Air Quality Fact Sheet: Schools, Hospitals and Care Homes in the ULEZ Expansion Area

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Experts in air quality management & assessment

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1 Summary

1.1 The Greater London Authority (GLA) has set a target to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m^3 by 2030. This target was derived from an air quality guideline set by the World Health Organisation (WHO) in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy[1] considers the 2005 guideline of 10 µg/m^3. The current (2021) WHO guideline for $PM_{2.5}$ is 5 µg/m^3. The air quality objective for annual mean nitrogen dioxide concentrations (NO_2) is 40 µg/m^3 (this is the legal UK limit), but the WHO 2021 guideline for this pollutant is 10 µg/m^3. While there is no current explicit requirement to meet the targets and guidelines, and the 2021 WHO guidelines are not in any national or local policies or regulations, it is GLA's ambition to work towards improved air quality for public health.

1.2 Data from the London Atmospheric Emissions Inventory (LAEI)[2] shows that there were 1,752 schools and other educational establishments, with a total of around 880,000 attendees, outside the Ultra Low Emission Zone (ULEZ) as it was before the end of August 2023 (2021 ULEZ, covering central and inner London between the North and South Circular Roads), that are now included in the ULEZ since its expansion to cover outer London at the end of August 2023.

1.3 Transport for London (TfL) has provided the location and concentration data for hospitals and care homes used within their population exposure analysis, which is available as part of the LAEI dataset. This shows that there were 501 health institutions outside the 2021 ULEZ that are now included in the ULEZ since its expansion at the end of August 2023.

NO_2

1.4 The LAEI datasets show that modelled annual mean NO_2 concentrations for 2019 exceeded the 2021 WHO guideline of 10 µg/m^3 at all of the educational establishments in the 2023 ULEZ expansion area, but the annual mean objective level of 40 µg/m^3 was not exceeded at any of them. Figure 1 shows the modelled concentrations. Concentrations were above 30 µg/m^3 at 4.7% of the establishments, just under half (47.6%) of which have nursery classes, and above 20 µg/m^3 at 97.9% of the establishments, just over half (50.7%) have nursery classes (see Table 1).

1 GLA (2018) London Environment Strategy

2 GLA and TfL (2023), London Atmospheric Emissions Inventory (LAEI) 2019 [online]. Available: https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2019

Table 1: Number of educational establishments in the 2023 ULEZ expansion area at locations where LAEI modelled annual mean NO_2 concentrations in 2019 were greater than 30 µg/m³ and 20 µg/m³.

Type of Establishment	Concentration Above 30 µg/m³		Concentration Above 20 µg/m³	
	Number	% with Nursery Classes	Number	% with Nursery Classes
Not applicable	30	33.3	384	36.2
Primary	36	77.8	1,000	69.3
Secondary	11	0.0	269	0.7
Nursery[3]	0	-	21	100.0
All-through	1	100.0	26	57.7
16 plus	4	0.0	15	0.0
Total	**82**	**47.6%**	**1,715**	**50.7%**
% of All Establishments	**4.7%**	**-**	**97.9%**	**-**

1.5 Similarly to the educational establishments, modelled annual mean NO_2 concentrations for 2019 exceeded the WHO guideline of 10 µg/m³ at all of the health institutions in the 2023 ULEZ expansion area, but the annual mean objective level of 40 µg/m³ was not exceeded at any of them. Figure 2 shows the modelled concentrations. Concentrations were above 30 µg/m³ at 4.8% of the institutions and above 20 µg/m³ at 98.4% (see Table 2).

Table 2: Number of health institutions in the 2023 ULEZ expansion area at locations where LAEI modelled annual mean NO_2 concentrations in 2019 were greater than 30 µg/m³ and 20 µg/m³.

Type of Establishment	Number with Concentration Above 30 µg/m³	Number with Concentration Above 20 µg/m³
Old peoples' home	18	362
Hospitals	4	93
General hospital	0	8
Mental hospital	2	23
Maternity hospital	0	2
Ear, nose and throat hospital	0	2
Hospice	0	2
Isolation hospital	0	1
Total	**24**	**493**
% of All Establishments	**4.8%**	**98.4%**

[3] The dataset does not include private nurseries but does include Local Authority nurseries.

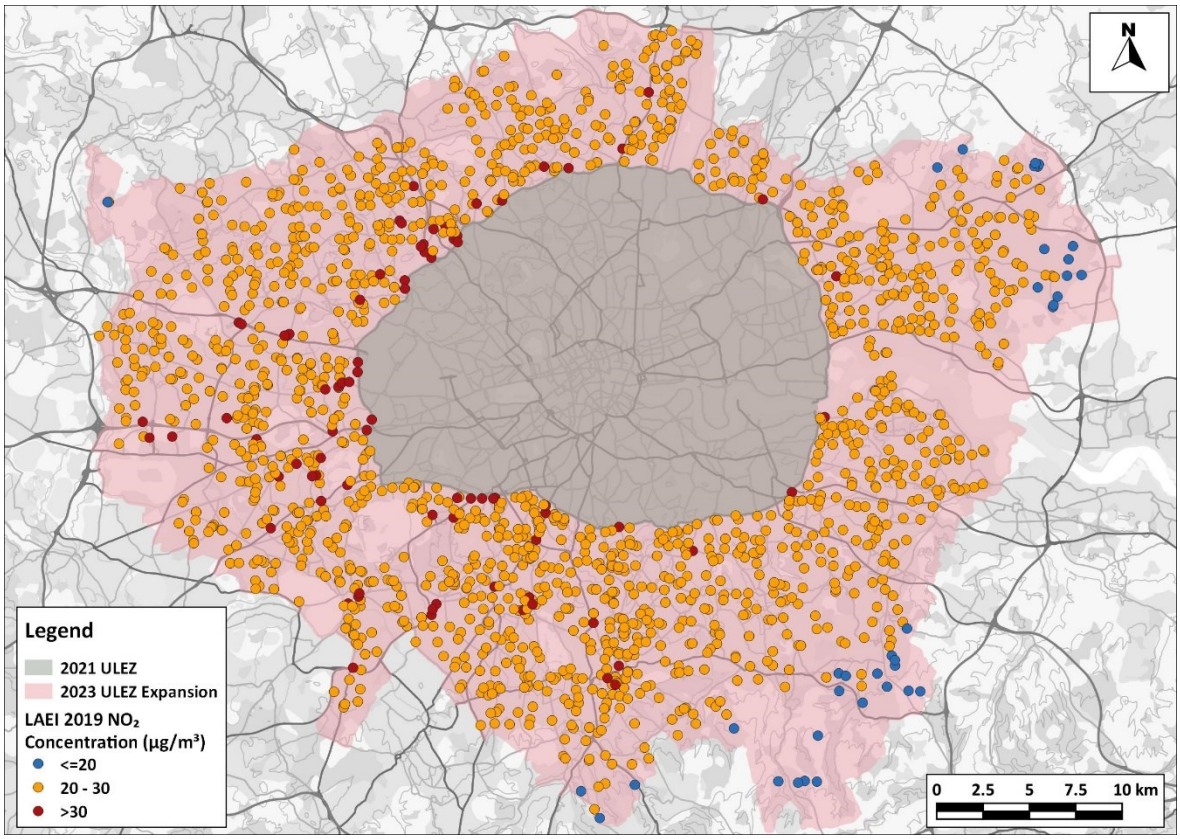

Figure 1: Schools and educational establishments in the 2023 ULEZ expansion area. Coloured dots show the LAEI modelled annual mean NO_2 concentrations in 2019[2].

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

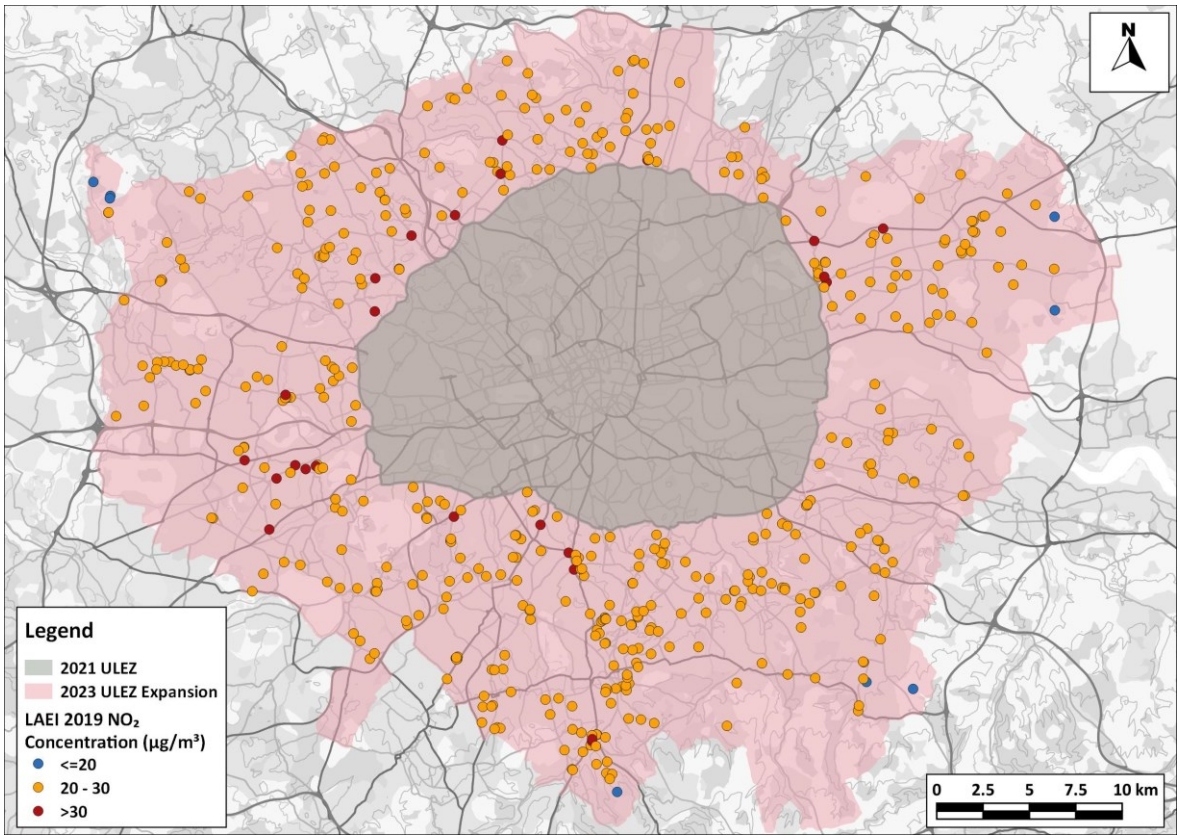

Figure 2: Health institutions in the 2023 ULEZ expansion area. Coloured dots show the LAEI modelled annual mean NO_2 concentrations in 2019.

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

$PM_{2.5}$

1.6 The GLA target of 10 µg/m^3 annual mean $PM_{2.5}$ (to be achieved by 2030) was exceeded at 75.7% of the educational establishments in the 2023 ULEZ expansion area in 2019 (see Figure 3). Over 54% of these schools have nursery classes and 20 of the 21 nurseries in the area are in locations that exceed the target (see Table 3). The WHO guideline of 5 µg/m^3 was exceeded at all of the educational establishments in the 2023 ULEZ expansion area in 2019.

Table 3: Number of educational establishments in the 2023 ULEZ expansion area at locations where LAEI modelled annual mean $PM_{2.5}$ concentrations exceed 10 µg/m³ in 2019.

Type of Establishment	Concentration Exceeding 10 µg/m³	
	Number	% with Nursery Classes
Not applicable	317	37.2
Primary	762	74.1
Secondary	193	0.5
Nursery[3]	20	100.0
All-through	24	58.3
16 plus	11	0.0
Total	**1,327**	**54.1%**
% of All Establishments	**75.7%**	**-**

1.7 The GLA target of 10 µg/m³ annual mean $PM_{2.5}$ (to be achieved by 2030) was exceeded at 79.4% of the health institutions in the 2023 ULEZ expansion area in 2019 (see Figure 4 and Table 4). The WHO guideline of 5 µg/m³ was exceeded at all of the health institutions.

Table 4: Number of health institutions in the 2023 ULEZ expansion area at locations where LAEI modelled annual mean $PM_{2.5}$ concentrations exceed the GLA target of 10 µg/m³ in 2019.

Type of Establishment	Number
Old peoples' home	287
Hospitals	78
General hospital	8
Mental hospital	18
Maternity hospital	2
Ear, nose and throat hospital	2
Hospice	2
Isolation hospital	1
Total	**398**
% of All Establishments	**79.4%**

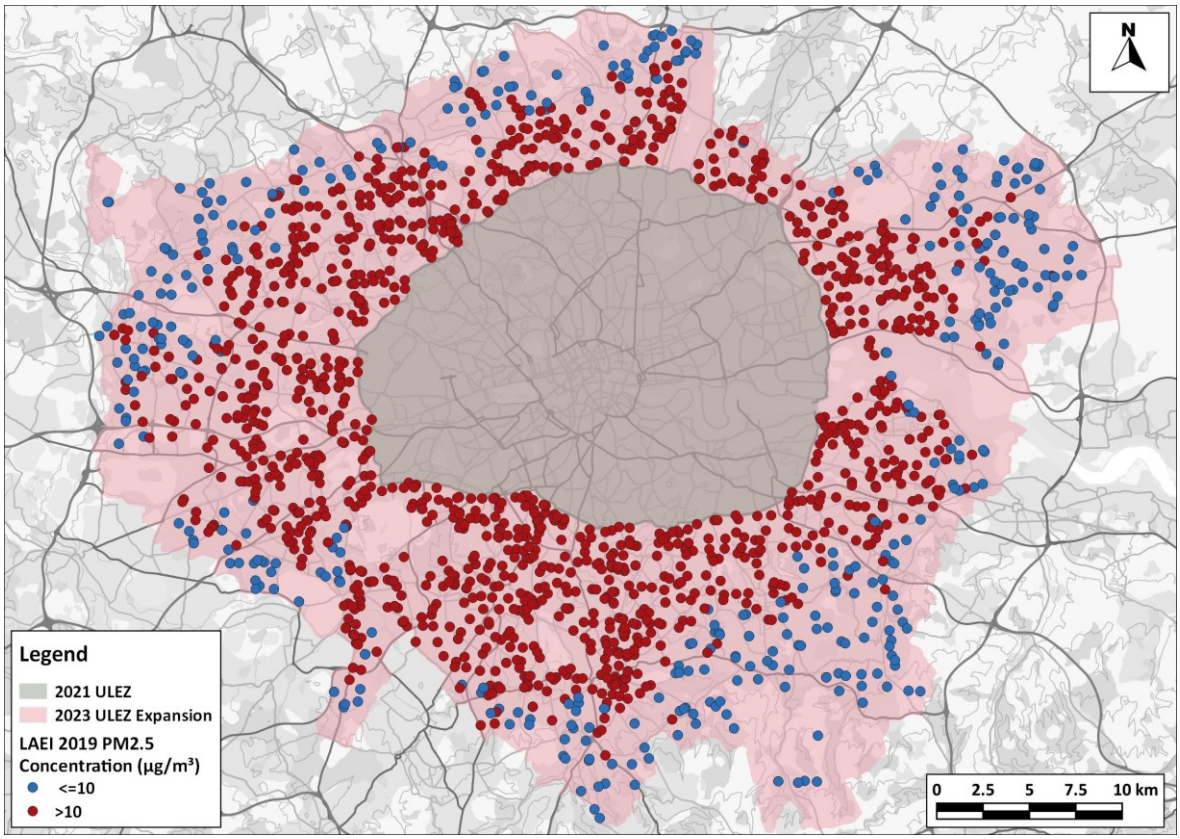

Figure 3: Schools and educational establishments in the 2023 ULEZ expansion area. Coloured dots show the LAEI modelled annual mean $PM_{2.5}$ concentrations in 2019[2].

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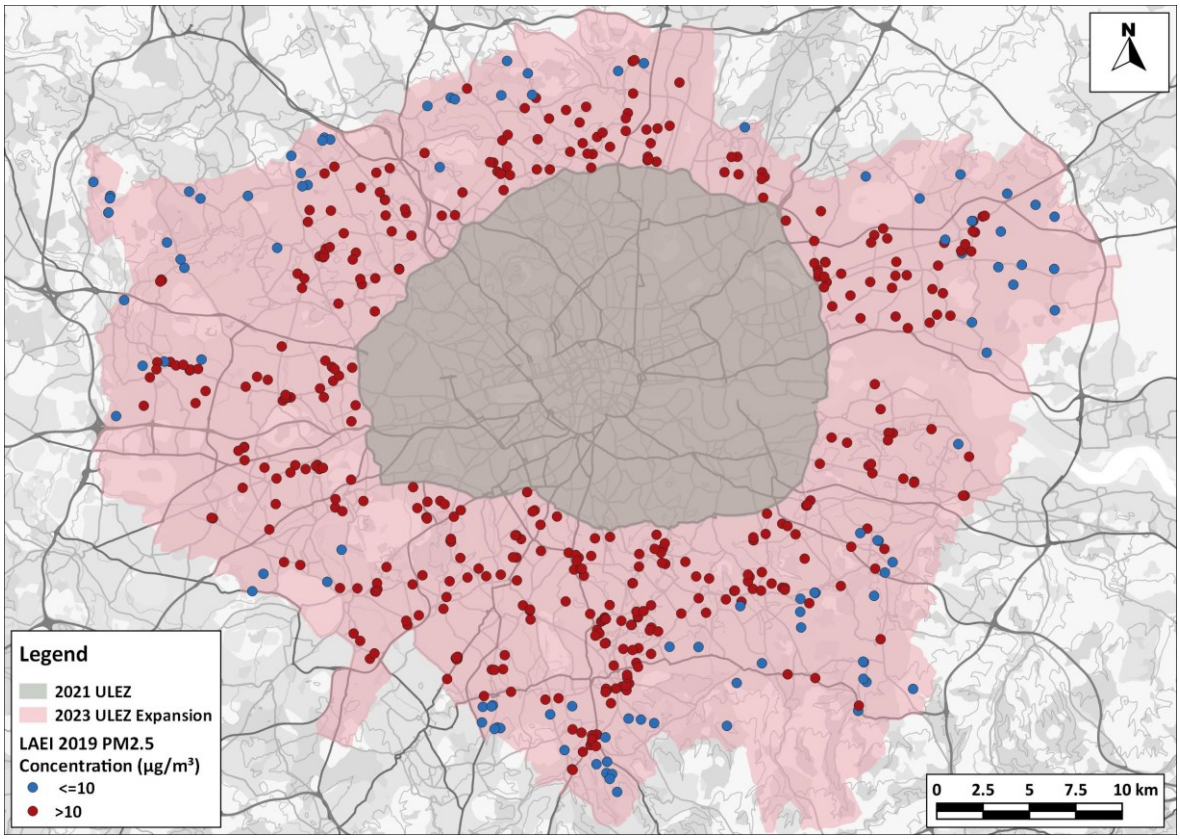

Figure 4: Health institutions in the 2023 ULEZ expansion area. Coloured dots show the LAEI modelled annual mean $PM_{2.5}$ concentrations in 2019[2].

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2 Methodology and Additional Information

2.1 The LAEI Population Exposure dataset and health institution data provided by TfL have been used to plot school and educational establishments, hospitals and care homes in London. The number of those located within the 2023 ULEZ expansion area has been calculated by determining the locations within the databases that fall within the 2023 ULEZ boundary but outside the 2021 ULEZ boundary. The LAEI Schools Summary dataset has been used to calculate the number of different types of schools and number of pupils within that area, and how many locations are in areas predicted to have NO_2 and $PM_{2.5}$ concentrations above specific levels in 2019, according to the LAEI dataset. The health institution data provided by TfL have been used to calculate the number of hospitals and care homes within that area, and how many are in areas predicted to have NO_2 and $PM_{2.5}$ concentrations above specific levels in 2019.