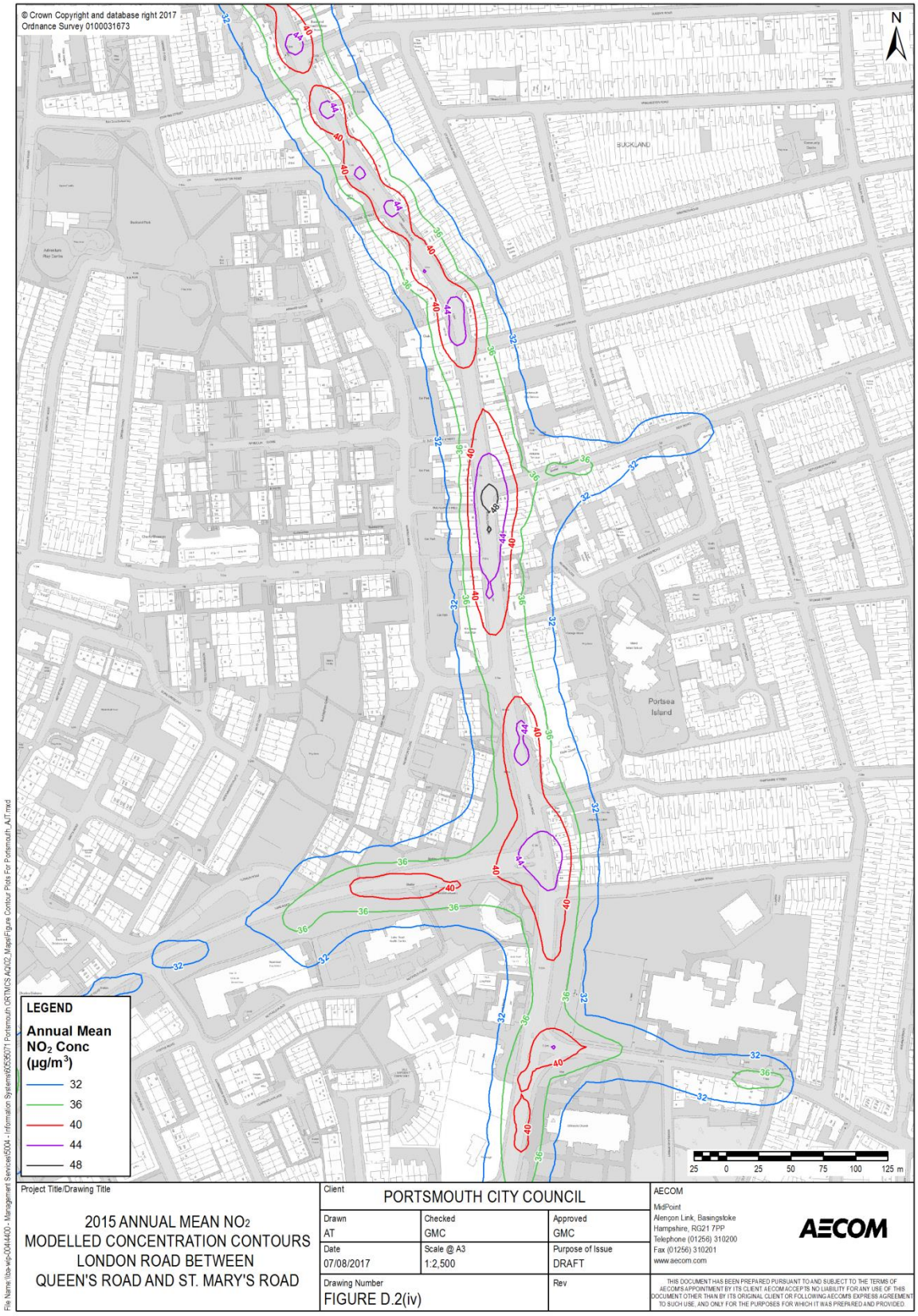
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Ordnance Survey 0100031673
N
BUCKLAND
Portsea Island
LEGEND
Annual Mean NO2 Conc (µg/m3)
32
36
40
44
48
25 0 25 50 75 100 125 m
Project Title/Drawing Title
2015 ANNUAL MEAN NO2 MODELLED CONCENTRATION CONTOURS LONDON ROAD BETWEEN QUEEN'S ROAD AND ST. MARY'S ROAD
Client
PORTSMOUTH CITY COUNCIL
Drawn AT
Checked GMC
Approved GMC
Date 07/08/2017
Scale @ A3 1:2,500
Purpose of Issue DRAFT
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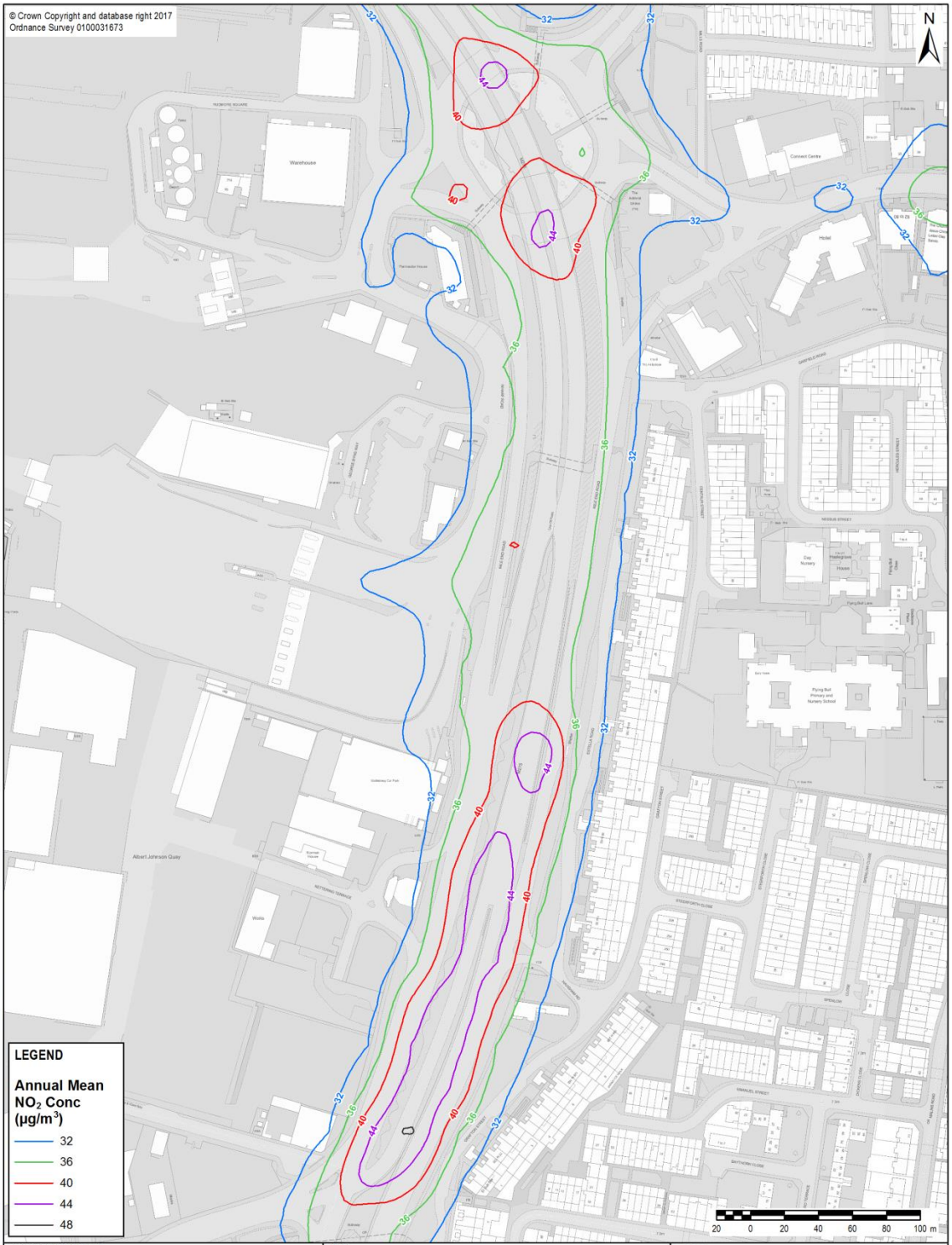

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Project Title/Drawing Title: 2015 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS M275 / A3 MILE END ROAD BETWEEN RUDMORE ROUNDABOUT AND PRICESS ROYAL ROAD	Client: PORTSMOUTH CITY COUNCIL		
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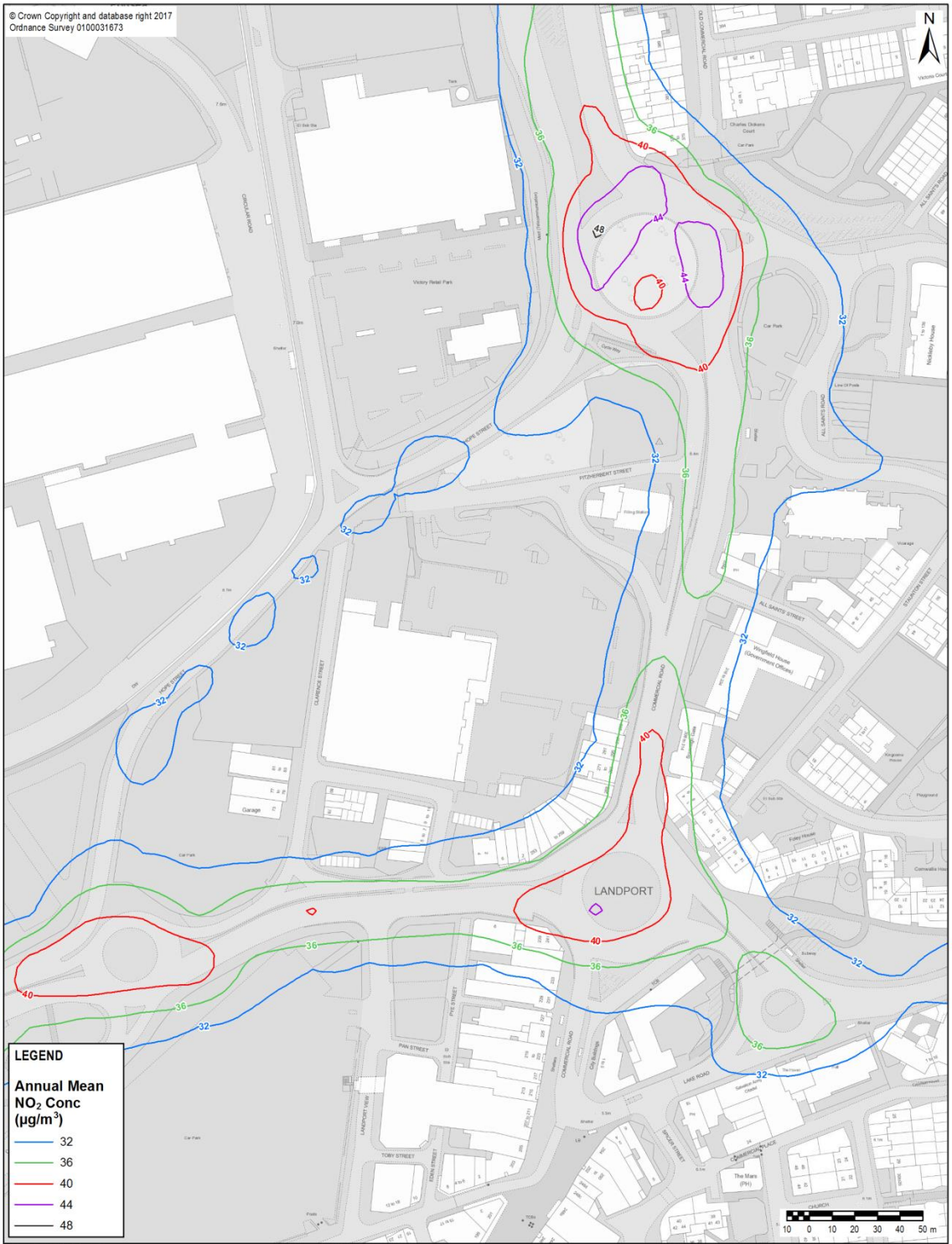

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Project Title/Drawing Title: 2015 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS HOPE STREET, COMMERCIAL ROAD AND MARKETWAY	Client: PORTSMOUTH CITY COUNCIL		
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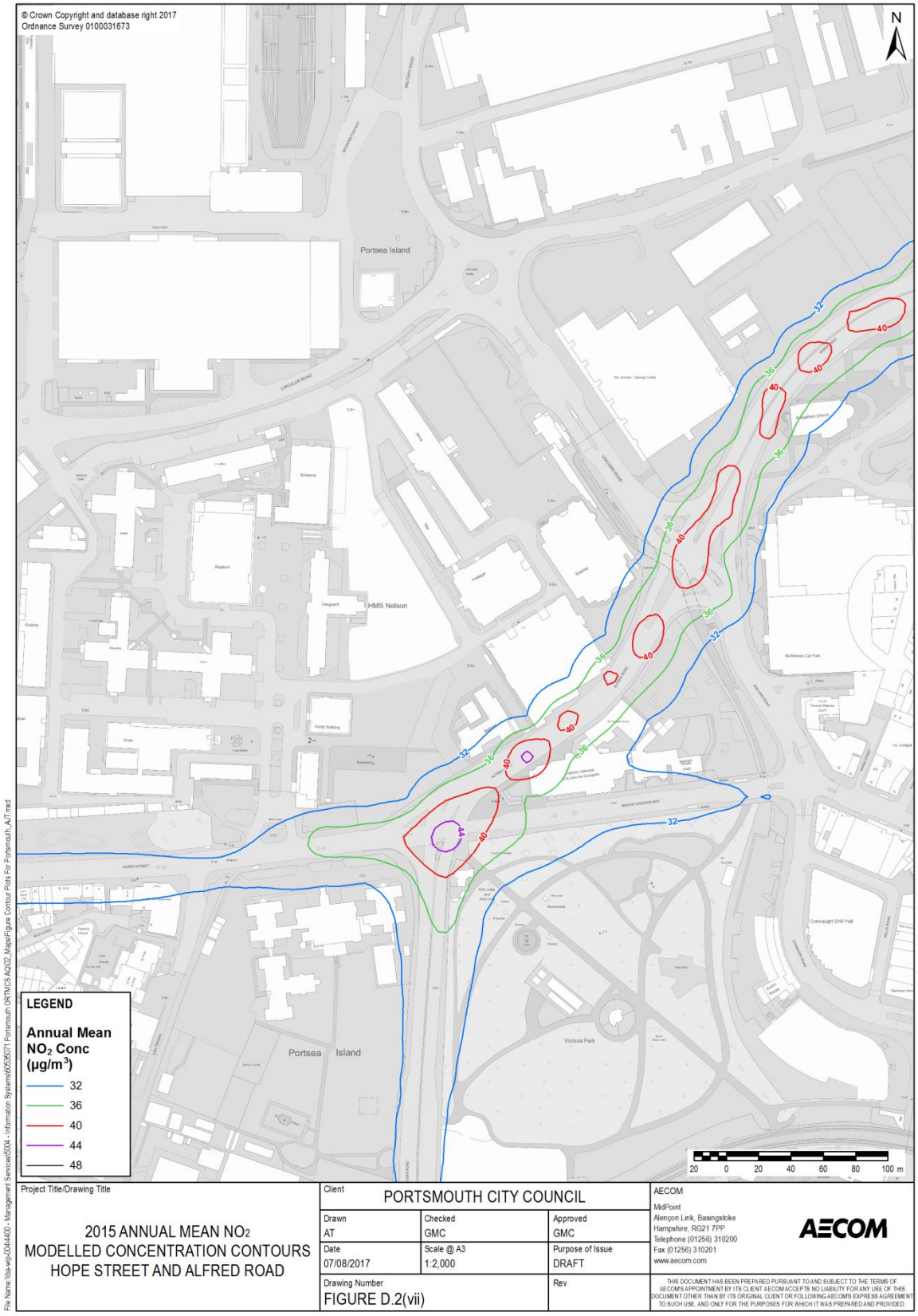
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Ordnance Survey 0100031673
N
Portsea Island
HMS Nelson
Portsea Island
LEGEND
Annual Mean NO2 Conc (µg/m3)
32
36
40
44
48
20 0 20 40 60 80 100 m
Project Title/Drawing Title
2015 ANNUAL MEAN NO2
MODELLED CONCENTRATION CONTOURS
HOPE STREET AND ALFRED ROAD
Client
PORTSMOUTH CITY COUNCIL
Drawn AT
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Approved GMC
Date 07/08/2017
Scale @ A3 1:2,000
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Drawing Number FIGURE D.2(vii)
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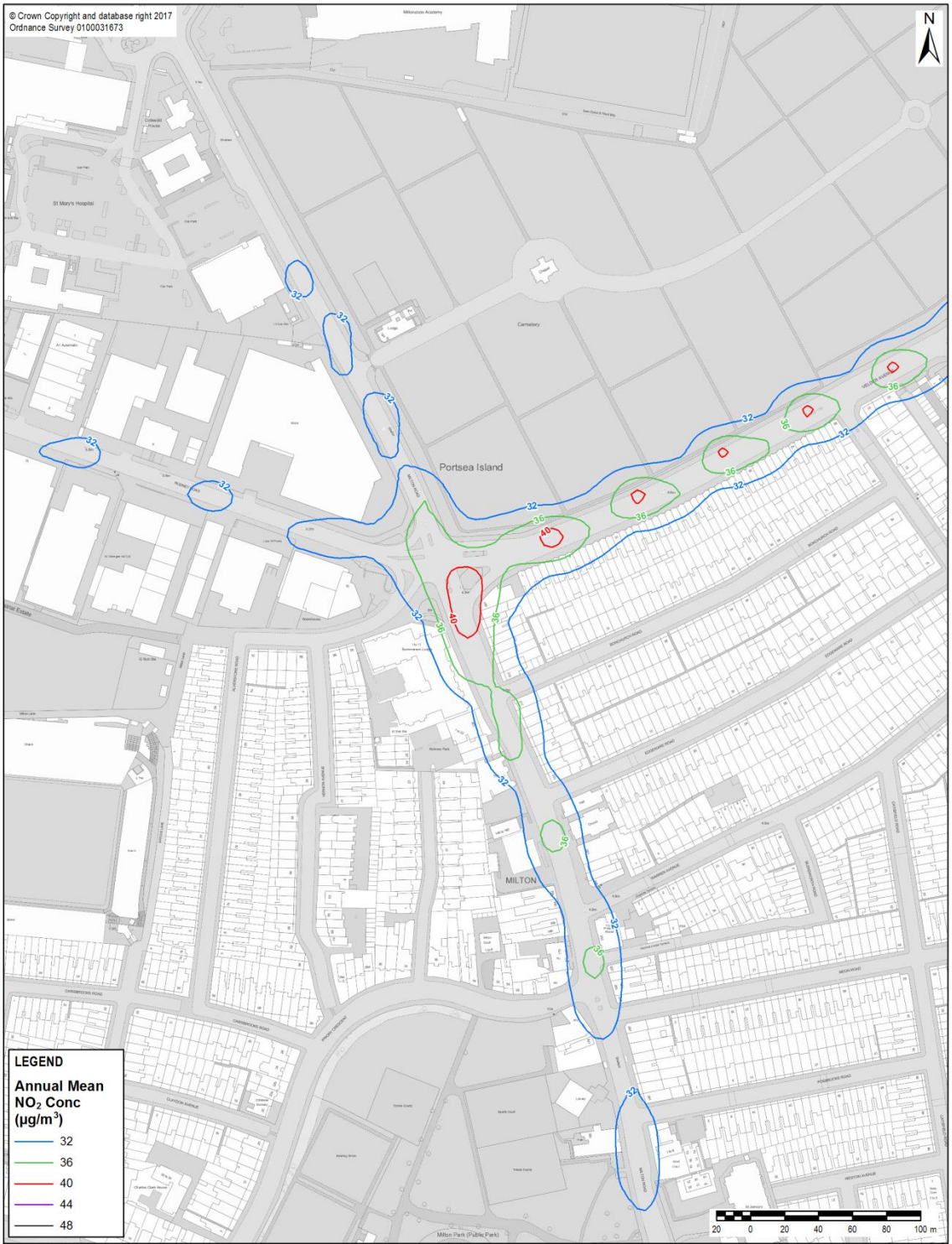

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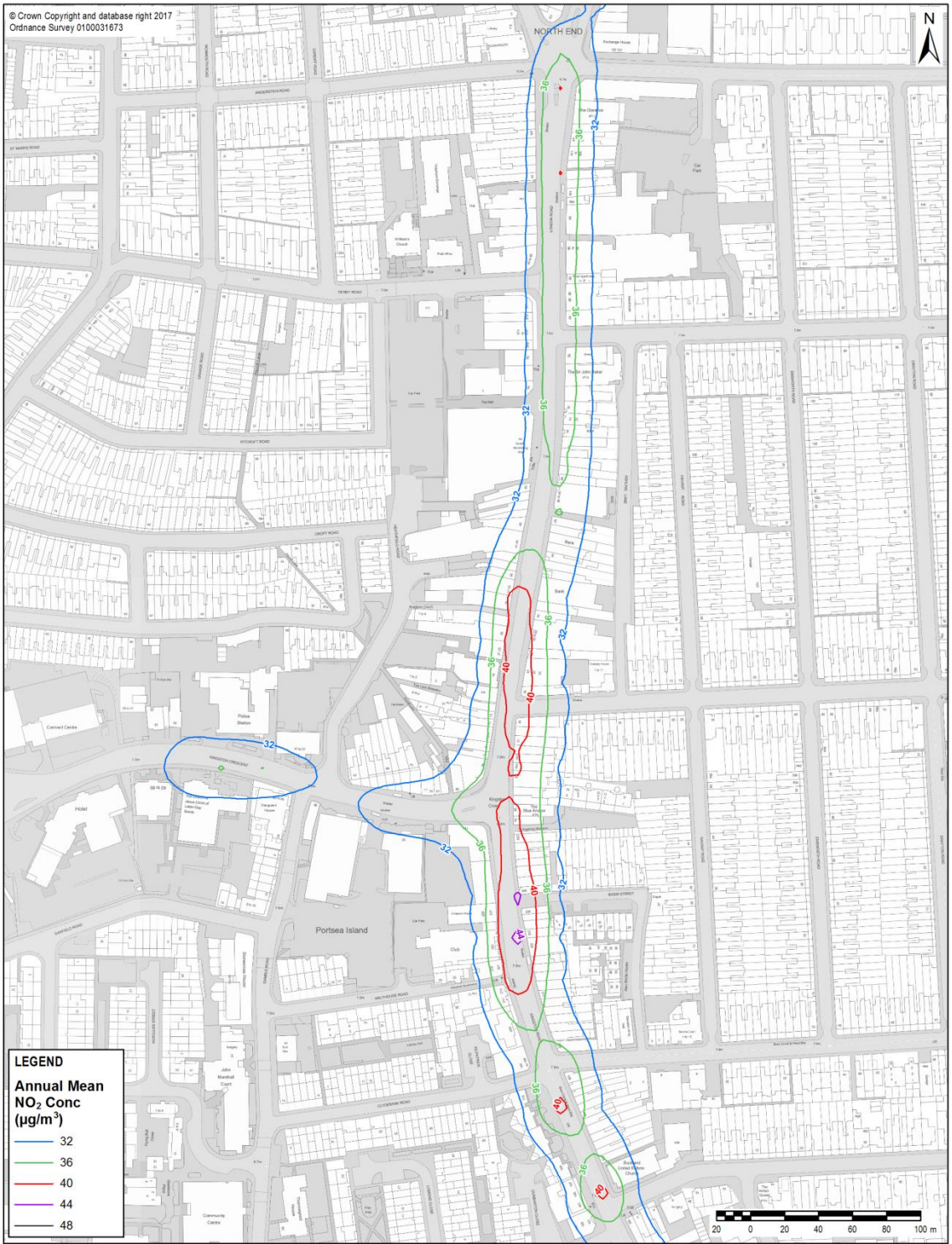

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Project Title/Drawing Title: 2020 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS LONDON ROAD BETWEEN STUBBINGTON ROAD AND QUEEN'S ROAD	Client: PORTSMOUTH CITY COUNCIL		
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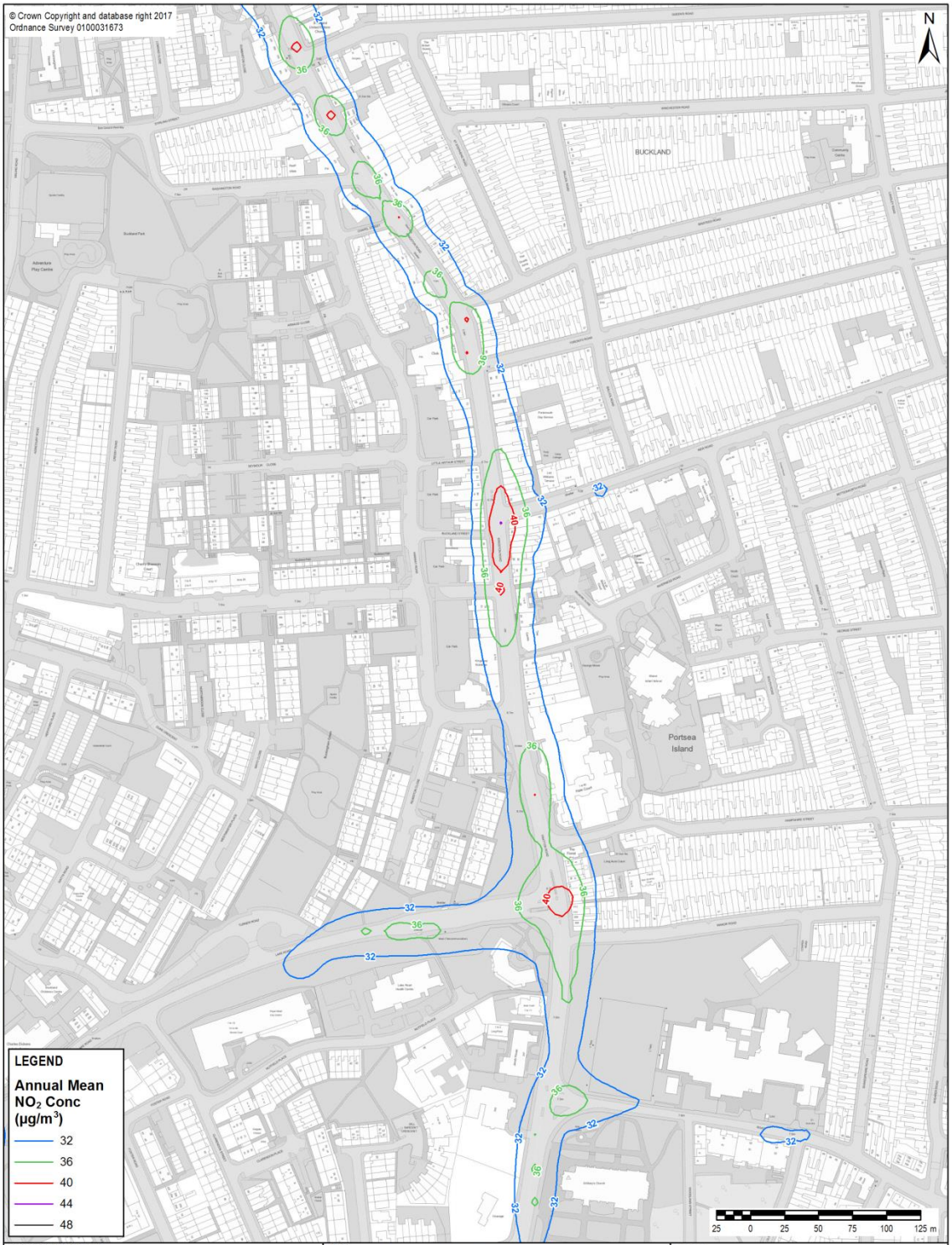

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Project Title/Drawing Title: 2020 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS LONDON ROAD BETWEEN QUEEN'S ROAD AND ST. MARY'S ROAD	Client: PORTSMOUTH CITY COUNCIL		AECOM, MidPoint, Alençon Link, Basingstoke, Hampshire, RG21 7PP, Telephone (01256) 310200, Fax (01256) 310201, www.aecom.com
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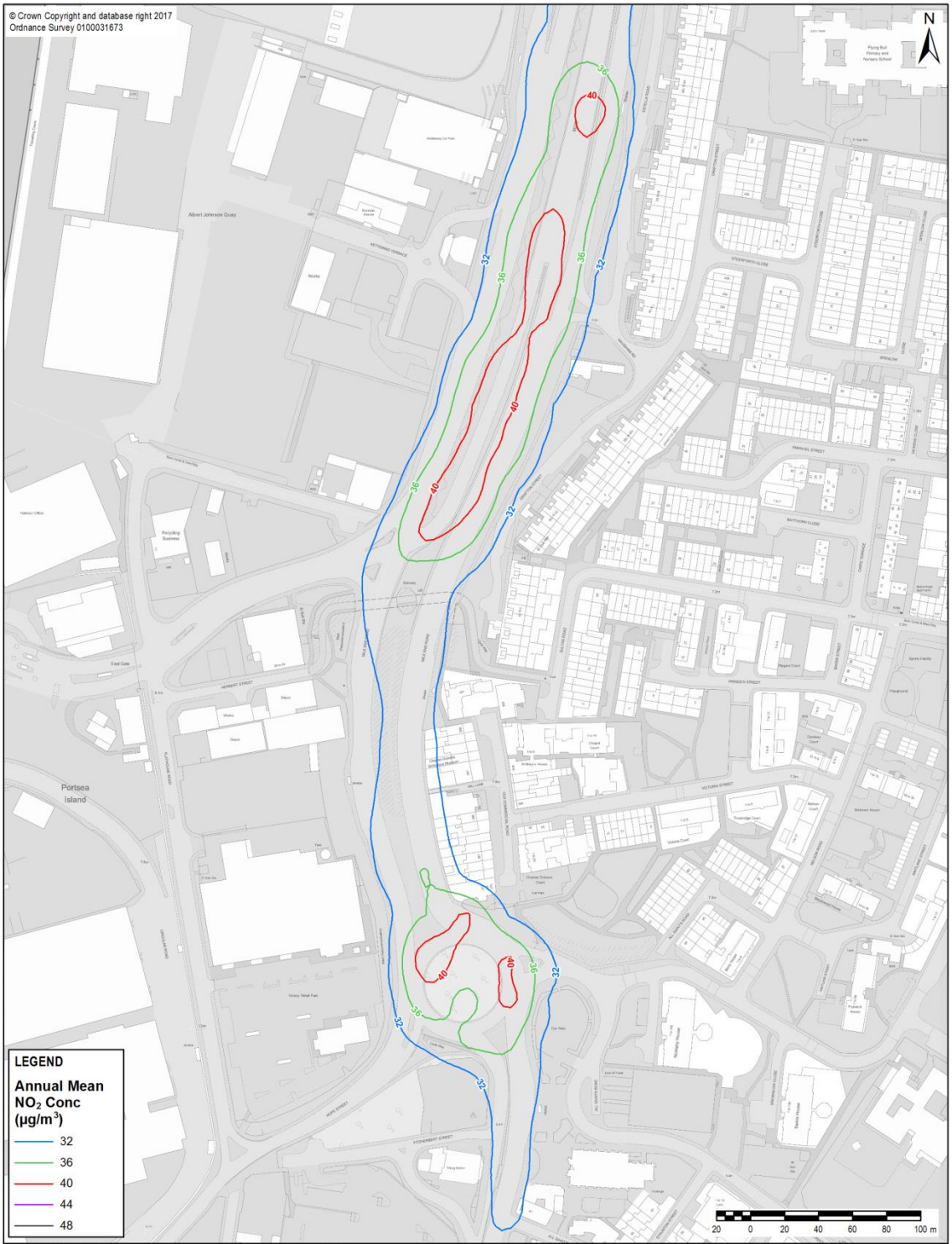
	Drawing Number: FIGURE D.3(ii)		Rev:



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Project Title/Drawing Title: 2020 ANNUAL MEAN NO_2 MODELLED CONCENTRATION CONTOURS M275 / A3 MILE END ROAD AND CHURCH STREET ROUNDABOUT	Client: PORTSMOUTH CITY COUNCIL		
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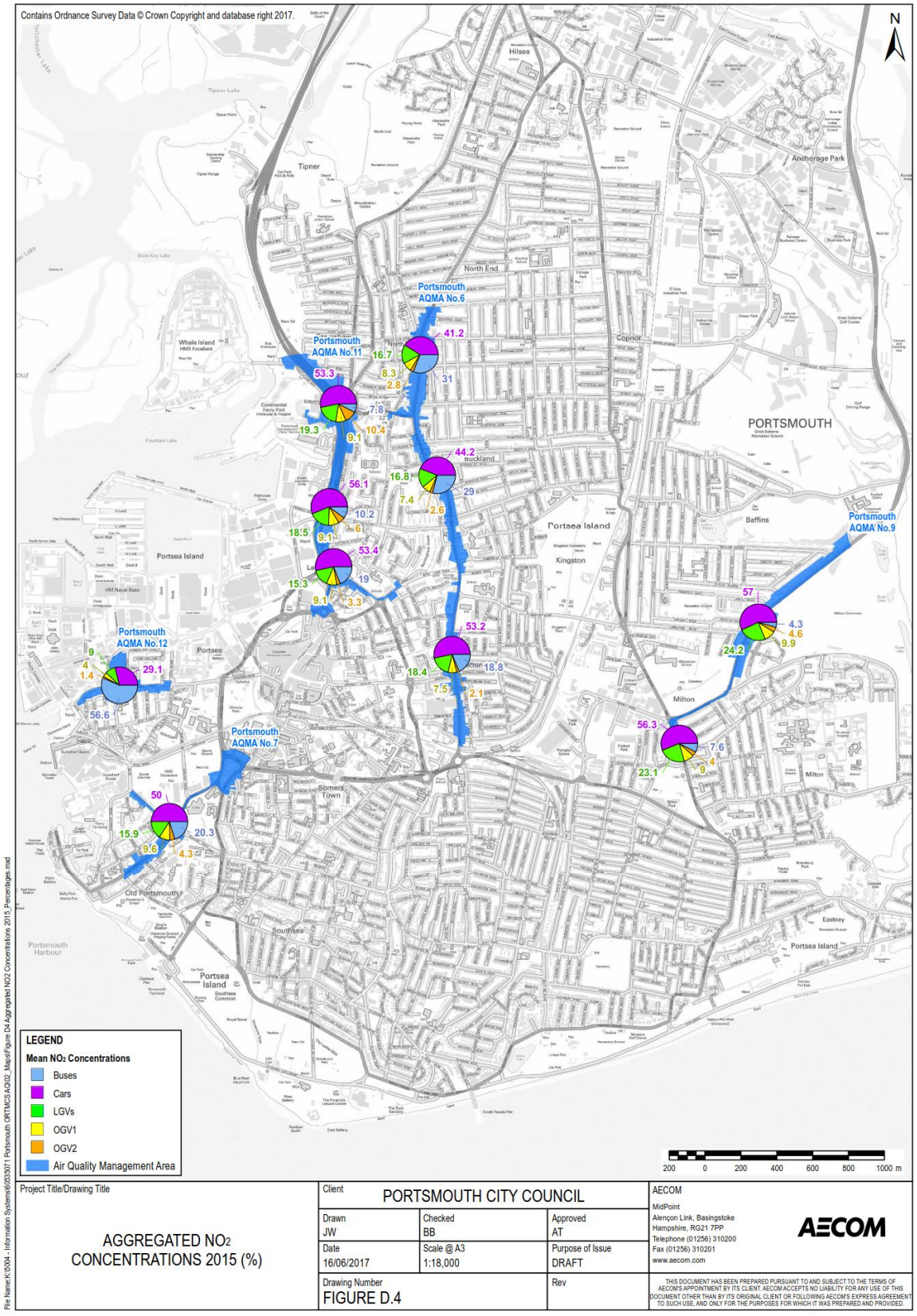

Project Title/Drawing Title: AGGREGATED NO_2 CONCENTRATIONS 2015 (%)	Client: PORTSMOUTH CITY COUNCIL		
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	Date: 16/06/2017	Scale @ A3: 1:18,000	Purpose of Issue: DRAFT
	Drawing Number: FIGURE D.4		Rev:

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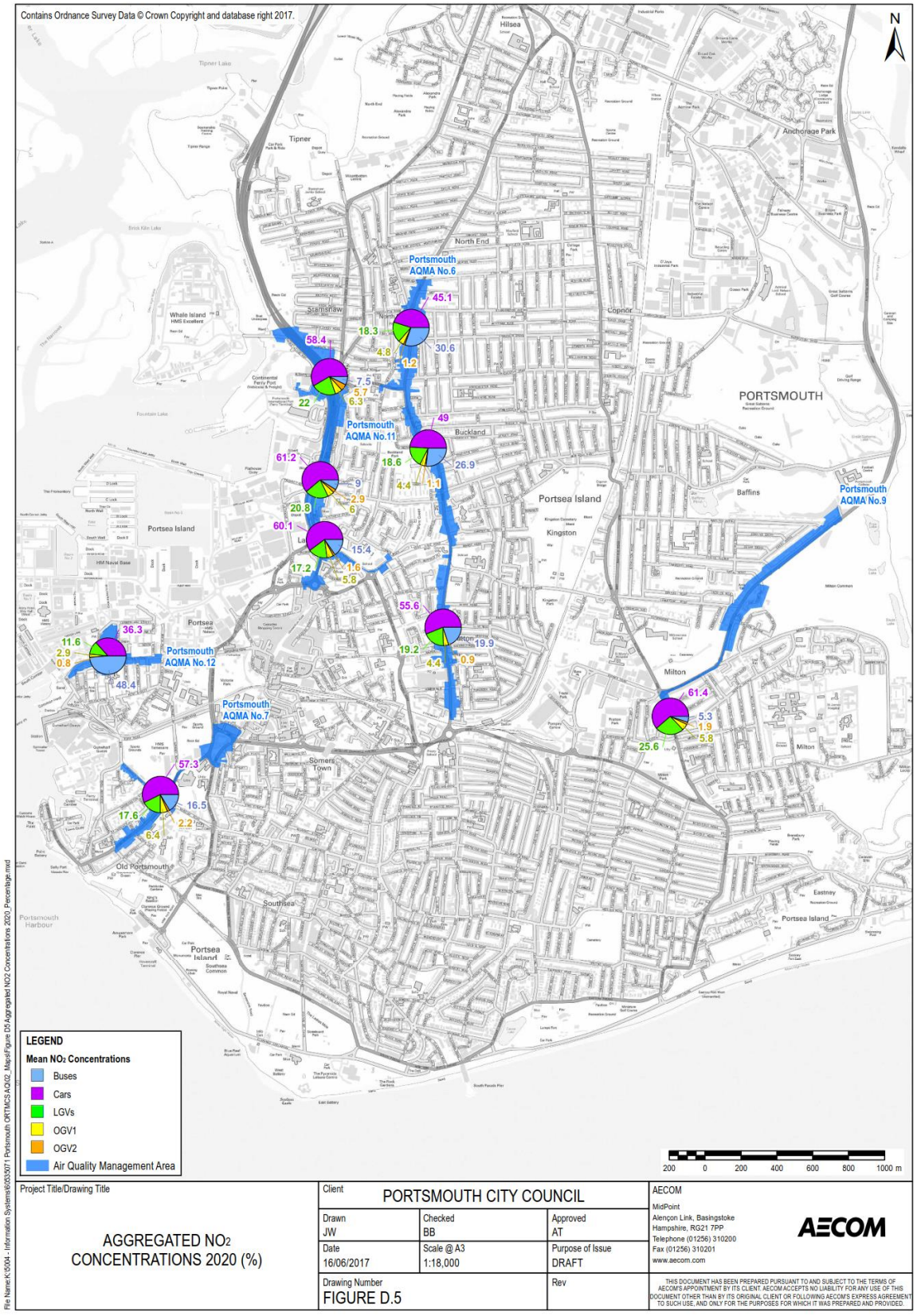

Project Title/Drawing Title: AGGREGATED NO_2 CONCENTRATIONS 2020 (%)	Client: PORTSMOUTH CITY COUNCIL		AECOM, MidPoint, Alençon Link, Basingstoke, Hampshire, RG21 7PP, Telephone (01256) 310200, Fax (01256) 310201, www.aecom.com
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File Name:K:\0004 - Information Systems\60053071 Portsmouth CRTM\CS\AQ\02_Maps\Figure D5 Aggregated NO2 Concentrations 2020 Percentage.mxd