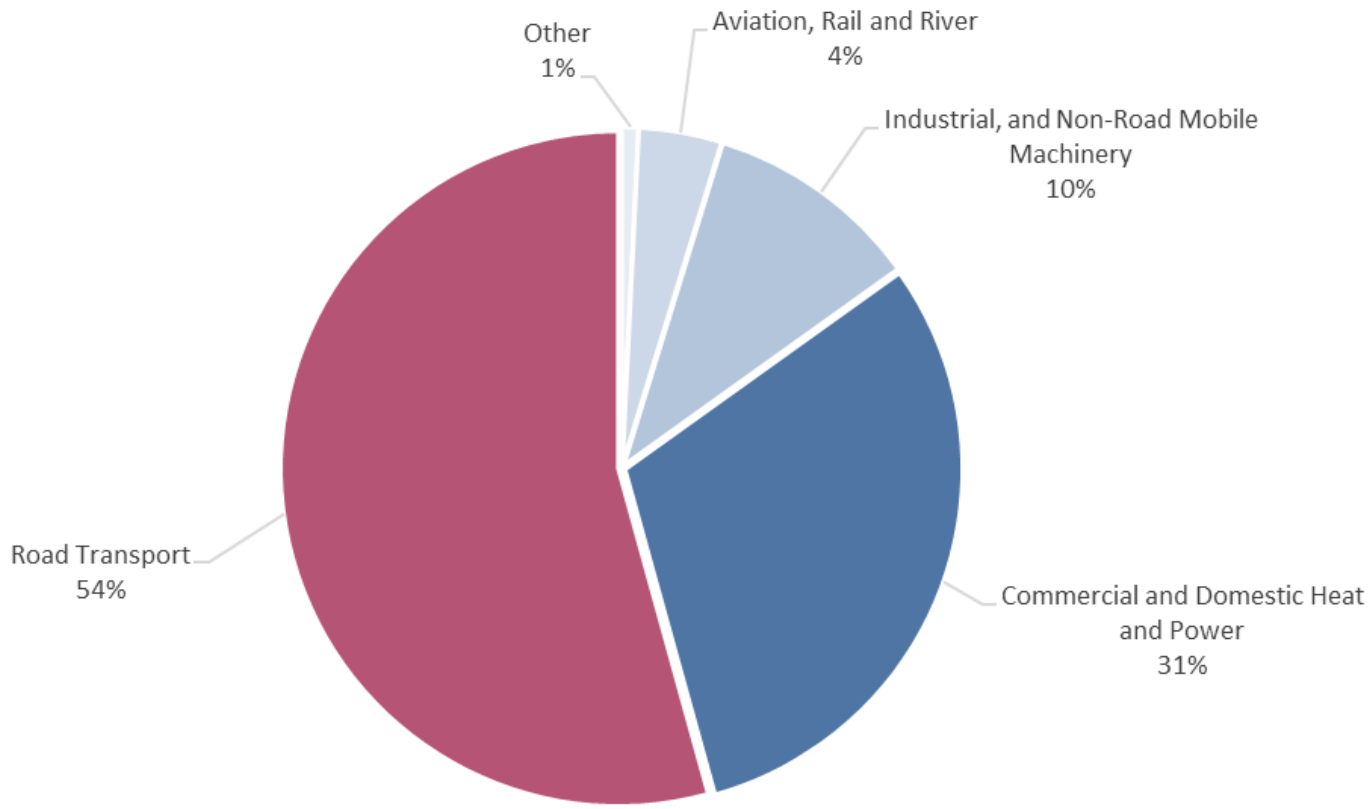
Air quality at London primary schools

18th February 2021

EDF
ENVIRONMENTAL
DEFENSE FUND®
Finding the ways that work

Helping to understand the problem (1)

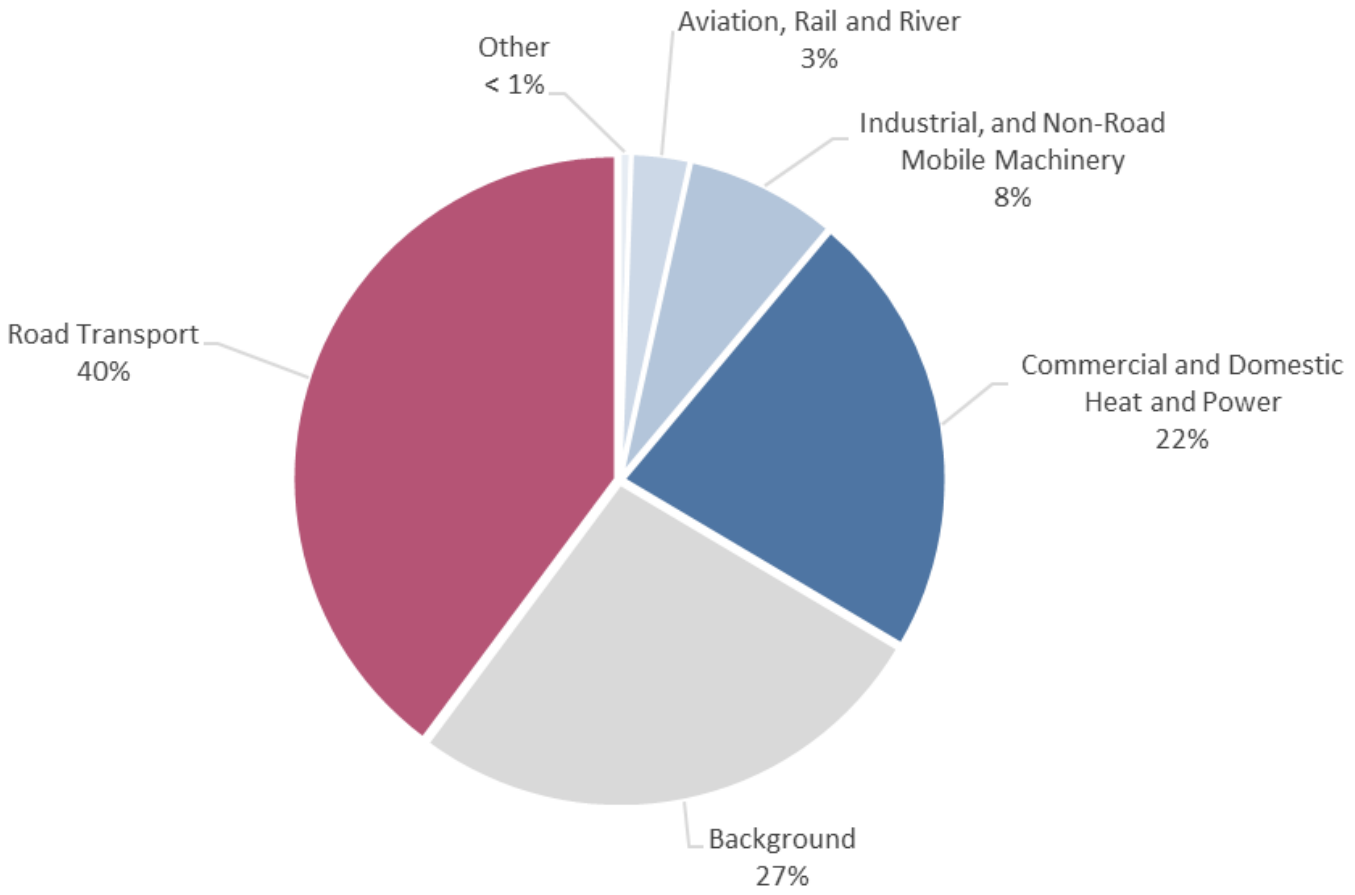
Local source contribution to annual average modelled NOx concentrations at London primary schools (2019)



Data source: Cambridge Environmental Research Consultants (CERC) as part of Breathe London pilot project

Helping to understand the problem (2)

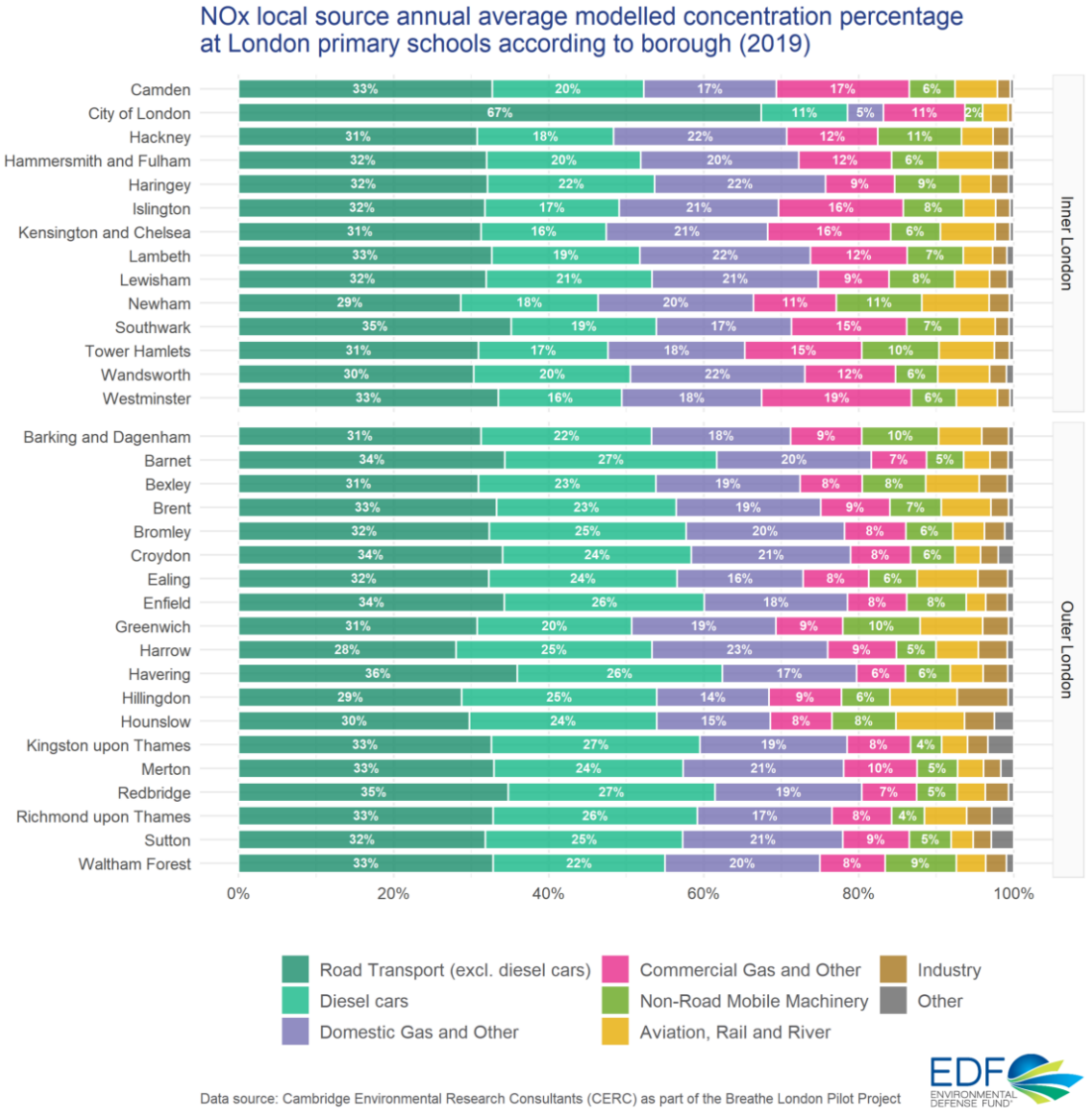
Source contribution to annual average modelled NOx concentrations at London primary schools (2019)



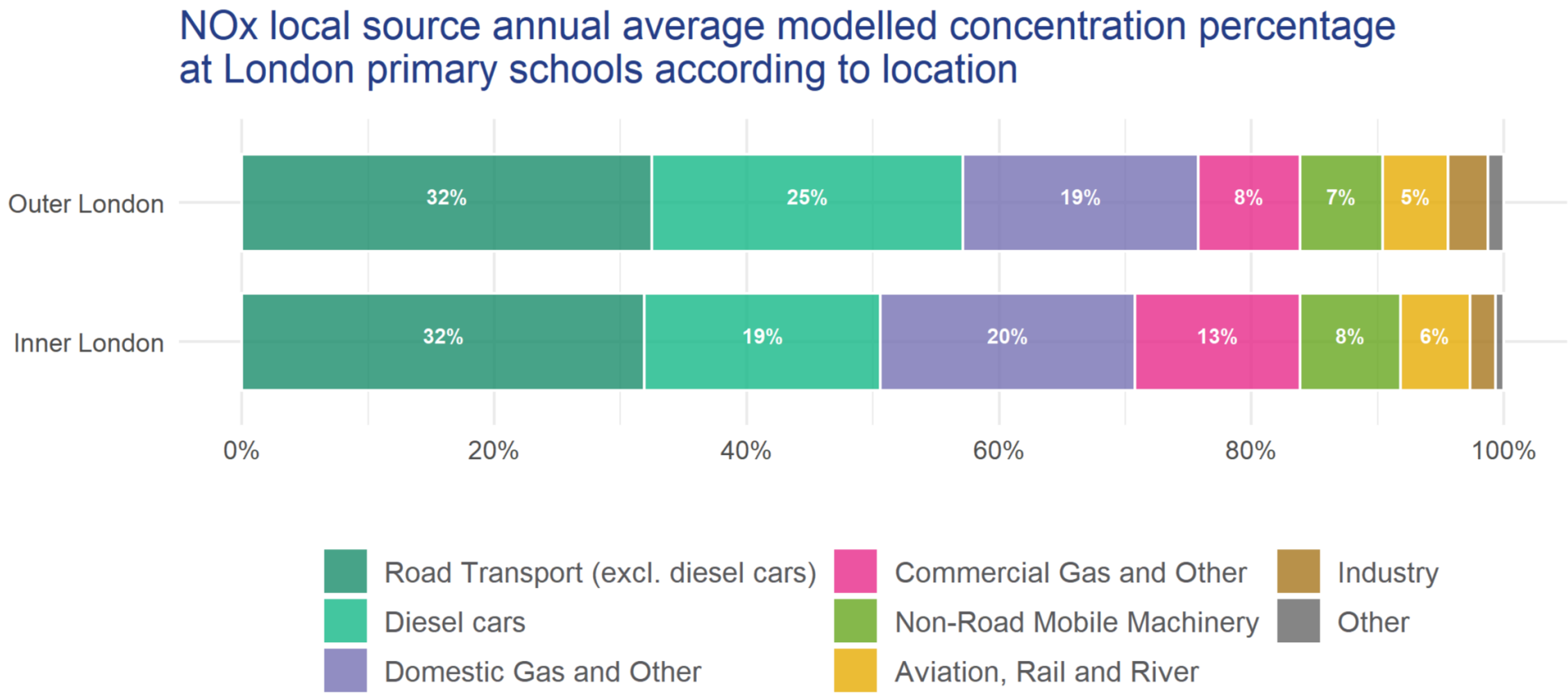
Data source: Cambridge Environmental Research Consultants (CERC) as part of Breathe London pilot project

Helping to understand the problem (3)

- We can work to splice the data geographically to give an idea of different priorities.
- Although relatively similar across boroughs.
- Diesel cars are a larger contributor in Outer London areas.



Helping to understand the problem (4)



Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

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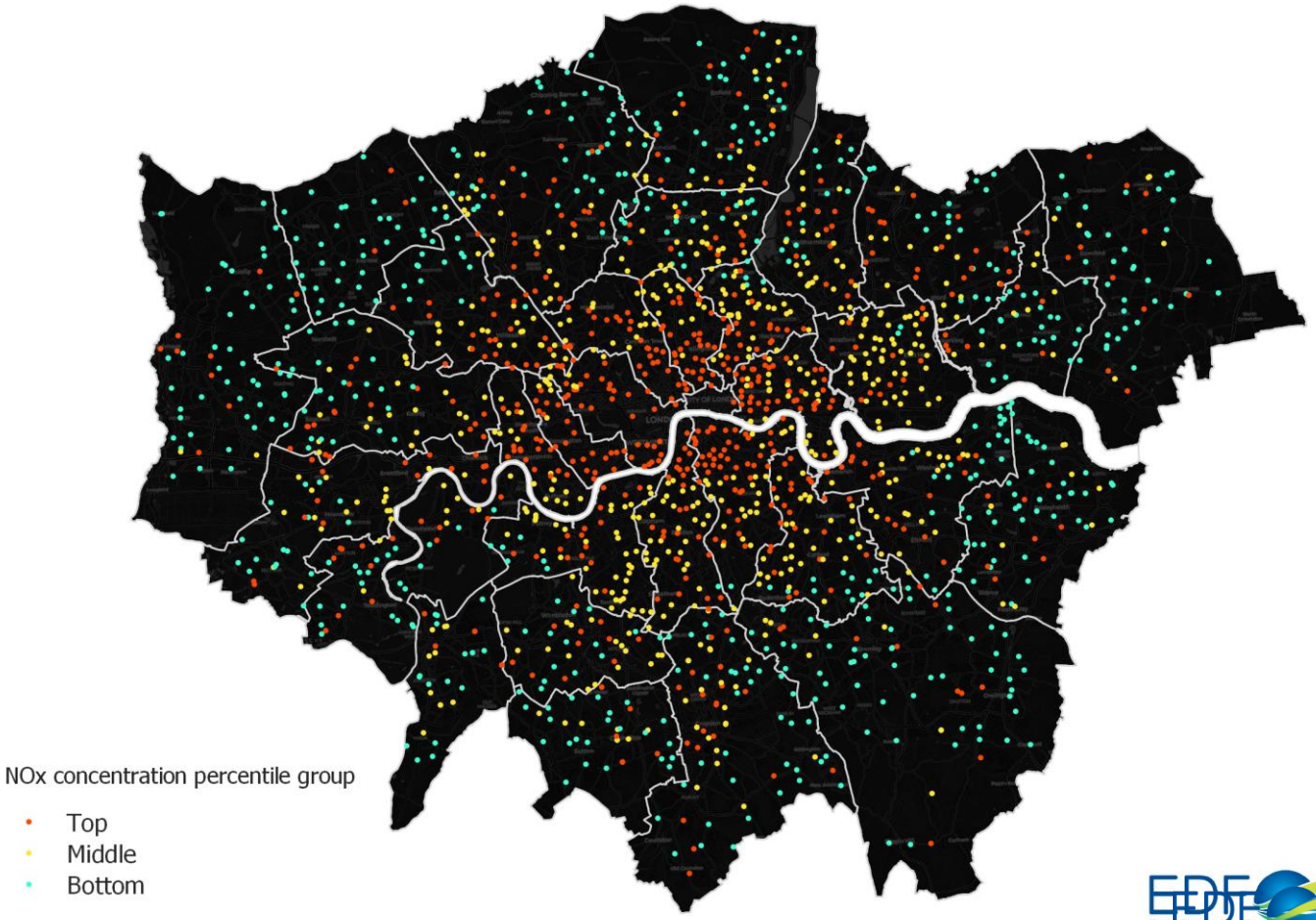
Looking at road transport in detail

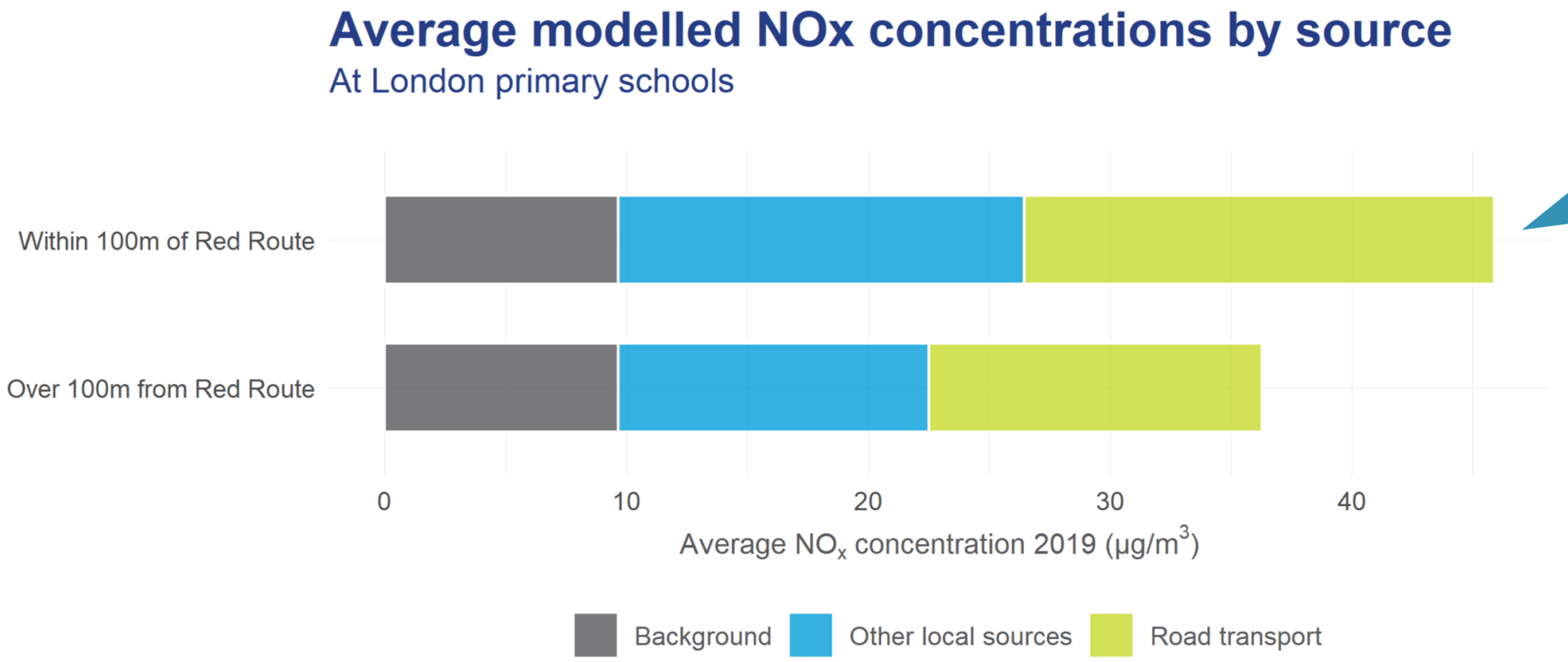
- The total NOx concentrations from road transport varies greatly across the 1,795 primary schools

Modelled NO_x concentrations from road transport sources at London primary schools (2019)



Data source: CERC as part of Breathe London pilot project. Basemap © OpenStreetMap contributors, © CARTO

Priority action for schools by TfL roads (1)



On average 25% higher at schools within 100m of a TfL road

Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

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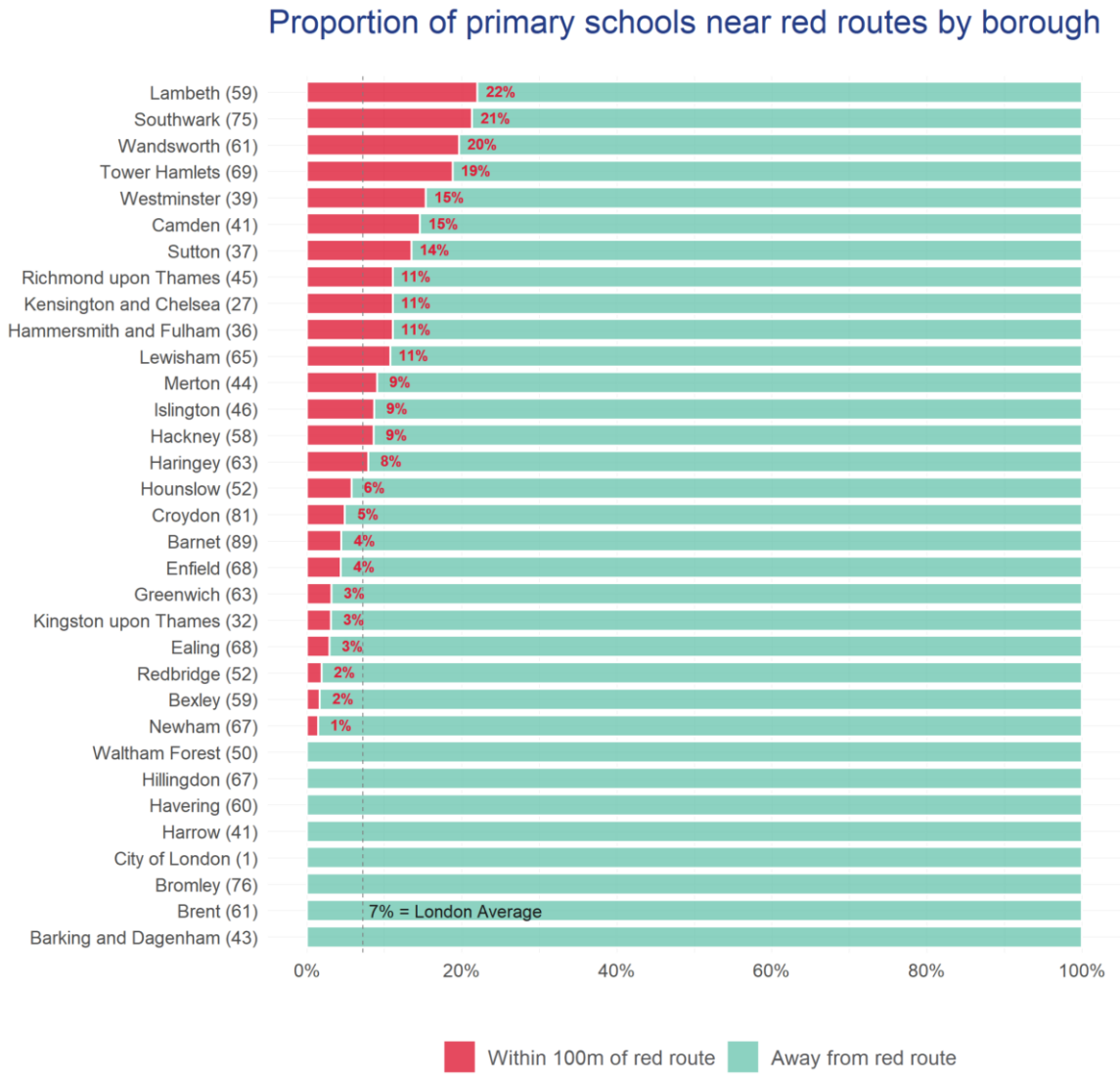
Priority action for schools by TfL roads (2)

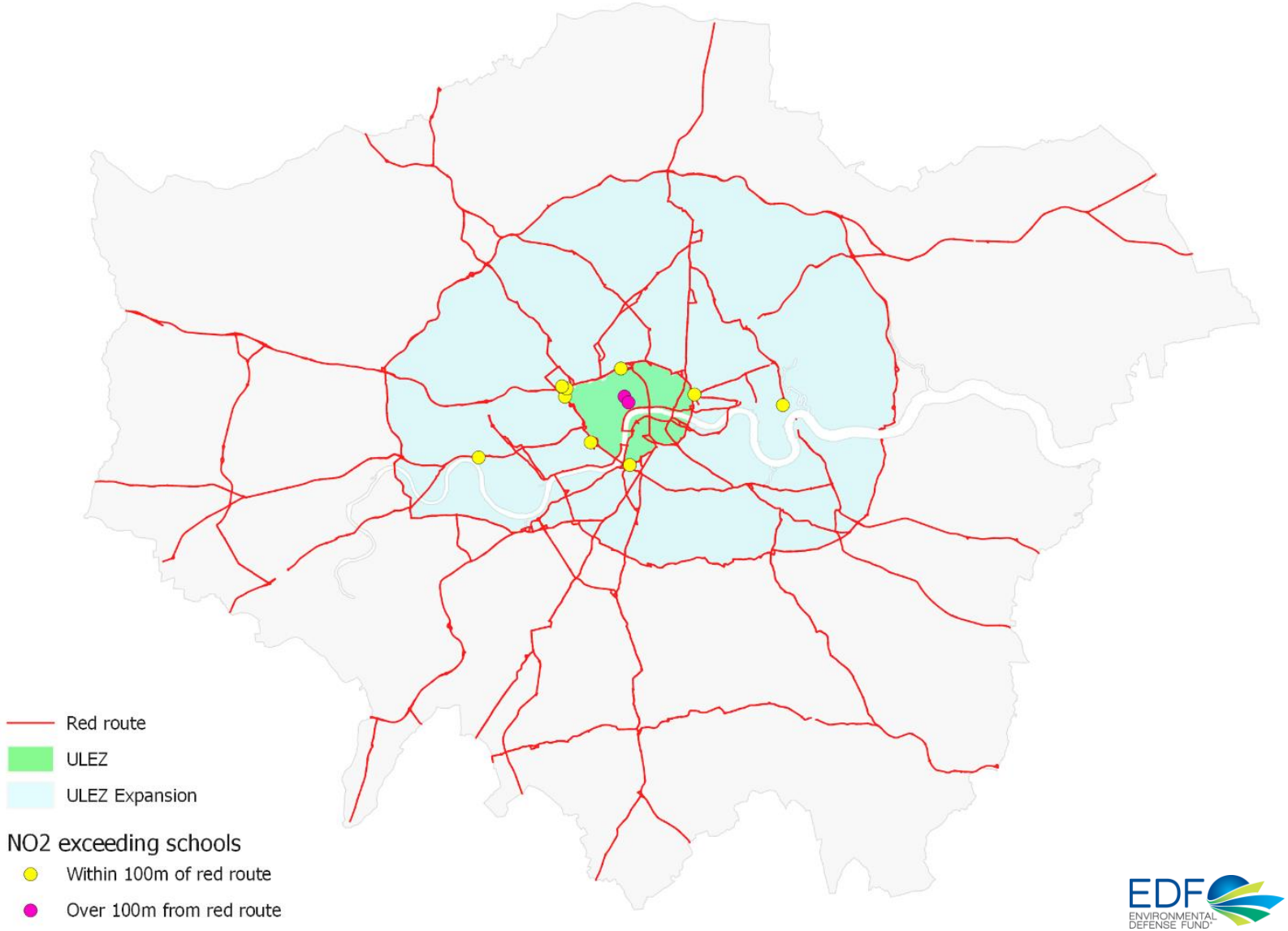


Data sources: Get information about schools (GIAS) service; Transport for London.

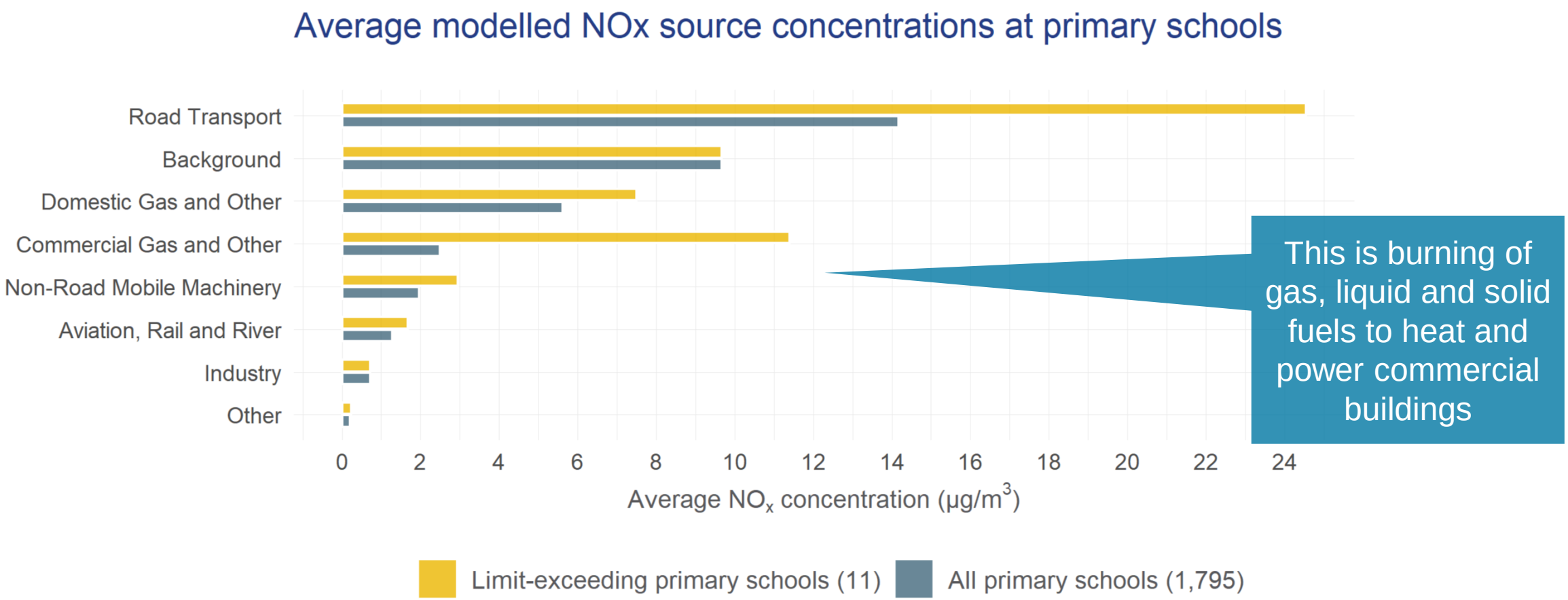
Trends at GLA NO2 exceeding schools (1)

- The GLA's modelled 2019 NO_2 levels, there are 11 primary schools in the capital still exceeding legal limits
- All of these schools are within the Expanded ULEZ zone (5 in central ULEZ, 6 in expanded).
- 9 of the 11 schools (82%) are within 100m of a red route. This is compared to just 7% of all London's primary schools being within 100m of a red route.

Trends at GLA NO2 exceeding schools (2)



Trends at GLA NO2 exceeding schools (3)



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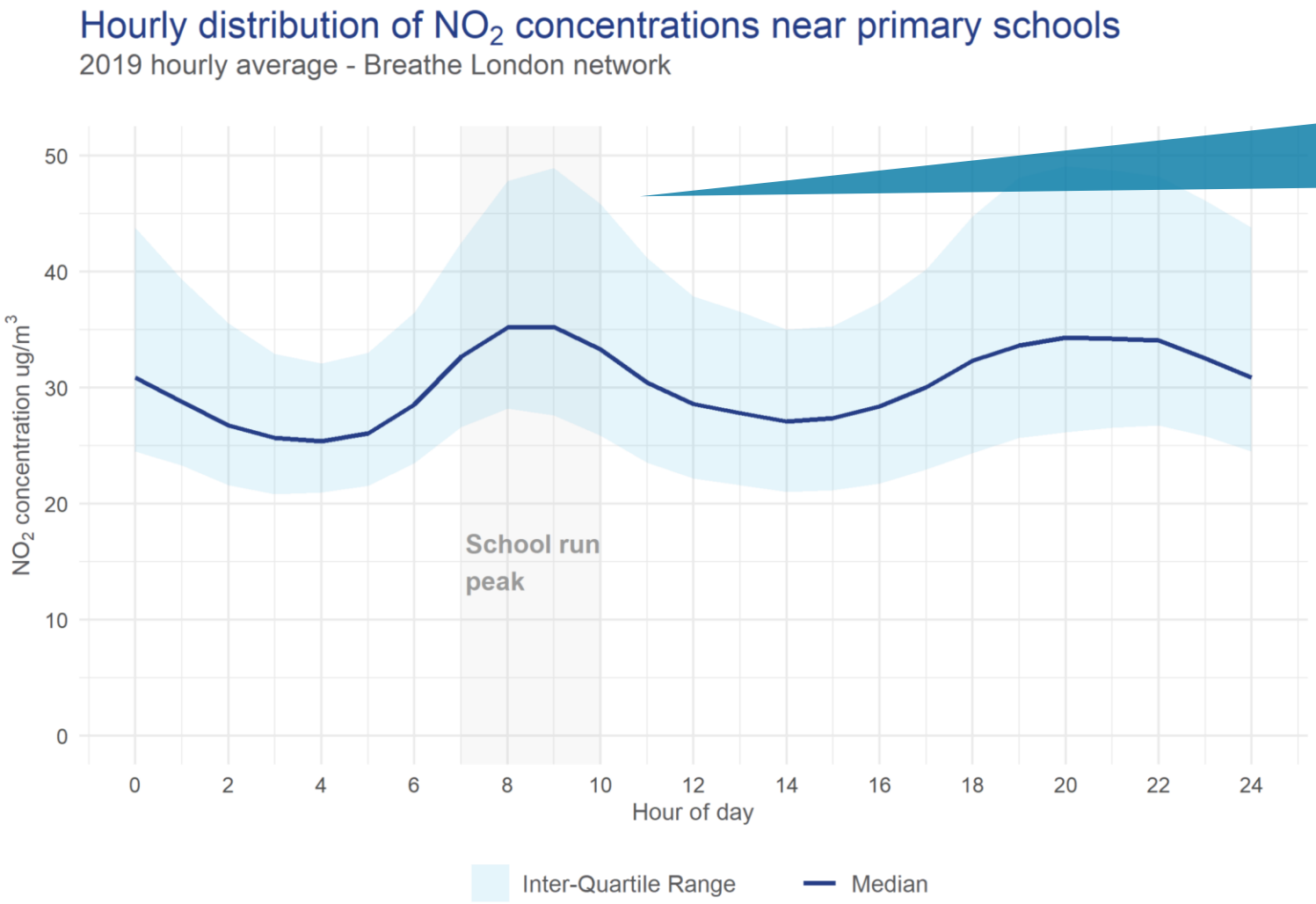
Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

The school run



Median hourly NO2 concentration is 17% higher between 07:00 – 09:00 than the average across all hours of day.

We have not included legal limit here because the hourly legal limit is 200ug/m3. The annual average limit is 40ug/m3.

This is more about showing when pollution levels are generally higher.

Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

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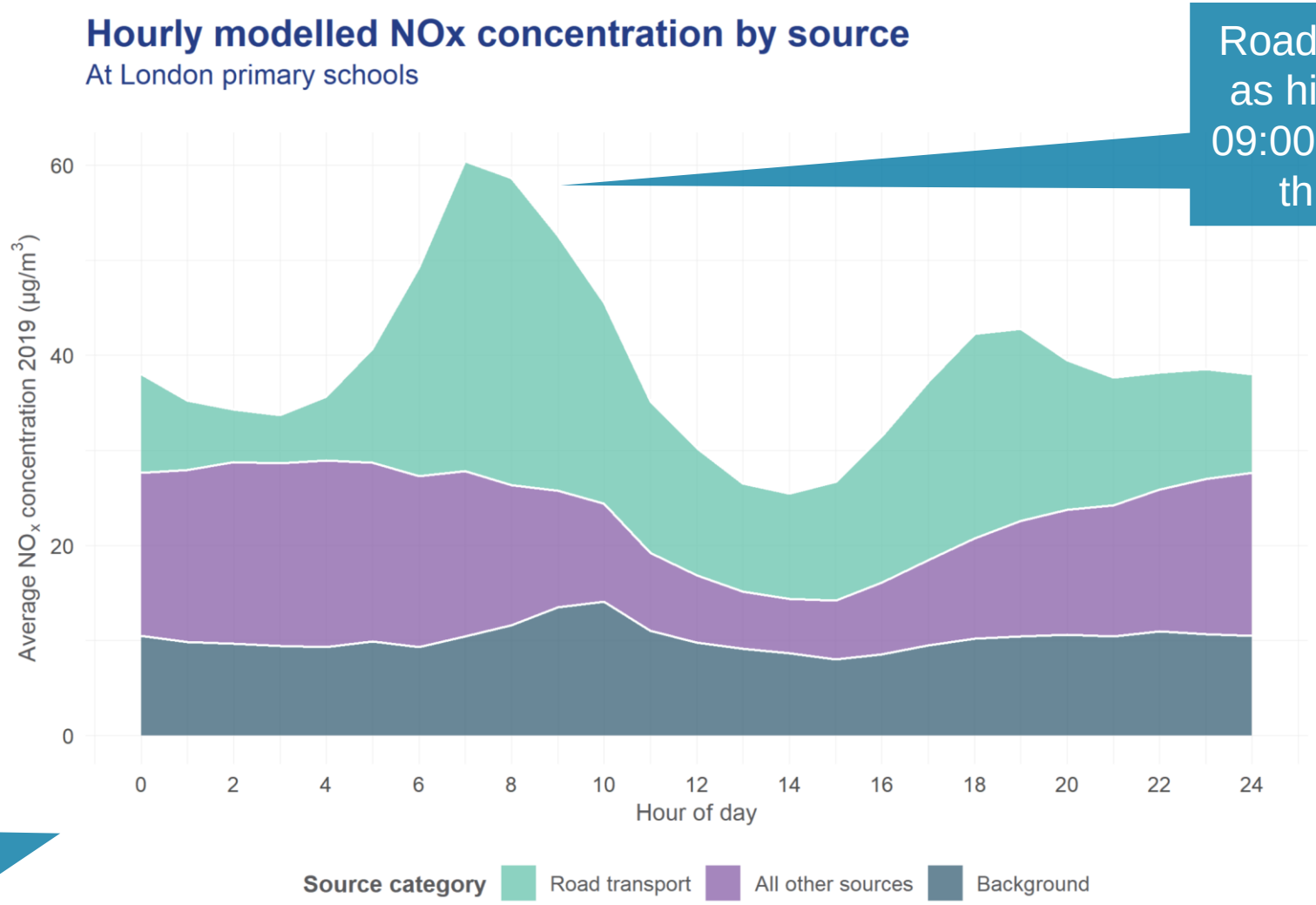
The school run (NOx)



Road transport NOx twice as high between 07:00 – 09:00 than it is on average throughout the day.

Between 07:00 – 09:00 road transport is responsible for over 50% of all NOx pollution

Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

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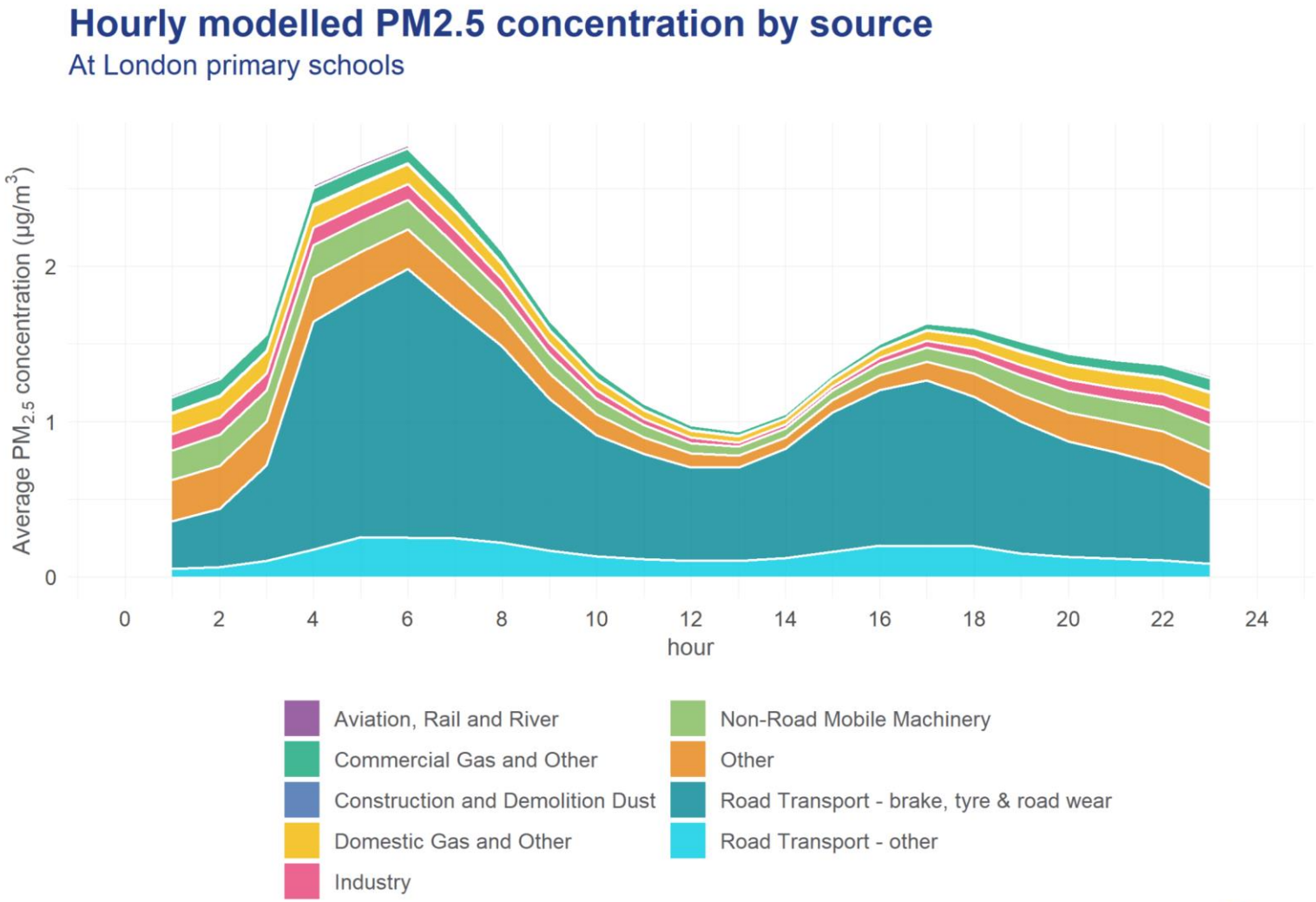
The school run (PM2.5)

Looking at local sources only we see road transport dominates concentrations, largely driven by tyre and brake wear and drives two peaks in the day: at 6AM and at 5PM



Data source: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project

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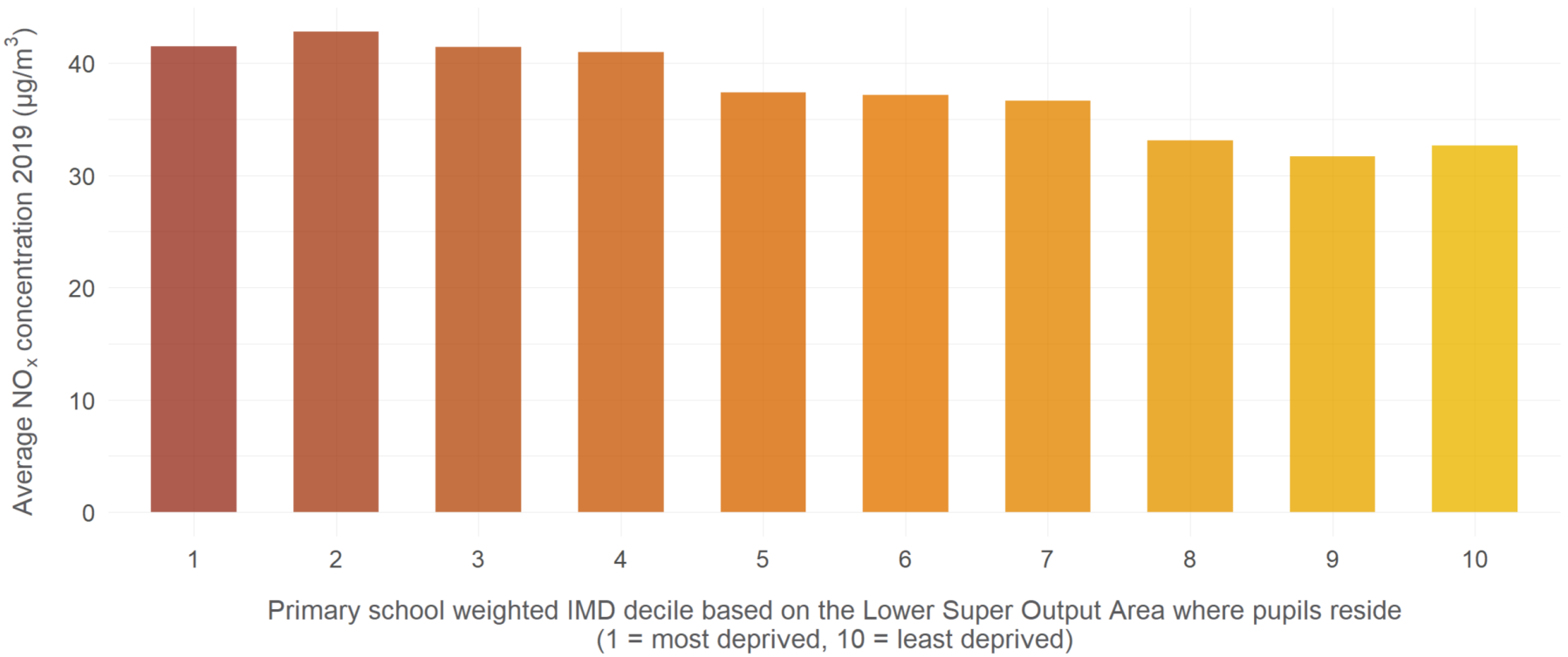
Deprivation

The median NOx is 27% higher at primary schools with pupils from the most deprived areas than at primary schools with pupils from the least deprived areas

Average modelled NOx concentrations at London primary schools

According to the level of deprivation where pupils reside



Data sources: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project; Ministry of Housing, Communities & Local Government.

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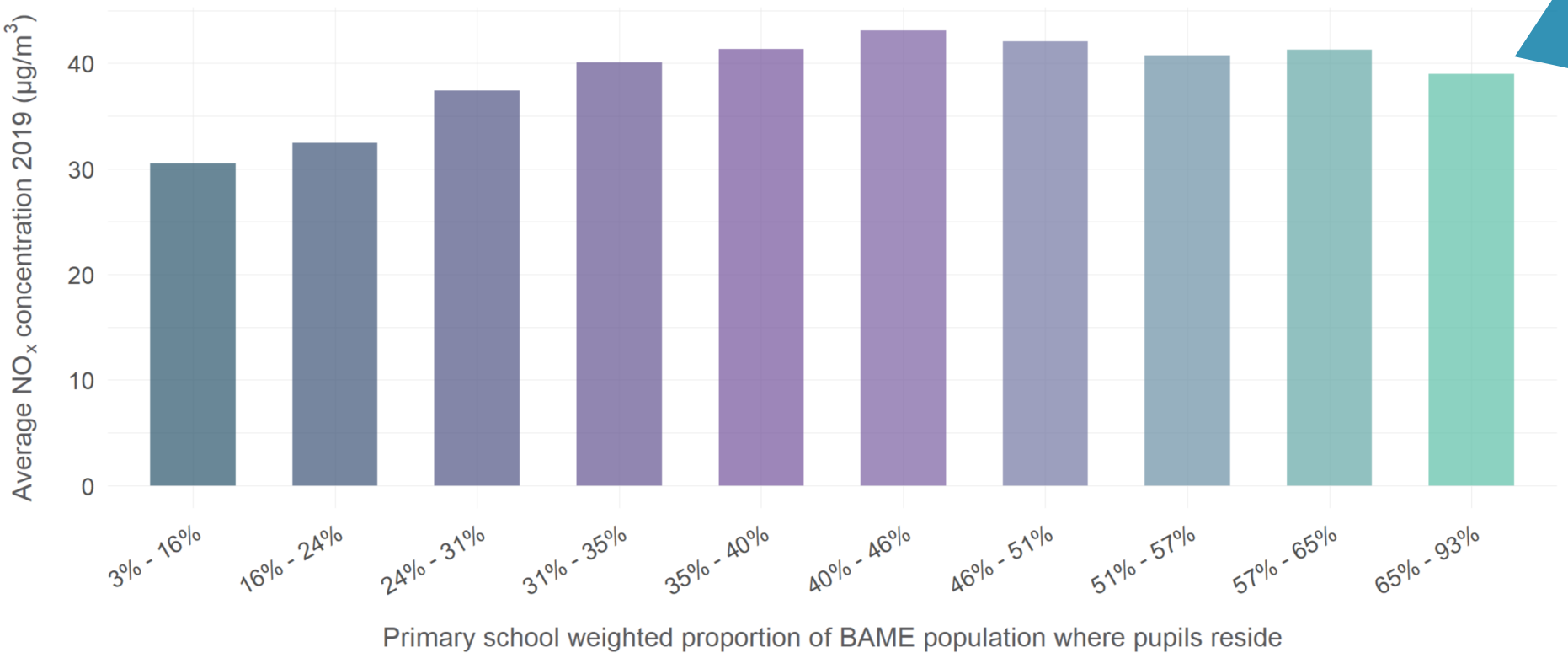
Ethnicity

Average modelled NOx concentration at London primary schools

According to the proportion of BAME population where pupils reside



Schools which have pupils from areas with the highest % of BAME population (65-93%) have average NOx concentrations 28% higher than schools which have pupils from areas with the lowest % of BAME population (3-16%)

Data sources: Cambridge Environmental Research Consultants (CERC) as part of the Breathe London Pilot Project; Office for National Statistics.

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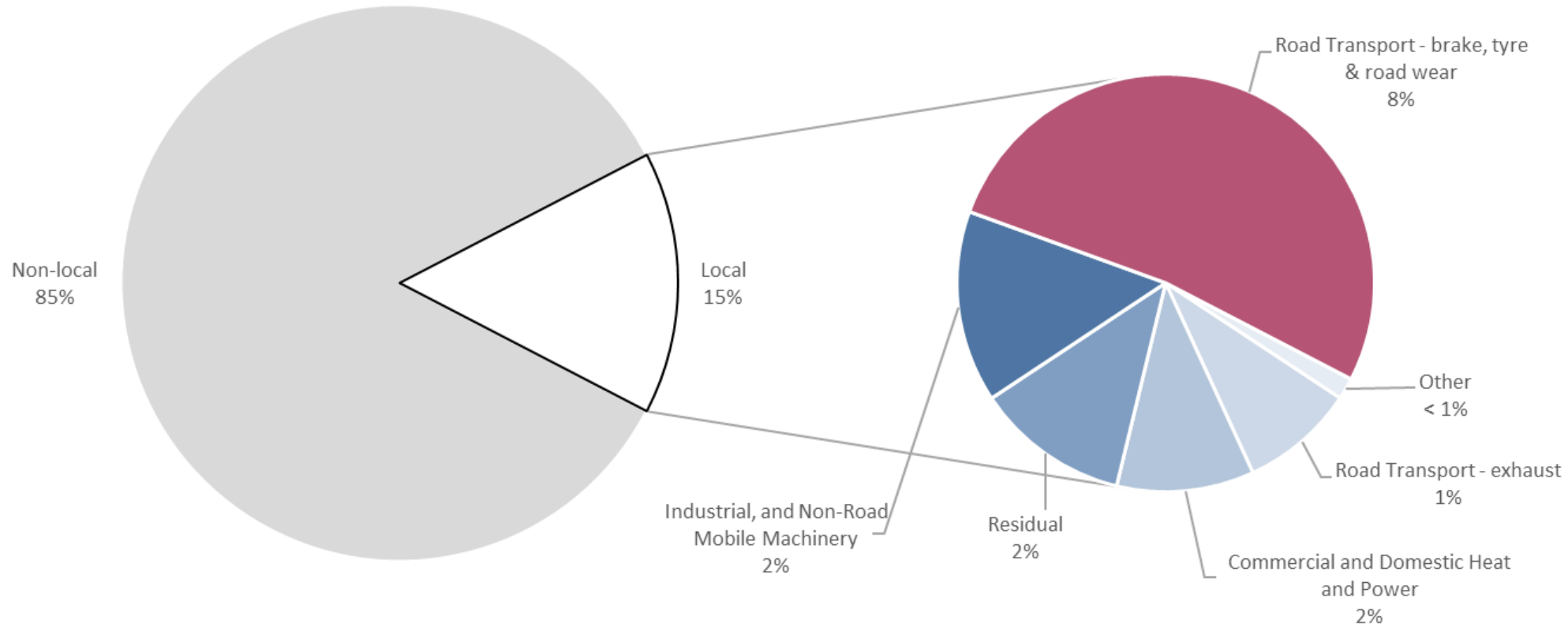
Helping to understand the problem (PM2.5)

Source contribution to annual average modelled $PM_{2.5}$ concentrations at London primary schools (2019)



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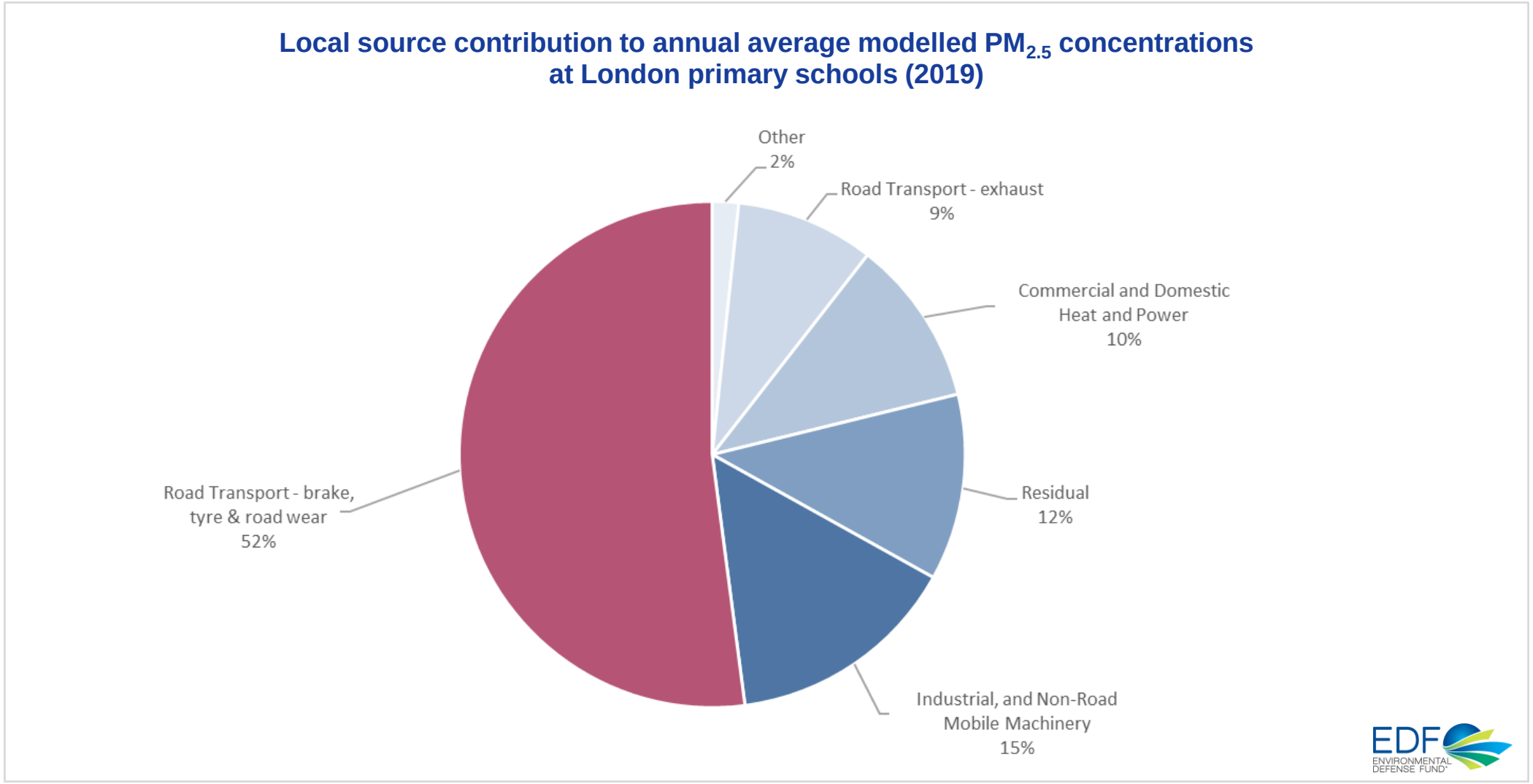
Helping to understand the problem (PM2.5)



Data source: Cambridge Environmental Research Consultants (CERC) as part of Breathe London pilot project

Modelling methodology

- This analysis was carried out using data produced by Cambridge Environmental Research Consultants (CERC) as part of the Breathe London pilot project. The data was created by the ADMS-Urban model, based on emissions of NOx taken from the London Atmospheric Emissions Inventory (LAEI) published by the GLA.
- This work used ‘LAEI 2013’, which was published in 2016, has a base year of 2013 and includes projections for 2020. It used annual average values for 2019, obtained by interpolating between the base year values and the projections for 2020.
- Modelled annual concentrations (µg/m3) at state-funded primary schools across Greater London for 27 different pollution sources.
- Sensitive receptors were modelled at 1 metre above ground.
- Rather than modelling pollution directly on or above buildings, new locations were created by selecting the nearest road section within 100m of the original location to give a better representative of children’s exposure.
- In this deck the average refers to the median; this was used to reduce model uncertainty at high levels of NOx concentration.