IMPERIAL

# Healthy urban transitions: reducing car dependency

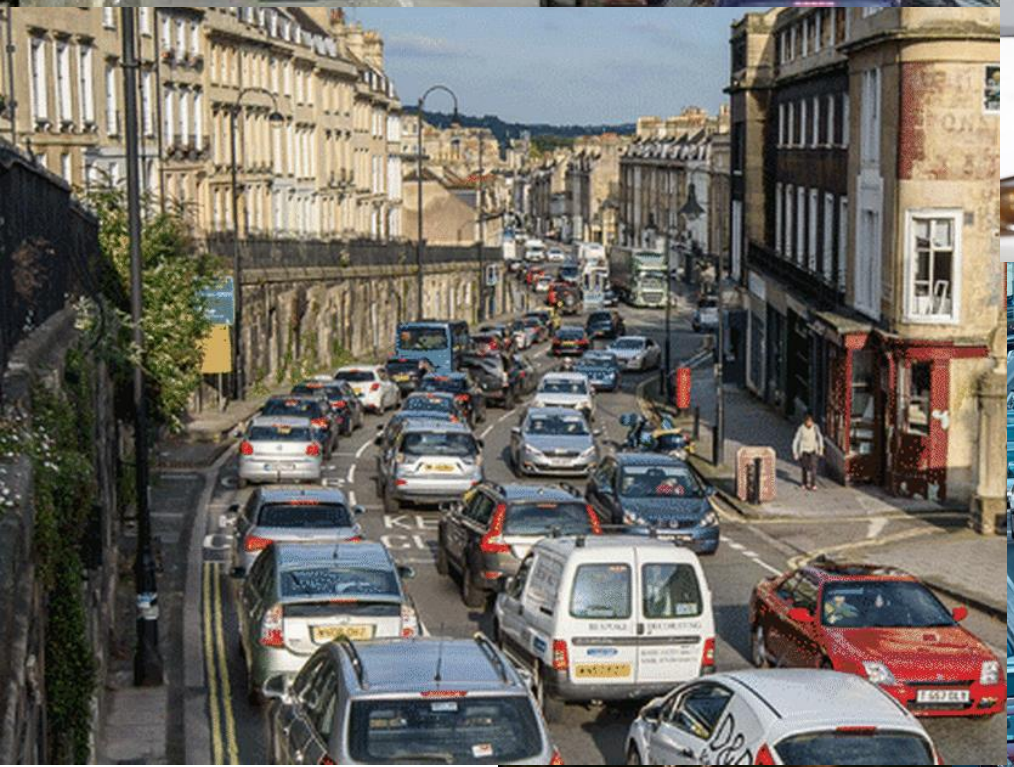
**Healthy People and Healthy Planet**

Leveraging AI for Decarbonised, Healthy, Inspiring and Energy-Positive Cities

July 25th 2024

**Audrey de Nazelle, Centre for Environmental Policy, Imperial College London**

© Alamy



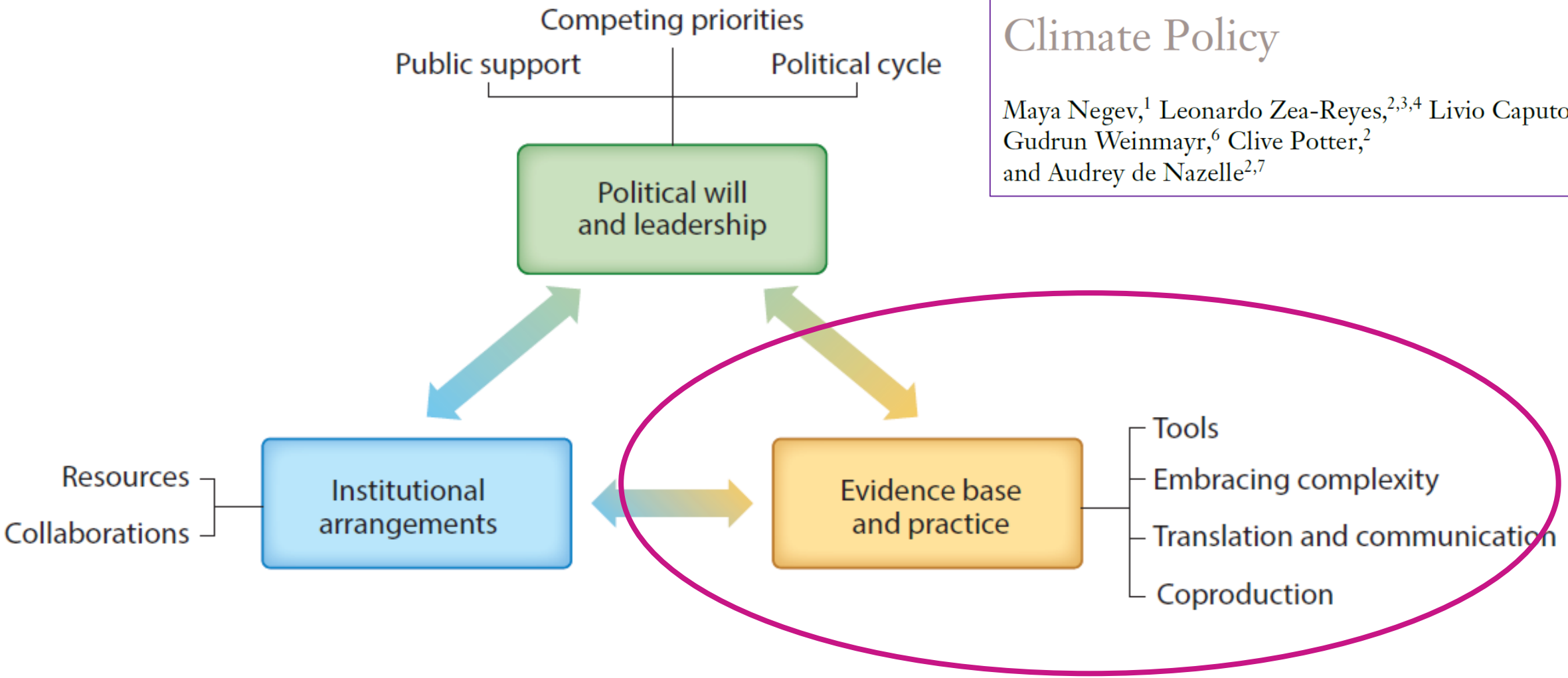
# Why are we not implementing transformational, ambitious urban solutions?

- Controversy
- Misinformation
- Siloed decision-making

*Annual Review of Public Health*

# Barriers and Enablers for Integrating Public Health Cobenefits in Urban Climate Policy

Maya Negev,[1] Leonardo Zea-Reyes,[2,3,4] Livio Caputo,[5] Gudrun Weinmayr,[6] Clive Potter,[2] and Audrey de Nazelle[2,7]

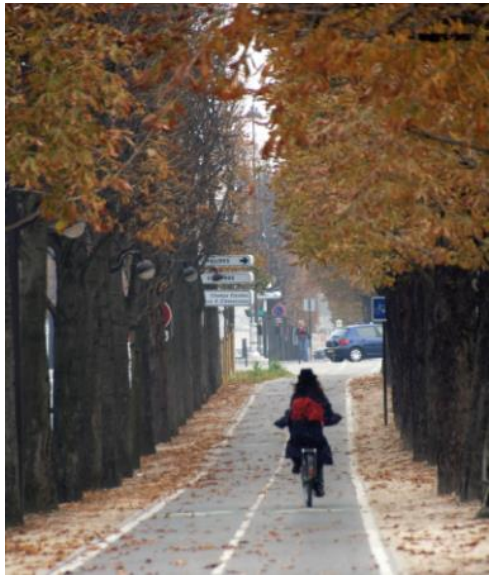




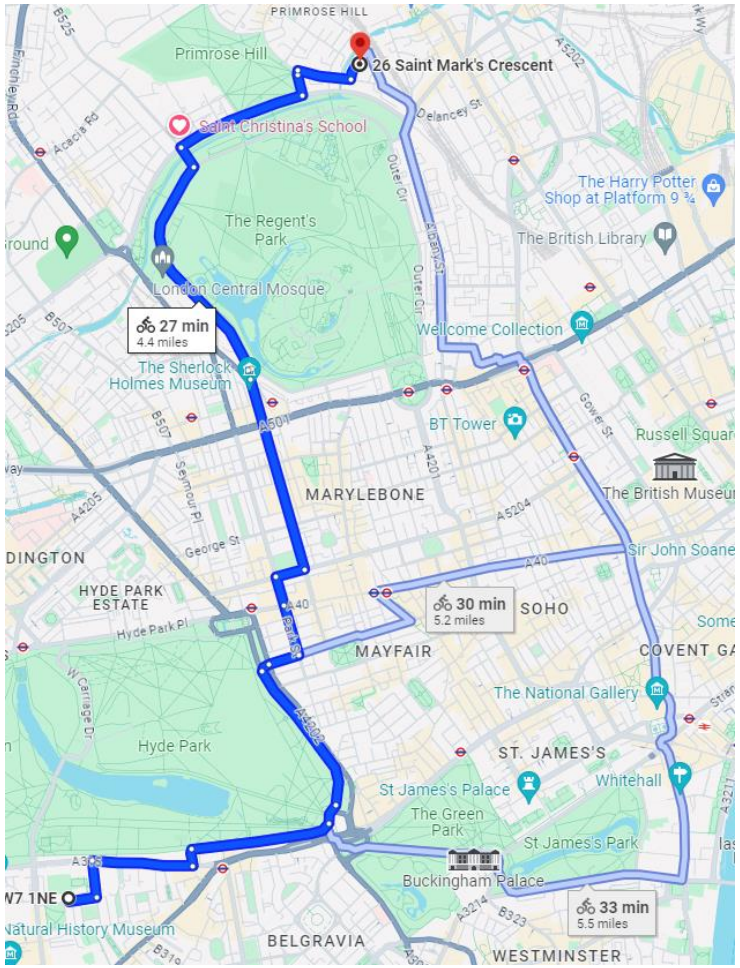

Annu. Rev. Public Health 2022. 43:255–70

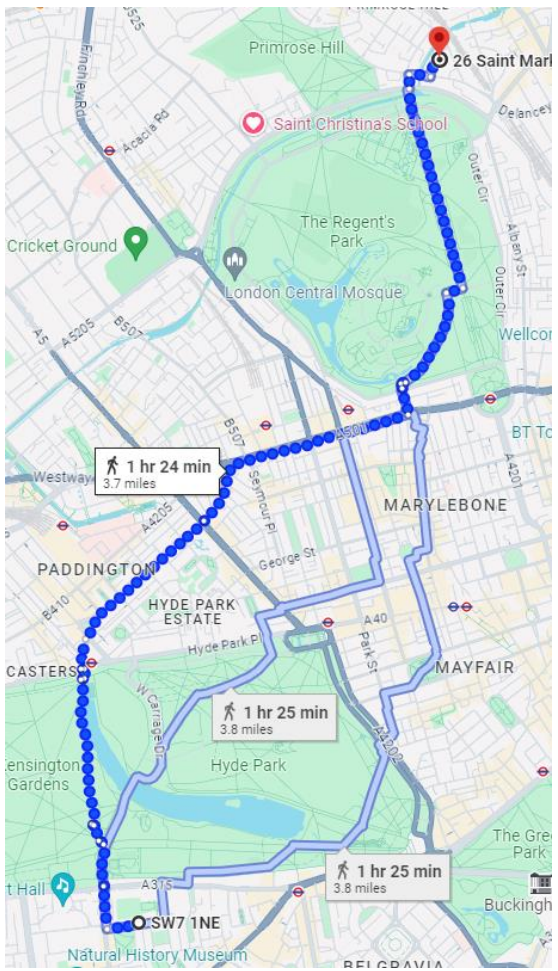
# What kind of evidence base can AI help with?

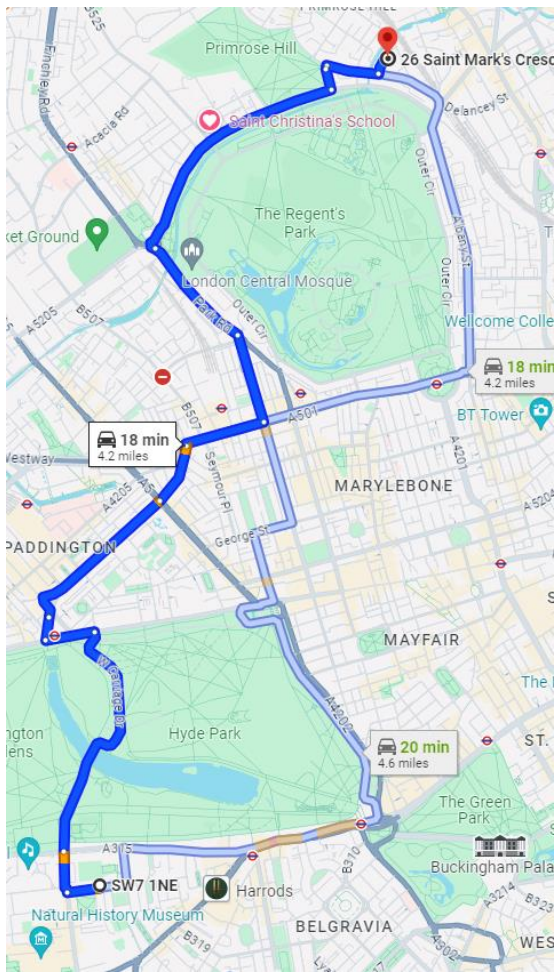
## Understanding urban – behaviour – health relationships
## &
## Identifying health-promoting urban designs

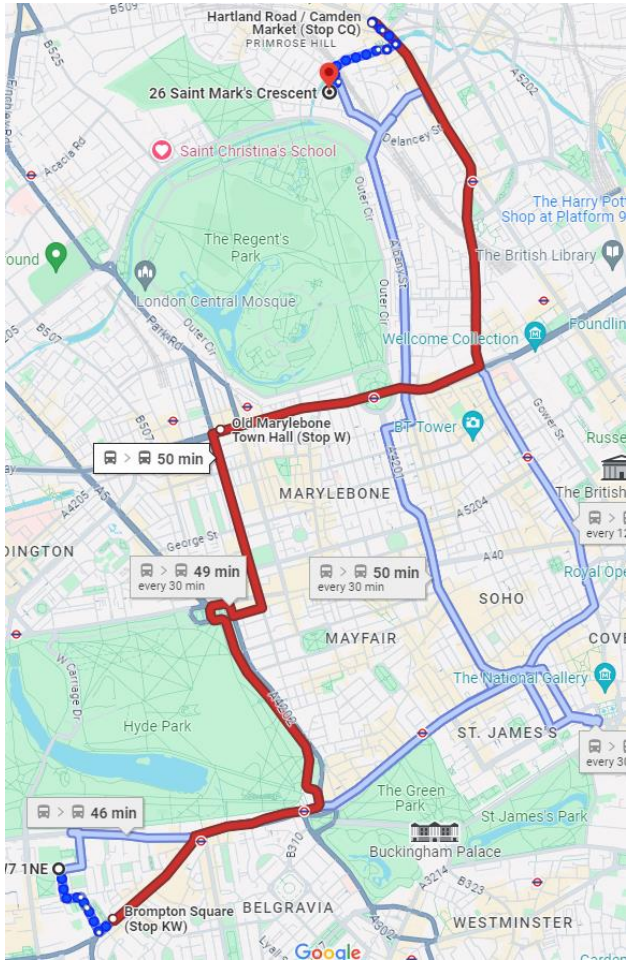


# Characterizing place, behaviours, exposures, and health

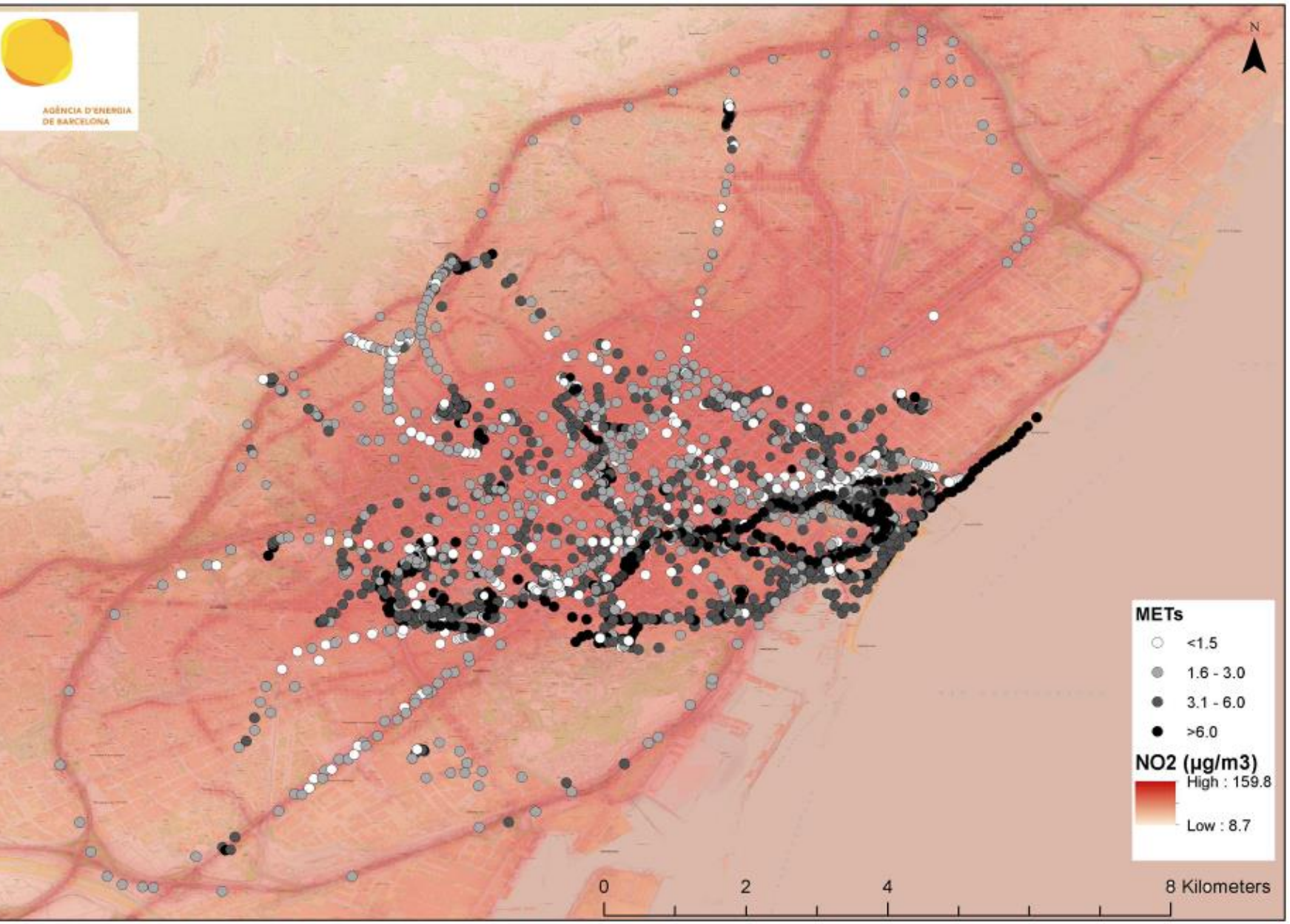

26 Saint Mark's Crescent
27 min
4.4 miles
30 min
5.2 miles
33 min
5.5 miles
SW7 1NE
Primrose Hill
Saint Christina's School
The Regent's Park
London Central Mosque
The Harry Potter Shop at Platform 9 ¾
The British Library
Wellcome Collection
The Sherlock Holmes Museum
BT Tower
MARYLEBONE
HYDE PARK ESTATE
SOHO
MAYFAIR
The National Gallery
Hyde Park
ST. JAMES'S
St James's Palace
Whitehall
The Green Park
St James's Park
Buckingham Palace
Natural History Museum
BELGRAVIA
WESTMINSTER


26 Saint Mark's Crescent
1 hr 24 min
3.7 miles
1 hr 25 min
3.8 miles
1 hr 25 min
3.8 miles
SW7 1NE
Primrose Hill
Saint Christina's School
Cricket Ground
The Regent's Park
London Central Mosque
MARYLEBONE
PADDINGTON
HYDE PARK ESTATE
MAYFAIR
Hyde Park
Natural History Museum


26 Saint Mark's Cresc
18 min
4.2 miles
18 min
4.2 miles
20 min
4.6 miles
SW7 1NE
Primrose Hill
Saint Christina's School
The Regent's Park
London Central Mosque
BT Tower
MARYLEBONE
PADDINGTON
MAYFAIR
Hyde Park
Harrods
Natural History Museum
BELGRAVIA


Hartland Road / Camden Market (Stop CQ)
26 Saint Mark's Crescent
50 min
49 min
every 30 min
50 min
every 30 min
46 min
Old Marylebone Town Hall (Stop W)
Brompton Square (Stop KW)
Primrose Hill
Saint Christina's School
The Regent's Park
London Central Mosque
The Harry Pot Shop at Platform 9
The British Library
Wellcome Collection
BT Tower
MARYLEBONE
MAYFAIR
SOHO
The National Gallery
Hyde Park
ST. JAMES'S
The Green Park
St James's Park
Buckingham Palace
BELGRAVIA
WESTMINSTER
Google

# Phone-based tracking and physical activity: promising opportunities

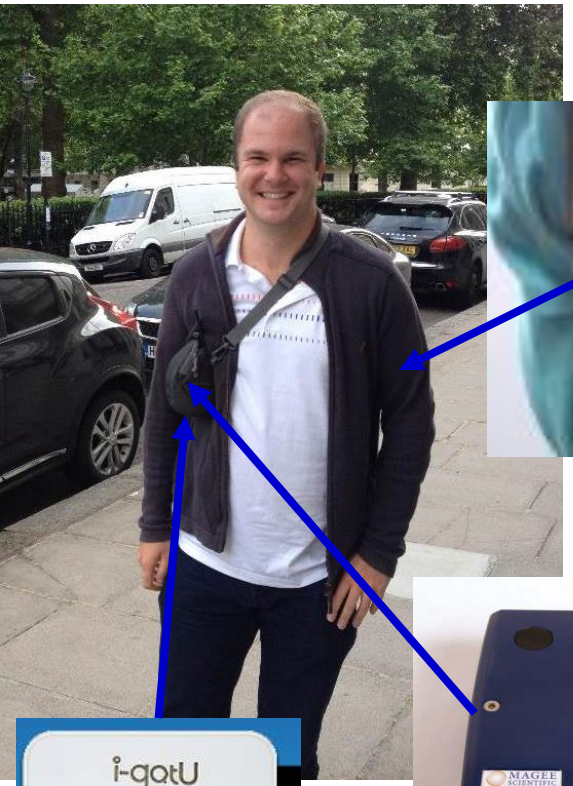


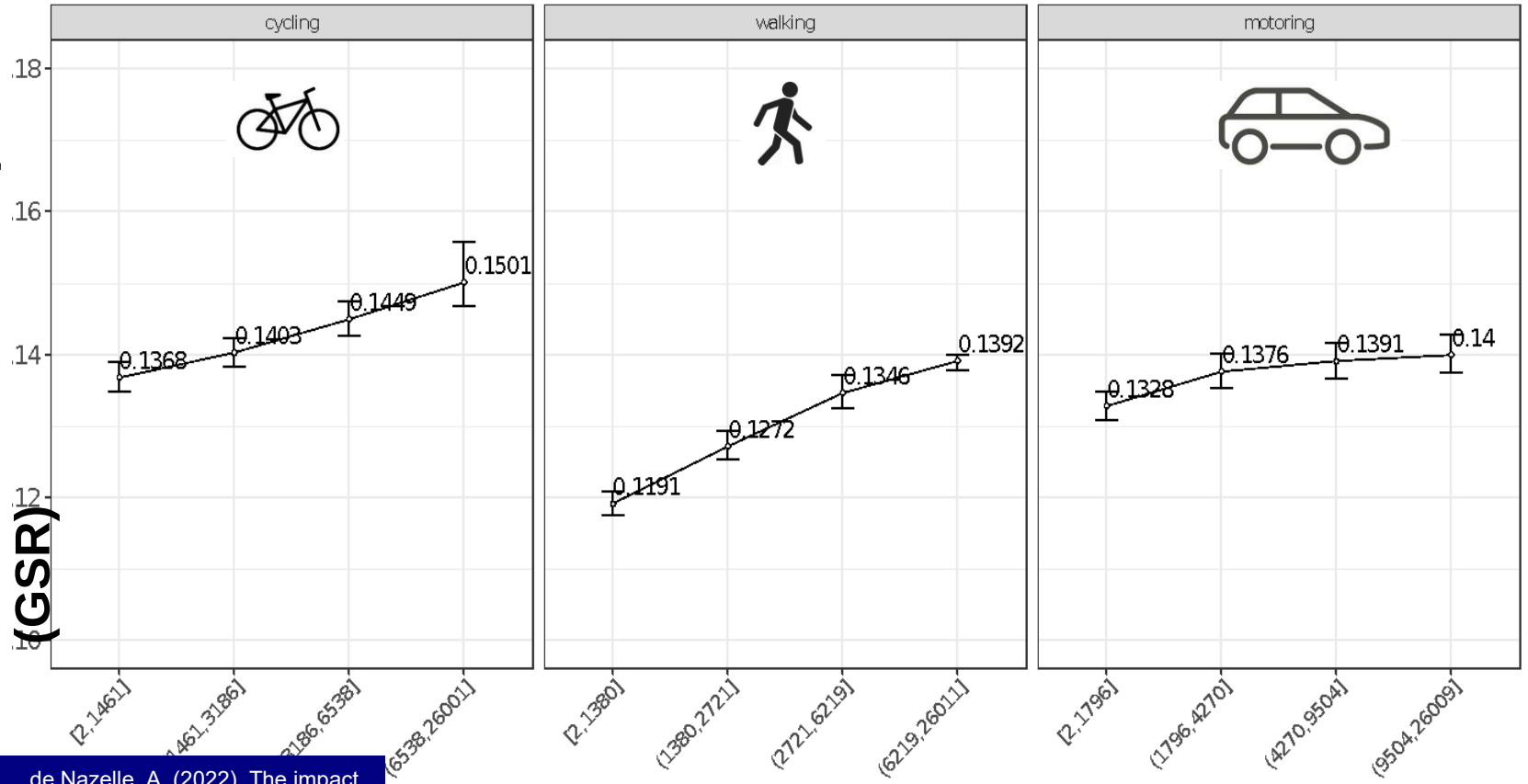

Some challenges:

- Accessing large data sets
- Transport mode recognition
- Characterizing the environment

De Nazelle, A., Seto, E., Donaire-Gonzalez, D., Mendez, M., Matamala, J., Nieuwenhuijsen, M. J., & Jerrett, M. (2013). Improving estimates of air pollution exposure through ubiquitous sensing technologies. *Environmental Pollution*, *176*.

- **Air pollution increases stress while cycling and walking, but not driving**
- **Greenspace and active travel infrastructure probably decrease stress**






PASTA

PHYSICAL ACTIVITY THROUGH SUSTAINABLE TRANSPORT APPROACHES

Yang, X., Orjuela, J. P., McCoy, E., Vich, G., Anaya-Boig, E., Avila-Palencia, I., … de Nazelle, A. (2022). The impact of black carbon (BC) on mode-specific galvanic skin response (GSR) as a measure of stress in urban environments. *Environmental Research*, *214*,

# Street level imagery and AI

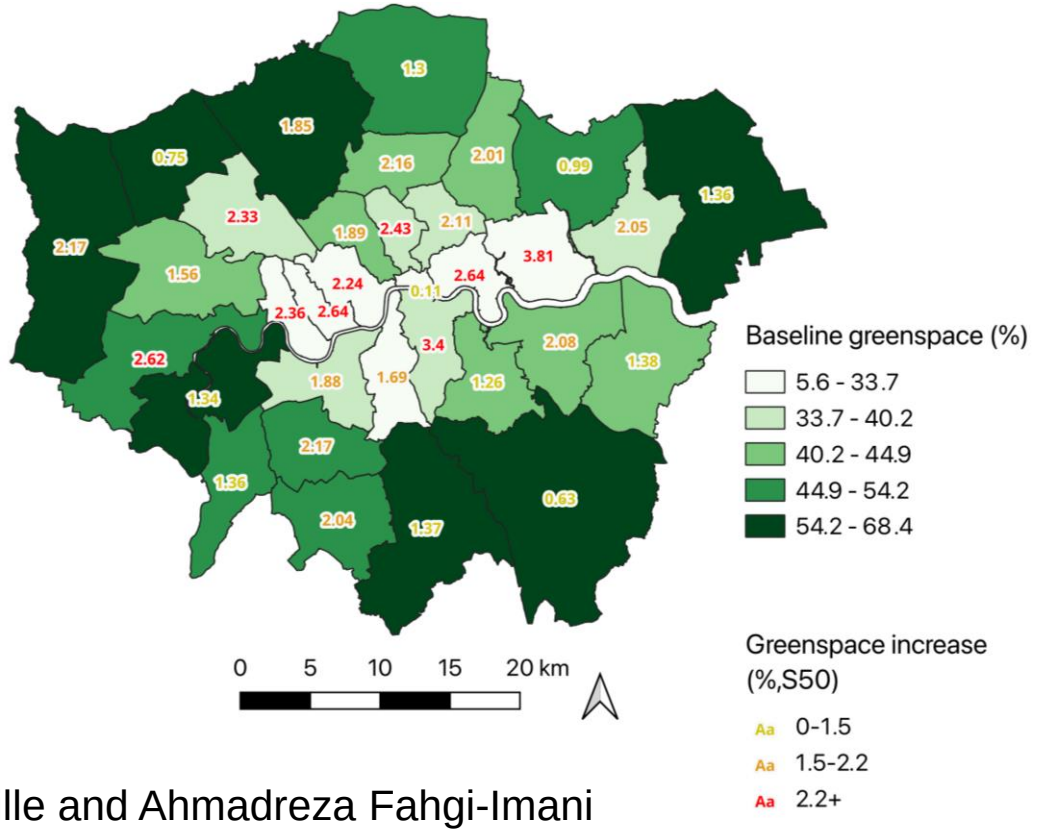
Zhang, F., Salazar-Miranda, A., Duarte, F., Vale, L., Hack, G., Chen, M., … Ratti, C. (2024). Urban Visual Intelligence: Studying Cities with Artificial Intelligence and Street-Level Imagery. *Annals of the American Association of Geographers*, *114*(5), 876–897.

Salazar-Miranda, A., Zhang, F., Sun, M., Leoni, P., Duarte, F., & Ratti, C. (2023). Smart curbs: Measuring street activities in real-time using computer vision. *Landscape and Urban Planning*, *234*, 104715

# Green infrastructure scenarios:

## Greening 50% of parking space in London would…

- generate 3.4% more greenspace and 6.46% more tree canopy
- prevent 90 deaths/year
- reduce London's stormwater runoff by 1.32%




With Alex Morgan-Grenville and Ahmadreza Fahgi-Imani

# What kind of evidence base can AI help with?

## Understanding policy resistance
## &
## opportunities to engage

The New York Times

# *He Wanted to Unclog Cities. Now He's 'Public Enemy No. 1.'*

Researchers like Carlos Moreno, the professor behind a popular urban planning concept, are struggling with conspiracy theories

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**EXCLUSIVE Extra 40-minute commutes, the taste of fumes in the air and ambulances stuck in gridlock: What life is like for Londoners living in 'nightmare' LTN**

- **The Streatham Wells LTN has caused 'chaos' since it was first introduced**

By EMILY JANE DAVIES
**PUBLISHED:** 08:18, 27 February 2024 | **UPDATED:** 11:52, 27 February 2024

Nick Fletcher MP @NickFletcher... · 2d

15 MINUTE CITIES

I spoke in Parliament today to ask the Government to hold a debate on the international socialist concept of so called 15 minute cities and 20 minute neighbourhoods.

1/7 #Doncasterisgreat
#stronglocaleconomy

Mail Online

**Now Sadiq Khan vows to seize control of High Street Kensington to REINSTALL hated cycle lane despite weeks of traffic chaos hours after council finally sta bollards and fully restore road**

← Post

Susan Hall AM
@Councillorsuzie

LTNs (low traffic neighbourhoods) are blocking ambulances from getting to where they need to be.

I am listening to Londoners and will do all I can to help councils remove unwanted LTNs. Tell me if there's an LTN you want removed 👇
action.conservatives.com/low-traffic-ne...

9:02 AM · Mar 5, 2024 · **141.4K** Views

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## LTN scrapped after three-mile bus journey took two hours

Labour-run Lambeth axes scheme at Streatham Wells, south-west London, after it caused major congestion

*By* Albert Tait
7 March 2024 • 5:24pm

Related Topics
London mayoral election, London, South West London, Roads, Sadiq Khan

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Evening Standard

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INSIDER

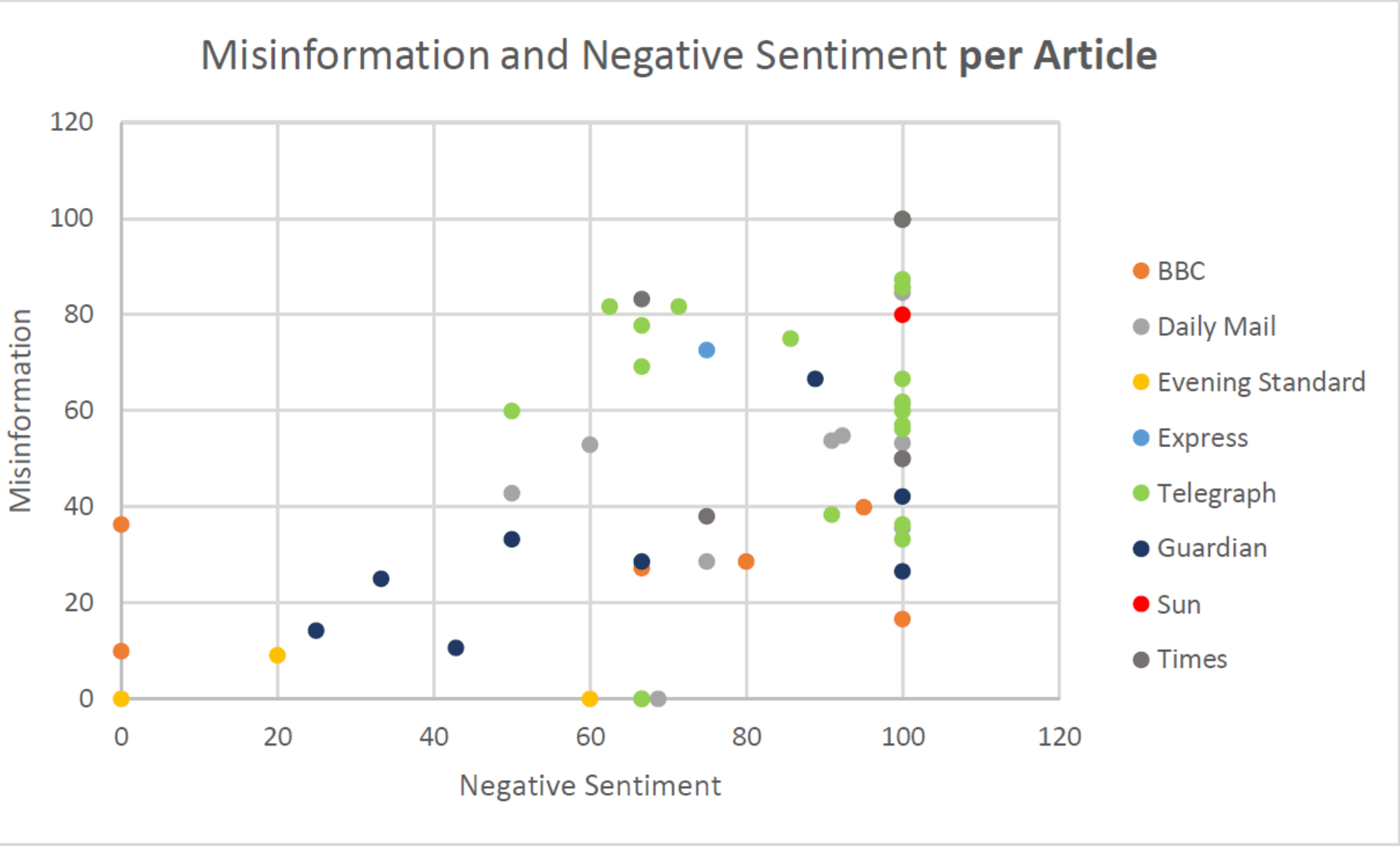
# Cycle war? It's only just begun

The removal of the segregated bike lane on Kensington High Street sparked a wave of protests. Now, campaigners are trying to take their fight through the High Court. Robbie Smith reports

# Low Traffing Neighborhoud (LTN) media misinformation and sentiment

- 85% of articles conveyed more negative sentiment than positive.
- 50.4% of articles contained 100% negative sentiment

- 87% articles contained at least one instance of misinformation.
- On average, amount of misinformation within individual articles ~ amount of valid information relating to LTNs




***LTN misinformation and Sentiment per Article and by newspaper***

With Ella Lee and Ahmadreza Faghih Imani

# Car reduction policies: truly controversial?

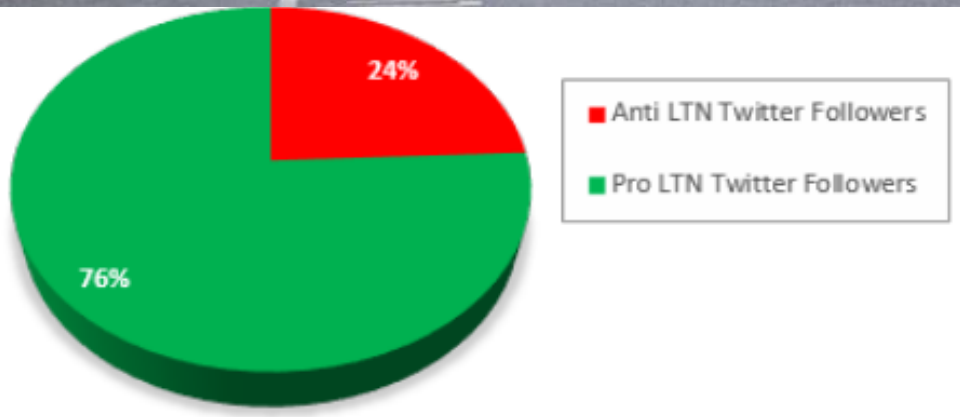



*Figure 5 - Breakdown of anti and pro-LTN followers on Twitter.*

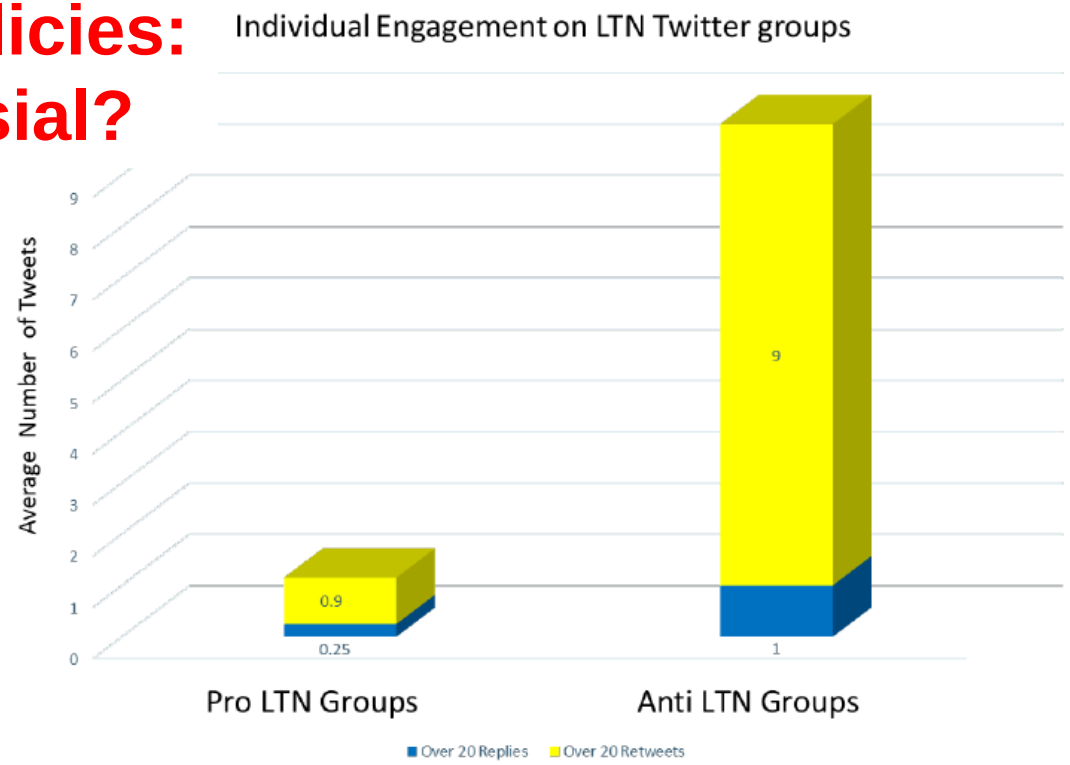



*Figure 6 - Engagement Metrics: average number of tweets with over 20 replies or retweets for pro and anti-LTN groups.*

MSc 2023 project on Islington

# Low Traffic Neighbourhoods

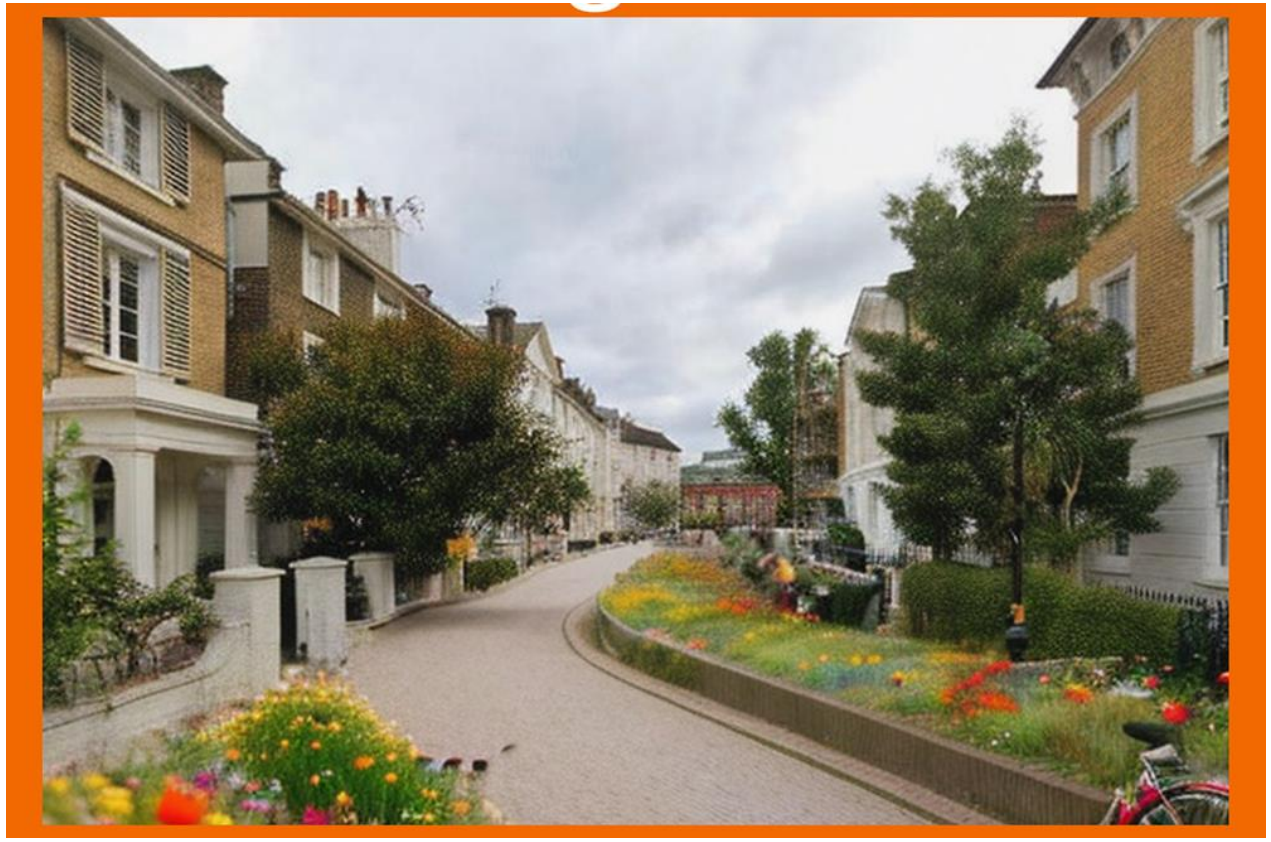
With Emma Kurihara, Laetitia Rovira, Maddy Shaw, Marco Solimeno and Ahmadreza Faghih Imani

Election results of candidates who ran with anti-LTN stances

| Politician and Party | Election | Number of Votes Received | % of Total Votes |
|---|---|---|---|
| Will Woodroofe, *Conservative* | St Mary's and St James' Local Elections (May 2022) | 446 | **4%** |
| Nick Brainsby, *Conservative* | St Peter's and Canalside Local Elections (May 2022) | 525 | **7%** |
| David Corrigall, Conservative | Laycock Local Elections (May 2022) | 369 | **4%** |

# “This tool re-imagines streets without cars, best use of AI 😄”

https://dutchcyclinglifestyle.com/





**THANK YOU!**