2019 Air Quality Annual Status Report (ASR)

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

September 2019

Local Authority Officer	Craig Gent
Department	Environmental Health
Address	Borough Offices, Bishops' College, Churchgate, Cheshunt, Waltham Cross, Hertfordshire, EN8 9XB
Telephone	01992 785 555
E-mail	envhealth@broxbourne.gov.uk
Report Reference number	BOB/2019/ASR
Date	September 2019

Executive Summary: Air Quality in Our Area

The Borough of Broxbourne is located to the North of Greater London, there are two main roads, the A10 which passes through on a north-south axis in addition to the M25 which runs along the southern boundary of the Borough. This unique position makes the Borough a desirable place to live and work and also places it within the axis of two major road transport hubs. In many areas, vehicle emissions have become the dominant source of air pollutants such as nitrogen dioxide (NO2), and PM10s (Particulate Matter up to 10 microns in diameter). These emissions contribute to risks of morbidity and mortality for drivers, commuters and individuals living near roadways, as shown by epidemiological studies, evaluations of proposed vehicle emission standards, and environmental impact assessments for specific road projects [1].

Air Quality in the Borough of Broxbourne

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[2,3].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion [4].

The main pollutant of concern within the Borough of Broxbourne is nitrogen dioxide (NO_2). In 2018 there were several areas within the Borough, where elevated levels of NO_2 were regularly recorded, which include Great Cambridge Road (A10), College Road, Halfhide Lane & Beltona Gardens within Cheshunt, Arlington Crescent, Eleanor Cross Road, Winston Churchill Way, Sturlas Way & High Street within Waltham Cross and Essex Road, Dinant Link Road/Burford Street Junction within Hoddesdon.

[1] World Health Organization. Health effects of transport-related air pollution. Copenhagen: WHO Regional Office for Europe; 2005. pp. 125–165
[2] 2Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[3] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[4] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

In response to these results the Borough of Broxbourne has previously declared AQMAs at the following locations,

- Arlington Crescent to Abbey Road, Waltham Cross (AQMA 1)
- 33-35 Teresa Gardens, Waltham Cross (AQMA 2)
- Tyle Kiln Cottage, Goffs Oak (AQMA 3)
- Eleanor Cross Road/Monarch's Way, Waltham Cross (AQMA 4)
- Monarch's Way/Winston Churchill Way, Waltham Cross (AQMA 5)
- Great Cambridge Road, Cheshunt (AQMA 6)
- High Road, Wormley (A1170) (AQMA7)

Actions to Improve Air Quality

AQMAs declared within the Borough of Broxbourne can be accessed via https://uk-air.defra.gov.uk/aqma/list

The Council commissioned Bureau Veritas to develop a single Air Quality Action Plan (AQAP) with respect to AQMAs 4-7. The single AQAP will also update the source apportionment and list of actions with respect to AQMA 1. The first steering group meeting was held in August 2017, where Officers and Member's from both the Borough of Broxbourne and Hertfordshire County Council took the opportunity to discuss existing and developing actions and policies which could contribute to emissions reductions within the AQMAs. Highways England were not present at the first Steering Group Meeting, however we expect their future attendance further to requesting their input in to the AQAP.

The Council Regularly attends meetings with other stakeholders including Hertfordshire County Council, the Herts and Beds Air Quality Monitoring Group and the North London Air Quality Cluster Group.

The Council will continue to monitor and report upon air quality within the district

The Borough of Broxbourne was successful in securing a grant of £249,780 from the Department of Transport (DFT) in 2016, through its Clean Bust Technology Fund (CBTF), in order to facilitate the retrofitting of 15 buses with Selective Catalytic Reduction Technology. The Borough of Broxbourne commissioned Green Urban Technologies Ltd to install their ecoNox "DMXr" SCR Technology which is a Selective

Catalytic Reduction System. The upgrades have brought improvements with the vehicle's emissions, which will improve the air quality within AQMAs 1, 2, 4 and 5 which are located within Waltham Cross. The retrofitted vehicles which operate out of Waltham Cross travel along the 410, 410A and 410X bus routes. Further information related to the current status of the CBTF project may be found within Section 2.2 below.

Conclusions and Priorities

Exceedances of the National Air Quality Objectives were identified at two locations with respect to the Annual Mean for nitrogen dioxide, after distance correction had been applied. The exceedances were identified within existing AQMAs 1 and 6. An Air Quality Action Plan is currently being developed on behalf of the Borough of Broxbourne in order to address exceedances of nitrogen dioxide within these areas.

The annual concentration of nitrogen dioxide was again compliant within AQMA 2, for the sixth consecutive year. The concentrations within AQMA 3 were also compliant in 2018 following Bias Adjustment, bringing the total number of consecutive years on record to four. There was a delay in the revocation of both AQMAs 2 & 3 due to unanticipated exigencies following two Ministerial Directions which were issued to the Borough of Broxbourne in 2018, which are discussed in further detail within Section 2.1 of this ASR.

Priorities for addressing air quality within the Borough of Broxbourne throughout 2018 include:

- Maintaining existing AQMAs 1, 4, 5, 6 and 7 for nitrogen dioxide.
- Continue to monitor nitrogen dioxide concentrations at existing long-term locations.
- Progress the development of a single Air Quality Action Plan (AQAP) for areas failing to meet the National Air Quality Objective for nitrogen dioxide and hold an associated Steering Group meeting in order to facilitate the Plan's development and delivery.

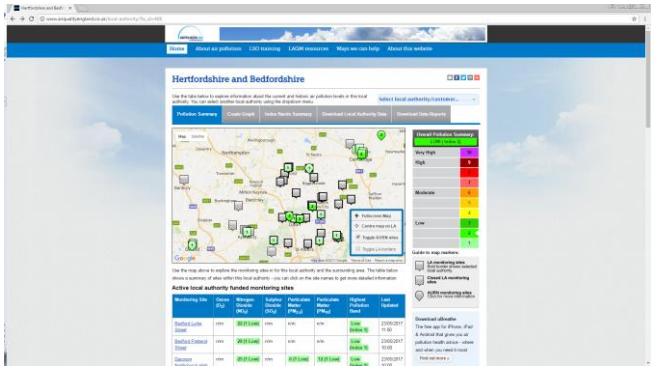
There are several large developments taking place within the Borough of Broxbourne in addition to several more which are in the Planning phase which have the potential to impact upon Air Quality with respect to nitrogen dioxide, $PM_{2.5}$ and $PM_{10.}$

One of the continued challenges is ensuring these developments do not contribute to the pollutants listed above, which is usually facilitated through the Planning System, which gives the Council the opportunity to stipulate conditions aimed at mitigating the effects of Air Pollutants to surrounding receptors and to ensure that future residents are not exposed to poor Air Quality.

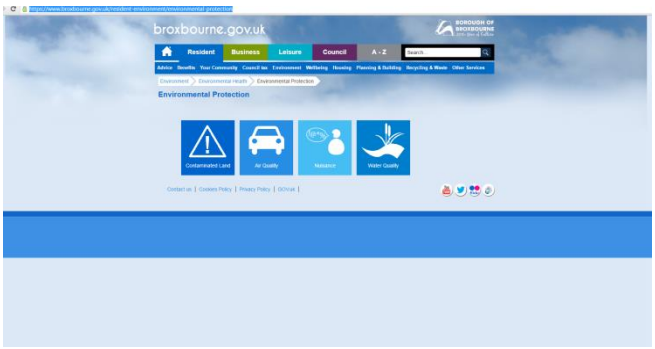
1 Local Engagement and How to get Involved

Informing people about local air quality, in particular when pollution is elevated can help to protect those members of the community who are most sensitive to the health impacts associated with air pollution. Increasing public understanding of the sources and effects of air pollution can also motivate lifestyle changes which can help improve air quality, for example promoting sustainable travel as method of reducing air pollution.

http://www.airqualityengland.co.uk/local-authority/?la_id=408



https://www.broxbourne.gov.uk/resident-environment/environmental-protection



http://Twitter.com/broxbournebc

Borough of Broxbourne

The Borough of Broxbourne consulted the public in 2016 with respect to the Emerging Local Plan, which contains several draft policies relevant to Air Quality in addition to Walking and Cycling routes and Sustainable Transport. The public were also given the opportunity to add further comments on the Pre-Submission Local Plan by December 2017 and comments with respect to this Plan may be viewed via,

http://consult.broxbourne.gov.uk/portal/planning/reg19/reg19?pointId=4653994

The Broxbourne Local Plan 2018 -2033 was submitted to the Secretary of State on 15 March 2018.

There are numerous simple measures which the public may adopt in order to improve the air quality around them. Such measures include,

- Making short trips and journeys on foot or by bike instead of by car, or using public transport.
- Car sharing with colleagues, or with other parents on the school run.
- Avoid Idling whilst your vehicle is stationary.
- Purchasing low-emission electric and/or hybrid vehicles, with government funding and grants available. Please see,

  https://www.gov.uk/plug-in-car-van-grants/what-youll-get

- Upgrading boilers to newest and most efficient gas condensing boilers with lowest NOx (and carbon) emissions.
- Conserving fuel efficiency of vehicles through ensuring correct tyre pressure is maintained.
- Ensuring your home is sufficiently insulated.
- Installing sources of renewable energy such as solar panel electricity systems, also known as solar photovoltaics or wind turbines.

Table of Contents

Executive Summary: Air Quality in Our Area i

Air Quality in The Borough of Broxbourne ..... i-ii

Actions to Improve Air Quality ..... ii-iii

Conclusions and Priorities ..... iiii-iv

Local Engagement and How to get Involved ..... v-vi

1 Local Air Quality Management 1

2 Actions to Improve Air Quality 2

2.1 Air Quality Management Areas 2-3

2.2 Progress and Impact of Measures to address Air Quality in The Borough of Broxbourne 15-19

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations 28

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance 29

3.1 Summary of Monitoring Undertaken 29

3.1.1 Automatic Monitoring Sites 29

3.1.2 Non-Automatic Monitoring Sites 29

3.2 Individual Pollutants 29

3.2.1 Nitrogen Dioxide (NO_2) 30-31

3.2.2 Particulate Matter (PM_{10}) 31

3.2.3 Particulate Matter ($PM_{2.5}$) 31

3.2.4 Sulphur Dioxide (SO_2) 31

Appendix A: Monitoring Results 32-38

Appendix B: Full Monthly Diffusion Tube Results for 2018 39-41

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC 42-47

Appendix D: Map(s) of Monitoring Locations and AQMAs 48-68

Appendix E: Summary of Air Quality Objectives in England 69

Glossary of Terms 70

References 71

List of Tables

Table 2.1 – Declared Air Quality Management Areas..... 4-6
Table 2.2 – Progress on Measures to Improve Air Quality 20-26
Table B.1-No2 Monthly Diffusion Tube Results-2018……39-41
Table A.2 – Details of Non-Automatic Monitoring Sites 32-35
Table A.3 – Annual Mean NO_2 Monitoring Results 36-38
Table E.1 – Air Quality Objectives in England 69

Figures 2.1: Maps of AQMA Boundaries and Diffusion Tube locations.

Figure 2.1 (1) AQMA 1……9
Figure 2.1 (2) AQMA 4…….....10
Figure 2.1 (3) AQMA 5……11
Figure 2.1 (4) AQMA 6…….....13
Figure 2.1 (5) AQMA 7……..…14

1 Local Air Quality Management

This report provides an overview of air quality in the Borough of Broxbourne during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Borough of Broxbourne to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by The Borough of Broxbourne can be found in Table 2.1.

Further information related to declared AQMAs, including maps of AQMA boundaries are available online at https://www.broxbourne.gov.uk/business-licensing-and-legislation-resident-environment-environmental-health/air-quality

Images of the AQMA boundaries in conjunction with the wider vicinity can also be viewed on our interactive map via,

http://mapping.broxbourne.gov.uk/geoexplorer/composer/#maps/10
In addition please also see Figures 2.1 for Maps of AQMA Boundaries and Appendix D: Map(s) of Monitoring Locations , which also provides for a map of air quality monitoring locations in relation to the AQMA(s).

A Detailed Assessment was completed in September 2016 and covered two areas within the Borough of Broxbourne. This assessment recommended the declaration of two new AQMAs, the first being at the junction of Great Cambridge Road and College Road in Cheshunt, including the Great Cambridge Road (A10) near Theobalds Lane junction up to the Brookfield Centre (B156 Flyover and B156/A10 Slip Road), with respect to likely annual and hourly mean breaches of nitrogen dioxide. The second AQMA recommended being along the High Road in Wormley (A1170) between the junctions of New Road/Springfields and West Side/The Springs, including the junctions of Station Road and Bell Lane, with respect to likely annual mean breaches of nitrogen dioxide. Subsequently the Borough of Broxbourne declared AQMA 6- Great Cambridge Road (A10) and AQMA 7- High Road in Wormley (A1170) in May 2017. Maps of these two new AQMAs can be seen within Figures 2.1.

Air Quality Management Areas 2 and 3

The Borough of Broxbourne Intended to revoke AQMA 2 (33-35 Teresa Gardens, Waltham Cross), within 2018, as the NO_2 levels recorded have consistently been recorded below the objective level of 40µg/m^3 for over three years. (See monitoring section) and following year on year improvements of nitrogen dioxide in 2014, 2015, 2016 and 2017. We are confident the improvement within AQMA 2 will be sustained in the long term.

The Borough of Broxbourne also intended to revoke AQMA 3 (Tyle Kiln Cottage-Jones Road), within 2018 due to three years sustained compliance with the national air quality objective for nitrogen dioxide. The results of which have been well below the threshold of 40µg/m3.

There was delay in revoking both AQMAs 2 & 3 in 2018. However both revocations took place on the 1 March 2019, further to an additional year of compliance.

Following feedback from the LAQM Helpdesk and in line with Paragraph 3.49 of Local Air Quality Management Technical Guidance (TG16) February 2018, the revocations were made on the basis of robust monitoring evidence, therefore detailed modelling to support the revocations was not deemed necessary.

Revocation Orders were drafted in conjunction with Paragraph 4.10 of Local Air Quality Management Guidance Policy Guidance (PG16). Copies of the Revocation Orders were also uploaded to the Council's Air Quality Web page and submitted to the Local Air Quality Management Report Submission Website.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 1 Arlington Crescent to Abbey Road	Declared 04/02/2004 Amended 10/03/2016	NO2 Annual Mean	Waltham Cross	Within a residential Cul-de- sac adjacent to the M25. The AQMA was further extended in March 2016 to include residential properties along Lodge Crescent, Abbey Rd and High Street.	YES	63	µg/m3	45.1	µg/m3	The Borough of Broxbourne's Single Air Quality Action Plan	Development Stage	N.A

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA 4 Eleanor Cross Rd/Monarchs Way	Declared 10/03/2016	NO2 Annual Mean	Waltham Cross	An area encompassing residential properties on Abbey Rd, King's Rd and Queen's Rd and including the Monarch's Way and Eleanor Cross Rd roundabout.	NO	78	µg/m3	37.5	µg/m3	The Borough of Broxbourne's Single Air Quality Action Plan	Development Stage	N.A.
AQMA 5 Monarchs Way/Winston Churchill Way	Declared 10/03/2016	NO2 Annual Mean	Waltham Cross	An area encompassing residential properties on Eleanor Rd, High Street, Sturlas Way and including the Monarch's Way and Winston Churchill Way roundabout.	NO	58	µg/m3	43	µg/m3	The Borough of Broxbourne's Single Air Quality Action Plan	Development Stage	N.A.

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)			Action Plan		
						At Declaration	Now		Name	Date of Publication	Link
AQMA 6 Great Cambridge Road (A10) & College Road	Declared 05/05/2017	NO2 1 Hour Mean	Cheshunt	Encompassing dozens of residential properties and a school along the (A10) and College Rd, from Theobalds Lane junction up to the Brookfield Centre (B156 Flyover and B156/A10 Slip Rd.	NO	Exceed-ances of the 60 µg/m3 Hourly Mean and the 40 µg/m3 Annual Mean	45	µg/m3	The Borough of Broxbourne's Single Air Quality Action Plan	Development Stage	N.A.
AQMA 7 High Road in Wormley (A1170)	Declared 05/05/2017	NO2 Annual Mean	Wormley/ Broxbourne	Including dozens of residential properties along the High Rd in Wormley (A1170) between the junctions of New Rd/Springfields and West Side/The Springs, including the junctions of	NO	Exceed-ances of the 40 µg/m3 Annual Mean	35.6	µg/m3	The Borough of Broxbourne's Single Air Quality Action Plan	Development Stage	N.A.

				Station Rd and Bell Lane							

Note: There is more than one monitoring location with respect to AQMAs 1, 5 & 6. Therefore the maximum recorded annual nitrogen dioxide concentration, within each AQMA has been applied with respect to column 8 above.

Figures 2.1 Maps of AQMA Boundaries and Diffusion Tube Locations

Figure 2.1 (1) AQMA 1 – Arlington Crescent to Abbey Road, Waltham Cross

Including: TUBE 8: 35 High Street, **(BB11), TUBE 13:** Parkside, **(BB48)** and **TUBE 6:** Arlington Crescent, **(BB05)**

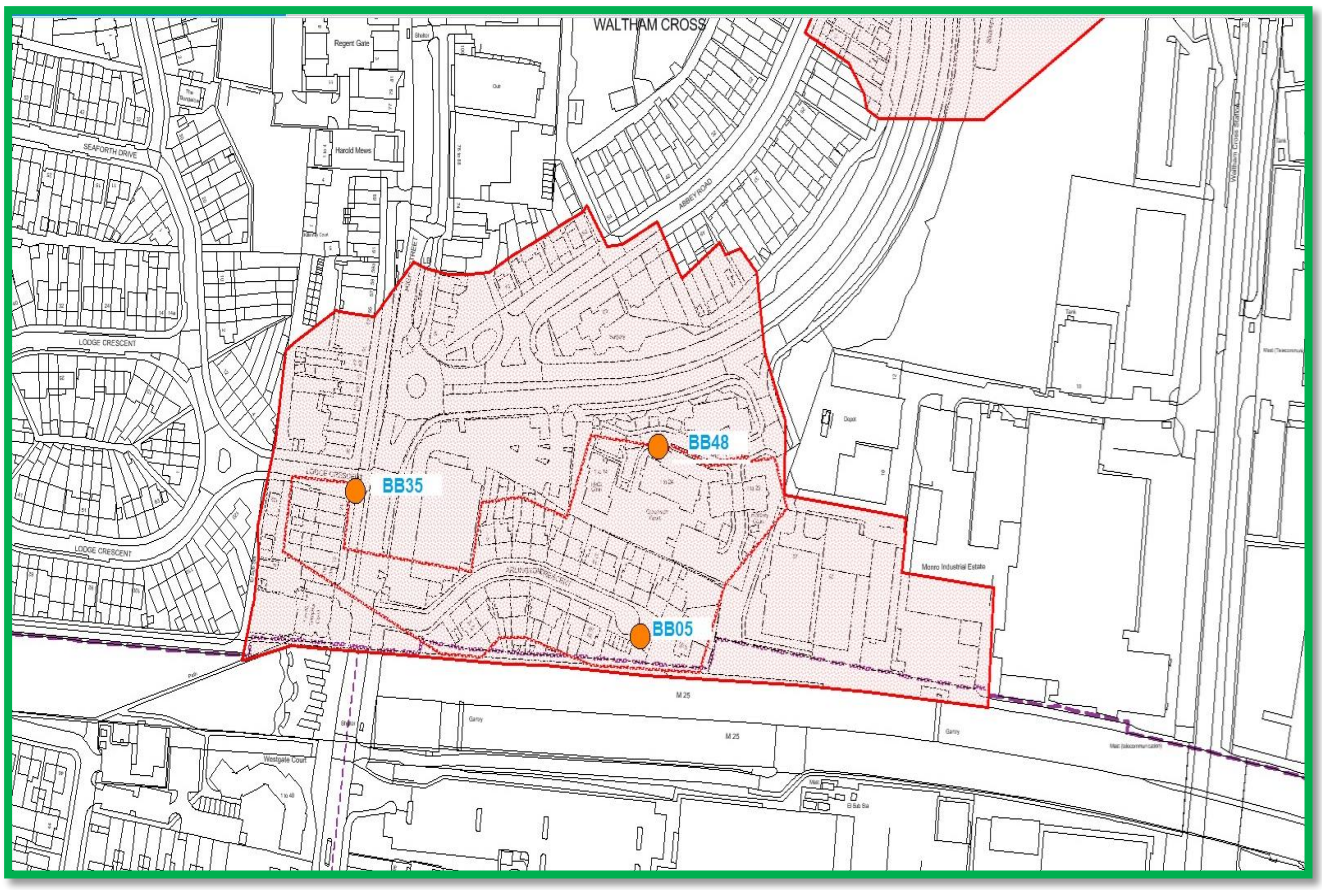


Figure 2.1 (2) AQMA 4- Eleanor Cross Road/Monarch's Way, Waltham Cross

Including: TUBE 12: Eleanor Cross Road, **(BB21)**

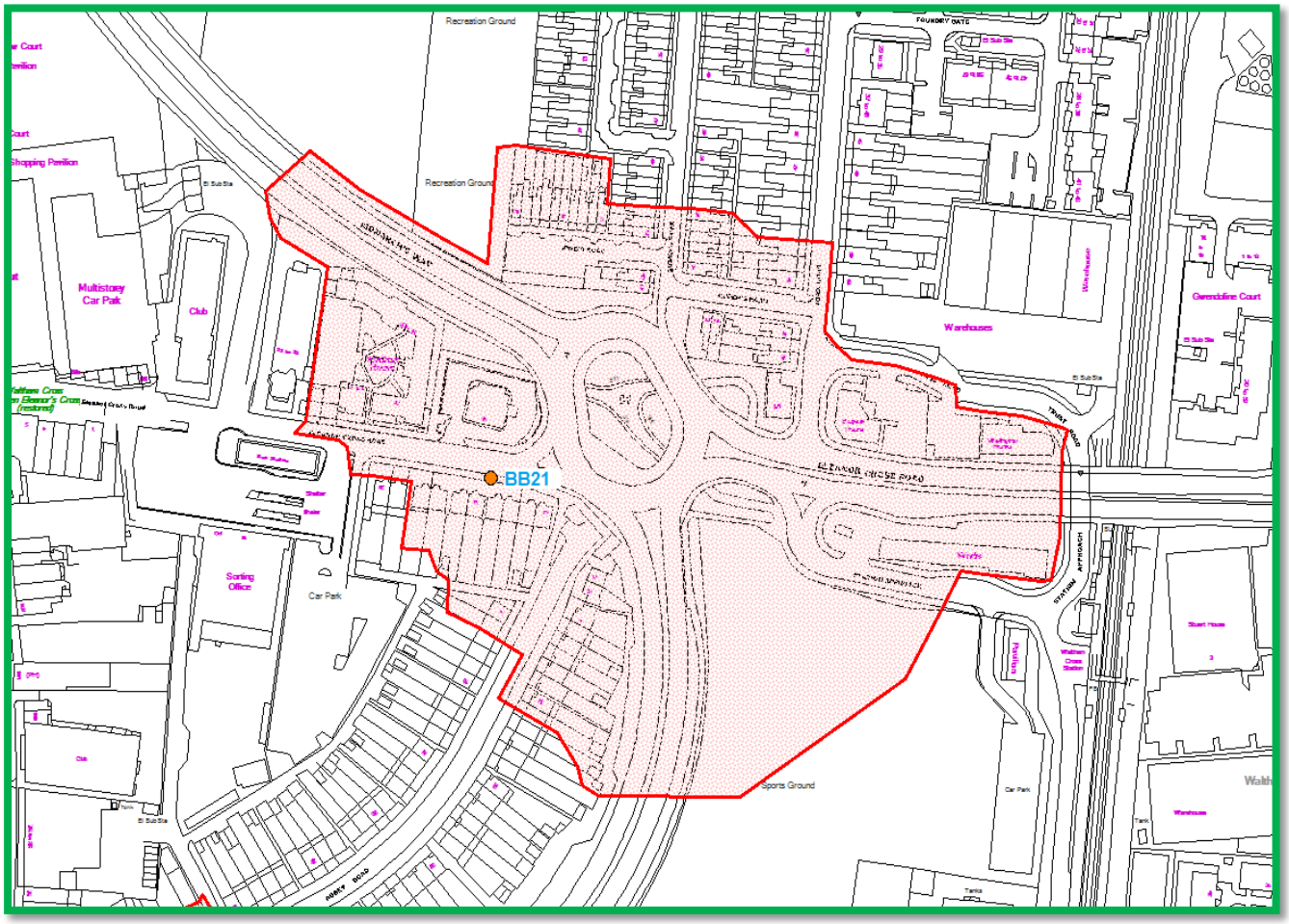
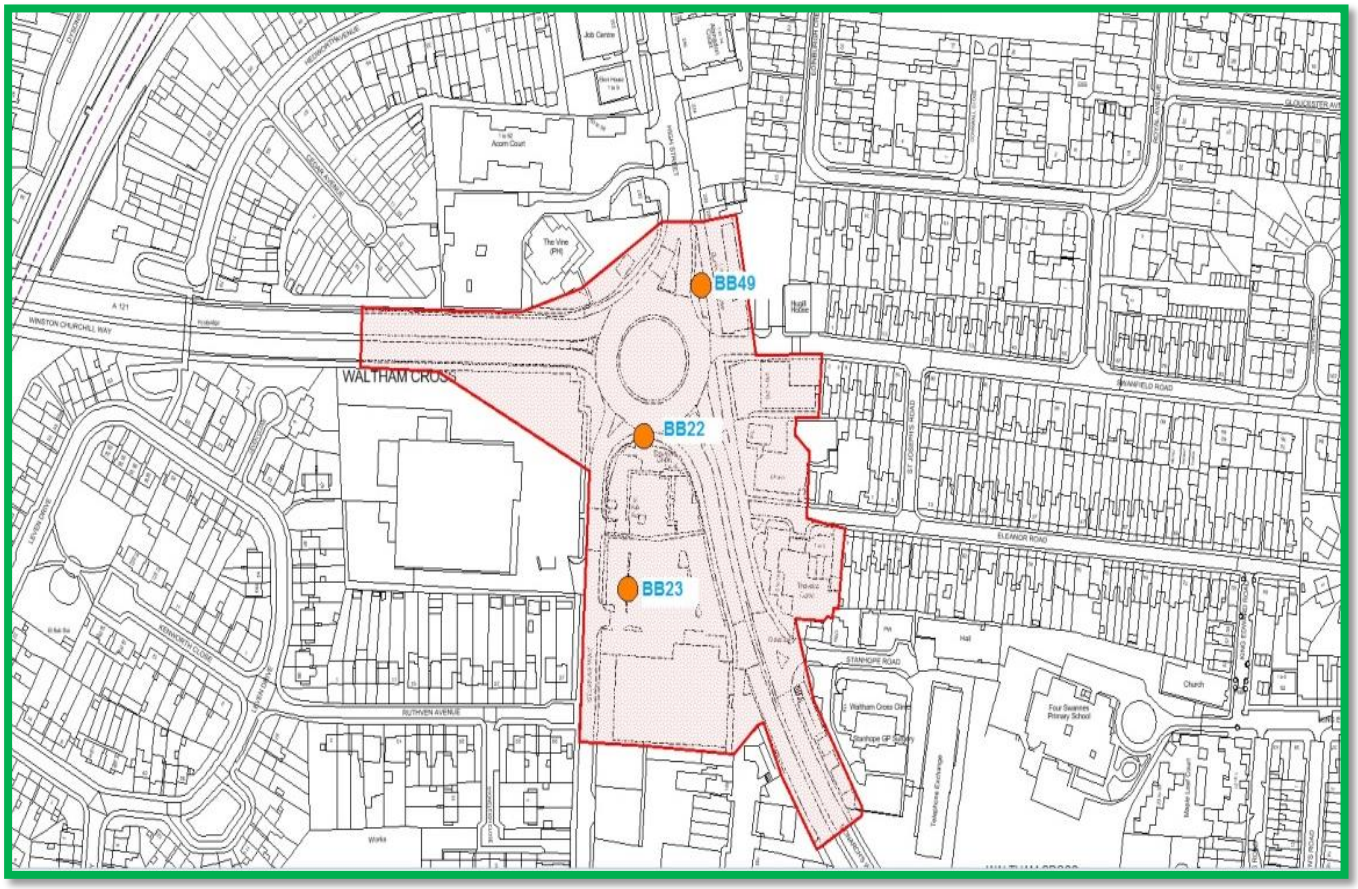


Figure 2.1 (3) AQMA 5-Monarch's Way/Winston Churchill Way, Waltham Cross
Including: TUBE 9: Sturlas Way, **(BB22), TUBE 10:** Wicks car park, **(BB23)** and **TUBE 11:** Winston Churchill Way/High Street, **(BB49)**



This Page is intentionally blank.

Figure 2.1 (4) AQMA 6-Great Cambridge Road (A10)

Including: TUBE 5: 100 Great Cambridge Road **(BB09), TUBE 21:** 214 Great Cambridge Road **(BB28), TUBE 27:** Farm Close, **(BB34), TUBE 28:** 86 College Road **(BB35), TUBE 32 :** College Rd/Goffs Churchgate Academy **(BB39), TUBE 19:** A10/College Road Junction **(BB40), TUBE 33:** 37 Beltona Gardens **(BB41)** and **TUBE 34 :** 48 Hobbs Close **(BB42)**

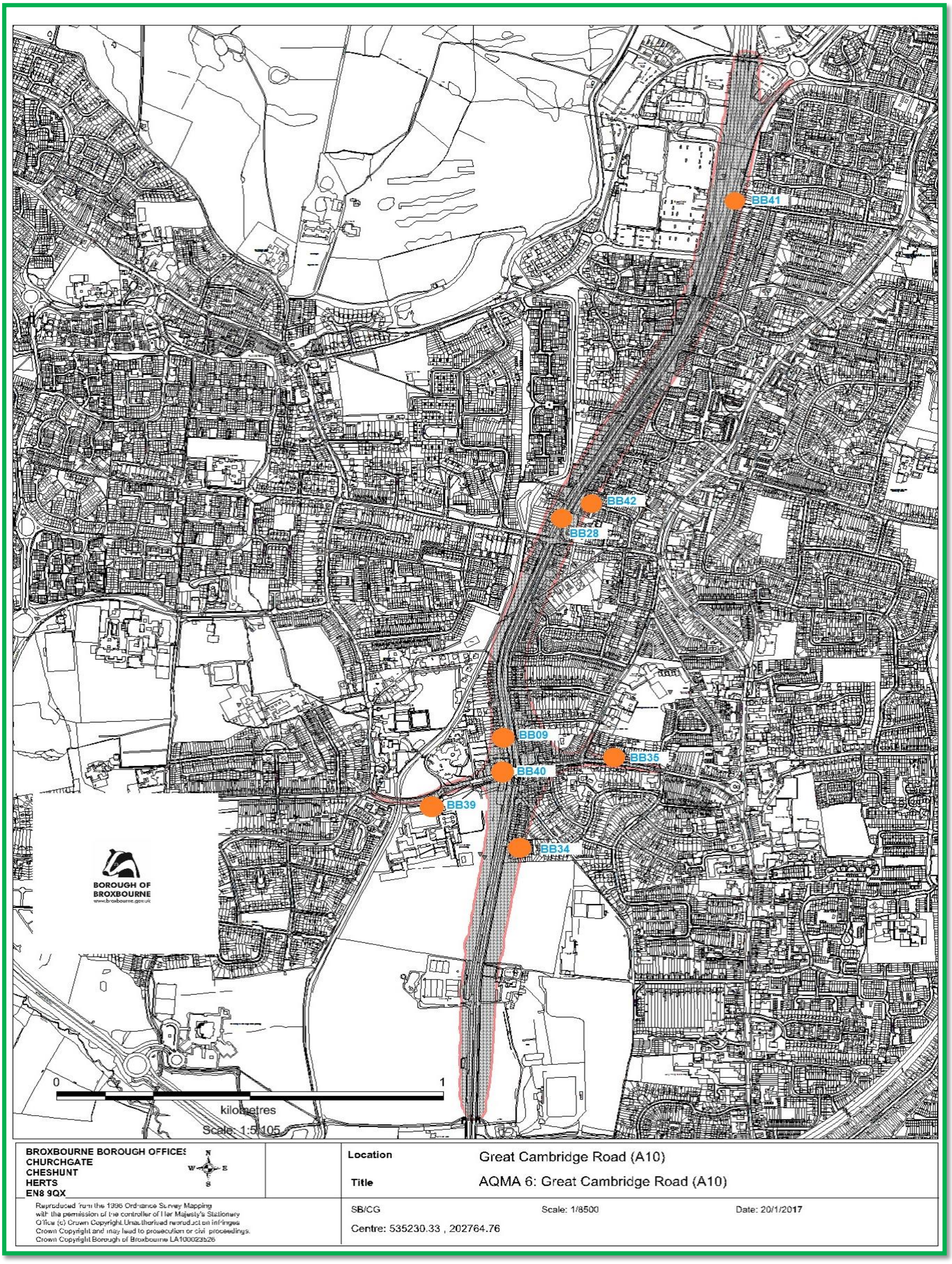
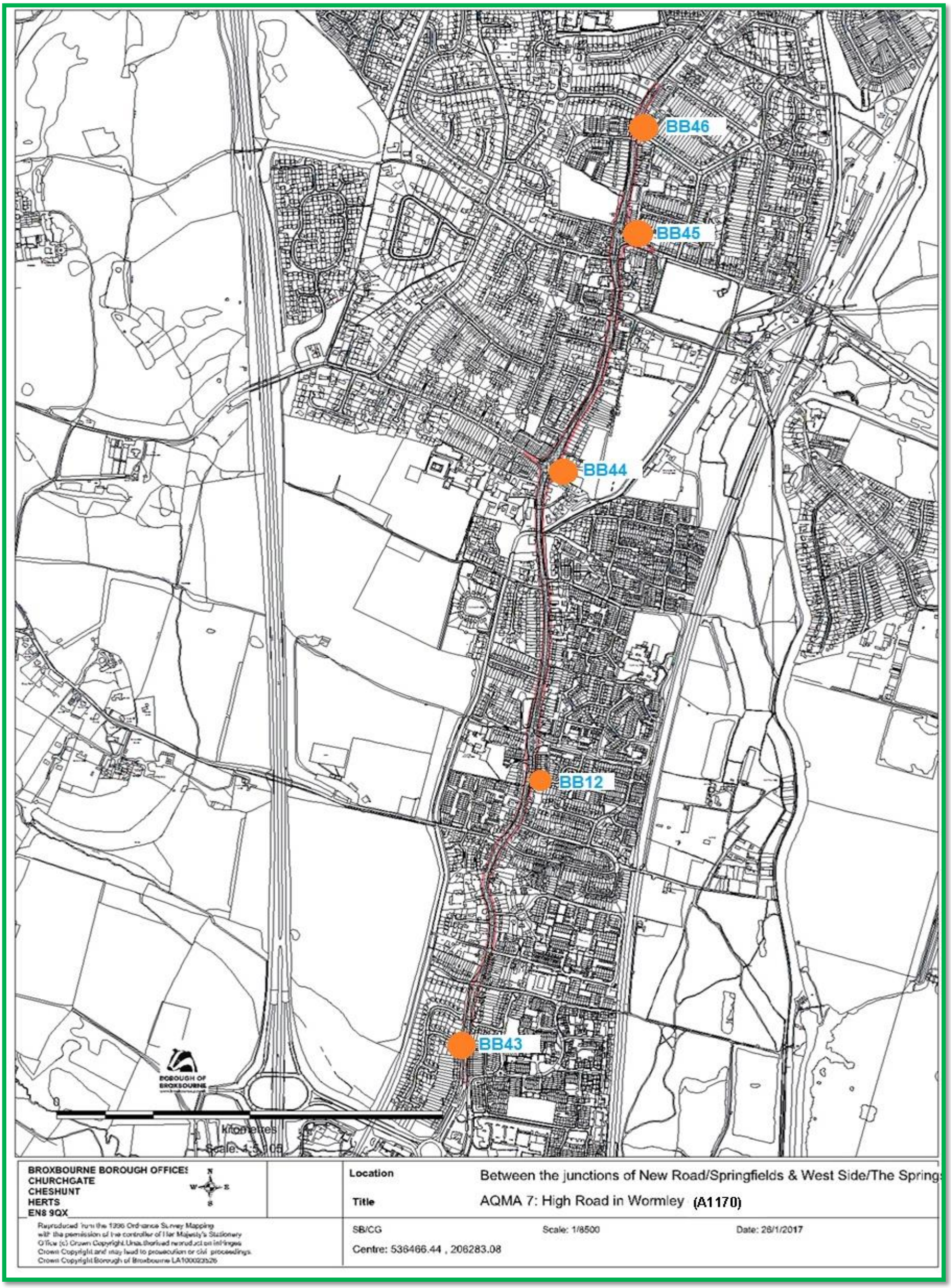


Figure 2.1 (5) AQMA 7-High Road in Wormley (A1170)

Including: TUBE 4: 15 High Road **(BB12)**, **TUBE 35:** 24 Westside **(BB43), TUBE 36:** High Road/Bell Lane Roundabout (163 High Road) **(BB44), TUBE 37:** High Road/Station Road Junction **(BB45) and TUBE 38:** High Road/Springfields Junction **(BB46)**



2.2 Progress and Impact of Measures to address Air Quality in Borough of Broxbourne

Defra's appraisal of last year's ASR concluded,

The report is well structured, detailed, and provides the information specified in the Guidance, following the latest reporting template.

1. *"The Council have responded to previous recommendations by:*
    - *Reviewing all monitoring sites in conjunction with LAQM Technical Guidance TG(16), and applying distance corrections to 2016 and 2017 results for sites which are not representative of relevant exposure.*
    - *Relocating BB01, BB17 and BB25 to sites of relevant exposure.*
    - *Recalculating annualisation factors for 2016 results.*
    - *Plans to provide a report in relation to monitoring evidence for relocating AQMAs 2 & 3, which is expected to be completed 2018.*
    - *Reviewing whether there are any other potential monitoring sites in AQMAs 2 and 3. This review found no viable additional locations in either AQMA.*

2. *The Local Authority has appropriately and correctly adjusted the data for bias adjustment, annualisation and distance correction. It is very helpful that these calculations have been presented in detail in Appendix C.*

3. *Monitoring data presented within the report demonstrates a small improvement in annual mean nitrogen dioxide concentrations over the last five years. There remain only four sites of exceedance, all of which are located within AQMAs.*

4. *An AQAP is currently in development for AQMAs 1, 4, 5, 6 and 7. The Local Authority should ensure that measures in the new AQAP specifically target improvement in the remaining AQMAs, and any other pollution hotspot.*

5. *It is also recommended that the new AQAP includes measures which specifically address $PM_{2.5}$, and engagement with Public Health England towards addressing $PM_{2.5}$.*

6. *It would be useful if estimated/actual completion dates were provided for all measures in the "Estimated/Actual Completion Date" column in Table 2.2."*

The Borough of Broxbourne has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

The Borough of Broxbourne expects the following measures to be completed over the course of the next reporting year:

- The full roll out of the Air Quality text alert system.
- Update the council's interactive webpage to include the revocations of

  AQMAs 2 & 3 and to provide details on how to sign up to the Air Quality text alert system.

Whilst the measures outlined within Table 2.2 will help contribute towards compliance, the Borough of Broxbourne anticipates the inclusion of further measures as its single Air Quality Action Plan develops, leading to compliance with the Air Quality Directive for nitrogen dioxide and the subsequent revocation of AQMAs 1, 4, 5, 6 and 7.

The Borough of Broxbourne's priorities for the coming year shifted following the receipt of its second Ministerial Direction in October 2018, which is explained with greater detail below.

Clean Bus Technology Fund (CBTF)

Borough of Broxbourne

The Borough of Broxbourne received a progress update from Green Urban towards the end of 2018. It has been confirmed that a total of 13 buses were retrofitted with selective catalytic reduction technology. Green Urban issued the Council with nine certificates confirming completion of the retrofitting. However certificates were not received with respect to four vehicles as the status surrounding the installation of their electrical units were unknown.

It transpired that GreenUrban Technologies Limited entered in to administration during December 2018, leaving a degree of uncertainty around the status of the CBTF project's full completion.

The Borough of Broxbourne will liaise with the DfT, before seeking guidance on an expedient way to conclude this project. A further update will be provided within the next ASR.

Ministerial Directions

A section of the A10 (Great Cambridge Road) which runs through Cheshunt and which also falls within AQMA 6 was identified within DEFRA's National Pollution Climate Mapping (PCM) Model, as having an exceedance and requiring further work with respect to the Ambient Air Quality Directive. The chart below was produced by DEFRA and it was originally anticipated that Borough of Broxbourne would have achieved compliance by 2019.

Roads in exceedance	Census ID	2017	2018	2019	2020	2021	Source apportionment
A10	78365	44	41	39.4	37	35	25% diesel cars; 21% LGV diesel; 15% HGVr; 8% HGVa; 6% petrol cars; 1% buses

Borough of Broxbourne

The Borough of Broxbourne received a legally binding Ministerial Direction on the 22 March 2018 which required it to develop a Targeted Feasibility Study (TFS) and provide the secretary of state with a document setting out the nature of exceedance on the stretch of A10 concerned and where the exceedance exists to provide recommended measure(s) that would achieve compliance with the Ambient Air Quality Directive in the shortest time possible. The deadline for the TFS's submission was the 31 July 2018. The TFS concluded that the pollution along the A10, was far worse than anticipated within the initial PCM Model. The A10 is projected to be compliant in 2028 as opposed to 2019 and therefore has a more persistent exceedance.

After an evaluation of several softer measures it was determined that a more extensive measure was required to significantly bring forward compliance. The preliminary assessment found that implementing a Class C Clean Air Zone (CAZ) (Buses, coaches, taxis, HGVs and LGVs) may bring forward compliance to 2026, whilst a Class D CAZ (Buses, coaches taxis, HGVs, LGVs and cars) may bring compliance further forwards to 2023.

A Class D CAZ was ultimately determined as the Borough of Broxbourne's benchmark option in line with JAQU (Joint Air Quality Unit - Comprising of DEFRA and DfT) guidance. Following receipt of a Second Ministerial Direction, which is explained in greater detail below, the Borough of Broxbourne subsequently developed a shortlist of options which were benchmarked against a Class D CAZ.

Following the successful submission of the TFS to JAQU, the Borough of Broxbourne received a second Ministerial Direction on the 4 October 2018, which required it to

undertake a Feasibility Study in accordance with the HM Treasury's Green Book approach, to identify the option which will deliver compliance with legal limits for nitrogen dioxide in the area for which the authority is responsible, in the shortest time possible.

There are several key deadlines which the Council is required to meet, with the deadlines highlighted in red being statutory.

- Proposal for a Local Plan development - by 30 November 2018
- Evidence Methodology Submission - Before 31 January 2019
- **Strategic Outline Case (Initial Plans) - by 31 January 2019**
- Outline Business Case - by 31 October 2019
- **Full Business Case (Final Plans) - TBC**

The work involved in facilitating the successful completion of the initial TFS and in meeting the first statutory deadline of the second Ministerial Direction as outlined above, has resulted in a temporary postponement of the Borough's AQAP as stakeholders resources are prioritised in assisting the Borough of Broxbourne in meeting the outstanding statutory deadlines.

It is also essential to recognise the likely synergies which may occur between the measure(s) implemented as a result of the Local Plan between the existing AQMAs. However the Council intends to re-evaluate the requirements of its AQAP following the submission of its Full Business Case at the start of 2020.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	The Council will continue to inspect all of its authorised processes to ensure compliance. Authorisations will be updated as and when appropriate so that operation conditions are up to date.	Environmental Permits	Other	Borough of Broxbourne	N.A.	Existing	Number of Part B Installations inspected and meeting compliance	Reduced emissions of nitrogen dioxide,PM10s & PM2.5'S	Environmental permits updated and maintained within database	Ongoing	N.A.
2	The Council will continue to educate residents and businesses to use smokeless fuel or an approved appliance for smokeless combustion.	Public Information	Via other mechanisms	Borough of Broxbourne	N.A.	Existing	Usually via reactive complaints, with records maintained.	Reduced vehicle emissions	Advisory Letters reviewed and updated	Ongoing	N.A.
3	The Council will continue to promote alternatives to domestic bonfires. We will encourage residents to recycle or compost as much waste as possible or dispose of it responsibly at a civic amenity site	Public Information	Via other mechanisms	Borough of Broxbourne	N.A.	Existing	Usually via reactive complaints, with records maintained.	Reduced vehicle emissions	Advisory Letters reviewed and updated	Ongoing	N.A.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
4	The Council will continue to enforce the Clean Air Act 1993 and encourage local businesses to dispose of waste in a responsible manner, so as to prevent dark smoke bonfires.	Public Information	Other	Borough of Broxbourne	N.A.	Existing	Usually via reactive complaints, with records maintained.	Reduced emissions of PM10s & PM2.5'S	Advisory Letters reviewed and updated	Ongoing	N.A.
5	The Council will continue play an active role in the Hertfordshire and Bedfordshire Air Quality Monitoring Network (Herts & Beds) and the north London cluster group.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	N.A.	Existing	Policies, relationships and processes in place to ensure air quality is considered wherever relevant.	N.A.	Continued participation of meetings	Ongoing	N.A.
6	Require developers to undertake an air quality assessment (AQA) for planning applications associated with increased transport and provide an air pollution mitigation plan where necessary.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	N.A.	Existing	Number of planning applications assessed and regulated through AQAs	Reduced vehicle emissions & Emissions from Boilers	Ongoing	Ongoing	N.A.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
7	Require developers to submit construction management plans, for the control of dust associated with large scale excavation, demolition and construction.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	N.A.	Existing	Number of Construction Management Plans and monitoring requirements included for relevant developments	Reduced emissions of PM10s & PM2.5'S	Ongoing	Ongoing	N.A.
8	Continue to use planning conditions and obligations to require developers to adopt measures which will reduce transport emissions such as requesting travel and business plans, and installing electric vehicle recharging infrastructure.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	N.A.	Existing	Number of sites with cycle parking facilities. Number of sites with EV charging points. Number of sites with travel plans.	Reduced vehicle emissions associated with developments	Ongoing	Ongoing	N.A.
9	Disseminate up to date information about air quality.	Public Information	Via the Internet	Borough of Broxbourne	N.A.	Annually	Number of visits to Broxbourne's air quality webpages and email and telephone queries.	N.A.	Results of the No2 Diffusion tube network are updated annually on the air quality England website.	Completed Annually	N.A.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
10	Implement "Hertfordshire and Bedfordshire Air Pollution Alert System" within a joint project with the "Herts & Beds Air Quality Network"	Public Information	Via other mechanisms	Hertfordshire County Council, Herts and Beds Stakeholders & Borough of Broxbourne	2015	March 2019	Uptake of public subscribed to the system.	N.A.	11 District Councils within the Herts & Beds Air Quality Network awarded Ricardo a contract to implement an Air Pollution Notification System. Following the successful role out of the System a Press Release was issued by the Council. Details of the System and how to sign up were subsequently update within Council's Air Quality web page.	Ongoing	Previous Software/IT solutions resulted in a delay in the full roll out of the system.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
11	Seek funding for air quality projects from The Department for Transport (DFT)	Vehicle Fleet Efficiency	Promoting Low Emission Public Transport	Borough of Broxbourne & DFT	April 2016	August 2016	Number of buses retrofitted with Selective Catalytic Reduction Technology.	Reduced vehicle emissions	The Borough of Broxbourne was successful in bidding funds from the DFT'S Clean Bus Technology fund. Green Urban completed the retrofitting low emission technology to an additional three busses belonging to Trustybus based at Waltham Cross in 2017 . Further details on the progress of this measure may be found within Section 2.2.	Ongoing	Logistical challenges in retrofitting vehicles whilst ensuring minimal disruption of service.
12	Workplace Pool Cars & Working From Home	Promoting Travel Alternatives	Workplace Travel Planning	Borough of Broxbourne	N.A.	Existing	Reduced Traffic volumes within the Borough	Reduced vehicle emissions	The Council has in place a car pool which may be utilised by members of staff, therefore negating the need to drive in to work. A working from home scheme has also been established.	Ongoing	N.A.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
13	Review and update the Council's Website with respect to Air Quality	Public Information	Via the Internet	Borough of Broxbourne	August 2018	October 2018	Updated webpages	N.A.	The interactive map on the council's Website was updated in October 2018 to include the 2018 ASR revised text with respect to Monitoring, AQMAs within Broxbourne, Targeted Feasibility Study, Regulation & Industrial Processes	Completed	N.A.
14	Emerging Local Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	2016	2019	Updated Local Plan & Associated Planning Policies	Reduced vehicle emissions	Following feedback from the Planning Inspectorate further consultation on Broxbourne Borough Council's draft Local Plan is envisaged in September 2019. With Policy TM4 relating to Electric Vehicle Charging Points	Ongoing	N.A.
15	Promoting Cycling	Alternatives to private vehicle use	Other	Sustrans & Borough of Broxbourne	N.A.	Existing	Number of visits to Broxbourne's Cycling webpage.	Reduced vehicle emissions	Ongoing- (Routes & Maps for Cycling are periodically produced/updated by Sustrans	Ongoing	N.A.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
16	Air Quality Action Plan	Other	Other	Borough of Broxbourne	May 2017	2020	Updated Air Quality Action Plan	Reduced nitrogen dioxide	The single AQAP which was being developed further to the declarations of AQMAs 6 & 7 in May 2017, was postponed in 2018 following two Ministerial Directions which required the Council to develop a Targeted Feasibility Study and a Local Plan for Air Quality. Please see Section 2.2.	Ongoing	N.A.
17	Draft AIR QUALITY PLANNING GUIDANCE DOCUMENT (SPD) (to support the Local Plan)	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Borough of Broxbourne	February 2017	N.A.	Updated Planning Guidance	Reduced emissions of nitrogen dioxide	Ongoing	Ongoing	The draft SPD was postponed in 2018 following the direction of time and resources towards the development of the Local Plan (Air Quality).

Note: Following the declaration of AQMAs 6 & 7 in May 2017, all measures will subsequently be reviewed and updated, within the developing Air Quality Action Plan.

This Page is intentionally blank.

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

$PM_{2.5}$s can penetrate deeply into the lung, irritate and corrode the alveolar wall, and consequently impair lung function.

Evidence from urban sites and the limited number of rural background measurement sites indicates that regional (rural) background concentrations make a considerable contribution to the overall mass of $PM_{2.5}$ in urban areas, accounting for around 60-80% of the background concentrations in the major urban areas of southern England[5].

The main traffic sources of $PM_{2.5}$ are exhaust emissions from diesel vehicles (cars, light goods vehicles and heavy goods vehicles), together with tyre wear, brake wear and road surface abrasion from all vehicles.

Many local authorities do not presently monitor $PM_{2.5}$ concentrations within their local authority area; $PM_{2.5}$ is still not incorporated into LAQM Regulations, and therefore there is no statutory requirement to review and assess $PM_{2.5}$ for LAQM purposes. Whilst an increase in $PM_{2.5}$ monitoring across the UK is desirable given the links to the Public Health Outcomes Framework, it is also recognised that the costs involved can be prohibitive.

The Borough of Broxbourne monitored for $PM_{2.5}$s at two locations within its area up to October 2017.

The Borough of Broxbourne has carried out several measures to improve its Air Quality as outlined within table 2.2, with some of these measures having an impact upon $PM_{2.5}$s. However such measures are subject to review and will be updated within the forthcoming Air Quality Action Plan.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

The Borough of Broxbourne does not operate any AURN sites. The nearest AURN sites are located at Borehamwood Meadow Park, Haringey Roadside and London Haringey Priory Park South.

3.1.2 Non-Automatic Monitoring Sites

The Borough of Broxbourne undertook non-automatic (passive) monitoring of nitrogen dioxide at 41 sites during 2018. Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Following on from the expansion of the diffusion tube network in 2017, the following sites were decommissioned and relocated in June 2018 in order to provide distances which are perpendicular from the kerb and hence provide data which is more representative of relevant exposure.

Sites BB01 (Turners Hill, Cheshunt), BB17 (Parkside, Waltham Cross) and BB24 (Winston Churchill Way, Waltham Cross) were relocated to sites which are closer to relevant exposure in June 2018, these being BB47 (Turners Hill 2, Cheshunt), BB48 (Parkside, outside Greenwich Court (Flats 13-24), Waltham Cross) & BB49 (Winston Churchill Way/High Street, Waltham Cross) respectively.

The 2018 monthly diffusion tube mean values, are provided within Appendix B. The NO_2 diffusion tube monitoring results indicate that the annual mean objective of 40µg/m3 was exceeded at two locations following Bias Adjustment and Distance Correction. A summary of exceedances is shown below. The data contained within this ASR suggests that there was an overall decrease with nitrogen dioxide concentrations, throughout the Borough during 2018, with the exception of BB05, where the primary source of pollution is a Highways England Road (M25) and BB28 which falls within AQMA 6 in addition the area identified as being in breach of the Ambient Air Quality Directive.

Exceedance Summary

- **BB05:** Arlington Crescent - Waltham Cross (Adjacent to the M25) - (Annual) and within **AQMA 1**
- **BB28:** 214 Cambridge Rd, Cheshunt - (Annual) **AQMA 6**

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

The annualisation process was reviewed and updated following feedback from the LAQM Helpdesk, with updated calculations for 2018 only shown within Appendix C.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

3.2.2-3.2.3 Particulate Matter (PM_{10}) and ($PM_{2.5}$)

The Borough of Broxbourne does not carry out any monitoring with respect to $PM_{2.5}$ and PM_{10} concentrations.

3.2.4 Sulphur Dioxide (SO_2)

No SO_2 monitoring is carried out within the Borough of Broxbourne.

Appendix A: Monitoring Results

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BB01*	Turners Hill, Cheshunt	Roadside	535935	202172	NO_2	NO	42	4	NO	2.2
BB04	43 Winford Drive Broxbourne	Suburban	536954	206416	NO_2	NO	5	2	NO	2.3
BB05	Arlington Crescent, Waltham Cross	Roadside	536213	200020	NO_2	YES	15.5	8	NO	1.6
BB07	Molesworth, Hoddesdon	Suburban	537336	210497	NO_2	NO	9	1	NO	2.3
BB09	100 Great Cambridge Rd	Roadside	535306	202351	NO_2	YES	12.4	3.5	NO	2.3
BB10	Teresa Gardens, Waltham Cross	Urban Background	535392	200128	NO_2	YES	5	69	NO	2.3
BB11	35 High Street, Waltham Cross	Roadside	536051	200090	NO_2	YES	6.5	7.8	NO	2.3
BB12	15 High Rd, Wormley	Roadside	536608	205769	NO_2	YES	12.5	2	NO	2.3
BB16	10 Colthurst Gardens	Urban Background	538548	209565	NO_2	NO	7	1	NO	2.3
BB17*	Parkside, Waltham Cross	Urban Background	536194	200096	NO_2	YES	7	39	NO	2.3
BB18	20 Mylne Close, Cheshunt	Roadside	535505	203740	NO_2	NO	8.5	2.5	NO	2.3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?	Height (m)
BB19	Great Stockwood Road	Suburban	532916	204110	NO_2	NO	11	1.5	NO	2.3
BB20	1 The Chase, Goffs Oak	Suburban	531955	203075	NO_2	NO	10	0.3	NO	2.3
BB21	36 Eleanor Cross Rd, Waltham Cross	Roadside	536292	200374	NO_2	YES	5	2	NO	2.3
BB22	Sturlas Way, Waltham Cross	Roadside	535999	200747	NO_2	YES	3	3	NO	2.3
BB23	Wickes Car Park	Other	536002	200692	NO_2	YES	13	20	NO	2.4
BB24*	Winston Churchill Way	Roadside	535986	200807	NO_2	YES	23	3	NO	2.4
BB25	Jones Road, Goffs Oak	Other	531543	200840	NO_2	YES	68	41	NO	2.3
BB27	59 College Road, Cheshunt	Roadside	535730	202230	NO_2	NO	3	1.5	NO	2.3
BB28	214 Cambridge Rd, Cheshunt	Roadside	535459	202978	NO_2	YES	11.5	3	NO	2.3
BB29	Brookfield Allotments	Roadside	535893	204228	NO_2	NO	N.A.	2	NO	2.3
BB30	Winnipeg Way, Turnford	Suburban	536014	204820	NO_2	NO	24	1	NO	2.3
BB31	Wormley Sports Club, Church Lane	Rural	536033	205804	NO_2	NO	360	68	NO	2.3
BB32	11 Baas Hill Close, Broxbourne	Suburban	536039	206764	NO_2	NO	14	1	NO	2.3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BB33	High Leigh Farm, Box Lane	Roadside	536189	208837	NO_2	NO	22	4	NO	1
BB34	Farm Close, Cheshunt	Roadside	535332	202039	NO_2	NO	5.8	16	NO	2.3
BB35	86 College Rd, Cheshunt	Roadside	535571	202271	NO_2	YES	10	3.5	NO	2.3
BB36	Essex Rd at rear of 6 Parrotts Field Hoddesdon	Roadside	537745	209049	NO_2	NO	15	2	NO	2.4
BB37	Junction of Burford St/Dinant Link Rd	Kerbside	537460	209109	NO_2	NO	19.5	0.5	NO	2.3
BB38	St Catherines School, Hoddesdon	Urban Centre	537457	208945	NO_2	NO	19	0.5	NO	2.4
BB39	College Rd/Goffs Churchgate Academy, Cheshunt	Roadside	535107	202160	NO_2	YES	40.5	1	NO	2.3
BB40	A10/College Rd Junction, Cheshunt	Roadside	535314	202244	NO_2	YES	6.5	2	NO	2.5
BB41	37 Beltona Gardens, Cheshunt	Suburban	535910	203822	NO_2	YES	4	17	NO	2.3
BB42	48 Hobbs Close, Cheshunt	Suburban	535516	202989	NO_2	YES	3	22	NO	2.5
BB43	24 Westside, Turnford	Roadside	536434	205004	NO_2	YES	11	1.5	NO	2
BB44	High Rd/Bell Lane Roundabout Broxbourne	Roadside	536673	206608	NO_2	YES	2	8	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BB45	High Rd/Station Rd Junction, Broxbourne	Kerbside	536847	207237	NO_2	YES	5	0.5	NO	2.4
BB46	High Rd/ Springfields Junction, Broxbourne	Roadside	536883	207545	NO_2	YES	5.9	1.3	NO	2
BB47	Turners Hill 2, Cheshunt	Kerbside	535924	202217	NO_2	NO	8	0.9	NO	2.3
BB48	Parkside, outside Greenwich Court (Flats 13-24),Waltham Cross	Urban Background	536214	200111	NO_2	YES	7	22.7	NO	2.2
BB49	Winston Churchill Way/High Street, Waltham Cross	Kerbside	536026	200819	NO_2	YES	11	0.7	NO	2.3

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property & all locations where members of the public might be regularly exposed).

(2) N/A if not applicable.

(3) Sites marked * were relocated to a site closer to relevant exposure in 2018, resulting in three new site ID's (BB47, BB48 & BB49)

Coordinates updated via http://gridreferencefinder.com/

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2014	2015	2016	2017	2018
BB01	Roadside	Diffusion Tube	60	25	**44.3**	**41.2**	**44.8**	39.1	39.3
BB04	Suburban	Diffusion Tube	100	100	20.2	23.7	20	18.9	18.2
BB05	Roadside	Diffusion Tube	83.3	83.3	**76.7**	**53.3**	**60.7**	**65.6**	**58.9**
BB07	Suburban	Diffusion Tube	100	100	30.9	20	21	20.5	19.4
BB09	Roadside	Diffusion Tube	100	100	**75.1**	**48.5**	**54.3**	**50.7**	**47.4**
BB10	Urban Background	Diffusion Tube	100	100	37.9	34.1	34.1	33.7	30.1
BB11	Roadside	Diffusion Tube	100	100	**73.1**	39.1	**43.6**	**42.4**	**41.3**
BB12	Roadside	Diffusion Tube	100	100	**56.8**	37.3	**40.2**	37.9	33.2
BB16	Urban Background	Diffusion Tube	91.6	91.6	24.3	20.5	26.2	22.2	20.5
BB17	Urban Background	Diffusion Tube	100	41.6	**53.5**	37.6	38.4	38.8	33.6
BB18	Roadside	Diffusion Tube	100	100	28	19.1	20.2	19.6	18.3
BB19	Suburban	Diffusion Tube	91.6	91.6	25.2	19.5	20.7	20.5	21.5
BB20	Suburban	Diffusion Tube	100	100	32.6	17	20.7	20.5	19.3
BB21	Roadside	Diffusion Tube	100	100	**64**	**47.7**	**48.5**	**48.1**	**44.0**
BB22	Roadside	Diffusion Tube	100	100	**56.1**	37.2	**41.2**	**42.6**	38.6
BB23	Other	Diffusion Tube	100	100	**44.9**	28.9	29.5	34.8	31.8
BB24	Roadside	Diffusion Tube	100	41.6	**63.4**	**43.7**	**45.4**	**48**	**43.0**
BB25	Other	Diffusion Tube	100	100	N.A.	24.3	23.9	25.9	23.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2018 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
					2014	2015	2016	2017	2018
BB27	Roadside	Diffusion Tube	100	100	N.A.	32.1	37.4	38.6	37.0
BB28	Roadside	Diffusion Tube	100	100	N.A.	**67.3**	**73.3**	**71.2**	**63.3**
BB29	Roadside	Diffusion Tube	91.6	91.6	N.A.	**47.3**	**44.7**	37.2	35.2
BB30	Suburban	Diffusion Tube	100	100	N.A.	31.4	27.3	26.9	24.3
BB31	Rural	Diffusion Tube	100	100	N.A.	23.3	23.4	22	21.5
BB32	Suburban	Diffusion Tube	100	100	N.A.	26.5	23.8	21.7	21.9
BB33	Roadside	Diffusion Tube	100	100	N.A.	20.6	19	18.1	17.8
BB34	Roadside	Diffusion Tube	100	100	N.A.	33.4	36.6	37.7	34.5
BB35	Roadside	Diffusion Tube	100	100	N.A.	32.6	33.2	36.1	33.4
BB36	Roadside	Diffusion Tube	66.6	66.6	N.A.	N.A.	**46.8**	39.6	34.7
BB37	Kerbside	Diffusion Tube	100	100	N.A.	N.A.	**55**	**54.2**	**46.9**
BB38	Urban Centre	Diffusion Tube	91.6	91.6	N.A.	N.A.	23	25.7	24.6
BB39	Roadside	Diffusion Tube	100	100	N.A.	N.A.	N.A.	25.1	31.2
BB40	Roadside	Diffusion Tube	91.6	91.6	N.A.	N.A.	N.A.	**42**	**48.6**
BB41	Suburban	Diffusion Tube	100	100	N.A.	N.A.	N.A.	33.3	35.7
BB42	Suburban	Diffusion Tube	91.6	91.6	N.A.	N.A.	N.A.	32.7	33.8
BB43	Roadside	Diffusion Tube	100	100	N.A.	N.A.	N.A.	38.1	35.3
BB44	Roadside	Diffusion Tube	100	100	N.A.	N.A.	N.A.	27	30.3
BB45	Roadside	Diffusion Tube	83.3	83.3	N.A.	N.A.	N.A.	26	30.2
BB46	Roadside	Diffusion Tube	100	100	N.A.	N.A.	N.A.	30	35.6
BB47	Kerbside	Diffusion Tube	100	58.3	N.A.	N.A.	N.A.	N.A.	38.3
BB48	Urban Background	Diffusion Tube	100	58.3	N.A.	N.A.	N.A.	N.A.	39.0
BB49	Kerbside	Diffusion Tube	100	58.3	N.A.	N.A.	N.A.	N.A.	**46.9**

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes: Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.92) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
BB01*	X	X	48.8	39.9	41.4	X	X	X	X	X	X	X	43.4	39.3	N.A.
BB04	23	23.2	24.3	17.5	14.1	9.7	15.4	17.8	19	21.5	26.2	26.3	19.8	18.2	N.A.
BB05	82.1	36.9	X	62.6	X	50.1	82.4	64.7	58.7	59.7	74.7	67.8	64.0	58.9	45.1
BB07	25.4	26.7	27.6	20.6	14.2	10.2	16.4	16.4	20.6	24.9	27	23.7	21.1	19.4	N.A.
BB09	46.9	29.1	64.7	59.7	58.3	43	58.3	51.9	43.1	57.3	61.5	44.9	51.6	47.4	35.6
BB10	42.3	33.9	40.3	32.8	24.2	18.3	28	32.9	37.8	28.9	36.8	36.9	32.8	30.1	N.A.
BB11	45.4	31.3	51.5	49.5	46.5	37.2	48.7	41.1	35.8	40.1	63.1	48.6	44.9	41.3	37.3
BB12	36.8	29.8	47.2	38.4	33.8	26.1	37	36	37.5	37.3	39.1	34.8	36.2	33.2	N.A.
BB16	26.9	16.3	31.2	24.1	15.8	11.7	19.5	19.1	21.2	X	29.9	29.4	22.3	20.5	N.A.
BB17	42.3	24.1	51.7	44.6	34	X	X	X	X	X	X	X	39.3	33.6	N.A.
BB18	25.8	13.3	26.7	21.1	13.9	13.1	15.8	15.8	17.1	18.6	32.5	25.7	20.0	18.3	N.A.
BB19	23.6	40.7	28.4	19.2	10.9	X	18	18.2	19.2	24.8	28.1	25.5	23.3	21.5	N.A.
BB20	25.1	23.1	27.6	19.1	14.1	9.9	17	16.8	18.7	22.7	31.6	25.8	21.0	19.3	N.A.
BB21	47.1	21.2	56.6	54.1	45.2	39	54.7	49.8	48.4	52.8	52.6	52.1	47.8	44.0	37.5
BB22	43.2	42.7	52.6	42.7	35.7	26.8	44.8	39.1	34.2	44.6	52.4	44.3	41.9	38.6	36.2

BB23	39.3	36.6	**46.5**	34	29	21.7	29.4	30.8	28.8	35.3	**43.8**	39.3	34.5	31.8	**N.A.**
BB24*	**50.8**	**56.8**	**54.4**	**49.3**	**40.6**	X	X	X	X	X	X	X	**50.4**	**43.0**	**N.A.**
BB25	32.5	33	32.6	28.5	15.5	13.4	24.3	27.2	25.3	23.7	26.9	27	25.8	23.8	**N.A.**
BB27	**40.4**	**41.5**	**51.7**	**41.5**	39.1	29.8	39.7	34.6	33.1	**40**	**49.4**	**42.5**	**40.3**	37.0	32.5
BB28	**72.1**	30.1	**79.7**	**74.9**	**75.3**	**68.5**	**86.4**	**74.7**	**64**	**65.8**	**74.8**	**60**	**68.9**	**63.3**	**45.0**
BB29	**40.1**	33	**46.7**	**42.9**	34.2	28	38.1	34.9	31.2	X	**47.7**	**43.8**	38.2	35.2	**N.A.**
BB30	33.1	**42.5**	31.2	25.5	6	17.4	22	23.5	26.3	28.8	31.1	29.2	26.4	24.3	**N.A.**
BB31	29.4	26.1	27.5	22.7	16.5	13.3	20.5	22.8	22.1	24.1	27.8	27.5	23.4	21.5	**N.A.**
BB32	28.8	25.2	30.6	20.5	17.6	13.3	20.9	20.9	21.1	27.5	31.5	28.6	23.9	21.9	**N.A.**
BB33	21.7	28.3	24.5	18.6	13.9	11.5	15.6	15.5	17.3	20.8	22.9	22.3	19.4	17.8	**N.A.**
BB34	38.3	**44.6**	38.9	36.8	33.2	24.3	38.4	37.3	35.1	**41.5**	**40.9**	**41.2**	37.5	34.5	**N.A.**
BB35	39.9	30.2	**43.6**	34.1	32.7	26.5	35.3	32.5	34.8	38.0	**45.7**	**42.4**	36.3	33.4	**N.A.**
BB36	X	35.7	**46.8**	38.1	31.8	30.3	**43.2**	X	X	X	**44.8**	37	38.5	34.7	**N.A.**
BB37	**48.7**	23.7	**58.5**	**54.3**	**46.7**	36	**61.7**	**59.5**	**54**	**56.7**	**57.4**	**54.1**	**50.9**	**46.9**	27.0
BB38	31	32	34.8	25.5	24.3	16.7	21	22.1	25.3	30.2	X	30.6	26.7	24.6	**N.A.**
BB39	34.9	**41.1**	34.6	31.4	36.7	28.9	35.3	30.9	30.8	34.4	33.5	34.2	33.9	31.2	**N.A.**
BB40	**48.9**	29.5	**60.7**	**59.6**	X	**45.8**	**68.3**	**53.4**	**50**	**56.3**	**61.9**	**46.6**	**52.8**	**48.6**	38.4
BB41	**46.7**	**42.4**	**41.3**	35.8	34.6	16.9	38.9	37.5	35.6	**46.8**	**43.1**	**45.9**	38.8	35.7	33.4
BB42	**41.5**	32	**41.3**	34.1	32.2	25.9	**40.4**	38.8	38.9	X	36.3	**42.1**	36.7	33.8	**N.A.**
BB43	**49.4**	31.8	**40.4**	38.8	33.3	26.1	33.7	38.4	36	38.6	**46**	**47.5**	38.3	35.3	**N.A.**
BB44	33.3	37.7	**41.9**	33.6	26.8	23.1	28.9	26	29	39.8	38.1	36.6	32.9	30.3	**N.A.**
BB45	X	X	**40.1**	33	32.4	25.7	32.2	24.7	30.1	33.4	**42**	34.3	32.8	30.2	**N.A.**
BB46	**42.4**	25.3	**48.6**	39.7	35.4	27.9	**40.1**	35	35.1	**44.2**	**47.7**	**42.7**	38.7	35.6	**N.A.**
BB47	X	X	X	X	X	31.6	40.1	35.0	35.1	**44.2**	**47.7**	**42.7**	39.3	38.3	29.3
BB48	X	X	X	X	X	25	39.6	**41.7**	36.5	**42**	**51.7**	**43.9**	**40.1**	39.0	37.4
BB49	X	X	X	X	X	**40.1**	**51.2**	**48.2**	**42.9**	**50.3**	**56.9**	**47.8**	**48.2**	**46.9**	33.7

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

(3) Sites marked * were not distance corrected for the following reasons- BB01 did not have similar elevations with respect to measuring horizontally from the kerb, whereas the receptor at BB24 was more than 20m further from the kerb than the diffusion tube. These sites were relocated to BB47 & BB49 respectively in June 2018.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

In 2018 the Diffusion tubes were supplied and analysed Gradko International Ltd. The preparation method used is 20% TEA in water. The laboratory follows the procedures set out within the Practical Guidance.

2018 Bias Adjustment Figure = 0.92

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 09/19

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of March 2020
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To view your selection, choose (All) from the pop-up list)	Year[2] (To view your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2018	R	Borough Council of King's Lynn and West Nor	12	26	24	6.0%	G	**0.94**
Gradko	20% TEA in water	2018	R	Cheshire West and Chester	12	36	37	-2.5%	G	**1.03**
Gradko	20% TEA in water	2018	R	Cheshire West and Chester	12	43	40	6.1%	G	**0.94**
Gradko	20% TEA in water	2018	R	Fareham Borough Council	12	28	34	-17.5%	G	**1.21**
Gradko	20% TEA in water	2018	R	Fareham Borough Council	12	37	34	8.9%	G	**0.92**
Gradko	20% TEA in water	2018	R	Fareham Borough Council	12	32	28	12.6%	G	**0.89**
Gradko	20% TEA in water	2018	R	NOTTINGHAM CITY COUNCIL	12	35	34	0.3%	G	**1.00**
Gradko	20% TEA in water	2018	R	Bracknell Forest Borough Council	12	44	37	19.4%	G	**0.84**
Gradko	20% TEA in water	2018	R	Brighton & Hove City Council	9	48	50	-3.7%	G	**1.04**
Gradko	20% TEA in water	2018	R	Eastleigh Borough Council	11	28	32	-12.0%	G	**1.14**
Gradko	20% TEA in water	2018	R	Eastleigh Borough Council	12	42	38	10.2%	G	**0.91**
Gradko	20% TEA in water	2018	UB	Eastleigh Borough Council	12	27	28	-4.4%	G	**1.05**
Gradko	20% TEA in water	2018	R	Gateshead Council	12	29	25	13.9%	G	**0.88**
Gradko	20% TEA in water	2018	R	Gateshead Council	12	32	29	10.8%	G	**0.90**
Gradko	20% TEA in water	2018	R	Gateshead Council	9	40	41	-1.8%	G	**1.02**
Gradko	20% TEA in water	2018	R	Wokingham Borough Council	12	38	33	13.2%	G	**0.88**
Gradko	20% TEA in water	2018	R	Bath & North East Somerset	12	40	39	4.0%	G	**0.96**
Gradko	20% TEA in water	2018	R	Bedford Borough Council	10	30	27	8.8%	G	**0.92**
Gradko	20% TEA in water	2018	KS	Marylebone Road Intercomparison	11	93	85	9.3%	G	**0.91**
Gradko	20% TEA in water	2018	R	South Gloucestershire Council	12	21	20	6.3%	G	**0.94**
Gradko	20% TEA in water	2018	R	Thurrock Borough Council	12	53	52	2.3%	S	**0.98**
Gradko	20% TEA in water	2018	R	Thurrock Borough Council	12	34	30	15.1%	G	**0.87**
Gradko	20% TEA in water	2018	R	Thurrock Borough Council	12	31	24	28.8%	G	**0.78**
Gradko	20% TEA in water	2018	UB	Thurrock Borough Council	12	27	25	9.2%	S	**0.92**
Gradko	20% TEA in water	2018	UC	Belfast City Council	12	32	27	16.4%	G	**0.86**
Gradko	20% TEA in water	2018	R	City of Lincoln Council	12	44	34	32.1%	G	**0.76**
Gradko	20% TEA in water	2018	R	Lancaster City Council	11	39	35	12.4%	G	**0.89**
Gradko	20% TEA in water	2018	R	Lancaster City Council	11	31	34	-8.5%	G	**1.09**
Gradko	20% TEA in water	2018	UB	Liverpool City Council	12	20	18	11.0%	G	**0.90**
Gradko	20% TEA in water	2018	R	Blackburn with Darwen Borogh Council	12	26	20	28.8%	G	**0.78**
Gradko	20% TEA in water	2018	R	Dartford Borough Council	11	50	48	4.3%	G	**0.96**
Gradko	20% TEA in water	2018	UB	Dudley MBC	11	24	19	29.3%	G	**0.77**
Gradko	20% TEA in water	2018	R	Dudley MBC	12	37	35	3.6%	G	**0.97**
Gradko	20% TEA in water	2018	R	Dudley MBC	11	47	46	1.9%	G	**0.98**
Gradko	20% TEA in water	2018		**Overall Factor[3] (40 studies)**				Use		**0.92**

Annualisation

Monitoring locations BB01, BB17, BB24, BB36, BB47, BB48 and BB49 had fewer than 9 months' worth of data, so were therefore subject to annualisation. The tubes were annualised following the Example within Box 7.9 on page 7-49 of Defra's Technical Guidance (TG16) February 2018. After annualisation, the tubes were corrected for bias.

Turners Hill, Cheshunt

Broxbourne_BB01				
Site	**Site Type**	**Annual Mean (µg/m³)**	**Period Mean (µg/m³)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	20.50	1.019
London Bexley	Rural Background	23.11	23.72	0.974
London Haringey Priory Park South	Suburban Background	22.57	23.38	0.965
Thurrock	Urban Background	24.95	25.37	0.984
Average Ratio				**0.986**

Therefore 43.4 × 0.986 = 42.8
Bias Adjustment = 42.8 × 0.92 = 39.4

Turners Hill 2, Cheshunt

Broxbourne_BB47				
Site	**Site Type**	**Annual Mean (µg/m³)**	**Period Mean (µg/m³)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	20.06	1.042
London Bexley	Rural Background	23.11	21.82	1.059
London Haringey Priory Park South	Suburban Background	22.57	21.00	1.075
Thurrock	Urban Background	24.95	23.65	1.055
Average Ratio				**1.058**

Therefore 39.3 × 1.058 = 41.6
Bias Adjustment = 41.6 × 0.92 = 38.3

Parkside, Waltham Cross

Broxbourne_BB17				
Site	**Site Type**	**Annual Mean (µg/m³)**	**Period Mean (µg/m³)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	22.10	0.945
London Bexley	Rural Background	23.11	24.93	0.927
London Haringey Priory Park South	Suburban Background	22.57	24.78	0.911
Thurrock	Urban Background	24.95	26.80	0.931
Average Ratio				**0.929**

Therefore 39.3 × 0.929 = 36.5
Bias Adjustment = 36.5 × 0.92 = 33.6

Parkside Outside Greenwich Court (Flats 13-24) Waltham Cross

Broxbourne_BB48				
Site	**Site Type**	**Annual Mean (µg/m³)**	**Period Mean (µg/m³)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	20.06	1.042
London Bexley	Rural Background	23.11	21.82	1.059
London Haringey Priory Park South	Suburban Background	22.57	21.00	1.075
Thurrock	Urban Background	24.95	23.65	1.055
Average Ratio				**1.058**

Therefore 40.1 × 1.058 = 42.4
Bias Adjustment = 42.4 × 0.92 = 39.0

Winston Churchill Way, Waltham Cross

Broxbourne_BB24				
Site	**Site Type**	**Annual Mean (µg/m^3)**	**Period Mean (µg/m^3)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	22.10	0.945
London Bexley	Rural Background	23.11	24.93	0.927
London Haringey Priory Park South	Suburban Background	22.57	24.78	0.911
Thurrock	Urban Background	24.95	26.80	0.931
Average Ratio				**0.929**

Therefore 50.4 × 0.929 = 46.8
Bias Adjustment = 46.8 × 0.92 = 43.0

Winston Churchill Way/High Street Waltham Cross

Broxbourne_BB49				
Site	**Site Type**	**Annual Mean (µg/m^3)**	**Period Mean (µg/m^3)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	20.06	1.042
London Bexley	Rural Background	23.11	21.82	1.059
London Haringey Priory Park South	Suburban Background	22.57	21.00	1.075
Thurrock	Urban Background	24.95	23.65	1.055
Average Ratio				**1.058**

Therefore 48.2 × 1.058 = 51.0
Bias Adjustment = 51.0 × 0.92 = 46.9

Essex Road at the rear of 6 Parrotts Field, Hoddesdon

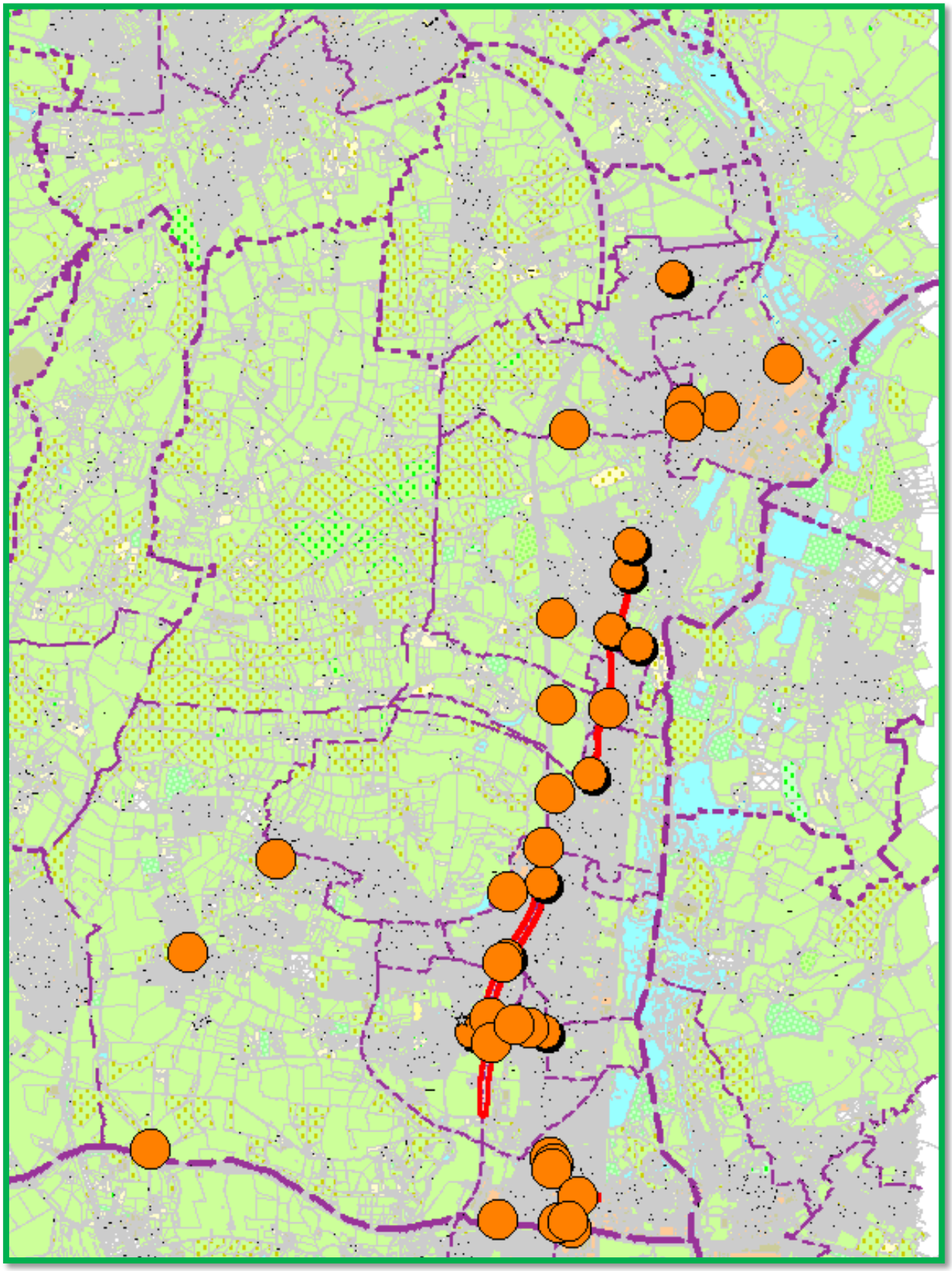
Broxbourne_BB36				
Site	**Site Type**	**Annual Mean ($\mu g/m^3$)**	**Period Mean ($\mu g/m^3$)**	**Ratio Annual Mean / Period Mean**
Borehamwood Meadow Park	Urban Background	20.90	21.46	0.974
London Bexley	Rural Background	23.11	23.30	0.992
London Haringey Priory Park South	Suburban Background	22.57	23.46	0.962
Thurrock	Urban Background	24.95	25.01	0.998
Average Ratio				**0.981**

Therefore 38.4 × 0.981 = 37.7
Bias Adjustment = 37.7 × 0.92 = 34.7

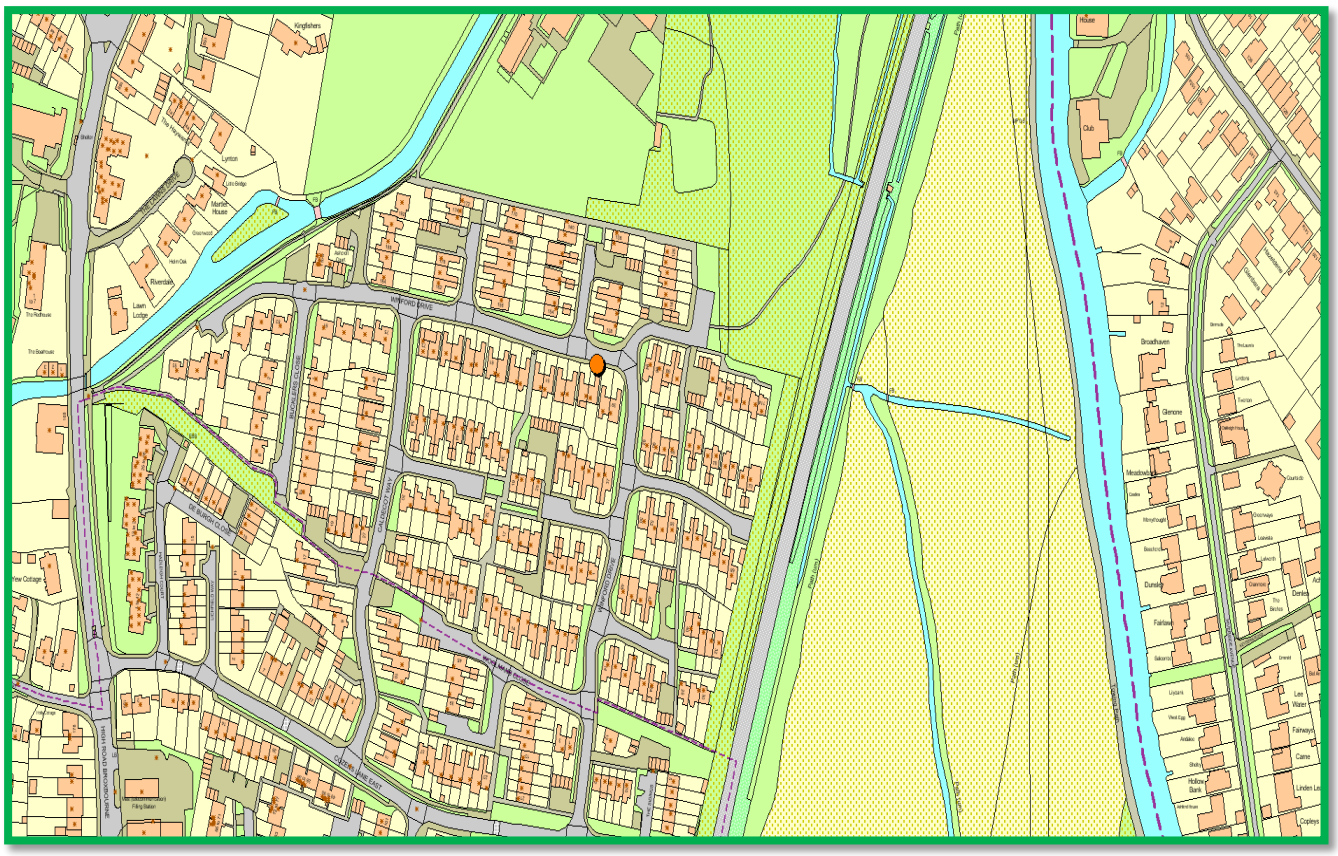
Distance Correction (2018)

Site Name/ID	Distance (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor	
BB05	8.0	23.5	21.9	58.9	**45.1**	Predicted concentration at Receptor above AQS objective. Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.
BB09	3.5	15.9	18.4	47.4	35.6	
BB11	7.8	14.3	21.9	41.3	*37.3*	Predicted concentration at Receptor within 10% the AQS objective.
BB21	2.0	7.0	21.9	44.0	*37.5*	Predicted concentration at Receptor within 10% the AQS objective.
BB22	3.0	6.0	25.3	38.6	*36.2*	Predicted concentration at Receptor within 10% the AQS objective.
BB27	1.5	4.5	18.4	37.0	32.5	
BB28	3.0	14.5	18.4	63.3	**45.0**	Predicted concentration at Receptor above AQS objective.
BB37	0.5	20.0	16.4	46.9	27.0	
BB40	2.0	8.5	18.4	48.6	*38.4*	Predicted concentration at Receptor within 10% the AQS objective.
BB41	14.7	19.5	17.3	35.7	33.4	Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.
BB47	0.9	8.9	18.4	38.3	29.3	
BB48	24.0	28.5	21.9	39.0	*37.4*	Predicted concentration at Receptor within 10% the AQS objective. Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution. Warning: your monitor is more than 10m further from the kerb than your receptor - treat result with caution.
BB49	0.7	11.7	21.9	46.9	33.7	

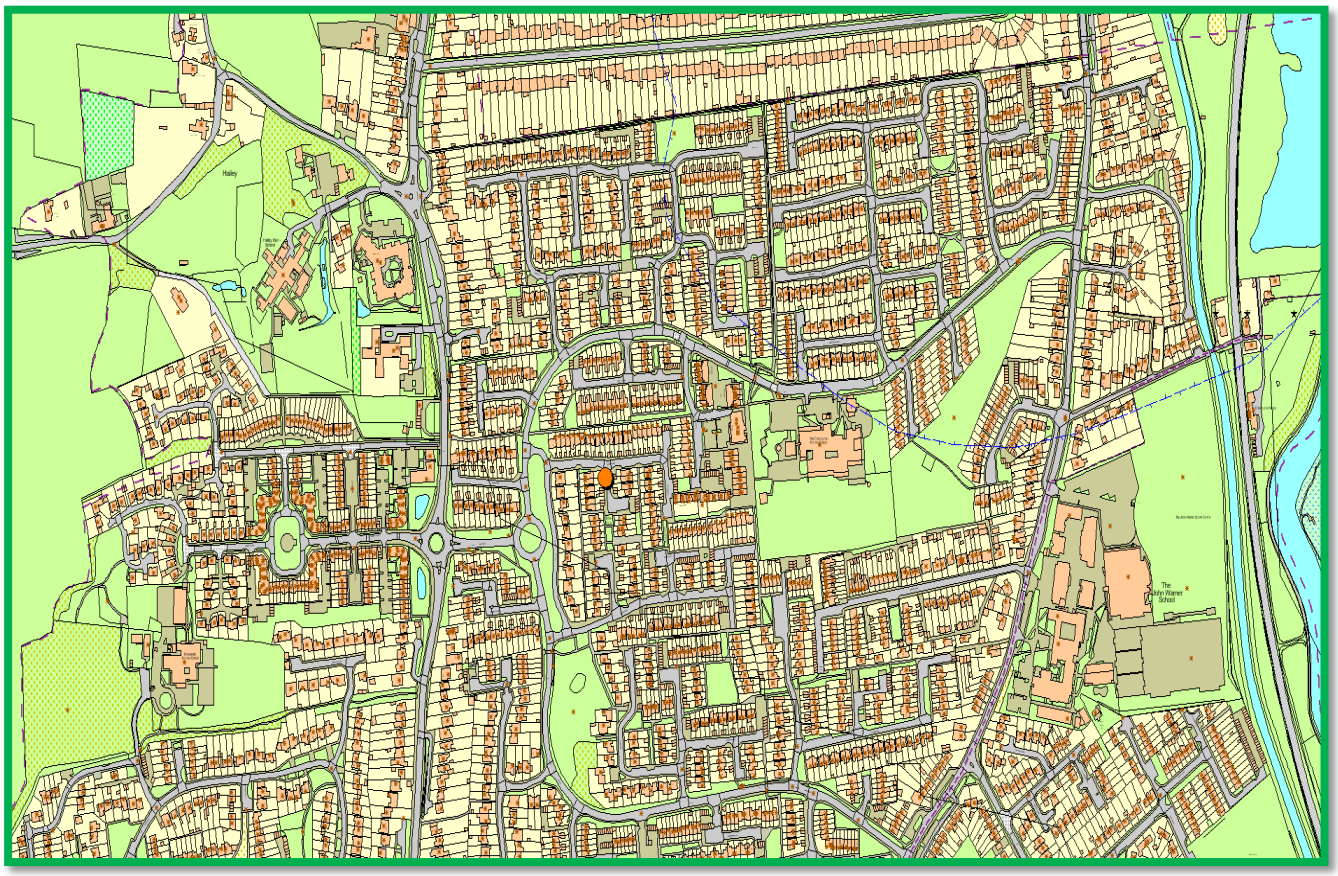
Appendix D: Map(s) of Monitoring Locations



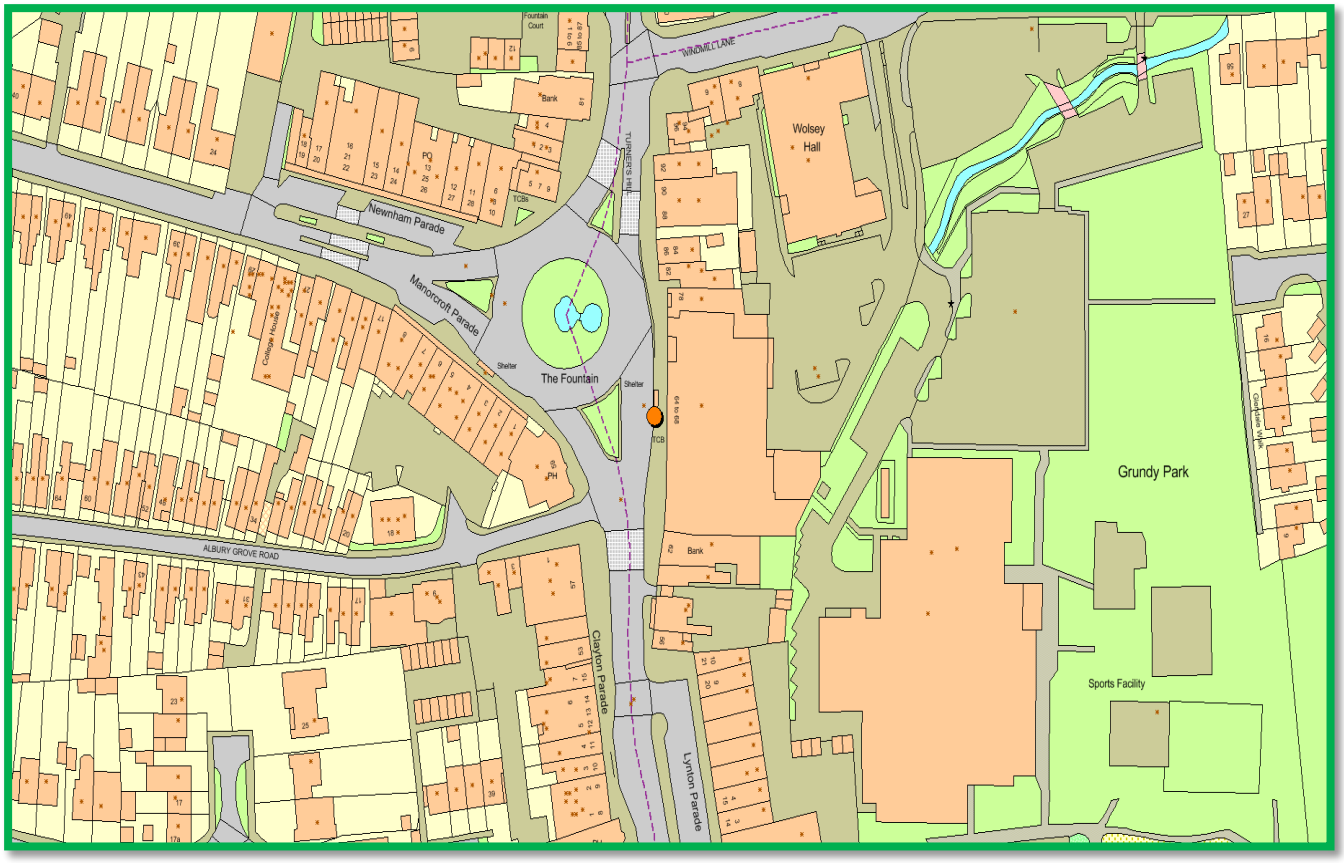
TUBE 1: 43 Winford Drive, Broxbourne, EN10 6PL. **(BB04)**



TUBE 2: 2 Molesworth, Hoddesdon. **(BB07)**

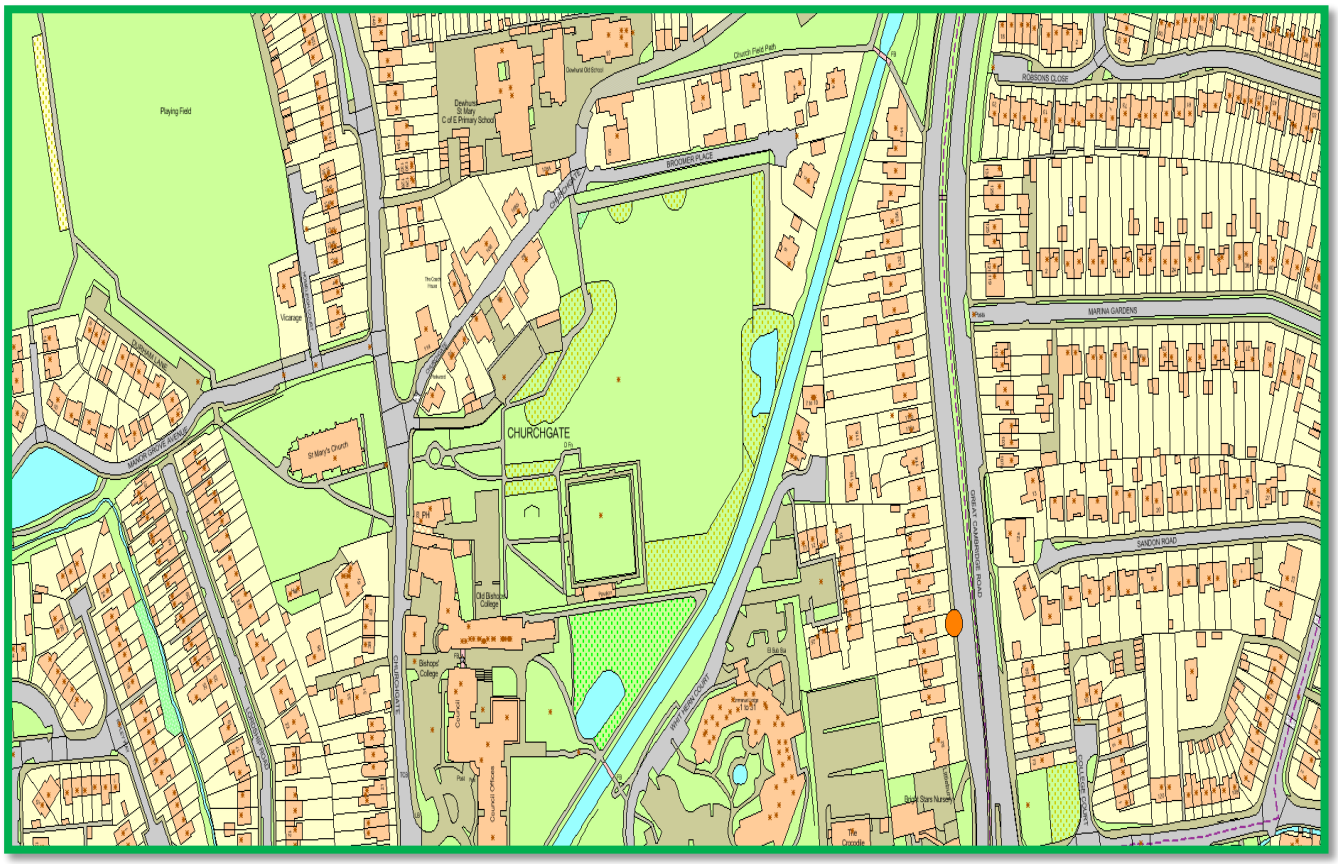


TUBE 3: Turners Hill, Cheshunt, EN8 8LQ. **(BB01)**

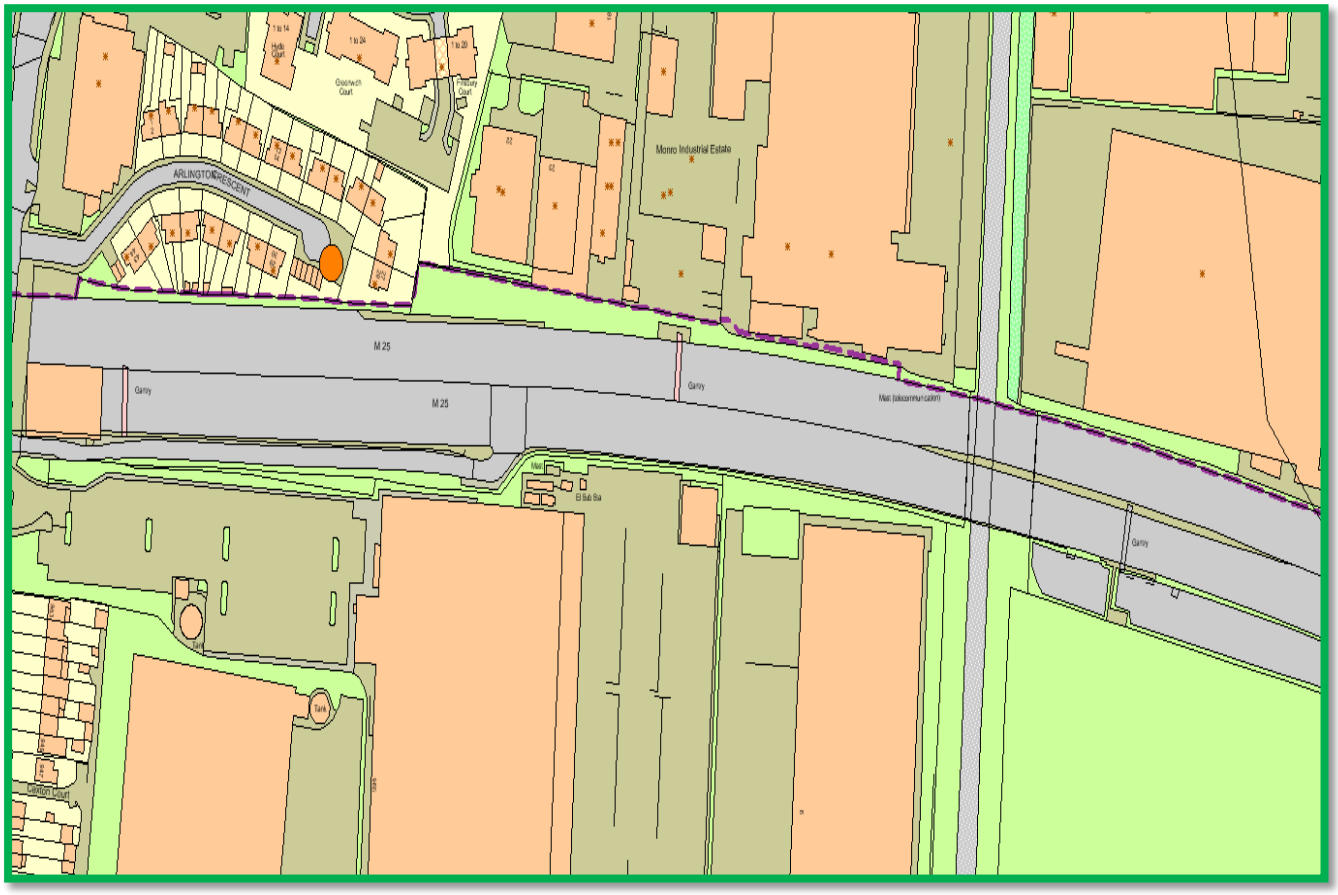


TUBE 4: 15 High Road, Wormley, EN10 6HT. **(BB12)**

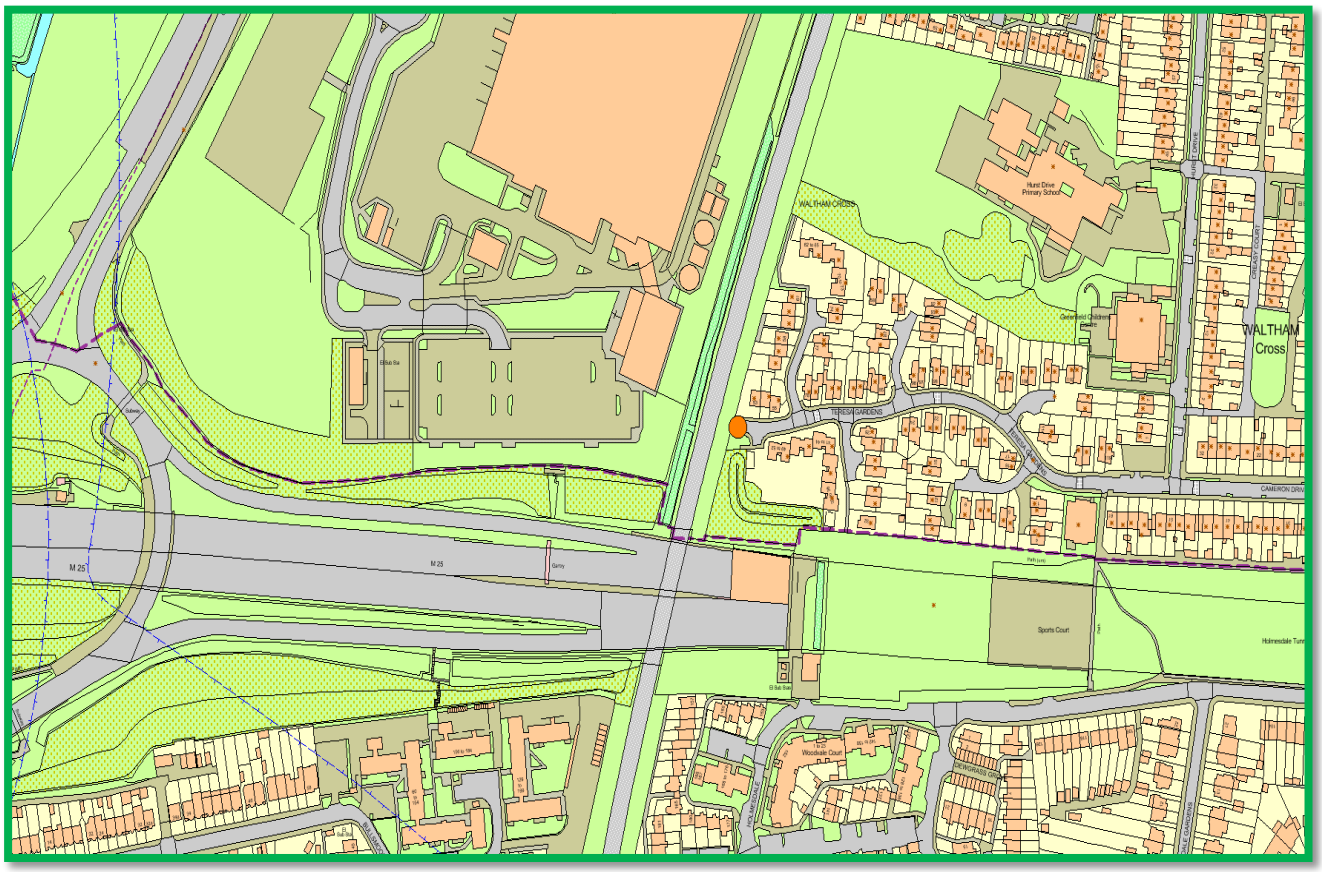
TUBE 5: 100 Great Cambridge Road, Cheshunt, EN8 9ES. **(BB09)**



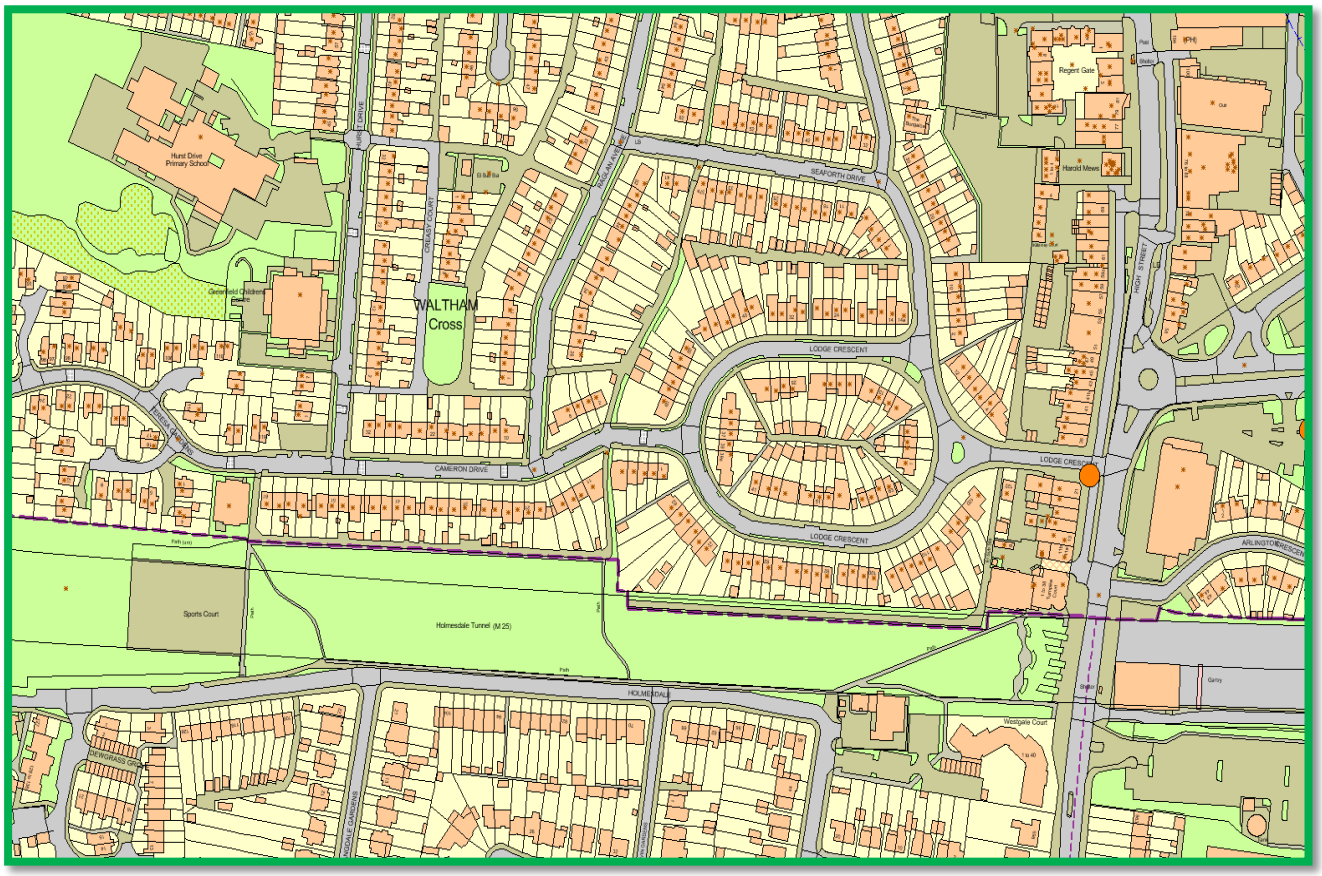
TUBE 6: 28 Arlington Crescent, WX, EN8 7RN **(BB05)**



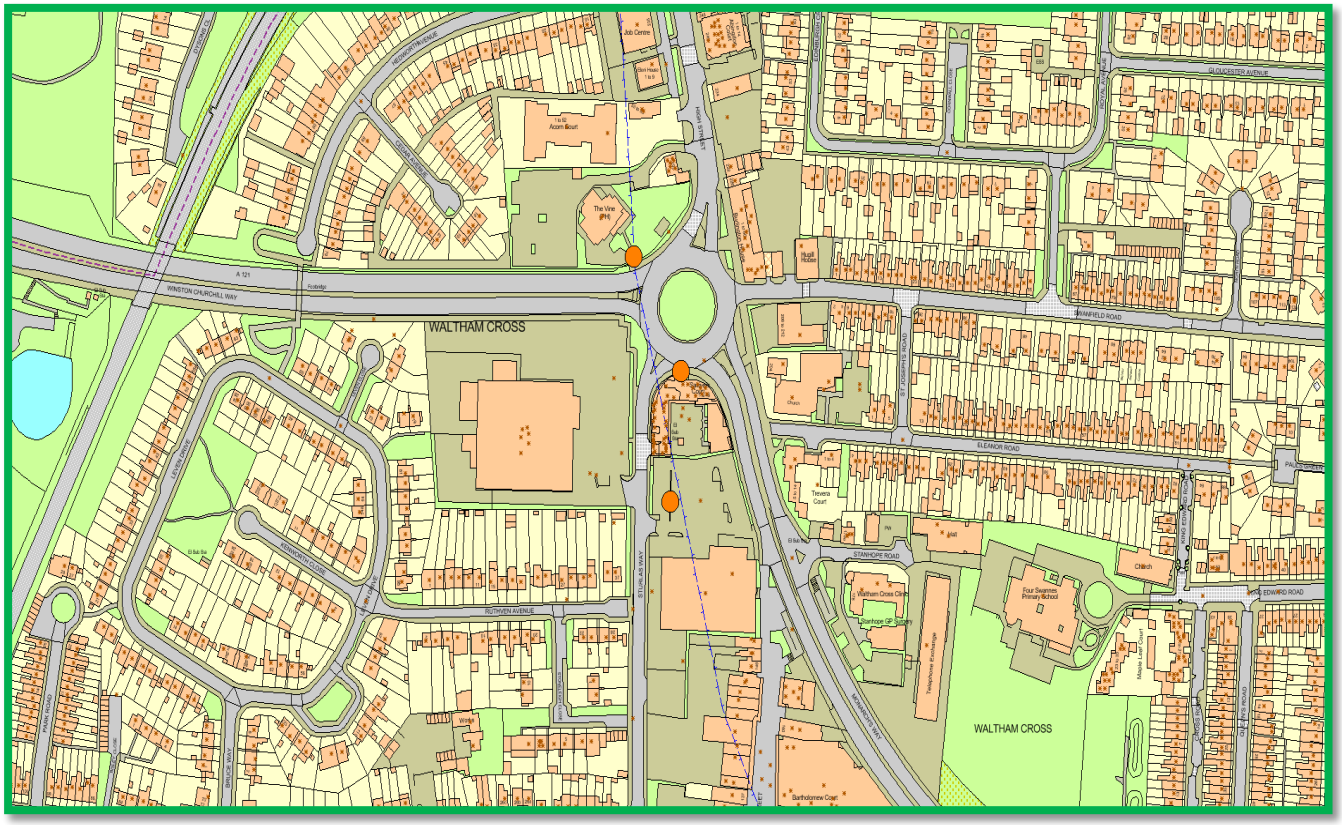
TUBE 7: 53 Teresa gardens, WX, EN8 8EG. **(BB10)**



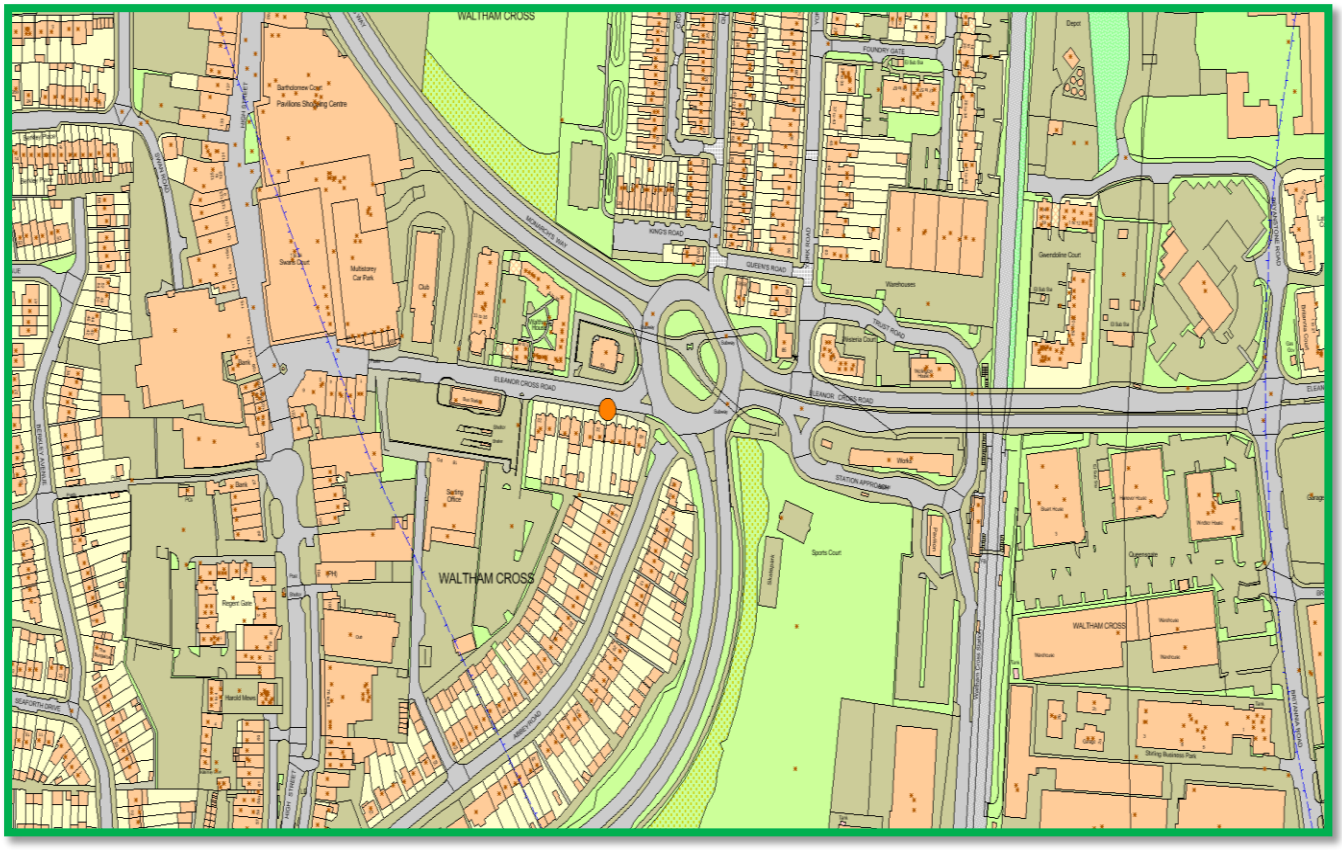
TUBE 8: 35 High Street, WX, EN8 7AB. **(BB11)**



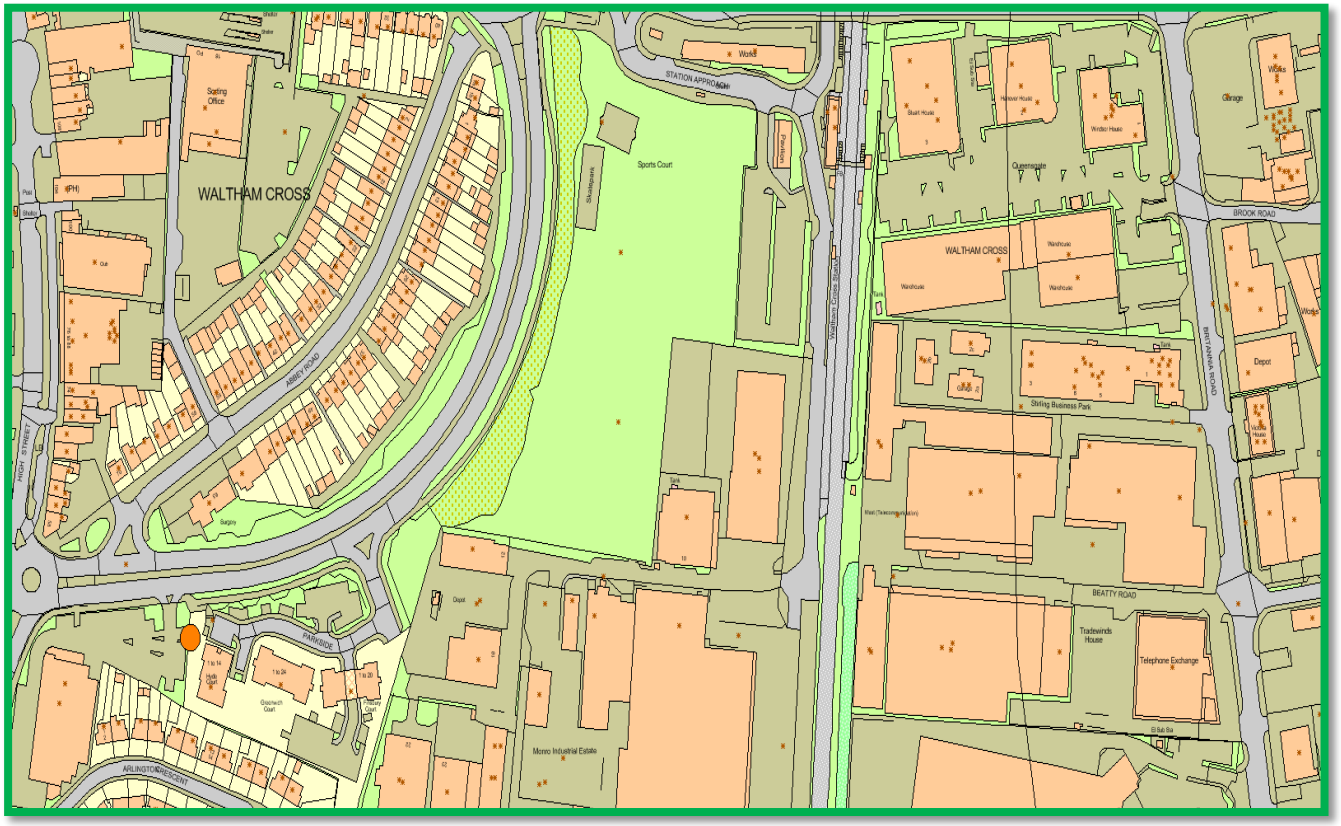
TUBE 9 (MIDDLE): Sturlas Way, WX, EN8 7BF. **(BB22)**
TUBE 10 (BOTTOM): Wicks car park, WX, EN8 7BF. **(BB23)**
TUBE 11 (TOP): Winston Churchill Way, WX, EN8 7BF. **(BB24)**



TUBE 12: Eleanor Cross Road, WX, EN8 7LD **(BB21)**

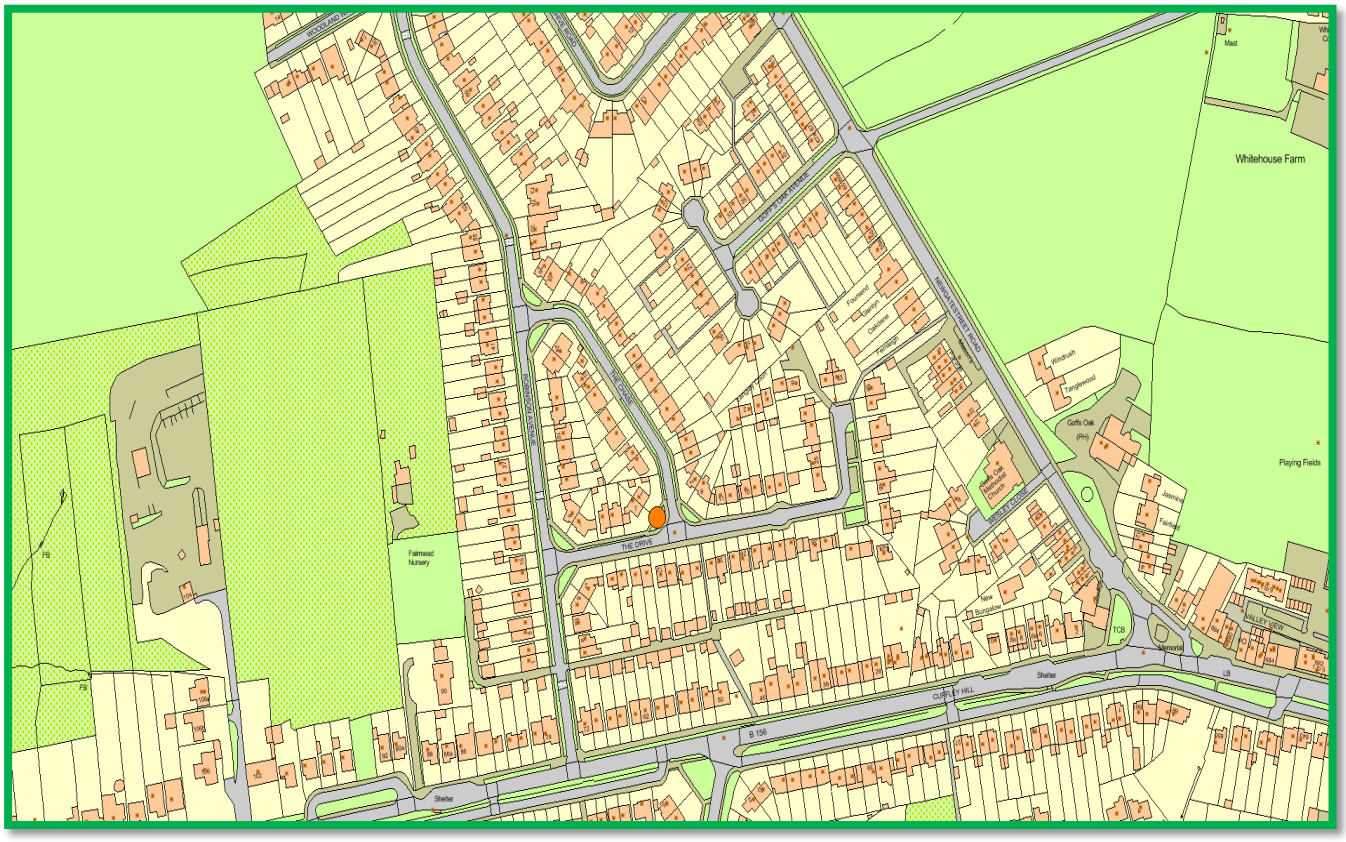


TUBE 13: Parkside, Waltham Cross, EN8 7TH **(BB17)**

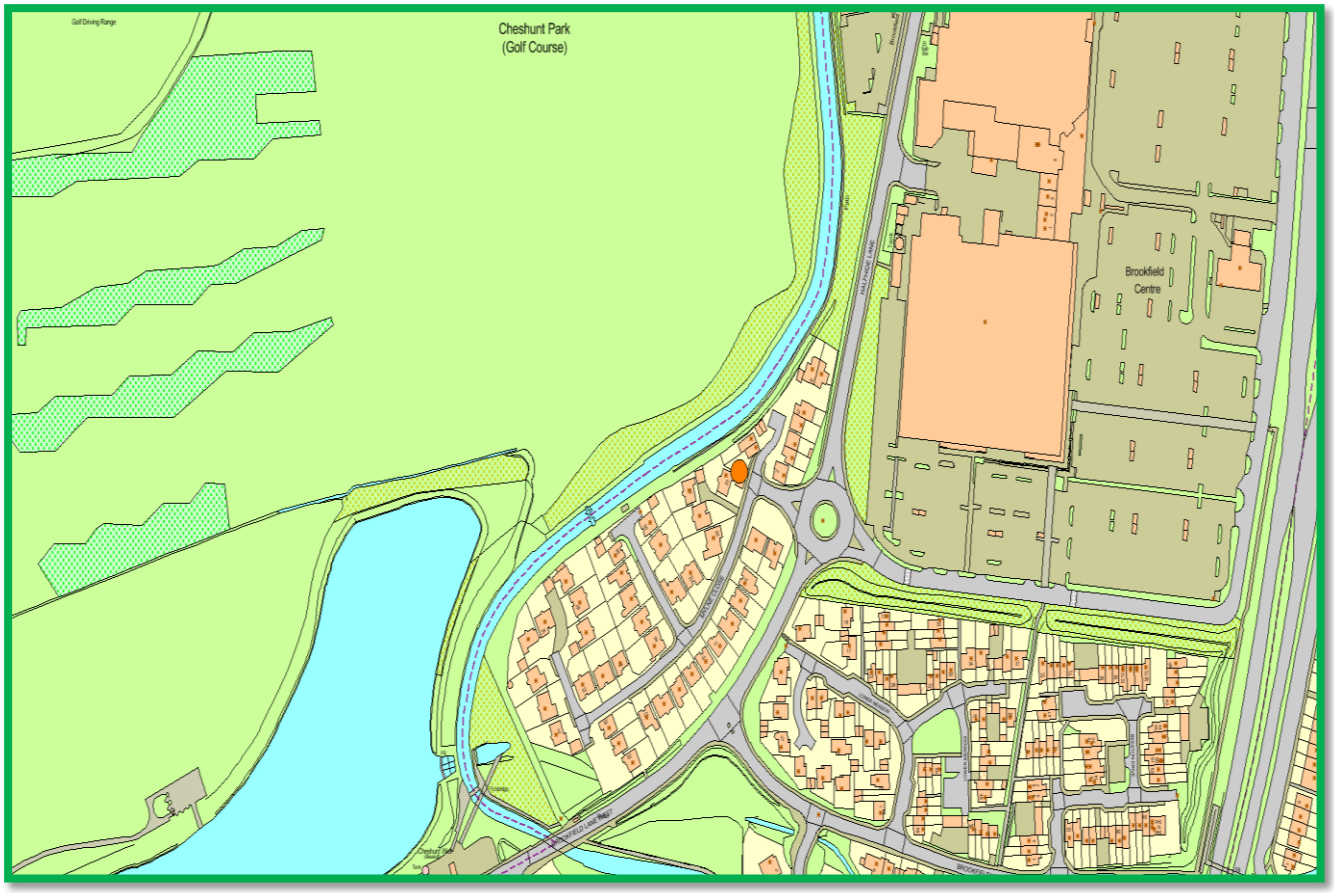


TUBE 14: Great Stockwood Road, EN7 **(BB19)**

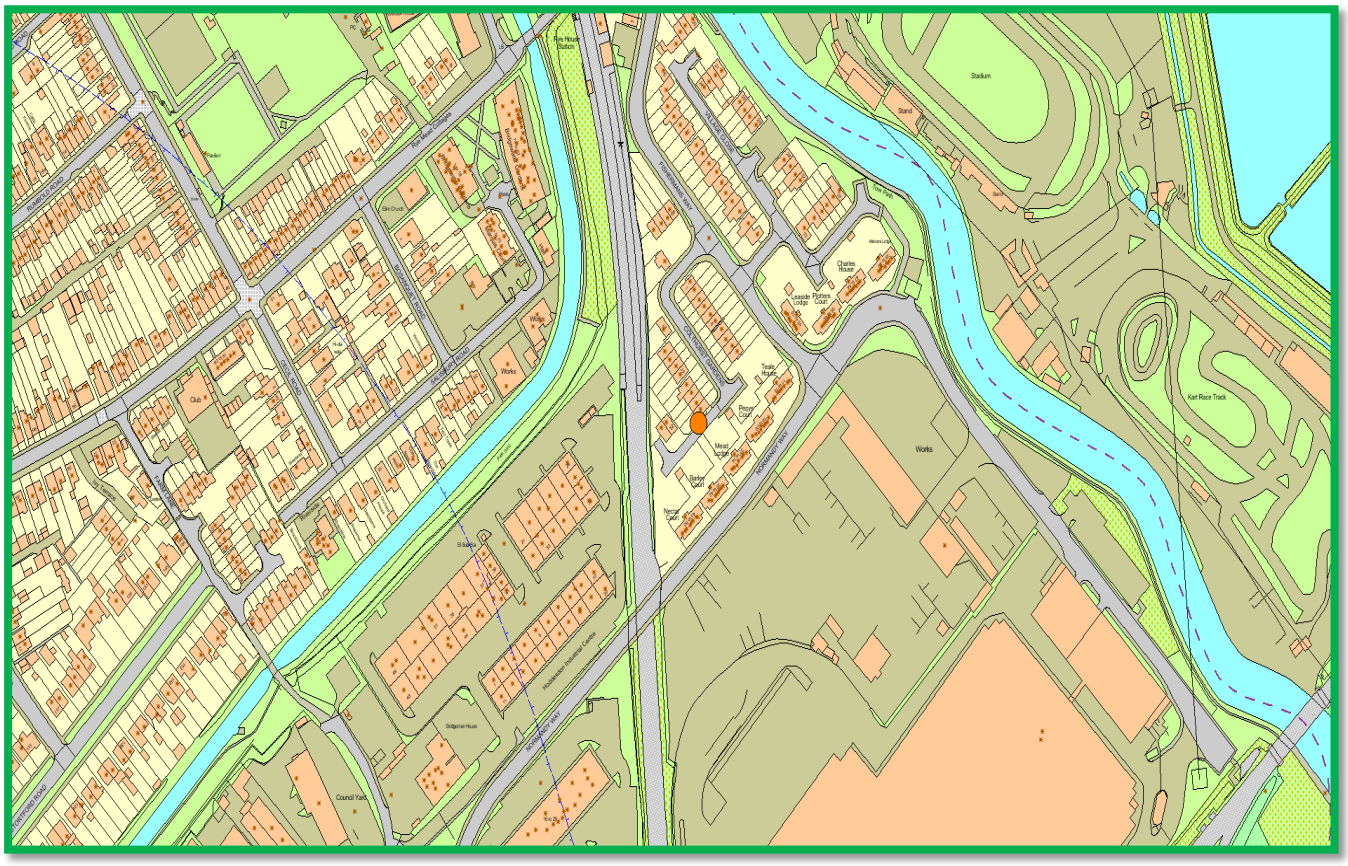
TUBE 15: 1 The Chase, Goffs Oak, EN7 9PB **(BB20)**



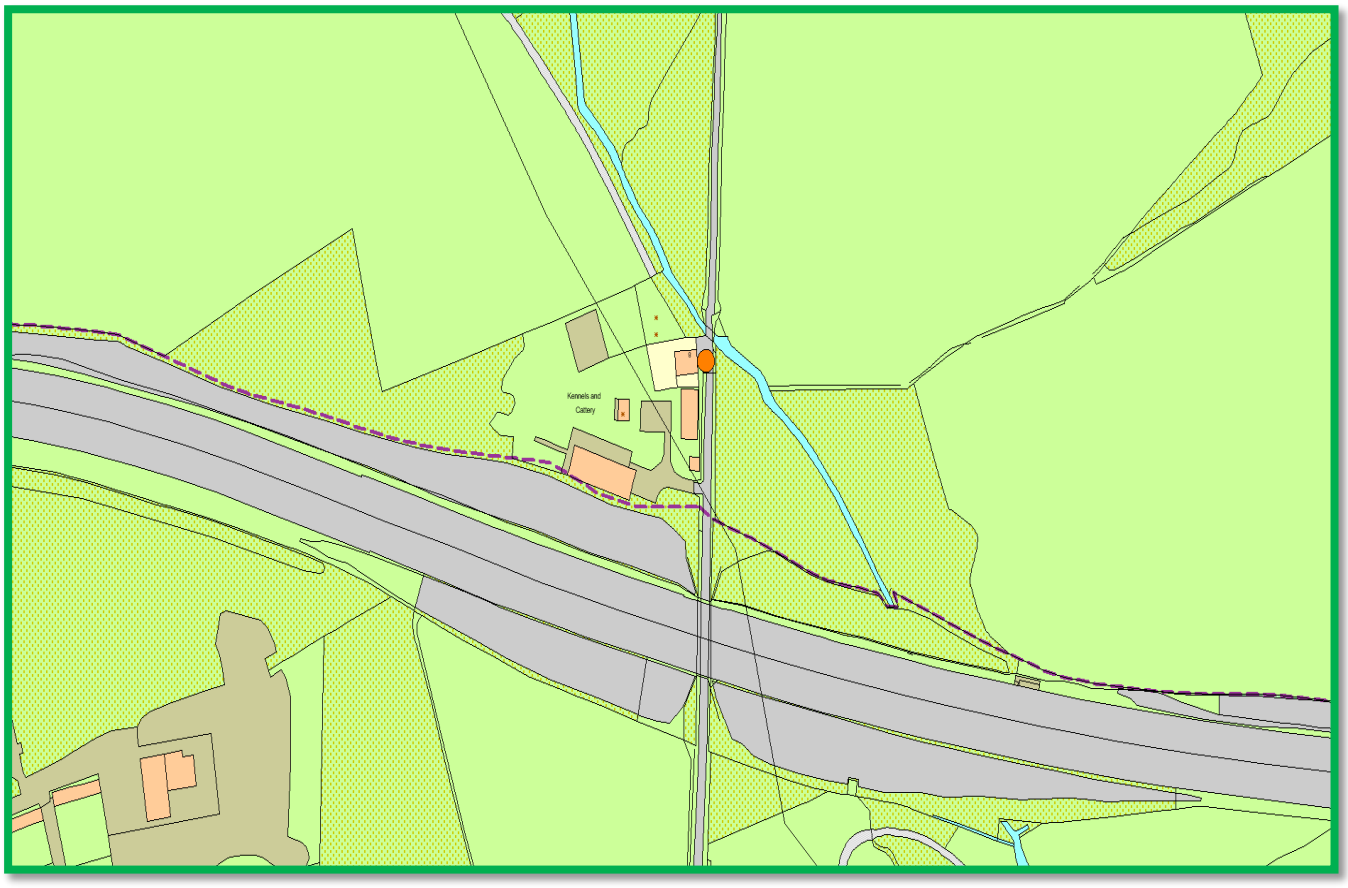
TUBE 16: 20 Mylne Close, Cheshunt, EN8 0PS. **(BB18)**



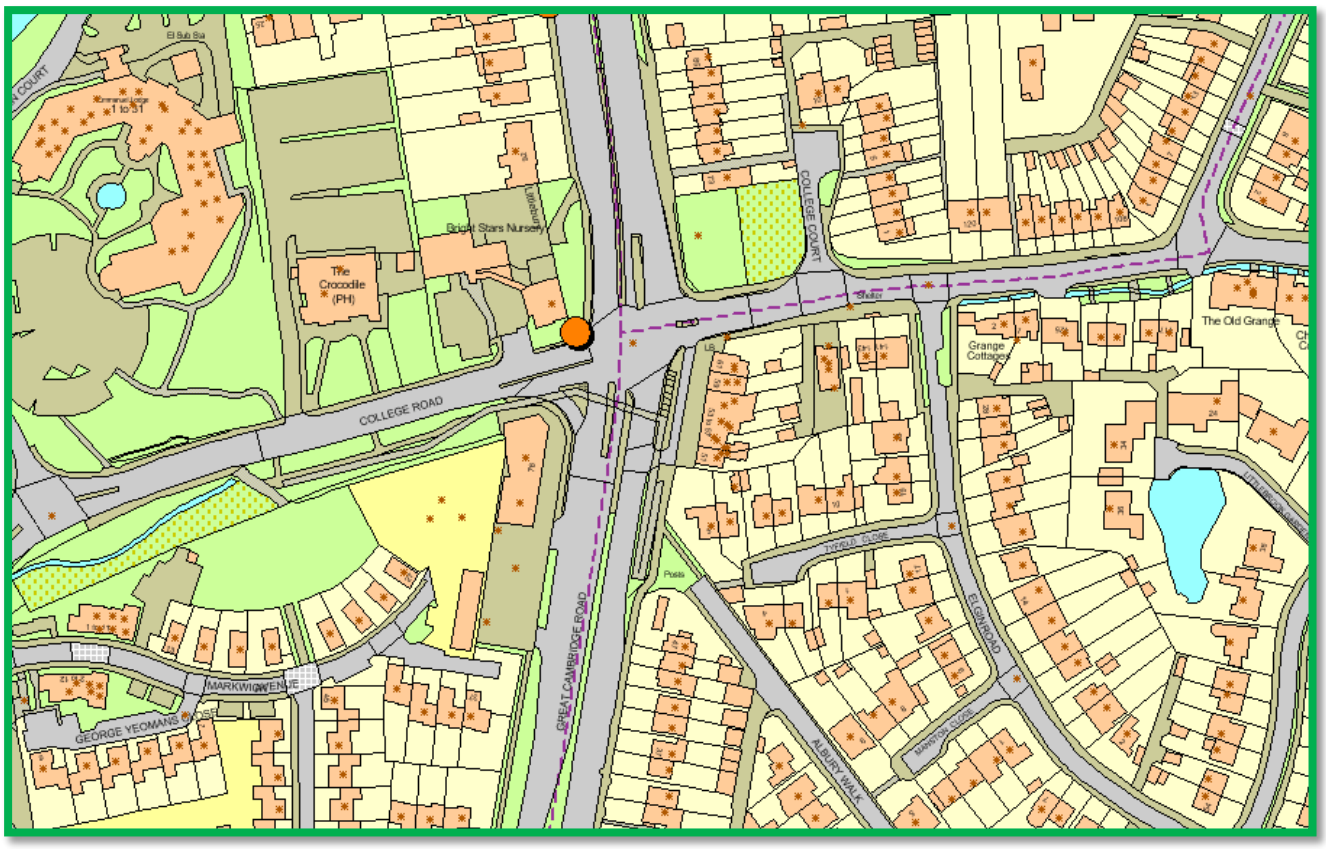
TUBE 17: 10 Colthurst Gardens, Hoddesdon, EN11 0GA. **(BB16)**



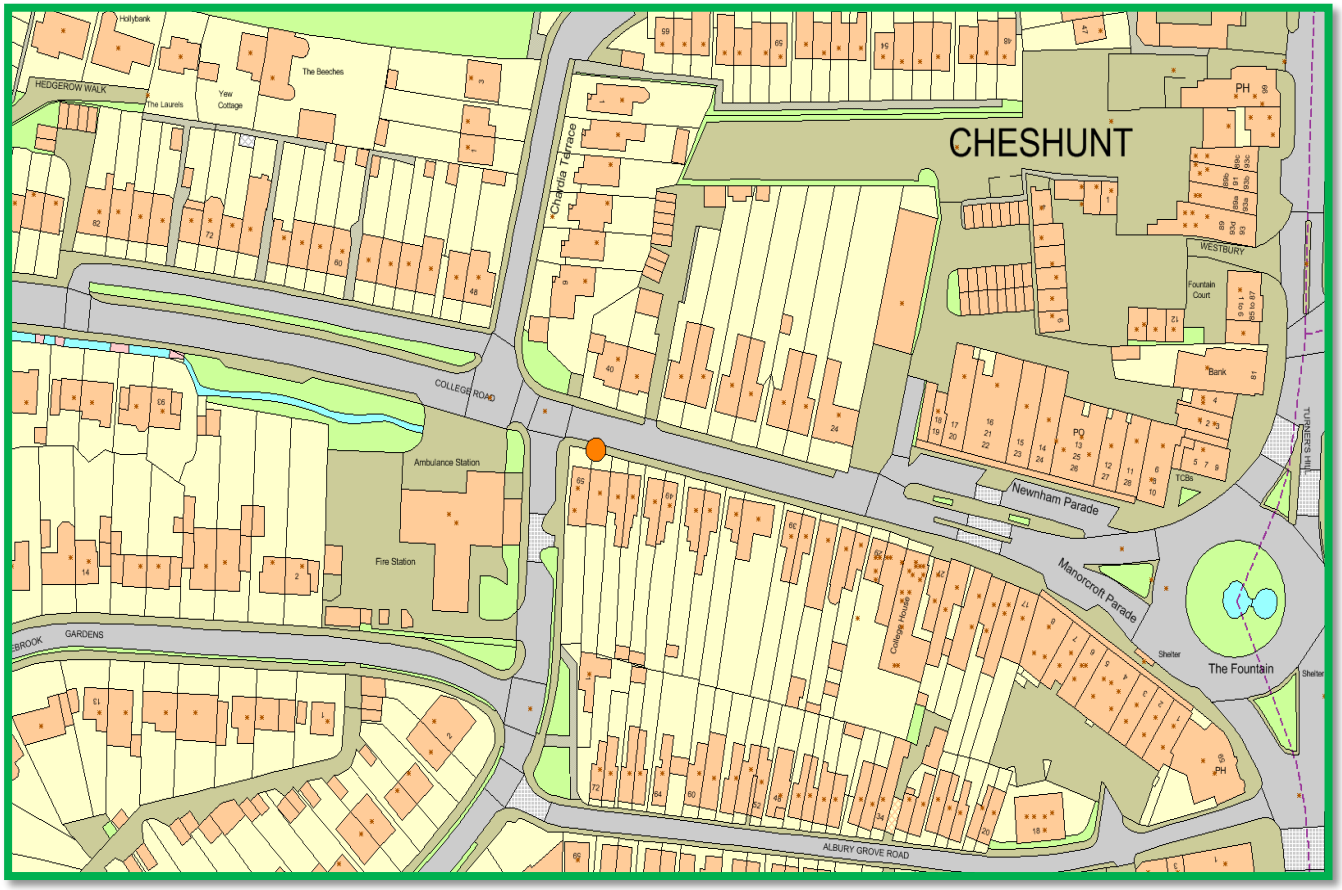
TUBE 18: Jones Road, EN7 5JB **(BB25)**



TUBE 19: A10/College Rd Junction, Cheshunt. **(BB40)**



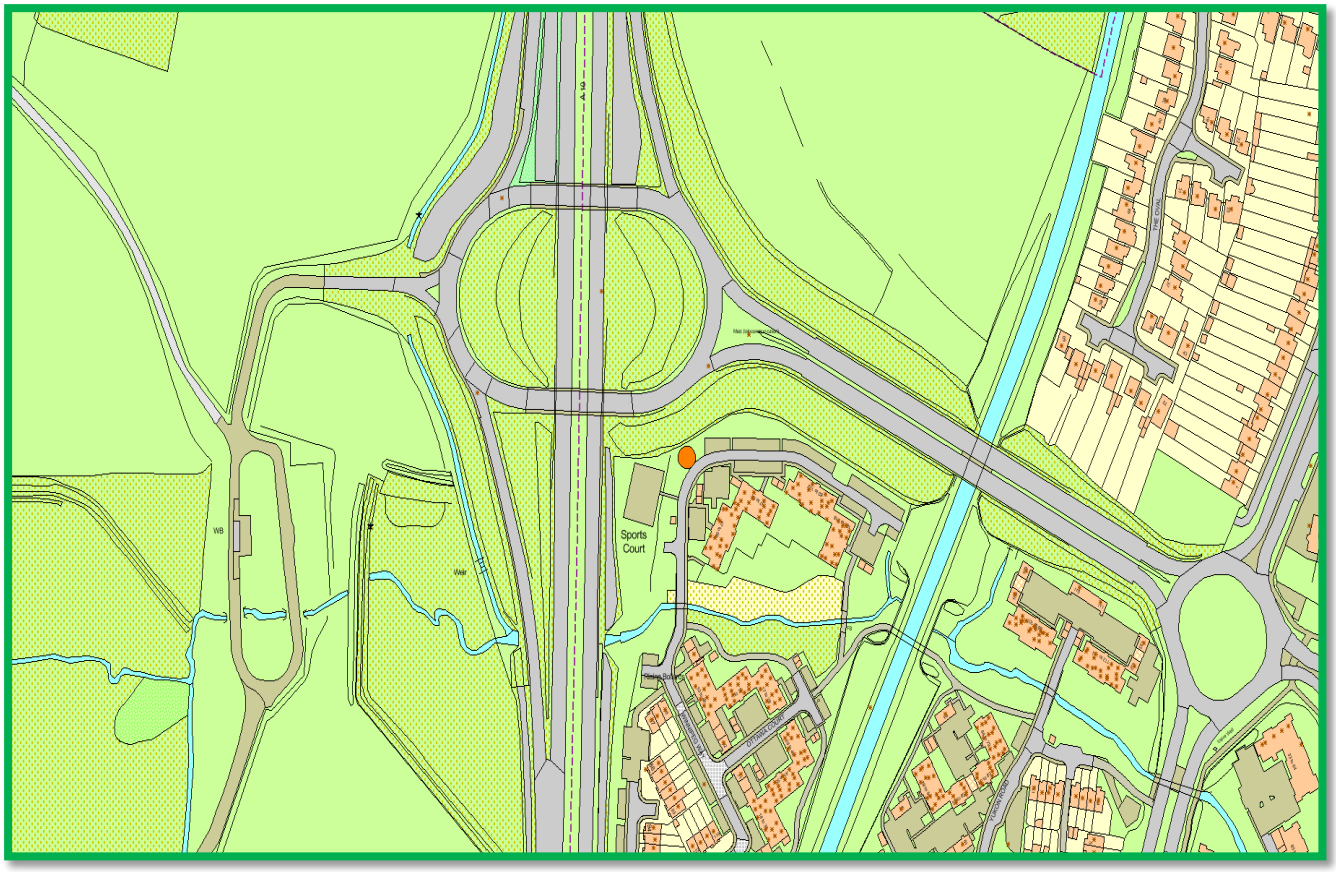
TUBE 20: 59 College Road, Cheshunt EN8 9LS **(BB27)**



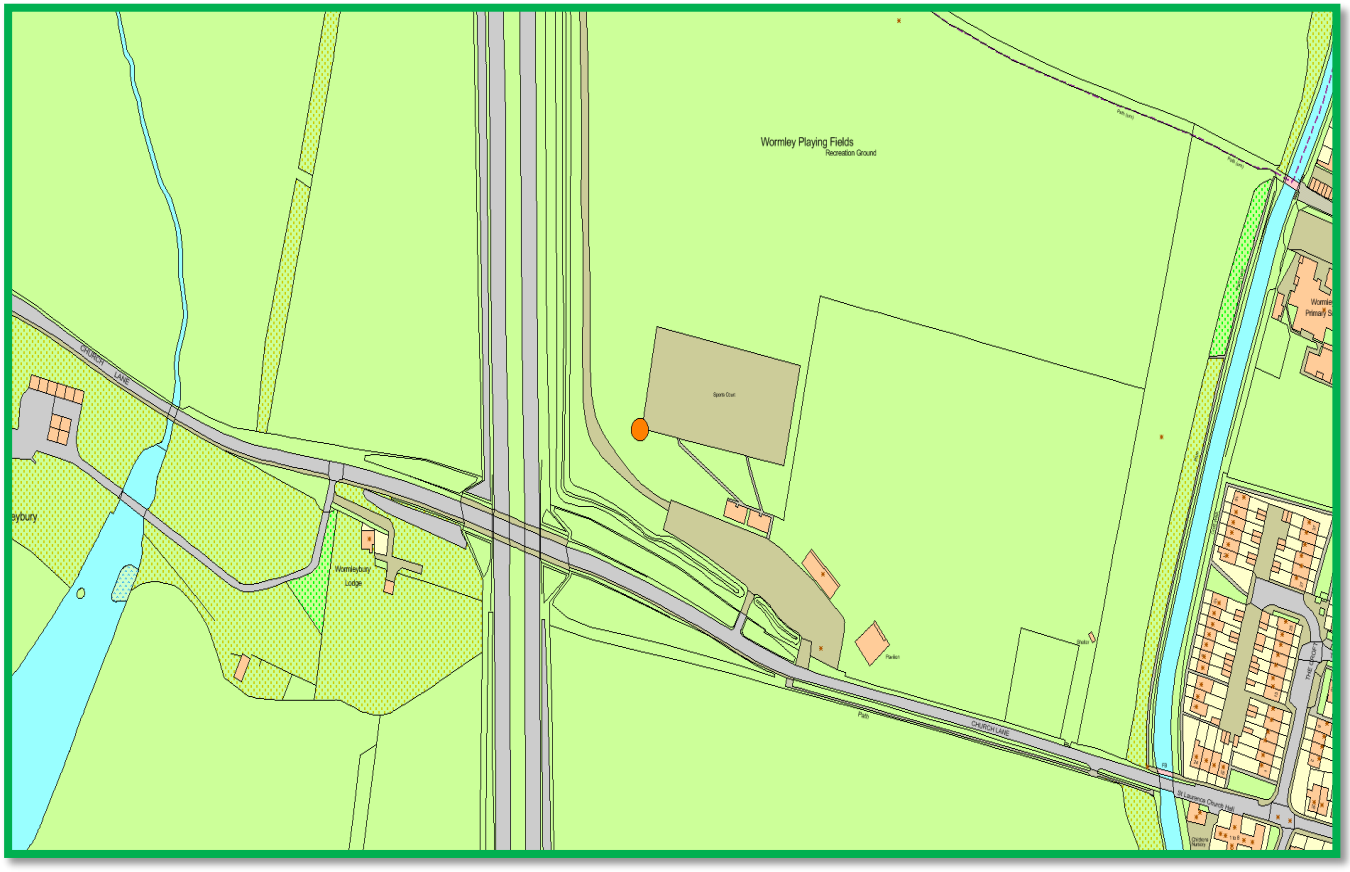
TUBE 21: 214 Great Cambridge Road, Cheshunt, EN8 0NB. **(BB28)**

TUBE 22: Brookfield Allotments/Halfhide Lane EN8 0NL. **(BB29)**

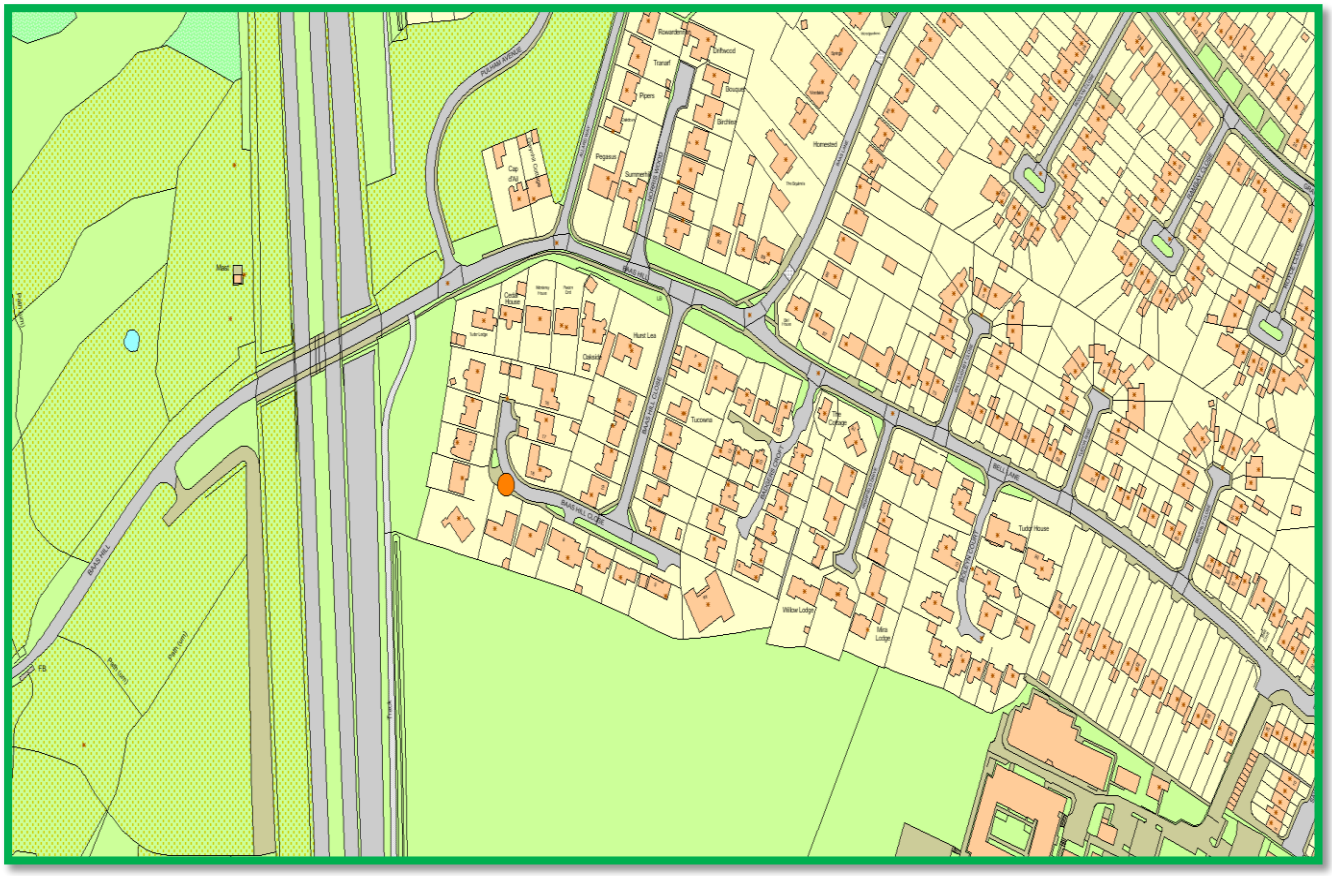
TUBE 23: Winnipeg Way, Turnford, EN10 6FH. **(BB30)**



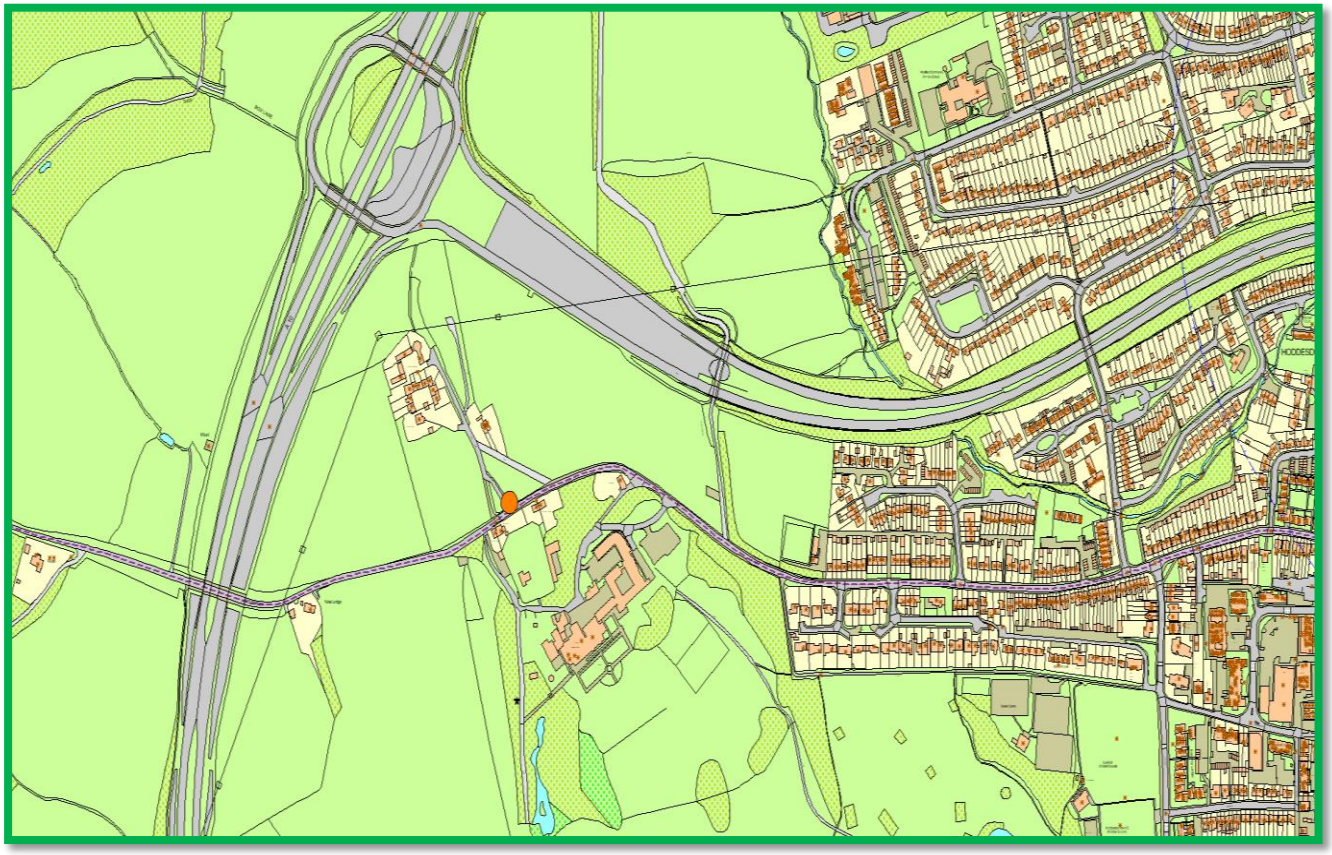
TUBE 24: Wormley Sports Club, Church Lane, EN10 7QE, **(BB31)**



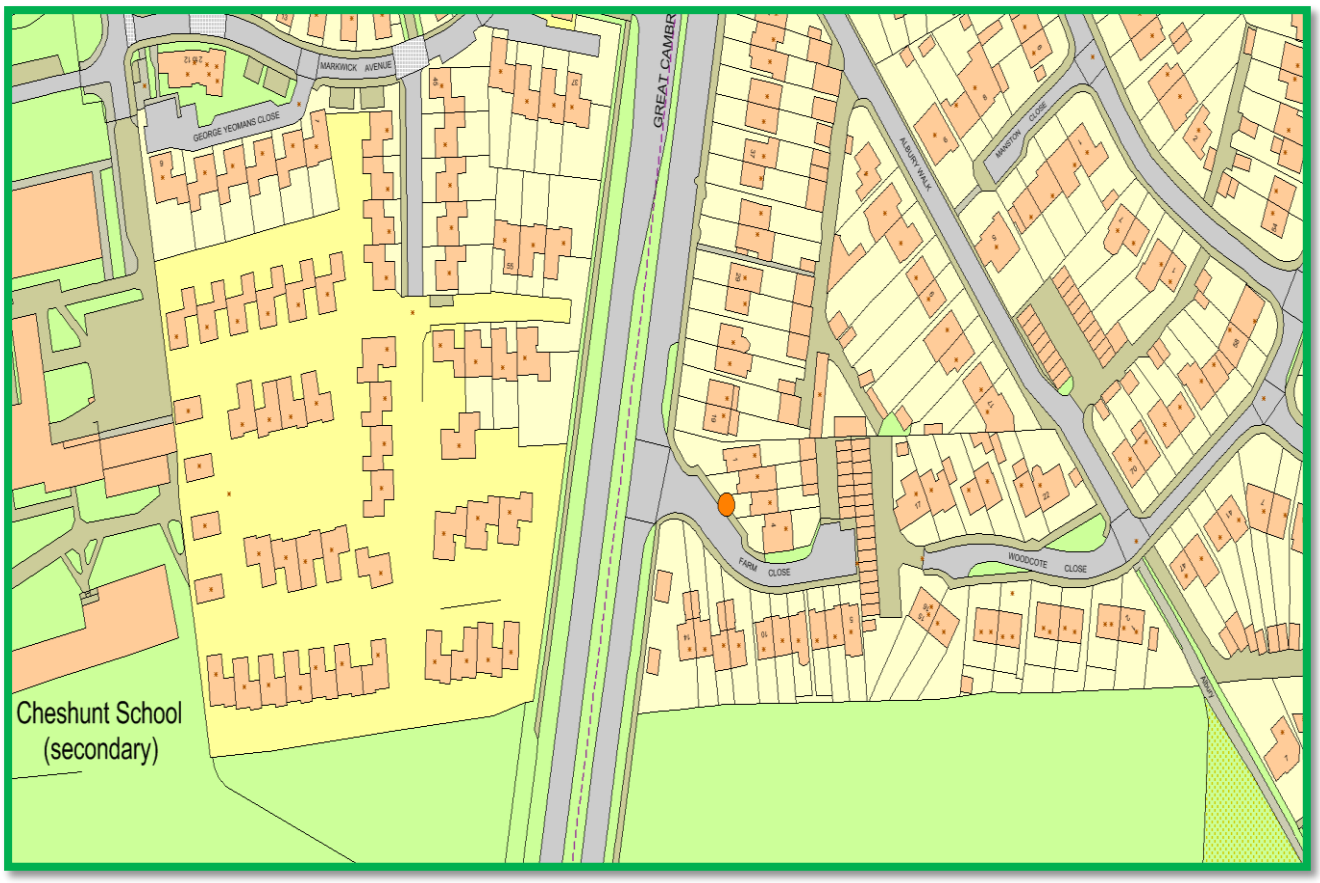
TUBE 25: 11 Baas Hill Close, Broxbourne, EN10 7EU. **(BB32)**



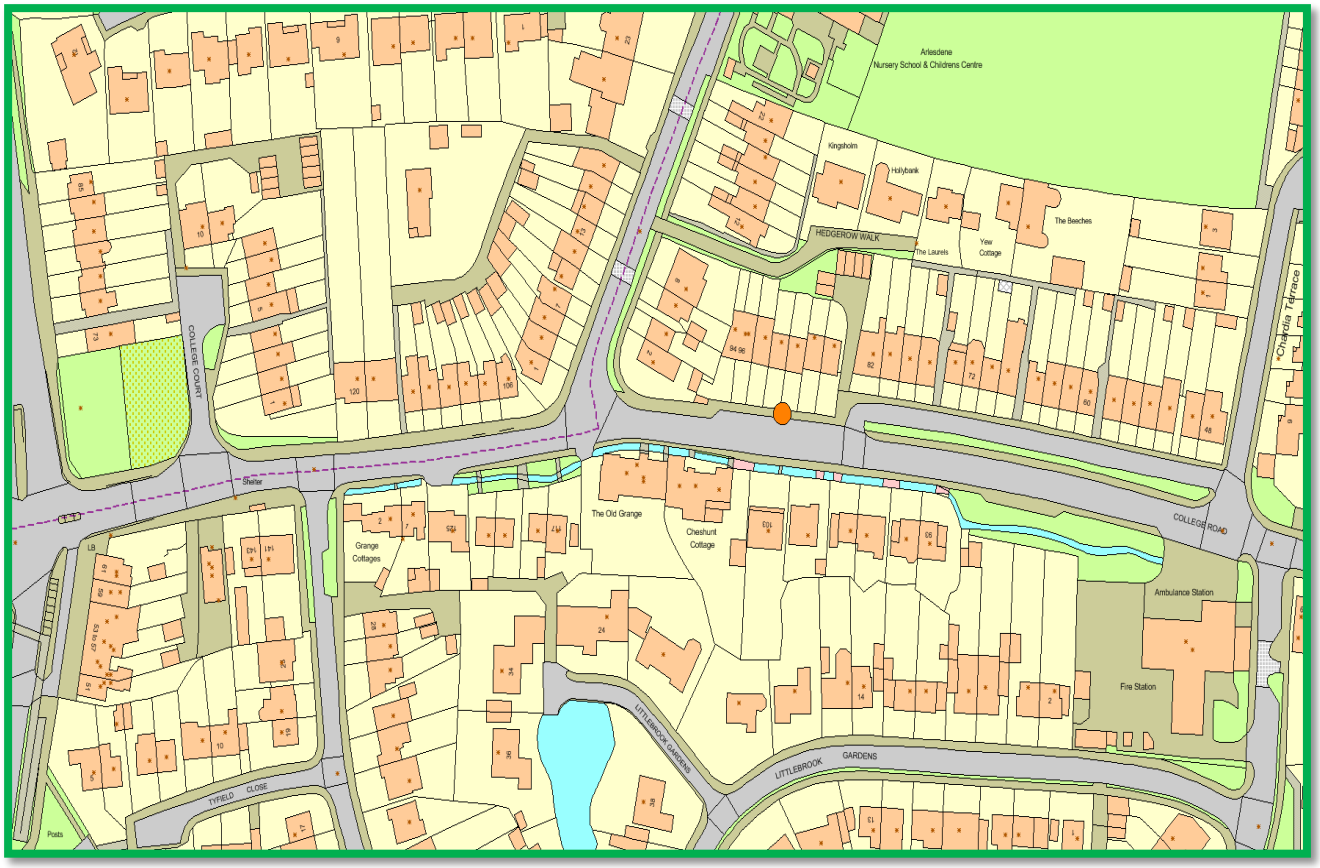
TUBE 26: High Leigh/Box Lane **(BB33)**



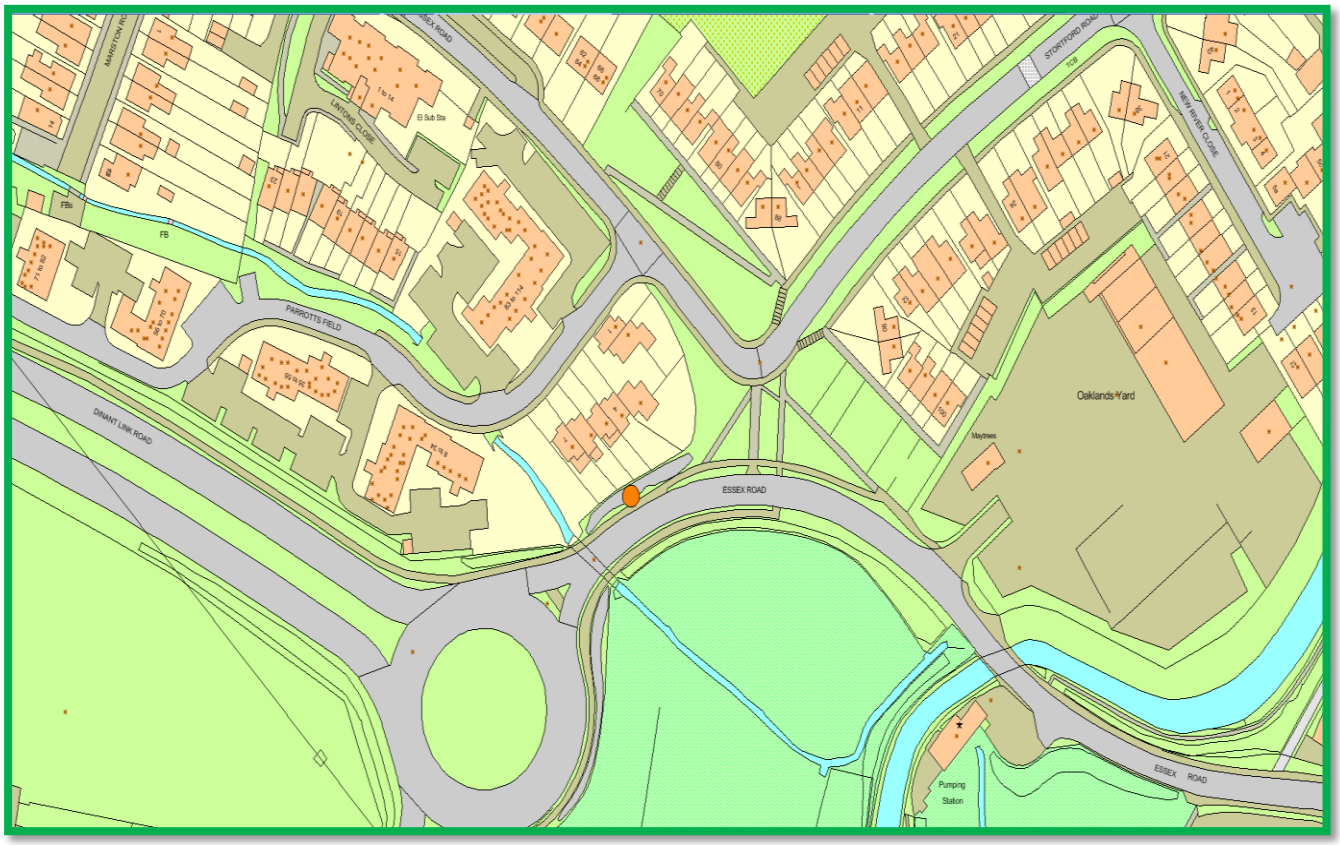
TUBE 27: Farm Close, Cheshunt, EN8 8PD **(BB34)**



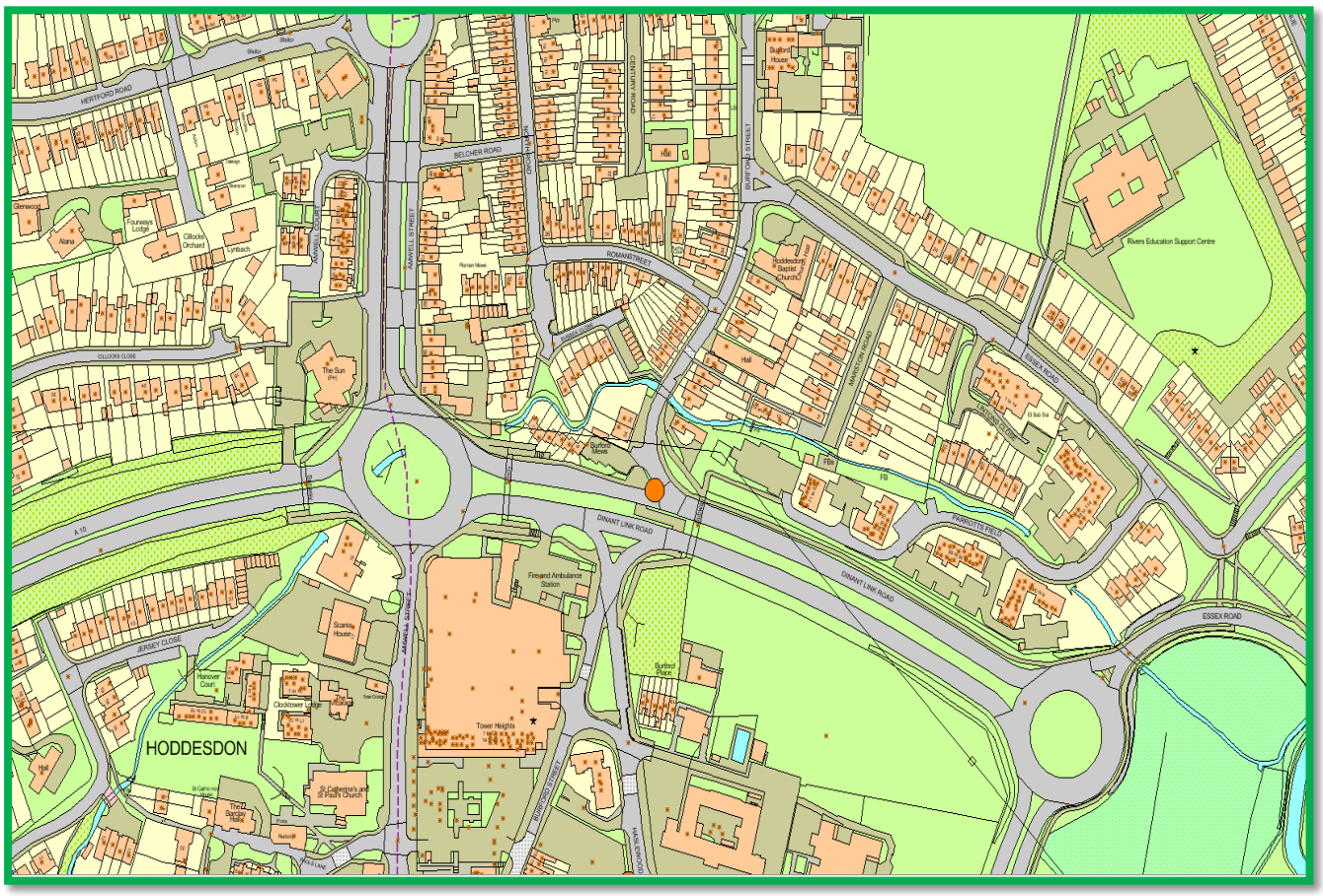
TUBE 28: 86 College Road, Cheshunt EN8 9NN **(BB35)**



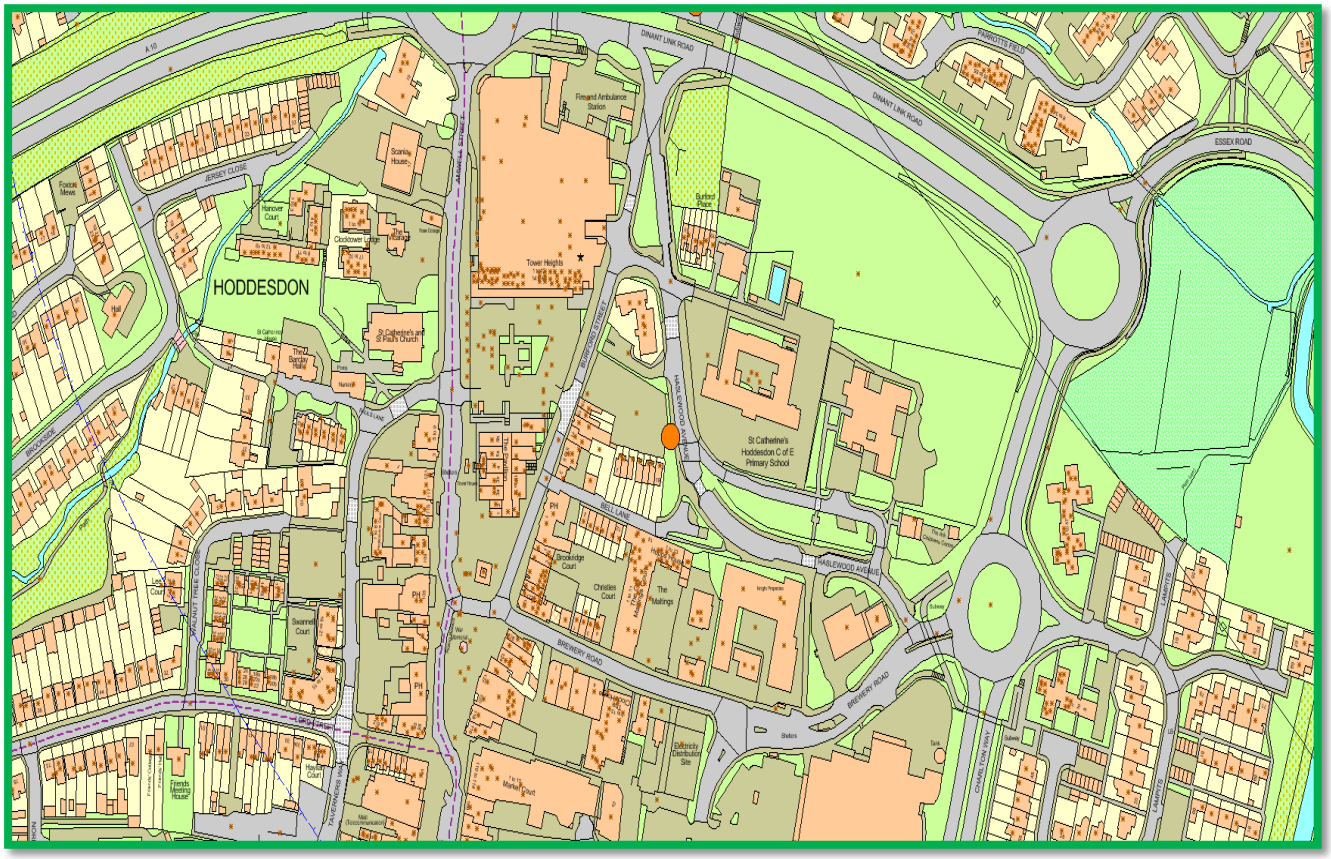
Tube 29: Essex Rd, behind 6 Parrots Field, Hoddesdon **(BB36)**



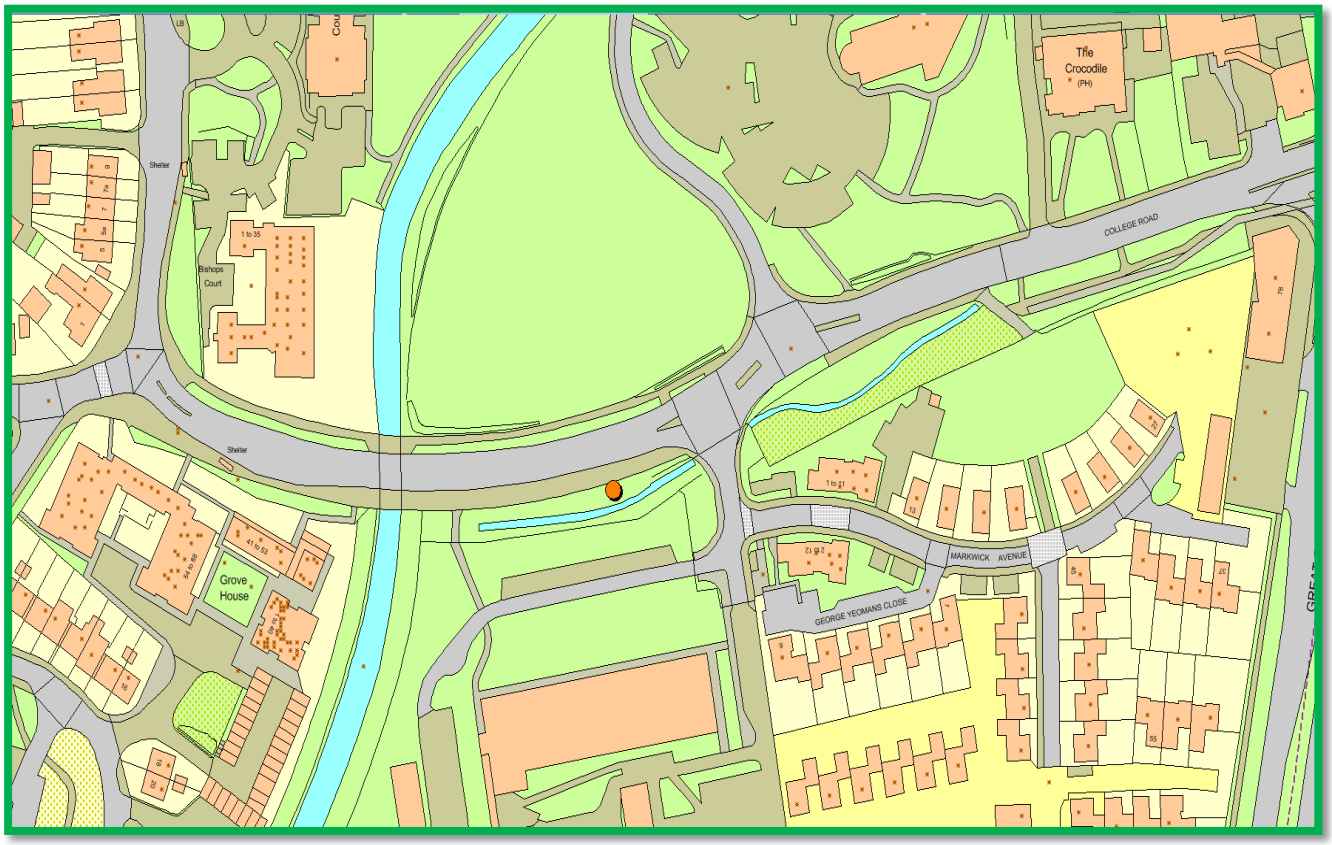
Tube 30: Junction of Burford St/Dinant Link Road, Hoddesdon **(BB37)**



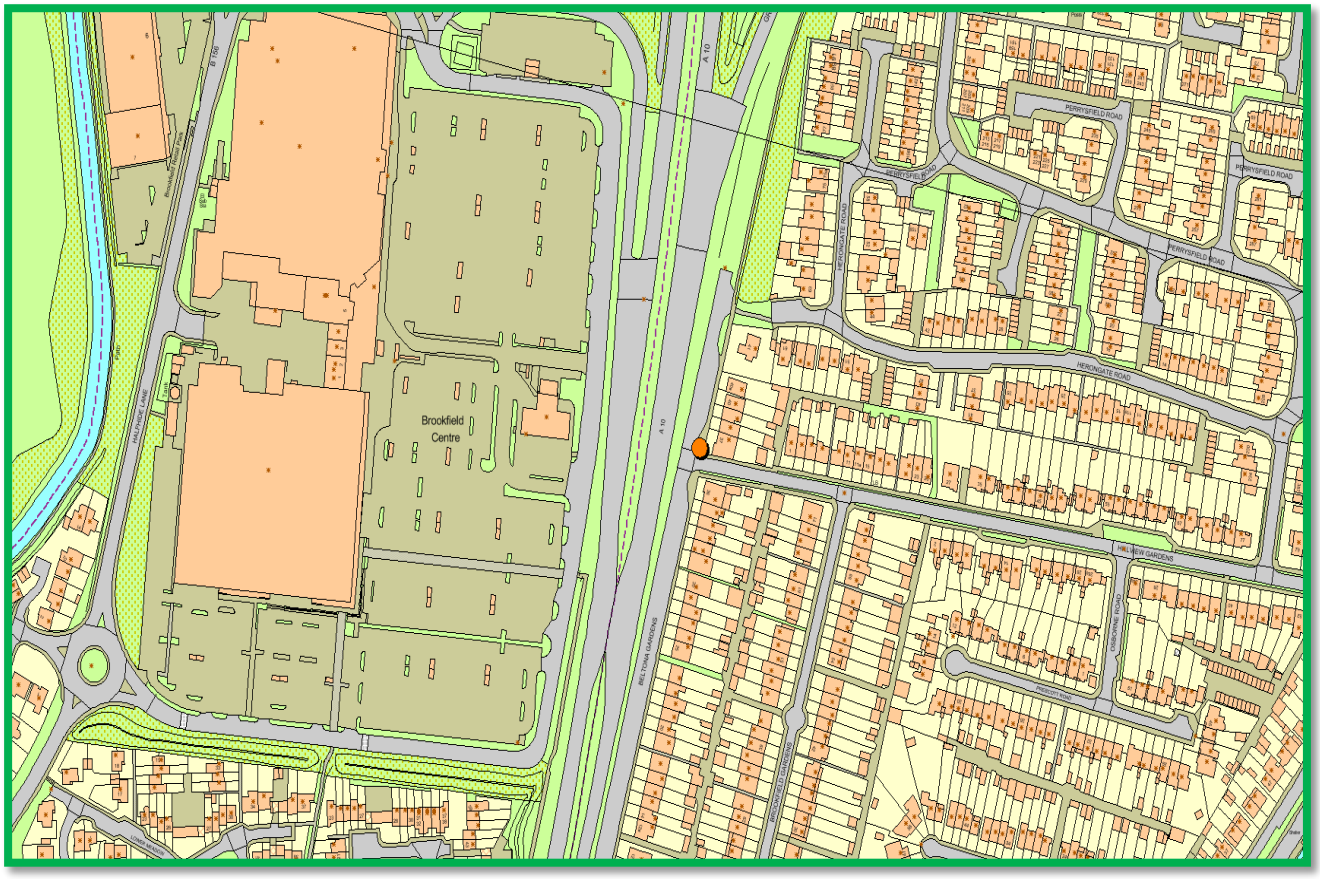
Tube 31: St Catherines School, Hoddesdon **(BB38)**



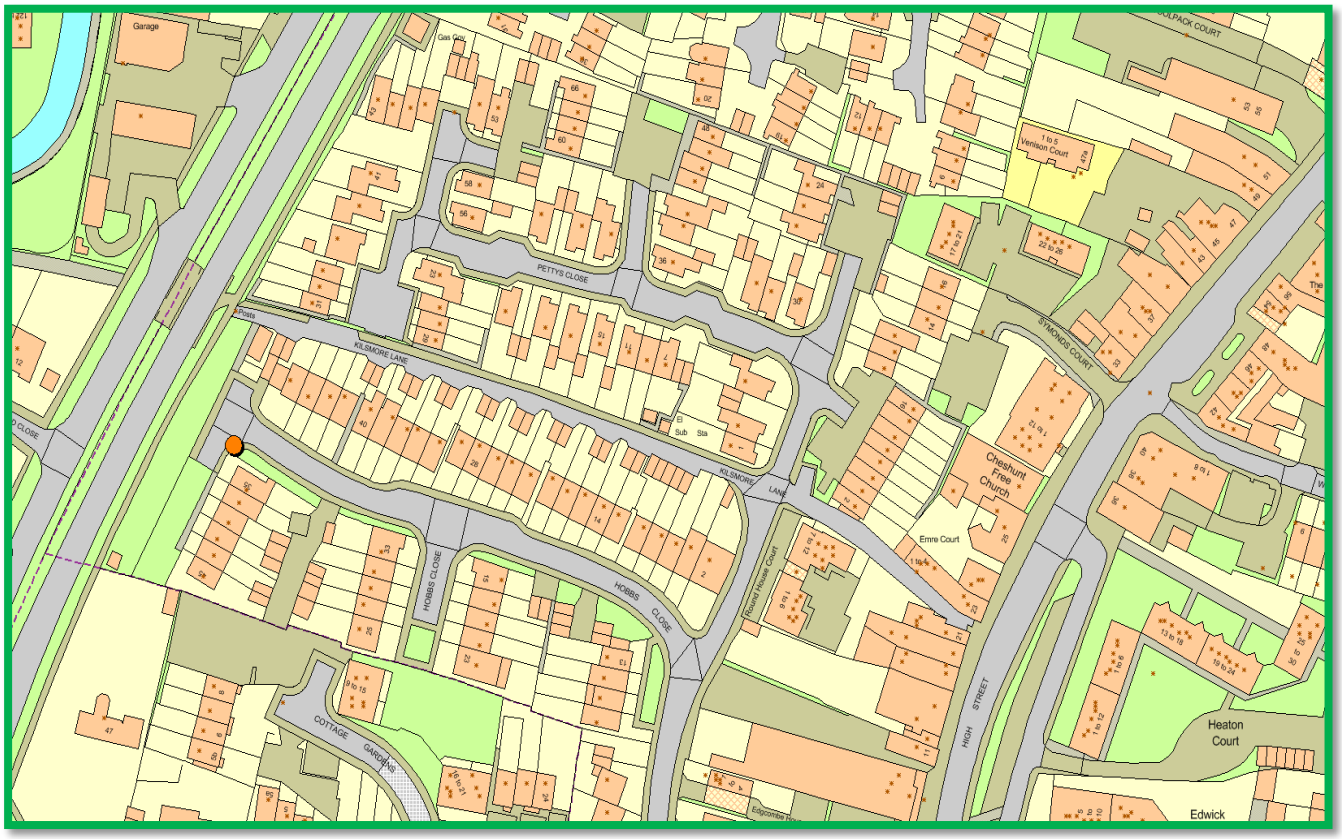
Tube 32: College Rd/Goffs Churchgate Academy, Cheshunt **(BB39)**



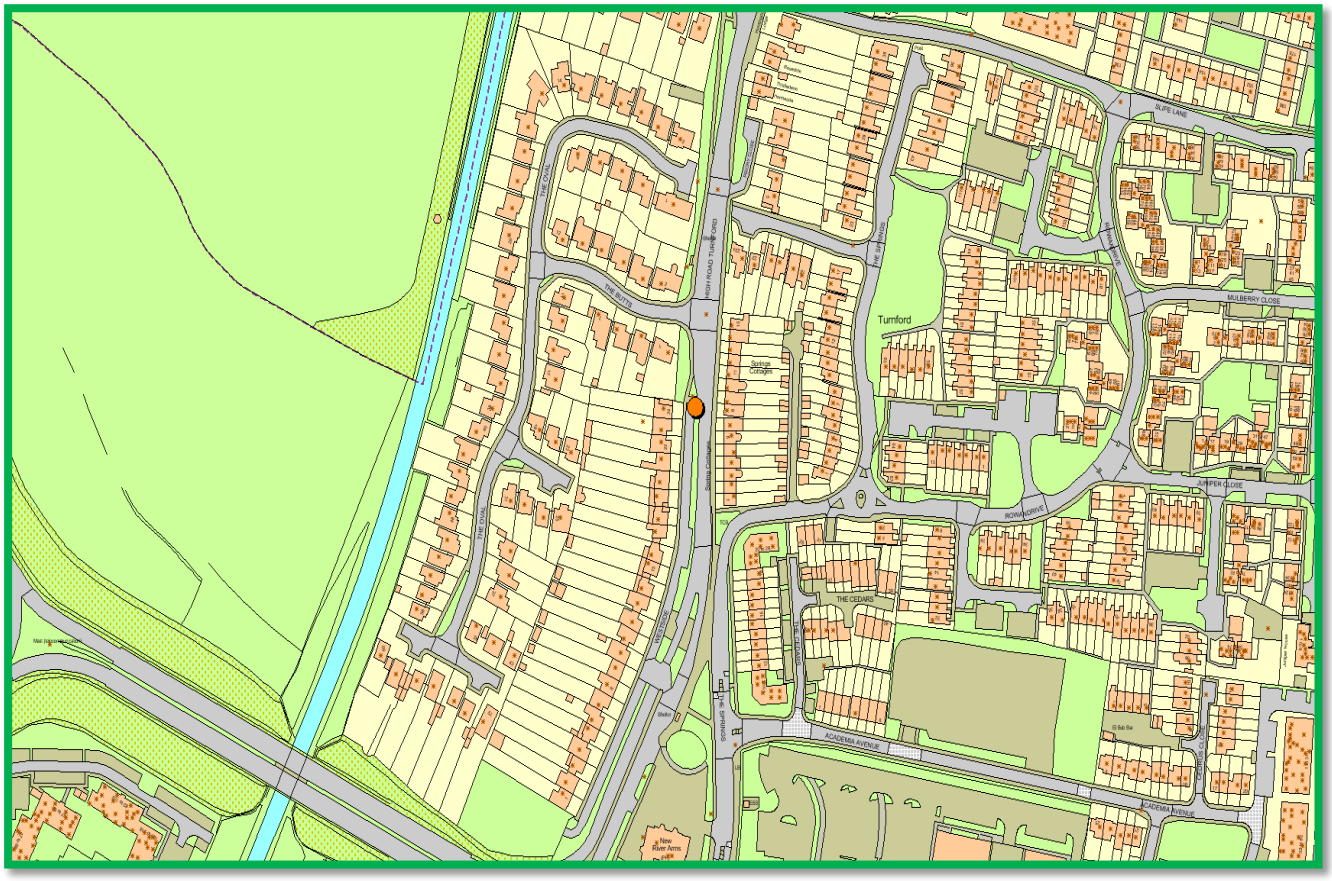
Tube 33: 37 Beltona Gardens, Cheshunt **(BB41)**



Tube 34: 48 Hobbs Close, Cheshunt **(BB42)**



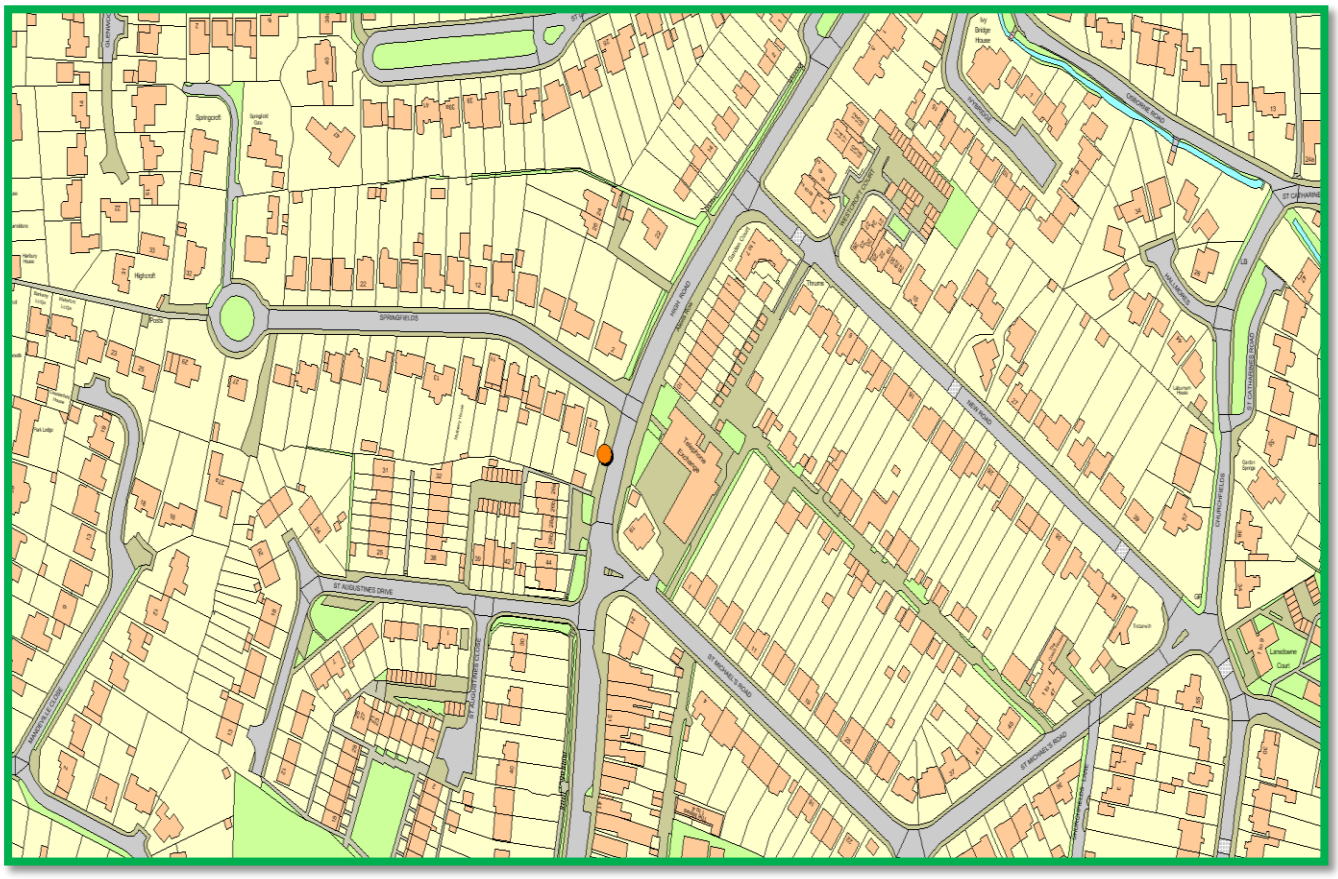
Tube 35: 24 Westside, Turnford **(BB43)**



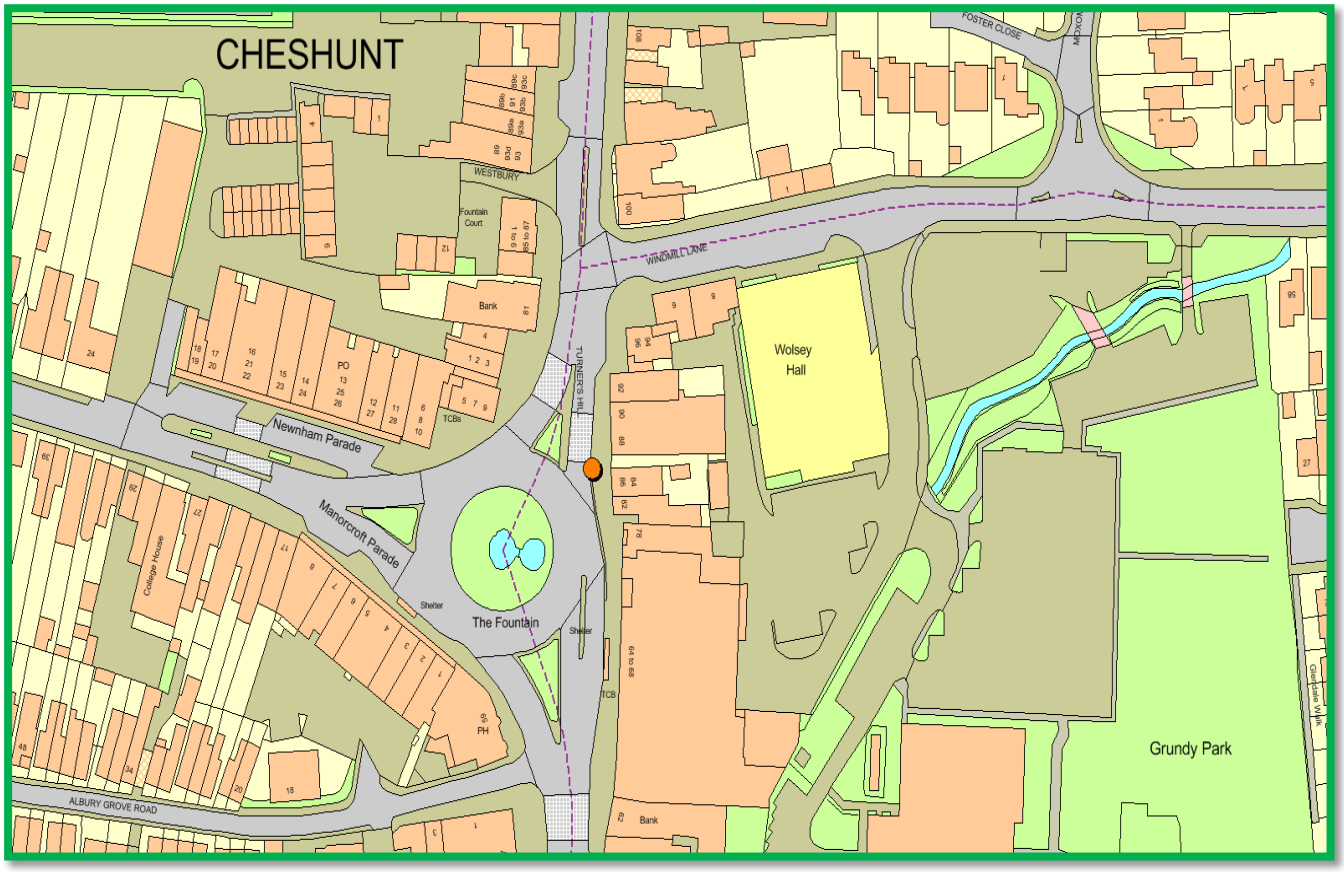
Tube 36: High Rd/Bell Lane Roundabout (163 High Rd) Broxbourne **(BB44)**

Tube 37: High Rd/Station Rd Junction, Broxbourne **(BB45)**

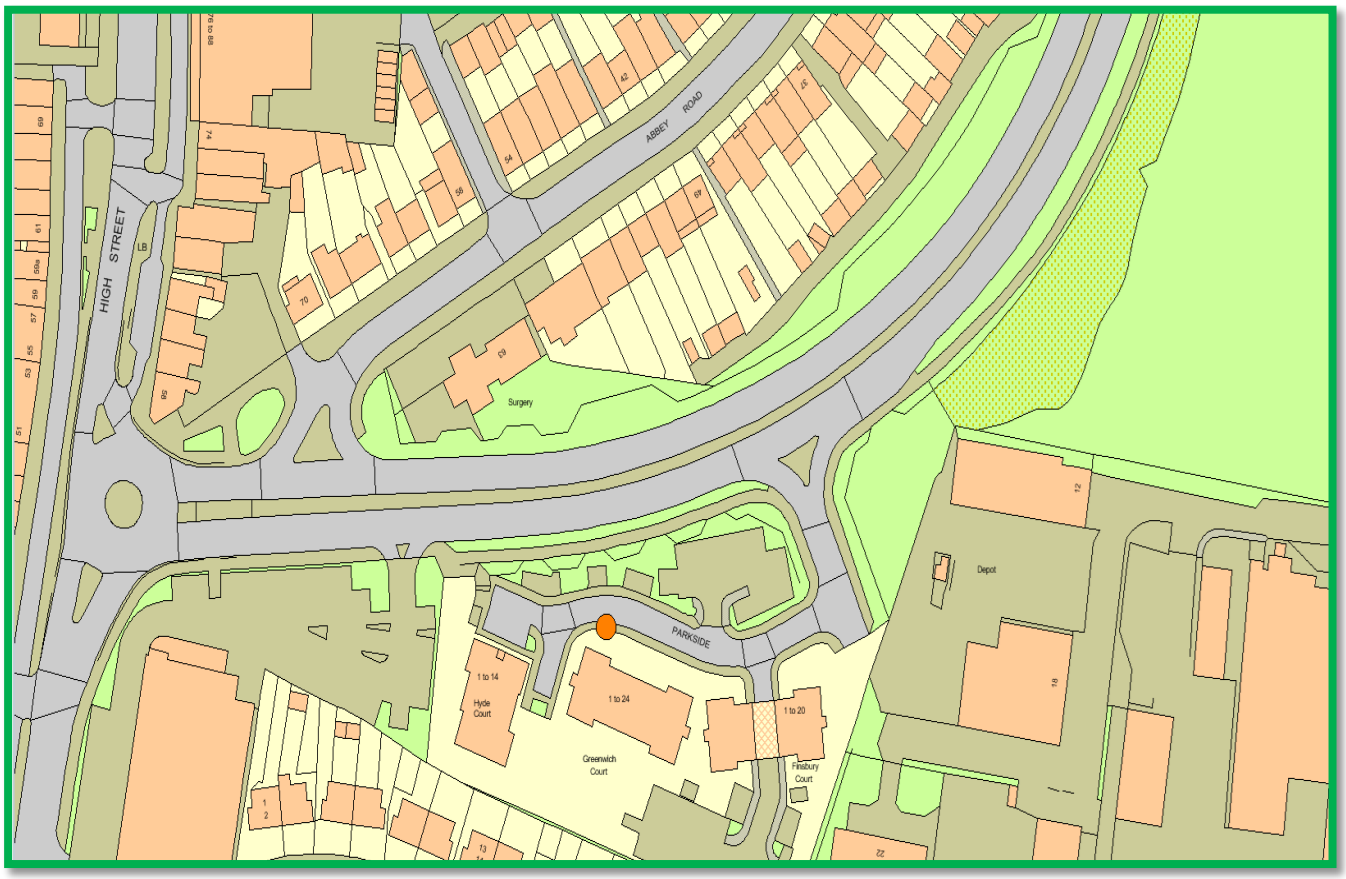
Tube 38: High Rd/Springfields Junction, Broxbourne **(BB46)**



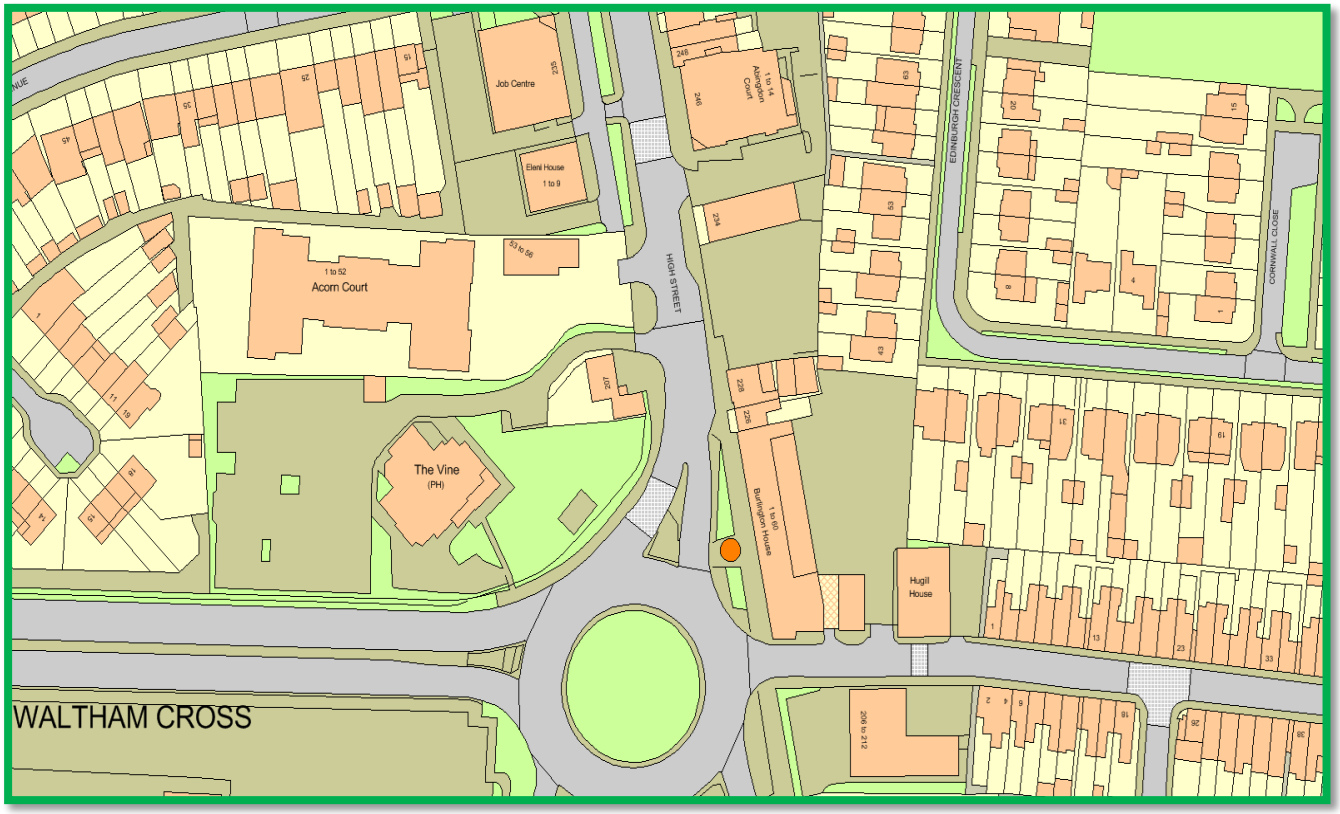
Tube 3: Turners Hill 2, Cheshunt **(BB47)**



Tube 13: Parkside, outside Greenwich Court (Flats 124), Waltham Cross **(BB48)**



Tube 11: Winston Churchill Way/High Street, Waltham Cross **(BB49)**



The Council has published an Interactive Map of the Current Local Plan, which also incorporates the Air Quality Management Areas. Which can be accessed via the following link, https://www.broxbourne.gov.uk/maps

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[1]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[1] The units are in micrograms of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
…	…

References

1) Air Quality Review and Assessment Website
http://laqm.defra.gov.uk/review-and-assessment/report-submission.html

2) Defra (February 2018) Local Air Quality Management, Technical Guidance (TG16)
https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

3) Defra (April 2016) Local Air Quality Management, Policy Guidance (PG16)
https://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf

4) Borough of Broxbourne, Draft Local Plan
http://consult.broxbourne.gov.uk/portal/planning/dlp/dlpc?pointId=3880076

5) AIR QUALITY EXPERT GROUP, Fine Particulate Matter (PM2.5) in the United Kingdom, 2012.
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69635/pb13837-aqeg-fine-particle-matter-20121220.pdf

6) National air quality objectives and European Directive limit and target values for the protection of human health.
https://uk-air.defra.gov.uk/assets/documents/Air_Quality_Objectives_Update.pdf