London Borough of Barnet Air Quality Annual Status Report for 2016
Date of publication: 4th May 2017

This report provides a detailed overview of air quality in the London Borough of Barnet during 2016. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2016 (LLAQM.TG(16)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

Table A.   Summary of National Air Quality Standards and Objectives

Pollutant	Objective (UK)	Averaging Period	Date[1]
Nitrogen dioxide - NO_2	200 μg m^{-3} not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
	40 μg m^{-3}	Annual mean	31 Dec 2005
Particles - PM_{10}	50 μg m^{-3} not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
	40 μg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 μg m^{-3}	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 µg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 µg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 µg m^{-3} mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1]by which to be achieved by and maintained thereafter

1. Air Quality Monitoring

1.1 Locations

Table B.   Details of Automatic Monitoring Sites for 2016

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
ABN1	Tally Ho	526344	192219	Kerbside	Y	5	0.5	3	NO_2, PM10	Chemiluminescent; TEOM
ABN2	Chalgrove School	524374	189642	Urban Background	Y	0	N/A	2.5	NO_2, PM10	Chemiluminescent; TEOM

Table C.   Details of Non-Automatic Monitoring Sites for 2016

Site ID:	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Distance from monitoring site to relevant Exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet Height	Tube co-located with an automatic monitor (Y/N)
PBN1	1 Pointalls Close	Roadside	X526278 Y190444	NO_2	Y	6	13	2.5	N
PBN2	71 Ballards Lane	Urban Centre	X525410 Y190980	NO_2	Y	0 [1]	4	2.5	N
PBN3	Sanders Lane Allotments	Urban background	X523754 Y191588	NO_2	Y	N/A	N/A	2.0	N

PBN5	St James Catholic High School	Urban background	X521885 Y190489	NO_2	Y	5	2	2.5		N
PBN6	347 Hendon Way	Roadside	X523127 Y188183	NO_2	Y	10	1.0	2.5		N
PBN8	Tally Ho monitoring station	Urban Centre	X526346 Y192224	NO_2	Y	5 [1]	0.5	2.5		Y
PBN9	52 Golders Green Road	Urban Centre	X524965 Y187505	NO_2	Y	0 [1]	5	2.5		N
PBN10	High Street, Barnet	Urban Centre	X524496 Y196615	NO_2	Y	0 [1]	3	2.5		N
PBN12	1295 High Road Whetstone	Urban Centre	X526381 Y194059	NO_2	Y	0 [1]	10	2.5		N
PBN13	Courtland Avenue, A1	Roadside	X520968 Y193457	NO_2	Y	6	22	2.5		N
PBN14	William Hill, Station Road Edgware	Urban Centre	X519497 Y192075	NO_2	Y	0 [1]	5	2.5		N
PBN17	National Express Bus Stop, Golders Green Bus Station	Bus station	X525207 Y187425	NO2	Y	0 [1]	N/A	2.5		N
PBN18	Rear of GG Bus Station	Bus station	X525278 Y187444	NO2	Y	0 [1]	N/A	2.0		N
PBN19	Rear of 7-12 Dyson Court, Tilling Road	Roadside	X523348 Y187589	NO_2	Y	0 (façade of residential building)	10	2.5		N
PBN20	Flats above 16 Cricklewood Lane	Urban Centre	X523885 Y185764	NO_2	Y	0 (façade of residential building)	6	6		N

Table D. Monitoring sites selected for Mayors Air Quality Fund in 2016

In 2016 a further 10 monitoring sites were established in locations where trees have been planted to improve air quality. One location (St Joseph's school) was chosen to assess the performance of a green screen made from ivy

Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor? (Y/N)	Reason for monitoring
Lodge Lane	526285	192418	Roadside	Y/N	2	0.5	2.5	NO_2	N	Tree-planting scheme
Woodberry Gardens	526050	191615	Roadside	Y	8	0.5	2.5	NO_2	N	Tree-planting scheme
7 Bow Lane	526433	190908	Roadside	Y	5	0.5	2.5	NO_2	N	Tree-planting scheme; opposite primary school
135 Woodhouse Road	527251	191951	Roadside	Y	10	0.5	2.5	NO_2	N	Tree-planting scheme
A41 Wessex Gardens	524135	187377	Roadside	Y	9m from school building; 13m from playground	2m	2.5	NO_2	N	School near to busy road
33 Somerton Road	524085	186234	Roadside	Y	7	0.5	2.5	NO_2	N	Tree-planting scheme
St Joseph's Hendon	522601	189022	School playground	Y	1m from playground	5m	2.5	NO_2	N	School near to busy road (A41), ivy

										screen planted
104 The Greenway	520698	189922	Roadside	Y	11	1.5m	2.5	NO$_2$	N	Tree-planting scheme
19 Oakmead Gardens	520650	192793	Roadside	Y	8	0.5	2.5	NO$_2$	N	Tree-planting scheme
Martins Court	526478	194076	Roadside	Y	4	0.5	2.5	NO$_2$	N	Tree-planting scheme

1.2   Comparison of Monitoring Results with AQOs

No results needed to be annualised. ABN1, PBN6 and PBN8 were distance corrected, to a location of relevant public exposure, the details of which are described in Appendix A.

Table D.   Annual Mean NO$_2$ Ratified and Bias-adjusted Monitoring Results (μg m^{-3})

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (μgm^{-3})						
				2010	2011	2012	2013	2014	2015	2016
ABN1	Automatic	97.1	97.1	**56.3**	**55.3**	**51.8**	**49.3**	**57**	**46.2**	38.8
ABN2	Automatic	99.6	99.6	32	31	32	32	27	23	28
PBN1	Diffusion tube	100	100		38.5	36	**42.2**	**52.5**	37.1	38.9
PBN2	Diffusion tube	100	100		**47.9**	**47.7**	**52.5**	**50.0**	**43.7**	**46.7**
PBN3	Diffusion tube	92	92	24.9	24.2	20.1	24.1	27.3	21.5	22.3
PBN5	Diffusion tube	100	100	36.4	34.9	30.1	31.6	33.2	27.9	30.5
PBN6	Diffusion tube	100	100	**49.0**	**46.5**	**49.2**	**50.5**	**50.7**	**41.7**	**50.6**

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µgm^{-3})						
				2010	2011	2012	2013	2014	2015	2016
PBN8	Diffusion tube	100	100	**50.7**	**43.6**	**47.0**	**46.7**	**49.6**	**41.7**	**45.1**
PBN9	Diffusion tube	100	100		**48.7**	**49.7**	**56**	**51.9**	**48.4**	**53.5**
PBN10	Diffusion tube	83	83		**47.9**	**51.4**	**51**	**53.8**	**51.0**	**55.7**
PBN12	Diffusion tube	92	92		**48.8**	**51.9**	**53**	**52.4**	**47.0**	**50.8**
PBN13	Diffusion tube	92	92		32.7	35.2	37.3	37.6	36.7	34.2
PBN14	Diffusion tube	100	100		**50.7**	**53.5**	**58.9**	**56.5**	**55.7**	**54.7**
PBN17	Diffusion tube	83	83	<u>**79.5**</u>	<u>**67.8**</u>	<u>**68.5**</u>	<u>**80.9**</u>	<u>**78.4**</u>	<u>**64.5**</u>	**58.4**
PBN18	Diffusion tube	100	100		**49.5**	**54.7**	**55.6**	**54.5**	**51.8**	**50.3**
PBN19	Diffusion tube	80	80		**49.5**	**51.2**	**55.5**	**54.8**	**52.3**	**52.2**
PBN20	Diffusion tube	100	100		**55.9**	**54.3**	**57.1**	<u>**62.3**</u>	**54.6**	**55.3**

Notes: Exceedance of the NO$_2$ annual mean AQO of 40 µgm^{-3} are shown in **bold**.
NO$_2$ annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO^2 hourly mean AQS objective are shown in bold and underlined.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Distance Adjustment
It is important to note that ABN1 (Tally Ho monitoring station) was distance corrected to relevant exposure. The result prior to this adjustment was 44 µgm^{-3}. Similarly, PBN8 (Tally Ho tube) was adjusted from 53.4 to 45.1 µgm^{-3}. And PBN6 (347 Hendon Way) was adjusted from 70.2 to 50.6 µgm^{-3}. Full details of how the results were adjusted are in appendix A.3.

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (μgm^{-3}) 2016
Lodge Lane	Diffusion tube	97.1	97.1	**42.0**
Woodberry Gardens	Diffusion tube	99.6	99.6	35.3
7 Bow Lane	Diffusion tube	100	100	37.2
135 Woodhouse Road	Diffusion tube	100	100	**41.1**
A41 Wessex Gardens	Diffusion tube	92	92	**<u>64.0</u>**
33 Somerton Road	Diffusion tube	100	100	**44.0**
St Joseph's Hendon	Diffusion tube	100	100	**<u>71.2</u>**
104 The Greenway	Diffusion tube	100	100	36.1
19 Oakmead Gardens	Diffusion tube	100	100	39.8
Martins Court	Diffusion tube	83	83	37.3

Notes: Exceedance of the NO_2 annual mean AQO of 40 μgm^{-3} are shown in **bold**.
NO_2 annual means in excess of 60 $\mu g\ m^{-3}$, indicating a potential exceedance of the NO^2 hourly mean AQS objective are shown in bold and underlined.

Trends in pollutant concentrations (nitrogen dioxide measured as an annual mean)

The graph below shows the trends in pollutant concentration as measured by diffusion tube. In 2016 one can see that nitrogen dioxide levels increased compared with 2015 at most locations.
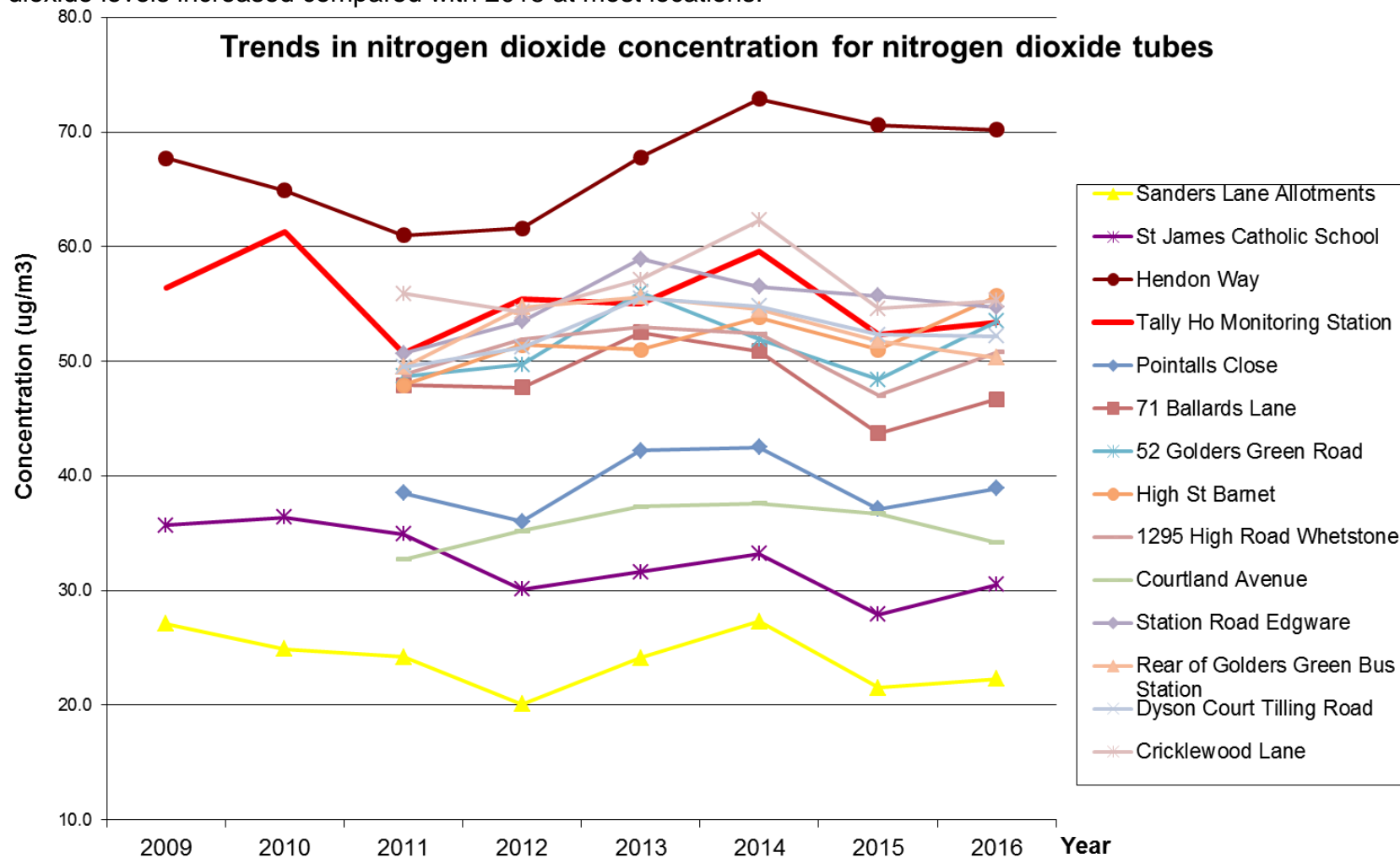

Trends in nitrogen dioxide concentration for nitrogen dioxide tubes

Legend:
- Sanders Lane Allotments
- St James Catholic School
- Hendon Way
- Tally Ho Monitoring Station
- Pointalls Close
- 71 Ballards Lane
- 52 Golders Green Road
- High St Barnet
- 1295 High Road Whetstone
- Courtland Avenue
- Station Road Edgware
- Rear of Golders Green Bus Station
- Dyson Court Tilling Road
- Cricklewood Lane

Table E.   NO$_2$ Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Number of Hourly Means > 200 µgm^{-3}						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
ABN1	97.1	97.1	**33**	15	17 (208)	5	9 (182)	0(136)	0
ABN2	99.6	99.6	0	0	0	0	0 (115)	0 (92)	0

Notes: Exceedance of the NO$_2$ short term AQO of 200 µgm^{-3} over the permitted 18 days per year are shown in **bold**.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The one hour mean objective was not exceeded in 2016.

Table F.   Annual Mean PM$_{10}$ Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Annual Mean Concentration (µgm^{-3})						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
ABN1	83.2	83.2	24	28	27	27	26	22(34)	23(35)
ABN2	*99.5*	*99.5*	20	21	19	19	20	18(28)	18

Notes: Exceedance of the PM$_{10}$ annual mean AQO of 40 µgm^{-3} are shown in **bold**.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%
[d] Results have been VCM corrected

The annual mean for PM10 was not exceeded in 2016 at either site, and has not been exceeded in the previous 6 years at these sites.

Table G.   PM$_{10}$ Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2016 % [b]	Number of Daily Means > 50 µgm^{-3}						
			2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]	2015 [c]	2016 [c]
ABN1	83.2	83.2	6	21	7(41)	5	6	6	4(35)
ABN2	*99.5*	*99.5*	1	14	0	0	0	3	3

Notes: Exceedance of the PM$_{10}$ short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**. Where the period of valid data is less than 90% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.
[a] data capture for the monitoring period, in cases where monitoring was only carried out for part of the year
[b] data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)
[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Levels of PM10 continue to comply with the daily mean objective

2. Action to Improve Air Quality

Table J.   Commitment to Cleaner Air Borough Criteria

Theme	Criteria		Achieved (Y/N)	Evidence
1. Political leadership	*1.a*	Pledged to become a Cleaner Air for London Borough (at cabinet level) by taking significant action to improve local air quality and signing up to specific delivery targets.	Y	Made pledge at Cabinet level in 2013
	1.b	Provided an up-to-date Air Quality Action Plan (AQAP), fully incorporated into LIP funding and core strategies.	Y	The 2017-2022 Action Plan is about to go out to public consultation. LIP funding is used for air quality projects. There is a quarterly steering group meeting to develop the action plan, including the Highways LIP engineer.
2. Taking action	2.a	Taken decisive action to address air pollution, especially where human exposure and vulnerability (e.g. schools, older people, hospitals etc) is highest.	Y	A project was delivered by the charity Living Streets to encourage walking to school, and to educate children about the importance of good air quality. (April 2016 to March 2016 in 7 schools within a mile of North Finchley town centre, an Air Quality Focus Area) Completion of project by MP Smarter Travel in October 2016. The Team worked alongside the Winter Well officer at Barnet Council and spoke to residents

				and professionals at the major hospitals in Barnet and council events. Presentations and Q&A sessions were delivered in community groups such as the Breathe Easy Group based in North Finchley. Approximately 350+ people were engaged over the course of 3 events and 2 community sessions.
	2.b	Developed plans for business engagement (including optimising deliveries and supply chain), retrofitting public buildings using the RE:FIT framework, integrating no engine idling awareness raising into the work of civil enforcement officers, (etc etc).	Y	Feasibility study undertaken from Jan to March 2017 to join North London Freight Consolidation Centre. (MAQF project) New officer to enforce NRMM and dust on construction sites started in January 2017. This involves lots of work with construction companies. (MAQF project)
	2.c	Integrated transport and air quality, such as: improving traffic flows on borough roads to reduce stop/start conditions, improving the public realm for walking and cycling, and introducing traffic reduction measures.	Y	Since April 2016 we have trained 2263 children in cycling projects at schools, and 622 individuals have attended the adult and family Cycle Skills training; funded by LIP
	2.d	Made additional resources available to improve local air quality, including by pooling its collective resources (s106 funding, LIPs, parking revenue, etc).	Y	LIP funding provided £80,000 to plant 216 trees in areas affected by poor air quality. Trees were planted in January 2017.
3. Leading by example	3.a	Invested sufficient resources to complement and drive action from others.	Y	Invested resources in the form of project and people management to enable

				Mayors Air Quality Fund projects to be realised.
				Officers now work with school travel planners to continue the work started by the Air Quality Champion in the first round of the Mayor's Air Quality Fund. Example – anti-idling campaigns outside schools will be done regularly.
				Contacts established in the action planning process, along with the successful round one MAQF project have enabled further tree planting, paid for from the LIP budget.
				The air quality lead has been invited to attend the Transport Strategy steering group.
	3.b	Maintained an appropriate monitoring network so that air quality impacts within the borough can be properly understood	Y	All existing AQ monitors maintained
	3.c	Reduced emissions from council operations, including from buildings, vehicles and all activities.	Y	EV vehicle points at main council offices reduce emissions from staff journeys. 2 cars are leased from E-Car.
				Stationery is now only delivered to Barnet Council twice a week, and for a minimum purchase order value, in order to reduce emissions connected with deliveries.
				Electric vehicles will be trialled for some council fleet vans.

				Safer Urban Driving and Driver CPC training is done for all council fleet drivers
	3.d	Adopted a procurement code which reduces emissions from its own and its suppliers activities, including from buildings and vehicles operated by and on their behalf (e.g. rubbish trucks).	Y	All current fleet vehicles are Euro V; all new fleet vehicles will be EURO VI. Fleet manager to investigate emissions in a procurement code for contracted-out special needs vehicles (school buses for disabled pupils) The air quality officer and procurement manager for Barnet agreed at the February 2017 steering group meeting to work to producing a procurement code for sustainable deliveries and cleaner delivery vehicles.
4. Using the planning system	**4.a**	Fully implemented the Mayor's policies relating to air quality neutral, combined heat and power and biomass.	Y	The Council's new Supplementary Planning Document for Sustainable Design and Construction (October 2016) now incorporates the Mayor's policies. Planning conditions are now applied
	4.b	Collected s106 from new developments to ensure air quality neutral development, *where possible* .	N	This subject will be debated at the next air quality steering group meeting (June 2017).
	4.c	Provided additional enforcement of construction and demolition guidance, with regular checks on medium	Y	Dust and NRMM construction site enforcement officer recruited in January

		and high risk building sites.		2017. He works across 4 Boroughs and is MAQF funded. In Barnet he has done over 40 visits to 18 separate sites, raising compliance with the NRMM regulations from under 25% to over 80% compliant in 3 months.
5. Integrating air quality into the public health system	**5**	Included air quality in the borough's Health and Wellbeing Strategy and/or the Joint Strategic Needs Assessment.	Y	The Council's new Air Quality Action Plan (2017-2022) signposts the 2015-2020 Joint Strategic Needs Assessment (JSNA) and Health and Wellbeing Strategy 2016-2020. The Director of Public Health has been briefed on the new Air Quality Action Plan, and public health are due to attend the next action plan steering group meeting in June 2017.
6. Informing the public	**6.a**	Raised awareness about air quality locally.	Y	Amelix theatre group visited four secondary schools in March 2017 to promote alternatives to the private motor car to get to school, and to increase awareness of air quality. The new air quality action plan will go out for public consultation in May 2017, and will include a Survey Monkey questionnaire.

2.1   Air Quality Action Plan Progress

Table K provides a brief summary of The London Borough of Barnet's progress against the Air Quality Action Plan, showing progress made this year.

Table K.   Delivery of Air Quality Action Plan Measures

Barnet Council's air quality action plan has been revised. It is due to go out to public consultation in May 2017.

Action ID	Action description	Progress	Further information
1	Minimise dust emissions from construction sites	The supplementary planning document for Sustainable construction was adopted in October 2016. Developers are required to supply where necessary an Air Quality and Dust Risk and Air Quality and Dust Management Plan. Officers continue to respond to complaints of dust from construction sites, and will investigate and take appropriate action using the Environmental Protection Act 1990. An enforcement officer for construction sites was recruited in January 2017. In 3 months he has made over 40 visits to 18 sites in respect of both dust and Non Road Mobile Machinery (NRMM) (action 2).	https://www.barnet.gov.uk/citizen-home/planning-conservation-and-building-control/planning-policies-and-further-information/supplementary-planning-documents/sustainable-design-and-construction.html
2	Enforce Non Road Mobile Machinery (NRMM) air quality policies	Enforcement officer recruited (See action 1.) The officer is increasing compliance of the NRMM regulations on construction sites. All NRMM over a certain size must comply with specific emissions criteria. Increasing compliance leads to a reduction in pollutant emissions.	New Action. Part-time officer has been in place since January 2017, funded by the Mayor's Air Quality Fund.

		An NRMM planning condition is now put on all major developments. NRMM requirements have been written into the Council's newly adopted (Oct 2016) Supplementary Planning Document.	
3	Enforce CHP and biomass air quality policies	The requirements in the London Plan's Sustainable Design and Construction SPG document 2014 for CHP to meet certain emissions standards are now being pursued by applying a planning condition. The requirements have been written into the Council's SPD.	New action since 2016
4	Enforce Air Quality Neutral policies and Monitor sustainable Travel Plans for developments	There is now an "air quality neutral" planning condition that is required for all major developments. The requirements are in the Council's SPD. Performance indicator PITD03 Monitoring Travel Plans for Developments	New action since 2016
5	Enforce Smoke Control Areas	The scientific services team continues to take action where necessary to ensure approved stoves / approved fuel is used in residential chimneys. About 5 complaints are received each year.	There are a lot of properties in the Borough that have wood burning stoves. It is our intention to have an information campaign for residents this winter.
6	Increase the planting of green barriers and vegetation	LIP funding was used to plant 216 trees with the specific aim to improve air quality, and also increase shading.	
7	Control air pollution from industrial /	All our authorised processes were inspected. This year we took back the inspections of petrol stations from the fire	Regional Enterprise Regulatory Services KPI EH02(LAPPC) for

		service. The Borough has 5 crematoria, 66 drycleaners, 1 print-works, 3 vehicle re-sprayers, 2 bulk cement, and 23 petrol station permits.	annual 100% inspection of medium and high risk rated premises.
8	Monitor air quality	The Council continues to monitor for both nitrogen dioxide and PM10 at two continuous monitoring stations. There are also 15 diffusion tubes around the borough. In 2016 a further 10 monitoring locations were chosen to monitor air quality in and around North Finchley air quality focus area, and other locations where magnolia trees were planted to reduce nitrogen dioxide.	Most of the diffusion tubes showed an increase in nitrogen dioxide concentrations in 2016. The roadside site of Tally Ho showed a decrease in NO2 levels. Chalgrove School background site saw an increase (but remains well within the objectives).
9	Regularly brief Director of Public Health (DPH) on air quality issues in Barnet; what is being done, and what is needed.	This has been done, and public health are invited to the air quality action plan steering group meetings.	Action will link Air quality and Health and Wellbeing
10	Director of Public Health to sign off statutory Annual Status Reports and all new Air Quality Action Plans	This ASR will be signed off by the Director of Public Health. He will sign off the final 2017-2022 Air Quality Action Plan once the consultation period on it has ended.	Action will link Air quality and Health and Wellbeing
11	Encourage schools to join the TfL STARS accredited travel planning	Over 90% of schools are STAR accredited. School Junior Travel Ambassadors have helped with anti-idling campaigns	

	programme by providing information on the benefits to schools and supporting the implementation of such a programme		
12	Air quality projects with schools	Amelix Theatre group visited 4 secondary schools in March 2017 to deliver a show to encourage children to travel to school in alternatives to the motor car. Living Streets visited 6 primary and 1 secondary school in the North Finchley air quality focus area to educate children about air quality and walking to school. Anti-idling campaigns are being programmed once a term.	Environmental Health are working with Highways(School travel Team) to deliver this action.
13	Investigate joining North London Freight Consolidation Scheme	A feasibility study was conducted from January to March 2017. It concluded that joining the scheme would be beneficial in reducing delivery miles.	Other related issues such as personal items delivery will be looked at. Procurement have taken steps to reduce the amount of deliveries through consolidation and minimum order value practises.
14	Achieve Bronze accreditation of the Fleet Operator Recognition Scheme (FORS) for the borough's own fleet	This is now planned for September 2017.	The department that runs the Council fleet is in the middle of operational changes, which have put back actions 14, 15 and 16.
15	Investigate the	Aim is to demo vehicles with alternative fuel for Parks &	

		Open Spaces and Street Cleansing Services between September – November 2017. If successful will be introduced in main fleet.	
	possibility of increasing the number of hydrogen, electric, hybrid, bio-methane and other cleaner vehicles in the borough's fleet		
16	Accelerate uptake of new Euro VI vehicles in borough fleet	All new vehicles purchased by L.B.Barnet will be Euro VI, going forward.	The refuse vehicles are currently Euro V with renewal due in 2022. Hope to have about 5 Euro VI vehicles in future. The possible extension of the ULEZ to include Barnet means that acceleration to Euro VI is becoming more important.
17	Safer Urban Driver Training for drivers of vehicles in Borough's fleet i.e. through training of fuel efficient driving and providing regular re-training of staff. This was introduced in 2012 with training from the Energy Savings Trust.	100% of drivers received smarter driver training	Aim to arrange Smarter Driver training for 50 drivers by end of December 2016 and on-going 100% of drivers to receive training
18	Explore the option of extending the	The Council is continuing to brief Councillors on the implications of the ULEZ extension.	This action is considered key to reducing air pollution in Barnet.

			Extending the ULEZ to cover the whole of the Borough for all vehicles is essential.
	Ultra Low Emission Zone (currently proposed to stop at the A406) to cover whole of London Borough of Barnet		
19	Lower the legal speed limit to 20mph in areas close to certain schools	The council is continuing to increase the number of 20mph zones close to schools.	A target of an extra 2km per year.
20	Differential charges for residential parking permits based on pollutant emissions	We implemented emissions based parking permits in 2015-16 and in 2016 introduced an additional surcharge of £10 for diesel cars.	The Council will constantly review its pricing strategy to reflect national, regional and local policies.
21	Improvement of electric vehicle charging point infrastructure	100 new points in next 3 years (2016-2019) The two points at Barnet House serve two electric cars for staff pool car use, as well as for members of the public.	
22	Increase provision of cycle parking	2017-2022	Target of between 50-100 extra cycle spaces per annum. Cabinet agreed in 2016 to improve cycling infrastructure and produce a Cycling Strategy.
23	Encourage modal shift to bicycle through improved bicycle routes and encourage a shift to walking by	2017-2022 Current evidence of 1% modal shift based on 3 years data from TfL. Target of 2,000 children and 250 adults to receive cycle training per year. Since April 2016 we have trained 2263 children in cycling projects at schools, and 622 individuals have attended the adult and family Cycle Skills training;	Regional Enterprise Highways PI HSTD02 target of 3 % of journeys by cycle in 2024 and HSTD01 % increase trips by walking from 29-31% by 2024

	providing safer, more accessible and attractive pedestrian routes.	funded by LIP	Funding for cycle training from TfL has now ended, and alternative revenue streams need to be found.
24	Liaise with Transport for London to explore traffic control actions on TfL-controlled roads	This action has not been progressed this year.	This action is very important as the busiest roads in the Borough are TfL-controlled, and so Tfl is best-placed to take the lead.
25	Liaise with the Highways Agency to explore options for improving air quality on the M1	Progress is slow – the work in 2016/2017 concerning feasibility of Noise and air quality barriers in Mill Hill by Highways England is not yet complete	

3. Planning Update and Other New Sources of Emissions

Table L. Planning requirements met by planning applications in the London Borough of Barnet in 2016

Condition	Number
Number of planning applications reviewed for air quality impacts	200
Number of planning applications required to monitor for construction dust	150 (primarily in construction method statement conditions); 0 for specific dust monitoring
Number of CHPs/Biomass boilers refused on air quality grounds	1
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	5
Number of AQ Neutral building and/or transport assessments undertaken	25
Number of AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	Approximately 30 conditions placed for NRMM; 150 as part of a construction method statement. There are now 14 sites registered. The enforcement officer has visited 19 sites, over the course of 40 visits. At the first visit, they were under 20% compliant (as a percentage of site machinery). By the last visit they are over 80% compliant.

These figures are approximations. We have started to use action codes on our Idox system to capture the numbers, and hopefully we will then have a complete year of data for 2017.

At the London Borough of Barnet Council, there is a system in place to ensure that Environmental Health (Scientific team) review all relevant planning applications. The team reviewed 712 applications in 2016. The vetters put cases through to our admin team who then add the case to our caseload system called Uniform. Standard planning conditions are regularly reviewed with planning colleagues. The scientific team are also consulted on the

"submission of details" planning applications to discharge planning conditions. There is sufficient expertise in the team to appraise consultant reports and recommend approval or refuse applications.

In terms of enforcement, as NRMM conditions are now being put on major developments, we now have the benefit of advising developers that enforcement is a possibility.

3.1   New or significantly changed industrial or other sources

There are new sources identified that are currently at the planning stage. As part of the Brent Cross development, there will be a new waste transfer station.

Appendix A Details of Monitoring Site QA/QC

A.1   Automatic Monitoring Sites

ABN1 and ABN2 are routinely calibrated, serviced and audited to ensure data is as accurate as possible. In 2016, the site audits and data management was carried out by Ricardo Energy and Environment to national standards and operational procedures defined by AURN. Site audits were carried out every six months and post audit the site data was then ratified.

Routine calibrations take place bi-monthly for ABN1 and monthly for ABN2 by Barnet Scientific Officers. Servicing and maintenance is carried out bi-annually by an external contractor. Throughout 2016 the contractor for both sites was Matts Monitors and bi-annual servicing followed the Ricardo Energy and Environment audits.

There was no period of significant data loss in 2016.

PM$_{10}$ Monitoring Adjustment

The TEOM data is corrected using the VCM method.

A.2   Diffusion Tube Quality Assurance / Quality Control

The diffusion tubes used in all London Borough of Barnet sampling are supplied and analysed by Gradko (UKAS 2187) and conform to BS EN 13528 Parts 1-3: 2002/3.

All of the long-term tubes used are prepared using 50% TEA/Acetone and analysed using the UKAS accredited in house method (GLM 9), by continuous flow colorimetric analyser. Gradko participates in the WASP scheme (Workplace Analysis Scheme for Proficiency).

Using the most recent national bias adjustment data (as of April 2017), a bias adjustment factor of 1.03 has been applied to all of the diffusion tubes in the 2016 calendar year. The relevant examples were selected using the spreadsheet workflow by using the same

manufacturer, preparation method and similar site location type. A local bias adjustment was not used as there is only one tube co-located and not triplicate.

A.3   Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

This was not necessary in 2016 as data capture was sufficiently high.

Distance Adjustment

A distance adjustment was required for the following sites that exceeded the objective but was not representative of public exposure:

Tally Ho automatic (5m from relevant exposure; measurement made 1m from kerb) distance adjusted from 44 μgm^{-3} to 38.8 μgm^{-3}

$Cz=((44-28)/(-0.5476 * Ln(1) +2.7171)) \times (-0.5476*Ln(5) +2.7171) + 28$

$= (5.88 \times 1.83)+28 = 38.8$

Tally Ho tube (5m from relevant exposure; measurement made 1m from kerb) distance adjusted from 53.4 μgm^{-3} to 45.1 μgm^{-3}

$Cz = ((53.4-28)/(-0.5476xLn(1) +2.7171)) \times (-0.5476*Ln(5)+2.7171) + 28$

$= 9.34 \times 1.84 + 28$

$= 45.1$

347 Hendon Way (10m from relevant exposure; measurement made 1m from kerb) distance adjusted from 70.2 μgm^{-3} to 50.6μgm^{-3}

$Cz = ((70.2-28)/(-0.5476xLn(1)+2.7171)) \times (-0.5476*Ln(10) + 2.7171) + 28$

$= 15.53x1.46 + 28$

$= 50.6$ μgm^{-3}

The background site used was Chalgrove monitoring station with an annual mean of 28μgm^{-3} for 2016.

This used the calculator on the Defra website created by Air Quality Consultants that follows the procedure set out in Box 2.3 of LAQMTG (09):

Box 2.3: Predicting nitrogen dioxide concentrations at different distances from roads

A method has been developed to allow NO2 measurements made at one distance from a road to be used to predict

concentrations at a different distance from the same road. It is appropriate for distances between 0.1 m and 140 m of the kerb.

Step 1: Identify the local background concentration in µg/m3, either from local monitoring or from the national maps published

at www.airquality.co.uk. (Note that the background concentration must be less than the measured concentration).

Step 2: apply the following calculation

$CZ = ((Cy-Cb) / (-0.5476 \times Ln(Dy) + 2.7171)) \times (-0.5476*Ln(Dz)+2.7171) + Cb$

Where:

Cz is the total predicted concentration (µg/m3) at distance Dz;

Cy is the total measured concentration (µg/m3) at distance Dy;

Cb is the background concentration (µg/m3);

Dy is the distance from the kerb at which concentrations were measured; and

Dz is the distance from the kerb (m) at which concentrations are to be predicted.

Ln(D) is the natural log of the number D.

Results derived in this way will have a greater uncertainty than the measured data. Further assistance with this procedure and

interpretation of the results can be obtained from the Review and Assessment helpdesk (www.uwe.ac.uk/aqm/review).

Appendix B Full Monthly Diffusion Tube Results for 2016

Table N.   NO$_2$ Diffusion Tube Results

Column1	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Average	Data Capture	Bias Adj (1.03)
10 Greggs High St. Barnet			69.84	49.35	54.66	53.01	42.89	52.38	59.20	45.40	55.90	58.00	54.06	83	55.7
12 1295 High St Whetstone	47.99		57.33	45.35	44.10	50.46	46.09	51.32	50.38	43.65	47.09	59.03	49.34	92	50.8
8 Tally Ho Monitoring Stn.	55.44	43.28	51.40	47.63	49.70	49.32	41.89	54.15	59.65	44.80	53.25	71.20	51.81	100	53.4
1 Pointails Close N	41.66	38.80	32.44	39.56	31.12	25.25	24.87	35.33	41.74	39.27	42.64	60.50	37.77	100	38.9
2 Ladbrokes 71 Ballards Lane	44.83	47.48	41.18	45.61	46.15	38.60	36.99	42.59	47.18	44.10	51.59	57.66	45.33	100	46.7
3 Sanders Lane Allotment	27.23	26.79	18.33	21.33	15.09	13.52	14.18	19.43		21.37	39.15	21.37	21.62	92	22.3
13 1 Courtland Avenue	50.11	32.96	31.03	29.55		29.55	25.03	32.57	33.58	30.10	40.79	30.10	33.22	92	34.2
14 William Hill, Station Rd, Edgware	57.60	54.46	49.37	55.63	53.02	46.18	42.91	52.80	59.35	50.83	64.46	50.83	53.12	100	54.7
5 St. James School	31.80	33.15	24.85	30.66	25.95	19.13	17.66	25.87	31.26	29.17	39.77	46.47	29.65	100	30.5
9 52 Golders Green Rd	49.10	58.42	51.47	51.29	60.67	35.21	42.74	45.94	53.73	55.31	61.96	56.95	51.90	100	53.5
17 Coach Stop at			58.64	57.70	55.03	52.16	48.45	59.99	58.86	49.04	57.63	69.48	56.70	83	58.4

Golders Green Station														
18 Back of Golders Green Bus Station	58.93	45.52	39.30	47.06	39.70	52.35	51.19	52.47	46.79	40.77	47.52	63.89	48.79	100	50.3
20 16 Cricklewood Lane	60.30	47.56	53.95	55.75	45.77	52.69	46.34	56.95	61.14	47.70	49.63	66.01	53.65	100	55.3
19 Tilling Rd Rear Of Dyson Court	57.73	44.98	31.18	46.73	50.04	44.36	49.34	53.46	55.05	51.35	63.72	60.09	50.67	100	52.2
6 349 Hendon Way	71.88	72.60	34.03	65.89	65.47	66.86	65.43	77.46	75.28	63.75	72.37	87.25	68.19	100	70.2