

Assessing the impact of Low Traffic Neighbourhoods

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ADMS User Group Meeting

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Outline

Low Traffic Neighborhoods (LTNs)

LTNs in London

Model Set Up

Model Results

Summary

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Summary

Low Traffic Neighbourhoods (LTNs)

- What are LTNs?
 - Groups of residential streets where traffic is discouraged or removed
 - Designed to prevent rat-running
 - Schemes with different names have the same approach
 - E.g. Mini-Hollands, Quieter Neighbourhoods
- Where?
 - Across the UK
 - Introduced in many London boroughs

- Why?

- Reduce traffic and road danger
- Encourage walking and cycling
- Improve air quality



Low Traffic Neighbourhoods (LTNs)

- How?

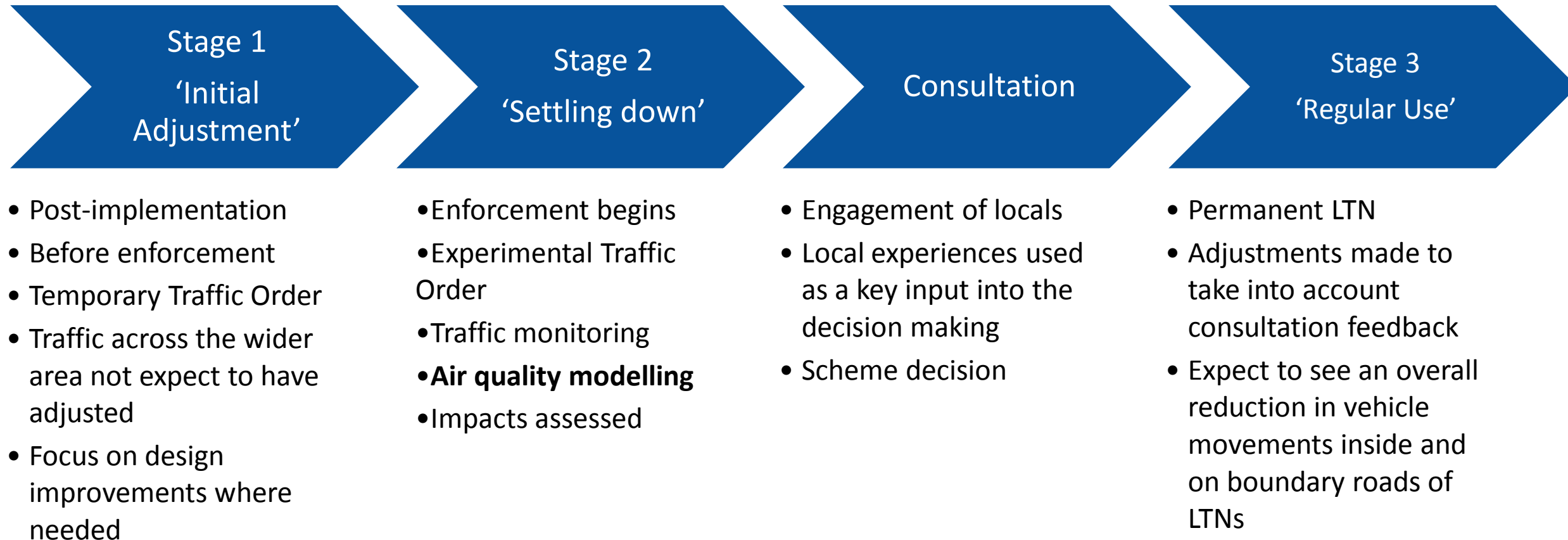
- Planters, road signs & bollards are used to create 'modal filters'
 - Allow pedestrians, cyclists, emergency services and buses to filter through
- Traffic orders are used to implement the LTNs
 - Legal documents that restrict or prohibit the use of the highway network
 - A Temporary Traffic Order (TTO) is used to implement LTNs
 - A Experimental Traffic Order (ETO) is used to impose restrictions
 - Can enforce restrictions for up to 18 months

Restriction types:

- All vehicles
- Vehicle types
- Weight limits
- Time-limited
- One-ways



Low Traffic Neighbourhoods (LTNs)



Source: Low Traffic Neighbourhoods Monitoring Strategy, Lambeth

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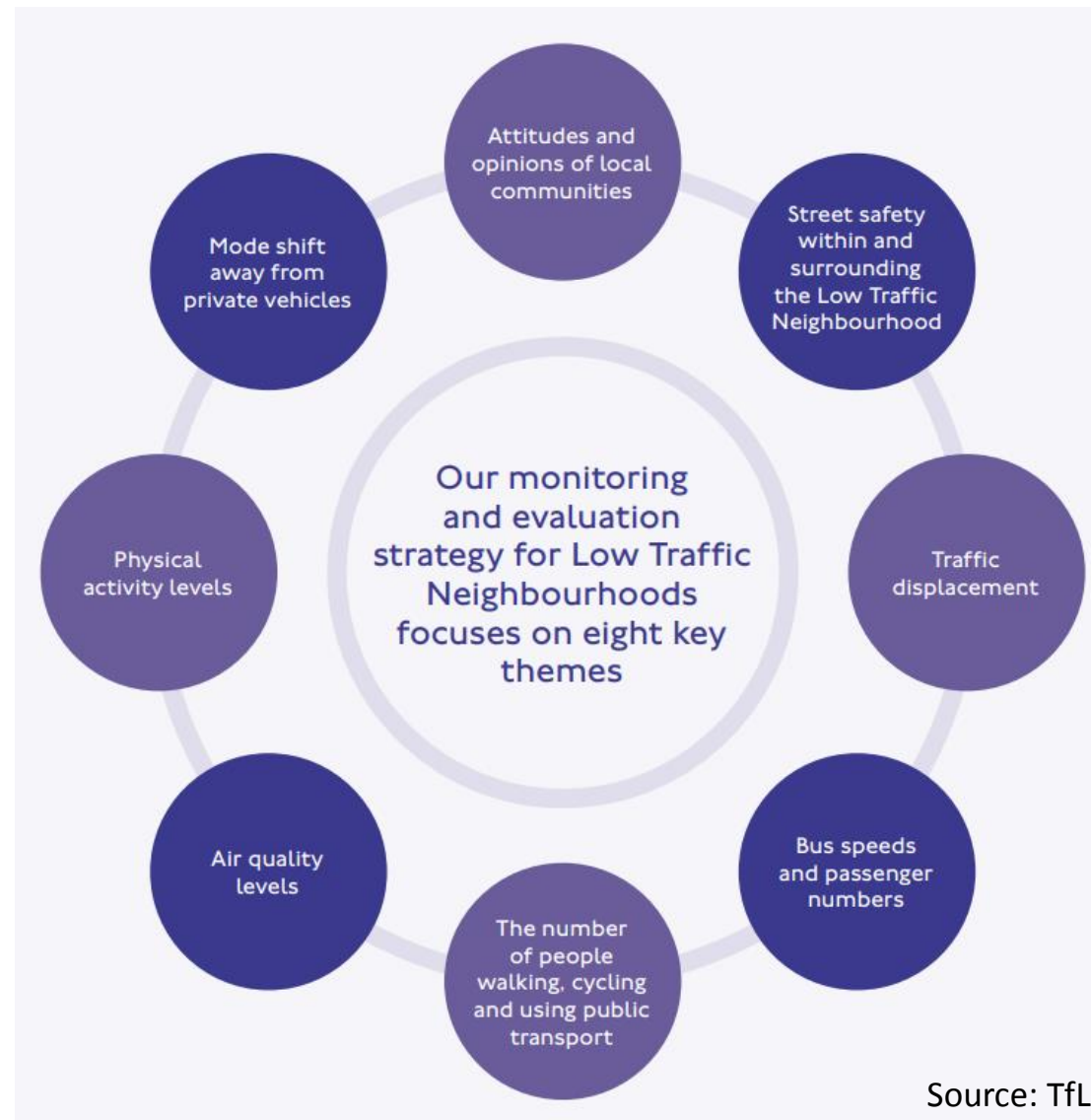
Model Set Up

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LTNs in London

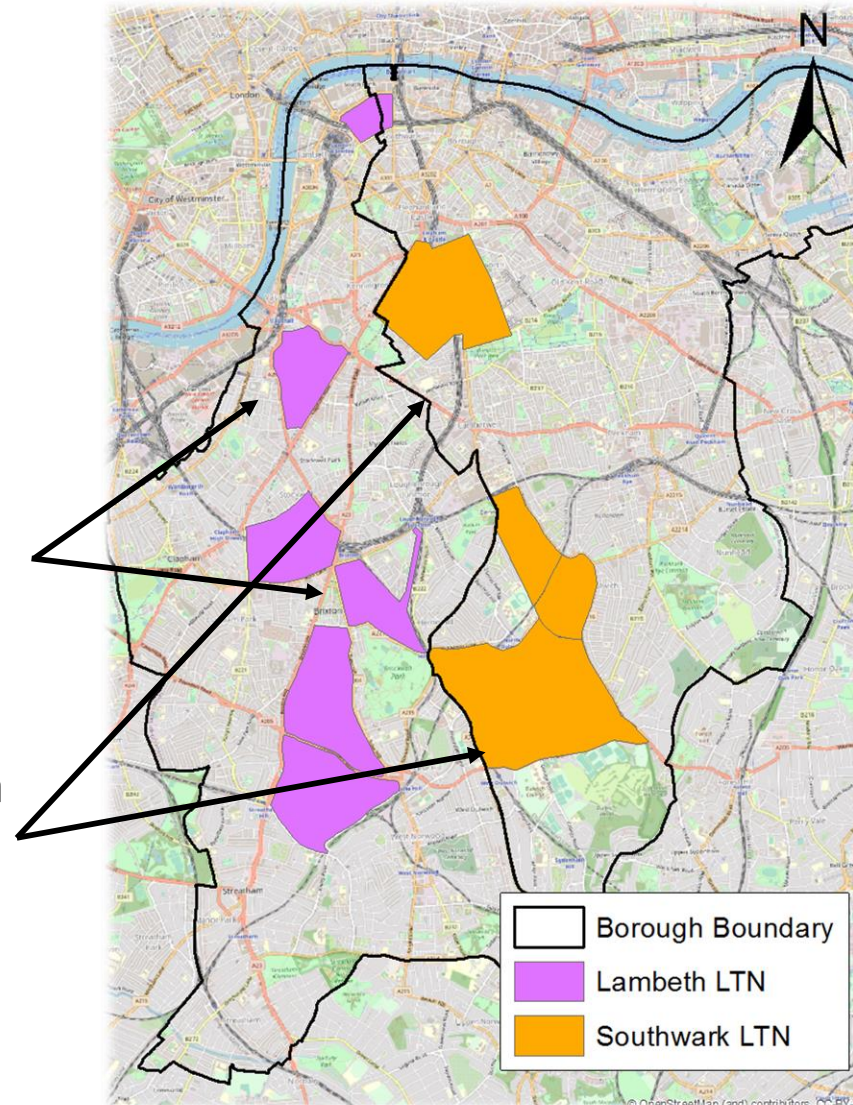
- Some LTNs have been around for decades
- Fast introduction of LTNs in many London Boroughs in Spring 2020
 - Part of an emergency transport response to the pandemic
 - Funded by TfL 'London Streetspace' programme
 - Introduced in 2020 to help people safely walk, cycle and use public transport during the pandemic
 - Helping to deliver the Mayor of London's plan



Source: TfL

LTNs in London

- CERC carried out air quality modelling for
 - Lambeth
 - 5 LTNs assessed
 - Oval and Railton LTNs are at the consultation phase
 - Southwark
 - Dulwich and Walworth LTNs assessed



- Three Scenarios

1. Baseline air quality model
 - 2019 used to avoid atypical conditions as a result of the pandemic
2. Pre-Scheme
3. Post-Scheme
 - To assess the impact of the LTN

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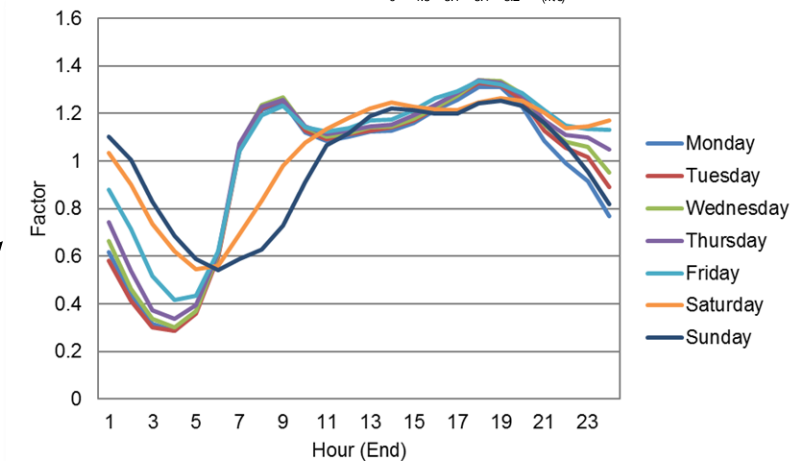
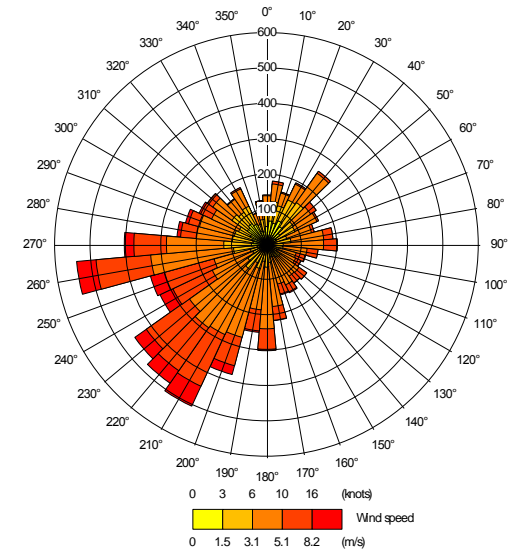
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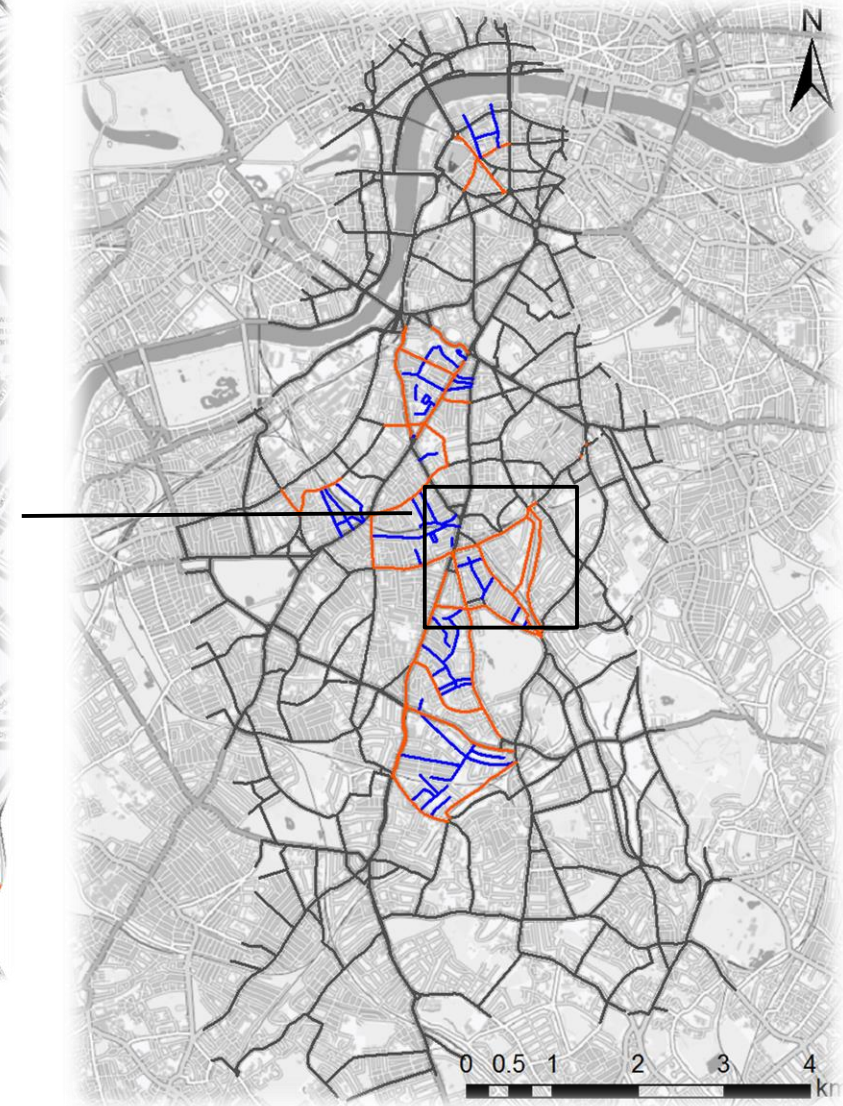
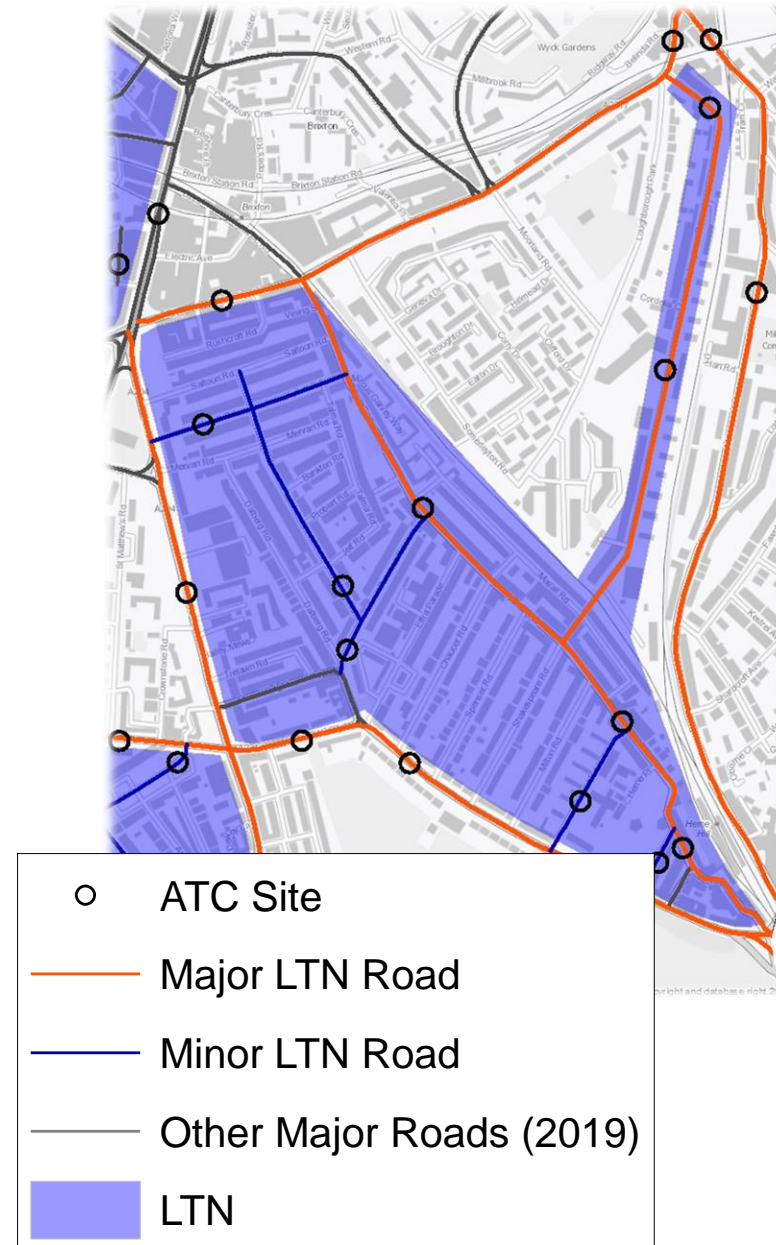
Model Set Up

- The model set-up was for a 2019 base year
- ADMS-Urban was used to consider emissions from all sources within London
 - Heathrow Meteorological data
 - Hourly wind-dependent rural background data
 - Urban Canopy and Advanced Street Canyon options used
 - Latest traffic emission factors (EFT v10.1)
 - Adjustments based on remote sensing measurements
 - Detailed consideration of chemical reactions using the Chemistry with Trajectory model option
 - Time varying emissions derived from TfL ATC site



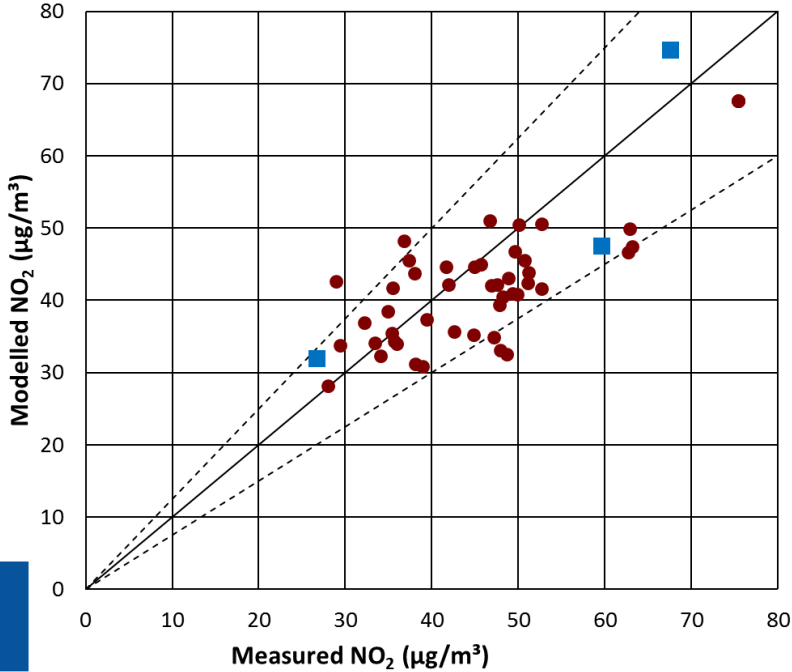
Model Set Up

- Traffic Data were provided on LTN roads for three scenarios:
 1. Base year (2019)
 - Based on historical traffic surveys
 2. Pre-Scheme (2021)
 3. Post-Scheme (2021)
 - LTN monitoring used to model the pre-scheme and post-scheme scenarios
- All other major roads used LAEI 2016 data
 - Adjusted to 2019 using DfT traffic counts

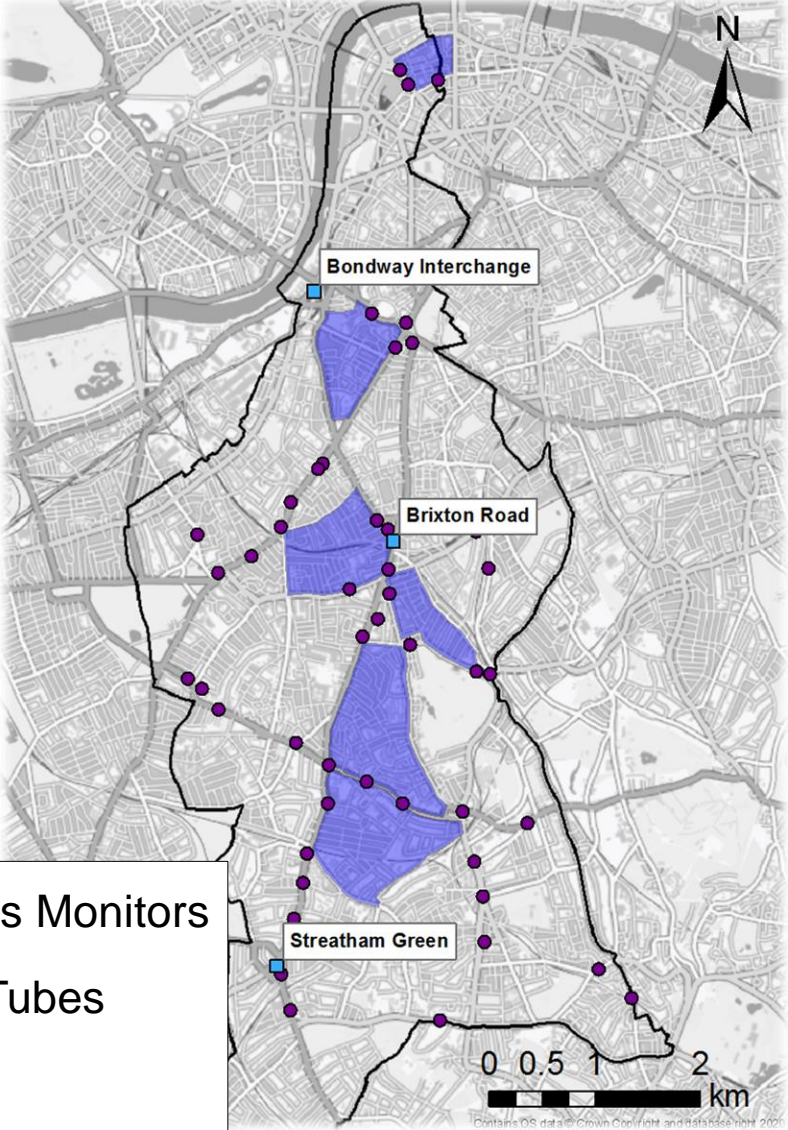


Model Set Up

- Model verification was carried out for:
 - 2019 base year
 - NO₂ and PM₁₀
 - Continuous monitors
 - Diffusion tubes



Modelled sites compared to measured	No. sites	%
75 ≥ % ≤ 125	45	90
90 ≥ % ≤ 110	21	42
> 125 %	2	4
< 75 %	3	6
Total	50	100



- Continuous Monitors
- Diffusion Tubes
- LTN
- Lambeth

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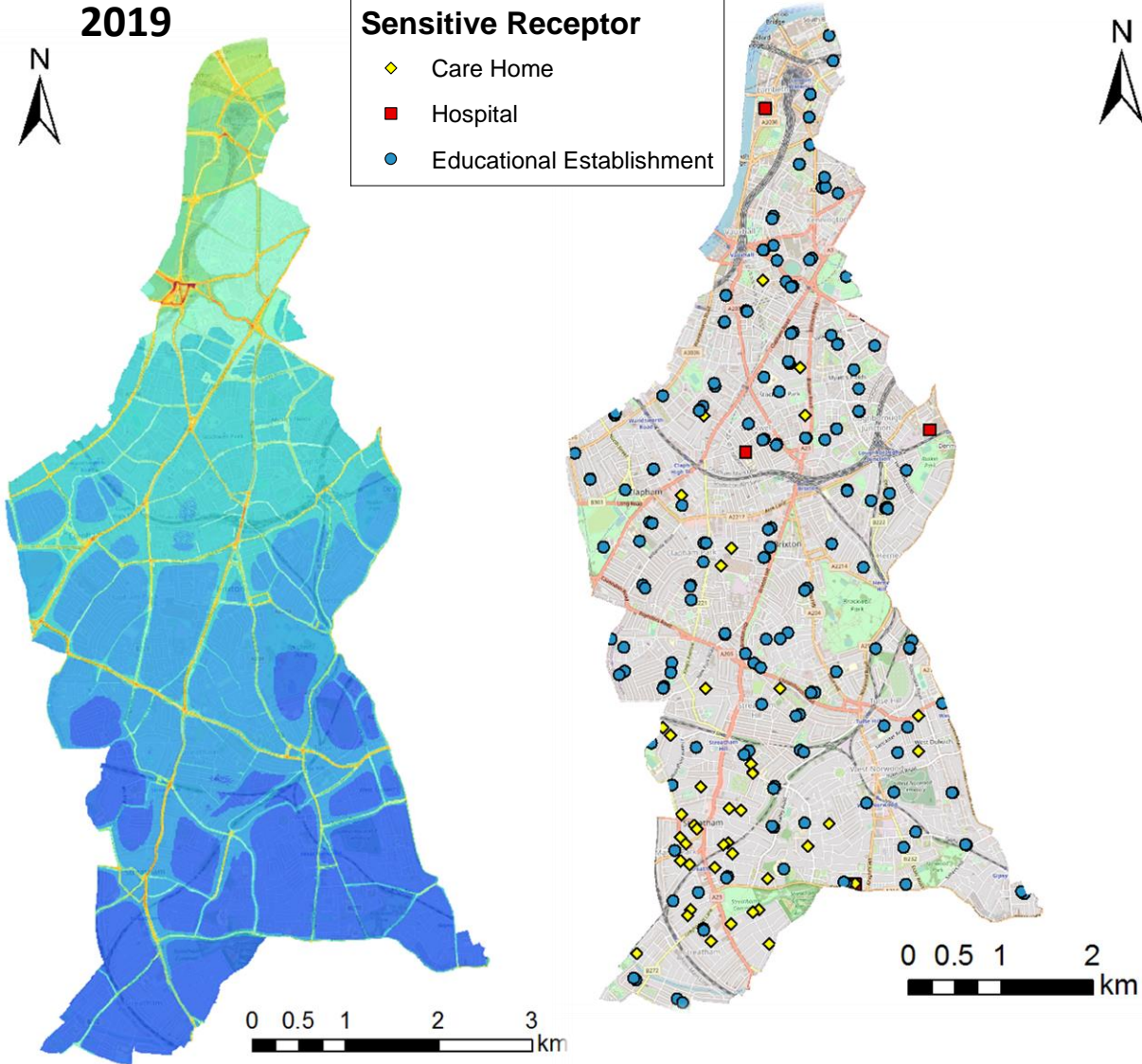
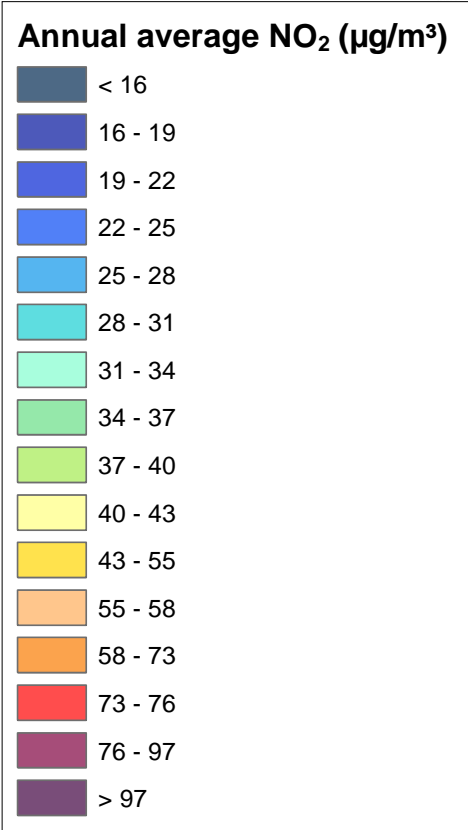
Model Set Up

Model Results

Summary

Model Results

- Identified the baseline (2019) air quality profile across Lambeth
 - NO_2 , PM_{10} and $\text{PM}_{2.5}$
- High resolution air quality maps
 - 20 m grid of receptor points
 - Additional source-oriented grids
- Concentrations were also modelled at sensitive receptors
 - Hospitals, schools and care homes



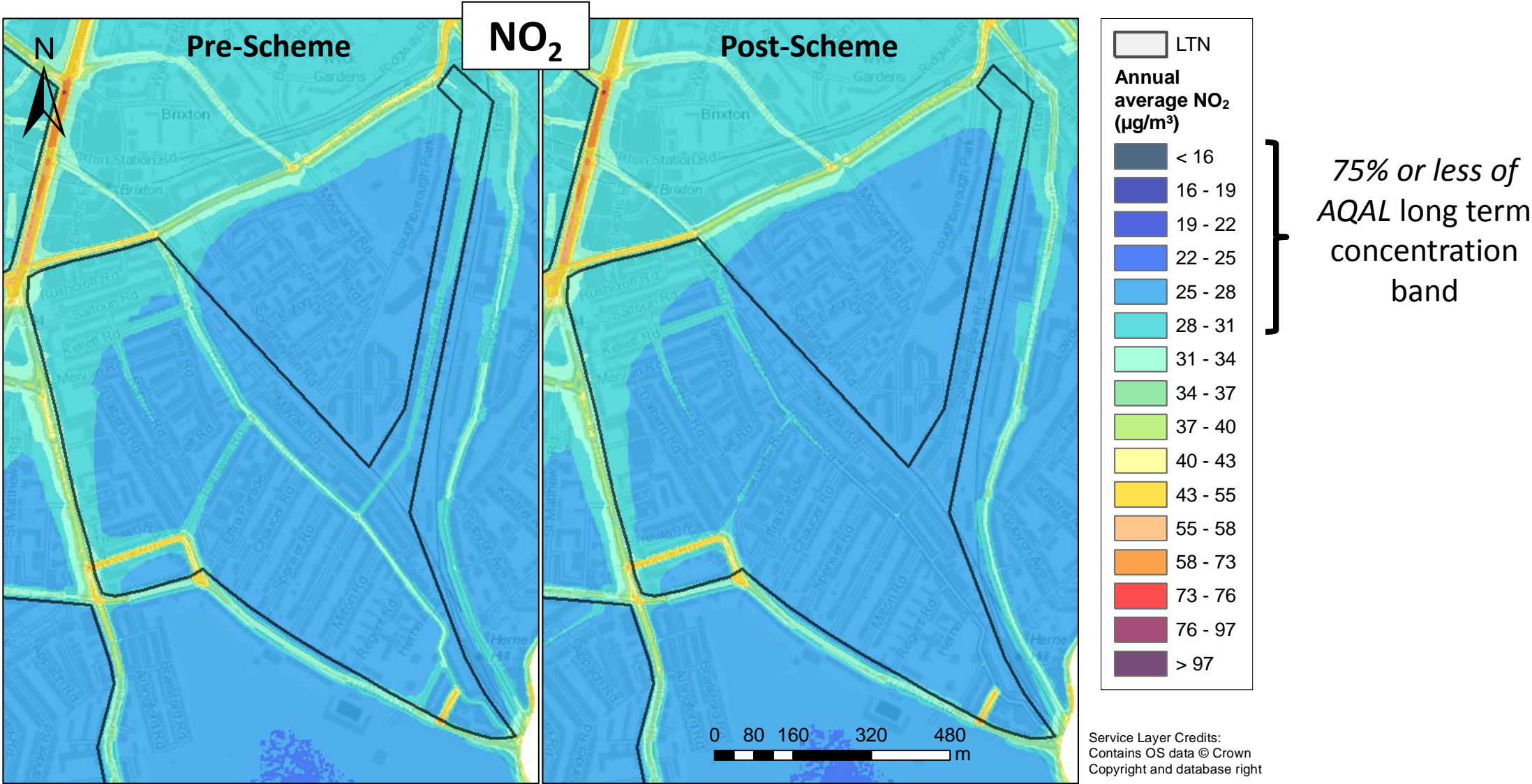
Model Results

- Significance was assessed using IAQM and EPUK planning guidance*

Long term average concentration at receptor in assessment year	% change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

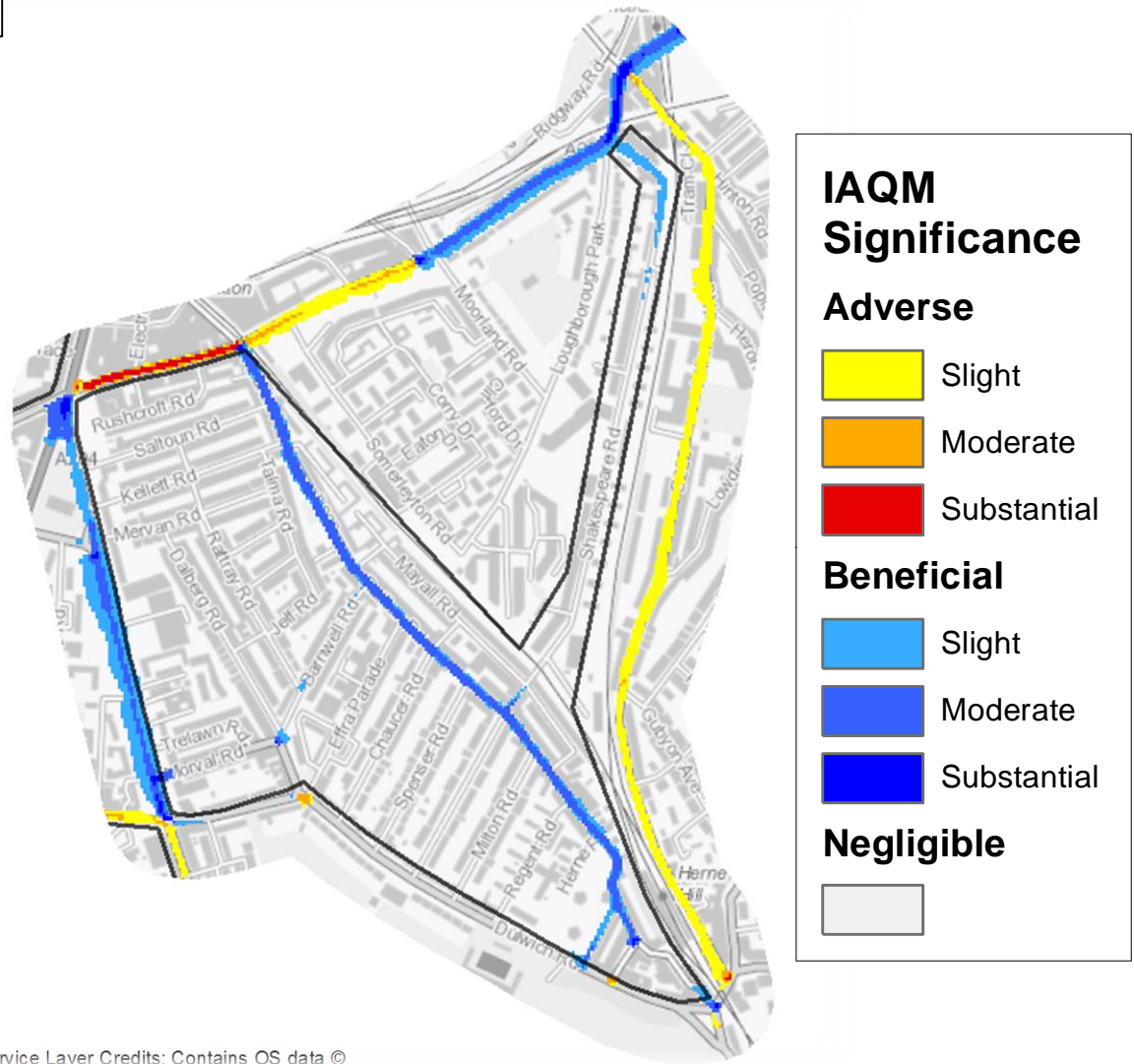
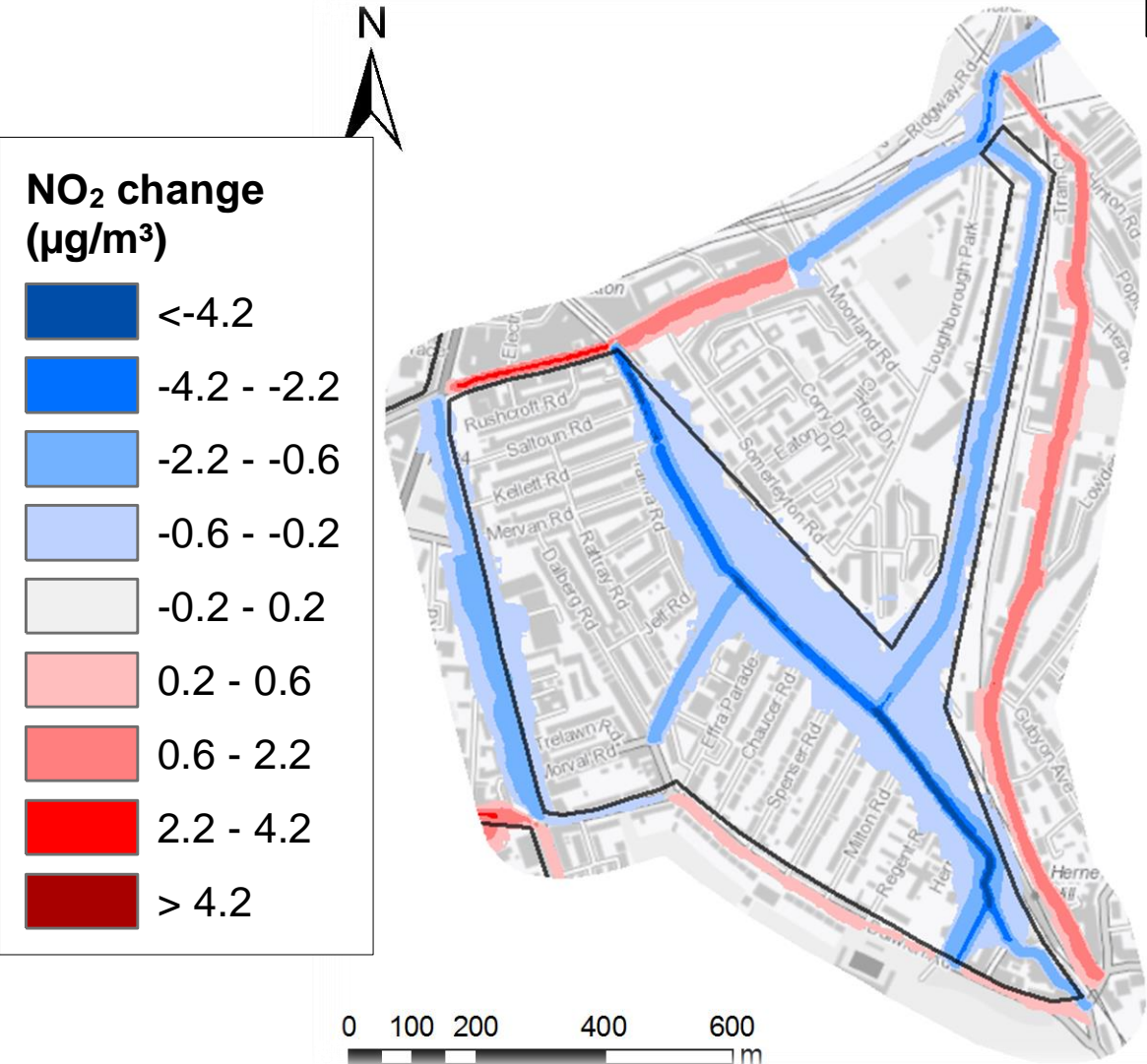
*Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) - *Land-use planning & development control: Planning for air quality*

Model Results



Model Results

NO₂



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- Assessment of Low Traffic Neighbourhoods
- Borough-wide modelling of NO₂, PM₁₀ and PM_{2.5} using ADMS-Urban
- Model set-up
 - Traffic data supplied for the current (2019) baseline and LTN scenarios
 - LAEI data for other emissions
 - Model verification against borough monitors
- Railton LTN:
 - Reductions in NO₂ on roads within LTN
 - Some increases in NO₂ along major boundary roads
 - See <https://beta.lambeth.gov.uk/> for further details