Impacts of London's ULEZ

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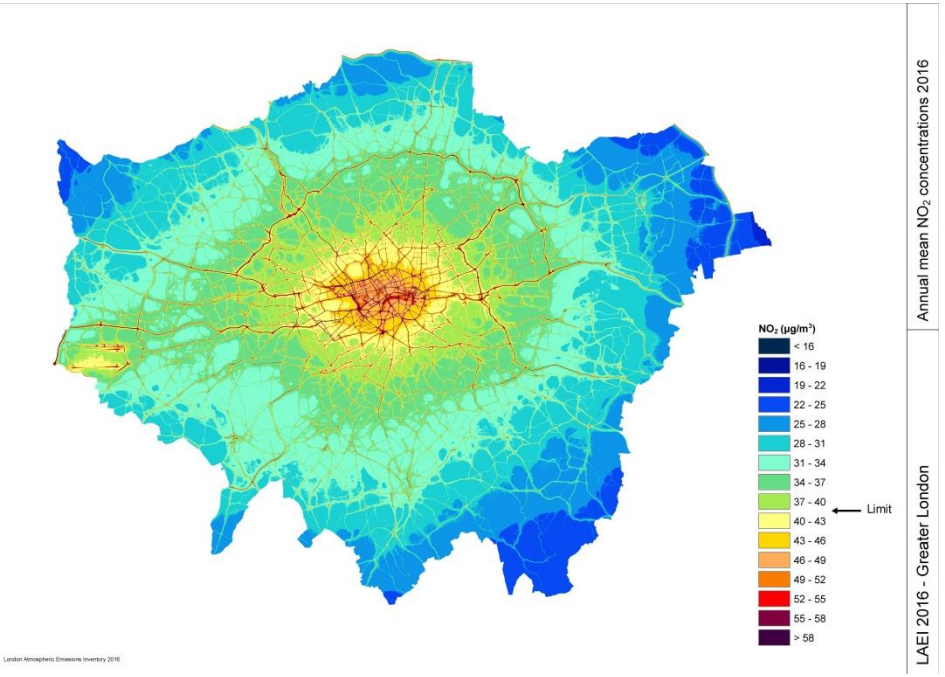
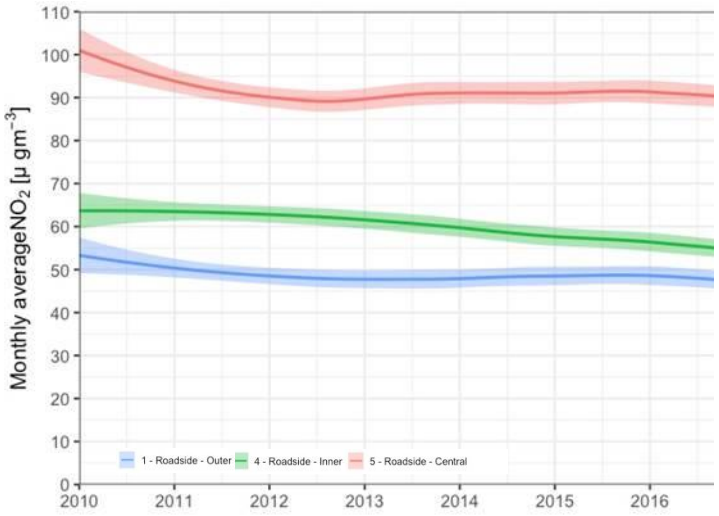
Why ULEZ?

- Focus on reducing NO_2
  - Also reduces particulates and CO_2
- Based on LAEI 2016[1]
  - 2 million people living in areas above legal limits (40µ/m^3 annual mean NO_2)
  - Over 50% of roadside locations exceed limit values
  - Nearly 500 schools exceed
  - Road transport contributes ~50% of NOx emissions across London
- Highest concentrations in central London
  - Exceedences on major roads across whole of London
- New research[2] estimates that around 1,000 hospitalisations for asthma and serious lung conditions due to harmful air pollution.
  - Around of quarter of these were children
- Roadside pollution levels between 2010 and 2016 showed little improvement

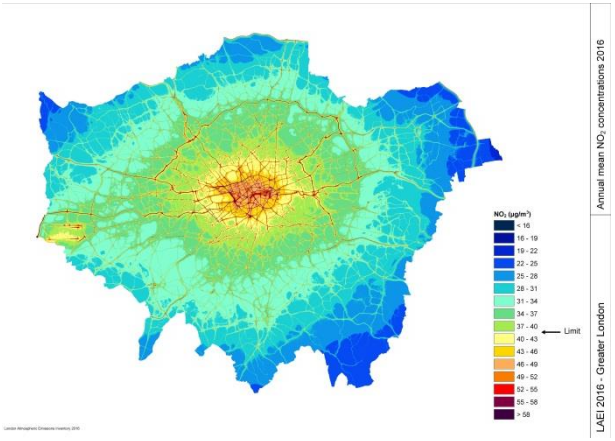


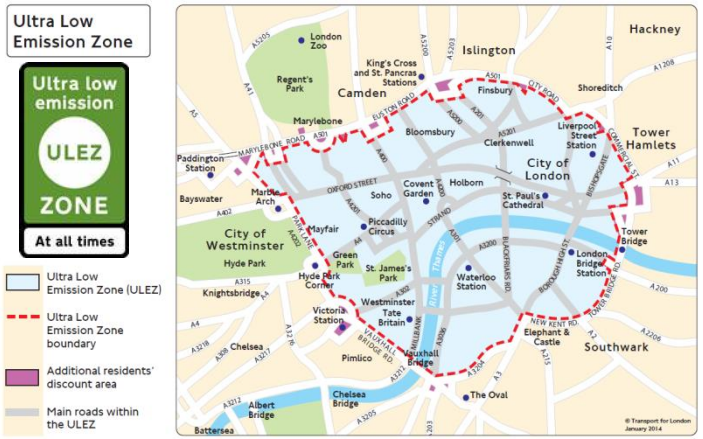


1. London Atmospheric Emissions Inventory 2016
2. Health Impact Assessment of Air Pollution on Asthma in London

Where and what is ULEZ?

- Same area as the Congestion Charge Zone
- 24 hours a day, every day
- Vehicles must meet strict emissions standards
  - Euro 4 petrol cars and vans (2005/2006)
  - Euro 6 diesel cars and vans (2015/2016)
  - Euro 3 motorcycles and mopeds (2007)
  - Euro VI for lorries, buses and coaches (2014)
- Private Hire Vehicles (PHVs) are included in ULEZ, Taxis are subject to age limits and Zero Emission Capable (ZEC) requirements
- Exemptions for registered residents, and vehicles with disabled passenger tax class including PHV
- See TFL website for more detailed information on ULEZ





Assessing the impacts of ULEZ

- Our assessment of the first six-months operation of ULEZ is based on four key metrics:
  - Numbers of vehicles and compliance rates based on camera data
  - Traffic flows from Automatic Traffic Counters
  - Estimated changes in vehicle emissions using COPERT5 emissions factors
  - Air quality monitoring data using London's air quality network

  Report is available at:
  https://www.london.gov.uk/sites/default/files/ulez_six_month_evaluation_report_final_oct.pdf

Vehicle numbers and compliance rates

- Vehicle numbers : the average number of vehicles detected driving in the zone each day*.
  - Available for CCZ Hours (7am – 18pm) from 2017 onwards, and ULEZ hours from 8th April 2019

Date	Number of vehicles driving in the charging zone per day during CC hours			Proportions of vehicles driving in the charging zone during CC hours	
	Unique vehicles detected in zone*	Non-compliant vehicles	Compliant vehicles	Non-compliant vehicles	Compliant vehicles
Feb-17	102,493	62,310	40,184	60.8%	39.2%
Mar-19	91,035	35,578	55,457	39.1%	60.9%
Apr-19	89,380	26,195	63,185	29.3%	70.7%
May-19	88,796	25,610	63,186	28.8%	71.2%
Jun-19	87,113	24,549	62,564	28.2%	71.8%
Jul-19	83,899	23,054	60,844	27.5%	72.5%
Aug-19	80,128	21,133	58,994	26.4%	73.6%
Sep-19	85,854	22,133	63,721	25.8%	74.2%

- Compliance rose from 39 per cent in February 2017 to 61 per cent in March 2019 (before scheme start)
  - equivalent to a 55 per cent increase the proportion of compliant vehicles detected.
- Compliance rose to 74 per cent in September 2019
  - equivalent to a 89 per cent increase the proportion of compliant vehicles detected since February 2017
  - equivalent to a 34 per cent decrease the proportion of non-compliant vehicles detected since March 2019
  - Approximately 40,000 fewer non-compliant vehicles detected in the zone since February 2017
  - Approximately 13,500 fewer non-compliant vehicles detected in the zone since March 2019
- Compliance rates are continuing to increase monthly
- ULEZ Hours compliance rates are tracking CCZ hours, but are slightly higher (77 per cent in September 2019)

* Not representative of traffic flow

Traffic flows

- TfL use automatic traffic count data at representative sites across London to monitoring changes in traffic flows.
  - Analysed total traffic flows (all vehicles) for each hour of the day
  - Averaged each month
  - Representing central, inner and outer London

- Compared monthly data in 2019 to same month in 2018 in order to take account of usual seasonal changes in

24-Hours	All Days of week			Weekdays			Weekends		
Comparison 2019 to 2018	Central	Inner	Outer	Central	Inner	Outer	Central	Inner	Outer
January	0%	-1%	2%	0%	-1%	2%	-1%	-1%	2%
February	0%	-1%	2%	0%	-1%	2%	0%	-2%	2%
March	2%	2%	4%	1%	2%	3%	4%	3%	6%
April	-2%	-2%	2%	-2%	-1%	2%	-3%	-2%	1%
May	-3%	-1%	1%	-2%	-2%	1%	-6%	0%	1%
June	-5%	0%	0%	-5%	0%	0%	-6%	1%	0%
July	-5%	-1%	na	-5%	-2%	na	-5%	0%	na
August	-8%	-4%	na	-7%	-4%	na	-9%	-3%	na
September	-9%	-2%	na	-9%	-2%	na	-11%	-1%	na

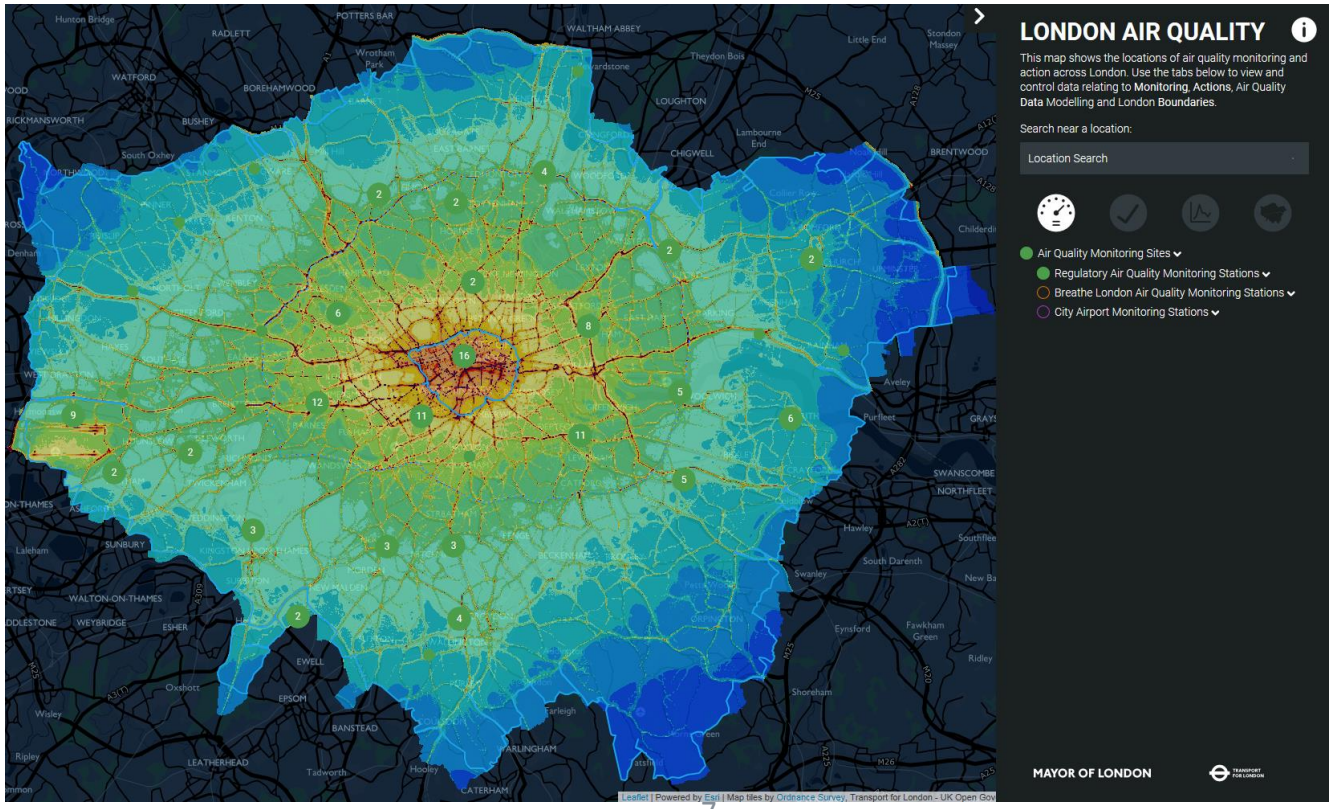
- Preliminary analysis suggests traffic flows in central London are reduced by between 3 and 9 per cent between May and September 2019 compared to 2018.
  - Similar reductions observed across weekdays and weekends
  - Analysis for different times of the days suggests more substantial differences in evening and night-time (times where charges have not applied before).

- Longer term analysis is required to determine complex changes in traffic flows including across inner and outer London, and to understand whether current trends are sustained.

- Changes to PHV requirements and inclusion in the ULEZ and CCZ likely to be contributing factors

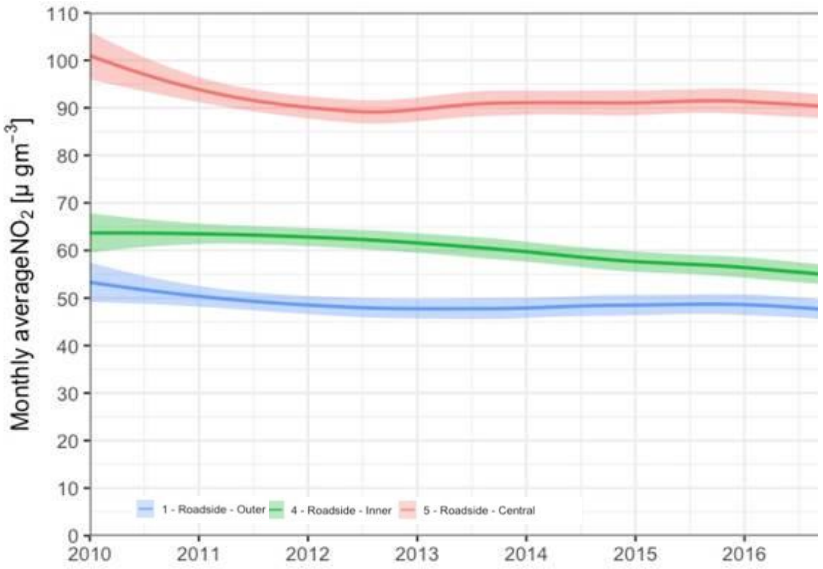
Air Quality

- We estimate road transport NOx emissions are 31 per cent lower than a scenario where there is no ULEZ
  - Estimate uses compliance rates for July – September 2019.
  - This is on track to meet the 45 per cent we expected for the first year.
- We have used London's air quality monitoring network to analyse monthly trends of NO_2 concentrations since 2010.
  - Over 160 monitoring sites for NO_2
  - Group by site type as roadside or background
  - Group by site locations as Central (ULEZ), Inner (to North and South Circular) and Outer London (to GLA Boundary)
  - See our interactive Air Quality Map showing our air quality policy locations and monitoring sites.



Timeline

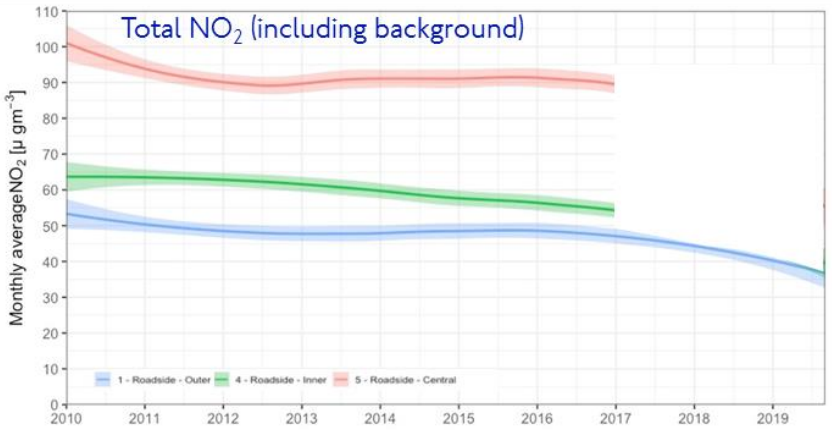
- Focusing on NO_2, our trends show little change between 2010 and 2016.

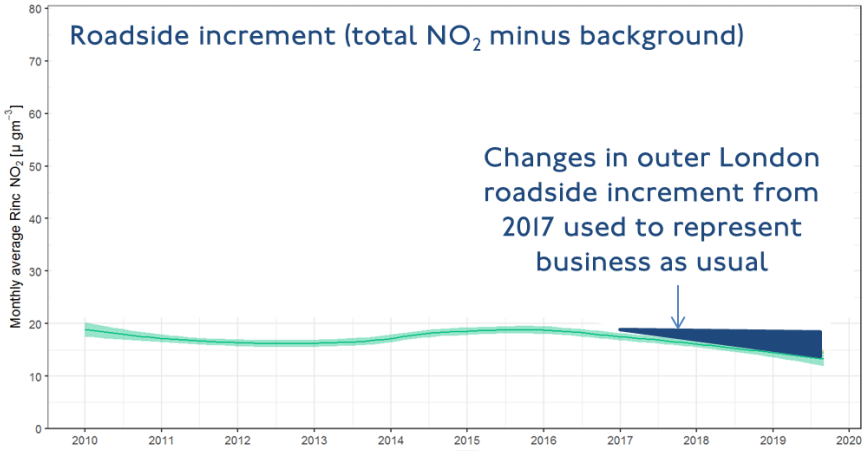


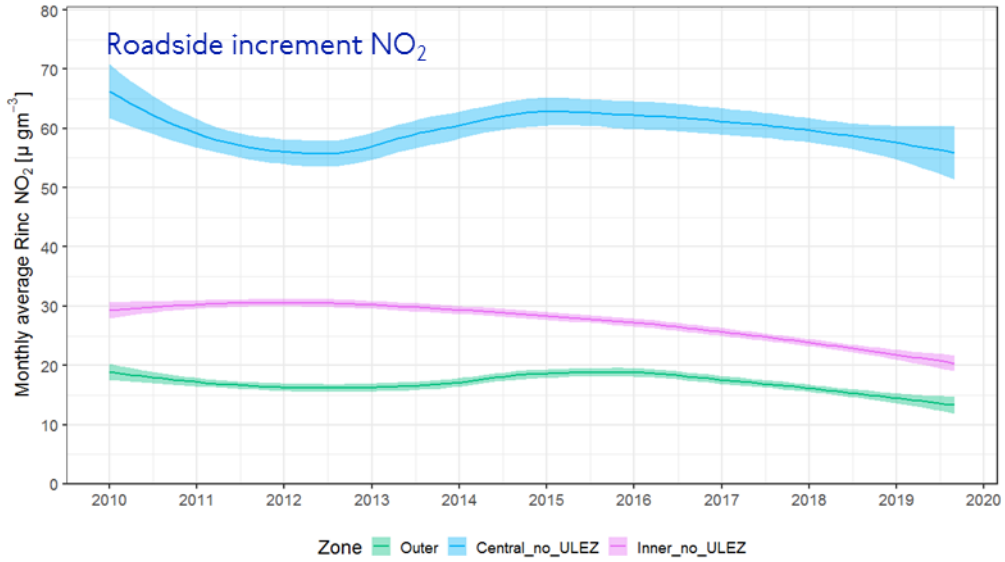
- **Mayor announced action plan for air quality in July 2016.**
- ULEZ policies included:
  - a T- charge in early 2017 (a pre-ULEZ scheme operating during congestion charging hours for pre-Euro 4 vehicles).
  - Introducing the Central London ULEZ in 2019
  - Proposals for expanding ULEZ
- November 2017: Mayor announced ULEZ for central London to be introduced on 8 April 2019
- June 2018: Mayor announced expansion of ULEZ (2021) and tightening of Londonwide Low Emission Zone (LEZ)
- December 2018: Mayor announced Private Hire Vehicles to be subject to Congestion Charge

Isolating the impact of ULEZ

- We need to estimate what would have happened without ULEZ so that we have something to compare to.
- Method uses trends in outer London as "business as usual" or what would have happened irrespective of the ULEZ:
  - largely away from the influence of ULEZ
  - control for weather and seasonal factors (which occur in all zones of London) by calculating the ***road increment*** by removing outer London background.
  - Decreasing roadside increment reflect turnover of the fleet at regional level





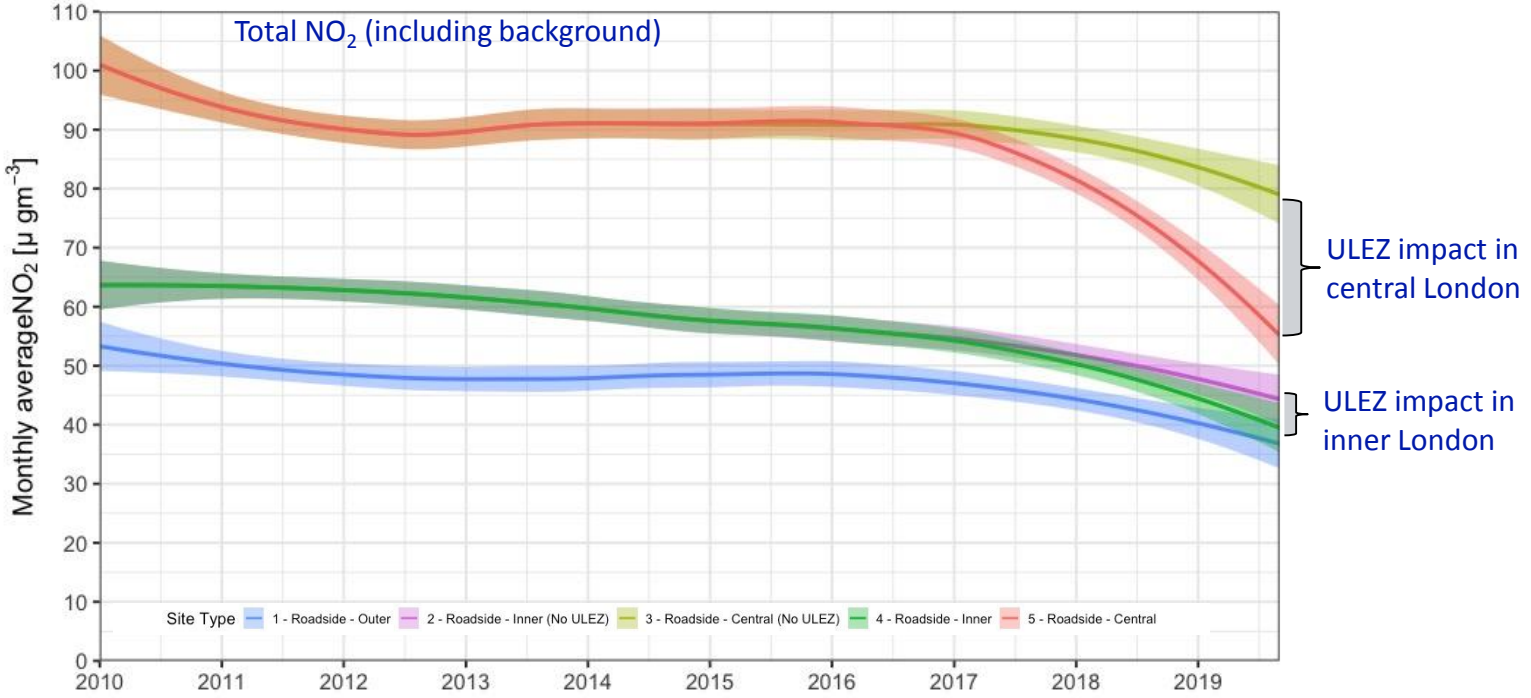


Apply outer BAU changes in roadside increment to central and inner increment from 2017 to provide a "no ULEZ" trend.

We can compare this to our monitored trends to determine the impact of ULEZ

Impact of ULEZ after six months

- Trends in measured total concentrations (including background) are compared to the “no ULEZ”



Impact of ULEZ (compared to “no ULEZ”)

Period	Reduction central London compared to "no ULEZ"		Reduction inner London compared to "no ULEZ"	
	µg/m^3	per cent	µg/m^3	per cent
Jan - March 2019	17	20%	3	7%
April - June 2019	20	24%	4	9%
July - Sept 2019	23	29%	5	10%

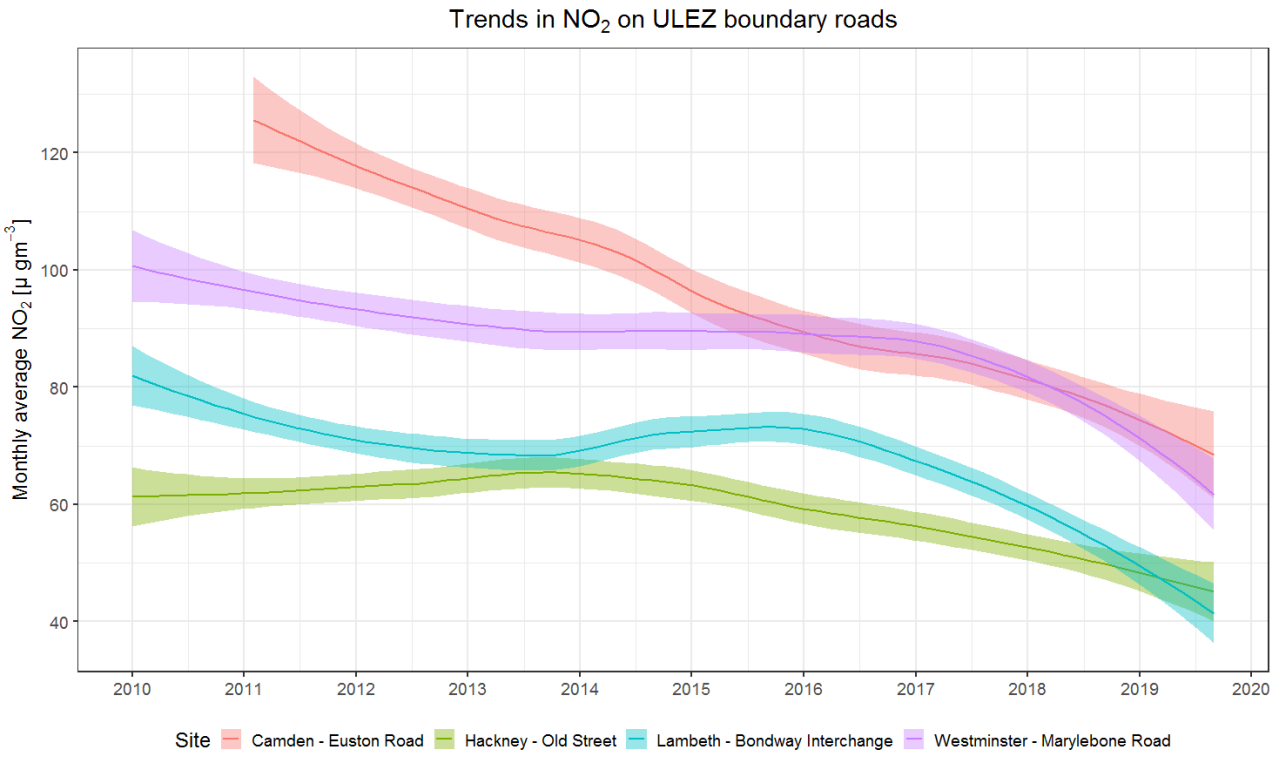
How have concentrations changed overall?

Quarterly Average NO_2 Concentrations µg/m^3	Central		Inner		Outer	
	Roadside	Background	Roadside	Background	Roadside	Background
January - March 2017	89	37	54	34	47	29
January - March 2019	66	31	44	27	40	25
April - June 2019	62	31	42	26	39	24
July - September 2019	57	30	40	25	37	24

Roadside NO_2 concentrations are 36% (32µg/m^3) lower in July-Sept 2019 than they were January – March 2017.

Significant and improving trends in NO_2 concentrations after years of stagnation

Boundary monitoring

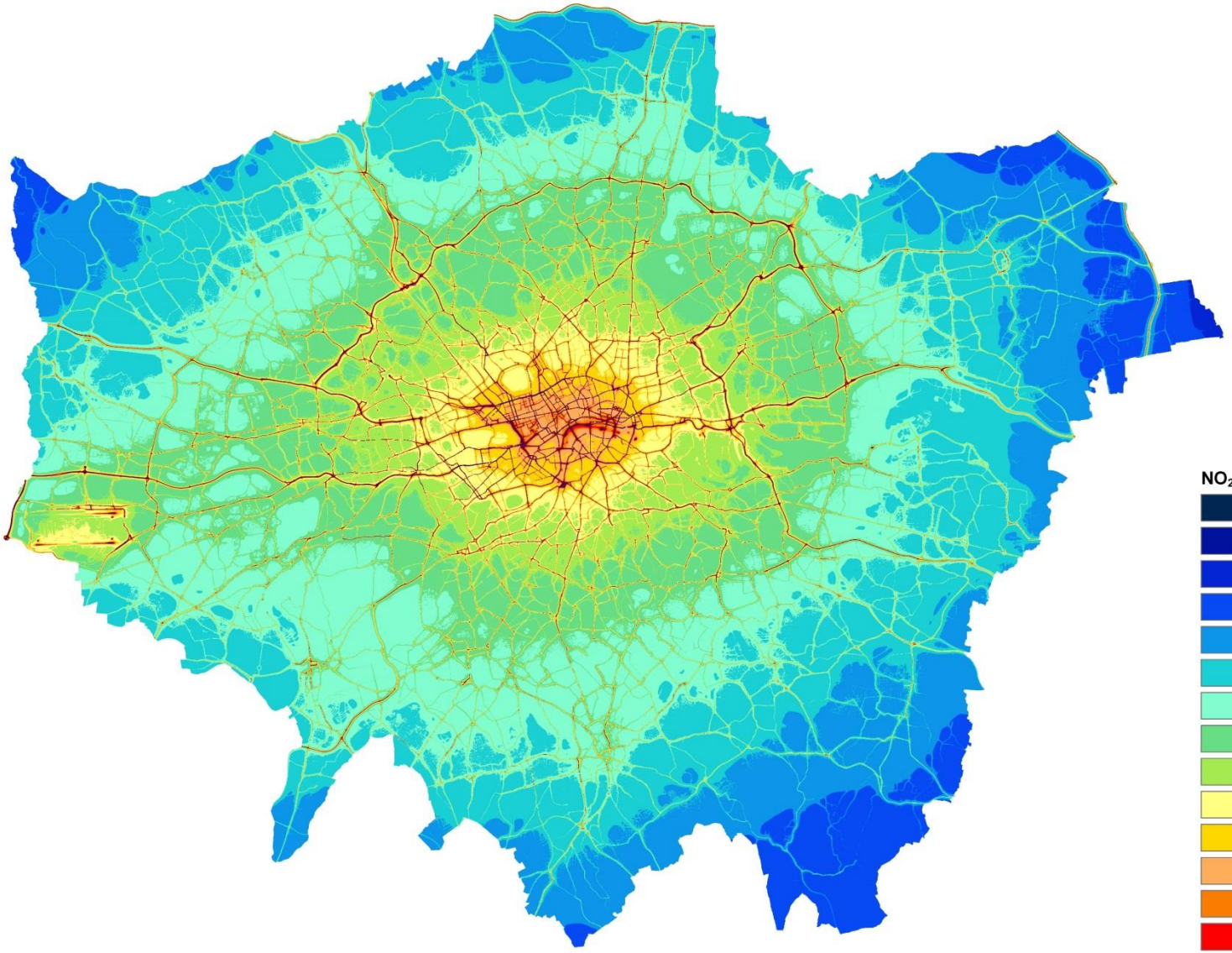


- There have been no increases in NO_2 pollution on the boundary within the first six months of scheme operation

Next steps

- Analysis of data after six months of operation of the ULEZ shows significant improvements in air quality
  - We have assessed trends and impact using zonal averages across large number of monitoring stations
  - We have shown that the greatest impacts on pollution levels are within the zone and that both the boundary and areas outside the zone have improved air quality
  - Further more detailed analysis for first year of operation and dispersion modelling for 2019 to help determine London wide impacts of ULEZ.
- BUT individual sites and large parts of London still exceed legal limits.
- Our policy for tightening the LEZ for heavy vehicles in October 2020, followed by expanding ULEZ to the North and South Circular roads in October 2021, as part of the Mayors Transport Strategy and London Environment Strategy are crucial to improving air quality across London and delivering health benefits to all Londoners.

From 2016

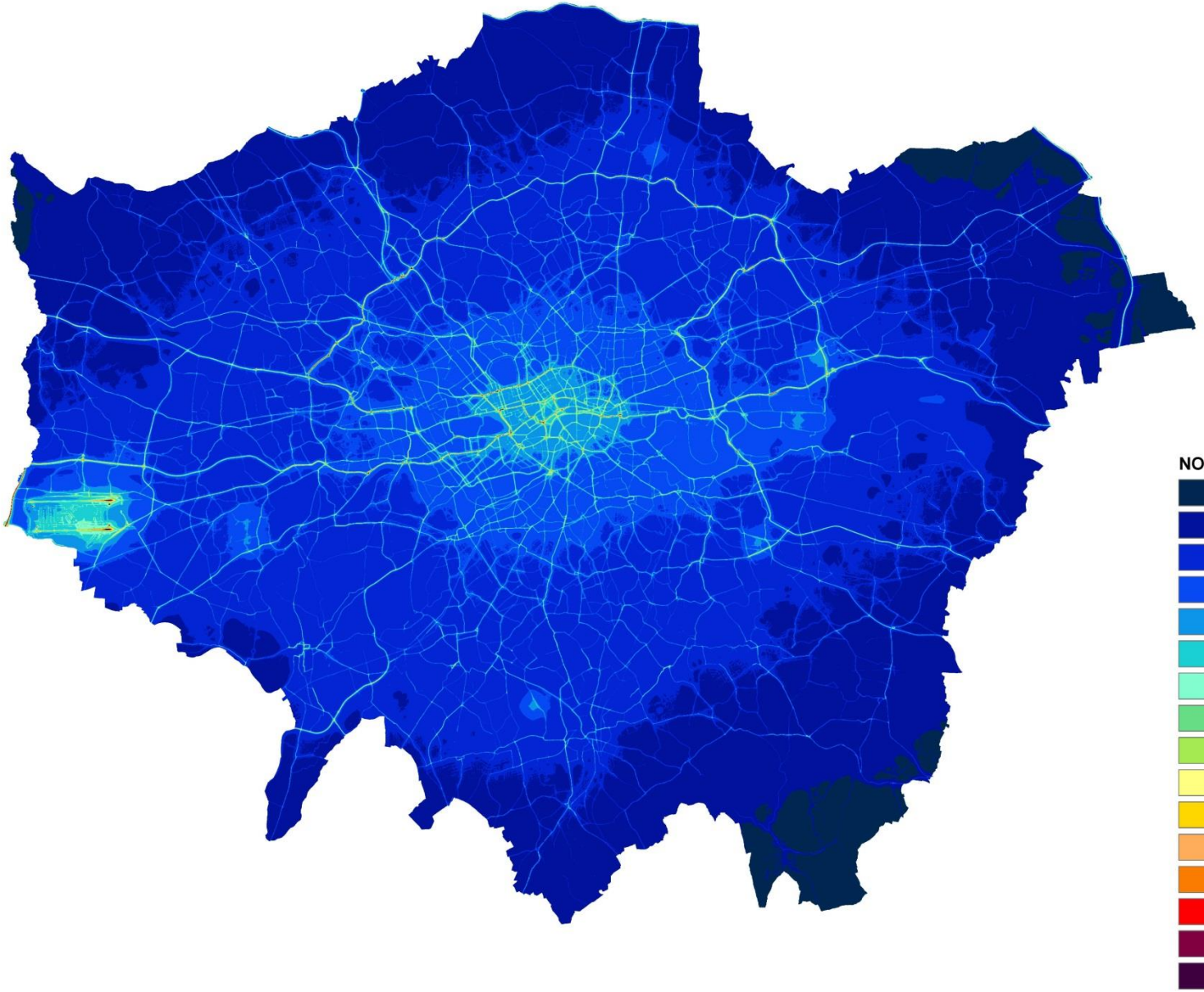


Annual mean NO_2 concentrations 2016

LAEI 2016 - Greater London

London Atmospheric Emissions Inventory 2016

To 2025



Annual mean NO_2 concentrations 2025

Greater London - London Environment Strategy

Thank you

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