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NIHR 135020: Low Traffic Neighbourhoods in London

Impacts of Low Traffic Neighbourhoods on the number, diversity and safety of cyclists

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NIHR135020: 'Low Traffic Neighbourhoods (LTNs) in London: a mixed-methods study of benefits, harms and experiences'



NIHR BASELINE GRANT

THIS PROJECT

Up to 8 planned LTNs in 6 London boroughs

8 matched control areas

LTNs only: longitudinal qualitative data
- 60 residents interviewed *2 [3 LTNs]
- 6 disability focus groups [3 LTNs]
- 22 stakeholders interviewed *2 [7 LTNs +]

Mixed methods triangulation

All LTNs + all controls: longitudinal quantitative data
- Continuous data collection for 38 months
- Plus annual data collection * 4, each June/September

→ Controlled before-and-after comparisons, with extended follow-up

LTNs built

Health modelling: physical activity, road injuries, air pollution

Publishing results, achieving policy impact

2021 2022 2023 2024 June 2025

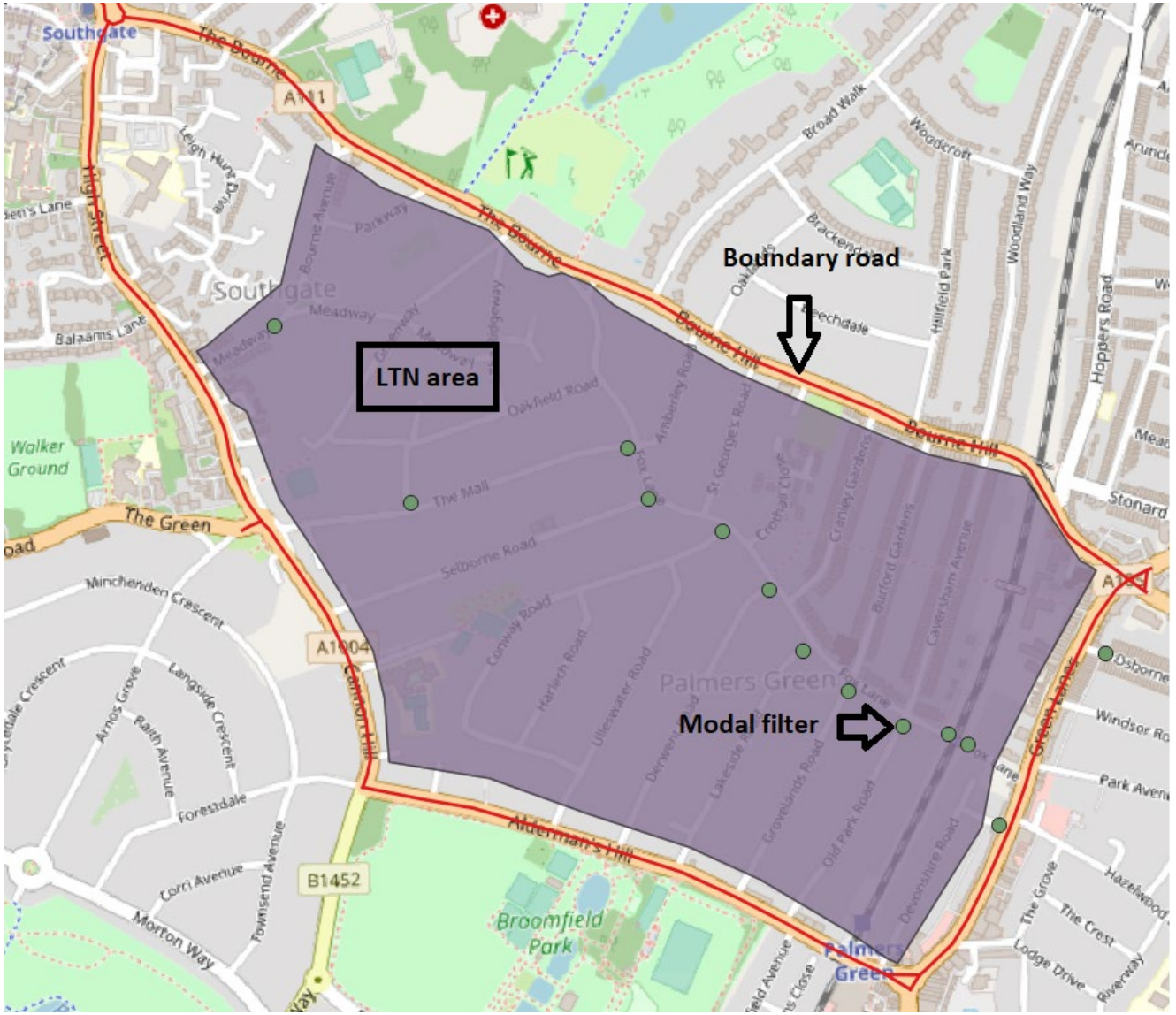
What are Low Traffic Neighbourhoods?

- LTNs remove through motor traffic in residential areas through modal filters (bollards, planters and cameras)
- They aim to reduce through-traffic and encourage mode shift to walking and cycling
- Implemented at a large scale in response to the COVID-19 pandemic





What are Low Traffic Neighbourhoods?



Research Questions

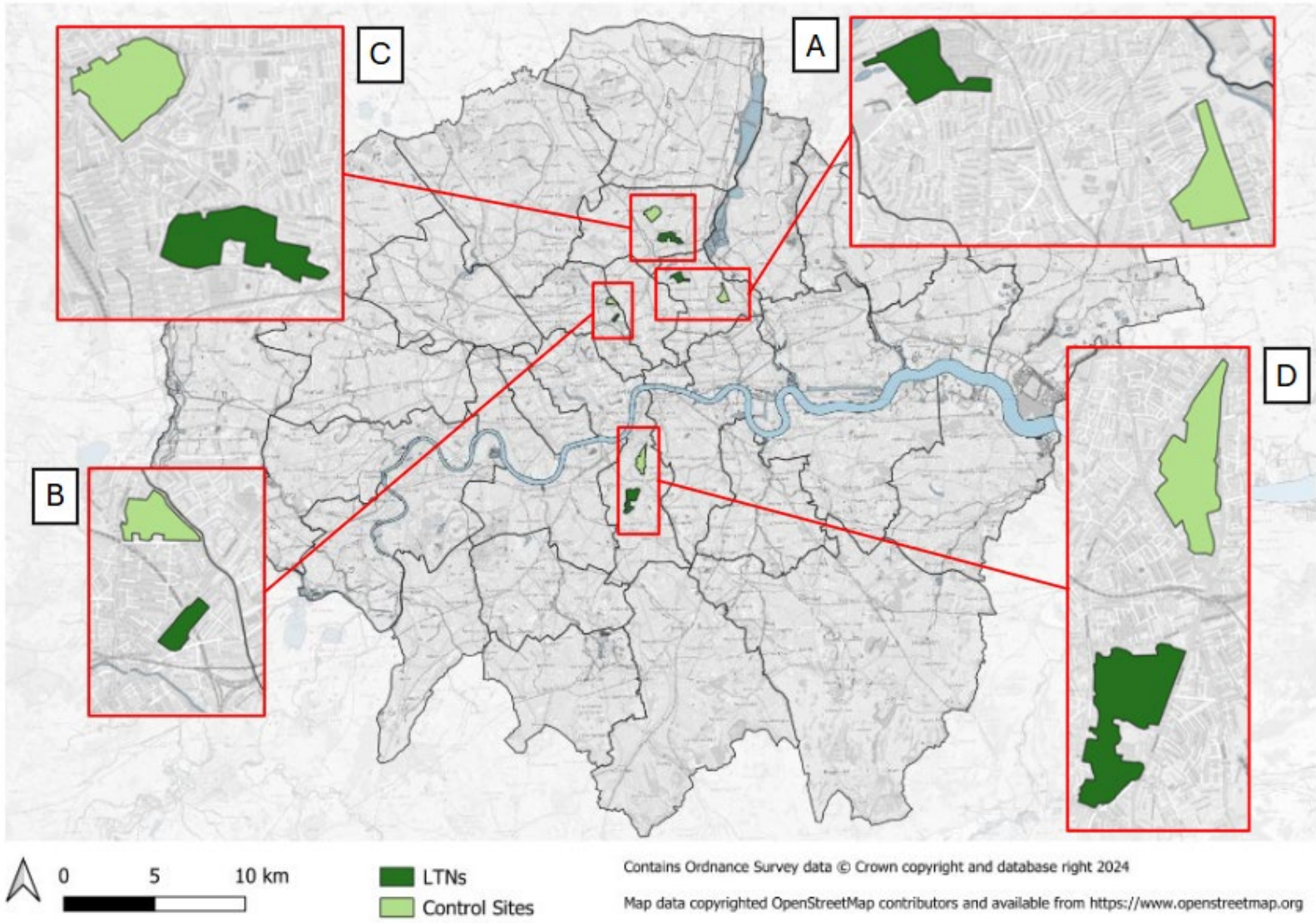
1. Do new LTNs lead to greater levels of, and more diverse cycling compared to areas without them?

2. What are the impacts on cyclist road injuries from these schemes (and how does this vary between LTN areas and boundary roads)?

Active travel participation

Do new LTNs lead to greater volumes of cycling compared to areas without them?

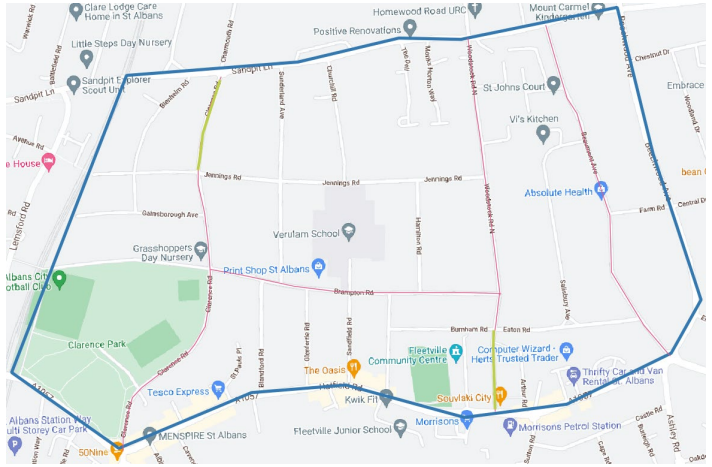
Methods: Matching LTNs to control areas



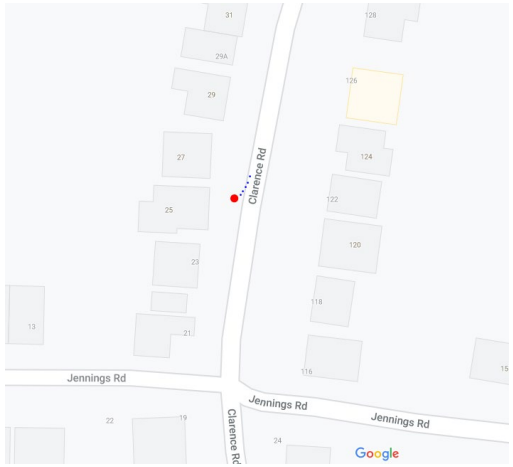
Selecting sensor locations

Selecting AI sensor locations in each LTN/control pair by:

- Identifying travel desire lines and road segments
- Finding a suitable lamp column
- Proximity to other characteristics



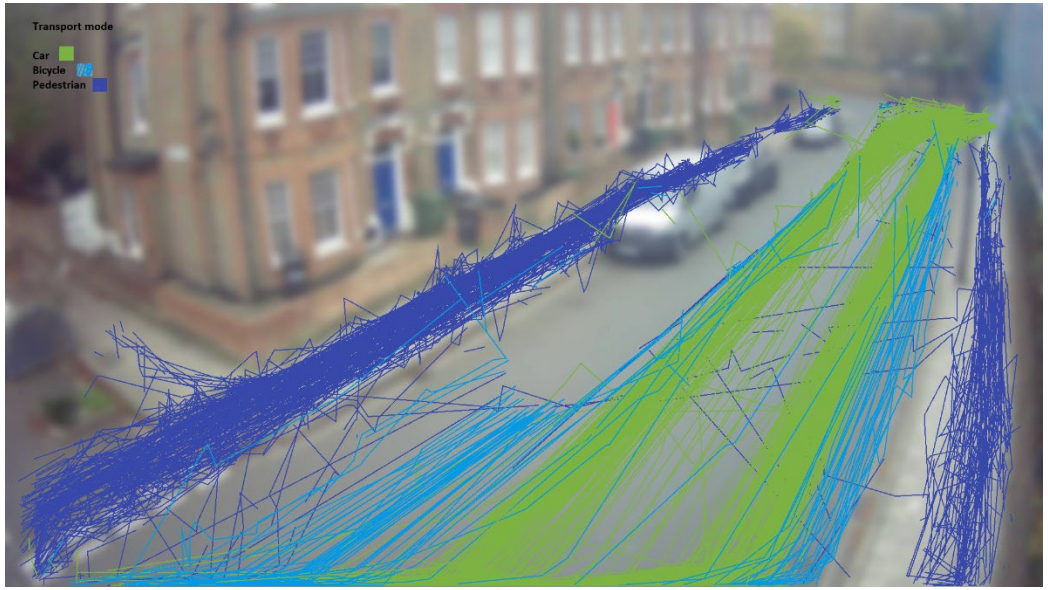




Methods: Data collection and cleaning

Collecting data from 2 machine learning sensors in LTN and 2 in matched control areas:

- Sensors record count data of different modes over time
- Data collected continuously – pre- and post-implementation



Results: cyclist volumes

Pooling results across our five LTNs, we found trends towards an increase in cyclist numbers, in both absolute and relative terms:

- **+63 cyclists per observation point per day** in our four LTNs (p=0.02), equivalent to a 6.6% relative increase (p=0.08).
- Absolute terms: smaller increase for cycling than walking. The reverse true for relative terms.
- Effects on cycling (and walking) varied across LTNs and within LTNs (I.e. at different observation points)
- **63% reduction** in motor vehicles across the four LTNs

Active travel diversity

Do new LTNs lead to greater diversity of cycling compared to areas without them?

Introduction

- Interested in various outcomes: gender, age, children's independent mobility
- Gender: participation in walking is generally equal but cycling still majority men
- Unclear if LTN-related increases in active travel would lead to a more equal gender split
- Age: active travel amongst school-aged children has declined with associated health disbenefits
- This reflects decline in children's independent mobility. Likely a reflection of parental perceptions of safety.

Method

- Video cameras installed at same locations as Vivacity cameras
- Pre vs post, LTN vs control
- Characteristics of active travel users manually coded

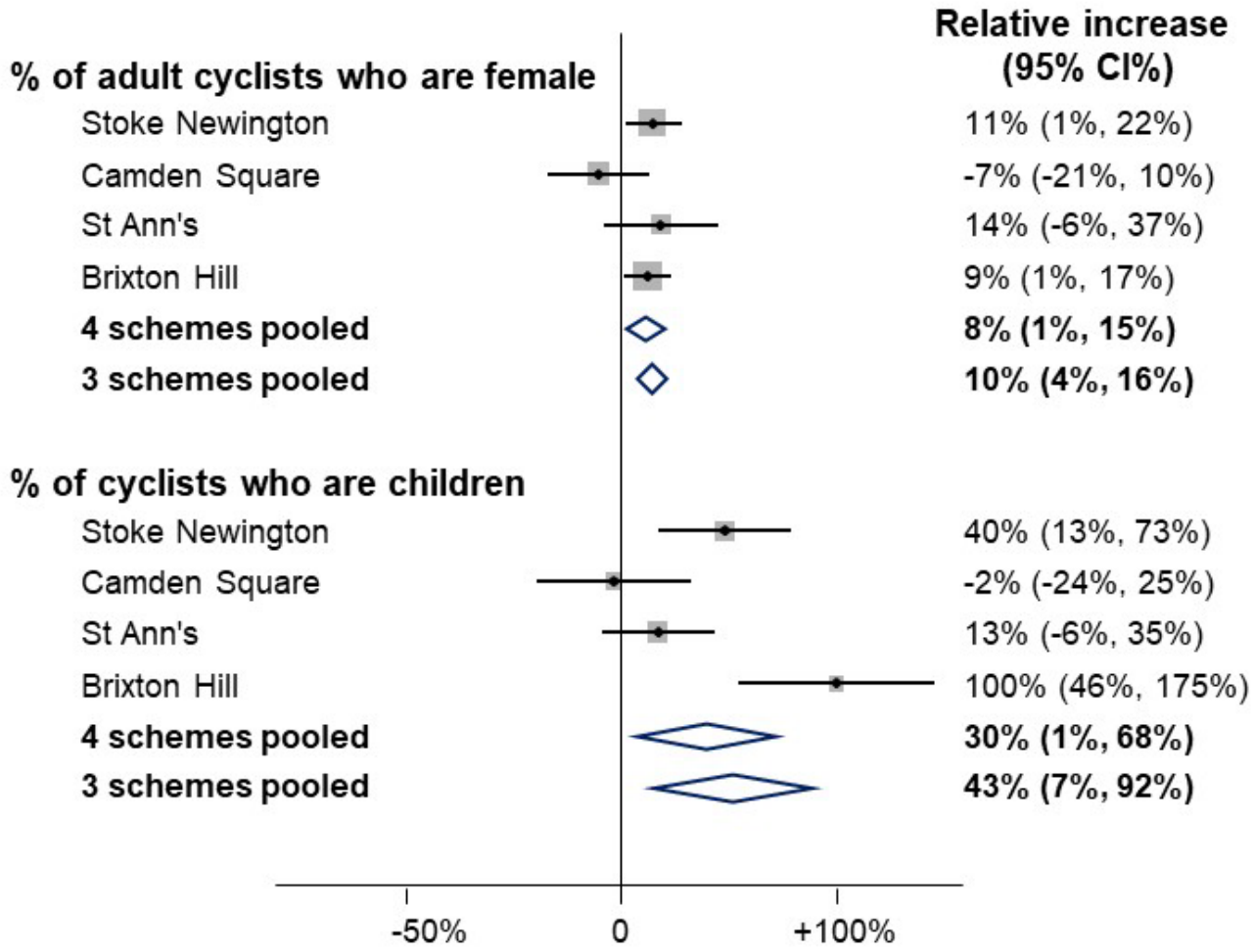
Scheme name	Date implemented	No. observation points, LTN/Control	Dates of 'before' data collection	Dates of 'after' data collection
Stoke Newington	20/09/2021	2 / 2	08/09/2021 to 11/09/2021	07/09/2022 to 10/09/2022
				06/09/2023 to 09/09/2023
				04/09/2024 to 07/09/2024
Camden Square	16/12/2021	1 / 1 †	30/06/2021 to 03/07/2021	08/06/2022 to 11/06/2022
				07/06/2023 to 10/06/2023
				05/06/2024 to 08/06/2024
St Anns	22/08/2022	2 / 2	30/06/2021 to 03/07/2021	07/06/2023 to 10/06/2023
			08/06/2022 to 11/06/2022	05/06/2024 to 08/06/2024
Brixton Hill	04/09/2023	2 / 2	23/06/2021 to 26/06/2021	05/06/2024 to 08/06/2024
			08/06/2021 to 11/06/2021	
			07/06/2023 to 10/06/2023	

Method

Subject	Characteristic	Coding
All	Estimated age group	4 categories: 0 to 3 years, 4 to 10 years, 11 to 16 years, 17 years plus
All	Estimated gender	3 categories: Male, Female, Unsure
All	Mode of travel	13 categories: Walk, Jog, Scoot/skate/rollerblade, Wheelchair, Mobility scooter, Other pedestrian mobility aid, Normal bike, Cargo bike, Long bike, Bike trailer, Mobility bike, Other modified bike, e-scooter
Cyclists and e-scooter users	Are they a delivery rider?	2 categories: Yes, No
Cyclists	Use of a) a helmet, b) high-visibility clothing, c) Cycle sportswear	Each of these 3 clothing types has 2 categories: Yes, No
Adults with children	Number of children being pushed or carried	Numeric
Children	Independent mobility	4 categories: Alone, travelling only with other children, travelling with adult(s) but not holding hands with an adult, travelling with adult(s) and holding hands with an adult

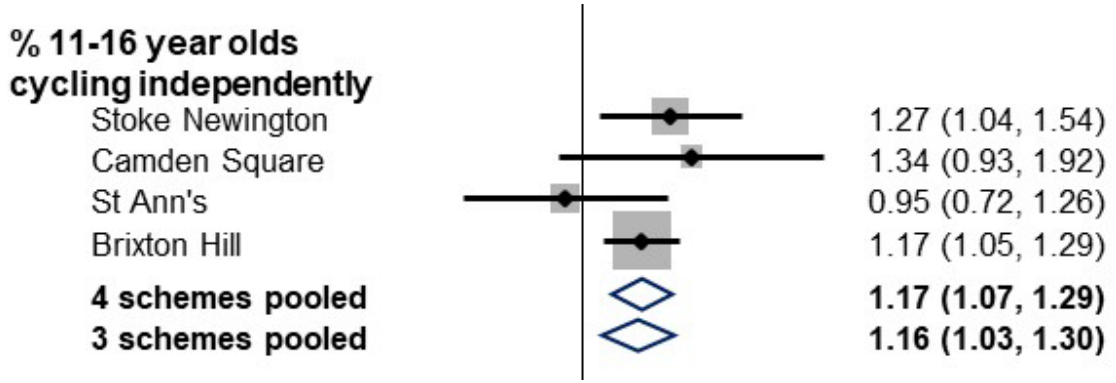
Results

- Proportion of women cyclists increased by 8% after LTN introduction
- Proportion of children cyclists increased by 30%



Results

- The proportion of children cycling without an adult increased by 17%



Results – cycling in the road

Pooling results across our five LTNs, we found trends, though not statistically significant, towards an increase in proportion of cyclists on the road (as opposed to pavement):

- **+2.7 percentage point change in the proportion of cyclists on the road** ($p<0.1$), equivalent to a 3% relative increase ($p>0.1$), which is equivalent to a 23% reduction in cyclists on the pavements.

Road traffic injuries

What are the impacts on cyclist road injuries from these schemes (and how does this vary between LTN areas and boundary roads)

Research questions

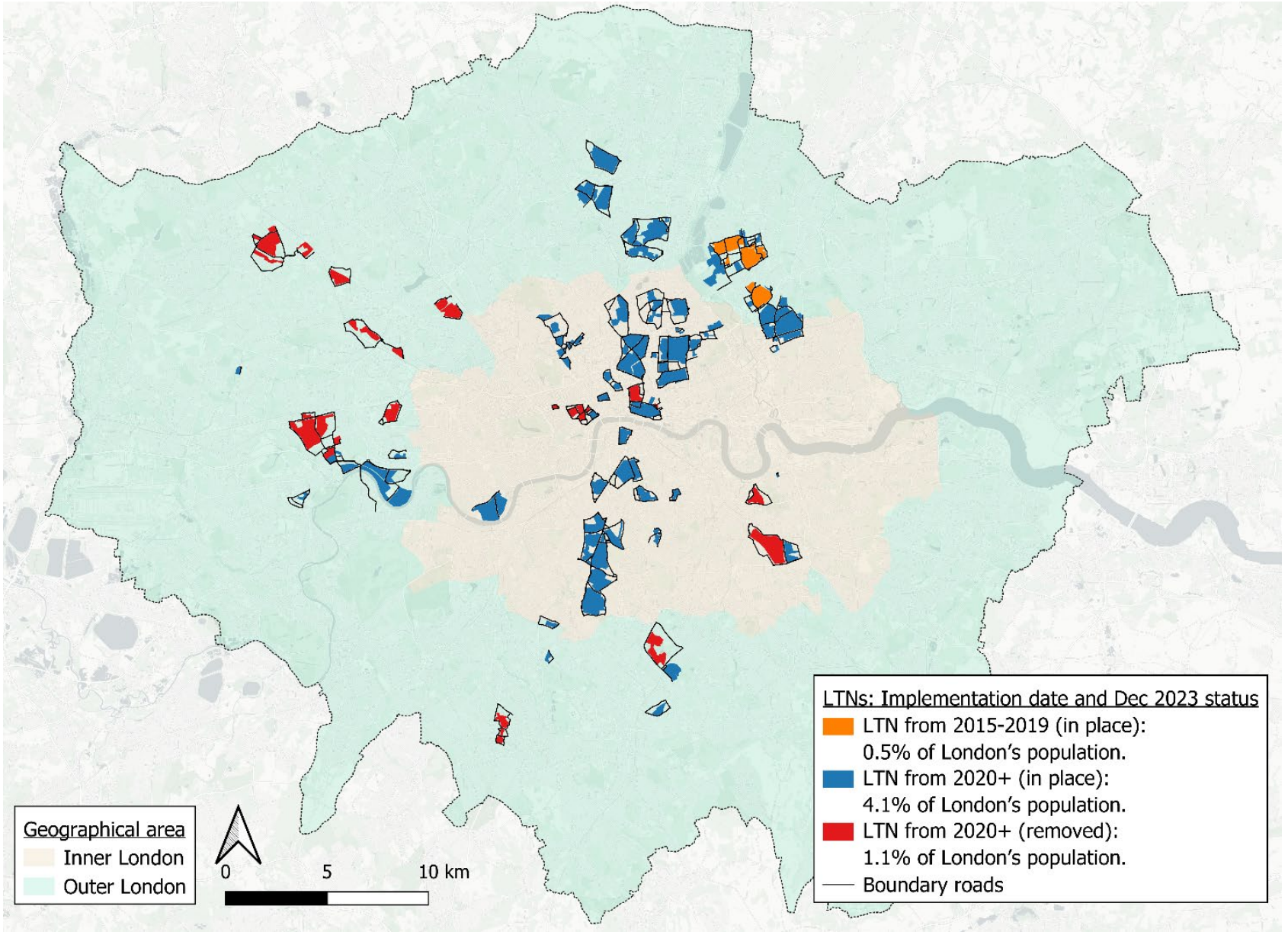
Primary RQs

- What is the impact of LTN implementation across Greater London on:

a) The number of cyclist road injuries / KSIs inside their boundaries?

b) The number of cyclist road injuries / KSIs on boundary roads?

Methodology



Results (1) Impacts of LTN overall

Inside LTN

- **-35%** injuries across all modes (-37% KSIs)

- Effect sizes suggest that presence of LTNs may have led to a decrease in injuries:

[(1139/0.65)-1139]=**613 injuries**
including [(171/0.63)-171]=**100 KSIs**

- This benefit entirely reversed if an LTN was removed

Boundary road

- No significant change on all injuries, with narrow confidence intervals (-2%, 95%CI -5% to +1%)

Results (2) Impacts of LTN for cyclists

Inside LTN

- **-22%** cyclists (-27% KSIs) - **significant**

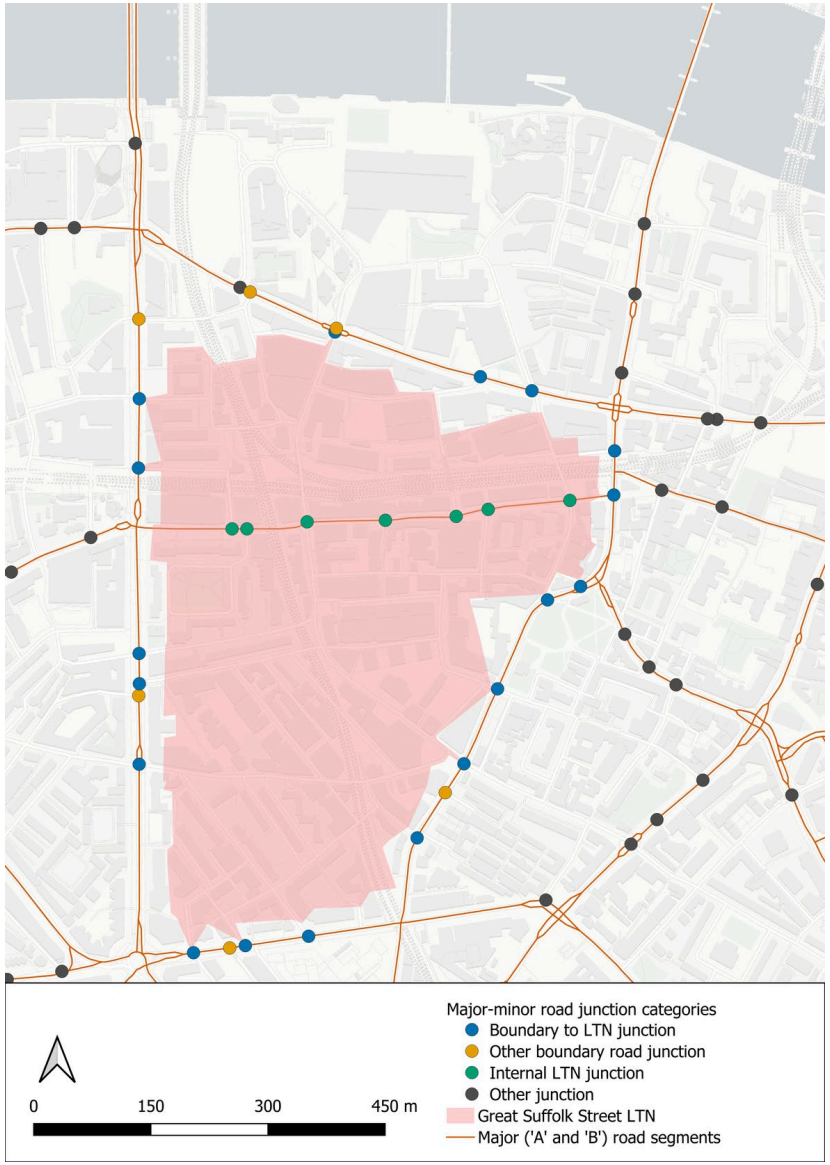
Boundary road

- **-7%** cyclists (-13% KSIs) - **significant**

Combined impact across LTNs and boundary roads

- **-9%** cyclists (-15% KSIs) - **significant**

Additional analysis (3) LTN-boundary junctions



Method

- Hypothesis: road safety improves at junctions where newly filtered minor LTN roads meet major boundary road
- Injuries matched to junctions. Junctions identified as ‘boundary LTN’.
- Regression model estimates change in casualty numbers across the same junctions pre- and post-LTN implementation

Results

- **-20%** cyclist casualties – **significant**
- **-14%** all road users **– significant**

Conclusion

LTNs in London have resulted in:

- Small but significant increases in cyclist numbers
- Increased women and children cycling
- A tentative increase in the number of cyclists on the road
- Increased cycling safety both within LTNs and on boundary roads
- Significantly increased safety at boundary to LTN junctions

- The walking and cycling injury benefits inside LTNs could be **even higher** if we account for increase in walking/cycling (i.e. risk per trip)

More walking/cycling + fewer injuries = lower risk per trip

- Still, complementary measures required on boundary roads where injury rates are x7 higher than inside LTN areas.