Epping Forest District Council

District Wide Air Quality Modelling

May 2023

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Document Control Sheet

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Purpose of Assessment

Bureau Veritas has been commissioned by Epping Forest District Council (the Council) to complete a Detailed Modelling Assessment to provide a district wide air quality model. Currently there is one AQMA within Epping Forest, declared in 2012 as a result of exceedances of the 40 µg/m^3 annual mean and 1-hour objectives for Nitrogen Dioxide (NO_2). This AQMA is located near the B1393/Theydon Road junction at Epping, Bell Common.

The Detailed Modelling Assessment focusses on the road network across Epping Forest to establish any changes in the spatial extent of NO_2 concentrations in order to identify any areas that are above, or within 10%, of the AQS annual mean objective. The area was modelled using the advanced atmospheric dispersion model ADMS-Roads (Version 5.0.1.3) and latest emissions from the Emissions Factors Toolkit (Version 11.0), with annual mean NO_2 concentration outputs produced at four discrete receptor locations, and across a receptor grid.

Assessment Findings

Results show that the NO_2 annual mean AQS objective is observed to be exceeded at one receptor location, with one further location within 10% of the objective. The discrete receptor location which reports annual mean NO_2 concentrations to be above of the AQS objective is located within the existing AQMA. The receptor with a reported concentration within 10% of the AQMA is located at a roadside location of junctions where key arterial roads meet along the A123/Hainault Rd near Station Road, at Chigwell.

The highest modelled annual mean concentration of NO_2 was recorded at Receptor R123 with a concentration of 48.27µg/m^3. Receptor R123 is located at Epping High Road, within the existing AQMA, along a façade of a residential property which immediately fronts onto a stretch of the B1393, susceptible to congestion due to the junction with Theydon Road. This compares to the maximum monitored concentration, 47.6µg/m^3, in 2019 at the diffusion tube 3, which is located adjacent to R123.

The empirical relationship given in LAQM.TG(22)[1] states that exceedances of the 1-hour mean objective for NO_2 are only likely to occur where annual mean concentrations are 60µg/m^3 or above. The NO_2 annual mean concentrations predicted at all receptors are below this hourly exceedance indicator.

The highest modelled annual mean concentration of PM_{10} and $PM_{2.5}$ were also recorded at Receptor R123 with concentrations of 23.07µg/m^3 and 14.21µg/m^3 respectively. Modelled annual mean concentrations of PM_{10} and $PM_{2.5}$ were all well below the AQS objectives throughout the study area.

1 Introduction

Bureau Veritas has been commissioned by Epping Forest District Council (the Council) to complete a District Wide Detailed Modelling Assessment. Currently there is one AQMA within Epping Forest, declared in 2012 as a result of exceedances of the 40 µg/m^3 annual mean and 1-hour objectives for Nitrogen Dioxide (NO_2). This AQMA is located near the B1393/Theydon Road junction at Epping, Bell Common. The aim of this Detailed Modelling Assessment is to increase the Councils' understanding of pollutant concentrations within Epping Forest District.

The air quality modelling has been completed using 2019 traffic data, 2019 monitoring data and the latest Local Air Quality Management (LAQM) tools. As travel restrictions were implemented during 2020 and 2021, due to the Covid-19 outbreak in the UK, traffic averages and consequently the monitored pollutant concentrations were lower during those years as set out in Table 3-2. Monitored data for 2019 is considered to be the latest monitored data representative of standard conditions at the time of producing this report and therefore used in this analysis. This report details modelled concentrations of NO_2, PM_{10} and $PM_{2.5}$ across the entire borough.

1.1 Scope of Assessment

It is the general purpose and intent of this assessment to determine, with reasonable certainty, the magnitude and geographical extent of any exceedances of the AQS objectives for NO_2, PM_{10} and $PM_{2.5}$ and highlight any areas of concern.

The following are the objectives of the assessment:

- To assess the air quality at selected locations ("receptors") representative of worst-case exposure relative to the averaging period of focus (i.e. annual objective - façades of the existing residential units), based on modelling of emissions from road traffic on the local road network;

- To establish the spatial extent of any likely exceedances of the UK annual mean NO_2 AQS objective limit, and to identify the spatial extent of any areas within 10%;

The approach adopted in this assessment to assess the impact of road traffic emissions on air quality utilised the atmospheric dispersion model ADMS-Roads version 5.0.1.3, focusing on emissions of oxides of nitrogen (NO_x), which comprise of nitric oxide (NO) and nitrogen dioxide (NO_2). Particulate Matter (PM_{10} and $PM_{2.5}$) emissions have also been considered for completeness.

The guiding principles for air quality assessments, as set out in the latest guidance provided by Defra for air quality assessment (LAQM.TG(22))[1], have been used.

[1] LAQM Technical Guidance LAQM.TG(22) – August 2022. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.

2 Air Quality – Legislative Context

2.1 Air Quality Strategy

The importance of existing and future pollutant concentrations can be assessed in relation to the national air quality standards and objectives established by Government. The Air Quality Strategy[2] (AQS) provides the over-arching strategic framework for air quality management in the UK and contains national air quality standards and objectives established by the UK Government and Devolved Administrations to protect human health. The air quality objectives incorporated in the AQS and the UK Legislation are derived from Limit Values prescribed in the EU Directives transposed into national legislation by Member States.

The CAFE (Clean Air for Europe) programme was initiated in the late 1990s to draw together previous directives into a single EU Directive on air quality. The CAFE Directive[3] has been adopted and replaces all previous air quality Directives, except the 4th Daughter Directive[4]. The Directive introduces new obligatory standards for $PM_{2.5}$ for Government but places no statutory duty on local government to work towards achievement of these standards.

The Air Quality Standards (England) Regulations[5] 2010 came into force on 11 June 2010 in order to align and bring together in one statutory instrument the Government's obligations to fulfil the requirements of the new CAFE Directive.

The objectives for ten pollutants – benzene (C_6H_6), 1,3-butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3) and Polycyclic Aromatic Hydrocarbons (PAHs), have been prescribed within the AQS[2].

The AQS objectives apply at locations outside buildings or other natural or man-made structures above or below ground, where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period. Typically, these include residential properties and schools/care homes for long-term (i.e. annual mean) pollutant objectives and high streets for short-term (i.e. 1-hour) pollutant objectives. Table 2-1 taken from LAQM TG(22)[1] provides an indication of those locations that may or may not be relevant for each averaging period.

As a result of traffic pollution the UK has failed to meet the EU Limit Values for NO_2 by the 2010 target date. As a result, the Government has had to submit time extension applications for compliance with the EU Limit Values, which has since passed and its continued failure to achieve these limits is currently giving rise to infraction procedures being implemented. The UK is not alone as the challenge of NO_2 compliance at EU level includes many other Member States.

In July 2017, the Government published its plan for tackling roadside NO_2 concentrations[6], to achieve compliance with EU Limit Values. This sets out Government policies for bringing NO_2 concentrations within statutory limits in the shortest time period possible. Furthermore, the Clean Air Strategy was published in 2019, which outlines how the UK will meet international commitments to significantly reduce emissions of five damaging air pollutants by 2020 and 2030 under the adopted revised National Emissions Ceiling Directive (NECD).

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[2] Defra (2007), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

[3] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.

[4] Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic hydrocarbons in ambient air.

[5] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.
[6] Defra, DfT (2017), UK plan for tackling roadside nitrogen dioxide concentrations

The AQS objectives for these pollutants are presented in Table 2-1.

Table 2-1 – Examples of where the Air Quality Objectives should apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens or residential properties[1].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one hour or more. Any outdoor locations at which the public may be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-minute mean	All locations where members of the public might reasonably be expected to spend a period of 15 minutes or longer.	

Note [1] For gardens and playgrounds, such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.

Table 2-2 – Relevant AQS Objectives for the Assessed Pollutants in England

Pollutant	AQS Objective	Concentration Measured as:	Date for Achievement
Nitrogen dioxide (NO_2)	200 µg/m³ not to be exceeded more than 18 times per year	1-hour mean	31st December 2005
	40 µg/m³	Annual mean	31st December 2005
Particles (PM_{10})	50 µg/m³ not to be exceeded more than 35 times a year	24-hour mean	31st December 2004
	40 µg/m³	Annual Mean	31st December 2004
Particles ($PM_{2.5}$)	20 µg/m³	Annual Mean	1st January 2020

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 were published on 30th January 2023. This sets a target of achieving a target of 10µg/m³ for $PM_{2.5}$ by 31st December 2040. For the purposes of this assessment, the 20µg/m³ target still applies, though the intersection of any exceedance of either target with LAQM duties (e.g. declaring an AQMA) is still to be determined.

2.2 Local Air Quality Management (LAQM)

Part IV of the Environment Act 1995[7] places a statutory duty on local authorities to periodically review and assess air quality within their area and determine whether they are likely to meet the AQS objectives set down by Government for a number of pollutants – a process known as Local Air Quality Management (LAQM). The AQS objectives that apply to LAQM are defined for seven pollutants: benzene, 1,3-butadiene, CO, Pb, NO_2, SO_2 and Particulate Matter.

Local Authorities were formerly required to report on all of these pollutants, but following an update to the regime in 2016, the core of LAQM reporting is now focussed around the objectives of three pollutants: NO_2, PM_{10} and SO_2. Where the results of the Review and Assessment process highlight that problems in the attainment of the health-based objectives pertaining to the above pollutants will arise, the authority is required to declare an AQMA – a geographic area defined by high concentrations of pollution and exceedances of health-based standards.

The areas in which the AQS objectives apply are defined in the AQS as locations outside (i.e. at the façade) of buildings or other natural or man-made structures above or below ground where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period of the AQS objective.

Following any given declaration, the Local Authority is subsequently required to develop an Air Quality Action Plan (AQAP), which will contain measures to address the identified air quality issue and bring the location into compliance with the relevant objective as soon as possible.

[7] http://www.legislation.gov.uk/ukpga/1995/25/part/IV

3 Review and Assessment of Air Quality Undertaken by the Council

3.1 Local Air Quality Management

The Council currently has one AQMA (AQMA Epping Forest District Council No.2 2012), declared in 2008 for the exceedance of the NO_2 annual mean UK AQS objective of 40 µg/m^3 and 1-hour mean objective. The AQMA, as shown in Figure 3-1, is located near the B1393/Theydon Road junction at Epping, Bell Common.

The most recent AQAP for this AQMA was published in 2023. Monitoring within the borough has shown that concentrations of NO_2 are generally declining. In the most recently available Annual Status Report (ASR), the only monitored exceedance of the NO_2 annual mean AQS objective was within the existing AQMA.

Every local authority that has an active AQMA, is required under Part IV of the Environment Act 1995 (as amended 2021) and Part III of the Environment (NI) Order 2002 to provide an AQAP as a means to address the areas of poor air quality that have been identified within the AQMA.

3.2 Review of Air Quality Monitoring

3.2.1 Local Air Quality Monitoring

During 2019, the Council's non-automatic monitoring programme consisted of recording NO_2 concentrations using a network of passive diffusion tubes at 42 sites across Epping Forest District. No automatic (continuous) monitoring took place within the district during 2019.

Between 2017 and 2021 there have been exceedances of the annual mean AQS objective at Sites; 1 and 3 as set out in the latest ASR available for EFDC[8]. During 2019, there was only one recorded exceedance of the annual mean AQS objective for NO_2 at Site 3: Bell Vue which monitored 47.6 µg/m^3.

The details of the diffusion tube monitoring within Epping for 2019 used for the purpose of the modelling assessment are shown in Table 3-1, and monitored concentrations for 2017-2021 are presented in Table 3-2.

Table 3-1 – Epping Forest District Council LAQM Diffusion Tube Monitoring

Site ID	Site Location	Site Type	In AQMA	OS Grid Ref X	OS Grid Ref Y	Monitoring Height (m)
1	105 Hainault Road (junction with Fencepiece Road), Chigwell	K	No	544234	192236	2.0
2	15 High Street, Epping	UB	No	545555	201732	2.0
3	Bell Vue, High Road, Bell Common, Epping	R	Yes, No 2	544928	201281	2.0
4	254 High Street, Epping (Ladbrokes)	R	No	546196	202355	2.5
5	202 High Street, Epping (Superdrug)	R	No	546058	202193	2.5

[8] https://www.eppingforestdc.gov.uk/wp-content/uploads/2022/07/2021-Annual-Status-Report.pdf

Site ID	Site Location	Site Type	In AQMA	OS Grid Ref X	OS Grid Ref Y	Monitoring Height (m)
6	1 Canes Cottages, Canes Lane A414, Hastingwood	UB	No	547838	206819	2.0
7	1 Church Hill, Loughton	R	No	542505	196668	2.0
8	72 Church Hill, Loughton	R	No	542664	196868	2.0
9	249 High Road,Loughton (Timpson)	R	No	542339	196360	2.5
10	252 High Road, Loughton (Love Brownies)	R	No	542373	196478	2.5
11	5 Goldings Hill, Loughton	R	No	543091	197316	2.5
12	66 Tempest Mead, North Weald	UB	No	549648	203671	2.0
13	20 High Street, Roydon	R	No	540919	209956	2.0
14	Burles Farm, Netherhall Road, Roydon	UB	No	539711	208662	2.0
15	Albion Terrace, Sewardstone Road, Sewardstone	R	No	537727	196187	2.0
17	14 The Elms, Waltham Abbey	UB	No	541320	200020	2.0
18	4 Leaview, Waltham Abbey (Abbeyview)	R	No	537808	200644	2.0
19	34 Hayden Road, Waltham Abbey	R	No	538386	199557	2.0
20	2 Lodge Lane, Waltham Abbey	R	No	538710	199860	2.0
21	110 Roundhills, Waltham Abbey	UB	No	538954	199973	2.0
22	26 Victoria Road, Buckhurst Hill (opposite Underground Station)	R	No	541719	193979	2.0
23	St Johns Sch, High Road, Buckhurst Hill	R	No	540902	194240	2.0
25	Regency Lodge, Roding Lane, Buckhurst Hill	R	No	541913	194020	2.0
26	131 High Street, Ongar (at Bottleneck)	R	No	555253	2020921	2.0.
27	3 Queens Terrace, Epping Road A414, Ongar	R	No	555125	203944	2.0
31	Station House, Station Approach, Epping Underground	O	No	546196	201563	2.5

Site ID	Site Location	Site Type	In AQMA	OS Grid Ref X	OS Grid Ref Y	Monitoring Height (m)
	Station, Epping					
32	Copped Hall, High Road, Bell Common, Epping	R	No	544709	201139	2.0
33	281 Fencepiece Road, Chigwell	R	No	544238	192212	2.5
34	414 Fencepiece Road, Chigwell (Sherrell House)	R	No	544268	192247	2.0
35	120 Manor Road, Chigwell	R	No	544183	192231	2.5
36	107 High Street, Ongar (Anchor)	R	No	555231	202875	2.5
37	149 High Street, Ongar (Queen Bee)	R	No	555253	202964	2.5
38	204 High Street, Ongar (Watsons)	R	No	555265	203108	2.0
39	224 High Street, Epping (Church's Butchers)	R	No	546107	202254	2.0
40	154 High Street, Epping (was Lloyds Bank)	R	No	545991	202095	2.5
41	259 High Street, Epping (Holland & Barrett)	R	No	546075	202253	2.5
Notes R: Roadside, K: Kerbside, UB: Urban Background, O: Other						

Table 3-2 – Relevant Epping Forest District Council LAQM Diffusion Tube Monitoring

Site ID	Valid Data Capture for 2019 (%)	Annual Mean NO_2 Concentration ($\mu g/m^3$)				
		2017	2018	2019	2020	2021
1	100	**45.3**	39.2	38.9	30.0	29.6
2	100	27.6	24.5	23.9	18.1	17.9
3	100	**64.5**	**54.8**	**47.6**	32.5	**41.0**
4	100	30.8	28.3	28.2	21.3	20.0
5	100	35.7	35.9	33.5	24.0	24.8
6	100	26.0	21.8	20.1	16.1	16.9
7	100	27.0	25.4	22.4	17.4	17.9
8	100	26.3	23.2	21.2	16.8	17.9
9	100	32.8	32.4	28.0	21.2	20.4
10	100	37.6	32.0	28.3	21.7	22.3
11	100	38.6	38.8	34.4	28.0	28.8
12	100	18.4	16.0	15.1	11.5	12.1
13	100	23.2	22.7	20.5	16.1	16.8
14	100	17.6	17.0	15.8	13.4	13.2
15	100	32.7	30.3	27.2	22.6	23.2
17	100	30.3	27.9	25.7	17.0	21.4
18	100	28.1	24.6	23.8	18.9	19.6
19	100	25.8	27.1	26.0	20.4	22.2

Site ID	Valid Data Capture for 2019 (%)	Annual Mean NO_2 Concentration (µg/m³)				
		2017	2018	2019	2020	2021
20	100	33.1	30.5	30.2	22.5	24.6
21	100	30.1	26.8	28.2	21.0	20.8
22	100	30.9	28.7	25.2	19.4	21.5
23	100	31.9	29.2	25.7	20.1	20.6
25	100		37.3	33.3	26.1	27.1
26	100		38.3	33.4	27.8	31.3
27	100		26.7	24.2	18.3	18.7
31	75			37.9	25.3	28.2
32	75			30.9	23.2	22.2
33	75			30.3	25.0	23.4
34	75			21.6	16.9	17.5
35	75			34.9	24.3	25.5
36	58.3			34.1	24.7	26.1
37	58.3			28.4	19.8	21.3
38	58.3			30.0	19.5	21.6
39	58.3			34.9	22.6	22.6
40	58.3			33.0	24.3	21.7
41	58.3			34.9	22.7	23.9

Notes
All values reported are bias adjusted as required and represent the monitoring location (i.e. absence of distance correction calculations)

The monitored exceedances of the annual average NO_2 limit were at location 3, which has recorded an exceedance every year since 2015, at location 1, which has recorded exceedance for 2016 and 2017, and 11, which has recording exceedance in 2015 and 2016. Monitoring at sites 31 to 41 commenced in 2019 so there are no historical data available for these sites.

The empirical relationship given in LAQM.TG(22)[1] states that exceedances of the 1-hour mean objective for NO_2 is only likely to occur where annual mean concentrations are 60 µg/m³ or above at a location of relevant exposure (Table 2-1). This indicates that an exceedance of the 1-hour mean objective is unlikely to have occurred at these sites and past 2017 at location 3.

As travel restrictions were implemented during 2020 and 2021, due to the Covid-19 outbreak in the UK, traffic averages and consequently the monitored pollutant concentrations were lower during those years as set out in Table 3-2. Monitored data for 2019 is considered to be the latest monitored data representative of standard conditions by the emission of this report and therefore used in this analysis. Epping Forest District Council AQMA boundary and the relevant 2019 council-operated monitoring locations are presented in Figure 3-1 and Figure 3-2 respectively.

Figure 3-1 – Epping Forest District Council AQMA Boundary

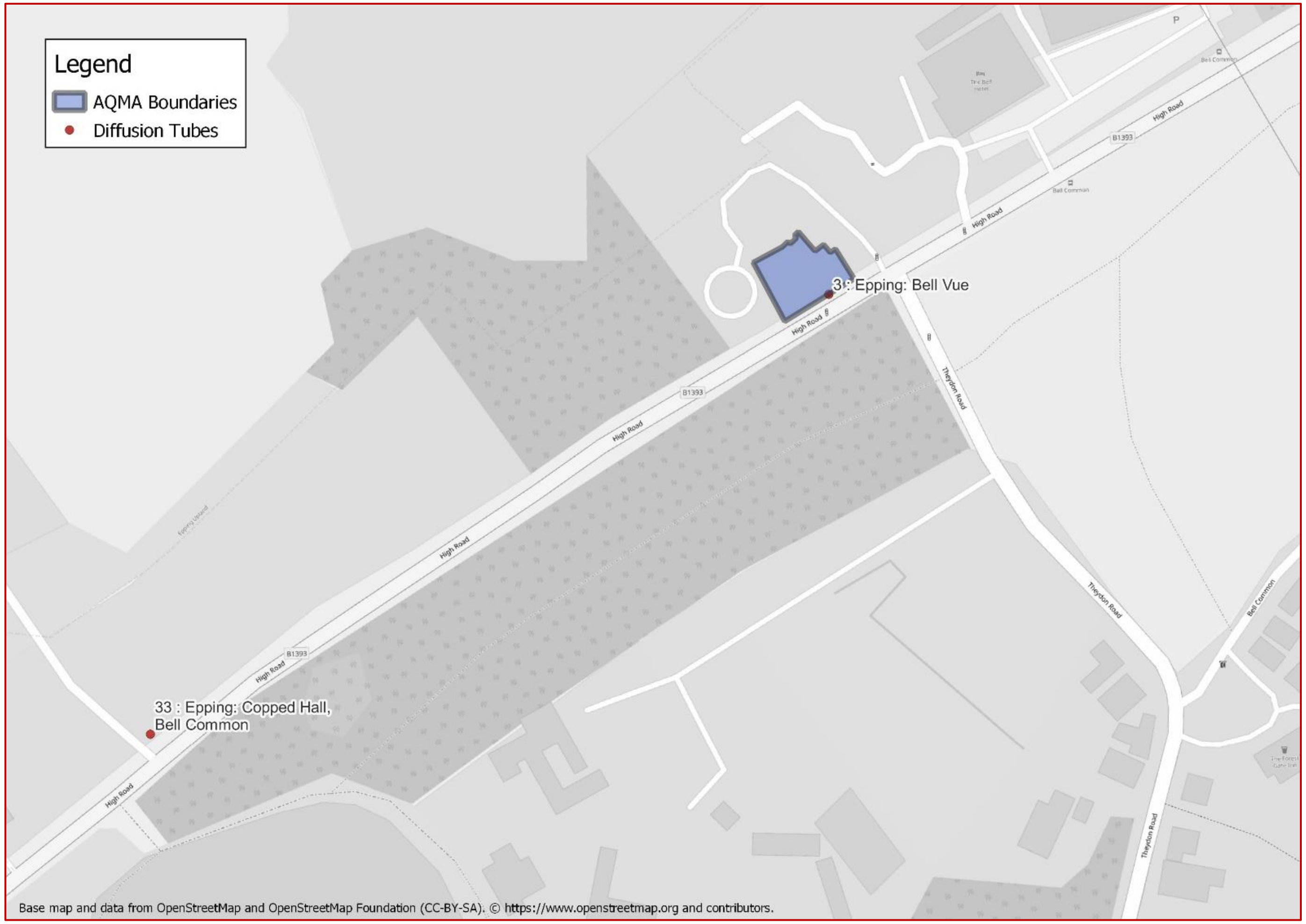


Figure 3-2 – Local Monitoring Locations - Overview

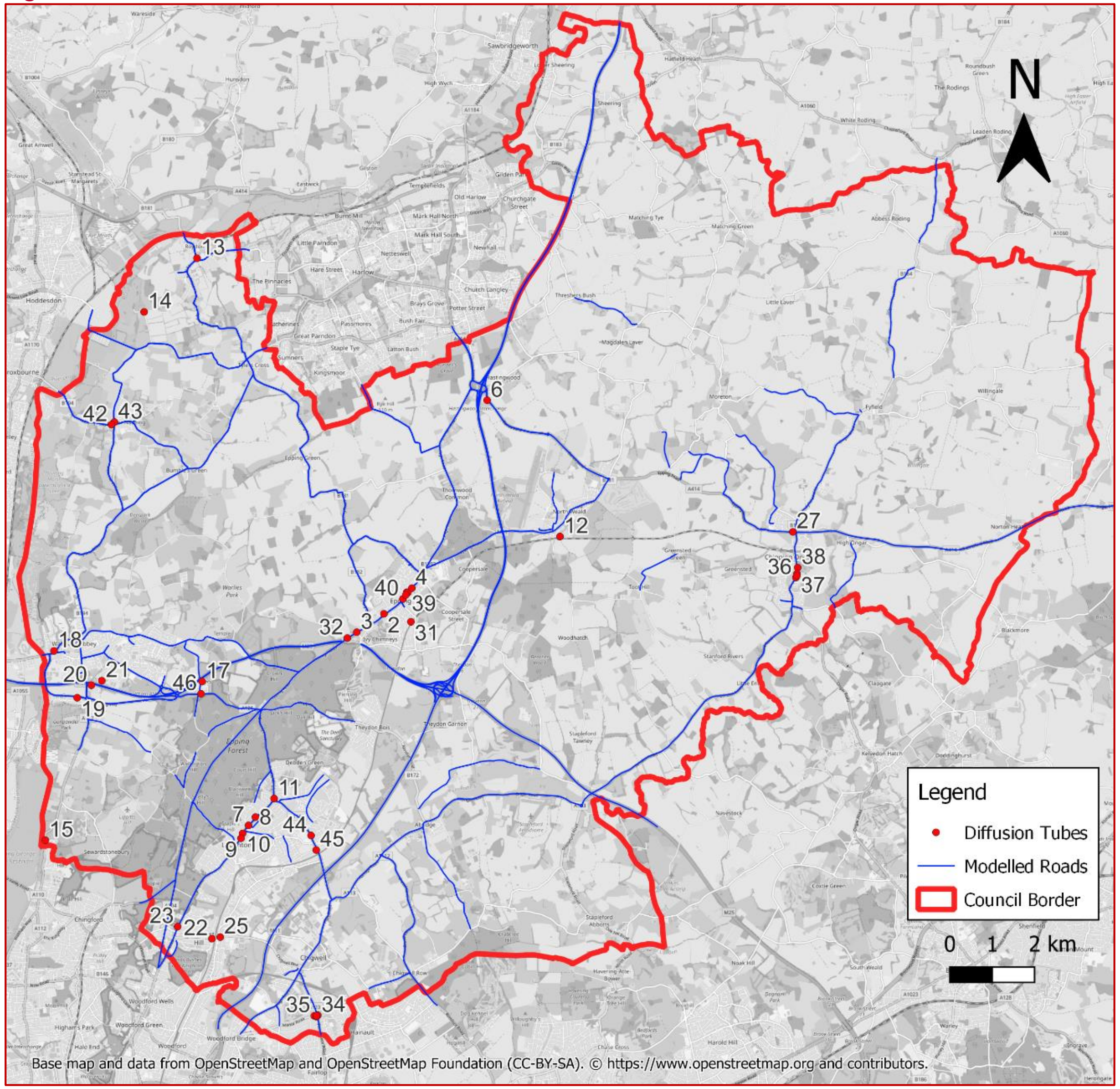
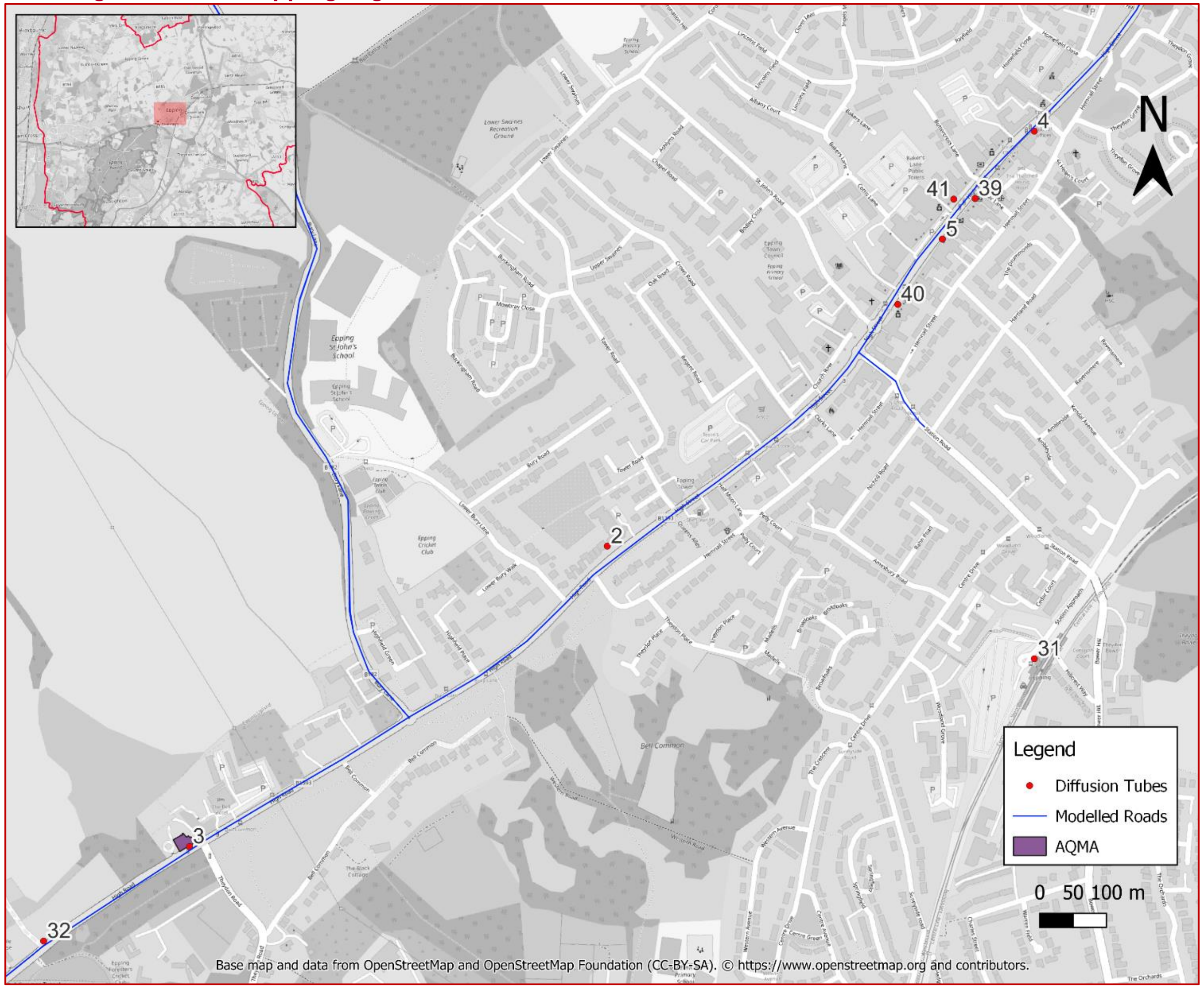


Figure 3-3 – Local Monitoring Locations – Epping High Street



3.3 Defra Background Concentration Estimates

Defra maintains a nationwide model of existing and future background air pollutant concentrations at a 1 km x 1 km grid square resolution. This data includes annual average concentration for NO_x, NO_2, PM_{10} and $PM_{2.5}$. The maps have used a baseline reference year of 2018 to predict concentrations between 2018 and 2030[9]. The model used to determine the background pollutant levels is semi-empirical in nature: it uses the National Atmospheric Emissions Inventory (NAEI) emissions to model the concentrations of pollutants at the centroid of each 1km grid square, but then calibrates these concentrations in relation to actual monitoring data.

Pollutant background concentrations used for the purposes of this assessment have been obtained from the Defra supplied background maps for the relevant 1 km x 1 km grid squares covering the modelled domain for the year 2019. The relevant annual mean background concentration will be added to the predicted annual mean road contributions in order to predict the total pollutant concentration at each receptor location. The total pollutant concentration can then be compared against the relevant AQS objective to determine the event of an exceedance.

The Defra mapped background concentrations for base year of 2019[9] for the whole district were used. All of the mapped background concentrations within the area are well below the respective annual mean AQS objectives.

[9] Defra Background Maps (2019), available at https://uk-air.defra.gov.uk/data/laqm-background-home

4 Assessment Methodology

To predict pollutant concentrations of road traffic emissions the atmospheric model ADMS Roads version 5.0.1.3 was used to model a 2019 baseline scenario. The guiding principles for air quality assessments as set out in the latest guidance and tools provided by Defra for air quality assessment (LAQM.TG(22))[1] have been used.

The approach used in this assessment has been based on the following:

- Prediction of NO_2 concentrations to which existing receptors may be exposed and comparison with the relevant AQS objectives;

4.1 Traffic Inputs

Traffic flows and vehicle class compositions were taken from the following sources:

- Essex County Council Transportation, Strategy and Infrastructure Team;
- Epping Forest District Council Traffic Counts;
- Hertfordshire County Council; and
- The Department for Transport (DfT) traffic count point database for traffic when other data was not available.

When available the 2019 baseline scenario was used. Where 2019 data was not available, a TEMPro factor was used to uplift the data to 2019.

Traffic speeds were modelled at either the relevant speed limit for each road or, where available, monitored vehicle speeds provided. Where appropriate, vehicle speeds have been reduced in accordance with LAQM TG(22)[1] to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue.

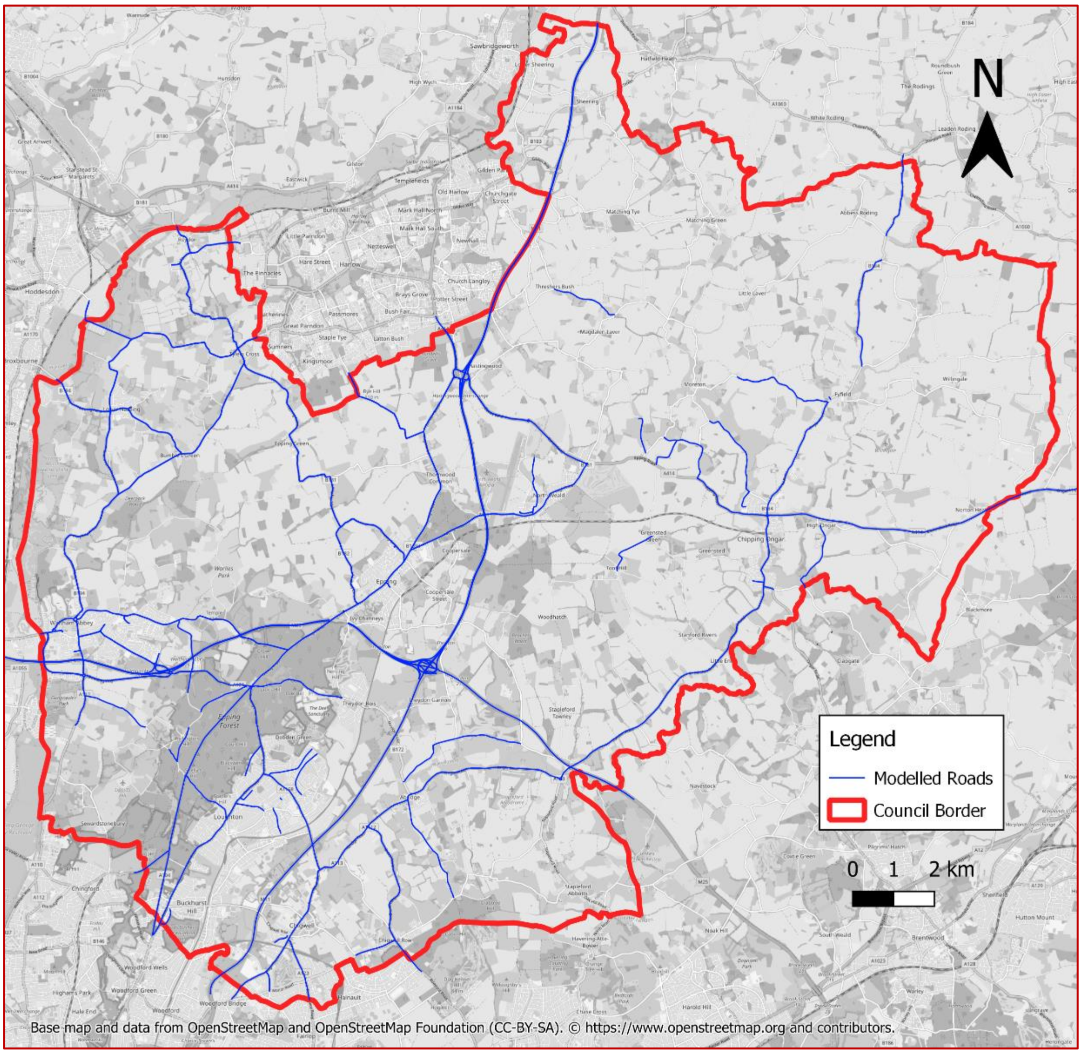
The Emissions Factors Toolkit (EFT) version 10.1 developed by Defra[10] has been used to determine vehicle emission factors for input into the ADMS-Roads model, based upon the traffic data inputs.

Details of the traffic flows used in this assessment including vehicle splits are provided in Table B.1 to Table B.3 of the Appendices. The modelled road network is presented in Figure 4-1.

It should be noted that for some minor roads, no traffic data was available. Emissions from these roads have been accounted for through use of background maps which includes minor roads.

[10] Defra, Emissions Factors Toolkit. https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html

Figure 4-1 – City Wide Modelled Road Network



4.2 Sensitive Receptors

A total of 172 discrete receptors were included at a height of 1.5 m to represent ground level exposure within the assessment to represent locations of relevant exposure. Details of the receptors are presented within Table C 1 of the Appendices and their locations are illustrated in Figure 4-2 to Figure 4-4.

The receptors were classified in 3 groups: residential buildings (R), education facilities (i.e. schools) (EF) and hospitals (H).

To model the source-to-receptor distance as accurately as possible a visual check through desk based reviews using Google Streetview and OpenStreetmap data was carried out to ensure that the modelled roads follow the actual alignment appropriately, and that the start/end nodes and vertices of links are in the correct place.

Concentrations were also modelled across a gridded area, at a standardised 'breathing zone' height of 1.5 m, covering the full extent of the model domain. Additional points were added at locations close to the roads for greater output resolution.

Figure 4-2 – Receptors Locations Considered in the Assessment

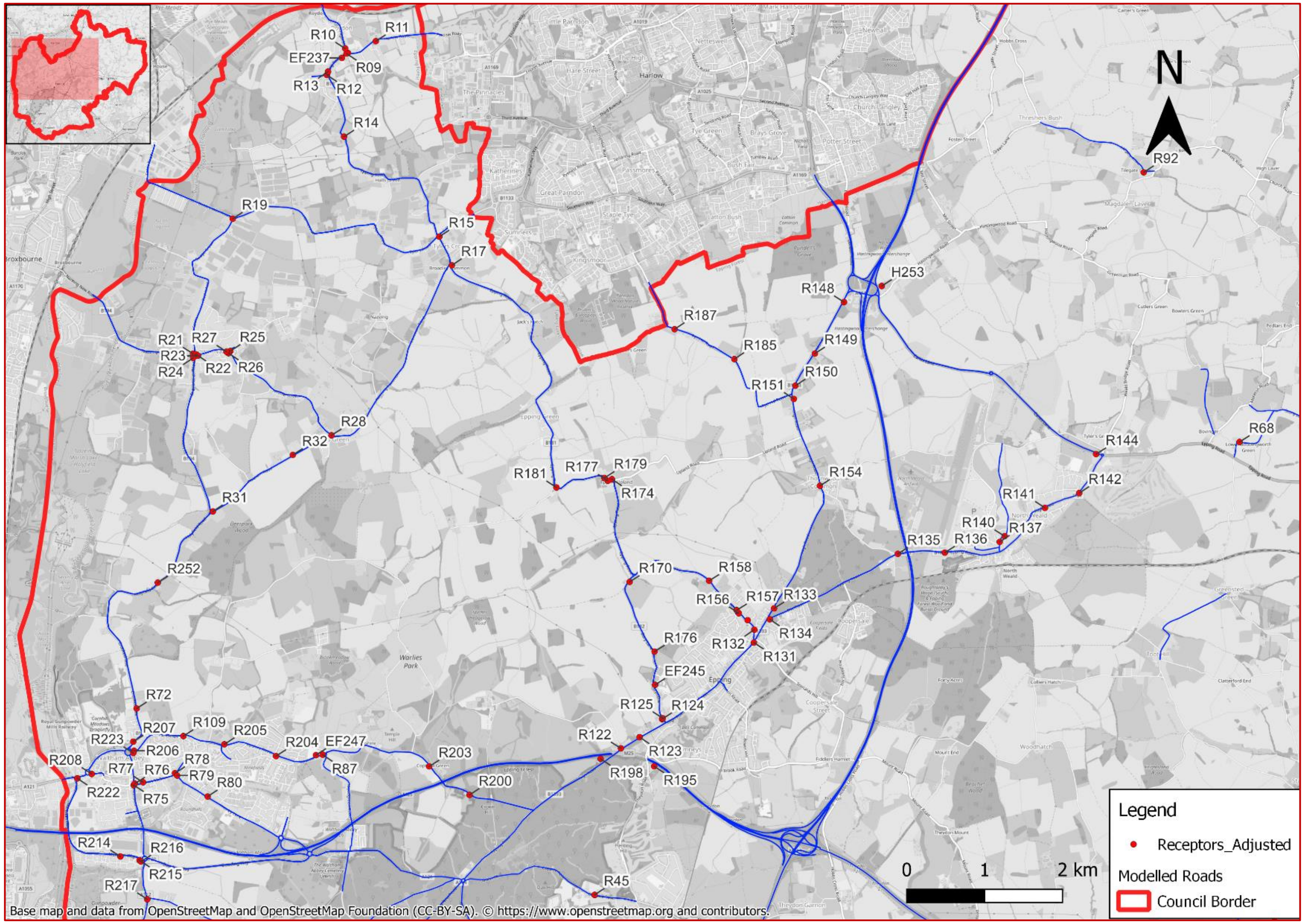


Figure 4-3 – Receptors Locations Considered in the Assessment

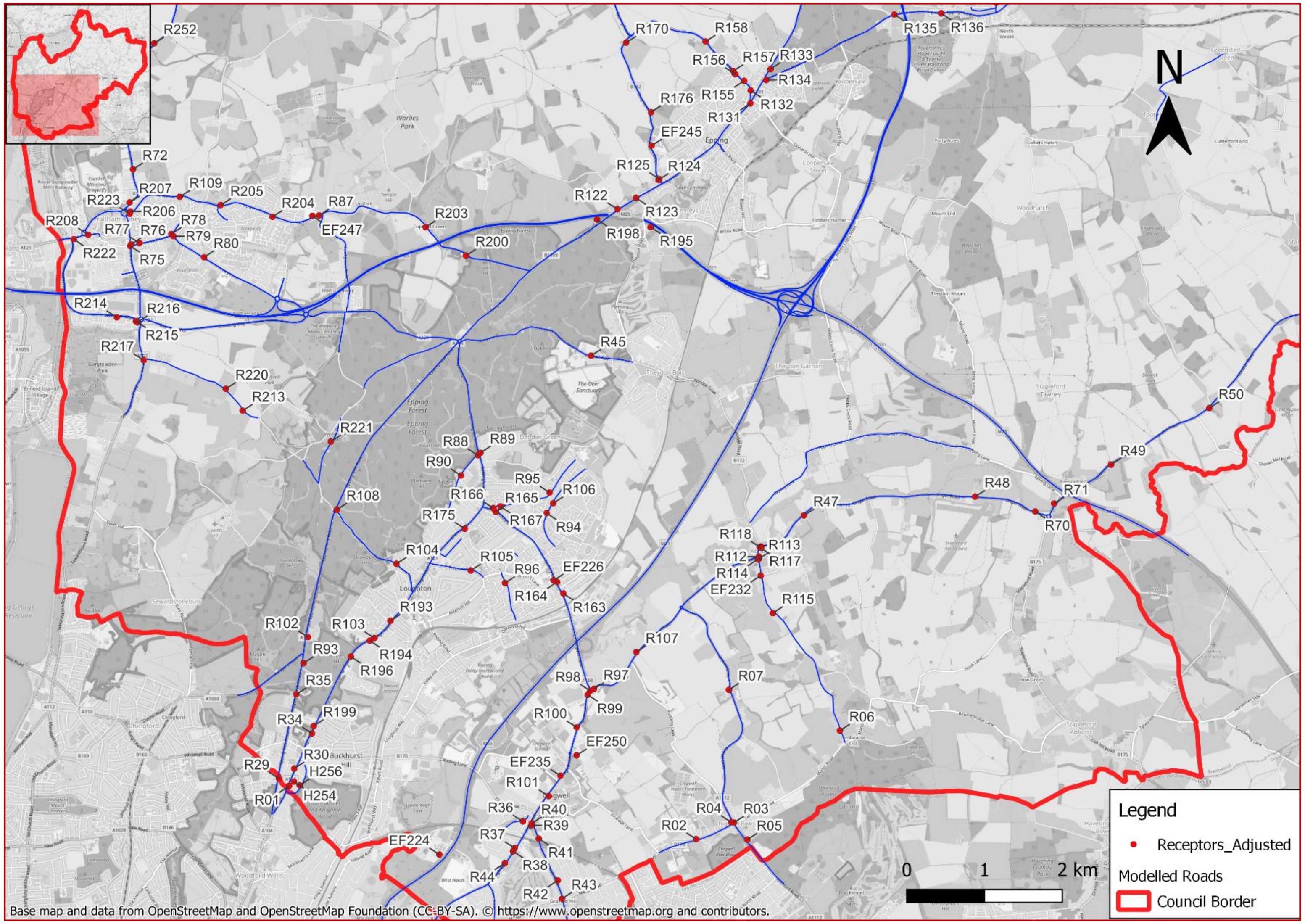
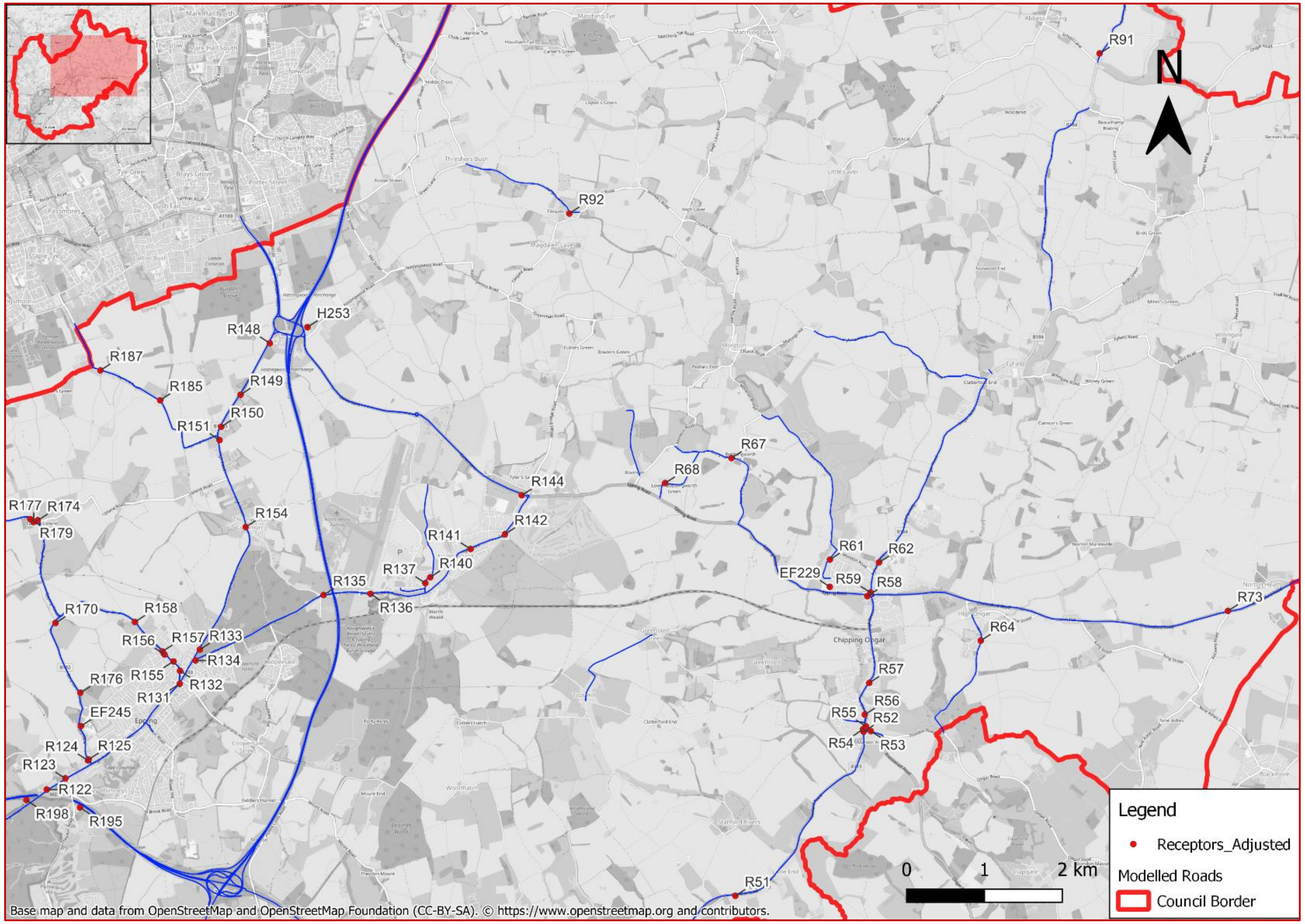


Figure 4-4 – Receptors Locations Considered in the Assessment



4.3 Other Emissions Sources

Emissions from the following sources have been accounted for through their inclusion within the Background Maps

- Aviation
- Industry
- Rail
- Domestic Sources
- Other Secondary Sources

Following a review of the National Atmospheric Emissions Inventory database of Large Point Sources, three were identified within EFDC's boundary:

- Ongar Waste Recycling Centre - which has data for PM and NOx emissions;
- Tesco Ongar - which has data for VOC and Benzene emissions; and,
- Nazeing Glassworks, Broxbourne - which includes PM emissions as well as other heavy metals

Ongar Waste Recycling Centre and Nazeing Glassworks have been identified as sources of NOx and PM and these are accounted for within the background NAEI maps.

4.4 General Model Inputs

A site surface roughness value of 0.5 m was entered into the ADMS-roads model, consistent with the parkland/open suburbia considered representative of the majority of the district. In accordance with CERC's ADMS Roads User Guide[11], a minimum Monin-Obukhov length of 30 m was used for the ADMS Road model to reflect the topography of the model domain.

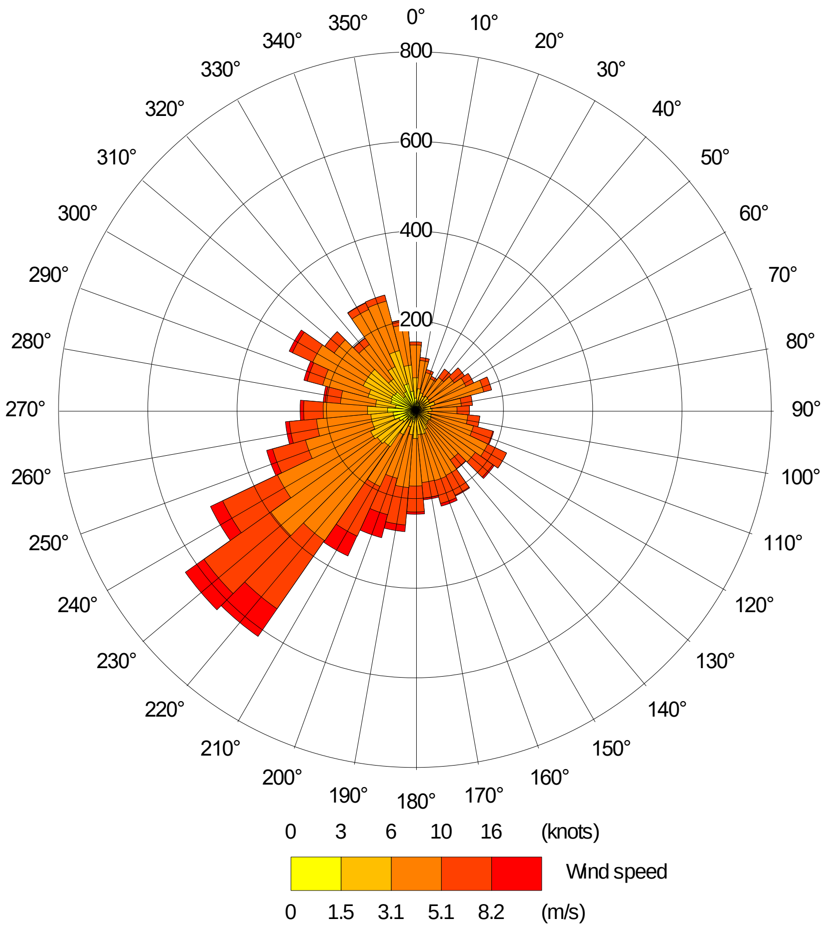
One year of hourly sequential meteorological data from a representative synoptic station is required by the dispersion model. 2019 meteorological data from Stansted Airport weather station has been used in this assessment. The station is located approximately 23 km north of the AQMA and is considered representative of the meteorological conditions experienced throughout the borough. A surface roughness value of 0.5 m was used for the area surrounding the meteorological station, representative of the Stansted airfield location and surrounding buildings.

Within the modelled domain a review of topography was undertaken to establish whether it was required to include modelled road gradients. Following this review, it was considered to not be required as two way traffic is required for roads to model this information and this was not generally available for the roads in question.

A wind rose for this site for the year 2019 is shown in Figure 4-5.

[11] CERC (2020), ADMS-Roads User Guide Version 5

Figure 4-5 – Wind Rose for Stansted Data 2019



Most dispersion models do not use meteorological data if they relate to calm winds conditions, as dispersion of air pollutants is more difficult to calculate in these circumstances. ADMS-Roads treats calm wind conditions by setting the minimum wind speed to 0.75 m/s. It is recommended in LAQM.TG(22)[1] that the meteorological data file be tested within a dispersion model and the relevant output log file checked, to confirm the number of missing hours and calm hours that cannot be used by the dispersion model. This is important when considering predictions of high percentiles and the number of exceedances. LAQM.TG(22)[1] recommends that meteorological data should have a percentage of usable hours greater than 85%. If the data capture is less than 85% short-term concentration predictions should be expressed as percentiles rather than as numbers of exceedances. The 2019 meteorological data from Stansted includes 8,666 lines of usable hourly data out of the total 8,760 for the year, i.e. 98.9% usable data. This is therefore suitable for the dispersion modelling exercise.

4.5 Model Outputs

The background pollutant values discussed in Section 3.3 have been used in conjunction with the concentrations predicted by the ADMS-Roads model to calculate predicted total annual mean concentrations of NO_x.

For the prediction of annual mean NO_2 concentrations for the modelled scenarios, the output of the ADMS-Roads model for road NO_x contributions has been converted to total NO_2 following the methodology in LAQM.TG(22)[1], using the NO_x to NO_2 conversion tool developed on behalf of Defra. This tool also uses the total background NO_x and NO_2 concentrations. This assessment has used version 8.1 (August 2020) of the NO_x to NO_2 conversion tool[12]. The road contribution is then added to the appropriate NO_2 background concentration value to obtain an overall total NO_2 concentration. Following an initial review, as there were elevated concentrations of NO_2 at receptor R217, considering the receptor is on the boundary of two background sites, the background concentration for the site with coordinates 538500, 198500 was used as it is considered more representative of the area.

The same process has been applied to provide annual mean concentrations for PM_{10} and $PM_{2.5}$. As no Particulate Matter monitoring was available within the study area, the verification factor used for NO_2 has been applied.

Verification of the ADMS-Roads assessment has been undertaken using a number of local authority diffusion tube monitoring locations. All NO_2 results presented in the assessment are those calculated following the process of model verification. Full details of the verification process are provided in Appendix A – ADMS Model Verification.

4.6 Uncertainty

Due to the number of inputs that are associated with the modelling of the study area there is a level of uncertainty that has to be taken into account when drawing conclusions from the predicted concentrations of NO_2. The predicted concentrations are based upon the inputs of traffic data, background concentrations, emission factors, street canyon calculations, meteorological data and the availability of monitoring data from the assessment area(s).

The modelled uncertainty within each verification zone is set out in Appendix A. The modelled verification shows that modelled results are typically within 10% of any monitoring results with some being within 25%. This should be considered when interpreting any modelled results.

4.7 Uncertainty in NO_x and NO_2 Trends

Recent studies have identified historical monitoring data within the UK that shows a disparity between measured concentration data and the projected decline in concentrations associated with emission forecasts for future years[13]. Ambient concentrations of NO_x and NO_2 have shown two distinct trends over the past twenty-five years: (1) a decrease in concentrations from around 1996 to 2002/04, followed by (2) a period of more stable concentrations from 2002/04 rather than the further decline in concentrations that was expected due to the improvements in vehicle emissions standards.

The reason for this disparity is related to the actual on-road performance of vehicles, in particular diesel cars and vans, when compared with calculations based on the Euro emission standards. Preliminary studies suggest the following:

- NO_x emissions from petrol vehicles appear to be in line with current projections and have decreased by 96% since the introduction of 3-way catalysts in 1993;
- NO_x emissions from diesel cars, under urban driving conditions, do not appear to have declined substantially, up to and including Euro 5. There is limited evidence that the same pattern may occur for motorway driving conditions; and
- NO_x emissions from HDVs equipped with Selective Catalytic Reduction (SCR) are much higher than expected when driving at low speeds.

This disparity in the historical national data highlights the uncertainty of future year projections of

[12] Defra NO_x to NO_2 Calculator (2020), available at https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc
[13] Carslaw, D, Beevers, S, Westmoreland, E, Williams, M, Tate, J, Murrells, T, Steadman, J, Li, Y, Grice, S, Kent, Aand Tsagatakis, I. 2011, Trends in NO_x and NO_2 emissions and ambient measurements in the UK, prepared for Defra, July 2011.

both NO_x and NO_2.

Defra and the Devolved Administrations have investigated these issues and have since published updated versions of the EFT that utilise COPERT 5 emission factors, which may go some way to addressing this disparity, but it is considered likely that a gap still remains. This assessment has used the latest EFT version 10.1 and associated tools published by Defra to help minimise any associated uncertainty when forming conclusions from the results.

All tools used within the modelling process and baseline year of assessment used are based on assumptions prior to the COVID-19 pandemic. All assumptions made are based on the best understanding at the time of writing but there is the potential for behaviours to change in future as a result of a shift towards more flexible working or changes in uptake of newer vehicles.

5 Results

5.1 Modelled Concentrations

Long Term

The assessment has considered emissions of NO_2, PM_{10} and $PM_{2.5}$ from road traffic at 171 existing receptor locations representing locations of relevant exposure, and across a generic output grid covering the modelled area. The modelled annual pollutant concentrations at each receptor are detailed at Table D 1 of the Appendices.

Table 5-1 provides a summary of the modelled receptors split into groups based on the predicted annual mean NO_2 concentration. It can be seen that of the 171 discrete receptors, one (0.6% of all modelled receptors) is predicted to be above the NO_2 annual mean AQS objective limit.

Table 5-1 – Summary of 2019 Modelled Receptor Results NO_2

Modelled NO_2 Concentration (µg/m^3)	Number of Receptors	Reference to the AQS Objective	Number of Receptors	% of Receptors
>44	1	**Above 40µg/m^3 AQS Objective**	**1**	**0.6**
40 - 44	0			
36 - 40	0	Within 10% of AQS Objective	0	0
32 - 36	9	Less than 10% below AQS Objective (i.e. 36µg/m^3)	170	99.4
<32	161			

The concentrations are presented graphically in Figure 5-1.

A summary of Particulate Matter results is provided in Table 5-2 and Table 5-3.for predicted annual mean PM_{10} and $PM_{2.5}$ concentrations respectively. It can be seen that of the 172 discrete receptors none are predicted to be above the PM_{10} and $PM_{2.5}$ annual mean AQS objective limit or within 10% of it. Modelled concentrations of both PM_{10} and $PM_{2.5}$ are below the relevant national objectives at all receptors.

Table 5-2 – Summary of 2019 Modelled Receptor Results PM_{10}

Modelled PM_{10} Concentration (µg/m^3)	Number of Receptors	Reference to the AQS Objective	Number of Receptors	% of Receptors
>44	0	**Above 40µg/m^3 AQS Objective**	**0**	**0**
40 - 44	0			
36 - 40	0	Within 10% of AQS Objective	0	0
32 - 36	0	Less than 10% below AQS Objective (i.e. 36µg/m^3)	171	100
<32	171			

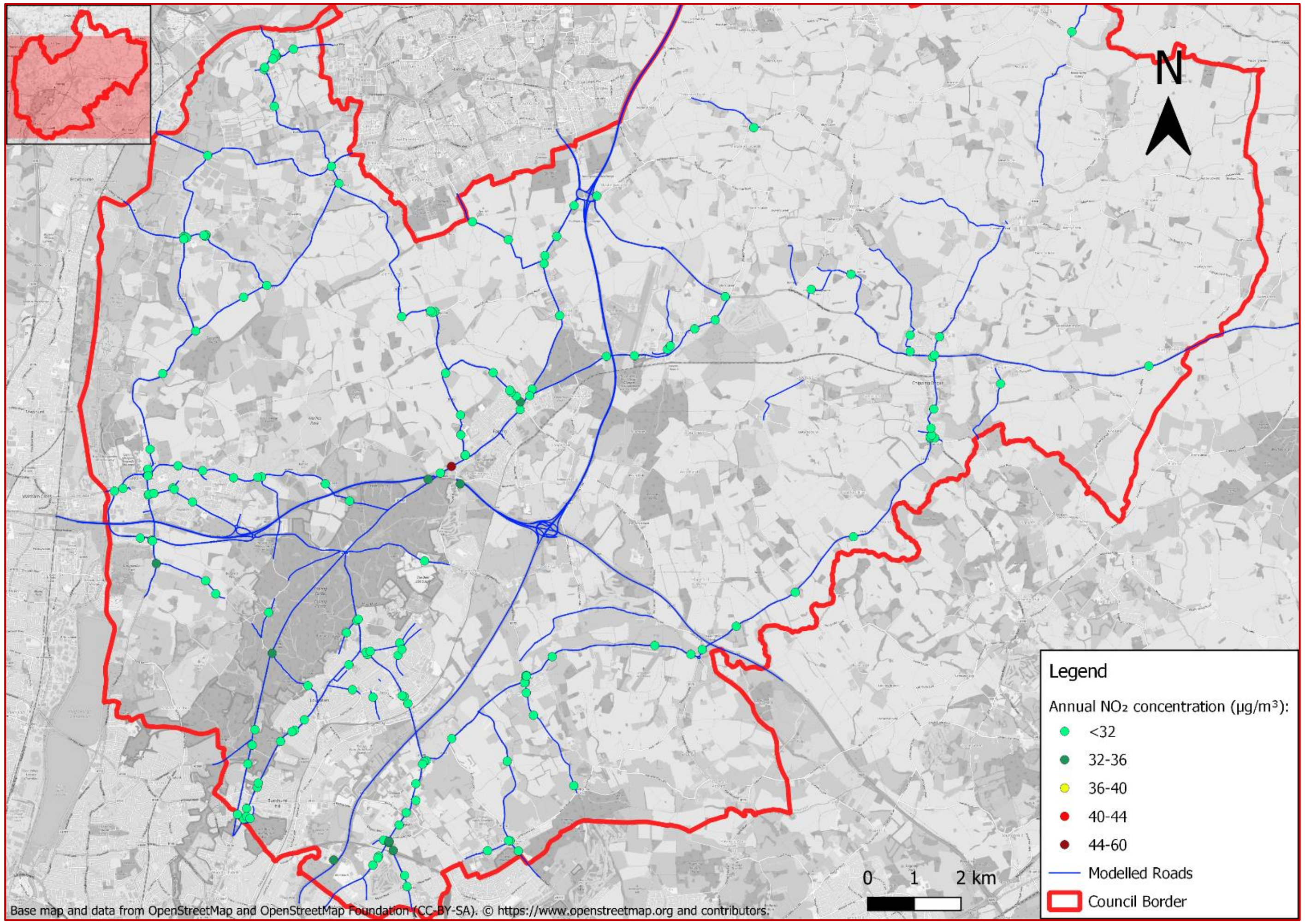
Table 5-3 – Summary of 2019 Modelled Receptor Results $PM_{2.5}$

Modelled $PM_{2.5}$ Concentration (μg/m³)	Number of Receptors	Reference to the AQS Objective	Number of Receptors	% of Receptors
>20	0	**Above 20μg/m³ AQS Objective**	**0**	**0**
18-20	0	Within 10% of AQS Objective		
15-18	0	Less than 10% below AQS Objective (i.e. 18μg/m³)	171	100
10-15	163			
<10	8			

Short Term

The empirical relationship given in LAQM.TG(22)[1] states that exceedances of the 1-hour mean objective for NO_2 is only likely to occur where annual mean concentrations are 60 μg/m³ or above at a location of relevant exposure (Table 2-1). Given the NO_2 annual mean concentration recorded at all receptors is below 60 μg/m³, exceedances of the hourly NO_2 AQS objective are unlikely.

Figure 5-1 – Annual NO_2 Concentration (µg/m³):



Contour Plots and Gridded Area

Modelled contour plots for total NO_2, PM_{10} and $PM_{2.5}$ annual mean concentrations are provided as a shape file inclusive of both road and background concentrations at the modelled study area.

The contour plot is representative of gridded output from the ADMS model showing how the model has dispersed pollutants based on the sources input. This shows the spatial extent of pollutant concentrations as assumed in the model. The contour plots are inclusive of the model outputs and background concentrations and are subject to the same assumptions around verification and conversion from NO_x to NO_2.

Figure 5-2 - Nitrogen Dioxide Modelled Concentrations

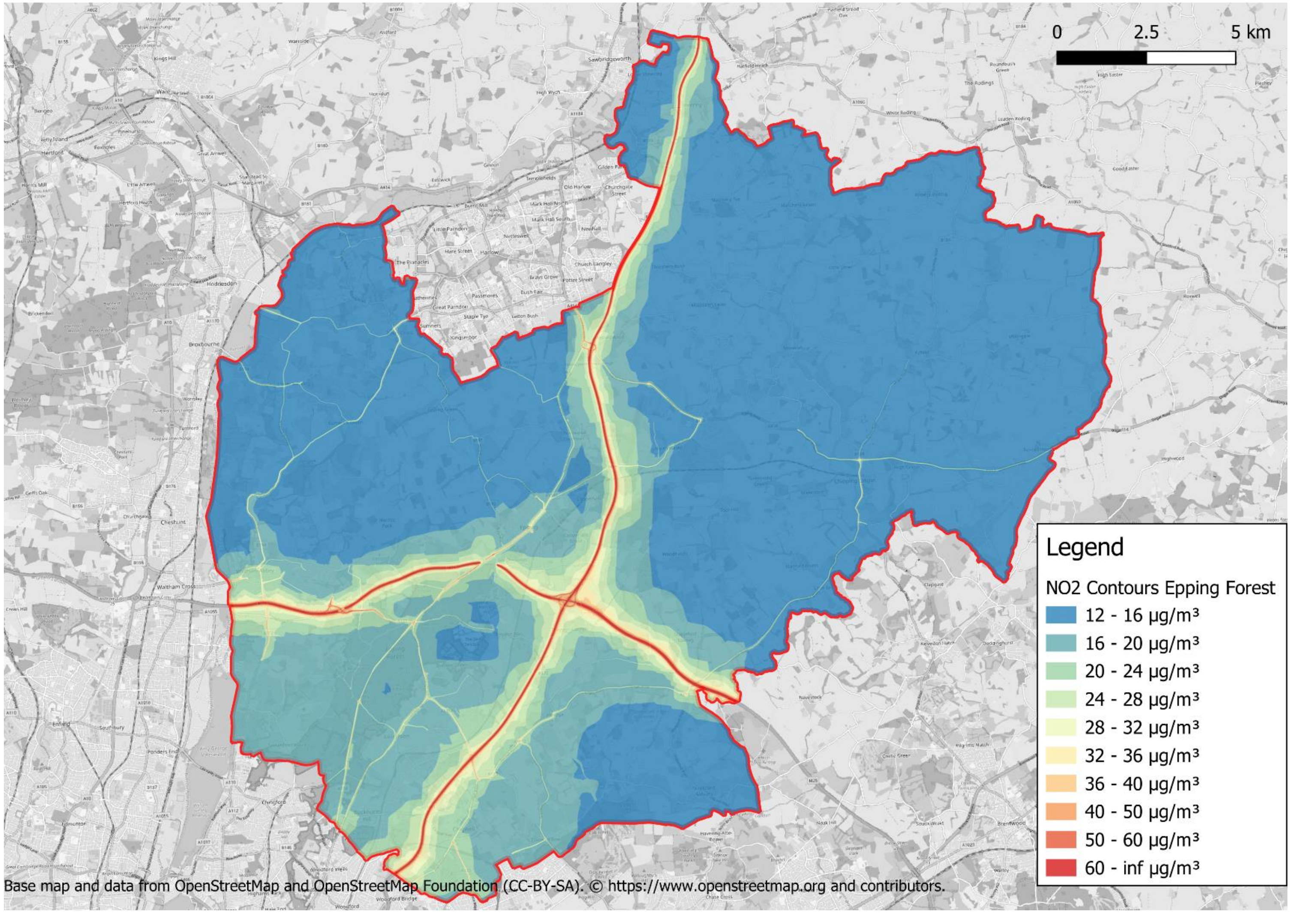
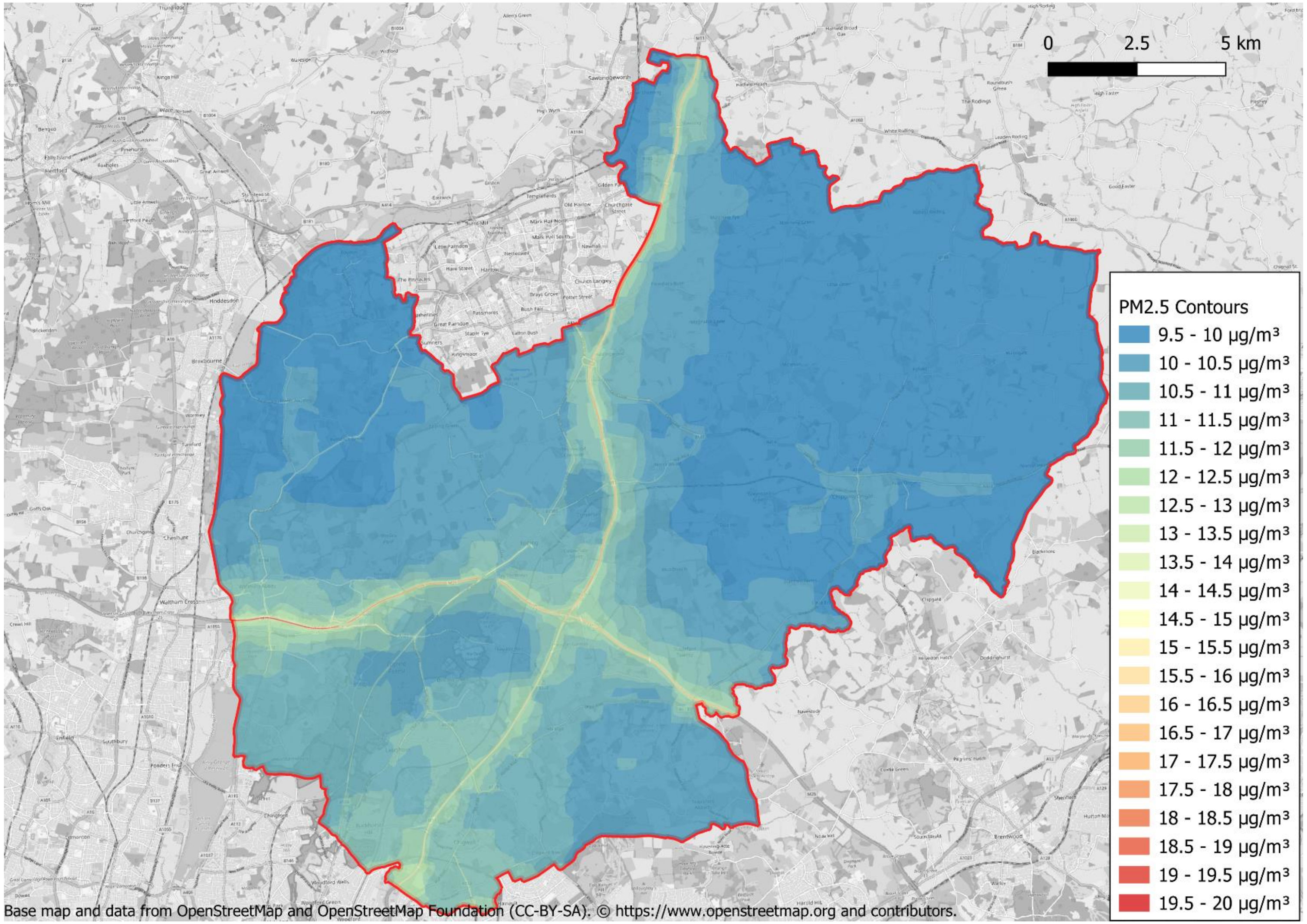


Figure 5-3 – PM_{10} Modelled Concentrations

Figure 5-4 - $PM_{2.5}$ Modelled Concentrations



6 Conclusions

The dispersion modelling exercise undertaken has provided the following updated perspective on NO_2, PM_{10} and $PM_{2.5}$ challenges within the Epping Forest.

All of receptors reporting NO_2 annual mean concentrations to be above or within 10% of the AQS objective limit are either located within the existing AQMA or are concentrated to roadside locations of junctions where key arterial roads meet and form the main transportation network within the region.

The highest annual mean concentration of NO_2 was modelled at R123, which is located within the existing AQMA, with a concentration of 48.27 µg/m^3.

The empirical relationship given in LAQM.TG(22)[1] states that exceedances of the 1-hour mean objective for NO_2 is only likely to occur where annual mean concentrations are 60 µg/m^3 or above at a location of relevant exposure. Given the NO_2 annual mean concentration recorded at all receptors is below 60 µg/m^3, exceedances of the hourly NO_2 AQS objective are unlikely.

PM_{10} and $PM_{2.5}$ concentrations have also been predicted as part of the modelling assessment. No modelled receptors recorded concentrations in exceedance of either of the annual mean objectives for these pollutants. The highest modelled PM_{10} concentration was 23.07µg/m^3 at R123. The highest modelled $PM_{2.5}$ concentration was 14.2µg/m^3 at R123.

Appendices

Appendix A – ADMS Model Verification

The ADMS-Roads dispersion model has been widely validated for this type of assessment and is specifically listed in the Defra's LAQM.TG(22)[1] guidance as an accepted dispersion model.

Model validation undertaken by the software developer (CERC) will not have included validation in the vicinity of the proposed site. It is therefore necessary to perform a comparison of modelled results with local monitoring data at relevant locations. This process of verification attempts to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results.

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including uncertainties associated with:

- Background concentration estimates;
- Source activity data such as traffic flows and emissions factors;
- Monitoring data, including locations; and
- Overall model limitations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

Model setup parameters and input data were checked prior to running the models in order to reduce these uncertainties. The following were checked to the extent possible to ensure accuracy:

- Traffic data;
- Distance between sources and monitoring as represented in the model;
- Speed estimates on roads;
- Background monitoring and background estimates; and
- Monitoring data.

The traffic data for this assessment has been collated using a combination of data provided by the highways department at Essex, Hertfordshire and DfT traffic count data, as outlined in Section 4.1.

During 2019, concentrations of NO_2 were monitored at 36 sites across Epping Forest, comprising 99 diffusion tubes, with the provision of triplicate colocation studies, undertaken at roadside, kerbside, urban background and other locations. Only kerbside monitoring locations were considered for the model verification. Six passive monitoring locations (Site 36 to 41) reported data capture to be below 75% for the duration of 2019 so were therefore removed from the verification. Additionally, the following 17 passive monitoring locations tubes were sited outside of the modelled road network (i.e. were not located next to a road for which data was available) so were therefore removed from the verification:

- Site 1;
- Site 2;
- Site 6;
- Site 8;

- Site 12;
- Site 14;
- Site 15;
- Site 17 to 22;
- Site 25;
- Site 31;
- Site 34; and
- Site 35;

The details of the LAQM monitoring sites considered for the purposes of model verification are presented in Table A. 1 below.

Table A. 1– Local Monitoring Data Available for Model Verification

Site ID	OS Grid Reference		2019 Annual Mean NO_2 Concentration (µg/m³)	2019 Data Capture (%)
	X	Y		
3a, 3b, 3c	544928	201281	47.6	100
4a, 4b, 4c	546196	202355	28.2	100
5a, 5b, 5c	546058	202193	33.5	100
7a, 7b	542505	196668	22.4	100
9a, 9b, 9c	542339	196360	28.0	100
10a, 10b	542373	196478	28.3	100
11a, 11b	543091	197316	34.4	100
13a, 13b, 13c	540919	209956	20.5	100
23a, 23b, 23c	540902	194240	25.7	100
26a, 26b, 26c	555253	202921	27.8	100
27a, 27b, 27c	555125	203944	18.3	100
32a, 32b, 32c	544709	201139	30.9	75
33a, 33b, 33c	544238	192212	30.3	75

NO_2 Verification Calculations

The verification of the modelling output was performed in accordance with the methodology provided in Chapter 7 of LAQM.TG(22)[1].

For the verification and adjustment of NO_x/NO_2, the 2019 monitoring data presented in Table A. 1 was used.

Verification was completed using the 2019 (2018 reference year) Defra background mapped concentrations for the relevant 1 km x 1 km grid squares within Epping Forest[9].

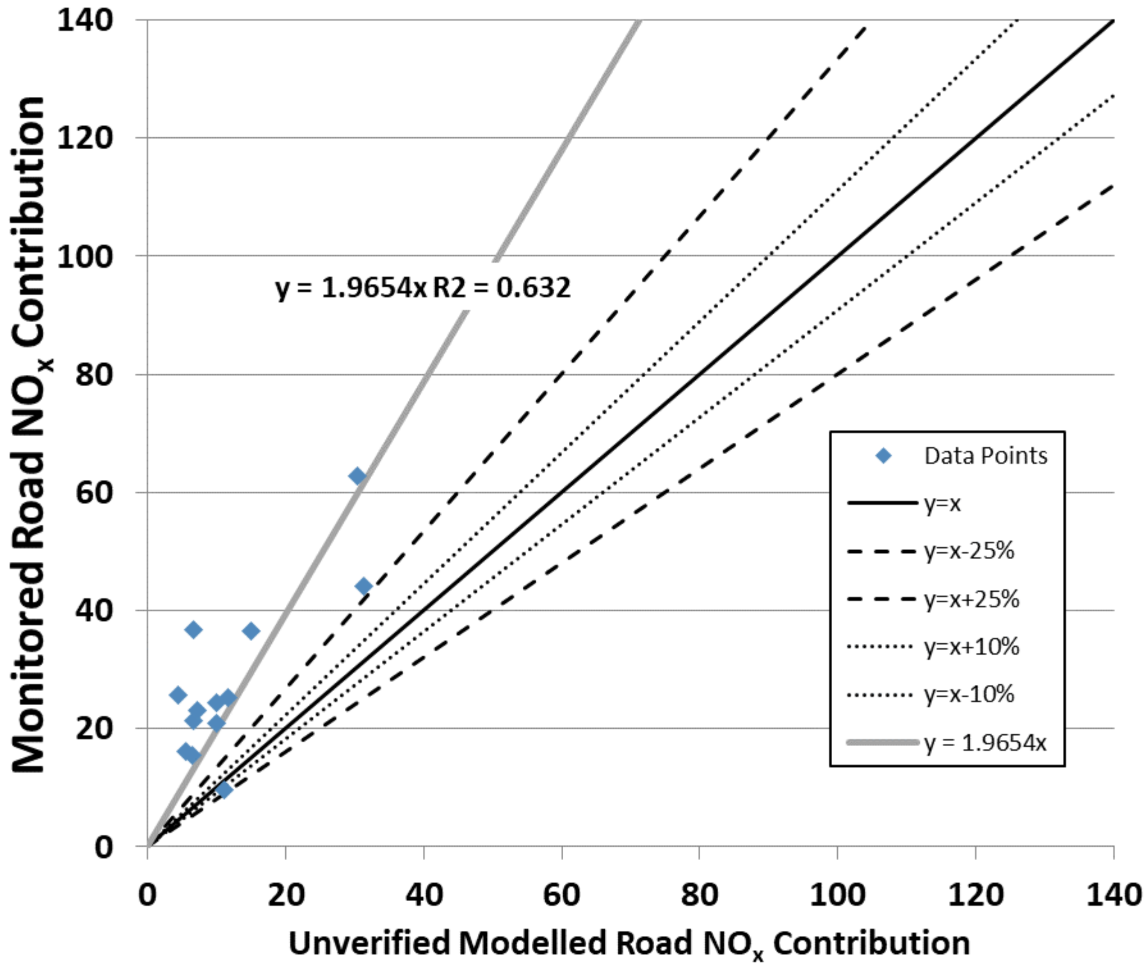
Table A. 2 below shows an initial comparison of the monitored and unverified modelled NO_2 results for the year 2019, in order to determine if verification and adjustment was required. Figure A- 1 shows this data graphically.

Table A. 2 – Comparison of Unverified Modelled and Monitored NO_2 Concentrations

Site ID	Background NO_2	Monitored total NO_2 (µg/m³)	Unverified Modelled total NO_2 (µg/m³)	Difference (modelled vs. monitored) (%)
3a, 3b, 3c	18.1	47.6	33.4	-29.8
4a, 4b, 4c	15.0	28.2	17.3	-38.5
5a, 5b, 5c	15.0	33.5	18.6	-44.5
7a, 7b	17.3	22.4	23.1	3.0
9a, 9b, 9c	17.3	28.0	22.5	-19.6
10a, 10b	17.3	28.3	20.8	-26.5
11a, 11b	16.2	34.4	24.0	-30.1

Site ID	Background NO_2	Monitored total NO_2 (µg/m³)	Unverified Modelled total NO_2 (µg/m³)	Difference (modelled vs. monitored) (%)
13a, 13b, 13c	11.9	20.5	14.9	-27.4
23a, 23b, 23c	17.7	25.7	21.1	-17.8
26a, 26b, 26c	11.2	33.4	27.4	-17.9
27a, 27b, 27c	11.4	24.2	16.8	-30.6
32a, 32b, 32c	18.1	30.9	24.2	-21.6
33a, 33b, 33c	18.5	30.3	22.3	-26.5

Figure A- 1 – Unverified Comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x



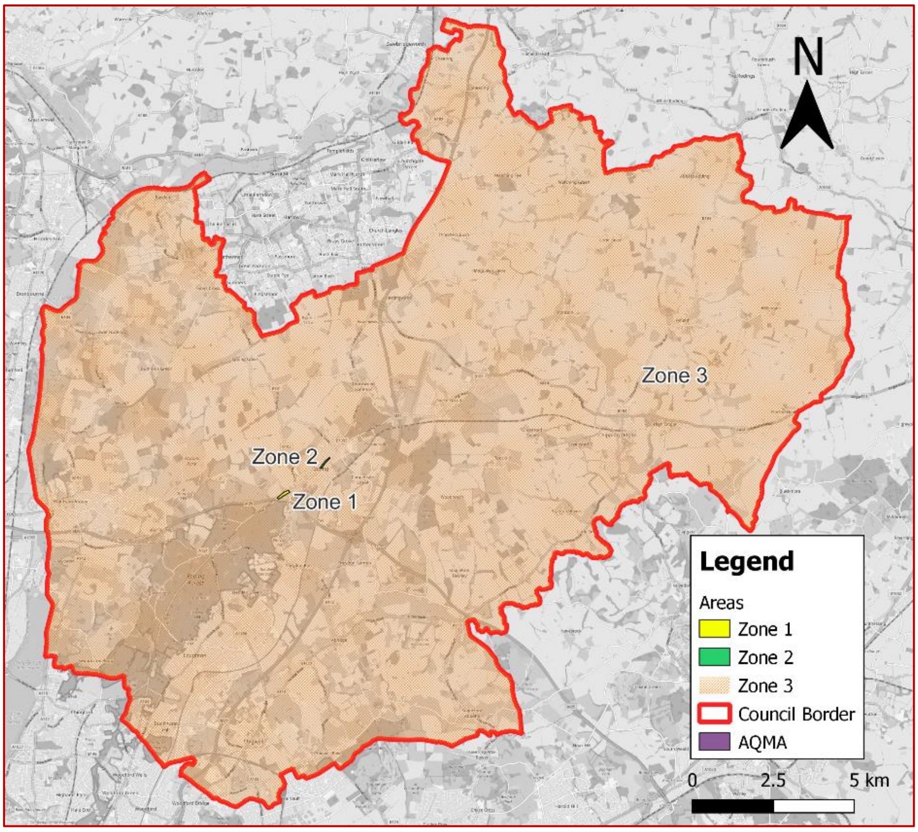
The data in the table above show that the model was under predicting at the verification points, except at Site 7 where it was over predicting. The highest under prediction between the modelled and monitored concentrations is observed at Site 5 (-44.5 %) and the highest over prediction between the modelled and monitored concentrations is observed at Site 7 (3.0 %). At this stage all model inputs were checked to ensure their accuracy, this includes road and monitoring site geometry, traffic data, link emission rates, 2019 monitoring results, background concentrations and modelling features such as street canyons. Following a level of QA/QC completed upon the model, no further improvement of the modelled results could be obtained on this occasion. The difference between modelled and monitored concentrations was greater than -25% at the majority of locations, therefore adjustment of the results was necessary. The relevant data was then gathered to allow the adjustment factor to be calculated.

It was also decided that, for the purpose of verification, the model domain would be split into three distinct areas, in order to improve the robustness of the verification factors output and provide a more location specific factor for each zone. They are shown in Figure A- 2, and are listed as follows:

- Zone 1 – Areas within and surrounding the AQMA;
- Zone 2 – Areas within and surrounding Epping High Street; and
- Zone 3 – All other areas within the district.

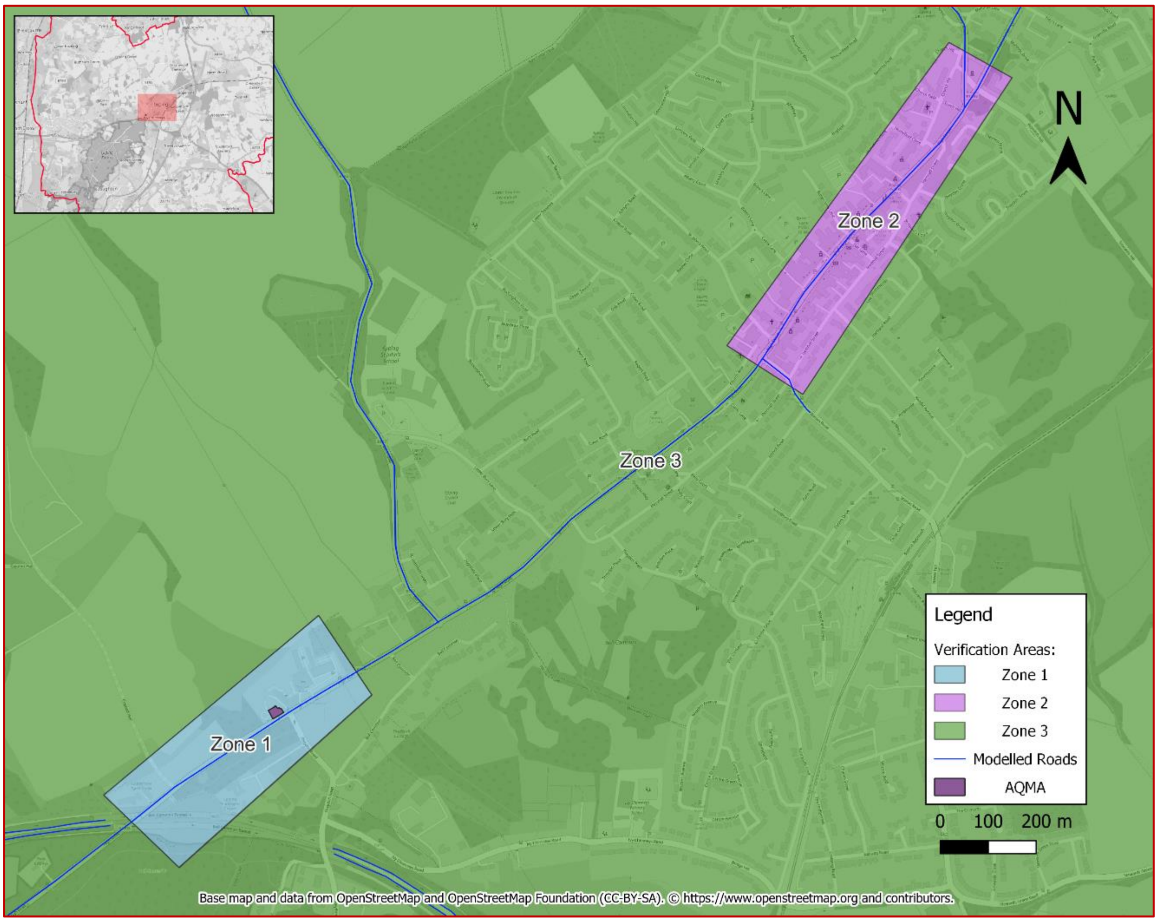
Model adjustment needs to be undertaken based on NO_x and not NO_2. For the Council operated monitoring results used in the calculation of the model adjustment, NO_x was derived from NO_2; these calculations were undertaken using a spreadsheet tool available from the LAQM website[14].

Figure A- 2 - Verification Zones Overview



[14] http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc

Figure A- 3 - Verification Zones close up



Zone 1 Verification

Table A.3 provides the relevant data required to calculate the model adjustment based on regression of the modelled and monitored road source contribution to NO_x.

Figure A- 4 provides a comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x, and the equation of the trend line based on linear regression through zero. The Total Monitored NO_x concentration has been derived by back-calculating NO_x from the NO_x/NO_2 empirical relationship using the spreadsheet tool available from Defra's website. The equation of the trend lines presented in Figure A- 4 gives an adjustment factor for the modelled results of 2.075.

Table A.3 – Data Required for Adjustment Factor Calculation – Zone 1

Site ID	Monitored total NO_2 (µg/m³)	Monitored total NO_x (µg/m³)	Background NO_2 (µg/m³)	Background NO_x (µg/m³)	Monitored road contribution NO_2 (total - background) (µg/m³)	Monitored road contribution NO_x (total - background) (µg/m³)	Modelled road contribution NO_x (excludes background) (µg/m³)
S03	47.6	88.1	18.1	25.2	29.5	62.8	30.5
S32	30.9	50.4	18.1	25.2	12.8	25.2	11.7

Figure A- 4 – Comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x

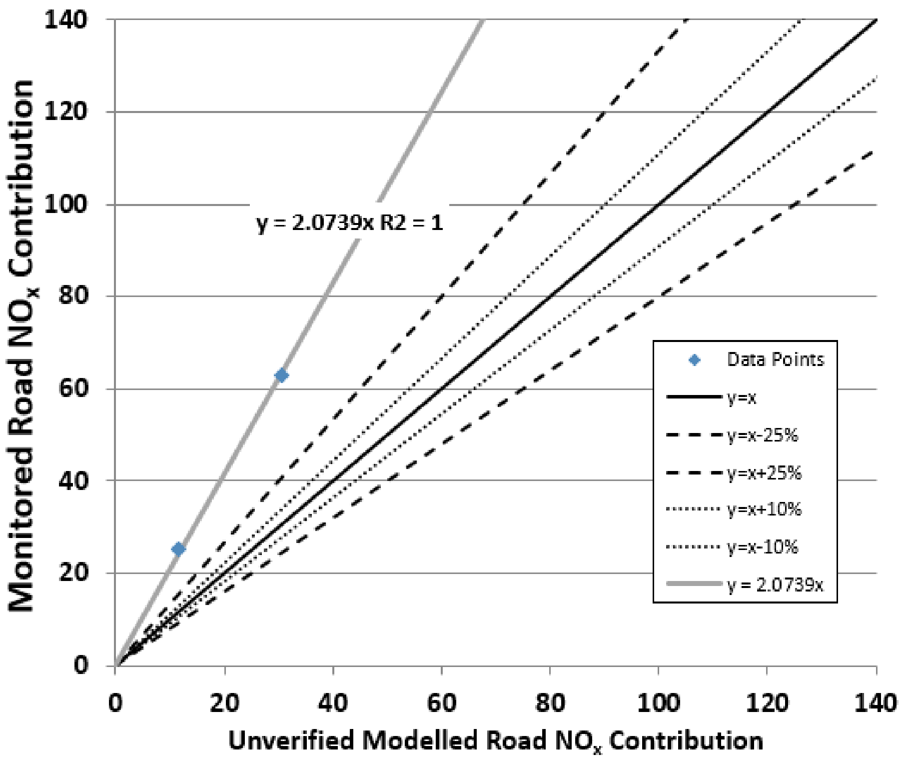


Table A.4 – Adjustment Factor and Comparison of Verified Results against Monitoring Results

Site ID	Ratio of monitored road contribution NO_x / modelled road contribution NOx	Adjustment factor for modelled road contribution NO_x	Adjusted modelled road contribution NO_x (µg/m^3)	Adjusted modelled total NO_x (including background NO_x) (µg/m^3)	Modelled total NO_2 (based upon empirical NO_x / NO_2 relationship) (µg/m^3)	Monitored total NO_2 (µg/m^3)	Difference (adjusted modelled NO_2 vs. monitored NO_2) (%)
S03	2.06	2.074	63.2	88.4	47.8	47.6	0.3
S32	2.16		24.2	49.4	30.4	30.9	-1.5

Figure A- 5 – Comparison of the Verified Modelled Total NO2 versus Monitored NO2

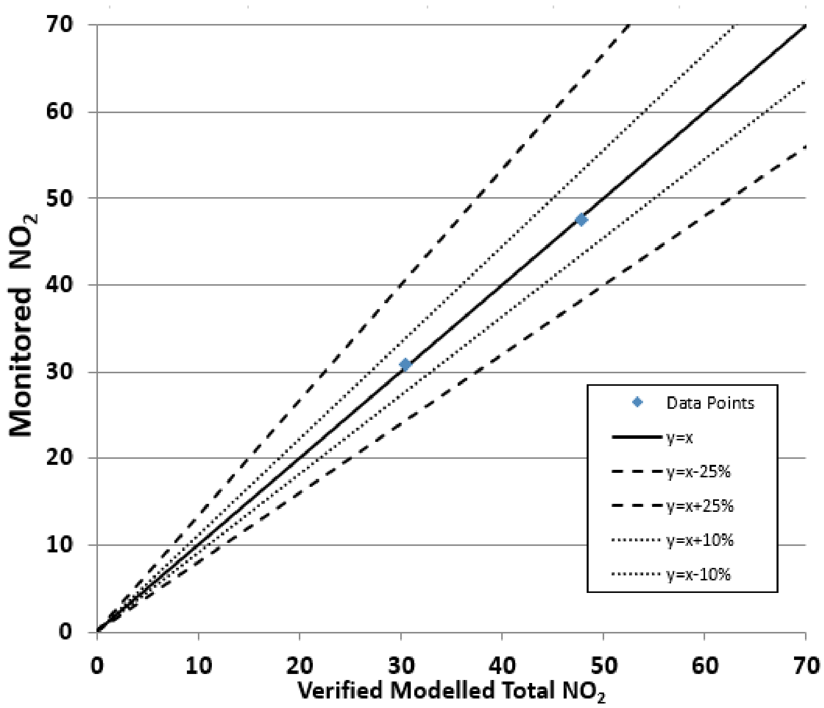


Table A.3 show the ratios between monitored and modelled NO_2 for each monitoring location after using the calculated adjustment factor. LAQM.TG(22)[1] states that:

"In order to provide more confidence in the model predictions and the decisions based on these, the majority of results should be within 25% of the monitored concentrations, ideally within 10%."

The sites show good agreement between the ratios of monitored and modelled NO_2, It can be seen that all of the verification points lie within ±10% tolerance as detailed in LAQM.TG(22).

A factor of 2.074 reduces the Root Mean Square Error (RMSE) from a value of 11.1 to 0.3.

The 2.074 Zone 1 adjustment factor was applied to the road contribution NOx concentrations predicted by the model for Zone 1 (see Figure A- 2) to arrive at the final NOx concentrations.

Zone 2 Verification

Table A.5 provides the relevant data required to calculate the model adjustment based on regression of the modelled and monitored road source contribution to NO_x.

Figure A- 6 provides a comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x, and the equation of the trend line based on linear regression through zero. The Total Monitored NO_x concentration has been derived by back-calculating NO_x from the NO_x/NO_2 empirical relationship using the spreadsheet tool available from Defra's website. The equation of the trend lines presented in Figure A- 6 gives an adjustment factor for the modelled results of 5.638.

Table A.5 – Data Required for Adjustment Factor Calculation – Zone 2

Site ID	Monitored total NO_2 (µg/m³)	Monitored total NO_x (µg/m³)	Background NO_2 (µg/m³)	Background NO_x (µg/m³)	Monitored road contribution NO_2 (total - background) (µg/m³)	Monitored road contribution NO_x (total - background) (µg/m³)	Modelled road contribution NO_x (excludes background) (µg/m³)
S04	28.2	46.2	15.0	20.5	13.2	25.6	4.3
S05	33.5	57.4	15.0	20.5	18.5	36.8	6.7

Figure A- 6 – Comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x

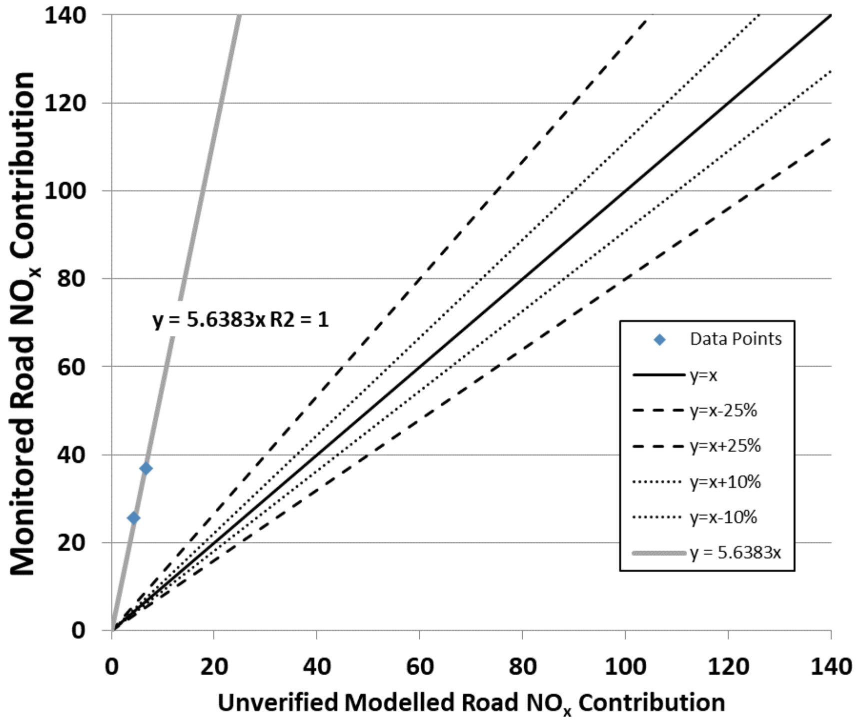


Table A.6 – Adjustment Factor and Comparison of Verified Results against Monitoring Results

Site ID	Ratio of monitored road contribution NO_x / modelled road contribution NOx	Adjustment factor for modelled road contribution NO_x	Adjusted modelled road contribution NO_x (µg/m³)	Adjusted modelled total NO_x (including background NO_x) (µg/m³)	Modelled total NO_2 (based upon empirical NO_x / NO_2 relationship) (µg/m³)	Monitored total NO_2 (µg/m³)	Difference (adjusted modelled NO_2 vs. monitored NO_2) (%)
S04	5.94	5.638	24.3	44.9	27.6	28.2	-2.3
S05	5.51		37.7	58.2	33.9	33.5	1.2

Figure A- 7 – Comparison of the Verified Modelled Total NO_2 versus Monitored NO_2

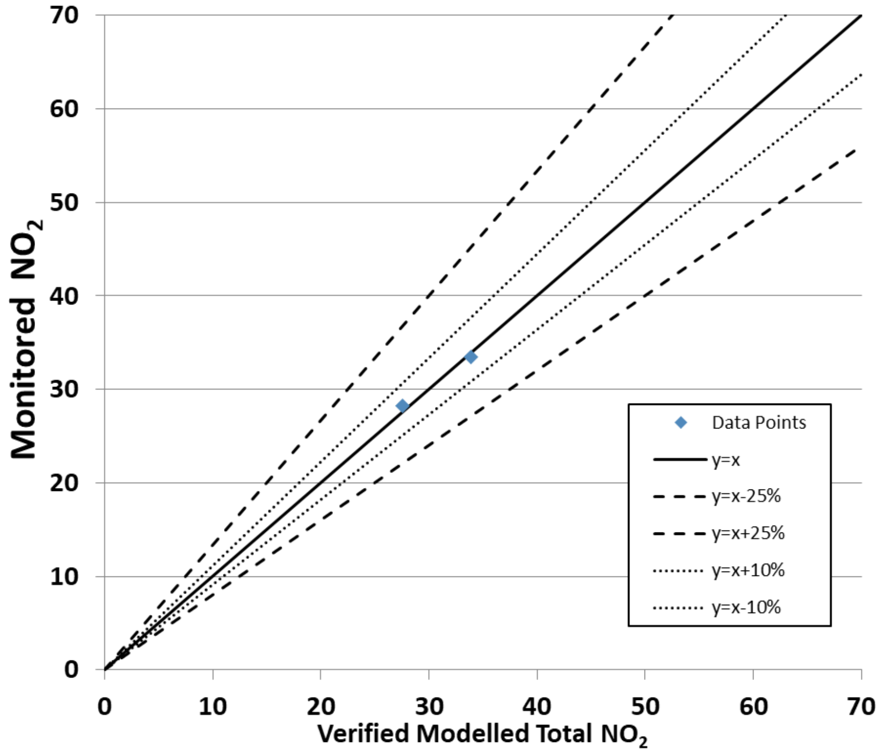


Table A.5 show the ratios between monitored and modelled NO_2 for each monitoring location after using the calculated adjustment factor.

The sites show good agreement between the ratios of monitored and modelled NO_2, It can be seen that all the sites are within ±10% tolerance.

A factor of 5.638 reduces the Root Mean Square Error (RMSE) from a value of 13.0 to 0.5.

The 5.638 Zone 2 adjustment factor was applied to the road contribution NOx concentrations predicted by the model for Zone 2 (see Figure A- 2) to arrive at the final NOx concentrations.

Zone 3 Verification

Table A.6 provides the relevant data required to calculate the model adjustment based on regression of the modelled and monitored road source contribution to NO_x.

Figure A- 8 provides a comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x, and the equation of the trend line based on linear regression through zero. The Total Monitored NO_x concentration has been derived by back-calculating NO_x from the NO_x/NO_2 empirical relationship using the spreadsheet tool available from Defra's website. The equation of the trend lines presented in Figure A- 8 gives an adjustment factor for the modelled results of 1.761.

Table A.7 – Data Required for Adjustment Factor Calculation – Zone 3

Site ID	Monitored total NO_2 (µg/m³)	Monitored total NO_x (µg/m³)	Background NO_2 (µg/m³)	Background NO_x (µg/m³)	Monitored road contribution NO_2 (total - background) (µg/m³)	Monitored road contribution NO_x (total - background) (µg/m³)	Modelled road contribution NO_x (excludes background) (µg/m³)
S07	22.4	34.0	17.3	24.3	5.1	9.7	11.0
S09	28.0	45.1	17.3	24.3	10.7	20.8	9.9
S10	28.3	45.7	17.3	24.3	11.0	21.4	6.6
S11	34.4	58.9	16.2	22.4	18.2	36.5	15.0
S23	25.7	40.4	17.7	25.0	8.0	15.4	6.5
S13	20.5	32.1	11.9	15.9	8.6	16.2	5.5
S26	33.4	59.1	11.2	14.9	22.2	44.2	31.4
S27	24.2	39.6	11.4	15.1	12.8	24.5	10.0
S33	30.3	49.4	18.5	26.2	11.8	23.2	7.2

Figure A- 8 – Comparison of the Modelled Road Contribution NO_x versus Monitored Road Contribution NO_x

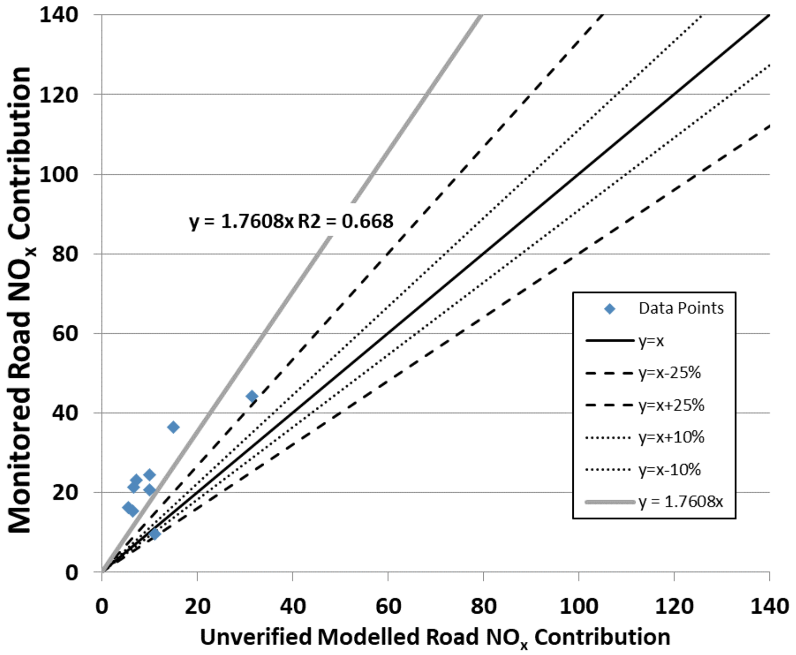


Table A.8 – Adjustment Factor and Comparison of Verified Results against Monitoring Results

Site ID	Ratio of monitored road contribution NO_x / modelled road contribution NO_x	Adjustment factor for modelled road contribution NO_x	Adjusted modelled road contribution NO_x (µg/m³)	Adjusted modelled total NO_x (including background NO_x) (µg/m³)	Modelled total NO_2 (based upon empirical NO_x / NO_2 relationship) (µg/m³)	Monitored total NO_2 (µg/m³)	Difference (adjusted modelled NO_2 vs. monitored NO_2) (%)
S07	0.88	1.761	19.4	43.7	27.3	22.4	21.9
S09	2.09		17.5	41.8	26.4	28.0	-5.9
S10	3.24		11.6	35.9	23.4	28.3	-17.3

Site ID	Ratio of monitored road contribution NO_x / modelled road contribution NOx	Adjustment factor for modelled road contribution NO_x	Adjusted modelled road contribution NO_x (µg/m^3)	Adjusted modelled total NO_x (including background NO_x) (µg/m^3)	Modelled total NO_2 (based upon empirical NO_x / NO_2 relationship) (µg/m^3)	Monitored total NO_2 (µg/m^3)	Difference (adjusted modelled NO_2 vs. monitored NO_2) (%)
S11	2.43		26.5	48.9	29.7	34.4	-13.7
S23	2.38		11.4	36.4	23.7	25.7	-7.9
S13	2.93		9.8	25.6	17.1	20.5	-16.4
S26	1.41		55.3	70.2	38.3	33.4	14.7
S27	2.45		17.6	32.7	20.7	24.2	-14.3
S33	3.23		12.6	38.9	25.1	30.3	-17.3

Figure A- 9 – Comparison of the Verified Modelled Total NO_2 versus Monitored NO_2

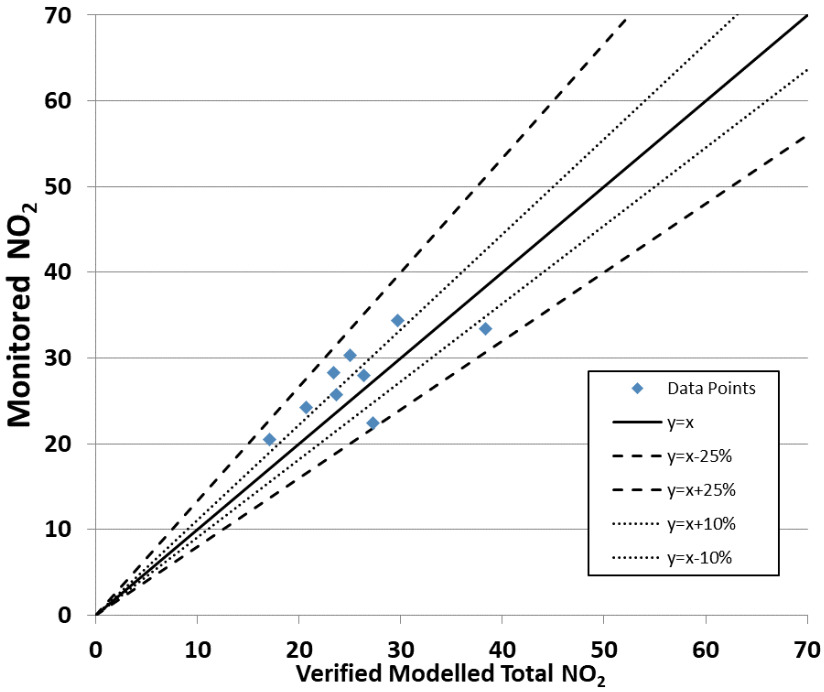


Table A.8 and Figure A- 9 show the ratios between monitored and modelled NO_2 for each monitoring location after using the calculated adjustment factor.

The sites show good agreement between the ratios of monitored and modelled NO_2, it can be seen that two site are within ±10% tolerance as detailed in LAQM.TG(22) and the other monitoring sites are just outside of 10% difference and within the acceptable 25%.

A factor of 1.761 reduces the Root Mean Square Error (RMSE) from a value of 6.7 to 4.1.

The 1.761 Zone 3 adjustment factor was applied to the road contribution NOx concentrations predicted by the model for Zone 3 (see Figure A- 2) to arrive at the final NO_x concentrations.

Appendix B – Traffic Inputs

Table B.1 – Traffic Data used in the Detailed Assessment - Data provided by the highways department at Essex

Road ID	Traffic Flow	% Car	% Taxi (black cab)	% LGV	% HGV	% Bus and Coach	% Motorcycle	Speed
L1B184	6936	91.3	0.0	6.6	1.3	0.0	0.7	31.2
L1B1842	6936	91.3	0.0	6.6	1.3	0.0	0.7	31.2
L1B184rs	6936	91.3	0.0	6.6	1.3	0.0	0.5	20.0
L2N	13500	91.4	0.0	7.1	1.0	0.0	0.4	30.9
L3S	13668	91.8	0.0	6.8	1.0	0.0	0.4	28.7
L3Srs	13668	91.8	0.0	6.8	1.0	0.0	0.6	20.0
L4A128	15662	92.4	0.0	6.0	1.0	0.0	0.6	26.6
L4A128rs	15662	92.4	0.0	6.0	1.0	0.0	0.6	20.0
L4RDrs	15662	92.4	0.0	6.0	1.0	0.0	1.6	20.0
L5B181	10921	92.5	0.0	5.0	0.9	0.0	1.6	30.4
L5B181rs	10921	92.5	0.0	5.0	0.9	0.0	1.0	20.0
L6A128	10780	90.2	0.0	7.3	1.5	0.0	1.0	30.8
L6A128rs	10780	90.2	0.0	7.3	1.5	0.0	1.4	20.0
L7B1393	18317	93.1	0.0	4.8	0.8	0.0	0.4	39.1
L8	4338	84.8	0.0	13.9	0.8	0.0	0.4	48.0
L8rs	4338	84.8	0.0	13.9	0.8	0.0	0.4	20.0
L8rs2	4338	84.8	0.0	13.9	0.8	0.0	0.2	20.0
L10U	5645	88.4	0.0	10.4	1.0	0.0	0.2	48.0
L10Urs	5645	88.4	0.0	10.4	1.0	0.0	0.2	20.0
L10Urs2	5645	88.4	0.0	10.4	1.0	0.0	0.2	20.0
L10UUA	5645	88.4	0.0	10.4	1.0	0.0	1.5	48.0
L11B172	8074	90.4	0.0	7.4	0.7	0.0	1.5	37.9
L11B172rs	8074	90.4	0.0	7.4	0.7	0.0	2.2	20.0
L12	1994	91.6	0.0	6.0	0.3	0.0	2.2	32.2
L12rs	1994	91.6	0.0	6.0	0.3	0.0	2.2	20.0
L12rs2	1994	91.6	0.0	6.0	0.3	0.0	1.7	20.0
L13A104	15058	93.0	0.0	4.6	0.7	0.0	1.7	43.4
L13A104rs	15058	93.0	0.0	4.6	0.7	0.0	0.5	20.0
L14A121	24243	91.9	0.0	6.3	1.3	0.0	0.5	37.4
L14rsRD	24243	91.9	0.0	6.3	1.3	0.0	0.7	37.4
L15A112	22368	76.4	0.0	18.2	4.7	0.0	0.5	48.0

Road ID	Traffic Flow	% Car	% Taxi (black cab)	% LGV	% HGV	% Bus and Coach	% Motorcycle	Speed
L16A112	24411	76.9	0.0	18.1	4.4	0.0	0.7	48.0
L17B1393	19742	83.8	0.0	12.4	3.2	0.0	0.7	48.0
L17B1393rs	19742	83.8	0.0	12.4	3.2	0.0	0.3	20.0
L18	4044	77.3	0.0	19.7	2.7	0.0	0.3	48.0
L18rs	4044	77.3	0.0	19.7	2.7	0.0	0.3	20.0
L18rs2	4044	77.3	0.0	19.7	2.7	0.0	0.4	20.0
L20rs2	631	83.1	0.0	15.5	1.0	0.0	0.4	20.0
L20U	631	83.1	0.0	15.5	1.0	0.0	0.4	48.0
L20Urs	631	83.1	0.0	15.5	1.0	0.0	0.7	20.0
L21A104	15819	83.3	0.0	13.3	2.8	0.0	0.7	96.0
L21A104rs	15819	83.3	0.0	13.3	2.8	0.0	0.5	20.0
L22U	4106	84.3	0.0	14.2	1.0	0.0	0.5	48.0
L22Urs	4106	84.3	0.0	14.2	1.0	0.0	0.5	20.0
L22Urs2	4106	84.3	0.0	14.2	1.0	0.0	0.4	20.0
L23U	3985	86.8	0.0	11.3	1.5	0.0	0.4	48.0
L23Urs	3985	86.8	0.0	11.3	1.5	0.0	0.4	20.0
L23Urs2	3985	86.8	0.0	11.3	1.5	0.0	0.7	20.0
L24A104	19671	83.6	0.0	13.3	2.4	0.0	0.7	96.0
L24A104rs	19671	83.6	0.0	13.3	2.4	0.0	0.7	20.0
L24A104rs2	19671	83.6	0.0	13.3	2.4	0.0	0.7	20.0
L24rsRD	19671	83.6	0.0	13.3	2.4	0.0	0.6	20.0
L4A128_N	15662	92.4	0.0	6.0	1.0	0.0	0.6	26.6
L4A128_S	15662	92.4	0.0	6.0	1.0	0.0	0.6	26.6
L4A128_C	15662	92.4	0.0	6.0	1.0	0.0	0.6	26.6

Notes

Traffic speeds were modelled at either the relevant speed limit for each road or where available monitored vehicle speeds

Where appropriate, vehicle speeds have been reduced to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue – in accordance with LAQM TG(22)[1]

Table B.2 – Traffic Data used in the Detailed Assessment – Data sourced from DfT

Modelled Road Link ID*	AADT	% Car	% LGV	% Rigid HGV	% Artic HGV	% Bus and Coach	% Motorcycle	Speed(kph)
16638	18005	0.81	0.15	0.02	0.01	0.00	0.01	64
16629	9067	0.76	0.20	0.02	0.00	0.00	0.01	64
26662	12197	0.85	0.14	0.01	0.00	0.00	0.00	48
36691	13854	0.73	0.21	0.04	0.01	0.00	0.01	96
36032	94194	0.72	0.20	0.03	0.03	0.01	0.01	112
36199	13795	0.84	0.14	0.01	0.00	0.00	0.01	64
38134	24436	0.83	0.15	0.01	0.00	0.00	0.01	64
46670	11853	0.78	0.18	0.02	0.00	0.00	0.01	64
48115	13706	0.79	0.18	0.02	0.00	0.00	0.01	64
46670B	11853	0.78	0.18	0.02	0.00	0.00	0.01	96
56669	11687	0.77	0.18	0.03	0.01	0.00	0.01	96
56688	12743	0.87	0.10	0.01	0.00	0.01	0.01	48
57576	7322	0.78	0.19	0.02	0.00	0.00	0.01	96
56677	8832	0.77	0.20	0.03	0.00	0.00	0.01	96
56688B	12743	0.87	0.10	0.01	0.00	0.01	0.01	64
6656	15285	0.80	0.15	0.03	0.01	0.00	0.01	80
7961	95531	0.72	0.20	0.03	0.03	0.01	0.01	112
78368	15315	0.84	0.14	0.01	0.00	0.00	0.01	48
73488	4221	0.79	0.18	0.02	0.00	0.00	0.01	64
78369	19083	0.81	0.15	0.02	0.01	0.00	0.01	48
78370	14178	0.81	0.16	0.02	0.00	0.01	0.01	64
73492	10364	0.88	0.11	0.01	0.00	0.00	0.01	48
73493	16862	0.83	0.08	0.02	0.00	0.06	0.01	48
78371	11101	0.85	0.14	0.01	0.00	0.00	0.00	64
78372	7762	0.78	0.19	0.02	0.00	0.00	0.01	64
7904	144785	0.61	0.21	0.04	0.14	0.00	0.00	112
801856	334	0.75	0.22	0.01	0.00	0.01	0.01	96
801905	212	0.72	0.25	0.03	0.00	0.00	0.00	96
800061	3851	0.81	0.16	0.02	0.00	0.00	0.01	96
812270	5153	0.90	0.08	0.00	0.00	0.02	0.00	48
8709	15580	0.81	0.16	0.02	0.00	0.01	0.01	48
803406	3757	0.86	0.10	0.00	0.00	0.03	0.00	48
800698	1212	0.80	0.18	0.01	0.00	0.00	0.01	64

Modelled Road Link ID*	AADT	% Car	% LGV	% Rigid HGV	% Artic HGV	% Bus and Coach	% Motorcycle	Speed(kph)
809476	625	0.82	0.16	0.01	0.00	0.00	0.01	64
808410	2029	0.83	0.15	0.00	0.00	0.00	0.01	48
808065	596	0.85	0.12	0.03	0.00	0.00	0.00	48
806744	2391	0.80	0.19	0.00	0.00	0.00	0.01	96
810394	2944	0.92	0.08	0.00	0.00	0.00	0.00	48
941206	865	0.82	0.14	0.02	0.00	0.01	0.01	96
941166	420	0.74	0.21	0.04	0.01	0.00	0.01	64
963793	1459	0.79	0.17	0.02	0.00	0.01	0.02	96
941165	128	0.72	0.25	0.02	0.00	0.00	0.02	96
941257	601	0.88	0.12	0.00	0.00	0.00	0.00	48
930083	4299	0.75	0.18	0.03	0.01	0.00	0.02	96
941334	313	0.88	0.10	0.01	0.00	0.00	0.01	48
951569	502	0.90	0.08	0.01	0.00	0.00	0.01	48
930889	1509	0.88	0.10	0.01	0.00	0.00	0.01	48
951553	100	0.89	0.08	0.03	0.00	0.00	0.00	48
990205	866	0.79	0.19	0.01	0.00	0.00	0.00	48
941432	1713	0.91	0.08	0.01	0.00	0.01	0.00	48
941438	473	0.87	0.13	0.00	0.00	0.00	0.00	48
930091	11987	0.82	0.15	0.02	0.00	0.00	0.01	48
941395	482	0.87	0.11	0.00	0.00	0.00	0.02	48
930900	1113	0.81	0.18	0.01	0.00	0.00	0.00	96
941245	1473	0.79	0.18	0.02	0.00	0.00	0.01	96
941169	1462	0.80	0.18	0.01	0.00	0.00	0.01	96
930090	8635	0.81	0.17	0.01	0.00	0.00	0.01	64

*DfT Count Point ID

Table B.3 – Traffic Data used in the Detailed Assessment – Data sourced from Hertfordshire County Council dataset

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1340	2891	47.54	32.29	18.14	0.00	0.00	1.28	0.38	0.12	0.23	0.04	30
1341	2289	52.09	35.31	10.02	0.23	0.14	1.40	0.42	0.13	0.25	0.02	46

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1343	2742	53.15	36.00	7.17	0.88	0.53	1.43	0.43	0.13	0.26	0.01	30
1344	2489	53.11	36.02	8.30	0.19	0.12	1.43	0.43	0.13	0.25	0.02	45
1345	2410	52.88	35.78	7.27	1.14	0.69	1.42	0.43	0.13	0.25	0.01	26
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1366	3693	49.37	33.45	10.72	2.72	1.64	1.33	0.40	0.12	0.24	0.02	63
1367	9005	42.06	28.60	14.36	8.22	4.96	1.13	0.34	0.10	0.20	0.03	56
1368	64138	35.46	26.21	5.46	19.81	11.61	0.91	0.27	0.08	0.16	0.01	108
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	43
1379	9147	40.37	27.63	8.11	13.83	8.35	1.08	0.32	0.10	0.19	0.02	30
1380	9809	39.88	27.29	8.35	14.21	8.58	1.07	0.32	0.10	0.19	0.02	40
1382	9737	43.53	29.75	9.00	9.90	5.98	1.16	0.35	0.11	0.21	0.02	22
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1387	1477	46.35	31.58	13.23	4.28	2.59	1.24	0.37	0.11	0.22	0.03	48
1388	3718	45.00	30.70	8.34	8.76	5.29	1.20	0.36	0.11	0.22	0.02	64
1389	3424	49.18	33.30	11.59	2.39	1.44	1.32	0.40	0.12	0.24	0.02	63
1390	1619	47.55	32.40	10.96	4.40	2.66	1.27	0.38	0.12	0.23	0.02	48
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1416	21288	41.36	28.66	12.16	10.02	6.05	1.10	0.33	0.10	0.20	0.03	90
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1435	8817	46.39	32.00	8.94	6.68	4.03	1.24	0.37	0.11	0.22	0.02	86
1436	3883	42.81	30.67	7.06	11.03	6.66	1.12	0.33	0.10	0.20	0.02	65
1437	26839	45.17	31.36	11.12	6.51	3.93	1.20	0.36	0.11	0.21	0.03	54
1438	22066	45.82	31.65	12.08	5.30	3.20	1.22	0.36	0.11	0.22	0.03	35
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1440	20040	45.46	31.46	12.13	5.63	3.40	1.21	0.36	0.11	0.22	0.03	83
1441	6808	44.32	31.05	8.18	9.10	5.49	1.17	0.35	0.11	0.21	0.02	37
1442	7258	46.32	32.39	10.13	5.74	3.47	1.23	0.37	0.11	0.22	0.02	45
1443	6991	48.82	33.93	11.35	2.39	1.45	1.30	0.39	0.12	0.23	0.03	87
1444	20661	39.53	27.57	12.22	11.85	7.16	1.05	0.31	0.10	0.19	0.03	34
1445	52995	33.17	24.51	6.08	21.99	12.89	0.85	0.26	0.08	0.15	0.01	108
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1447	14839	45.71	31.80	13.05	4.68	2.83	1.21	0.36	0.11	0.22	0.03	72
1448	6991	48.82	33.93	11.35	2.39	1.45	1.30	0.39	0.12	0.23	0.03	39

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1449	26988	41.57	28.99	11.47	10.11	6.10	1.10	0.33	0.10	0.20	0.03	61
1450	4146	42.11	29.98	6.67	12.15	7.34	1.10	0.33	0.10	0.20	0.02	72
1451	17138	44.78	31.23	12.42	6.04	3.65	1.19	0.35	0.11	0.21	0.03	42
1452	13125	28.72	19.88	6.74	27.09	16.36	0.76	0.23	0.07	0.14	0.01	54
1453	4809	48.07	33.34	11.89	2.91	1.76	1.28	0.38	0.12	0.23	0.03	65
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1455	48471	32.26	23.93	5.99	23.02	13.50	0.83	0.25	0.08	0.15	0.01	107
1456	8299	52.08	35.53	7.36	1.76	1.06	1.39	0.42	0.13	0.25	0.01	43
1457	2028	51.37	34.91	8.33	2.00	1.21	1.38	0.41	0.13	0.25	0.02	47
1458	9374	52.22	35.55	7.51	1.56	0.94	1.40	0.42	0.13	0.25	0.02	30
1459	8433	50.91	34.73	8.76	2.14	1.29	1.36	0.41	0.13	0.24	0.02	25
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1480	13142	32.33	22.30	7.07	23.03	13.91	0.86	0.26	0.08	0.15	0.02	53
1484	12979	40.65	27.84	8.86	13.05	7.88	1.09	0.32	0.10	0.19	0.02	53
1485	9438	42.82	29.20	14.76	7.10	4.29	1.15	0.34	0.11	0.20	0.03	51
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1492	10811	42.95	29.26	15.93	6.25	3.77	1.15	0.34	0.11	0.21	0.03	55
1496	11726	40.97	28.05	8.51	12.92	7.80	1.10	0.33	0.10	0.20	0.02	37
1498	2439	50.38	34.23	8.44	3.00	1.81	1.35	0.40	0.12	0.24	0.02	47
1500	3334	46.09	31.44	9.78	6.69	4.04	1.23	0.37	0.11	0.22	0.02	63
1501	1279	34.81	24.01	8.15	19.67	11.88	0.93	0.28	0.09	0.17	0.02	63
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1503	6914	50.80	34.78	8.82	2.16	1.30	1.36	0.41	0.12	0.24	0.02	43
1504	7456	49.36	33.79	9.04	3.57	2.15	1.32	0.39	0.12	0.24	0.02	39
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1506	1306	37.90	26.06	12.03	13.97	8.44	1.01	0.30	0.09	0.18	0.03	60
1507	11088	39.29	26.92	8.33	14.84	8.96	1.05	0.31	0.10	0.19	0.02	53
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	47
1509	10125	47.59	32.52	7.09	6.73	4.06	1.27	0.38	0.12	0.23	0.01	40
1633	55299	29.25	21.58	5.68	26.66	15.63	0.75	0.23	0.07	0.13	0.01	110
1634	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	92
1634	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	92
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1638	15793	31.70	21.87	6.22	24.23	14.64	0.84	0.25	0.08	0.15	0.01	43
1480	13142	32.33	22.30	7.07	23.03	13.91	0.86	0.26	0.08	0.15	0.02	53
1638	15793	31.70	21.87	6.22	24.23	14.64	0.84	0.25	0.08	0.15	0.01	43
1480	13142	32.33	22.30	7.07	23.03	13.91	0.86	0.26	0.08	0.15	0.02	53
1501	1279	34.81	24.01	8.15	19.67	11.88	0.93	0.28	0.09	0.17	0.02	63

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1506	1306	37.90	26.06	12.03	13.97	8.44	1.01	0.30	0.09	0.18	0.03	60
1506	1306	37.90	26.06	12.03	13.97	8.44	1.01	0.30	0.09	0.18	0.03	60
1501	1279	34.81	24.01	8.15	19.67	11.88	0.93	0.28	0.09	0.17	0.02	63
1388	3718	45.00	30.70	8.34	8.76	5.29	1.20	0.36	0.11	0.22	0.02	64
1500	3334	46.09	31.44	9.78	6.69	4.04	1.23	0.37	0.11	0.22	0.02	63
1500	3334	46.09	31.44	9.78	6.69	4.04	1.23	0.37	0.11	0.22	0.02	63
1388	3718	45.00	30.70	8.34	8.76	5.29	1.20	0.36	0.11	0.22	0.02	64
1500	3334	46.09	31.44	9.78	6.69	4.04	1.23	0.37	0.11	0.22	0.02	63
1388	3718	45.00	30.70	8.34	8.76	5.29	1.20	0.36	0.11	0.22	0.02	64
1500	3334	46.09	31.44	9.78	6.69	4.04	1.23	0.37	0.11	0.22	0.02	63
1388	3718	45.00	30.70	8.34	8.76	5.29	1.20	0.36	0.11	0.22	0.02	64
1387	1477	46.35	31.58	13.23	4.28	2.59	1.24	0.37	0.11	0.22	0.03	48
1390	1619	47.55	32.40	10.96	4.40	2.66	1.27	0.38	0.12	0.23	0.02	48
1366	3693	49.37	33.45	10.72	2.72	1.64	1.33	0.40	0.12	0.24	0.02	63
1389	3424	49.18	33.30	11.59	2.39	1.44	1.32	0.40	0.12	0.24	0.02	63
1389	3424	49.18	33.30	11.59	2.39	1.44	1.32	0.40	0.12	0.24	0.02	63
1366	3693	49.37	33.45	10.72	2.72	1.64	1.33	0.40	0.12	0.24	0.02	63
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1362	6687	40.40	27.63	16.24	8.73	5.27	1.08	0.32	0.10	0.19	0.03	62
1365	6523	39.64	27.02	15.11	10.31	6.22	1.06	0.32	0.10	0.19	0.03	61
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1360	2364	49.67	33.59	11.50	1.95	1.18	1.34	0.40	0.12	0.24	0.02	61
1386	2498	49.69	33.61	11.79	1.75	1.06	1.34	0.40	0.12	0.24	0.02	63
1367	9005	42.06	28.60	14.36	8.22	4.96	1.13	0.34	0.10	0.20	0.03	56
1485	9438	42.82	29.20	14.76	7.10	4.29	1.15	0.34	0.11	0.20	0.03	51
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	33
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	37
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	33
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	47
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	43
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	47
1504	7456	49.36	33.79	9.04	3.57	2.15	1.32	0.39	0.12	0.24	0.02	39
1509	10125	47.59	32.52	7.09	6.73	4.06	1.27	0.38	0.12	0.23	0.01	40
1509	10125	47.59	32.52	7.09	6.73	4.06	1.27	0.38	0.12	0.23	0.01	40
1504	7456	49.36	33.79	9.04	3.57	2.15	1.32	0.39	0.12	0.24	0.02	39
1509	10125	47.59	32.52	7.09	6.73	4.06	1.27	0.38	0.12	0.23	0.01	40
1504	7456	49.36	33.79	9.04	3.57	2.15	1.32	0.39	0.12	0.24	0.02	39
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1505	5639	45.56	31.03	6.39	9.41	5.68	1.22	0.37	0.11	0.22	0.01	59

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1405	2674	49.87	34.35	9.10	2.85	1.72	1.33	0.40	0.12	0.24	0.02	62
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1502	7460	50.12	34.42	8.39	3.09	1.86	1.34	0.40	0.12	0.24	0.02	75
1477	7757	49.48	33.86	9.02	3.46	2.09	1.32	0.40	0.12	0.24	0.02	78
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1439	6687	49.27	33.95	8.25	4.02	2.43	1.31	0.39	0.12	0.23	0.02	73
1737	5653	48.24	33.62	9.04	4.41	2.67	1.28	0.38	0.12	0.23	0.02	78
1747	28096	42.07	29.24	11.19	9.80	5.92	1.12	0.33	0.10	0.20	0.03	61
1747	28096	42.07	29.24	11.19	9.80	5.92	1.12	0.33	0.10	0.20	0.03	61
1749	8817	46.39	32.00	8.94	6.68	4.03	1.24	0.37	0.11	0.22	0.02	64
1451	17138	44.78	31.23	12.42	6.04	3.65	1.19	0.35	0.11	0.21	0.03	42
1749	8817	46.39	32.00	8.94	6.68	4.03	1.24	0.37	0.11	0.22	0.02	64
1448	6991	48.82	33.93	11.35	2.39	1.45	1.30	0.39	0.12	0.23	0.03	39
1435	8817	46.39	32.00	8.94	6.68	4.03	1.24	0.37	0.11	0.22	0.02	86
1443	6991	48.82	33.93	11.35	2.39	1.45	1.30	0.39	0.12	0.23	0.03	87
1758	2485	50.48	34.35	13.02	0.00	0.00	1.35	0.40	0.12	0.24	0.03	40
1340	2891	47.54	32.29	18.14	0.00	0.00	1.28	0.38	0.12	0.23	0.04	40
1758	2485	50.48	34.35	13.02	0.00	0.00	1.35	0.40	0.12	0.24	0.03	40
1340	2891	47.54	32.29	18.14	0.00	0.00	1.28	0.38	0.12	0.23	0.04	40
1758	2485	50.48	34.35	13.02	0.00	0.00	1.35	0.40	0.12	0.24	0.03	40
1340	2891	47.54	32.29	18.14	0.00	0.00	1.28	0.38	0.12	0.23	0.04	40
1758	2485	50.48	34.35	13.02	0.00	0.00	1.35	0.40	0.12	0.24	0.03	40
1341	2289	52.09	35.31	10.02	0.23	0.14	1.40	0.42	0.13	0.25	0.02	46
1344	2489	53.11	36.02	8.30	0.19	0.12	1.43	0.43	0.13	0.25	0.02	45
1341	2289	52.09	35.31	10.02	0.23	0.14	1.40	0.42	0.13	0.25	0.02	46
1344	2489	53.11	36.02	8.30	0.19	0.12	1.43	0.43	0.13	0.25	0.02	45

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1395	1722	51.32	34.94	9.72	1.15	0.69	1.38	0.41	0.13	0.25	0.02	64
1486	1590	52.22	35.53	7.73	1.43	0.87	1.40	0.42	0.13	0.25	0.02	61
1796	10354	42.26	28.72	15.21	7.49	4.52	1.13	0.34	0.10	0.20	0.03	53
1492	10811	42.95	29.26	15.93	6.25	3.77	1.15	0.34	0.11	0.21	0.03	55
1796	10354	42.26	28.72	15.21	7.49	4.52	1.13	0.34	0.10	0.20	0.03	53
1492	10811	42.95	29.26	15.93	6.25	3.77	1.15	0.34	0.11	0.21	0.03	55
1796	10354	42.26	28.72	15.21	7.49	4.52	1.13	0.34	0.10	0.20	0.03	53
1492	10811	42.95	29.26	15.93	6.25	3.77	1.15	0.34	0.11	0.21	0.03	55
1796	10354	42.26	28.72	15.21	7.49	4.52	1.13	0.34	0.10	0.20	0.03	53
1492	10811	42.95	29.26	15.93	6.25	3.77	1.15	0.34	0.11	0.21	0.03	55
1796	10354	42.26	28.72	15.21	7.49	4.52	1.13	0.34	0.10	0.20	0.03	53
1457	2028	51.37	34.91	8.33	2.00	1.21	1.38	0.41	0.13	0.25	0.02	47
1498	2439	50.38	34.23	8.44	3.00	1.81	1.35	0.40	0.12	0.24	0.02	47
1456	8299	52.08	35.53	7.36	1.76	1.06	1.39	0.42	0.13	0.25	0.01	43
1503	6914	50.80	34.78	8.82	2.16	1.30	1.36	0.41	0.12	0.24	0.02	43
1456	8299	52.08	35.53	7.36	1.76	1.06	1.39	0.42	0.13	0.25	0.01	43

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1503	6914	50.80	34.78	8.82	2.16	1.30	1.36	0.41	0.12	0.24	0.02	43
1379	9147	40.37	27.63	8.11	13.83	8.35	1.08	0.32	0.10	0.19	0.02	30
1382	9737	43.53	29.75	9.00	9.90	5.98	1.16	0.35	0.11	0.21	0.02	22
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1453	4809	48.07	33.34	11.89	2.91	1.76	1.28	0.38	0.12	0.23	0.03	65
1453	4809	48.07	33.34	11.89	2.91	1.76	1.28	0.38	0.12	0.23	0.03	65
1453	4809	48.07	33.34	11.89	2.91	1.76	1.28	0.38	0.12	0.23	0.03	65
1453	4809	48.07	33.34	11.89	2.91	1.76	1.28	0.38	0.12	0.23	0.03	65
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1872	17465	39.75	27.70	11.90	11.83	7.14	1.05	0.32	0.10	0.19	0.03	59
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1633	55299	29.25	21.58	5.68	26.66	15.63	0.75	0.23	0.07	0.13	0.01	110
1633	55299	29.25	21.58	5.68	26.66	15.63	0.75	0.23	0.07	0.13	0.01	110
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1634	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	92
1634	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	92
1447	14839	45.71	31.80	13.05	4.68	2.83	1.21	0.36	0.11	0.22	0.03	72
1445	52995	33.17	24.51	6.08	21.99	12.89	0.85	0.26	0.08	0.15	0.01	108
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1446	50474	28.03	20.79	5.58	28.03	16.43	0.72	0.22	0.07	0.13	0.01	107
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1348	3859	50.57	34.63	10.33	1.45	0.88	1.35	0.40	0.12	0.24	0.02	62
1835	4583	52.67	35.85	7.96	0.81	0.49	1.41	0.42	0.13	0.25	0.02	61
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1363	4025	33.41	22.93	17.17	15.62	9.43	0.89	0.27	0.08	0.16	0.04	63
1364	4322	35.35	24.38	18.82	12.43	7.50	0.94	0.28	0.09	0.17	0.04	60
1343	2742	53.15	36.00	7.17	0.88	0.53	1.43	0.43	0.13	0.26	0.01	30
1345	2410	52.88	35.78	7.27	1.14	0.69	1.42	0.43	0.13	0.25	0.01	26
1343	2742	53.15	36.00	7.17	0.88	0.53	1.43	0.43	0.13	0.26	0.01	30
1345	2410	52.88	35.78	7.27	1.14	0.69	1.42	0.43	0.13	0.25	0.01	26
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1372	1774	49.45	33.35	14.62	0.29	0.18	1.33	0.40	0.12	0.24	0.03	62
1979	2386	47.43	31.98	18.23	0.20	0.12	1.28	0.38	0.12	0.23	0.04	63
1380	9809	39.88	27.29	8.35	14.21	8.58	1.07	0.32	0.10	0.19	0.02	40
1496	11726	40.97	28.05	8.51	12.92	7.80	1.10	0.33	0.10	0.20	0.02	37
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1478	3648	44.45	30.19	15.89	4.71	2.85	1.19	0.36	0.11	0.21	0.03	62
1487	3818	44.48	30.22	17.51	3.67	2.21	1.19	0.36	0.11	0.21	0.04	61
1389	3424	49.18	33.30	11.59	2.39	1.44	1.32	0.40	0.12	0.24	0.02	63
1366	3693	49.37	33.45	10.72	2.72	1.64	1.33	0.40	0.12	0.24	0.02	63
1440	20040	45.46	31.46	12.13	5.63	3.40	1.21	0.36	0.11	0.22	0.03	83
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1454	70580	31.40	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	103
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1433	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	104
1634	65712	35.86	26.04	7.84	18.15	10.64	0.93	0.28	0.09	0.17	0.02	92
1445	52995	33.17	24.51	6.08	21.99	12.89	0.85	0.26	0.08	0.15	0.01	108

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1416	21288	41.36	28.66	12.16	10.02	6.05	1.10	0.33	0.10	0.20	0.03	90
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
2645	11387	40.43	27.34	13.24	10.76	6.50	1.09	0.33	0.10	0.19	0.03	40
2781	6513	43.40	29.47	15.80	5.90	3.56	1.16	0.35	0.11	0.21	0.03	59
3050	6513	43.40	29.47	15.80	5.90	3.56	1.16	0.35	0.11	0.21	0.03	60
3052	5414	48.50	32.82	9.67	4.32	2.61	1.30	0.39	0.12	0.23	0.02	55
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3317	4441	39.29	26.54	12.11	12.71	7.68	1.06	0.32	0.10	0.19	0.02	84
3318	4445	36.43	24.98	21.21	9.85	5.95	0.97	0.29	0.09	0.17	0.05	42
3319	11921	44.26	30.05	11.51	7.66	4.63	1.19	0.36	0.11	0.21	0.02	31
3320	4773	37.16	25.34	22.19	8.55	5.16	1.00	0.30	0.09	0.18	0.05	36
3321	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	27
3322	5774	39.93	27.12	18.72	7.80	4.71	1.07	0.32	0.10	0.19	0.04	43
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3324	11131	41.83	28.39	17.40	6.59	3.98	1.12	0.34	0.10	0.20	0.04	54
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3326	2804	42.32	28.72	15.45	7.29	4.41	1.14	0.34	0.10	0.20	0.03	42
3328	6556	43.42	29.48	16.80	5.25	3.17	1.17	0.35	0.11	0.21	0.03	57
3329	2930	42.41	28.79	15.34	7.25	4.38	1.14	0.34	0.10	0.20	0.03	47
3332	86191	34.65	25.20	5.82	20.74	12.16	0.90	0.27	0.08	0.16	0.01	105
3347	11107	42.42	28.76	18.60	5.23	3.16	1.14	0.34	0.10	0.20	0.04	56
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3349	5100	44.25	29.84	19.82	2.61	1.58	1.19	0.36	0.11	0.21	0.04	23
3350	3742	43.26	29.02	21.95	2.43	1.47	1.17	0.35	0.11	0.21	0.04	30
3351	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	46
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45
3370	6897	42.73	29.00	17.83	5.36	3.24	1.15	0.34	0.11	0.20	0.04	57
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3372	3410	45.02	31.06	15.23	4.22	2.55	1.20	0.36	0.11	0.21	0.03	25
3373	3562	44.51	30.52	15.56	4.68	2.83	1.19	0.36	0.11	0.21	0.03	30
3374	7334	51.01	34.36	10.26	1.37	0.83	1.37	0.41	0.13	0.25	0.02	30
3375	2498	37.68	25.76	14.89	12.50	7.55	1.01	0.30	0.09	0.18	0.03	63
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3377	18998	32.11	22.17	6.87	23.37	14.12	0.85	0.26	0.08	0.15	0.02	64
3378	64411	31.02	23.23	4.47	25.24	14.80	0.79	0.24	0.07	0.14	0.01	103
3379	86191	34.65	25.20	5.82	20.74	12.16	0.90	0.27	0.08	0.16	0.01	108
3380	15255	30.19	20.93	7.05	25.29	15.27	0.80	0.24	0.07	0.14	0.02	63
3381	6189	51.62	35.38	8.29	1.57	0.95	1.38	0.41	0.13	0.25	0.02	68
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3383	4433	47.33	32.93	10.96	4.22	2.55	1.26	0.38	0.12	0.22	0.03	73
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
3385	6577	50.10	33.81	11.53	1.51	0.91	1.35	0.40	0.12	0.24	0.02	26
3386	6035	50.97	34.33	9.35	1.98	1.20	1.37	0.41	0.13	0.25	0.02	62
3387	17610	34.10	23.41	6.86	21.31	12.87	0.91	0.27	0.08	0.16	0.01	59
3388	3270	51.45	35.70	8.77	1.19	0.72	1.37	0.41	0.13	0.24	0.02	71
3389	2593	48.78	33.88	10.81	2.78	1.68	1.29	0.39	0.12	0.23	0.03	72
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55
3392	5398	49.82	33.64	10.97	2.14	1.30	1.34	0.40	0.12	0.24	0.02	44
3374	7334	51.01	34.36	10.26	1.37	0.83	1.37	0.41	0.13	0.25	0.02	30
3385	6577	50.10	33.81	11.53	1.51	0.91	1.35	0.40	0.12	0.24	0.02	26
3052	5414	48.50	32.82	9.67	4.32	2.61	1.30	0.39	0.12	0.23	0.02	55
3729	5759	49.56	33.45	8.63	3.90	2.35	1.33	0.40	0.12	0.24	0.02	49
3729	5759	49.56	33.45	8.63	3.90	2.35	1.33	0.40	0.12	0.24	0.02	49
3052	5414	48.50	32.82	9.67	4.32	2.61	1.30	0.39	0.12	0.23	0.02	55
3729	5759	49.56	33.45	8.63	3.90	2.35	1.33	0.40	0.12	0.24	0.02	49
3893	15628	44.71	30.34	12.45	6.61	3.99	1.20	0.36	0.11	0.21	0.03	36
2645	11387	40.43	27.34	13.24	10.76	6.50	1.09	0.33	0.10	0.19	0.03	40
3893	15628	44.71	30.34	12.45	6.61	3.99	1.20	0.36	0.11	0.21	0.03	36
3896	7599	38.22	25.81	12.88	13.37	8.08	1.03	0.31	0.09	0.18	0.03	28
3319	11921	44.26	30.05	11.51	7.66	4.63	1.19	0.36	0.11	0.21	0.02	31
3896	7599	38.22	25.81	12.88	13.37	8.08	1.03	0.31	0.09	0.18	0.03	28
3317	4441	39.29	26.54	12.11	12.71	7.68	1.06	0.32	0.10	0.19	0.02	84
3900	7104	44.88	30.31	11.87	6.87	4.15	1.21	0.36	0.11	0.22	0.02	86
3319	11921	44.26	30.05	11.51	7.66	4.63	1.19	0.36	0.11	0.21	0.02	31
3896	7599	38.22	25.81	12.88	13.37	8.08	1.03	0.31	0.09	0.18	0.03	28
3317	4441	39.29	26.54	12.11	12.71	7.68	1.06	0.32	0.10	0.19	0.02	84
3900	7104	44.88	30.31	11.87	6.87	4.15	1.21	0.36	0.11	0.22	0.02	86
3900	7104	44.88	30.31	11.87	6.87	4.15	1.21	0.36	0.11	0.22	0.02	86
3906	6367	42.15	28.56	11.67	9.87	5.96	1.13	0.34	0.10	0.20	0.02	20
3317	4441	39.29	26.54	12.11	12.71	7.68	1.06	0.32	0.10	0.19	0.02	84
3318	4445	36.43	24.98	21.21	9.85	5.95	0.97	0.29	0.09	0.17	0.05	42
3320	4773	37.16	25.34	22.19	8.55	5.16	1.00	0.30	0.09	0.18	0.05	36
3318	4445	36.43	24.98	21.21	9.85	5.95	0.97	0.29	0.09	0.17	0.05	42
3320	4773	37.16	25.34	22.19	8.55	5.16	1.00	0.30	0.09	0.18	0.05	36
3321	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	27
3351	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	46
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3352	5366	44.87	30.42	18.80	2.48	1.50	1.20	0.36	0.11	0.22	0.04	45
3348	4555	41.97	28.36	21.40	4.02	2.43	1.13	0.34	0.10	0.20	0.04	42
3349	5100	44.25	29.84	19.82	2.61	1.58	1.19	0.36	0.11	0.21	0.04	23
3350	3742	43.26	29.02	21.95	2.43	1.47	1.17	0.35	0.11	0.21	0.04	30
3349	5100	44.25	29.84	19.82	2.61	1.58	1.19	0.36	0.11	0.21	0.04	23
3350	3742	43.26	29.02	21.95	2.43	1.47	1.17	0.35	0.11	0.21	0.04	30
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3384	272	56.40	41.24	0.05	0.01	0.01	1.46	0.44	0.13	0.26	0.00	46
3382	813	36.06	25.27	18.87	11.39	6.88	0.95	0.28	0.09	0.17	0.05	45
3381	6189	51.62	35.38	8.29	1.57	0.95	1.38	0.41	0.13	0.25	0.02	68
3387	17610	34.10	23.41	6.86	21.31	12.87	0.91	0.27	0.08	0.16	0.01	59

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
3381	6189	51.62	35.38	8.29	1.57	0.95	1.38	0.41	0.13	0.25	0.02	68
3387	17610	34.10	23.41	6.86	21.31	12.87	0.91	0.27	0.08	0.16	0.01	59
3379	86191	34.65	25.20	5.82	20.74	12.16	0.90	0.27	0.08	0.16	0.01	108
3388	3270	51.45	35.70	8.77	1.19	0.72	1.37	0.41	0.13	0.24	0.02	71
3389	2593	48.78	33.88	10.81	2.78	1.68	1.29	0.39	0.12	0.23	0.03	72
3389	2593	48.78	33.88	10.81	2.78	1.68	1.29	0.39	0.12	0.23	0.03	72
3388	3270	51.45	35.70	8.77	1.19	0.72	1.37	0.41	0.13	0.24	0.02	71
3324	11131	41.83	28.39	17.40	6.59	3.98	1.12	0.34	0.10	0.20	0.04	54
3347	11107	42.42	28.76	18.60	5.23	3.16	1.14	0.34	0.10	0.20	0.04	56
3324	11131	41.83	28.39	17.40	6.59	3.98	1.12	0.34	0.10	0.20	0.04	54
3347	11107	42.42	28.76	18.60	5.23	3.16	1.14	0.34	0.10	0.20	0.04	56
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3375	2498	37.68	25.76	14.89	12.50	7.55	1.01	0.30	0.09	0.18	0.03	63
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55
3375	2498	37.68	25.76	14.89	12.50	7.55	1.01	0.30	0.09	0.18	0.03	63
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
3375	2498	37.68	25.76	14.89	12.50	7.55	1.01	0.30	0.09	0.18	0.03	63
3391	2923	39.69	27.08	13.26	11.39	6.88	1.06	0.32	0.10	0.19	0.03	55
3375	2498	37.68	25.76	14.89	12.50	7.55	1.01	0.30	0.09	0.18	0.03	63
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3322	5774	39.93	27.12	18.72	7.80	4.71	1.07	0.32	0.10	0.19	0.04	43
3370	6897	42.73	29.00	17.83	5.36	3.24	1.15	0.34	0.11	0.20	0.04	57
3322	5774	39.93	27.12	18.72	7.80	4.71	1.07	0.32	0.10	0.19	0.04	43
3370	6897	42.73	29.00	17.83	5.36	3.24	1.15	0.34	0.11	0.20	0.04	57
3370	6897	42.73	29.00	17.83	5.36	3.24	1.15	0.34	0.11	0.20	0.04	57
3322	5774	39.93	27.12	18.72	7.80	4.71	1.07	0.32	0.10	0.19	0.04	43
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
3388	3270	51.45	35.70	8.77	1.19	0.72	1.37	0.41	0.13	0.24	0.02	71
3389	2593	48.78	33.88	10.81	2.78	1.68	1.29	0.39	0.12	0.23	0.03	72
3383	4433	47.33	32.93	10.96	4.22	2.55	1.26	0.38	0.12	0.22	0.03	73
3379	86191	34.65	25.20	5.82	20.74	12.16	0.90	0.27	0.08	0.16	0.01	108
4357	81839	30.86	22.76	5.04	25.27	14.81	0.79	0.24	0.07	0.14	0.01	106
4357	81839	30.86	22.76	5.04	25.27	14.81	0.79	0.24	0.07	0.14	0.01	106
4357	81839	30.86	22.76	5.04	25.27	14.81	0.79	0.24	0.07	0.14	0.01	106
3380	15255	30.19	20.93	7.05	25.29	15.27	0.80	0.24	0.07	0.14	0.02	63
3383	4433	47.33	32.93	10.96	4.22	2.55	1.26	0.38	0.12	0.22	0.03	73
4886	4882	40.67	27.68	14.60	9.54	5.76	1.09	0.33	0.10	0.19	0.03	20
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
4889	8429	38.74	26.63	7.88	15.65	9.45	1.03	0.31	0.10	0.18	0.02	20
4890	10300	36.18	24.95	7.38	18.68	11.28	0.96	0.29	0.09	0.17	0.02	20
4891	6434	43.46	29.63	16.76	5.17	3.12	1.16	0.35	0.11	0.21	0.04	20

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
4936	6298	43.43	29.55	14.93	6.38	3.85	1.16	0.35	0.11	0.21	0.03	20
4955	2351	45.52	31.06	9.02	7.77	4.70	1.22	0.36	0.11	0.22	0.02	20
4987	6556	43.42	29.48	16.80	5.25	3.17	1.17	0.35	0.11	0.21	0.03	60
5055	4379	44.48	30.44	9.24	8.69	5.25	1.19	0.36	0.11	0.21	0.02	30
5056	2759	37.69	25.40	11.65	14.75	8.91	1.01	0.30	0.09	0.18	0.02	23
5057	1599	52.08	35.13	7.52	1.91	1.15	1.40	0.42	0.13	0.25	0.01	63
5058	11455	43.52	29.68	7.99	10.58	6.39	1.17	0.35	0.11	0.21	0.02	23
5059	1511	52.28	35.27	8.69	0.96	0.58	1.41	0.42	0.13	0.25	0.02	46
5060	1511	52.28	35.27	8.69	0.96	0.58	1.41	0.42	0.13	0.25	0.02	64
5061	2536	57.51	38.72	1.33	0.00	0.00	1.55	0.46	0.14	0.28	0.00	24
5062	4004	56.92	38.30	2.16	0.13	0.08	1.53	0.46	0.14	0.27	0.00	30
5063	2594	56.35	37.96	2.74	0.35	0.21	1.52	0.45	0.14	0.27	0.01	45
5064	11407	42.00	28.69	8.43	11.91	7.19	1.12	0.34	0.10	0.20	0.02	30
1638	15793	31.70	21.87	6.22	24.23	14.64	0.84	0.25	0.08	0.15	0.01	43
5066	10063	27.24	18.93	7.92	27.91	16.85	0.72	0.22	0.07	0.13	0.02	47
5067	16361	32.35	22.29	6.25	23.53	14.21	0.86	0.26	0.08	0.15	0.01	41
5068	10764	28.62	19.83	8.02	26.39	15.94	0.76	0.23	0.07	0.14	0.02	55
5088	70580	31.39	22.77	7.41	23.40	13.72	0.82	0.24	0.07	0.15	0.02	81
5089	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
5090	20180	20.38	15.12	3.24	38.10	22.34	0.52	0.16	0.05	0.09	0.01	79
5091	50401	35.92	25.92	9.13	17.36	10.18	0.94	0.28	0.09	0.17	0.02	81
5092	50440	35.93	25.92	9.13	17.36	10.18	0.94	0.28	0.09	0.17	0.02	69
5093	33530	37.55	27.54	5.74	17.43	10.22	0.97	0.29	0.09	0.17	0.01	76
5094	37366	33.92	24.34	10.32	18.92	11.09	0.89	0.26	0.08	0.16	0.02	90
5095	13321	41.60	30.37	5.76	12.96	7.60	1.08	0.32	0.10	0.19	0.01	74
5096	23579	24.70	18.06	4.48	32.62	19.12	0.64	0.19	0.06	0.11	0.01	78
5097	14605	32.90	24.40	4.26	23.39	13.71	0.84	0.25	0.08	0.15	0.01	72
5098	7891	50.30	35.08	12.50	0.00	0.00	1.33	0.40	0.12	0.24	0.03	75
5099	61825	34.71	25.72	5.14	20.82	12.20	0.89	0.27	0.08	0.16	0.01	108
5100	45984	36.02	26.93	5.18	19.17	11.24	0.92	0.28	0.08	0.16	0.01	107
5101	32182	34.10	24.48	10.02	18.90	11.08	0.89	0.27	0.08	0.16	0.02	102
5102	3400	50.45	35.57	11.87	0.00	0.00	1.33	0.40	0.12	0.24	0.03	77
5103	10275	48.91	34.42	11.02	2.27	1.33	1.29	0.39	0.12	0.23	0.03	74
5104	1599	52.08	35.13	7.52	1.91	1.15	1.40	0.42	0.13	0.25	0.01	48
5105	4150	56.02	37.71	2.71	0.74	0.44	1.51	0.45	0.14	0.27	0.01	46
5096	23579	24.70	18.06	4.48	32.62	19.12	0.64	0.19	0.06	0.11	0.01	78
5096	23579	24.70	18.06	4.48	32.62	19.12	0.64	0.19	0.06	0.11	0.01	78
5091	50401	35.92	25.92	9.13	17.36	10.18	0.94	0.28	0.09	0.17	0.02	81
5093	33530	37.55	27.54	5.74	17.43	10.22	0.97	0.29	0.09	0.17	0.01	76
3390	6523	35.05	24.01	16.30	14.43	8.71	0.94	0.28	0.09	0.17	0.04	53
3376	7245	37.10	25.47	16.58	12.01	7.25	0.99	0.30	0.09	0.18	0.04	54

Source ID*	Traffic Flow	Petrol Car	Diesel Car	LGV	Rigid HGV	Artic HGV	Full Hybrid Petrol Cars	Plug-In Hybrid Petrol Cars	Full Hybrid Diesel Cars	Battery EV Cars	Battery EV LGV	Speed (kph)
1484	12979	40.65	27.84	8.86	13.05	7.88	1.09	0.32	0.10	0.19	0.02	20
1484	12979	40.65	27.84	8.86	13.05	7.88	1.09	0.32	0.10	0.19	0.02	53
1507	11088	39.29	26.92	8.33	14.84	8.96	1.05	0.31	0.10	0.19	0.02	20
1507	11088	39.29	26.92	8.33	14.84	8.96	1.05	0.31	0.10	0.19	0.02	53
1758	2485	50.48	34.35	13.02	0.00	0.00	1.35	0.40	0.12	0.24	0.03	30
1340	2891	47.54	32.29	18.14	0.00	0.00	1.28	0.38	0.12	0.23	0.04	40
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	37
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	47
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	33
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	43
1508	544	31.20	21.33	11.81	21.40	12.93	0.83	0.25	0.08	0.15	0.03	37
1378	1826	27.17	18.85	5.83	29.31	17.70	0.72	0.22	0.07	0.13	0.01	43
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
3378	64411	31.02	23.23	4.47	25.24	14.80	0.79	0.24	0.07	0.14	0.01	103
1368	64138	35.46	26.21	5.46	19.81	11.61	0.91	0.27	0.08	0.16	0.01	108
1368	64138	35.46	26.21	5.46	19.81	11.61	0.91	0.27	0.08	0.16	0.01	108
1484	12979	40.65	27.84	8.86	13.05	7.88	1.09	0.32	0.10	0.19	0.02	53
1484	12979	40.65	27.84	8.86	13.05	7.88	1.09	0.32	0.10	0.19	0.02	53
1507	11088	39.29	26.92	8.33	14.84	8.96	1.05	0.31	0.10	0.19	0.02	53
1507	11088	39.29	26.92	8.33	14.84	8.96	1.05	0.31	0.10	0.19	0.02	53
1406	69562	32.18	23.92	4.94	23.73	13.91	0.82	0.25	0.08	0.15	0.01	108
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
1637	69716	36.47	26.78	5.97	18.46	10.82	0.94	0.28	0.09	0.17	0.01	108
3323	9513	42.79	29.24	17.60	5.32	3.21	1.14	0.34	0.11	0.20	0.04	52
5186	3730	44.26	30.13	15.54	5.10	3.08	1.19	0.35	0.11	0.21	0.03	44
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3371	8543	40.73	27.81	18.27	7.13	4.31	1.09	0.33	0.10	0.19	0.04	57
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3315	2978	46.78	31.74	14.11	3.35	2.02	1.26	0.38	0.12	0.22	0.03	53
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60
3325	2336	47.44	32.06	17.24	0.76	0.46	1.28	0.38	0.12	0.23	0.04	60

Notes

Traffic speeds were modelled at either the relevant speed limit for each road or where available monitored vehicle speeds

Where appropriate, vehicle speeds have been reduced to simulate queues at junctions, traffic lights and other locations where queues or slower traffic are known to be an issue – in accordance with LAQM TG(22)[1].

Figure B.1 shows a map of Road Source Locations for the Hertfordshire County Council dataset. .

Figure B.1 Road IDs of Links Modelled North-West

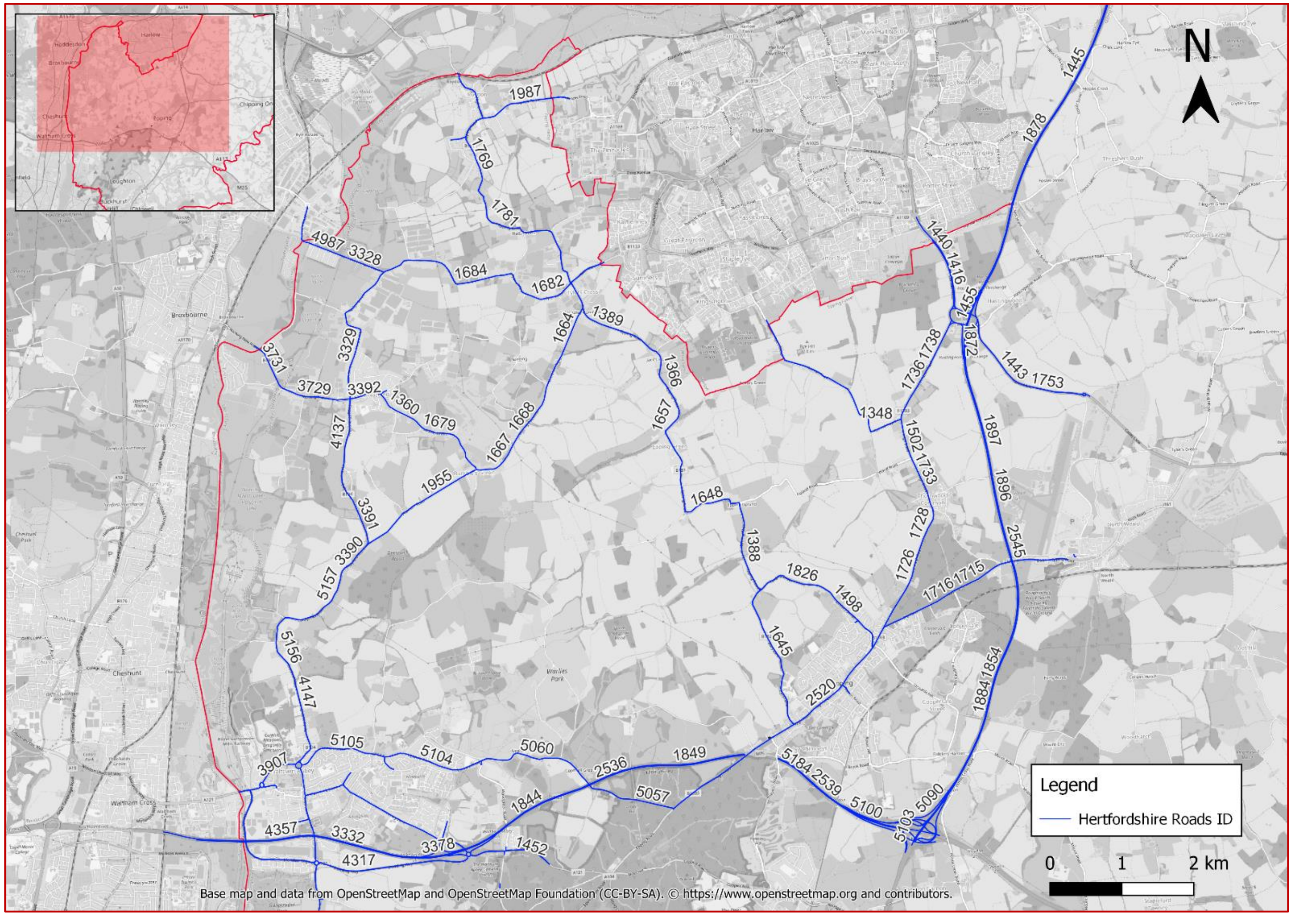


Figure 6-1 Road IDs of Links Modelled North-East

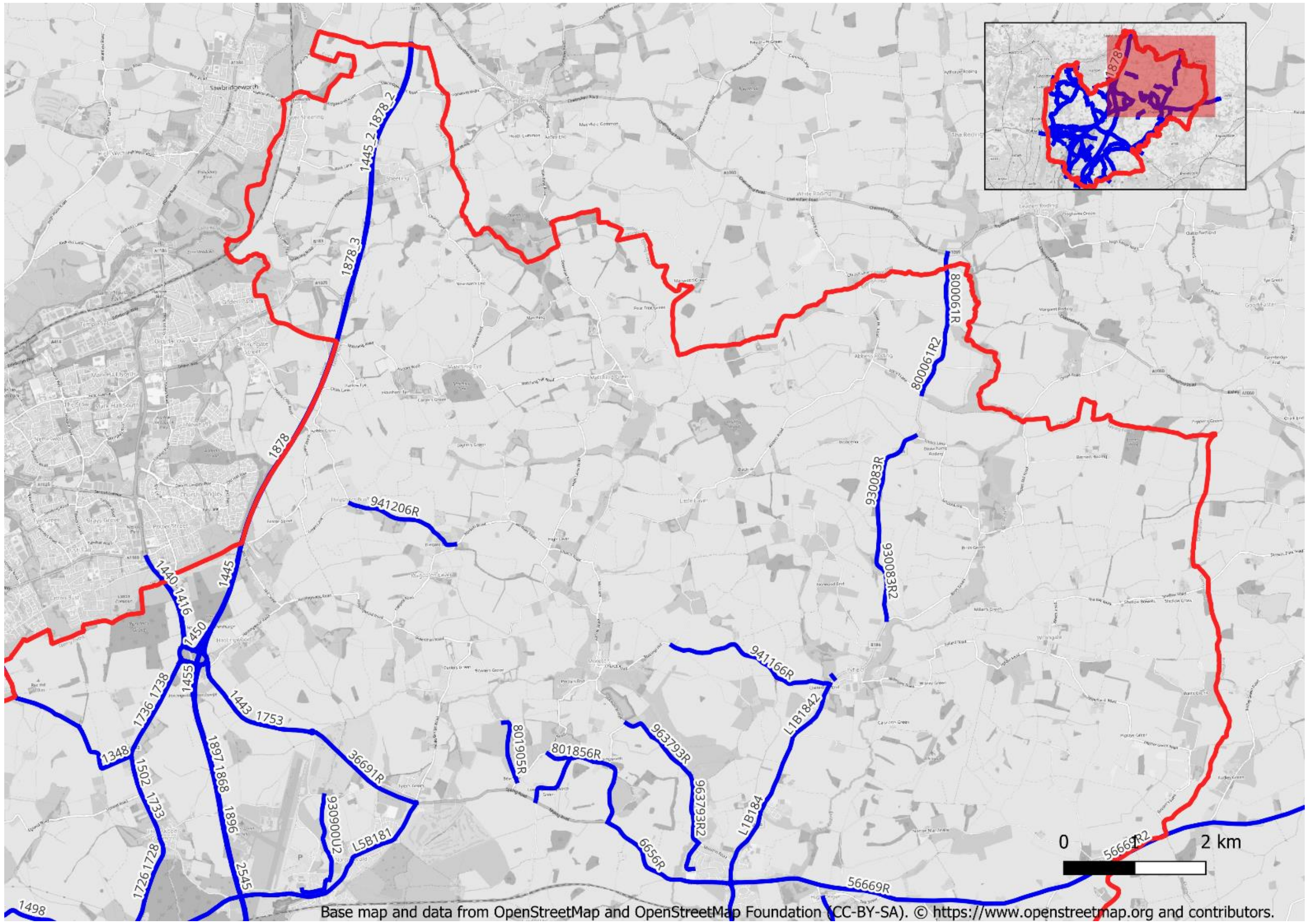


Figure 6-2- Road IDs of Links Modelled South

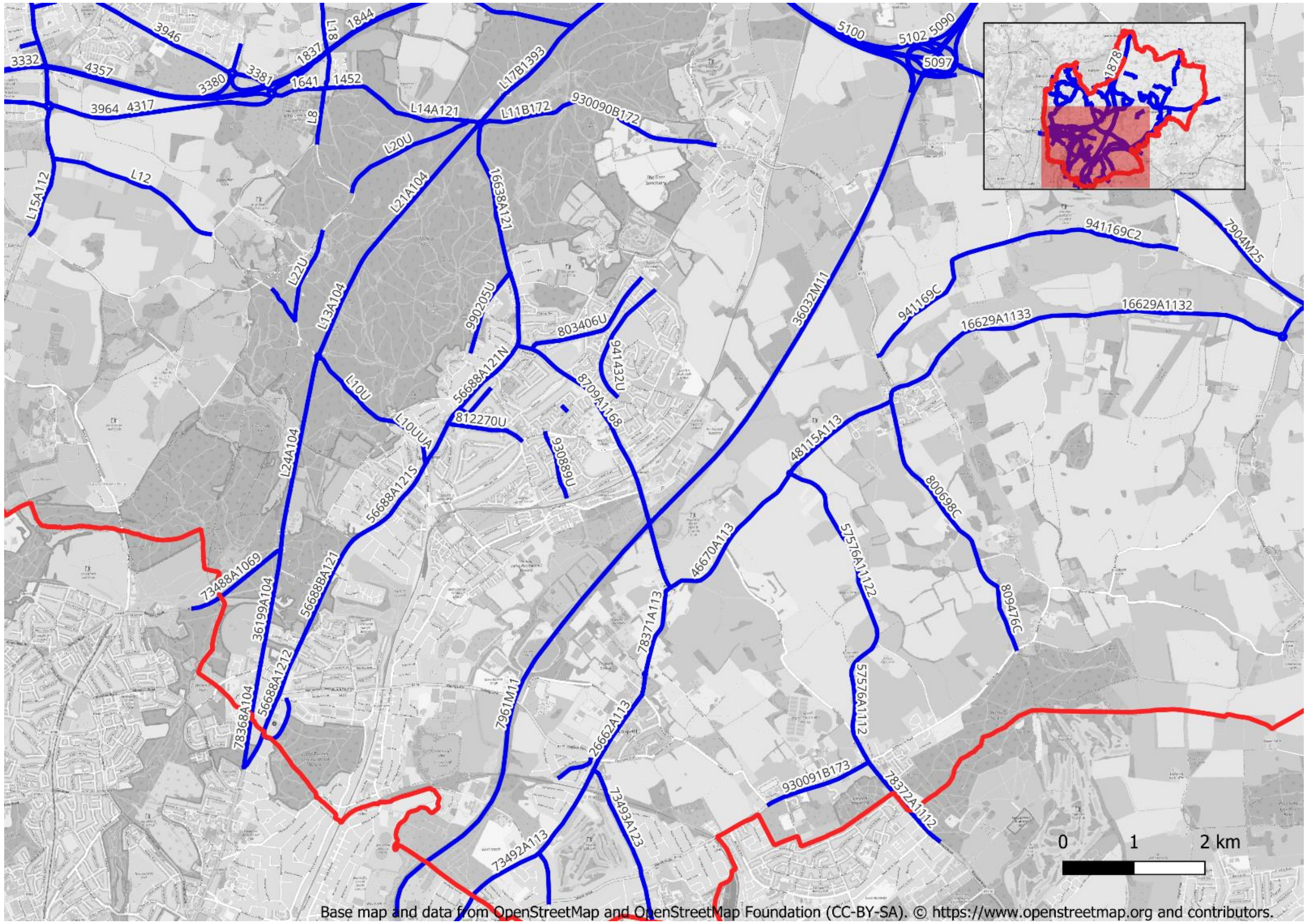
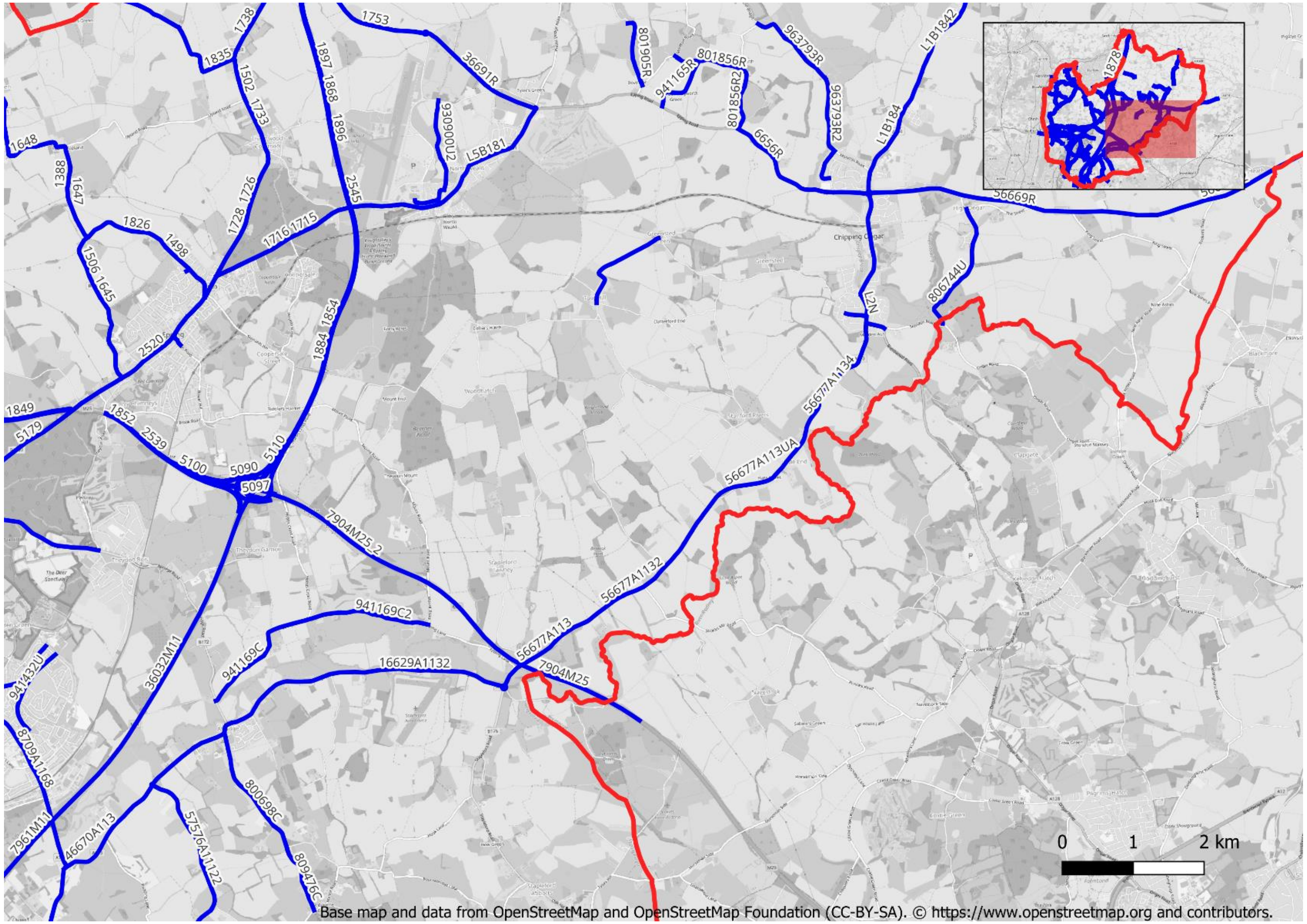


Figure 6-3 Road IDs of Links Modelled East



Appendix C – Receptors

Table C 1 – Coordinates and height of receptors.

Receptor ID	X	Y	Height
R01	540685	193632	1.5
R02	545932	193098	1.5
R03	546411	193324	1.5
R04	546376	193327	1.5
R05	546591	193112	1.5
R06	547738	194541	1.5
R07	546298	195022	1.5
R08	540939	209917	1.5
R09	540921	209908	1.5
R10	540902	209972	1.5
R11	541291	210077	1.5
R12	540678	209628	1.5
R13	540690	209671	1.5
R14	540919	208846	1.5
R15	542176	207604	1.5
R17	542346	207243	1.5
R19	539522	207758	1.5
R21	539061	206021	1.5
R22	539100	206014	1.5
R23	539124	205996	1.5
R24	539063	205966	1.5
R25	539539	206068	1.5
R26	539516	206039	1.5
R27	539489	206057	1.5
R28	540864	205027	1.5
R29	540551	193722	1.5
R30	540744	193856	1.5
R31	539371	204012	1.5
R32	540376	204763	1.5
R34	540959	194311	1.5
R35	540743	194807	1.5
R36	543700	193262	1.5
R37	543603	192917	1.5
R38	543583	192875	1.5
R39	543812	193213	1.5
R40	543814	193241	1.5
R41	543910	193048	1.5
R42	544169	192518	1.5
R43	544230	192285	1.5
R44	543482	192720	1.5
R45	544405	199247	1.5
R47	547196	197282	1.5
R48	549386	197586	1.5
R49	551119	198047	1.5
R50	552358	198810	1.5
R51	553567	200032	1.5
R52	555149	202182	1.5
R53	555242	202192	1.5
R54	555141	202215	1.5
R55	555177	202250	1.5
R56	555157	202401	1.5
R57	555203	202808	1.5

Receptor ID	X	Y	Height
R58	555143	203916	1.5
R59	555184	203962	1.5
R61	554649	204369	1.5
R62	555280	204352	1.5
R64	556615	203392	1.5
R67	553348	205627	1.5
R68	552506	205281	1.5
R70	550164	197419	1.5
R71	550403	197528	1.5
R72	538463	201466	1.5
R73	559774	203871	1.5
R75	538452	200485	1.5
R76	538466	200505	1.5
R77	538571	200525	1.5
R78	538977	200652	1.5
R79	539006	200624	1.5
R80	539405	200366	1.5
R87	540866	200941	1.5
R88	542989	197931	1.5
R89	543023	197964	1.5
R90	542778	197667	1.5
R91	557906	210940	1.5
R92	551174	208688	1.5
R93	540827	195210	1.5
R94	543893	197217	1.5
R95	543923	197481	1.5
R96	543383	196306	1.5
R97	544565	194984	1.5
R98	544518	194959	1.5
R99	544486	194906	1.5
R100	544356	194486	1.5
R101	544022	193593	1.5
R102	540873	195543	1.5
R103	541726	195554	1.5
R104	541982	196514	1.5
R105	542939	196454	1.5
R106	543974	197345	1.5
R107	545094	195471	1.5
R108	541199	197185	1.5
R109	539072	201130	1.5
R112	546634	196739	1.5
R113	546635	196711	1.5
R114	546621	196705	1.5
R115	546833	196020	1.5
R116	546659	196866	1.5
R117	546641	196855	1.5
R118	546659	196851	1.5
R122	544689	201131	1.5
R123	544924	201280	1.5
R124	545206	201520	1.5
R125	545214	201531	1.5
R131	546356	202532	1.5
R132	546356	202697	1.5
R133	546602	202977	1.5
R134	546551	202836	1.5
R135	548169	203721	1.5
R136	548770	203754	1.5

Receptor ID	X	Y	Height
R137	549469	203912	1.5
R140	549530	203987	1.5
R141	550037	204363	1.5
R142	550471	204566	1.5
R144	550672	205070	1.5
R148	547385	206917	1.5
R149	547030	206249	1.5
R150	546793	205832	1.5
R151	546777	205661	1.5
R154	547144	204560	1.5
R155	546267	202816	1.5
R156	546152	202900	1.5
R157	546123	202940	1.5
R158	545759	203306	1.5
R163	544137	196192	1.5
R164	544053	196339	1.5
R165	543239	197214	1.5
R166	543206	197262	1.5
R167	543297	197284	1.5
R170	544740	203262	1.5
R174	544475	204569	1.5
R175	542847	196986	1.5
R176	545085	202381	1.5
R177	544424	204546	1.5
R179	544379	204581	1.5
R181	543767	204442	1.5
R185	546000	206148	1.5
R187	545223	206507	1.5
R193	541928	195782	1.5
R194	541669	195520	1.5
R195	545122	200913	1.5
R196	541431	195309	1.5
R198	544432	200989	1.5
R199	540979	194407	1.5
R200	542764	200480	1.5
R203	542236	200830	1.5
R204	540268	200907	1.5
R205	539601	201039	1.5
R206	538444	200925	1.5
R207	538431	201041	1.5
R208	537909	200613	1.5
R213	539955	198418	1.5
R214	538306	199567	1.5
R215	538554	199525	1.5
R216	538573	199510	1.5
R217	538666	199029	1.5
R220	539731	198692	1.5
R221	541097	198054	1.5
R222	537727	200552	1.5
R223	538435	200895	1.5
EF224	542638	192807	1.5
EF226	544005	196358	1.5
EF229	554658	204019	1.5
EF232	546664	196495	1.5
EF235	544165	193862	1.5
EF237	540863	209851	1.5
EF245	545105	201956	1.5

Receptor ID	X	Y	Height
EF247	540780	200933	1.5
EF250	544366	194128	1.5
R252	538690	203083	1.5
H253	547862	207136	1.5
H254	540745	193688	1.5
H256	540821	193644	1.5

Appendix D – Modelled Annual Pollutant Concentrations at Receptors

Table D 1 – Modelled Annual Pollutants Concentrations at Receptors.

Receptor name	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
R01	25.3	17.5	11.7
R02	21.6	17.8	11.3
R03	25.0	17.4	11.3
R04	20.5	16.9	11.0
R05	19.5	16.8	11.0
R06	16.2	15.9	10.4
R07	19.0	17.1	10.8
R08	16.1	16.1	10.2
R09	16.0	16.1	10.2
R10	14.7	15.8	10.1
R11	13.3	15.4	9.9
R12	14.3	15.7	10.0
R13	13.7	15.6	10.0
R14	13.8	16.0	10.1
R15	25.2	17.3	11.2
R17	17.9	16.0	10.4
R19	16.4	16.1	10.2
R21	16.2	16.4	10.5
R22	19.6	17.1	10.9
R23	17.0	16.5	10.6
R24	15.3	16.1	10.3
R25	18.0	16.7	10.6
R26	15.6	16.2	10.4
R27	15.9	16.3	10.4
R28	16.3	15.5	10.2
R29	26.0	17.6	11.7
R30	23.3	17.2	11.5
R31	20.5	17.7	11.1
R32	16.7	16.3	10.5
R34	23.9	17.5	11.5
R35	24.8	17.7	11.6
R36	23.1	17.4	11.4
R37	23.5	17.1	11.4
R38	24.4	17.2	11.5
R39	32.6	18.7	12.2

Receptor name	Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
R40	32.8	18.8	12.2
R41	34.8	19.9	12.8
R42	25.7	18.1	12.0
R43	27.4	18.0	12.0
R44	24.6	17.2	11.5
R45	19.7	16.9	10.8
R47	20.7	17.7	11.0
R48	21.9	17.6	11.0
R49	23.0	19.1	11.4
R50	20.2	18.4	11.0
R51	14.8	16.9	10.3
R52	18.0	16.7	10.5
R53	18.4	17.1	10.7
R54	15.7	16.5	10.4
R55	17.5	16.9	10.6
R56	15.9	16.6	10.4
R57	20.3	17.5	10.9
R58	19.9	17.8	10.9
R59	21.7	18.2	11.1
R61	11.8	16.1	9.9
R62	14.7	16.4	10.1
R64	12.6	16.3	10.1
R67	11.1	16.0	9.8
R68	11.8	15.7	9.8
R70	27.9	19.6	12.0
R71	27.9	19.4	11.9
R72	28.4	19.1	12.3
R73	16.6	17.0	10.3
R75	27.6	18.2	12.1
R76	30.9	18.8	12.4
R77	26.1	17.8	11.9
R78	24.8	17.6	11.7
R79	22.3	18.1	11.7
R80	20.3	17.8	11.5
R87	19.4	17.3	11.2
R88	20.9	16.4	10.9
R89	24.5	17.2	11.5
R90	17.1	15.8	10.6
R91	10.5	17.1	10.0

Receptor name	Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
R92	11.5	15.9	9.8
R93	22.0	16.9	11.2
R94	18.6	16.4	11.0
R95	18.9	16.5	11.1
R96	19.4	16.7	11.2
R97	28.3	17.4	11.4
R98	31.6	17.8	11.6
R99	25.6	17.2	11.3
R100	22.0	16.7	10.9
R101	22.4	18.2	11.5
R102	22.2	16.9	11.2
R103	25.0	17.5	11.5
R104	19.1	16.5	10.8
R105	20.3	16.6	11.2
R106	18.8	16.4	11.0
R107	21.7	17.1	10.9
R108	33.5	18.8	12.0
R109	18.1	16.8	10.8
R112	22.5	17.6	11.2
R113	21.3	17.3	11.0
R114	21.0	17.3	11.0
R115	18.4	17.0	10.8
R116	26.4	17.9	11.4
R117	27.7	18.0	11.5
R118	27.2	18.0	11.4
R122	27.7	19.8	12.3
R123	48.3	23.1	14.2
R124	21.1	17.5	11.3
R125	22.3	17.9	11.5
R131	22.1	17.3	11.2
R132	32.1	19.7	12.6
R133	22.7	17.7	11.5
R134	22.6	17.6	11.4
R135	29.6	19.2	12.1
R136	26.4	18.5	11.7
R137	17.0	16.9	10.6
R140	17.0	16.8	10.6
R141	17.5	16.2	10.4
R142	19.8	16.5	10.6

Receptor name	Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
R144	18.6	16.6	10.4
R148	26.0	19.7	12.0
R149	24.9	19.5	11.8
R150	17.8	17.8	10.8
R151	17.8	17.7	10.8
R154	19.7	18.7	11.7
R155	22.2	17.4	11.3
R156	22.8	17.4	11.3
R157	20.0	16.9	11.0
R158	15.6	18.0	10.8
R163	26.8	18.1	11.8
R164	26.6	18.1	11.8
R165	24.1	17.5	11.7
R166	22.9	17.2	11.5
R167	20.3	16.8	11.2
R170	14.6	17.3	10.5
R174	14.9	17.0	10.5
R175	24.4	17.5	11.7
R176	17.4	16.9	10.8
R177	17.4	17.7	10.8
R179	17.0	17.6	10.8
R181	15.6	17.5	10.6
R185	17.5	17.6	10.8
R187	15.9	17.0	10.5
R193	21.5	17.0	11.2
R194	24.4	17.4	11.5
R195	35.1	20.9	13.0
R196	24.8	17.6	11.5
R198	35.3	20.2	13.0
R199	22.2	17.2	11.3
R200	25.7	18.5	11.7
R203	26.1	18.5	11.8
R204	18.3	17.1	11.0
R205	17.4	16.6	10.7
R206	25.2	17.7	11.8
R207	21.0	17.2	11.2
R208	30.4	18.7	12.2
R213	17.9	17.5	11.0
R214	26.9	18.9	12.1

Receptor name	Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
R215	27.5	19.0	12.2
R216	27.9	19.1	12.2
R217	35.9	19.8	12.7
R220	18.3	17.6	11.1
R221	17.9	16.0	10.6
R222	28.7	18.6	12.2
R223	24.9	17.6	11.7
EF224	34.2	19.1	12.5
EF226	23.8	17.5	11.5
EF229	12.6	16.3	10.1
EF232	19.0	17.0	10.8
EF235	21.6	18.0	11.4
EF237	13.3	15.5	9.9
EF245	18.3	16.9	11.0
EF247	18.3	17.1	11.0
EF250	20.6	16.5	10.8
R252	20.3	17.5	11.1
H253	29.7	20.0	12.3
H254	22.2	17.0	11.4
H256	21.2	16.9	11.3