

# Hammersmith and Fulham Council Air Quality Annual Status Report for 2021

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This report provides a detailed overview of air quality in Hammersmith & Fulham during 2021. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process<sup>1</sup>.

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<sup>1</sup> LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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## Abbreviations

<b>Abbreviation</b>	<b>Description</b>
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
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 <sub>10</sub>	Particulate matter less than 10 micron in diameter
PM <sub>2.5</sub>	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**

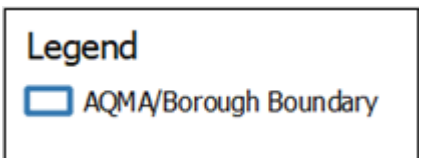
Pollutant	Standard / Objective (UK)	Averaging Period	Date <sup>(1)</sup>
Nitrogen dioxide (NO <sub>2</sub> )	200 µg m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
Nitrogen dioxide (NO <sub>2</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2005
Particles (PM <sub>10</sub> )	50 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
Particles (PM <sub>10</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2004
Particles (PM <sub>2.5</sub> )	25 µg m <sup>-3</sup>	Annual mean	2021
Particles (PM <sub>2.5</sub> )	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2021
Sulphur dioxide (SO <sub>2</sub> )	266 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO <sub>2</sub> )	350 µg m <sup>-3</sup> not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO <sub>2</sub> )	125 µg m <sup>-3</sup> not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

**Notes:**

(1) Date by which to be achieved by and maintained thereafter



Figure 1: AQMA Boundary (Entire borough)



# 1. Air Quality Monitoring

## 1.1 Locations

**Table B. Details of Automatic Monitoring Sites for 2021**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
HF4	Shepherd's Bush	523313	179900	Roadside	Y	6	2	2	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; TEOM for PM <sub>10</sub> until 23/11/2021 and then Continuous Beta attenuation Particulate Monitor (BAM) for PM <sub>10</sub>
HF5	Hammersmith Town Centre	523343	178567	Roadside	Y	3.7	1.2	2.3	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , O <sub>3</sub>	Chemiluminescent; Continuous Beta attenuation Particulate Monitor (BAM) for PM <sub>10</sub> and PM <sub>2.5</sub> , UV absorption



**Figure 2. Shepherds Bush Automatic Monitoring Site**

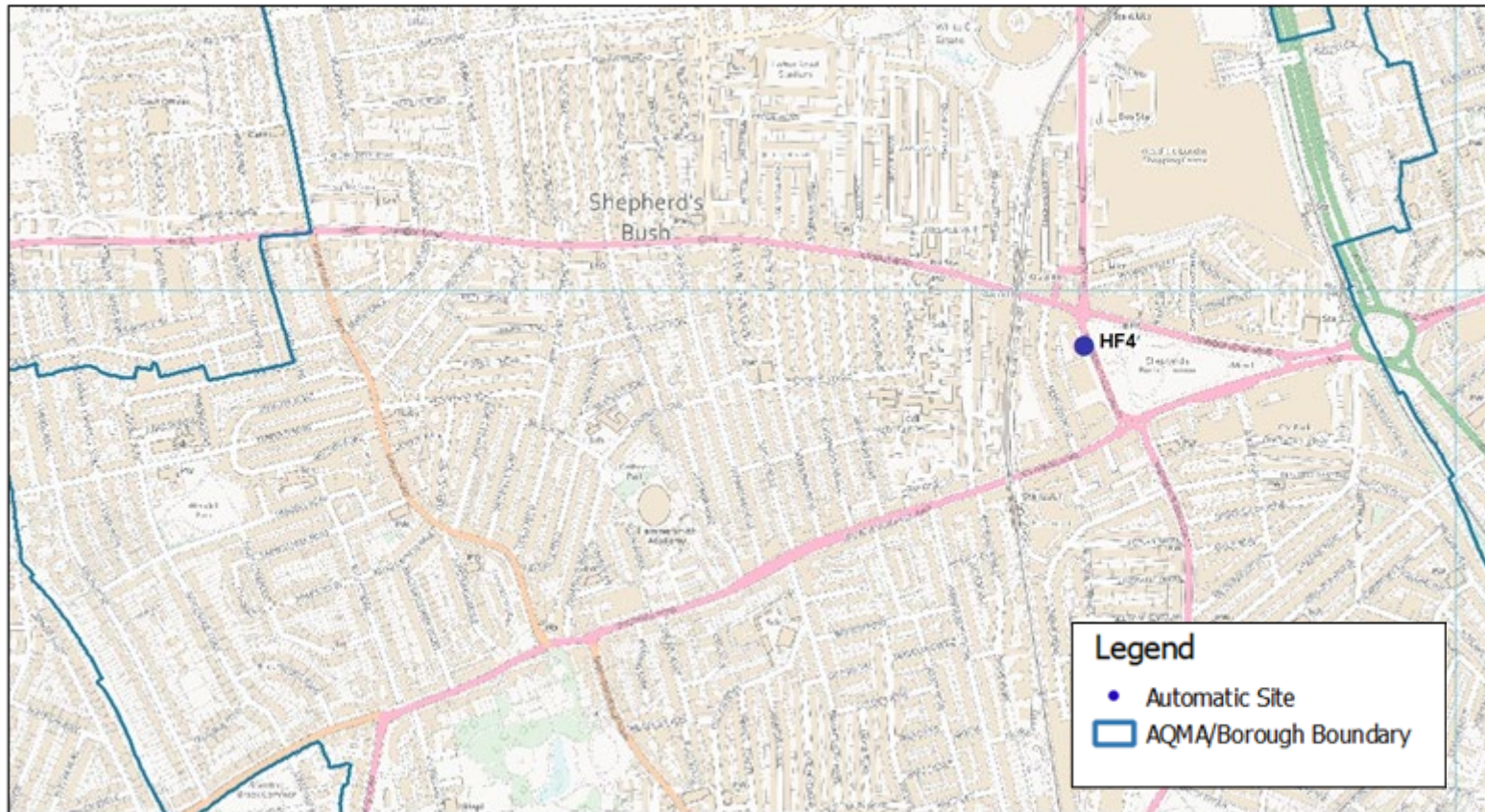
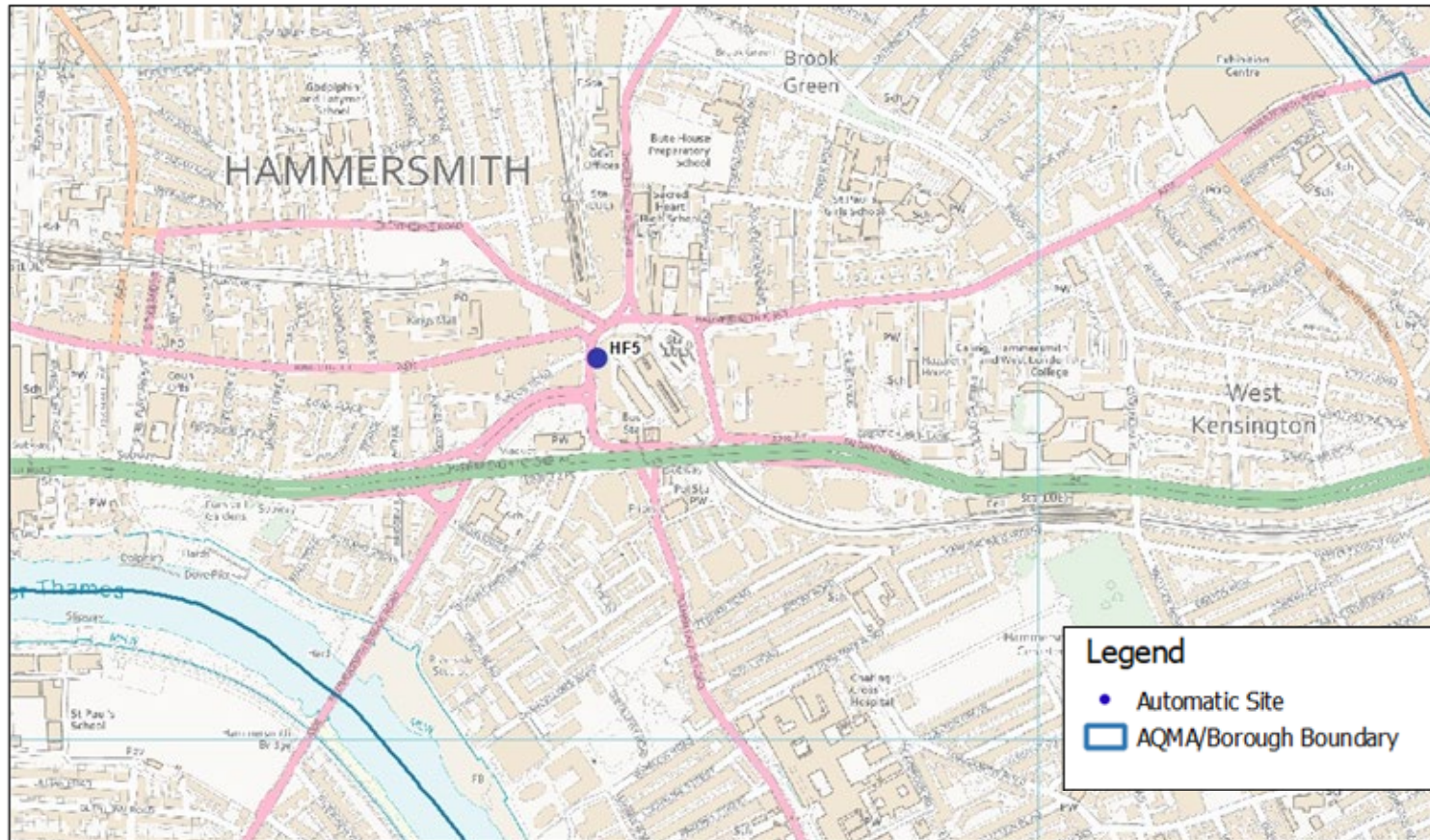




Figure 3. Hammersmith Town Centre Automatic Monitoring Site



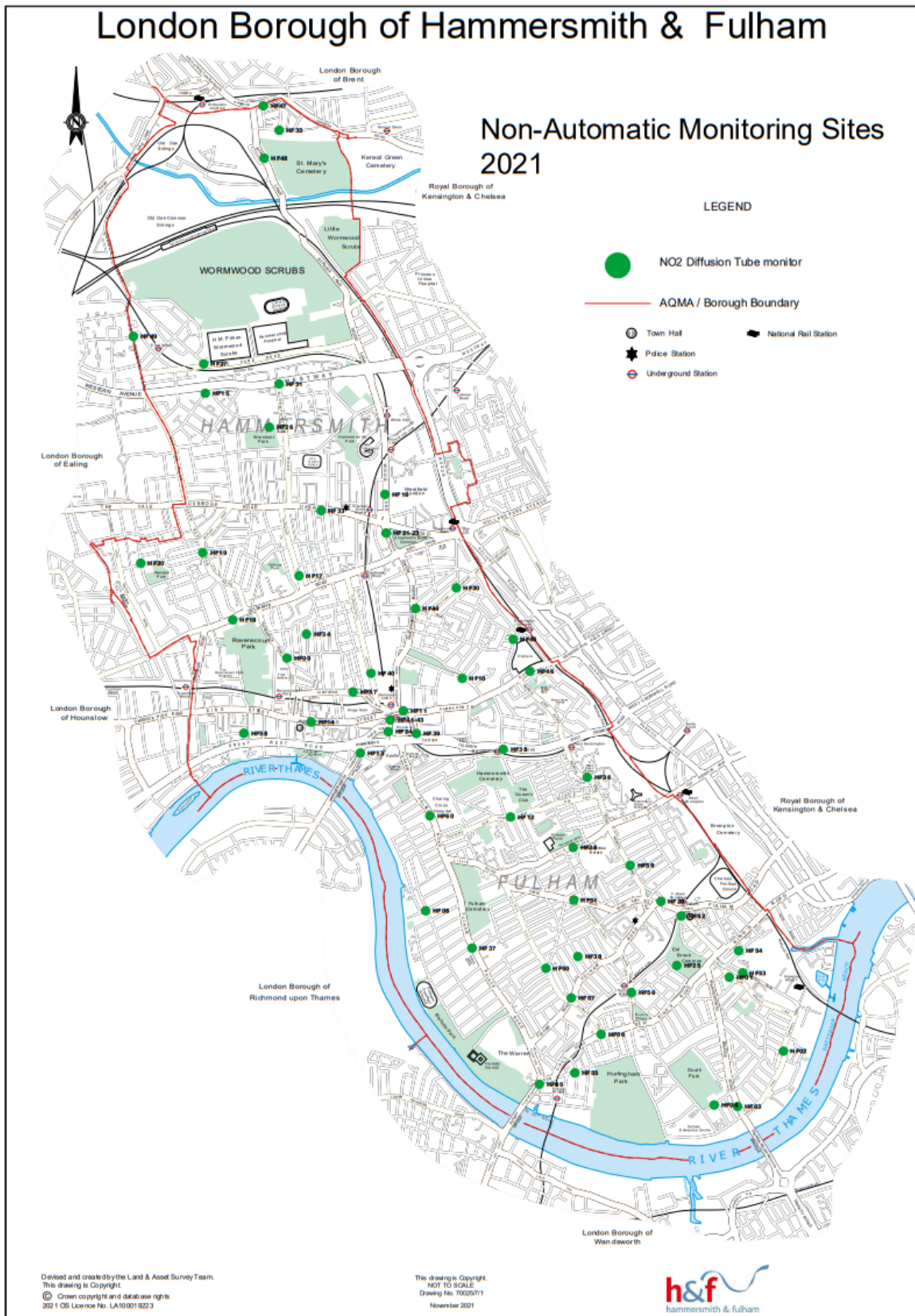
**Table C. Details of Non-Automatic Monitoring Sites for 2021**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance 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)
HF01	Bagleys Lane	525760	176732	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF02	Townmead Road	526146	176205	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF03	Wandsworth Bridge Road	525819	175810	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF04	Hugon Road	525652	175821	Urban Background	Y	3	1	2.5	NO <sub>2</sub>	N
HF05	Fulham High Street	524406	175969	Roadside	Y	5	2	2.5	NO <sub>2</sub>	N
HF06	New Kings Road	524846	176325	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF07	Fulham Road	524633	176585	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF08	Lysia Street	523595	177206	Urban Background	Y	5	1	2.5	NO <sub>2</sub>	N
HF09	Paddenswick Road	522606	179008	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF10	Brook Green Road	523856	178863	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF11	Hammersmith Road (west)	523436	178632	Roadside	Y	0	5	2.5	NO <sub>2</sub>	N
HF12	Greyhound Road	524200	177875	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF13	Hammersmith Bridge Road	523129	178331	Roadside	Y	21	3	2.5	NO <sub>2</sub>	N
HF14	King Street	522777	178551	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF15	Hemlock Road	522024	180896	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF16	Wood Lane	523305	180176	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF17	Coningham Road	522693	179595	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF18	Goldhawk Road	522220	179281	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N

HF19	Askew Road	522006	179760	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF20	Lefroy Road	521564	179685	Urban Background	Y	3	1	2.5	NO <sub>2</sub>	N
HF 21/22/23	Shepherd's Bush AQMS	523313	179900	Roadside	Y	6	2	2.5	NO <sub>2</sub>	Y – Triplicate co-location
HF24 (HF32)	Queen Caroline Street	523329	178484	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF 25 (HF44)	Eel Brook Common	525386	176816	Urban Background	Y	45	32	2.5	NO <sub>2</sub>	N
HF 26 (HF45)	Bryony Road	522480	180655	Urban Background	Y	8	1	2.5	NO <sub>2</sub>	N
HF27 (HF47)	Wulfstan Street	522013	181106	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF28 (HF48)	Lillie Road	524647	177657	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF29 (HF50)	Fulham Broadway	525273	177273	Roadside	Y	3	4.7	2.5	NO <sub>2</sub>	N
HF30 (HF53)	Addison Gardens	523801	179498	Urban Background	Y	5	1	2.5	NO <sub>2</sub>	N
HF31 (HF54)	Bloemfontein Road	522550	180963	Roadside	Y	5	3	2.5	NO <sub>2</sub>	N
HF32 (HF60)	Waldo Road	522550	182790	Urban Background	Y	4	1	2.5	NO <sub>2</sub>	N
HF33 (HF61)	Uxbridge Road	522850	180060	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF34 (HF62)	Cardross Street	522745	179179	Urban Background	Y	3	1	2.5	NO <sub>2</sub>	N
HF35 (HF63)	Talgarth Road	524148	178358	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF36 (HF64)	North End Road	524747	178158	Roadside	Y	3.7	1	2.5	NO <sub>2</sub>	N
HF37 (HF65)	Fulham Palace Road (south)	523926	176940	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF38 (HF66)	Radipole Road	524680	176880	Urban Background	Y	5	1	2.5	NO <sub>2</sub>	N

HF39	Butterwick (a)	523529	178470	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF40	Hammersmith Grove	523050	179549	Roadside	Y	8	1	2.5	NO <sub>2</sub>	N
HF41/42/43	Hammersmith Town Centre (AQMS)	523343	178567	Roadside	Y	1.5	1.5	2.3	NO <sub>2</sub>	Y – Triplicate co-location
HF44	Shepherds Bush Road	523687	178446	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF45	Maclise Road	523705	178448	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF46	Hammersmith Road (east)	524339	178914	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF47	Harrow Road	522437	182947	Roadside	Y	2	1	2.5	NO <sub>2</sub>	N
HF48	Scrubs Lane	522444	182573	Roadside	Y	3	1	2.5	NO <sub>2</sub>	N
HF49	Old Oak Common Lane	521511	181302	Roadside	Y	3.5	1.5	2.5	NO <sub>2</sub>	N
HF50	Munster Road	524453	176796	Roadside	Y	2	1	2.5	NO <sub>2</sub>	N
HF51	Dawes Road	524652	177283	Roadside	Y	4	1	2.5	NO <sub>2</sub>	N
HF52	Harwood Road	525417	177168	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF53	Imperial Road	525856	176763	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF54	Waterford Road	525827	176921	Roadside	Y	2	1	2.5	NO <sub>2</sub>	N
HF55	Hurlingham Road	524659	176050	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF56	Parsons Green Lane	525062	176623	Roadside	Y	1.5	1	2.5	NO <sub>2</sub>	N
HF 57	Glenthorne Road	523077	178767	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF 58	St Peters Road	522299	178472	Roadside	Y	5	1	2.5	NO <sub>2</sub>	N
HF 59	North End Road	525053	177530	Roadside	Y	2.5	1	2.5	NO <sub>2</sub>	N
HF 60	Fulham Palace Road (north)	523625	177883	Roadside	Y	3.3	5	2.75	NO <sub>2</sub>	N

Figure 4. Non-Automatic Monitoring Sites





## 1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for “annualisation” and for distance to a location of relevant public exposure (if required), the details of which are described in Appendix A.

**Table D. Annual Mean NO<sub>2</sub> Ratified and Bias-adjusted Monitoring Results**

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020	2021	2021 distance corrected
HF4	Automatic	99.58	99.58	<b>80.3</b>	<b>76.0</b>	<b>78.9</b>	<b>77.0</b>	<b>71.0</b>	<b>60</b>	<b>43</b>	<b>41</b>	36.5
HF5	Automatic	95.41	95.41	-	-	-	-	-	<b>53</b>	37	<b>44</b>	<b>40.9</b>
HF01	Diffusion tube	75	75	-	-	-	37.4	33.1	36.7	22.7	23.2	
HF02	Diffusion tube	67	67	-	-	-	<b>47.5</b>	<b>46.9</b>	<b>49.2</b>	28.9	26.5	
HF03	Diffusion tube	67	67	-	-	-	<b>87.1</b>	<b>74.3</b>	<b>76.9</b>	<b>54.7</b>	<b>48.2</b>	38.8
HF04	Diffusion tube	42	42	-	-	-	30.0	27.6	28.3	18.6	18.5	
HF05	Diffusion tube	75	75	-	-	-	<b>54.3</b>	<b>53.1</b>	<b>48.8</b>	38.6	<b>40.9</b>	35.3
HF06	Diffusion tube	67	67	-	-	-	<b>56.3</b>	<b>45.5</b>	<b>46.8</b>	28.9	30.7	
HF07	Diffusion tube	75	75	-	-	-	<b>61.0</b>	<b>53.4</b>	<b>59.6</b>	39.8	<b>42.4</b>	36.9
HF08	Diffusion tube	67	67	-	-	-	27.9	27.1	27.4	16.9	17.6	
HF09	Diffusion tube	75	75	-	-	-	<b>44.4</b>	<b>42.2</b>	35.5	25.5	30.4	
HF10	Diffusion tube	67	67	-	-	-	35.7	32.0	31.3	20.2	22.5	

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020	2021	2021 distance corrected
HF11	Diffusion tube	75	75	-	-	-	<u>78.6</u>	<u>74.8</u>	<u>69.1</u>	43.1	46.0	44.5
HF12	Diffusion tube	58	58	-	-	-	34.2	32.2	32	21.2	21.3	
HF13	Diffusion tube	75	75	-	-	-	<u>64.1</u>	<u>48.4</u>	35.8	27.5	24.7	
HF14	Diffusion tube	75	75	-	-	-	<u>60.1</u>	<u>51.9</u>	<u>53.8</u>	38.8	<u>44.7</u>	36.5
HF15	Diffusion tube	75	75	-	-	-	35.1	31.1	31	19.3	21.6	
HF16	Diffusion tube	75	75	-	-	-	<u>58.9</u>	<u>51.5</u>	<u>51.2</u>	33.2	<u>48.6</u>	<u>41.2</u>
HF17	Diffusion tube	75	75	-	-	-	<u>40.2</u>	35.3	36.1	22.6	25.1	
HF18	Diffusion tube	83	83	-	-	-	<u>60.8</u>	<u>49.3</u>	38.6	24.2	27.7	
HF19	Diffusion tube	67	67	-	-	-	<u>57.5</u>	<u>50.1</u>	<u>49.7</u>	32.5	33.3	
HF20	Diffusion tube	67	67	-	-	-	31.4	30.3	32.2	18.4	19.7	
HF 21/22/23	Diffusion tube	50	50	-	-	-	-	<u>64.4</u>	<u>58.1</u>	38.6	32.8	
HF24 (HF32)	Diffusion tube	83	83	<u>78.8</u>	<u>77.5</u>	<u>79.9</u>	<u>72.9</u>	<u>62.2</u>	<u>55.6</u>	34.4	36.4	34.4
HF 25 (HF44)	Diffusion tube	67	67	29.6	28.5	32.7	31.9	26.2	26.7	17.5	17.8	
HF 26 (HF45)	Diffusion tube	83	83	35.1	34.1	39.6	36.7	31.2	32.4	18.3	20.7	
HF27 (HF47)	Diffusion Tube	83	83	<u>46.0</u>	<u>45.4</u>	<u>46.9</u>	<u>46.6</u>	39.8	39	25.3	26.0	

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020	2021	2021 distance corrected
HF28 (HF48)	Diffusion Tube	83	83	49.1	44.5	52.3	44.8	41.7	40.5	25.8	29.8	
HF29 (HF50)	Diffusion Tube	67	67	<u>65.0</u>	<u>60.3</u>	<u>68.3</u>	<u>56.3</u>	<u>47.8</u>	<u>53.9</u>	34.5	34.8	
HF30 (HF53)	Diffusion Tube	83	83	32.5	32.6	38.2	<u>42.1</u>	31.5	34.3	22.3	26.2	
HF31 (HF54)	Diffusion Tube	83	83	<u>80.7</u>	<u>76.6</u>	<u>84.3</u>	<u>76.8</u>	<u>68.1</u>	<u>59.6</u>	38.3	<u>43.3</u>	38.7
HF32 (HF60)	Diffusion Tube	67	67	39.2	37.6	<u>40.8</u>	<u>40.6</u>	34.5	36.7	23.1	21.5	
HF33 (HF61)	Diffusion Tube	75	75	<u>45.8</u>	<u>45.9</u>	<u>49.4</u>	<u>42.6</u>	38.7	37.3	23.1	25.7	
HF34 (HF62)	Diffusion Tube	83	83	31.8	30.7	34.4	37.0	27.4	28.2	17.9	20.7	
HF35 (HF63)	Diffusion Tube	83	83	<u>56.1</u>	<u>49.8</u>	<u>59.8</u>	<u>50.9</u>	<u>47.4</u>	<u>44.2</u>	27.5	29.7	
HF36 (HF64) <sup>e</sup>	Diffusion Tube	75	75	-	-	-	<u>58.8</u>	<u>54.2</u>	<u>51.8</u>	<u>41.1</u>	33.5	
HF37 (HF65)	Diffusion Tube	58	58	<u>57.7</u>	<u>57.1</u>	<u>68.6</u>	<u>53.0</u>	<u>48.3</u>	<u>50.8</u>	32.0	38.8	31.9
HF38 (HF66)	Diffusion Tube	58	58	33.2	31.5	34.6	32.9	31.2	30.3	19.2	20.4	
HF39	Diffusion Tube	83	83	-	-	-	-	<u>69.4</u>	<u>60.5</u>	37.6	<u>44.3</u>	39.5
HF40	Diffusion Tube	67	67	-	-	-	-	-	=	22.4	20.1	
HF41/42/43	Diffusion Tube	67	67	-	-	-	-	-	=	<u>43.8</u>	<u>44.1</u>	<u>42.1</u>
HF44	Diffusion Tube	75	75	-	-	-	-	-	=	23.2	27.7	

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020	2021	2021 distance corrected
HF45	Diffusion Tube	75	75	-	-	-	-	-	-	22.7	26.0	
HF46	Diffusion Tube	83	83	-	-	-	-	-	-	<b>41.3</b>	<b>45.5</b>	<b>40.8</b>
HF47	Diffusion Tube	83	83	-	-	-	-	-	-	25.4	28.1	
HF48	Diffusion Tube	83	83	-	-	-	-	-	-	31.4	35.6	
HF49	Diffusion Tube	83	83	-	-	-	-	-	-	25.9	29.8	
HF50	Diffusion Tube	67	67	-	-	-	-	-	-	26.4	26.0	
HF51	Diffusion Tube	67	67	-	-	-	-	-	-	26.8	28.9	
HF52	Diffusion Tube	83	83	-	-	-	-	-	-	<b>50.8</b>	<b>46.4</b>	38.2
HF53	Diffusion Tube	67	67	-	-	-	-	-	-	21.61	24.3	
HF54	Diffusion Tube	67	67	-	-	-	-	-	-	22.4	21.0	
HF55	Diffusion Tube	58	58	-	-	-	-	-	-	18.4	23.5	
HF56	Diffusion Tube	83	83	-	-	-	-	-	-	24.8	29.1	
HF57	Diffusion Tube	83	83	-	-	-	-	-	-	-	27.0	
HF58	Diffusion Tube	83	83	-	-	-	-	-	-	-	21.1	
HF59	Diffusion Tube	58	58	-	-	-	-	-	-	-	25.5	

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020	2021	2021 distance corrected
HF60	Diffusion Tube	75	75	-	-	-	-	-	-	-	<b>40.1</b>	37.9

During 2018 a number of the diffusion tube monitoring sites were re-named to provide consistency within the current network. Where site IDs were updated the previous site ID is shown in brackets below the current site ID..

**Notes:**

The annual mean concentrations are presented as  $\mu\text{g m}^{-3}$ .

Exceedances of the NO<sub>2</sub> annual mean AQO of  $40 \mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of  $60 \mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Results have been distance corrected where applicable.

(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%).



During 2021, the UK was still affected by the Covid-19 pandemic which is likely to have impacted the air quality results for 2021. The council is monitoring nitrogen dioxide at 56 locations across the borough. This includes four new locations that were added to the diffusion tube monitoring in 2021, of these the Fulham Palace Road (HF60) result is close to exceeding the annual mean objective at  $37.9 \mu\text{g m}^{-3}$ . Only five locations exceeded the annual mean after distance correction was applied: Hammersmith Road (A315) HF11 and HF46; Hammersmith Town Centre Triplicate diffusion tube location (HF41/42/43) and automatic monitor (HF5); and (HF16) Wood Lane. There were no results over  $60 \mu\text{g m}^{-3}$ , which would indicate a potential exceedance of the NO<sub>2</sub> hourly mean objective.

**Table E. NO<sub>2</sub> Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2015	2016	2017	2018	2019	2020	2021
HF4	99.58	99.58	<b>19</b>	<b>33</b>	<b>20</b>	8	4	0	0
HF5	95.41	95.41	-	-	-	-	2	1	2

**Notes**

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m<sup>-3</sup> have been recorded.

Exceedance of the NO<sub>2</sub> short term AQO of 200 µg m<sup>-3</sup> over the permitted 18 hours per year are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%)

Automatic monitoring results show that the borough has complied with the 1-hour mean objective since 2018 and this trend continues.

**Table F. Annual Mean PM<sub>10</sub> Automatic Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2015	2016	2017	2018	2019	2020	2021
HF4	94.47	94.47	25.0	27.4	38.0	26.4	25	28	34
HF5	93.64	93.64	-	-	-	-	22	19	19

**Notes**

The annual mean concentrations are presented as µg m<sup>-3</sup>.

Exceedances of the PM<sub>10</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 25%.

(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%).

There were several active construction sites in close vicinity to the monitoring station at HF4 at Shepherds Bush, which will have affected the results for 2020 and 2021. HF5 at Hammersmith Town Centre recorded lower levels of PM10 than in 2019, likely affected by lockdown periods in 2020 and 2021.

**Table G. PM<sub>10</sub> Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM<sub>10</sub> 24-Hour Means > 50 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2015	2016	2017	2018	2019	2020	2021
HF4	94.47	94.47	10	17	14	4	11	13	<b>55</b>
HF5	93.64	93.64	-	-	-	-	5	5	1

**Notes**

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50 µg m<sup>-3</sup> over the permitted 35 days per year) are shown in **bold**.

Where the period of valid data is less than 85% of a full year, the 90.4th percentile is provided in brackets.

(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%).

There were several active construction sites in close vicinity to the monitoring station at HF4 at Shepherds Bush, which may have affected the results for 2020 and 2021

**Table H. Annual Mean PM<sub>2.5</sub> Automatic Monitoring Results ( $\mu\text{g m}^{-3}$ )**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	2015	2016	2017	2018	2019	2020	2021
HF5	94.53	94.53	-	-	-	-	15	14	11

**Notes**

The annual mean concentrations are presented as  $\mu\text{g m}^{-3}$ .

Exceedances of the PM<sub>2.5</sub> annual mean AQO of  $25 \mu\text{g m}^{-3}$  are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture is less than 75% and more than 25%.

(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%).

PM<sub>2.5</sub> results show a downward trend from 2019 (when monitoring commenced) to 2021, however results in 2020 and 2021 were likely to be impacted by changes to travel during the covid pandemic.



**Table I. O<sub>3</sub> Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 8-Hour Means > 100 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>a</sup>	Valid data capture 2021 % <sup>b</sup>	8 hour running mean > 100 µg m-3 2020	8 hour running mean > 100 µg m-3 2021
HF5	87.87	87.87	2	2

**Notes**

Exceedances of the O<sub>3</sub> objective are shown in **bold** (8 hour running mean >100 -10 allowed a year).

(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%).

Exceedance of the 8-hour running mean occurred two times at HF5 in 2021, the same number of exceedances were recorded in 2020, remaining below the objective.

## 2. Action to Improve Air Quality

### 2.1 Air Quality Action Plan Progress

Table J provides a brief summary of Hammersmith and Fulham progress against the Air Quality Action Plan, showing progress made this year.

**Table J. Delivery of Air Quality Action Plan Measures**

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
1	Cleaner Transport	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Encourage improved availability of alternative fuels</p>	<p>a) The Council continue to work with Source London to provide 7 &amp; 22 kWh Chargepoints. This includes expansion of existing sites (from single to dual charge points) and the development of 49 new sites through 2022.</p> <p>b) The Council continue to explore opportunities to develop Rapid Charging in the Borough. We have delivered a total 13 50 kWh rapid charge points across the borough, including 3 'mini charging hubs' with 3 x 50kWh rapid charge points each.</p> <p>c) The Council delivered 700 new lamp column charge points by December 2021 and has most recently secured funding to further expand the network to deliver up to 3,000 additional charge points by March 2023.</p> <p>d) Through an Innovate UK led project, working with Liberty Charge, the Council have delivered 112 active</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>charge points with passive provision complete to enable future site expansion.</p> <p>e) The Council have installed 23 public charge points to serve both fleet vehicles and offer additional facilities for public charging.</p> <p>f) To support future development of a fully electric Car Club fleet in the Borough, we are working directly with Enterprise and Liberty Charge to introduce 'Car Club Mobility Hubs' and convert all existing car club vehicles to electric. The Council are also working towards the electrification of 20 fixed car club sites.</p> <p>g) The Council has installed 43 power points for street traders in North End Road, enabling them to switch from fossil fuel generators or gas cooking appliances to greener energy sources.</p> <p>h) H&amp;F is home to the UK's first flagship EV hub, at Shell Fulham. The converted petrol station features nine ultra-rapid 175kWh charge points that run on 100% renewable electricity – removing sale of all traditional fuels. These charge points can take most EV batteries from 0-80% in 10 minutes. <a href="#">Fulham now home to the world's first Shell EV charging hub   LBHF</a></p>
2	Cleaner Transport	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Provide incentives for use of alternative fuels</p>	<p>Emissions based charging for pay and display was introduced in March 2021. This included a diesel surcharge of £1. The charges are shown at website <a href="#">Emissions based parking charges   LBHF</a></p>

Measure	LLAQM Action Matrix Theme	Action	<p><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>Free resident parking permits continue to be provided for fully electric vehicles and publicised at the webpage <a href="#">Green vehicle permits   LBHF</a>.</p> <p>The Council is about to introduce a 50% discount on business and trader permits for green vehicles to make them in line with the resident green permit scheme. In addition, businesses/market traders with fully electric vehicles will be entitled to a free permit.</p>
3	Delivery Servicing and Freight	<p>Reducing Emissions at its source</p> <p>Promote travel plans to encourage a switch to low emission vehicles</p>	<p>As part of Hammersmith BID MAQF business LEN Project the Council engaged with businesses, on developing last mile zero emission delivery schemes. In 2019 H&amp;F launched 'Parcels Not Pollution' a ground-breaking scheme that reduces the number of goods vehicles travelling into and within our town centres. Goods are redirected from source to a freight hub outside of the borough, consolidated and re-delivered by ecargo-bike for the last mile to customers across the borough. A number of the council's services use the service with plans to support more services, reducing the council's direct emissions.</p> <p>As part of a previous project Clean Air Villages 2, The council worked with Zipcar, Fulham Broadway BID and Cross River Partnership to launch an electric van service for small businesses in Fulham in March 2021, to reduce air pollution from local businesses. The electric van continues to be available to use for qualifying businesses based in Fulham including market traders on North End Road</p>

Measure	LLAQM Action Matrix Theme	Action	<p><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>Market. <a href="#">H&amp;F launches pollution-busting electric van service for local businesses   LBHF</a></p> <p>Since January 2021, 159 trips have been made and 2188 miles driven. by local businesses joined up to the scheme with the van in Fulham Broadway. For Shepherds Bush where a van has been available since January 2022, 39 trips have been made by businesses in the van, equating to 575 miles driven.</p> <p>The Shepherds bush van was delivered in January 2022 as part of the Clean Air Villages 3 (CAV3) project. For Park Royal two new shared electric vans have been available from March 2022 for businesses based in H&amp;F.</p>
4	Borough Fleet	<p>Reducing Emissions at its source</p> <p>Reduce emissions from the Council fleet</p>	<p>From February 2022 seventy-five percent of the council's ground maintenance vehicles will be electric by the end of the year, along with all handheld tools, to improve air quality. The switch to electric power is also estimated to reduce carbon emissions by 51 per cent .<a href="#">H&amp;F parks go electric to improve air quality and reduce noise   LBHF</a></p> <p>As detailed in action 3 response, Hammersmith BID MAQF business LEN Project involved the Council engaging with businesses, on developing last mile zero emission delivery schemes. H&amp;F launched 'Parcels Not Pollution' a ground-breaking scheme that reduces the number of goods vehicles travelling into and within our town centres. A number of the council's services use the service with plans to support more services, reducing the council's direct</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>emissions. This includes placing and collecting the council's air quality nitrogen dioxide diffusion tubes from 2020.</p> <p>The Councils fleet and waste contractors' fleet have implemented the following measures:</p> <p>18 council fleet vehicles now fully electric (approx. 14% of fleet)</p> <p>Work ongoing with council fleet users to transition to zero or lower emission lease vehicles (or reduce number of vehicles needed for operations).</p> <p>Previously there were 14 7/11 kw chargers plus the HGV workshop points at Bagley's Lane depot. Additionally, we are commissioning 6 x 7kw solo, 3 x 22kw solo and 2 x 50kw dual chargers at this depot. Discussions ongoing with UK Power network regarding capacity requirements for further in depot points.</p> <p>1 x 3 kw charger installed at Normand Park out depot with one more planned</p> <p>1 x 7kw charger installed at Wormwood Scrubs out depot with further being planned</p> <p>All waste contract vehicles ULEZ compliant. In addition to the supervisor vans previously described waste contractor has an additional 3 x 3.5 tonne cage tipper vehicles, 1 x electric panel van, and 1 x electric refuse collection vehicles (ERCV)</p> <p>The council ran about 75 Dr Bikes across the year, 5 hours every Saturday from 10-3 alternating between Ravenscourt Park and Normand Park and averaging 15 bikes per</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>session. The Council also ran Dr Bikes for 3 months alongside our adult cycle training (4 days a week), averaging 3 bikes a day. We started a weekly Dr Bike outside the Nourish Hub on St Ann's Road in March 2022, averaging 3 bikes per session. Additionally, the Council ran Dr Bikes for special events including the Transport Climate Day in October 2021 (we did around 30 bikes) and Hammersmith BID's sustainable Christmas Markets (around 5 bikes per market).</p>
5	Cleaner Transport	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Seek a reduction in emissions from the bus fleet</p>	<p>From June 2021, 20 hydrogen fuel cell double decker buses are running through the borough on Route 7 between East Acton and Oxford Circus. Passengers will benefit from smoother, quieter journeys due to fewer vibrations and will be able to take advantage of free-to-use USB charging points <a href="#">Mayor launches England's first hydrogen double decker buses   London City Hall</a></p>
6	Cleaner Transport	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Encourage the use of vehicles with smaller, more efficient engines</p>	<p>As discussed in Action 2 emissions-based charging for pay and display was introduced in March 2021. This included a diesel surcharge of £1. The charges are shown at website <a href="#">Emissions based parking charges   LBHF</a></p> <p>Free parking permits continue to be provided for fully electric vehicles, details can be found at the webpage <a href="#">Green vehicle permits   LBHF</a>.</p> <p>Planning work was completed for a new scheme to introduce a 50% discount on business and trader permits for green vehicles to make them in line with the resident</p>

Measure	LLAQM Action Matrix Theme	Action	<p><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			green permit scheme. In addition, businesses/market traders with fully electric vehicles will be entitled to a free permit.
7	Delivery Servicing and Freight	<p>Reducing Emissions at its source</p> <p>Seek to reduce emissions from larger vehicles (Low Emission Zone)</p>	<p>South Fulham TCPR (Traffic, Congestion and Pollution Reduction Scheme) introduced in July 2020, traffic reduced by 75% on streets east of Wandsworth Bridge Road and by 12% on Wandsworth Bridge Road.</p> <p>DEFRA funded Clean Air Villages 3 (CAV3) project produced Ultra Low Emission Supplier Directories for Hammersmith Town Centre, Fulham Town Centre and Shepherds Bush Town Centre Clean Air Villages (<a href="http://crossriverpartnership.org">crossriverpartnership.org</a>), 1 x Shared Electric Vans for Shepherds Bush for use by H&amp;F based businesses.</p> <p>H&amp;F were successful in their joint bid with other London Boroughs and Business Improvement Districts (BIDs) for DEFRA funding round 2020-21 for CAV4., submitted by Cross River Partnership. This is an expansion on Clean Air Village 1,2 and 3 Projects - engagement and behavioural change project to reduce emissions from the delivery of goods and services for businesses, hospitals and communities. <a href="#">Clean Air Villages 4 - Cross River Partnership</a></p> <p>This project is focusing on hospital emissions in Hammersmith and Fulham and will run until summer 2022.</p> <p>As part of a previous project Clean Air Villages 2, The council worked with Zipcar, Fulham Broadway BID and Cross River Partnership to launch an electric van service for</p>



Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>small businesses in Fulham in March 2021, to reduce air pollution from local businesses. The electric van continues to be available to use for qualifying businesses based in Fulham including market traders on North End Road Market. <a href="#">Electrifying Fulham Businesses   Zipcar</a></p> <p>Additionally for Park Royal two shared electric business vans have been available from March 2022.</p> <p>Parcels not pollution scheme, an emissions free delivery service, which results from a partnership between Hammersmith and Fulham Council, Hammersmith BID, Transport for London and e-cargo bikes continues to operate across the borough. Parcels Not Pollution made almost 4 tonnes of CO2 savings across the year (3.99 tonnes).</p>
8	Public Health and awareness raising	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Seek to reduce emissions from badly maintained vehicles</p>	<p>For 2021 Community enforcement officers served 7 notices for idling and 110 complaints were received regarding idling. There are 59 enforcement officers.</p>
9	Public Health and awareness raising	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Encourage more environmentally friendly driving behaviour</p>	<p>The Council has continued progress in addressing speeding concerns across the borough and has recently completed the extension of 20mph speed limits on New Kings Road, Putney Bridge, Wandsworth Bridge Road and Wandsworth Bridge. Work also continues on reviewing compliance at locations where there has been high exceedance of the speed limit and where there is a continuing record of collisions. Plans are ongoing for the conversion of speed “cushions” to more effective sinusoidal humps where</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>suitable, and the consideration of traffic calming measures following interest or requests received from residents</p> <p>A minimum of 600 anti-idling signs were erected around the borough in 2019. All schools in the borough now have anti-idling signage. The amount of signs at each school is dependent on how many roads around it would allow waiting/parking. Signs were not placed where a school borders an A road with no wait/no load at any time restrictions are in force, because traffic are not allowed to stop there anyway.</p> <p>The Council continues to participate in the three-year MAQF 3 No Idling project during the period 2019 to 2022. During the pandemic this has consisted of helping to share the messages through the council's website and twitter of the idling action London project <a href="#">Idling Action London — Reducing engine idling to help clear London's air.</a> Additionally, events took place at Charing Cross Hospital (18th June 2021), Wendell Park Primary School (13/12/2021) and Normand Croft Community School (07/02/2022).</p>
10	Emissions from developments and buildings	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Seek a reduction in emissions of small particles from construction sites</p>	<p>The Council continues to require demolition and construction management plans for major development sites, including the submission of an AQDMP (Air Quality Dust Management Plan) that includes a dust risk assessment as well as measures to minimise dust emissions and are required to follow the London Mayor's "The Control of Dust and Emissions During Construction and Demolition" SPG, 2014.and the 'London Code of</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>Construction Practice 2022' These include the requirements to meet NRMM criteria.</p> <p>Complaints of dust nuisance investigated as and when reported. 87 complaints were received in 2021 about construction/ demolition dust. This is a significant increase in complaints from last year, likely associated with increased home working due to covid-19. For covid safety reasons, officers were not going into resident's premises unless it was necessary and covid safe and as a result officers engaged with the complainants and sought to resolve issues through advice and education</p> <p>The Stage IV NRMM emission standard was required by planning condition on 51 sites during 2020. The Council were part of the MAQF3 NRMM compliance project during 2021: 35 sites were registered on the NRMM website; 23 site Audits were undertaken, 2 sites were self-compliant, no sites worked towards and achieved Compliance. 0 sites failed to achieve compliance; 17 were completed sites or had no NRMM. The London Borough Hammersmith &amp; Fulham achieved a Total Compliance status of 100% of those sites audited under the NRMM project.</p> <p>The Council will continue to participate in the MAQF3 NRMM compliance project for the three-year period from 2019 to 2022.</p> <p>The council was awarded Defra Air Quality Grant funding for a bid submitted for round 20/21 for "Development of a</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>borough wide construction site monitoring website” that is being developed 21/22, this will assist council officers in ensuring emissions from construction sites are controlled within the limits set by planning conditions on new developments in the construction phase <a href="https://www.gov.uk/government/news/5-million-boost-for-local-authorities-to-tackle-air-pollution">£5 million boost for local authorities to tackle air pollution - GOV.UK (www.gov.uk)</a></p>
11	Emissions from developments and buildings	<p style="text-align: center;">Reducing Emissions at its source</p> <p style="text-align: center;">Seek a reduction in emissions from domestic and commercial properties</p>	<p>Policy CC1 of the Local Plan requires sustainable energy measures to be included in major developments and encourages these measures in all other developments. Minimising energy use helps to not only reduce CO2 emissions from buildings but also other pollutants as well. On-site renewable energy use is also promoted in new developments and the most frequent technology deployed is PV panels and heat pumps which generate no local emissions. Use of Combined Heat and Power (CHP) units are only accepted where they can be used without having an unacceptable impact on air quality.</p> <p>Though most of the buildings have reopened after Covid-19 shutdown, staff utilisation is still at &lt;20% as most still working from home hence carbon impact has been minimal from the corporate Estate. This gave an opportunity to retro fit sustainable solutions for Hard FM as program started to replace building’s aging boilers with either electrical or heat source pumps dependant on size and usage of building as well as cost effectiveness. There are currently 4 large sites being planned for heat source pumps and one smaller building had electrical boilers put in as a pilot which has</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>proven successful to roll out further as it is no longer reliant on gas.</p> <p>In addition to this, H&amp;F main depot has its LED lighting replacement with 15 other sites now being appraised.</p> <p>The Kings Street redevelopment is going well. The town hall extension and surrounding buildings have been demolished and the Town Hall is undergoing its massive multi-million-pound redevelopment program to make it a new Breeam awarded building as its future flagship building. Expected opening date is late 2023.</p> <p>Corporate's estate electricity is now supplied by REGO green energy tariff. Changing to 100% Green baskets have proven to be unsuccessful due to the heavy market fluctuations of what is happening with energy supplies, causing all utility suppliers to pull their offers off the shelf and now are no longer available for purchase. Alternatively, H&amp;F is considering joining a PAN-London procurement exercise to invest in green PPAs. Currently it is in early stages of development.</p> <p>Less residual waste produced per household results in less waste to be collected and less waste incinerated.</p> <p>Christmas tree recycling for 2021/2022 was 77.32 tonnes.</p> <p>Residual waste per household per year (Kg) (kg/hh/yr) has again declined during the year ending 2020/21:</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>														
			<ul style="list-style-type: none"> <li>• 2017/18 = 419.60 kg/hh/yr</li> <li>• 2018/19 = 407.00 kg/hh/yr</li> <li>• 2019/20 = 378.2 kg/hh/yr</li> <li>• 2020/21 = 359.9 kg/hh/yr</li> </ul> <p>The council started collecting food waste from selected streets from November 2020, 474.700kg has been collected so far.</p> <p>In 2021 there have been 5 bonfire complaints these were addressed by the Council's Environmental Health team and provide an opportunity for the council to engage with residents on the issue of air quality-</p> <p>In 2021 in energy efficiency and insulation measures were implemented in 927 private homes as detailed below:</p> <table border="1"> <tbody> <tr> <td>Light bulbs provided</td> <td style="text-align: center;">381</td> </tr> <tr> <td>Power-down devices provided</td> <td style="text-align: center;">82</td> </tr> <tr> <td>Radiator panels provided</td> <td style="text-align: center;">205</td> </tr> <tr> <td>Draught proofing - doors provided</td> <td style="text-align: center;">48</td> </tr> <tr> <td>Draught proofing - windows provided</td> <td style="text-align: center;">58</td> </tr> <tr> <td>Door brushes provided</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Shower heads provided</td> <td style="text-align: center;">55</td> </tr> </tbody> </table>	Light bulbs provided	381	Power-down devices provided	82	Radiator panels provided	205	Draught proofing - doors provided	48	Draught proofing - windows provided	58	Door brushes provided	1	Shower heads provided	55
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			Save-a-flush bags provided	20
			Shower timers provided	97
			Swivel taps provided	14
			Tap aerators provided	11
12	Monitoring and other core statutory duties	Reducing Emissions at its source Seek to control and minimise emissions from industrial premises	Regulation duties continued in line with the LAPPC requirements. We received one compliant in 2021/2022 regarding odours from a Part B LAPPC permitted dry cleaning operation. The complaint was fully investigated, and three inspection visits were undertaken. Inspection of the premises has found that the operation is being undertaken in line with the conditions of the permit. No notices were served. Routine inspections were undertaken to ensure compliance with permits wherever possible in line with COVID.	
13	Cleaner Transport	Reducing the Need to Travel Sustain and improve town & local centres, facilities and employment areas	<p>The 2018 Local Plan is still in place and policies that sustain and improve town centres continue to be implemented to help provide facilities locally. This discourages the need for people to travel for shopping, entertainment and recreation purposes etc. The council will begin a review of its Planning Guidance SPD in 2021 and it is expected to be consulted on in 2022. Consideration is being given in particular to adding guidance on mitigating and adapting to climate change impacts, which includes reducing the need to travel.</p> <p>The Council's Local Implementation Plan (LIP3) for Transport was agreed by Cabinet in November 2018 was approved by the Mayor of London in February 2019.</p>	

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			<p>The LIP’s key principles and projects include ensuring that sustainable modes (walking, cycling and public transport) are the main choice in the borough’s regeneration areas, “Filtered permeability” in residential areas to prevent rat running and encourage walking and cycling, a TFL funded “Liveable Neighbourhoods project to reduce the dominance of motor traffic in North End Road, and longer term aspirations to replace Hammersmith Flyover with a tunnel, provide a new pedestrian/cycle bridge over the Thames at Imperial Wharf, and remove general traffic from the north side of Shepherds Bush Green.</p> <p>TCPR South Fulham</p> <p>South Fulham TCPR (Traffic, Congestion and Pollution Reduction Scheme) introduced in July 2020, traffic reduced by 75% on streets east of Wandsworth Bridge Road and by 12% on Wandsworth Bridge Road.</p> <p>Our Space is your space, which allows businesses to use highway space for outdoor seating etc, which has been more necessary during pandemic, <a href="#">Local businesses – Our space is your space   LBHF</a></p> <p>We have installed 1.5 Kms of fully segregated permanent cycle route along King Street, with a further 1km due to be completed by Spring 2022.</p> <p>The temporary cycle lanes introduced in response to the pandemic are being upgraded to have semi-permanent</p>



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			<p>wands. This amounts to another 4kms of segregated cycle route.</p>
14	Emissions from developments and buildings	<p style="text-align: center;">Reducing the Need to Travel</p> <p style="text-align: center;">Seek to reduce the air quality impact of new development</p>	<p>The 2018 Local Plan is still in place and policies that help reduce the need to travel and promote sustainable forms of transport are still being implemented to help reduce emissions. It is also worth noting that the council's approach on reducing CO2 emissions helps improve the air quality impacts of new developments by encouraging use of on-site renewable energy generation such as heat pumps and solar power. These reduce reliance on gas combustion-based systems, reducing local emissions. Some developments are starting to install electric boilers instead of gas fired boilers which also helps to reduce emissions and improve local air quality</p> <p>There is also an emerging trend for major developments in particular to include on-site energy generation technologies such as Heat Pumps that produce no local emissions. Some developments are starting to install electric boilers instead of gas fired boilers which also help to reduce emissions and improve local air quality.</p> <p>In 2021 as detailed in section 3 of the ASR the following number of sites were required to implement air quality mitigation via the development control process: 236 development sites with Ventilation strategy to reduce indoor exposure to poor air quality, 655 sites with zero emission plant , 49 sites with Air Quality Dust Management Plan (AQDMP) with stage IV NRMM emission standards (instead</p>

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			<p>of the standard Stage IIIB, a greater London requirement) and the use of ULEZ compliant vehicles, 83 sites with Low Emission Strategies, 2 sites with stricter diesel emergency generator emission standards. There were also 8 conditions recommended for green barriers and 40 conditions for aerobic food digestors. There were 35 conditions placed for electric charging points. As part of the development process when planning applications are submitted the council transport planners secure in line with London Plan policies T5 and T6: car free developments where possible; adequate electric vehicle charging infrastructure; car club spaces; sufficient cycle parking and improvements to cycle infrastructure; improvements to walking infrastructure; and travel plans for developments which will generate significant trips such as new schools and residential areas. Construction logistics plans and delivery and servicing plans are secured for developments that generate significant freight movements, produced in line with Transport for London guidance. Facilities can be required to minimise additional freight trips from missed developments to reduce the impact of online retailing. Additionally, facilities to enable micro consolidation will be considered for larger developments to promote sustainable last mile deliveries.</p> <p>42 Construction Logistic Plans have been agreed for the 2021-2022 period.</p>

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15	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Promotion of bus services</p>	<p>From June 2021, 20 hydrogen fuel cell double decker buses running through the borough on Route 7 between East Acton and Oxford Circus. Passengers will benefit from smoother, quieter journeys due to fewer vibrations and will be able to take advantage of free-to-use USB charging points <a href="#">Mayor launches England's first hydrogen double decker buses   London City Hall</a></p>
16	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Promotion of other forms of public transport</p>	<p>Day of car-free events offered for Car Free Day 2021 <a href="#">Car Free Day is your chance to scoot, cycle or walk in H&amp;F   LBHE</a></p> <p>We have successfully implemented an E-scooter trial in the borough. 735,000 trips have been made across London as part of the trial so far.</p> <p>Average distance travelled by E-scooter as part of the trial ranged from 2.4- 2.9 km</p> <p>Average time spent on each trip = 16-24 mins.</p> <p>Number of e-scooter parking bays = 26</p> <p>Number of e-scooter training sessions held since trial started = 8</p> <p>Number of safety helmets given out free during trial so far = +800</p> <p>We are also launching a new E-bike trial in the borough. The E-bike trial will start on the 23<sup>rd</sup> March 2022. Initially 250 e-bikes will be deployed across the borough. There will be an initial 40 e-bike bays.</p>

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17	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Promotion of cycling</p>	<p>Council maintains a waiting list for cycle stands and hangers and looks for funding opportunities to install these <a href="#">Cycle parking   LBHF</a></p> <p>As discussed previously TCPR implemented in south Fulham in 2020, which supports cycling through reduction in traffic recorded.</p> <p>Day of car-free events offered for Car Free Day 2021 <a href="#">Car Free Day is your chance to scoot, cycle or walk in H&amp;F   LBHF</a>.</p> <p>We have installed 1.5Kms of fully segregated permanent cycle route along King street, with a further 1km due to be completed by Spring 2022.</p> <p>The temporary cycle lanes introduced in response to the pandemic are being upgraded to have semi-permanent wands. This amounts to another 4kms of segregated cycle route.</p> <p>A new Cycle Hub that will house 92 cycles in a secure location under the Flyover is being constructed and will open in April 2022</p> <p>DOTT e-bike scheme that went live on the 23/03/2022 <a href="#">H&amp;F becomes first UK home for Dott rental e-bikes   LBHF</a></p> <p>Bike library launched at Ark Burlington Danes <a href="#">White City pupils and parents to enjoy new bike 'library'   LBHF</a></p>

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			<p>As part of the MAQF CABB (Clean Air Better Business) project in 2018 an air quality and journey planner widget to promote active travel was produced for the H &amp; F and can found on the Council website <a href="https://www.lbhf.gov.uk/environment/pollution-and-air-quality/air-quality-forecast-and-cleaner-air-route-finder">https://www.lbhf.gov.uk/environment/pollution-and-air-quality/air-quality-forecast-and-cleaner-air-route-finder</a>. The page had 93 unique page views in 2021.</p>
18	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Promotion of Walking</p>	<p>The introduction of emissions-based charging for pay and display usage has led to changes in behaviours, with more people walking and less people driving short journeys.</p> <p>TCPR scheme implemented in South Fulham supports walking through reduction in traffic.</p> <p>One new informal crossing was installed at Parsons Green Lane, outside Lady Margaret's Secondary School.</p> <p>Improvements made to pedestrian crossings at Hammersmith Gyratory <a href="#">New road design to make Hammersmith Gyratory safer for cyclists, pedestrians and motorists   LBHF</a></p> <p>As part of the MAQF CABB project in 2018 an air quality and journey planner widget to promote active travel was produced for the H&amp;F and can be found on the Council</p>

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			<p>website. (See webpage <a href="#">Air quality forecast and cleaner air route finder   LBHF</a>).</p> <p>Also, as part of the MAQF CABB during 2018 four clean air walking routes were produced for walking routes within the borough and can be seen at the journey planner webpage. The page had 93 unique page views in 2021.</p>
19	Public Health and awareness raising	<p>Encouraging a Switch to Less Polluting Forms of</p> <p>Encourage a reduction in car use for the journey to school</p>	<p>422 children and 596 adults were given Bikeability and adult cycle training in the borough throughout 21/22. These numbers are from April 2021 to March 2022 – there was no lockdown in place, but numbers were still lower than would be expected.</p> <p>The council has run around 100 Dr Bike sessions this year. From the Autumn we alternated every Saturday between Normand Park and Ravenscourt Park fixing on average 20 bikes per session, plus Tuesdays to Fridays across the borough as part of our adult cycle training programme, averaging the fixing of five bikes per day. We are also now running a regular Dr Bike session outside the Nourish Hub on St Ann's Road which is building up local interest.</p> <p>63 schools have School Travel Plans. 9 schools have done Hands Up Surveys over the past academic year. 12 schools have Gold STARS, and 1 bronze.</p> <p>Nine school air quality audits (SAQAs) were conducted in 2021-2022 and as a result of DEFRA funding a further 21</p>

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			SAQA will be conducted 2022-2024 (prioritised in accordance with data from LAEI 2019).
20	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Encourage a reduction in car use for the journey to work and business trips</p>	<p>We have installed 1.5Kms of fully segregated permanent cycle route along King Street, with a further 1km due to be completed by Spring 2022.</p> <p>The temporary cycle lanes introduced in response to the pandemic are being upgraded to have semi-permanent wands. This amounts to another 4kms of segregated cycle route.</p> <p>We have successfully launched an E-scooter trial and are launching an e-bike trial in the borough. South Fulham TCPR scheme also led to reduction in traffic.</p>
21	Cleaner Transport	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Control provision of on and off-street parking to deter car commuting into and within the borough</p>	Emissions based charging for pay and display was introduced in March 2021. This included a diesel surcharge of £1. The charges are shown at website <a href="#">Emissions based parking charges   LBHF</a> Free parking permits continue to be provided for fully electric vehicles <a href="#">Green vehicle permits   LBHF</a> .
22	Delivery Servicing and Freight	<p style="text-align: center;">Encouraging a Switch to Less Polluting Forms of Transport</p> <p style="text-align: center;">Encourage freight to be transported in a sustainable manner</p>	DEFRA funded Clean Air Villages 3 (CAV3) project produced Ultra Low Emission Supplier Directories for Hammersmith Town Centre, Fulham Town Centre and Shepherds Bush Town Centre <a href="#">Clean Air Villages (crossriverpartnership.org)</a> , 1 x Shared Electric Vans for

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			<p>Shepherds Bush for use by H&amp;F based businesses, Clean Air Tool (<a href="http://crossriverpartnership.org">Clean Air Tool (crossriverpartnership.org)</a>)</p> <p>H&amp;F were successful in their joint bid with other London Boroughs and Business Improvement Districts (BIDs) for DEFRA funding round 2020-21 for CAV4, submitted by Cross River Partnership. This is an expansion on Clean Air Village 1,2 and 3 Projects - engagement and behavioural change project to reduce emissions from the delivery of goods and services for businesses, hospitals and communities <a href="#">Clean Air Villages 4 - Cross River Partnership</a>. This project is focusing on hospital emissions in Hammersmith and Fulham and will run until summer 2022.</p> <p>In March 2022, the council was advised that its single and joint bids to the Defra Air Quality Grant were successful these will be completed in 22/23 <a href="http://www.gov.uk">£11.6m boost for local authorities to tackle air pollution - GOV.UK (www.gov.uk)</a>. The single bid was for “Monitoring, engagement, and awareness raising in schools” and the joint bid was with Cross River Partnership for “Project to move freight to London by river rather than road and continue ongoing deliveries through fleet of zero emission electric vehicles, cargo bikes and walking. (Delivered through Westminster Cross River Partnership in partnership with London Boroughs of Hammersmith &amp; Fulham, Islington, Lambeth, Lewisham, Southwark, Wandsworth. Plus, Port of London Authority (PLA), Cadogan Estates, and The Fitzrovia Partnership)”</p>



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			<p>Parcels not pollution scheme, an emissions free delivery service, which results from a partnership between Hammersmith and Fulham Council, Hammersmith BID, Transport for London and e-cargobikes continues to operate across the borough.</p> <p>In partnership with Hammersmith BID Zero Emission Urban Arts Markets were held in November and December 2021, February and March 2022 see <a href="#">Hammersmith BID   Zero-emissions Arts Market</a> . All stalls and materials were delivered with zero-emissions and all stallholders will be supported by Parcels not Pollution, Hammersmith's zero-emissions delivery service.</p>
23	Cleaner Transport	<p style="text-align: center;">Make a More Efficient Use of Road Transport</p> <p style="text-align: center;">Encourage car sharing</p>	<p>We are continuing to work with our car club operators to deliver cleaner, greener and smarter travel opportunities in the borough.</p> <p>The free-floating car sharing (FFCS) scheme Zipcar Flex has been operating since 2020.</p> <p>The fleet continues to become greener and cleaner with an average 30% of all car club vehicles operating in borough being electric. Our operator Zip Car is also committed to increase the percentage of EV car club vehicles throughout 2022.</p> <p>As well as Zip Car, the Council are also working with operators Enterprise, who deliver fixed car club schemes in the Borough.</p>

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			<p>To support future development of a fully electric car club fleet in the Borough, we are also working directly with Enterprise and Liberty Charge to introduce 'Car Club Mobility Hubs' and convert all existing car club vehicles to electric. The Council are working toward also working towards the electrification of 20 fixed car club sites to create micro-mobility bays.</p>
24	Cleaner Transport	<p>Make a More Efficient Use of Road Transport</p> <p>Discourage short journeys</p>	<p>We are supporting residents to complete short journeys by other means such as cycling and use of electric scooters. As per action 20, we have installed 1.5Kms of fully segregated permanent cycle route along King Street, with a further 1km due to be completed by Spring 2022.</p> <p>The temporary cycle lanes introduced in response to the pandemic are being upgraded to have semi-permanent wands. This amounts to another 4kms of segregated cycle route.</p> <p>We have successfully launched an E-scooter trial and are launching an e-bike trial in the borough.</p>
25	Cleaner Transport	<p>Other Measures to Reduce Road Traffic Emissions</p> <p>Reduce the amount of road traffic in residential areas and town centres</p>	<p>The 2018 Local Plan is still in place and policies that help reduce the need to travel and promote sustainable forms of transport are still being implemented to help reduce emissions.</p> <p>Developments in areas well connected by public transport are expected to be car-free, with no parking provided, other than for disabled people. Where appropriate and in</p>

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			<p>accordance with the aims of the London Plan the Council also encourages the provision of car club bays, especially those with restricted parking. Planning policies also require electric vehicle parking spaces for both residential and commercial uses – e.g., the requirement for residential developments is that a minimum of 20% of all spaces must be for electric vehicles and provide active charging facilities. Cycling and walking are also encouraged by planning policies which require improvements to the environment and provision of facilities such as cycle parking and provision of support for cycle hire schemes.</p> <p>The council began a review of its Planning Guidance SPD in 2021 and it is expected to be consulted on in 2022. Consideration is being given to whether additional guidance should be provided on reducing traffic levels in residential areas and town centres.</p> <p>Planning policies also require electric vehicle parking spaces for both residential and commercial uses – e.g., the requirement for residential developments is that 20% of all spaces must be for electric vehicles with an additional 20% passive provision for electric vehicles in the future.</p> <p>Cycling and walking are also encouraged by planning policies which require improvements to the environment and provision of facilities such as cycle parking and provision of support for cycle hire schemes.</p>

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			<p>The Council is proactively co-producing the design of the TCPR west extension with residents and local businesses.</p>
26	Localised solutions	<p>Other Measures to Reduce Road Traffic Emissions</p> <p>Promote the use of trees to help improve local air quality</p>	<p>In 2021/22 the Council planted 159 new trees on the public highway and felled 129 trees. For Parks, Open Spaces and Cemeteries in 2021/22, 165 standard sized trees at 2-3 metres high and 1810 whips at 1 metre or less in the form of saplings were planted.</p> <p>The Council pruning programme which began in 2019, to spread the pruning of trees in large roads over several years, also continues.</p> <p>Planning for two further tiny forests has started, further to tiny forest in Hammersmith park March 2021. <a href="#">Two more 'tiny forests' coming to Fulham   LBHF</a>. Additional tiny forests are planned for Normand Park and Eel Brook Common with work planned to commence from March 2022.</p>
27	Localised solutions	<p>Other Measures to Reduce Road Traffic Emissions</p> <p>Reduce the amount of traffic on the A4 and A40</p>	<p>Work is continuing the Hammersmith SPD which is now expected to be consulted on before the end of 2022.</p>
28	Public health and awareness raising	<p>Raise Awareness of the Links Between Air Quality and Health</p> <p>Provide information to allow people to make informed choices about travel behaviour</p>	<p>The Council continue to support airTEXT and promote it to the public on our website and at events. There were 43 additional subscribers to airTEXT pollution alerts from January 2021. Subscribers receive alerts by text message (249 people) and voicemail (30 subscribers).</p>

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29	Emissions from developments and buildings	Provide information so people can make informed choices about reducing pollution from domestic activities	There was a complete update of the council's air quality webpages, which included updates related to wood burning stoves including the clearskies stove accreditation scheme and links to the Woodsure ready to burn guidance.
30	Monitoring and other core statutory duties	<p>Raise Awareness of the Links Between Air Quality and Health</p> <p>Continue to monitor air quality and make information available</p>	<p>The Breathe London AQMesh monitor located at Melcombe Primary School was retained after transition of the Breathe London Programme from EDF to Imperial college London In December 2020. A Breathe London Clarity sensor was deployed at a new location, Charing Cross Hospital in March 2021. Monitoring at Bloemfontein Road ended March 21. Information and data from the monitors is available at <a href="#">Breathe London</a> . The council supported the scheme providers in identifying suitable locations for the low-cost monitors and information on available electrical infrastructure to support sensor deployment.</p> <p>Provisional data from Breathe London, downloaded from <a href="#">Breathe London</a> for 2021 suggests Annual Average NO2 at Charing Cross hospital (The Breathe London Node is located on a wall near the entrance on Fulham Palace Road) was 21.10 ug m3. Annual average PM2.5 at this location was 7.51 ug m3. Nearby at Melcombe Primary school NO2 was 35.15 ug m3 and 8.47 for annual average PM2.5.</p> <p>Two other nodes are placed at 366 North end road (32.29 for NO2 11.81 for PM2.5) and 316-321 North end road (monitoring occurred late July through to end December –</p>

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			<p>NO2 average was 37.44 ug m3 for this period and for PM2.5 11.47 ug m3)</p> <p>Live access to the real time air quality monitoring stations is available on-line (See <a href="#">London Borough of Hammersmith &amp; Fulham - Air Quality monitoring service (airqualityengland.co.uk)</a>) and links to this are provided on the Council website (See <a href="#">Air quality   LBHF</a>)</p> <p>The council continued to maintain two automatic monitors and its network of diffusion tubes. Full year's data from the automatic monitor installed at Hammersmith town centre in March 2019 is reported for the first time this year.</p> <p>Low-cost sensors were installed to monitor the impact on air quality as part of the SW6 TCPR scheme in July 2020. <a href="#">South Fulham Traffic, Congestion and Pollution Reduction scheme   LBHF</a></p>

### 3. Planning Update and Other New Sources of Emissions

**Table K. Planning requirements met by planning applications in Hammersmith and Fulham in 2021**

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	17
Number of planning applications required to monitor for construction dust	<u>28</u>
Number of CHPs/Biomass boilers refused on air quality grounds	<u>0</u>
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	<u>1</u>
Number of developments required to install Ultra-Low NO <sub>x</sub> boilers	<u>2</u>
Number of developments where an AQ Neutral building and/or transport assessments undertaken	<u>15</u>
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	<u>11</u>
Number of planning applications with S106 agreements including other requirements to improve air quality	<u>1</u>
Number of planning applications with CIL payments that include a contribution to improve air quality	<u>0</u>
<p><b>NRMM: Central Activity Zone and Canary Wharf</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant <a href="#">NRMM website</a> and that all NRMM used on-site is compliant with Stage IV of the Directive and/or exemptions to the policy.</p>	4 conditions included
<p><b>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at <a href="http://www.nrmm.london">www.nrmm.london</a> and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	<p>43 conditions included</p> <p>conditions included requiring compliance with Stage IV of the Directive</p> <p>35 registered and 23 site audits completed and compliant (2 of these self-compliant)</p>

Air Quality Officers review weekly list of planning applications to ensure air quality conditions are requested on all relevant applications. In addition, consultation requests are sent out to air quality officers from the council's planning department on

major developments. Breach of air quality conditions would be investigated and enforced by planning enforcement officers.

### **3.1 New or significantly changed industrial or other sources**

No new sources identified.



## **4. Additional Activities to Improve Air Quality**

### **4.1 London Borough of Hammersmith and Fulham Fleet**

The Council has 18 fully electric fleet vehicles and no zero-emission capable vehicle, this represents approximately 14% of the fleet.

### **4.2 NRMM Enforcement Project**

Hammersmith and Fulham council will continue to support the NRMM Enforcement project in 2022 – 23.

### **4.2 Air Quality Alerts**

Hammersmith and Fulham Council support *air*TEXT (<https://www.airtext.info/>).

## Appendix A Details of Monitoring Site Quality QA/QC

### A.1 Automatic Monitoring Sites

Data management and Local Site Operator (LSO) duties for Hammersmith & Fulham's automatic monitoring stations have been completed by Ricardo Energy and Environment since November 2017. All real-time data from the monitoring stations are independently collected and validated on a daily basis. A combination of automatic and manual checks is used to assess data, identify and diagnose potential equipment faults and adjust data to take account of calibration tests. Automatic overnight calibrations are supplemented with regular manual calibrations of analysers, every two weeks. The procedures used conform to the EU standards that are a requirement of the AURN.

All data is formally ratified and is available online by accessing the [Air quality in England \(airqualityengland.co.uk\)](https://airqualityengland.co.uk) and selecting Hammersmith & Fulham within the 'Select local authority' menu bar. During this process the validation decisions can be ratified with the benefit of hindsight and using greater information, such as service records, calibration records and the results of station audits. Station audits are carried out by Ricardo Energy and Environments in house audit team every six months.

#### PM<sub>10</sub> and PM<sub>2.5</sub> Monitoring Adjustment

PM<sub>10</sub> data from HF4 Shepherds Bush up to 23/11/2021 presented in this report has been corrected to gravimetric equivalent using the Volatile Correction Model (VCM). A BAM for PM<sub>10</sub> was then installed and correction was applied to the BAM data to gravimetric equivalent (The corrections set out in LLAQM TG19 for the MetOne BAM will be applied (sections 4.43 to 4.47) and the PM<sub>10</sub> data will be multiplied by 0.833)

At Hammersmith Town Centre HF5 the equipment for monitoring PM is an unheated PM<sub>10</sub> BAM and a smart heated PM<sub>2.5</sub> BAM. Therefore, the corrections set out in LLAQM TG19 for the MetOne BAM will be applied (sections 4.43 to 4.47) and the PM<sub>10</sub> data will be multiplied by 0.833 and no correction is applied to the PM<sub>2.5</sub>.

Adjustment of the raw data is completed by Ricardo Energy and Environment through the current data management contract, therefore this is also true of any data that is presented on the Air Quality England website.

## A.2 Diffusion Tubes

The diffusion tubes for January-December 2021 were supplied and analysed by UKAS accredited SOCOTEC, with the 50% Triethanolamine (TEA) in acetone preparation method utilised. UKAS accredited laboratories follow the procedures set out by Defra within Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance for Laboratories and Users and have strict internal QA/QC procedures to ensure that concentrations reported are as accurate as possible. The laboratory precision results are available at the Defra webpages <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/precision-and-accuracy/> In addition, SOCOTEC participates in the AIR-PT QA/QC scheme to ensure its performance is constantly independently reviewed, the results of which can be viewed at the webpage <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/qa-qc-framework/>.

### Results of laboratory precision results

#### AIR-PT (SOCOTEC)

AIR is an independent proficiency-testing (PT) scheme that is operated by LGC standards and supported by the Health and Safety Laboratory (HSL). AIR-PT began in April 2014 and combined two long running PT schemes: LGC Standards STACKS PT scheme, and the HSL WASP PT scheme. AIR is a recognised performance-testing programme for labs undertaking NO<sub>2</sub> diffusion tube analysis as part of a wider UK NO<sub>2</sub> monitoring network. The AIR-PT results for SOCOTEC are presented in Table L below, SOCOTEC has 100% for results so far in 2021 (results after March 2021 not yet available).

Further information on proficiency testing can be found at Defra's Local Air Quality Management webpages under QA/QC framework for NO<sub>2</sub> diffusion tube monitoring.

**Table L. SOCOTEC Performance within AIR-PT for NO2 Diffusion Tubes-2021**

Laboratory	AIR PT AR042	AIR PT ARO	AIR PT ARO	AIR PT ARO
	January – March 2021	tbc	tbc	tbc
SOCOTEC 50% TEA in Acetone	100%	tbc	tbc	tbc

Precision and accuracy results

The spreadsheet of diffusion tube co-location results, used for calculating a national bias adjustment factor, also contains information on the precision of the diffusion tubes, in those cases where duplicate or triplicate tubes were exposed. A greater proportion of good results will show careful handling of the tubes in both the laboratory and the field. The results for SOCOTEC in 2021 are shown in Table M below, with only 3 bad results recorded and 20 good results recorded for 2021.

**Table M. SOCOTEC Precision Summary Results 2019- 2021**

Laboratory	2019 Good	2019 Bad	2020 Good	2020 Bad	2021 Good	2021 Bad
SOCOTEC 50% TEA in Acetone	40	1	24	0	20	3

### Factor from Local Co-location Studies

Annual means and bias for both of Hammersmith and Fulham’s co-location studies are included in Table N below. In 2020 a second co-location study started at the new Hammersmith Town centre analyser, co-location at Shepherd’s Bush has been completed since 2018. The monitoring locations at both Shepherd’s Bush (HF4) and Hammersmith Town Centre (HF5) are classified as Roadside sites. Shepherds Bush diffusion tubes recorded an annual mean of 43.7  $\mu\text{g m}^{-3}$  against an automatic mean of 38.6  $\mu\text{g m}^{-3}$ , giving a bias adjustment factor of 0.88. The Hammersmith Town Centre study recorded a diffusion tube annual mean of 60.2  $\mu\text{g m}^{-3}$  against an automatic mean of 43.2, to give an adjustment factor of 0.72. Both co-location studies had good overall precision as shown in Table N below, taken from the diffusion tube data processing tool utilised. The overall bias adjustment factor from the borough’s co-location studies was 0.79.

**Table N: Precision of borough co-location studies**

	<b>STEP 3a Local Bias Adjustment Input 1 (Shepherds Bush-Roadside)</b>	<b>STEP 3b Local Bias Adjustment Input 2 (Hammersmith-Roadside)</b>
<b>Periods used to calculate bias</b>	5	8
<b>Bias Adjustment Factor A</b>	0.88 (0.79 - 1.01)	0.72 (0.66 - 0.78)
<b>Diffusion Tube Bias B</b>	13% (-1% - 27%)	39% (28% - 51%)
<b>Diffusion Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	43.7	60.2
<b>Mean CV (Precision)</b>	3.4%	8.8%
<b>Automatic Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	38.6	43.2
<b>Data Capture</b>	100%	100%
<b>Adjusted Tube Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	38 (35 - 44)	43 (40 - 47)

<b>Overall Diffusion Tube Precision</b>	<b>Good Overall Precision</b>	<b>Good Overall Precision</b>
<b>Overall Continuous Monitor Data Capture</b>	<b>Good Overall Data Capture</b>	<b>Good Overall Data Capture</b>
<b>Combined Local Bias Adjustment Factor</b>	<b>0.79</b>	

The national bias adjustment factor for SOCOTEC with the 50% Triethanolamine (TEA) in acetone preparation method was 0.78, taken from 23 co-location studies (database version 03/22).

Hammersmith & Fulham are part of the London Wide Environmental Programme (LWEP) for which a number of co-location studies are completed across six London Boroughs. During 2021 triplicate diffusion tube monitoring was completed at the HF4 and HF5 automatic monitoring stations. This year the LWEP bias adjustment was 0.82 based on 12 co-location studies. Other boroughs participating in the LWEP include Greenwich, Newham, Kensington and Chelsea, and Croydon.

#### Discussion of Choice of Factor to Use

For this year the national factor has been utilised, with a factor of 0.78, as although the co-location studies were for the whole year at both sites, the data capture was just 50% at the Shepherds Bush monitoring site for diffusion tubes. Although the local adjustment factor is slightly higher at 0.79 than the national factor it was felt it was a more robust approach to use the national factor.

The table of adjustment factors applied in Hammersmith from 2009 are shown below, the adjustment factor for 2021 is considerably lower than adjustment factors for previous years, except for 2020 when the same factor was applied. From 2013, when possible, a local factor has been applied, initially from North Kensington and then from Hammersmith co-location study/studies from 2019.

**Table O. Bias Adjustment Factor 2009-2021**

<b>Year</b>	<b>Local or National</b>	<b>If National, Version of National Spreadsheet</b>	<b>Adjustment Factor</b>
2021	National	03/22	0.78
2020	National	06/21	0.78
2019	Local-Shepherds Bush HF4	-	1.02
2018	Local--North Kensington	-	0.98
2017	Local--North Kensington	-	1.18
2016	Local--North Kensington	-	1.15
2015	Local--North Kensington	-	1.07
2014	Local-North Kensington		1.03
2013	Local-North Kensington		1.14
2012	-		1.01
2011	-		0.94
2010	-		0.93
2009	-		0.92

### **A.3 Adjustments to the Ratified Monitoring Data**

#### Short-term to Long-term Data Adjustment

Where data capture for automatic and non-automatic results is less than 75% and greater than 33% of a full calendar year (between 3 and 9 months), the mean has been “annualised”, adjusted using the methodology outlined in LLAQM.TG (19) before being compared to annual mean objectives. For 2021 this was completed for 27 tubes, as calculated in Table P below.

#### Distance Adjustment

For monitoring sites where the concentration is greater than  $36\mu\text{g m}^{-3}$ , and which are not representative of public exposure, the procedure specified in LLAQM.TG(19) to estimate the concentration at the nearest receptor has been followed using the tool available at [Diffusion Tube Data Processing Tool | LAQM \(defra.gov.uk\)](https://defra.gov.uk/llaqm/diffusion-tube-data-processing-tool). The outputs from the spreadsheets are included in Table Q below.

To complete the NO<sub>2</sub> fall off with distance calculations a background value for each monitoring location is required. Background NO<sub>2</sub> concentrations for 2021 have been derived from the Defra Background Map database that has a current baseline of 2018.



**Table P. Short-Term to Long-Term Monitoring Data Adjustment**

Site ID	Annualisation Factor London Westminster	Annualisation Factor London Bloomsbury	Annualisation Factor London Hillingdon	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Annual Mean ( $\mu\text{g m}^{-3}$ )	Annualised Annual Mean ( $\mu\text{g m}^{-3}$ )	Comments
HF02	0.9042	0.8999	0.8920		0.8987	37.7	33.9	
HF03	0.9042	0.8999	0.8920		0.8987	68.8	61.8	
HF04	0.9179	0.9110	0.9008		0.9099	26.1	23.8	
HF06	0.9819	0.9736	0.9530		0.9695	40.6	39.4	
HF08	0.9450	0.9471	0.9472		0.9464	23.8	22.5	
HF10	0.9638	0.9359	0.9477		0.9491	30.4	28.8	
HF12	0.9638	0.9359	0.9477		0.9491	25.5	24.2	
HF19	0.9281	0.9205	0.9216		0.9234	46.2	42.7	
HF20	0.9411	0.9022	0.9670		0.9367	27.0	25.3	
HF21	1.0108	0.9355	1.0196		0.9887	-	-	Triplicate Site with HF21, HF22 and HF23 - Annual data provided for HF23 only
HF22	1.0108	0.9355	1.0196		0.9887	-	-	Triplicate Site with HF21, HF22 and HF23 - Annual data provided for HF23 only
HF23	1.0108	0.9355	1.0196		0.9887	42.6	42.1	Triplicate Site with HF21, HF22 and HF23 - Annual data provided for HF23 only
HF25	0.9411	0.9022	0.9670		0.9367	24.3	22.8	
HF29	0.9870	0.9638	0.9808		0.9772	45.7	44.7	
HF32	0.9411	0.9022	0.9670		0.9367	29.5	27.6	
HF37	0.8793	0.8785	0.8722		0.8767	56.8	49.8	
HF38	0.8793	0.8785	0.8722		0.8767	29.8	26.1	
HF40	0.9757	0.9483	0.9707		0.9649	26.7	25.8	
HF41	0.9411	0.9022	0.9670		0.9367	-	-	Triplicate Site with HF41, HF42 and HF43 - Annual data provided for HF43 only
HF42	0.9411	0.9022	0.9670		0.9367	-	-	Triplicate Site with HF41, HF42 and HF43 - Annual data provided for HF43 only

Site ID	Annualisation Factor London Westminster	Annualisation Factor London Bloomsbury	Annualisation Factor London Hillingdon	Annualisation Factor Site 4 Name	Average Annualisation Factor	Raw Data Annual Mean ( $\mu\text{g m}^{-3}$ )	Annualised Annual Mean ( $\mu\text{g m}^{-3}$ )	Comments
HF43	0.9411	0.9022	0.9670		0.9367	60.4	56.6	Triplicate Site with HF41, HF42 and HF43 - Annual data provided for HF43 only
HF50	0.9522	0.9166	0.9773		0.9487	35.1	33.3	
HF51	0.9281	0.9205	0.9216		0.9234	40.1	37.1	
HF53	0.9411	0.9022	0.9670		0.9367	33.2	31.1	
HF54	0.9450	0.9471	0.9472		0.9464	28.4	26.9	
HF55	0.9405	0.9252	0.9341		0.9333	32.3	30.2	
HF59	0.9769	0.9783	0.9815		0.9789	33.4	32.7	

**Table Q. NO<sub>2</sub> Fall off With Distance Calculations**

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted ( $\mu\text{g m}^{-3}$ ))	Background Concentration ( $\mu\text{g m}^{-3}$ )	Concentration Predicted at Receptor ( $\mu\text{g m}^{-3}$ )	Comments
HF4	2.0	8.0	41.0	27.1	36.5	Predicted concentration at Receptor within 10% the AQS objective.
HF5	1.2	3.7	44.0	30.9	<b>40.9</b>	Predicted concentration at Receptor above AQS objective.
HF03	1.0	6.0	48.2	22.2	38.8	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF05	2.0	7.0	40.9	21.6	35.3	
HF07	1.0	4.0	42.4	22.7	36.9	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF11	5.0	7.0	46.0	30.85	<b>44.5</b>	<i>Predicted concentration at Receptor above AQS objective.</i>
HF14	1.0	9.0	44.7	26.26	36.5	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF16	1.0	6.0	48.6	28.1	<b>41.2</b>	<i>Predicted concentration at Receptor above AQS objective.</i>
HF24	1.0	6.0	36.4	30.9	34.4	
HF31	3.0	8.0	43.3	25.0	38.7	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF37	1.0	6.0	38.8	19.7	31.9	
HF39	1.0	6.0	44.3	30.9	39.5	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF41, HF42, HF43	1.5	3.0	44.1	30.9	<b>42.1</b>	<i>Predicted concentration at Receptor above AQS objective.</i>
HF46	1.0	4.0	45.5	28.8	<b>40.8</b>	<i>Predicted concentration at Receptor above AQS objective.</i>
HF52	1.0	6.0	46.4	25.9	38.2	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>
HF60	5.0	8.3	40.1	22.8	37.9	<i>Predicted concentration at Receptor within 10% the AQS objective.</i>

## Appendix B Full Monthly Diffusion Tube Results for 2021

Table R. NO<sub>2</sub> Diffusion Tube Results

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2021 % <sup>(b)</sup>	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
HF01	75	75	38.8	31.5	29.5		22.5	21.0			29.1	29.8	38.0	28.4	29.8	23.2
HF02	67	67	<b>44.6</b>	33.9	33.4		28.9				38.6	<b>40.5</b>	<b>44.9</b>	36.7	37.7	26.5
HF03	67	67	<b>70.8</b>	<b>64.7</b>	<b>62.1</b>		<b>64.6</b>				<b>71.1</b>	<b>80.1</b>	<b>68.6</b>	<b>66.1</b>	<b>68.8</b>	<b>48.2</b>
HF04	42	42	35.5	26.7	24.4		16.6					27.1			26.1	18.5
HF05	75	75	<b>44.0</b>	<b>48.9</b>	<b>48.7</b>		<b>51.7</b>	<b>53.8</b>			<b>64.9</b>	<b>55.9</b>	<b>55.4</b>	<b>49.1</b>	<b>52.5</b>	<b>40.9</b>
HF06	67	67		38.3	39.3		36.6	37.5			<b>43.2</b>	<b>42.8</b>	<b>47.9</b>	39.0	<b>40.6</b>	30.7
HF07	75	75	<b>58.3</b>	<b>50.1</b>	<b>58.9</b>		<b>42.4</b>	<b>53.0</b>			<b>60.6</b>	<b>55.0</b>	<b>60.7</b>	<b>51.4</b>	<b>54.4</b>	<b>42.4</b>
HF08	67	67	32.3	29.7	25.7		18.3	17.2			22.0	17.6	29.3		23.8	17.6
HF09	75	75	<b>43.7</b>	<b>42.5</b>	32.6		34.6	30.2			<b>44.3</b>	38.9	<b>43.4</b>	<b>40.1</b>	39.0	30.4
HF10	67	67	<b>41.3</b>		31.4		21.6	20.6			29.8	30.5	36.3	31.1	30.4	22.5
HF11	75	75	<b>64.5</b>	<b>55.8</b>	<b>57.5</b>		<b>57.8</b>	<b>54.1</b>			<b>62.0</b>	<b>60.2</b>	<b>63.8</b>	<b>56.0</b>	<b>59.0</b>	<b>46.0</b>
HF12	58	58	35.2		30.6		20.9	25.2				28.2	35.2	27.0	25.5	21.3
HF13	75	75	<b>44.1</b>	36.8	37.3		23.8	25.7			26.7	27.7	35.6	28.8	31.6	24.7
HF14	75	75	<b>60.0</b>	<b>54.9</b>	<b>48.6</b>		<b>52.4</b>	<b>53.1</b>			<b>76.9</b>	<b>65.3</b>	<b>60.0</b>	<b>45.5</b>	<b>57.3</b>	<b>44.7</b>
HF15	75	75	36.2	28.6	26.7		19.0	22.4			29.8	25.8	35.4	26.1	27.7	21.6
HF16	75	75	<b>53.6</b>	<b>47.2</b>	<b>45.8</b>		<b>45.7</b>	<b>129.8</b>			<b>61.8</b>	<b>61.0</b>	<b>62.9</b>	<b>54.7</b>	<b>62.3</b>	<b>48.6</b>
HF17	75	75	35.7	36.0	31.5		31.1	24.5			37.1	32.3	33.9	28.9	32.2	25.1
HF18	83	83	<b>46.1</b>	38.9	39.0	34.5	27.3	30.3			32.0	32.5	39.4	36.5	35.6	27.7
HF19	67	67	<b>47.2</b>	<b>42.5</b>	<b>50.2</b>			36.4			<b>47.5</b>	<b>48.0</b>	<b>51.7</b>	<b>46.0</b>	<b>46.2</b>	33.3
HF20	67	67	36.4	26.3	29.4	24.6	20.7	17.5					35.0	26.9	27.0	19.7
HF21	42	42			<b>49.1</b>	<b>45.2</b>	<b>45.8</b>						<b>43.5</b>	38.6	-	-
HF22	42	42			<b>50.8</b>		<b>40.6</b>	<b>43.0</b>					<b>42.0</b>	37.9	-	-
HF23	50	50			<b>45.1</b>	<b>45.2</b>	<b>44.8</b>	<b>30.8</b>					<b>42.3</b>	<b>40.0</b>	-	-

HF24	83	83	<b>47.2</b>	<b>45.1</b>	<b>48.3</b>	<b>49.8</b>	<b>48.9</b>	<b>40.6</b>			<b>57.7</b>	<b>44.8</b>	<b>48.4</b>	37.8	<b>46.7</b>	36.4
HF25	67	67	33.4	19.2	26.6	22.1	22.4	15.5					29.5	26.0	24.3	17.8
HF26	83	83	35.1	30.8	27.6	20.5	18.3	18.0			28.3	26.7	32.0	29.4	26.6	20.7
HF27	83	83	<b>46.1</b>	32.0	34.7	31.7	27.6	22.8			36.5	34.5	<b>41.0</b>	28.1	33.4	26.0
HF28	83	83	<b>44.4</b>	39.4	37.3	35.2	31.0	32.7			<b>45.9</b>	<b>42.3</b>	<b>40.2</b>	34.4	38.2	29.8
HF29	67	67			<b>43.3</b>	<b>49.1</b>	<b>41.1</b>	33.6			<b>53.1</b>	<b>43.1</b>	<b>52.6</b>	<b>48.7</b>	<b>45.7</b>	34.8
HF30	83	83	<b>45.3</b>	31.1	31.4	30.9	24.1	23.0			<b>40.0</b>	33.9	<b>42.4</b>	33.9	33.6	26.2
HF31	83	83	<b>51.6</b>	<b>56.7</b>	<b>42.2</b>	<b>67.1</b>	<b>49.9</b>	<b>52.2</b>			<b>65.1</b>	<b>51.3</b>	<b>63.4</b>	<b>54.5</b>	<b>55.6</b>	<b>43.3</b>
HF32	67	67	39.1	33.1	31.9	25.4	19.1	18.0					38.7	31.1	29.5	21.5
HF33	75	75	<b>42.6</b>	33.9	29.8	31.8	23.4	23.6			37.3		<b>40.0</b>	34.5	33.0	25.7
HF34	83	83	35.3	29.6	29.0	23.5	19.0	15.0			28.0	26.0	33.0	27.4	26.5	20.7
HF35	83	83	39.9	39.5	39.5	<b>40.0</b>	32.4	25.6			<b>46.2</b>	39.1	39.4	38.2	38.1	29.7
HF36	75	75		36.6	31.2	28.2	28.3	<b>44.3</b>			<b>55.1</b>	<b>53.3</b>	<b>56.6</b>	<b>52.3</b>	<b>43.0</b>	33.5
HF37	58	58	<b>54.1</b>	<b>44.2</b>	<b>46.2</b>						<b>49.1</b>	<b>69.3</b>	<b>65.1</b>	<b>64.6</b>	<b>56.8</b>	38.8
HF38	58	58	38.9	25.7	28.3						28.2	27.6	33.4	27.6	29.8	20.4
HF39	83	83	<b>51.7</b>	<b>58.3</b>	<b>54.8</b>	<b>62.0</b>	<b>57.1</b>	<b>46.9</b>			<b>62.7</b>	<b>53.5</b>	<b>65.2</b>	<b>56.0</b>	<b>56.8</b>	<b>44.3</b>
HF40	67	67		33.5	29.1	24.5	21.1	16.2				27.4	32.0	29.5	26.7	20.1
HF41	67	67	<b>64.8</b>	<b>51.8</b>	<b>60.0</b>	<b>65.8</b>	<b>55.2</b>	<b>59.0</b>					<b>64.6</b>	<b>56.4</b>	-	-
HF42	67	67	<b>59.3</b>	<b>66.9</b>	<b>56.3</b>	<b>65.4</b>	<b>44.5</b>	<b>53.4</b>					<b>65.9</b>	<b>59.5</b>	-	-
HF43	67	67	<b>51.3</b>	<b>67.2</b>	<b>55.5</b>	<b>68.4</b>	<b>63.4</b>	<b>52.4</b>					<b>72.0</b>	<b>65.9</b>	-	-
HF44	75	75	<b>42.7</b>	36.5	37.3	33.3	28.5	26.5			36.8		<b>43.0</b>	35.5	35.5	27.7
HF45	75	75	<b>41.4</b>	31.7	27.2	30.4	25.4	25.5				36.5	<b>45.0</b>	36.6	33.4	26.0
HF46	83	83	<b>82.8</b>	<b>58.8</b>	<b>66.5</b>	<b>52.4</b>	<b>51.2</b>	<b>50.0</b>			<b>59.8</b>	<b>58.2</b>	<b>57.0</b>	<b>50.2</b>	<b>58.3</b>	<b>45.5</b>
HF47	83	83	<b>47.4</b>	37.5	<b>40.9</b>	30.8	29.0	24.6			32.9	<b>40.2</b>	<b>44.4</b>	33.9	36.1	28.1
HF48	83	83	<b>51.4</b>	<b>52.2</b>	<b>46.8</b>	39.2	36.9	36.9			<b>47.6</b>	<b>50.7</b>	<b>51.9</b>	<b>44.2</b>	<b>45.7</b>	35.6
HF49	83	83	<b>46.3</b>	36.4	37.9	36.0	31.7	32.4			<b>43.1</b>	38.7	<b>41.4</b>	38.6	38.2	29.8
HF50	67	67	<b>43.1</b>		35.3	30.1	29.4	27.6			38.5		<b>41.7</b>	35.9	35.1	26.0
HF51	67	67	39.9	39.1	36.9			33.6			<b>45.7</b>	<b>42.5</b>	<b>44.1</b>	39.0	<b>40.1</b>	28.9
HF52	83	83	<b>72.0</b>	<b>60.6</b>	<b>73.2</b>	<b>51.1</b>	<b>56.1</b>	<b>44.8</b>			<b>64.0</b>	<b>63.1</b>	<b>59.9</b>	<b>53.1</b>	<b>59.5</b>	<b>46.4</b>
HF53	67	67	<b>44.6</b>	36.9	35.2	28.0	28.1	24.4					37.1	33.0	33.2	24.3
HF54	67	67	39.6	30.6	26.2		20.4	19.8			26.6	28.9	35.2		28.4	21.0
HF55	58	58			<b>55.8</b>	26.1	20.3				31.0	31.5	34.7	29.4	32.3	23.5
HF56	83	83	<b>43.5</b>	<b>42.7</b>	39.7	35.6	32.2	29.5			38.7	31.5	<b>44.4</b>	37.5	37.3	29.1
HF57	83	83	39.6	37.4	30.7	34.7	29.8	30.0			38.5	32.8	<b>42.2</b>	31.6	34.6	27.0
HF58	83	83	25.7	29.2	26.7	25.4	24.5	18.7			30.0	27.5	31.7	30.5	27.0	21.1
HF59	58	58				35.6	30.8	28.0			32.2	32.0	39.3	35.0	33.4	25.5

HF60	75	75	<b>53.7</b>	<b>43.7</b>	<b>45.0</b>	<b>45.2</b>	<b>56.7</b>	<b>49.8</b>				<b>55.8</b>	<b>59.6</b>	<b>52.8</b>	<b>51.4</b>	<b>40.1</b>
HF21/22/23	50	50			<b>48.3</b>	<b>45.2</b>	<b>43.7</b>	36.9					<b>42.6</b>	38.8	<b>42.6</b>	32.8
HF41/42/43	67	67	<b>58.5</b>	<b>62.0</b>	<b>57.3</b>	<b>66.5</b>	<b>54.4</b>	<b>54.9</b>					<b>67.5</b>	<b>60.6</b>	<b>60.4</b>	<b>44.1</b>

### Notes

Concentrations are presented as  $\mu\text{g m}^{-3}$ .

Exceedances of the  $\text{NO}_2$  annual mean AQO of  $40 \mu\text{g m}^{-3}$  are shown in **bold**.

$\text{NO}_2$  annual means in excess of  $60 \mu\text{g m}^{-3}$ , indicating a potential exceedance of the  $\text{NO}_2$  hourly mean AQS objective are shown in **bold and underlined**.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

(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%).

Triplicate Tube