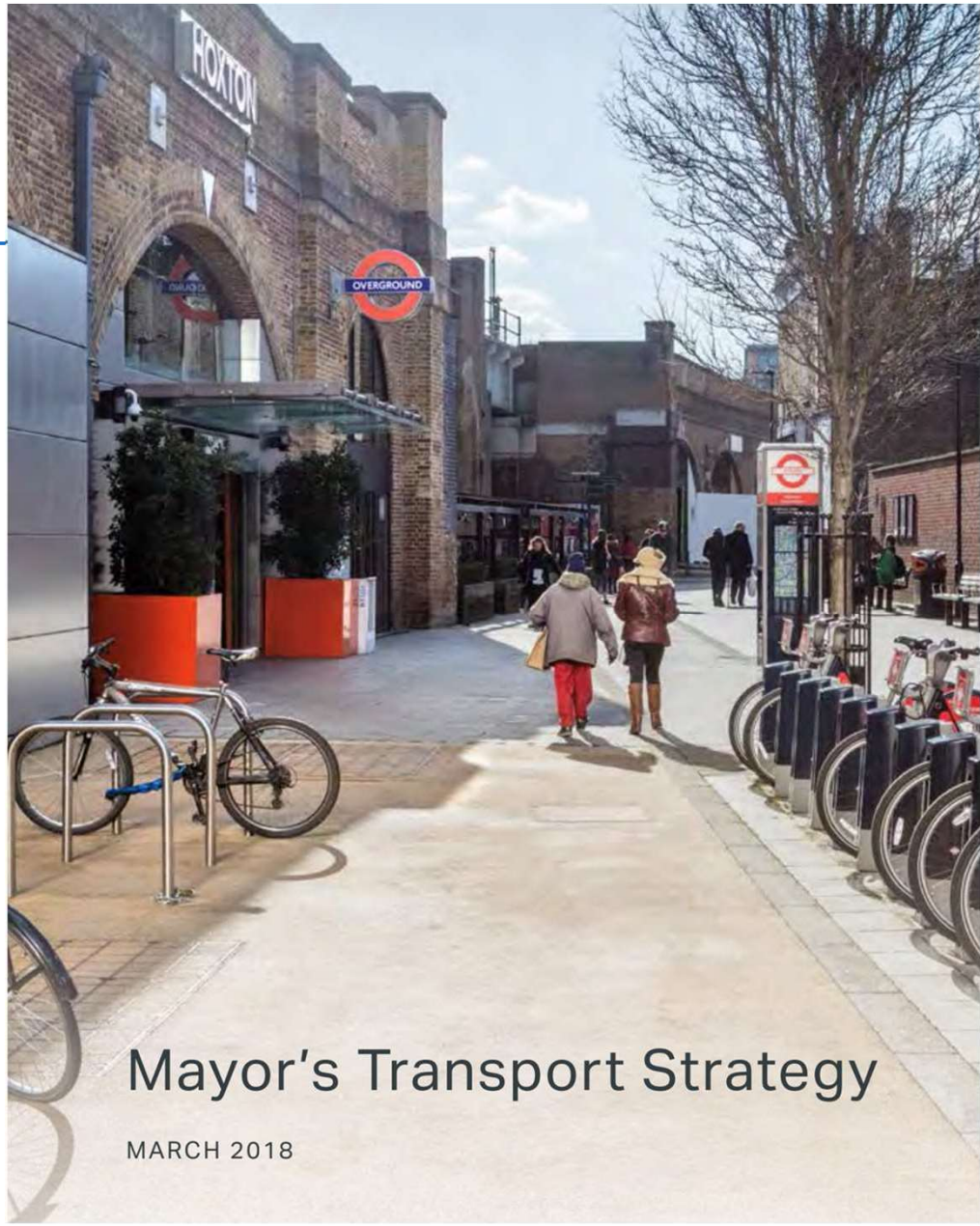
Cycling in London
Data analysis

Thoughtworks project – Group 6

Background
Transport Strategy of 2018

- **London's Bold Goal:** Aiming for 80% of trips by walking, cycling, or public transport by 2041.
- **TfL's Cycling Push:** 2018 Transport Strategy invests in cycling infrastructure.
- **Focus on Accessibility:** Expanding cycle lanes, improving street safety, and making cycling inclusive.

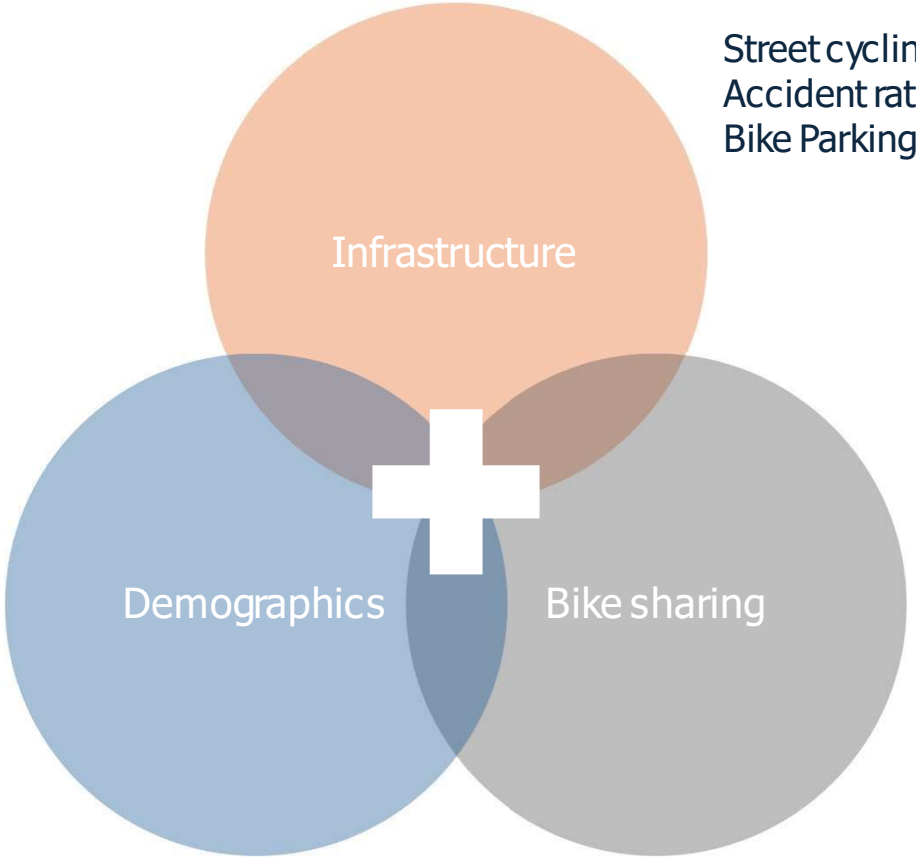


Business Question

- **Progress Assessment:** Analyse current data to understand how far London has come towards the 2041 target. This involved evaluating metrics like the number of cycling trips and the extent of cycling infrastructure development.

- **Barrier Identification: E**xplore the key factors hindering more Londoners from embracing cycling. Including concerns around safety, lack of dedicated cycling lanes, or limited access to secure bike parking.

Key question: What would encourage people to cycle more?



Street cycling infrastructure
Accident rate
Bike Parking and Theft

Profile of London cyclists
Social barriers to cycling
Community engagement

Bike sharing schemes
New York Case study

Cycling Behaviour

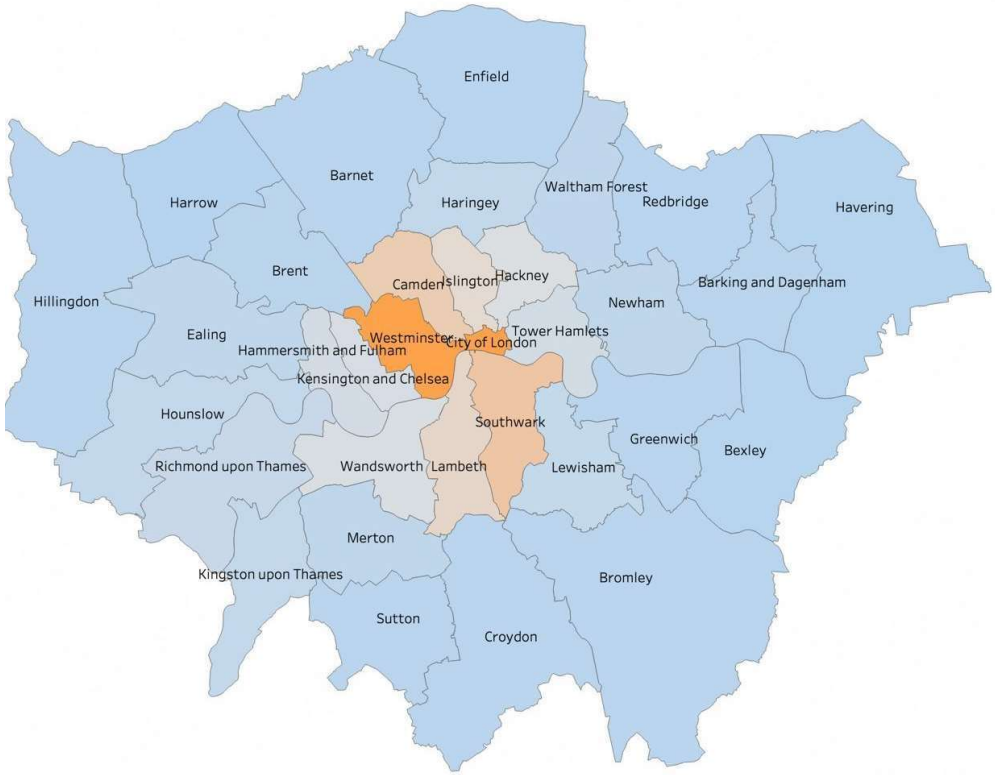
Cycling infrastructure

Bike sharing

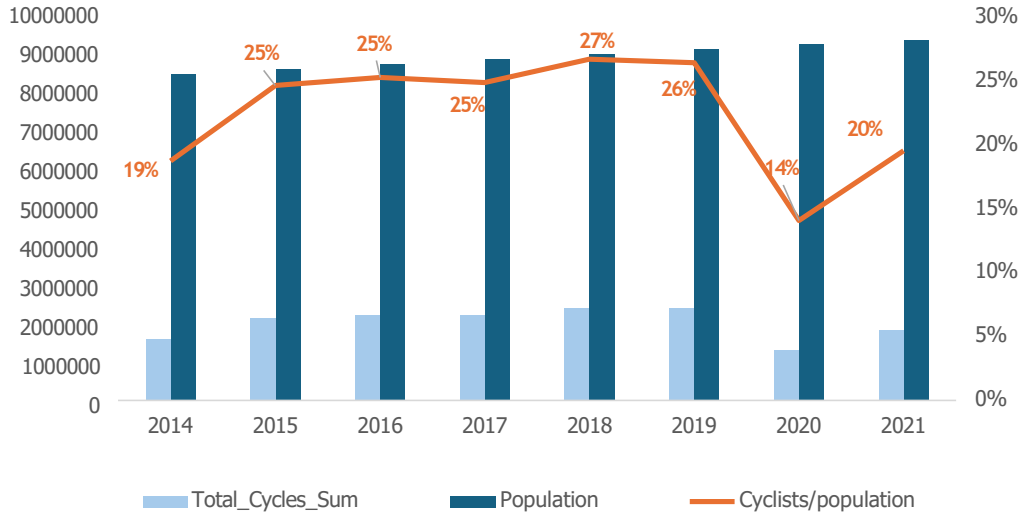
Cycling behaviour

OPTIMAL ROUTE INITIATIVE

Daily average of bikes per borough



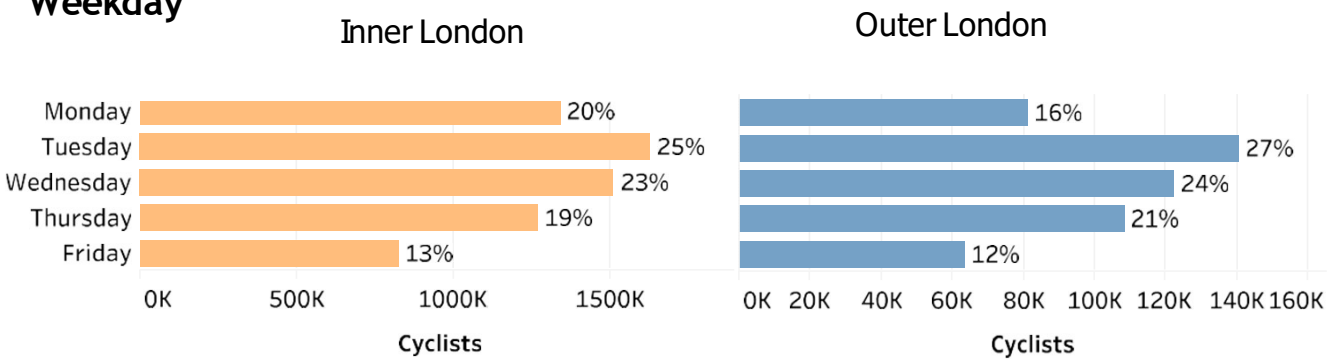
Number of cyclists to population



Cycling behaviour in London

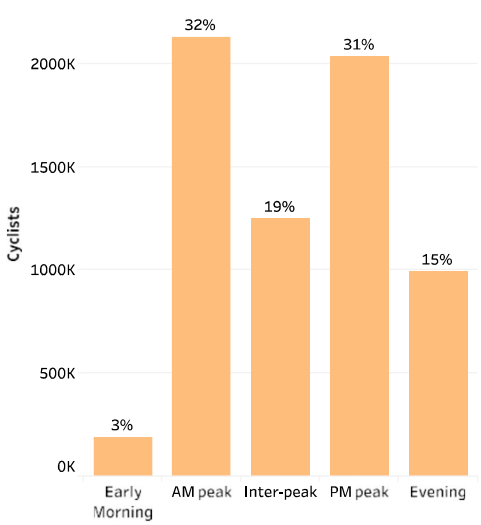
OPTIMAL ROUTE INITIATIVE

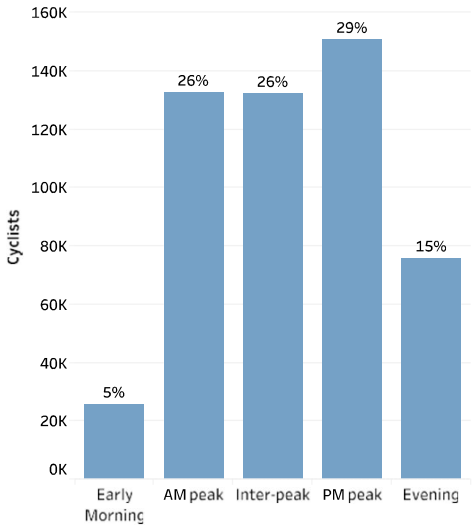
Weekday



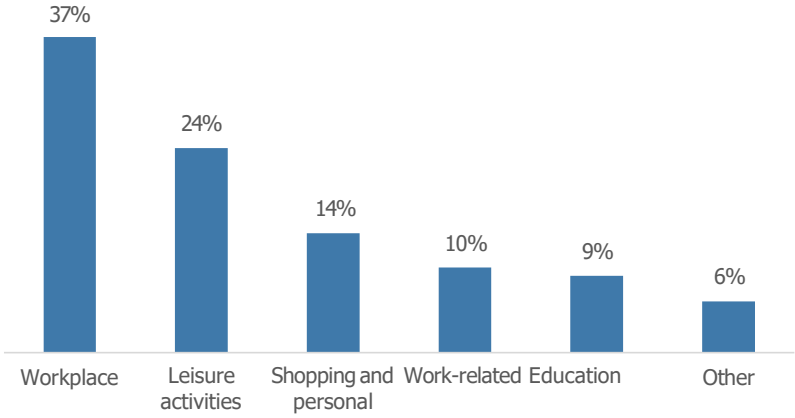
Weather conditions

Period of the day

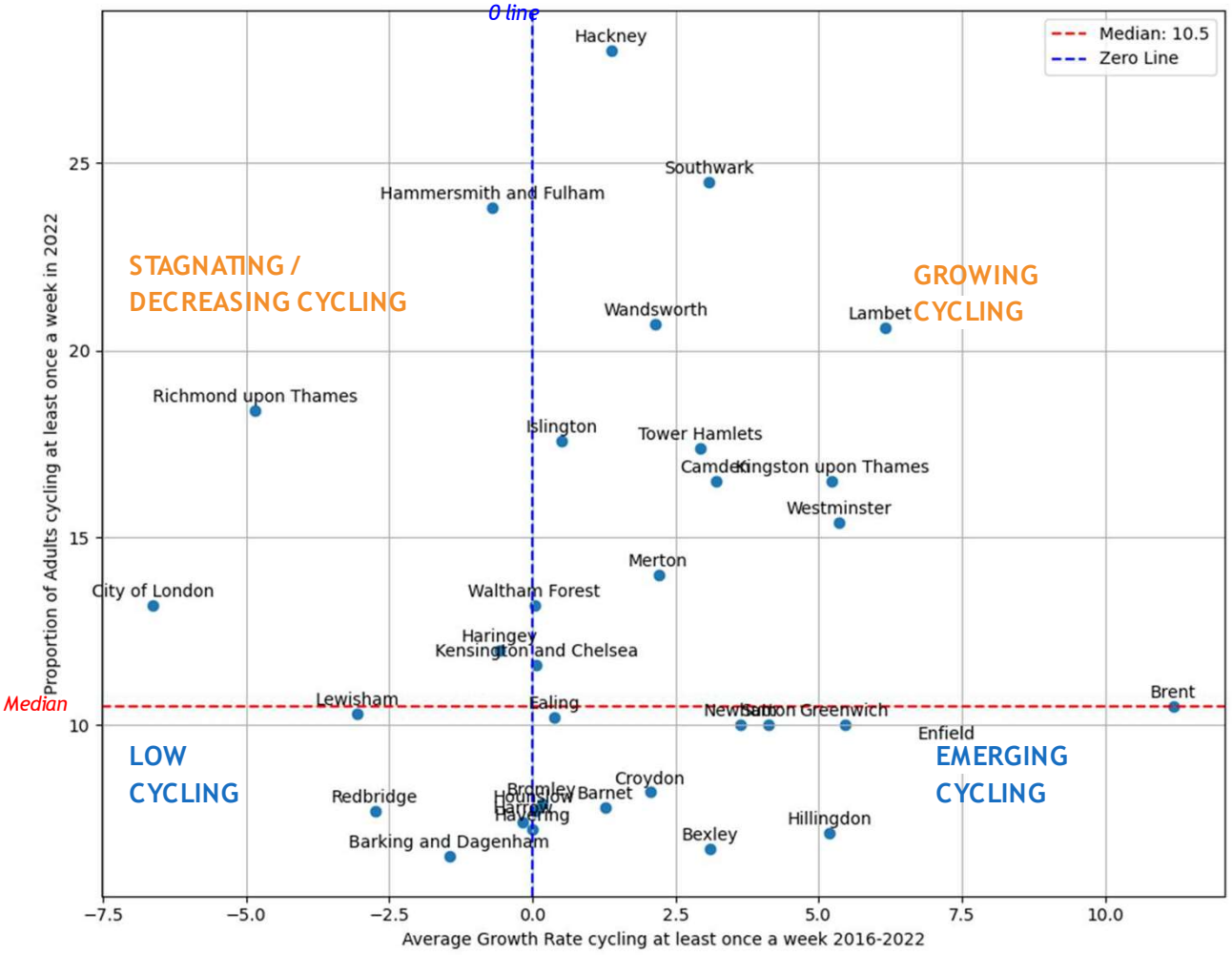




Cycling activity by purpose of travelling



Reaching New Riders in Key Boroughs



STAGNATING/DECREASING CYCLING - Stagnant/Declining: Above median proportion in 2022 and negative change

- **Renew**

GROWING CYCLING - Thriving: Above median proportion in 2022 and positive change

- **Sustain**

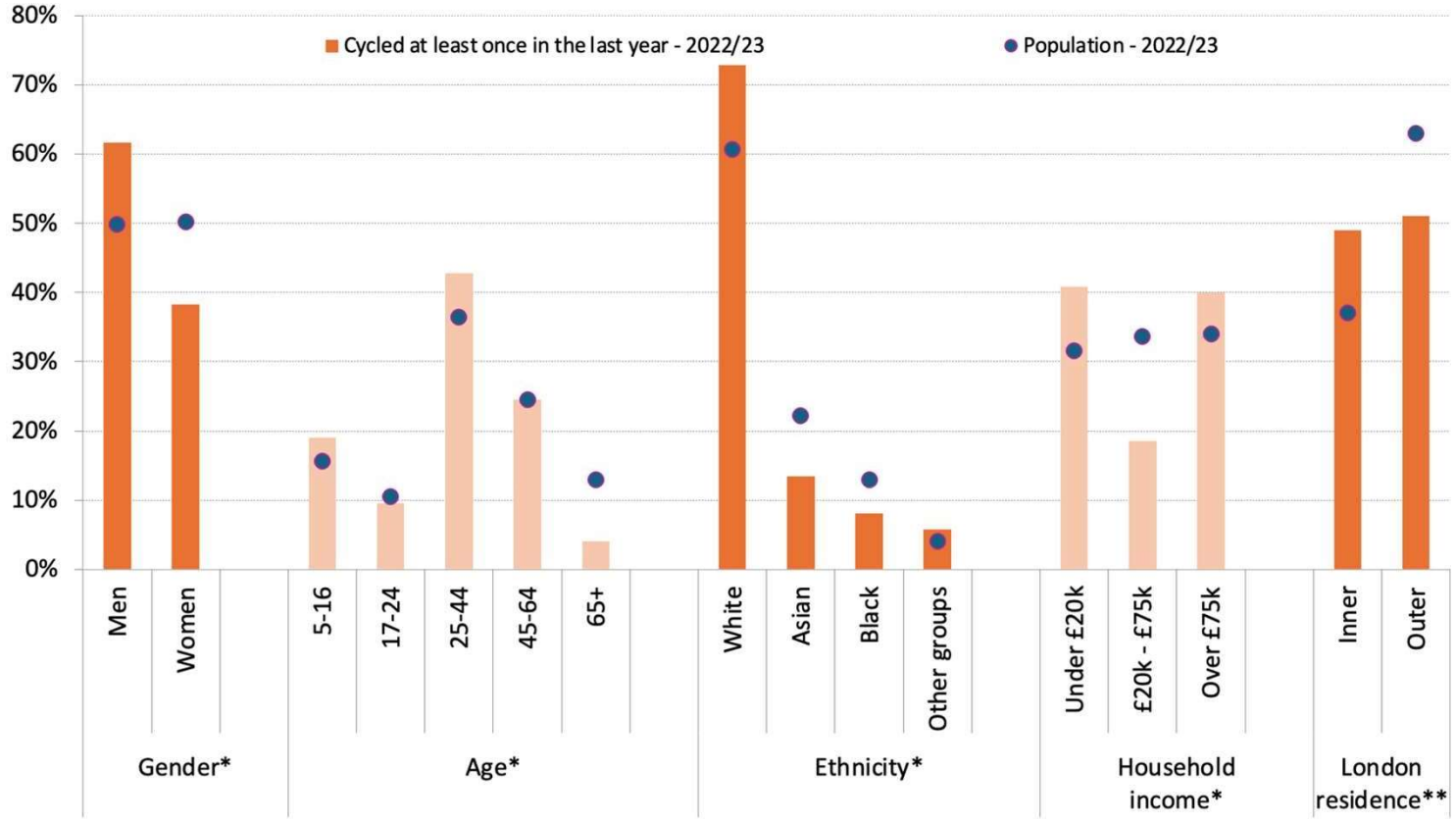
LOW CYCLING - Declining: Below median proportion in 2022 and negative change

- **Revitalise**

EMERGING CYCLING - Rising: Below median proportion in 2022 and positive change

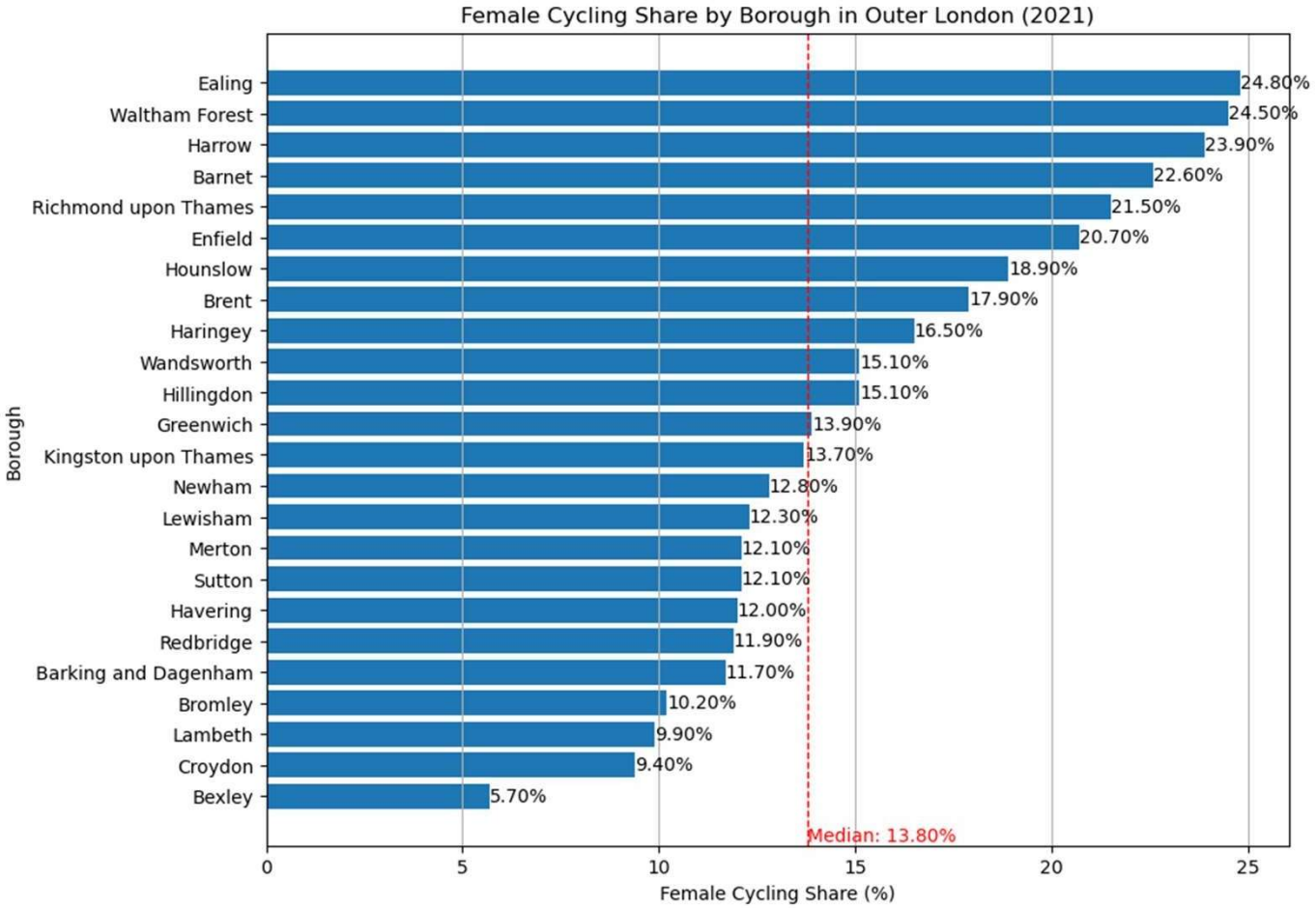
- **Amplify**

London's Cycling Revolution: Unveiling Demographic Trends



*Travel in London 2023. Figure 16: Socio Demographic profile of London residents who cycled at least once in the last year versus population profile, LTDS, 2010/11, 2019/20 and 2022/23.
**Profile of London cyclist. Cycling potential in London's diverse communities 2021

Empowering Women Cyclists in Key Boroughs



- **51,6%** of London population
- **33%** of cycling trips
- only **15%** of cyclists are female on Outer London roads

Target boroughs:

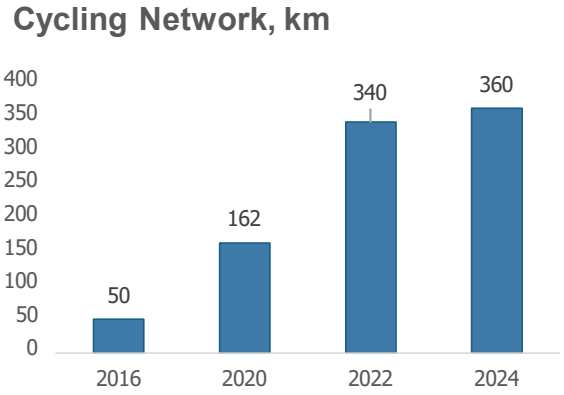
(1) Bexley (2) Croydon (3) Lambeth (4) Bromley (5) Barking and Dagenham (6) Redbridge (7) Havering (8) Sutton (9) Merton (10) Lewisham (11) Newham (12) Kingston

Cycling behaviour

Cycling infrastructure

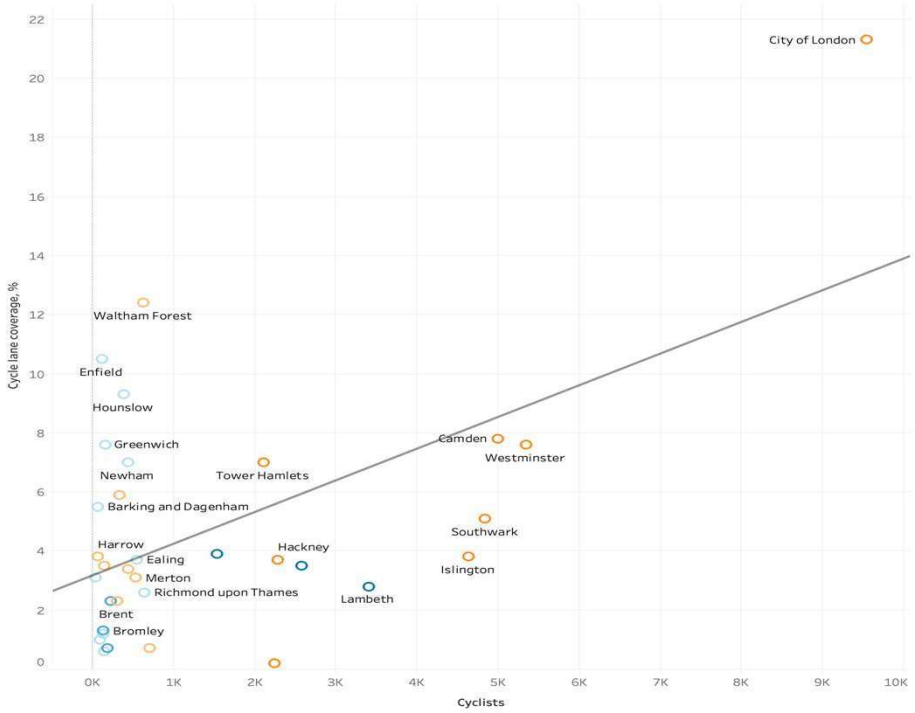
Bike sharing

Cycling infrastructure



City of London and Camden - high numbers of cyclists and high cycle lane coverage
Waltham Forest and Enfield higher than expected cycle lane coverage relative to cyclist numbers
Westminster - cycle lane coverage is less than might be expected given the number of cyclists

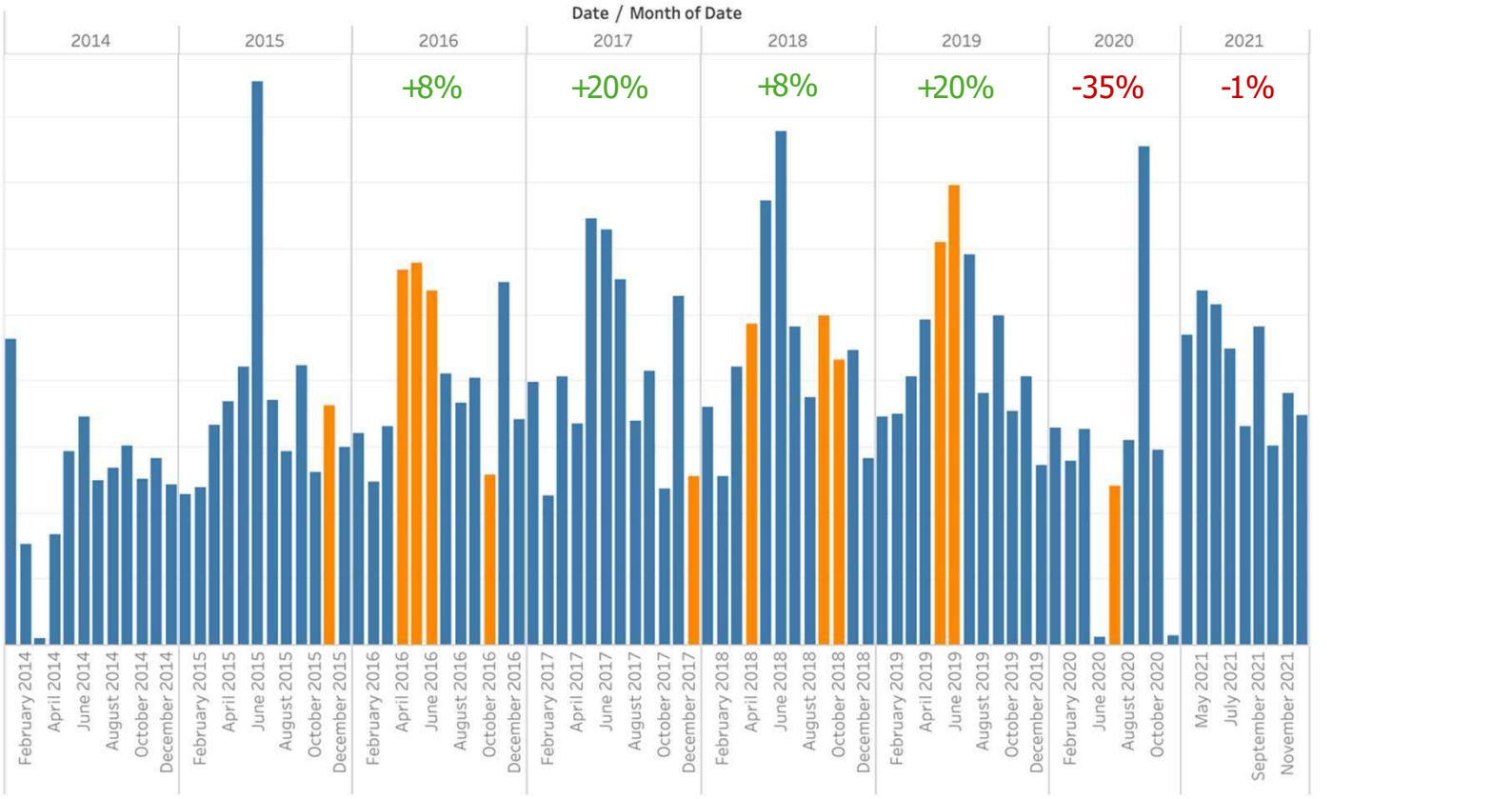
Correlation between the number of cyclists and Cycle lane coverage in %



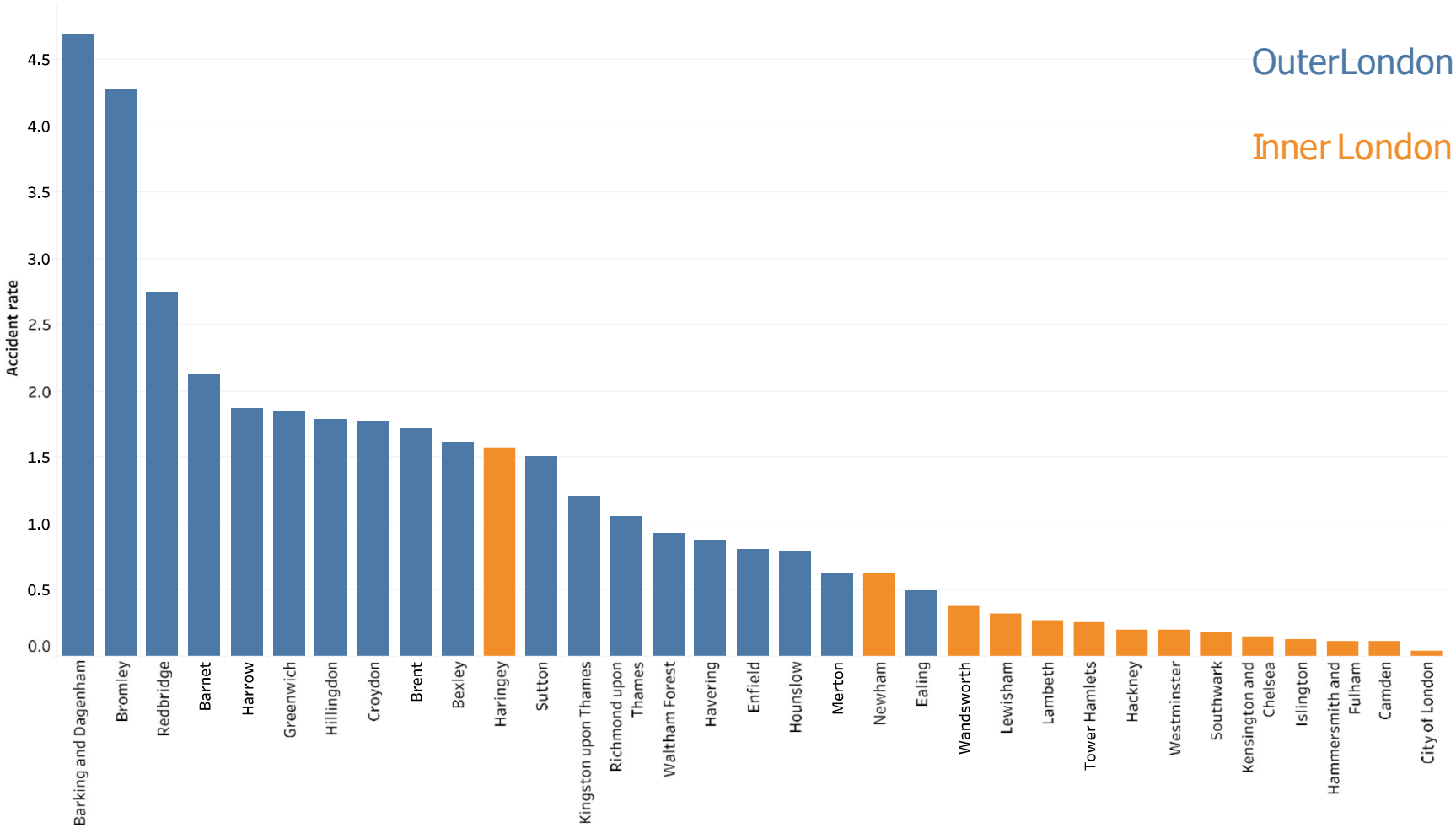
A positive correlation between cycle lane coverage and the number of cyclists. As lane length increases, the total number of cycles also tends to increase.

Cycling Surge: Trends in Inner London

Yearly Average number of cyclists
Central and Inner London



Outer London Boroughs at Higher Risk for Cycling Accident

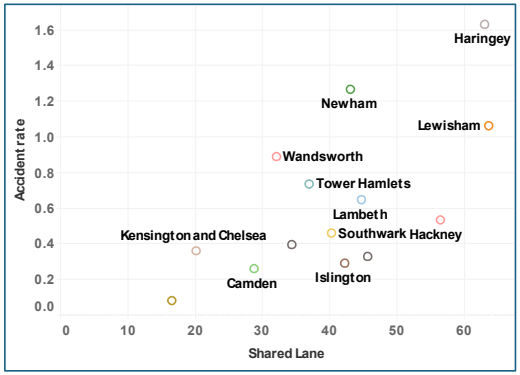


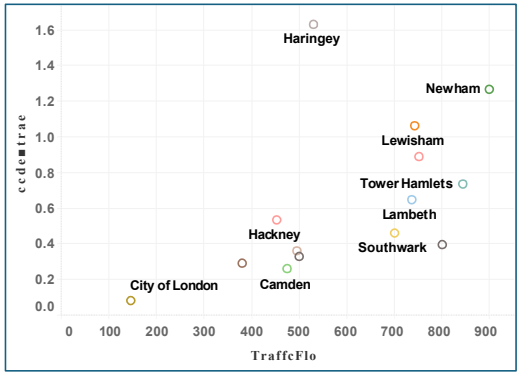
Inner London Boroughs: How Infrastructure Affects Bike Accident Rates

OPTIMAL ROUTE INITIATIVE

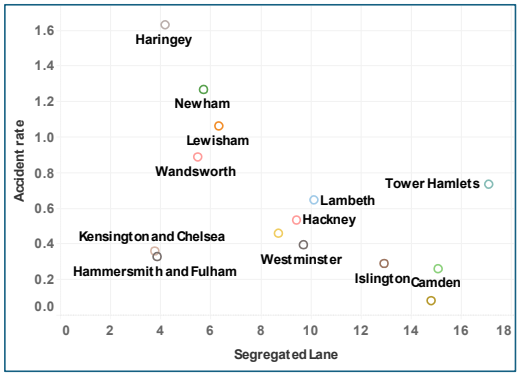
Inner London

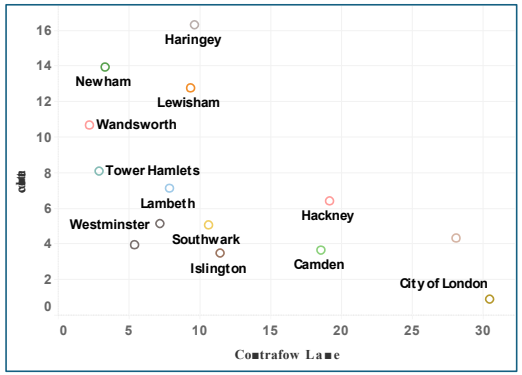
Shared lanes and higher traffic flow result in more accidents





Segregated and contraflow lanes result in fewer accidents





Recommendations:

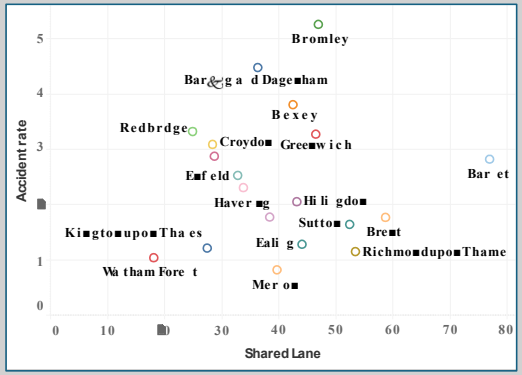
- Reduce shared lanes, building more segregated and contra flow lanes in Haringey, Newham, Lewisham and Wandsworth.
- Examples:
  - Lewisham: decrease 10% shared lanes, decrease 23% of accidents
  - Southwark: build 10% more segregated lane and could have 18% less accident
  - Kensington and Chelsea: build 10% more contraflow lane and could have 12% less accident.

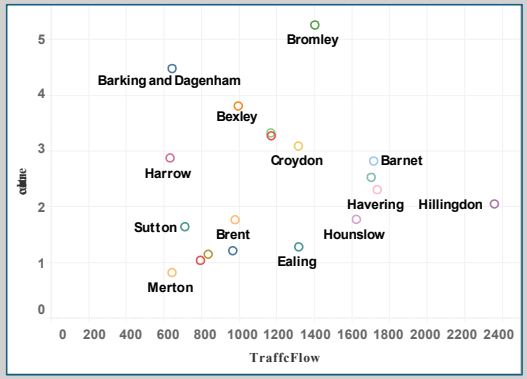
A Multifaceted Issue: Bike Accident Rates and Infrastructure in Inner vs. Outer London

OPTIMAL ROUTE INITIATIVE

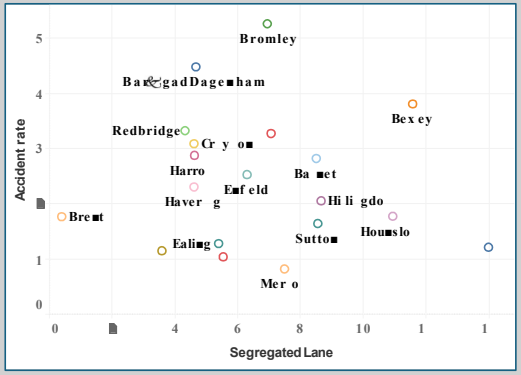
Outer London

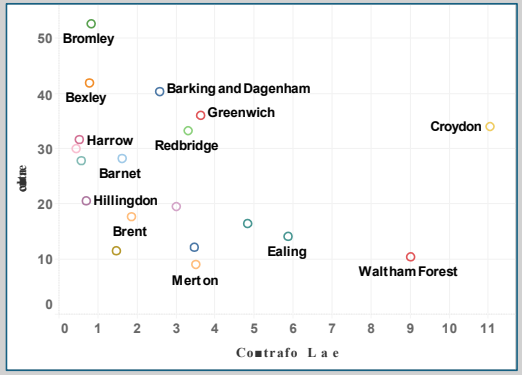
Weak correlation between shared lanes and traffic





Weak correlation between segregated and contraflow lanes

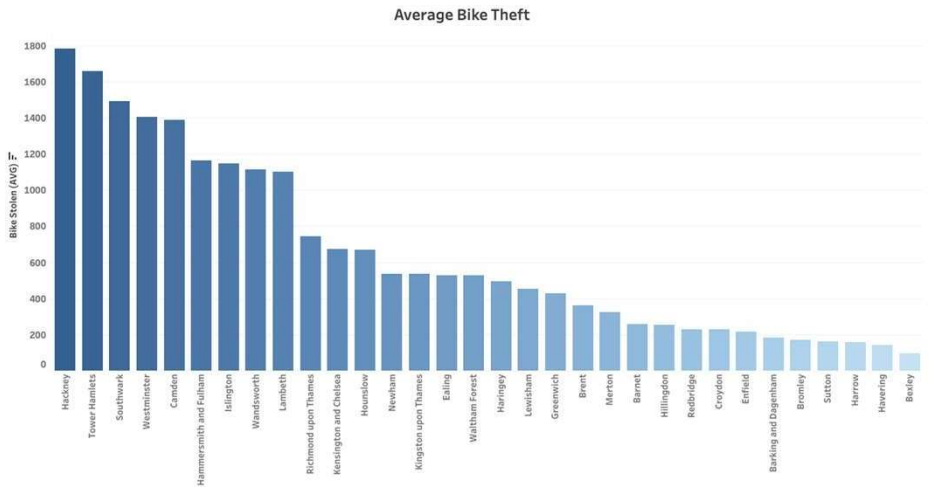


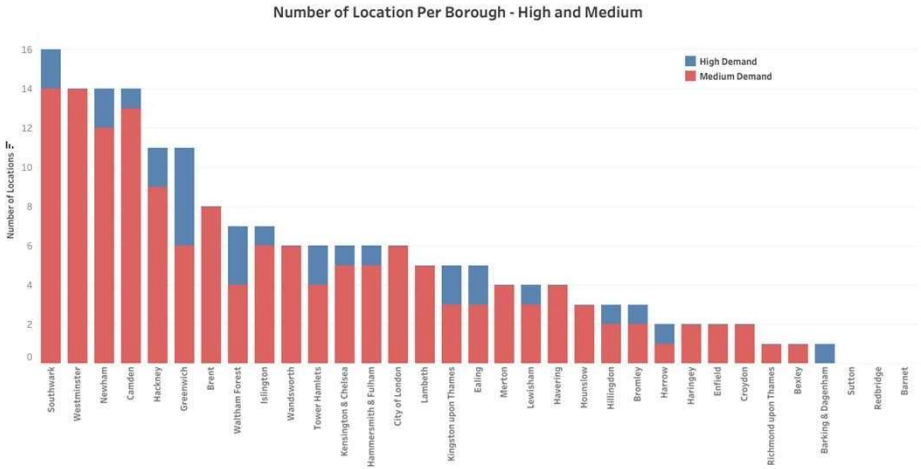


Recommendations:

- Make outer London more like Inner London
- Lower impact on single improvement
- Examples:
  - Bexley: build 10% more segregated lane and will have 10% less accident
  - Croydon: build 10% more contraflow lane and will have 5% less accident.
  - Bromley: build 10% more segregated lane and will have 6% less accident

Quality instead of Quantity: Cycle Parking





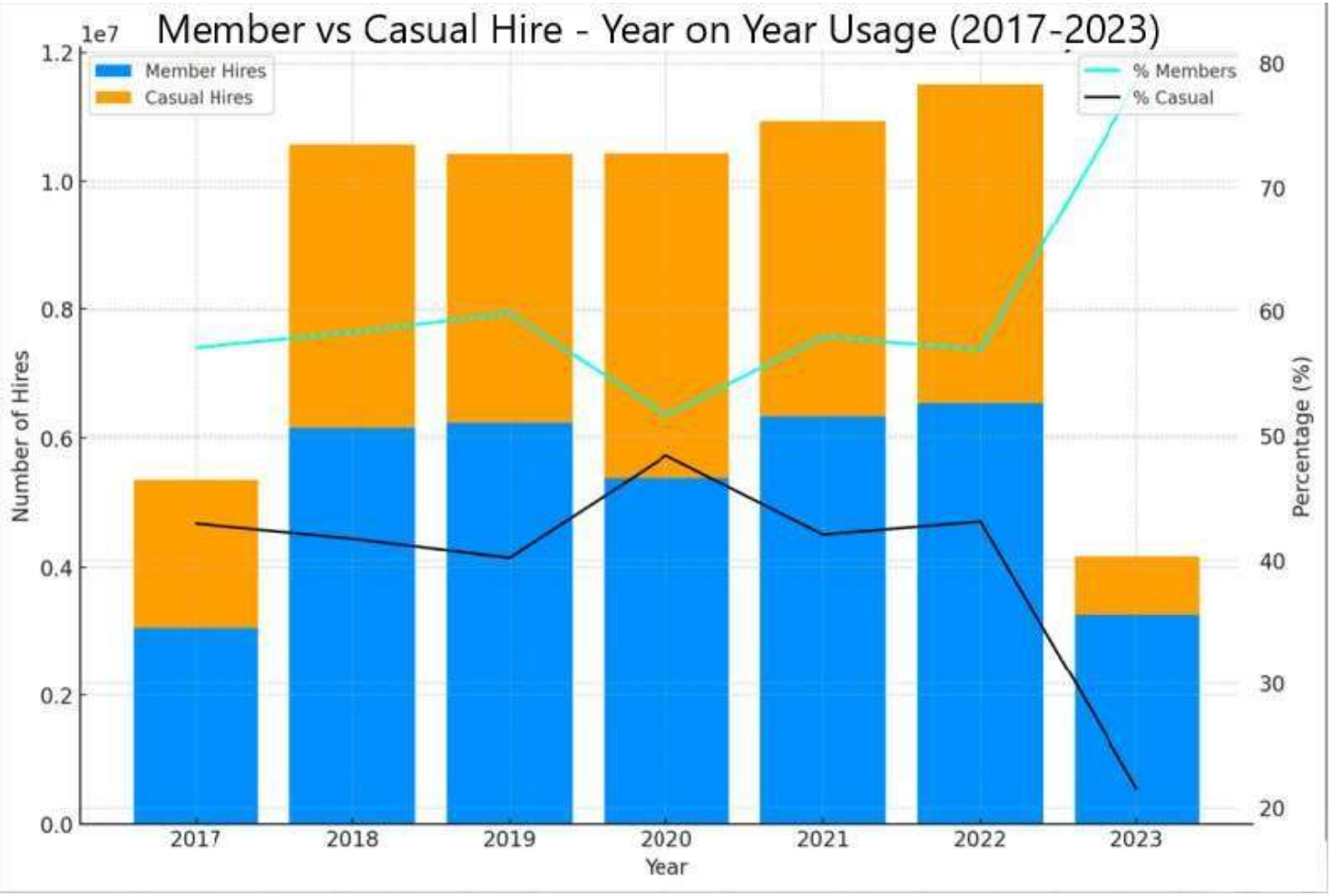
Need and Demand		
Key Take-Aways:	**Easy wins:**	**Recommendations**
1. Total Parking Spaces: 145,973 2. Total Parking Locations: 23,758 3. Percentage of insecure locations: 99%	Stage 1: Missing any secure locations 1. Enfield 2. Kensington and Chelsea	Stage 2: Quality instead of Quantity 1. Increase secure locations 2. Improve minimum standard locations based on Demand

Cycling behaviour

Cycling infrastructure

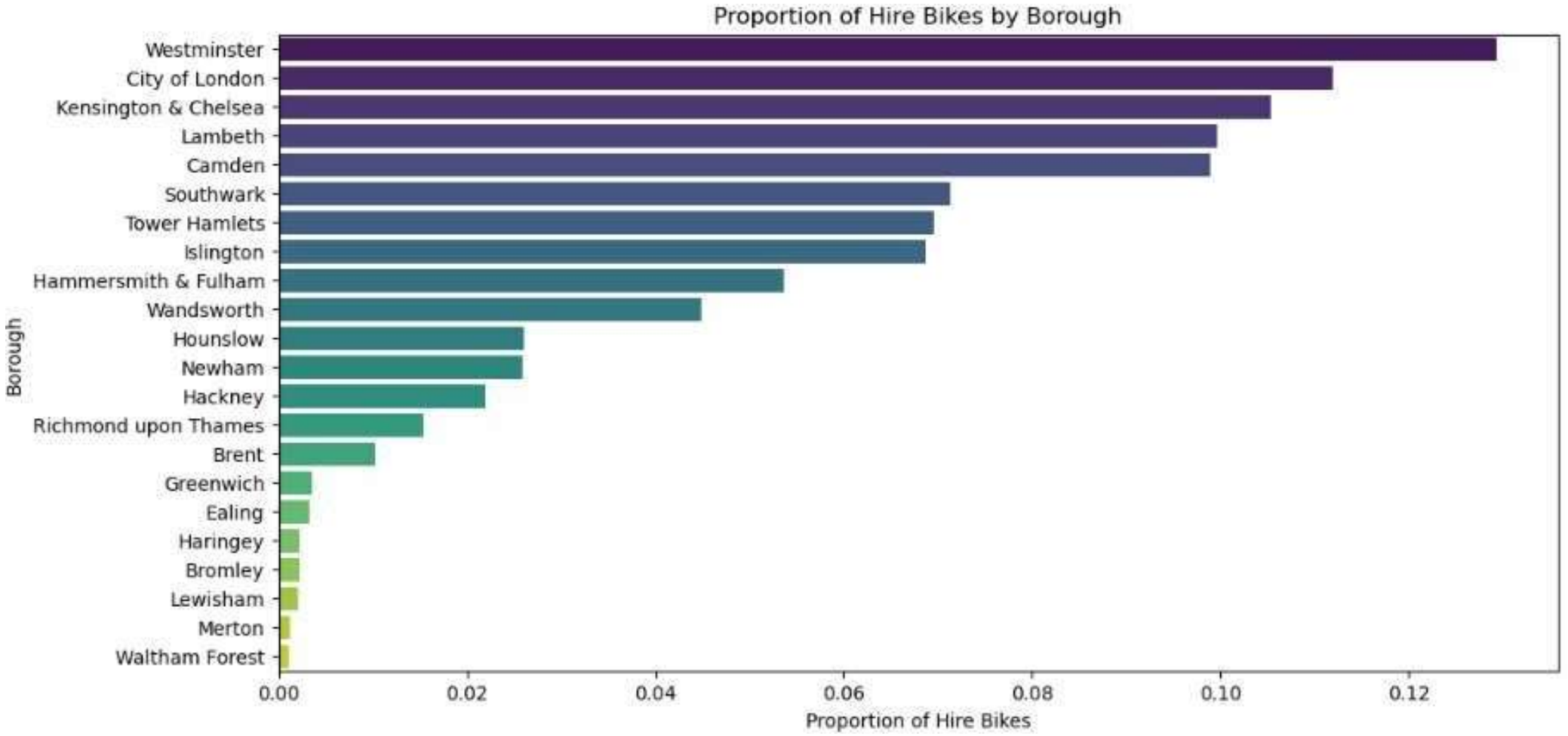
Bike sharing

Trends and Growth for a Thriving Network



- Reward Members
- Support Commuters
- Convert Casuals
- Engage Communities
- Break Down Barriers
- Stay Competitive
- Campaign for Infrastructure

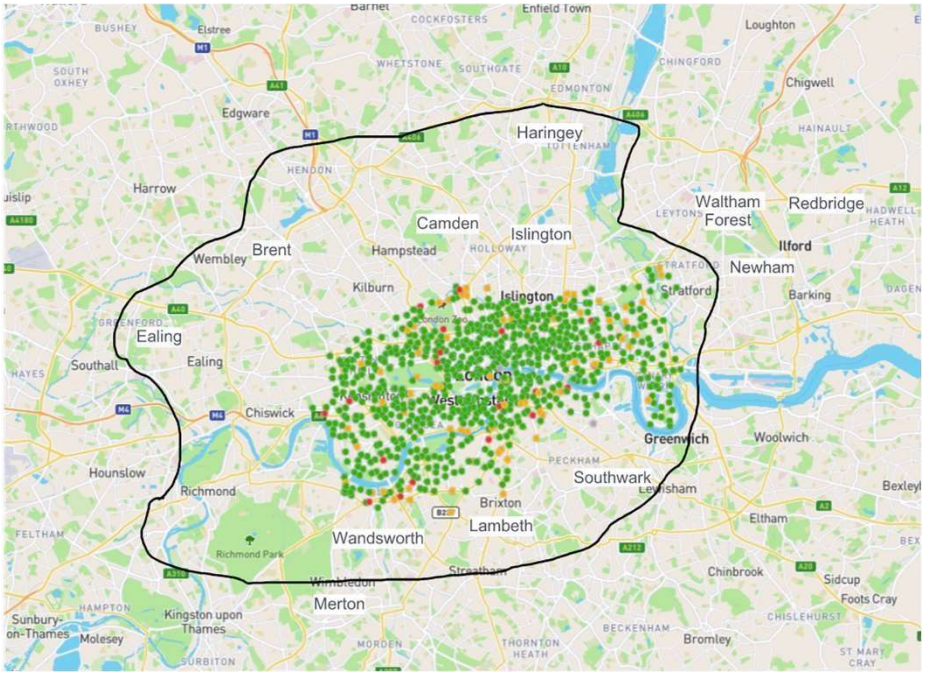
Optimising Bike Hire - Unlocking Borough Insights



Santander should expand its coverage

OPTIMAL ROUTE INITIATIVE

Santander bike coverage



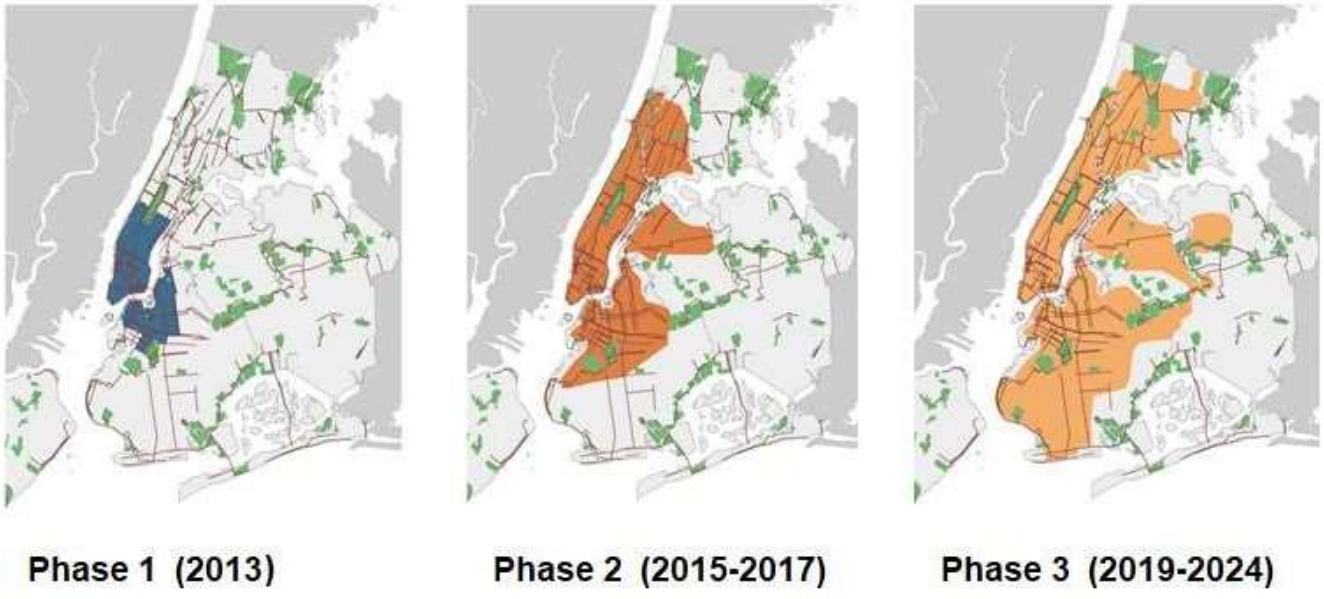
Lime bike coverage

Presence of Lime bikes

- 40% low public transport accessibility
- 50% areas of higher deprivation
- 34% of riders combining their e-bike trips with public transport.
- 97% of the population in the service area can access a Lime e-bike within a two-minute walk.

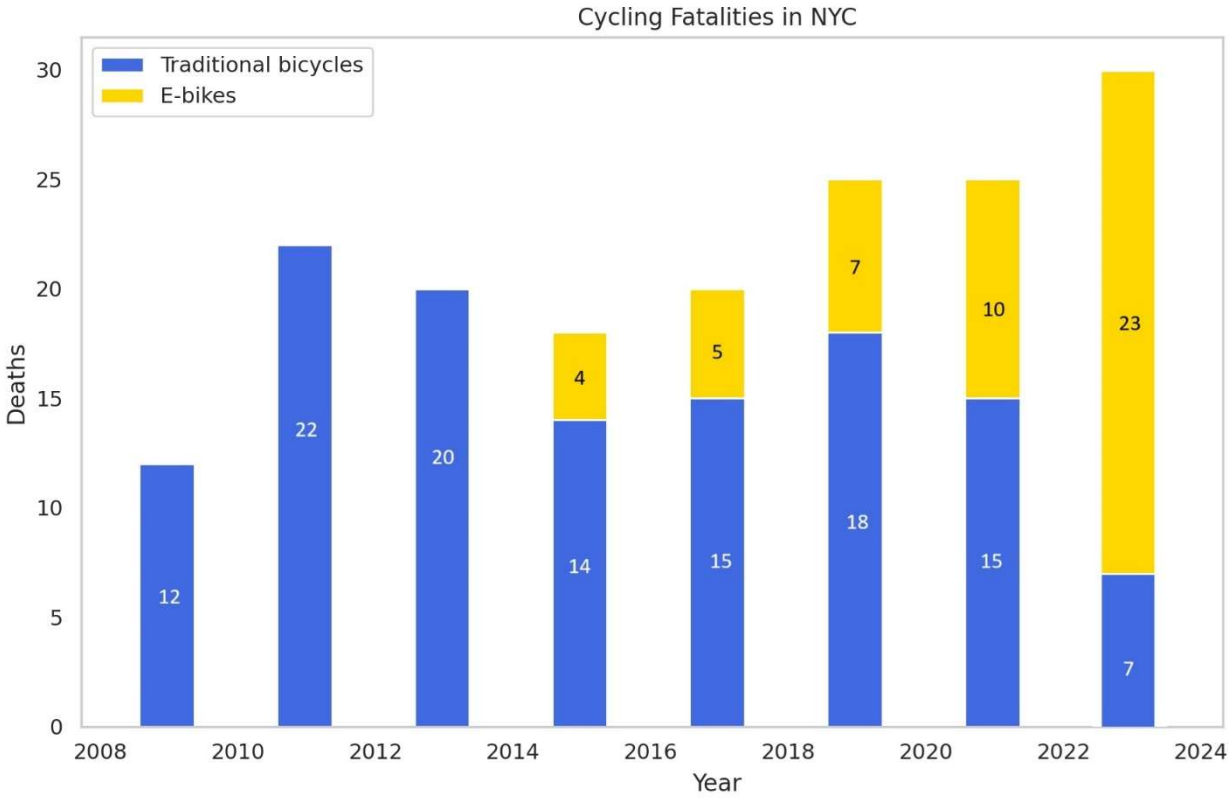
NYC itiBike Expansion

- Consistent increase in daily cycling trips (2008-2022)
- Higher percentage of male cyclists over time
- Over 1500 miles of bike lanes.
- Over 27,000 bikes.
- Enhances accessibility.
- Reduces barriers such as parking and crime.
- Integrated with public transport.



Phase 1 (2013) Phase 2 (2015-2017) Phase 3 (2019-2024)

NYC – 'Vision Zero' Safety Measures



Year	Fatalities as % of Total Cyclists	Total Cyclists	Total Fatalities
2008	0.03	36000	12
2010	0.06	40000	22
2012	0.05	42000	20
2014	0.04	45000	18
2016	0.04	48000	20
2018	0.05	52000	25
2020	0.04	59000	25
2022	0.05	66000	30

Conclusions

Exploring London's Cycling Landscape Through Clustering

Advanced Cycling Hub		
Demographics	**Infrastructure**	**Recommendations**
High incomes Considerable diversity	Extensive infrastructure Lowest traffic, low accident rate, presence of Santander	Expand contraflow lanes, Improve connectivity with neighbouring areas
Progressive Urban Hubs		
High incomes High diversity	Moderate to high traffic Significant cycling investments Strong emphasis on cyclist and pedestrian safety	Expand contraflow lanes Enhance segregated paths Expand Santander bike sharing
Emerging Cycling		
Moderate/low incomes High diversity	High traffic, some cycling infrastructure Mix accident rates No Santander bike sharing	Expand contraflow lanes Enhance segregated paths Implement Santander bike sharing

The number of cyclists /Cycle lane coverage %/ Accident rate / Traffic flow / Santander bike-sharing programme / Parking availability / Cycle street infrastructure attributes

Exploring London's Cycling Landscape Through Clustering

Suburban Cycling		
Demographics	**Infrastructure**	**Recommendations**
Moderate incomes Older adults Predominantly white	Cycling infrastructure less developed No Santander bike sharing High traffic/accidents	Upgrade to segregated lanes Secure parking Family-friendly cycling

Developing Cycling		
Lower incomes Young population High Asian community	Higher accident rates Moderate cycle lanes No Santander bike sharing Lower parking availability	Extend bike lanes, Implement 20mph zones Secure parking

The number of cyclists /Cycle lane coverage %/ Accident rate / Traffic flow / Santander bike-sharing programme / Parking availability / Cycle street infrastructure attributes

Conclusions

- Demographics:
  - Incentivize woman and ethics minorities to cycle
  - Income-based discounts for cycle hire schemes and bike acquisition.
- Infrastructure
  - Inner London: Expand the network of contraflow lanes and to enhance connectivity within neighbouring areas.
  - Outer London: Develop radial routes that connect Outer London boroughs to Inner London, implement low limit zones, implement secure parking
- Santander bike sharing expansion

Q&A

Appendix

Recommendations

- ✓ Implement targeted safety improvements such as traffic calming measures, better signage, more visible bike lanes, and education programs to reduce accident rates and enhance cyclist safety.
- ✓ Launch campaigns to educate both cyclists on road safety, cycling etiquette, and sharing the road responsibly. This could include workshops, public service announcements, and school programmes.
- ✓ Regularly assess the effectiveness of cycle lanes and related infrastructure by analysing user feedback.
- ✓ Consider offering income-based discounts for cycle hire schemes and bike acquisition.
- ✓ Implement systems to monitor the usage of bike lanes and cycling facilities, using sensors or manual counts to gather data on cyclist numbers and patterns.
- ✓ Expand secure parking facilities to accommodate high usage at key locations such as train stations, shopping centres, and business districts. Develop secure bike storage solutions for residential areas.

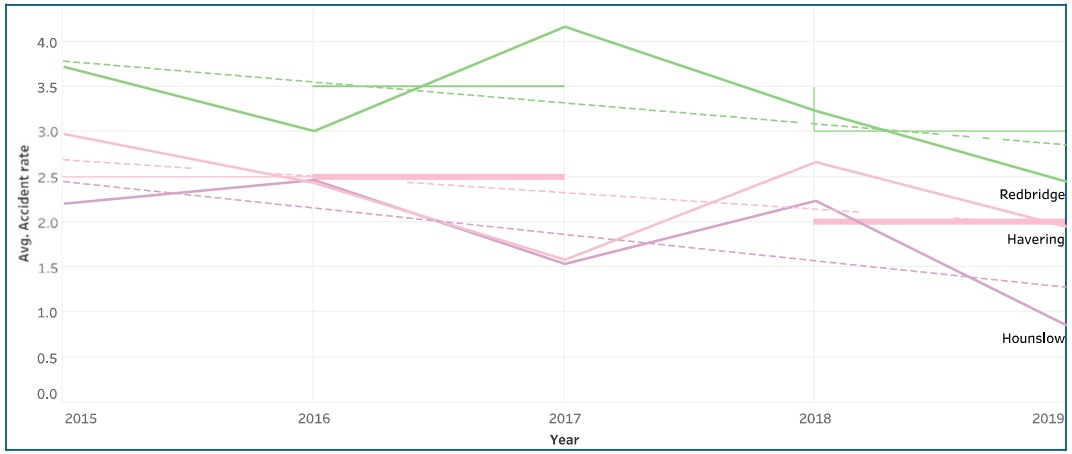
Appendix - Further analysis

1. Evaluate progress have been made since the introduction of the Mayor's of London Transport strategy.
2. Evaluate the increase in population within boroughs with poor cycling infrastructure and provide justification for the recommendations. Create the prediction model of the number of cyclists according to growing population.
3. Evaluate the significant infrastructure developments in New York and Sydney and their impact on cyclist numbers, exploring potential applications to London.
4. Bike sharing -?
5. Analyse the occupancy rates of parking locations relative to public transport stations.
6. Investigate how bike theft impacts cycling demand and propose strategies to mitigate this effect.

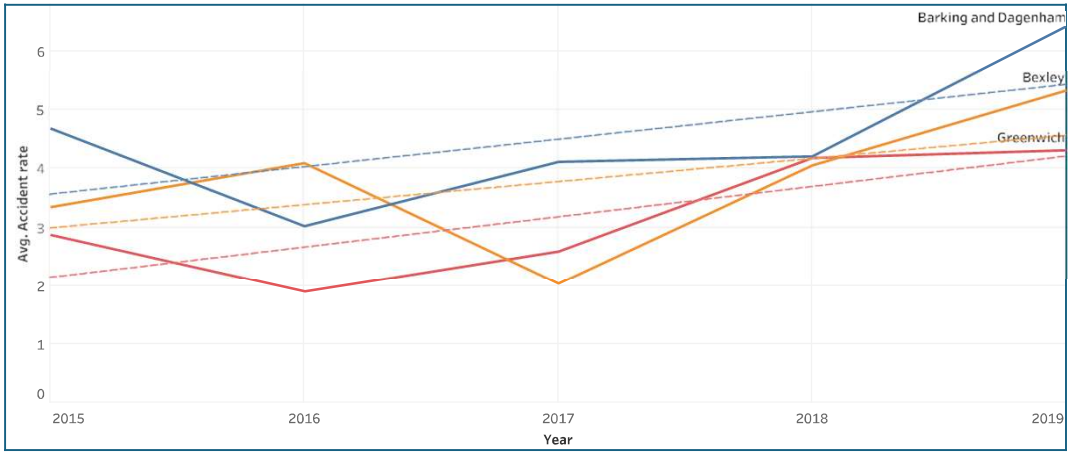
The Double-Edged Sword of London's Cycling Revolution

OPTIMAL ROUTE INITIATIVE

Accidents rates decreasing over time (trend)

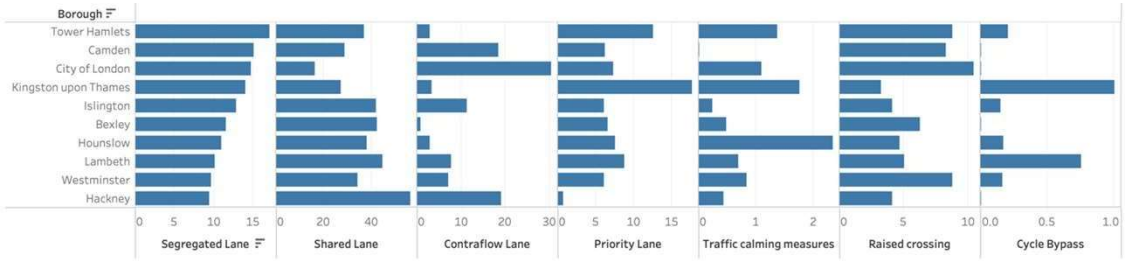


Accidents rates increasing over time (trend)

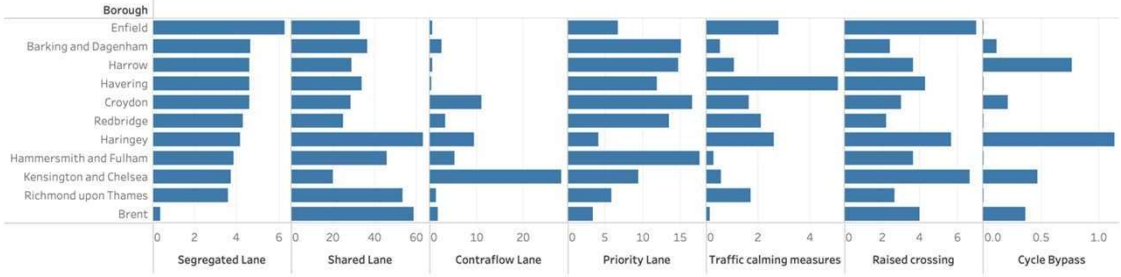


Appendix - Cycling infrastructure

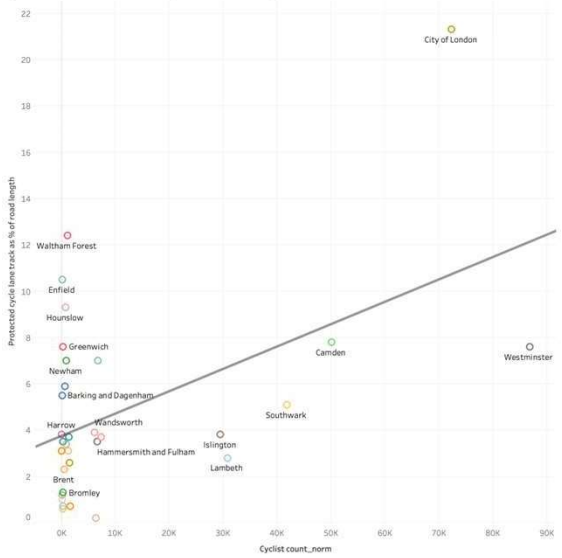
Boroughs Most developed cycling infrastructure
The number of cycle lanes with a specific attribute, %



Boroughs Least developed cycling infrastructure
The number of cycle lanes with a specific attribute, %



Cyclist count VS Protected cycle lane coverage

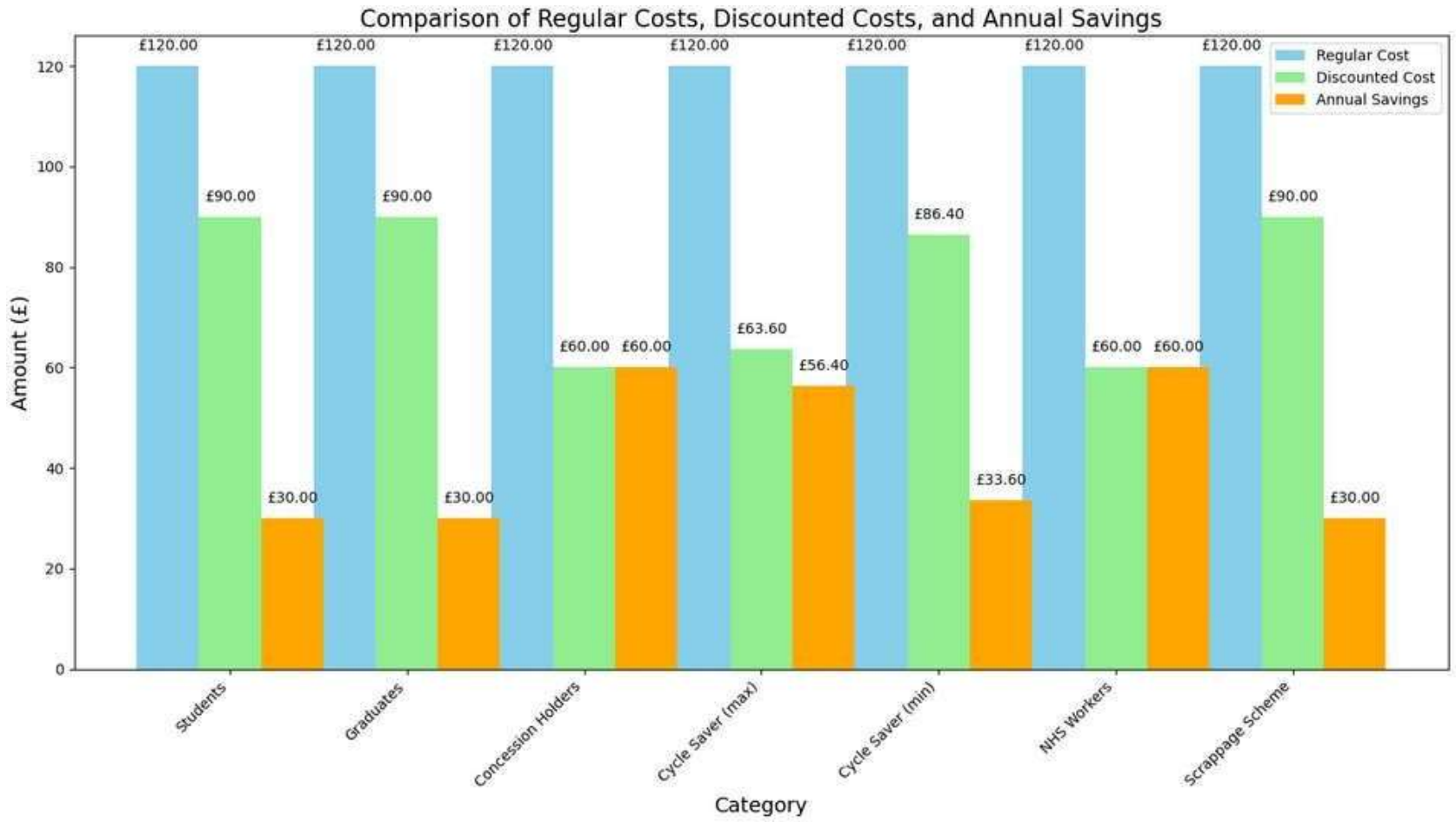


A positive correlation between the percentage of segregated lanes and the number of cyclists. Boroughs with a higher percentage of segregated lanes tend to have more cyclists.

Cluster	Demographics	Infrastructure	Recommendations	Boroughs
Advanced Cycling Hub	High incomes, Young adults (20-39) Considerable diversity	Extensive infrastructure Lowest traffic	Expand contraflow lanes, Improve Outer-Inner connectivity	Camden, City of London, Hackney, Islington, Kensington and Chelsea, Southwark, Tower Hamlets, Westminster
Emerging Cycling	Moderate to low incomes, Young adults High diversity	High traffic Mix accident rates Presence of priority/contraflow lanes No Santander bike sharing	Expand contraflow lanes Enhance segregated paths	Brent, Haringey, Harrow, Kingston upon Thames, Lewisham, Merton, Sutton, Waltham Forest
Progressive Urban Mobility Hubs	High incomes Young adults (20-39) High diversity	Moderate to high traffic Significant cycling investments Strong emphasis on cyclist and pedestrian safety	Enhance connectivity **Traffic calming measures:** Integrate additional speed cushions and other effective traffic calming measures to maintain the current low accident rates while accommodating increasing cyclist numbers.	Hammersmith and Fulham Lambeth Wandsworth
Suburban Cycling	Moderate incomes Older adults predominantly white	Cycling infrastructure less developed No Santander bike sharing High traffic/accidents	Upgrade to segregated lanes Secure parking Family-friendly cycling	Barnet Bromley, Hillingdon
Developing Cycling	Lower incomes Young population, High Asian community	Higher accident rates Moderate cycle lanes No Santander bike sharing Lower parking availability	Extend bike lanes, Implement 20mph zones Secure parking	Barking and Dagenham, Bexley, Croydon, Ealing, Enfield, Greenwich, Havering, Hounslow, Newham, Redbridge, Richmond upon Thames

Save more on your commute!

OPTIMAL ROUTE INITIATIVE

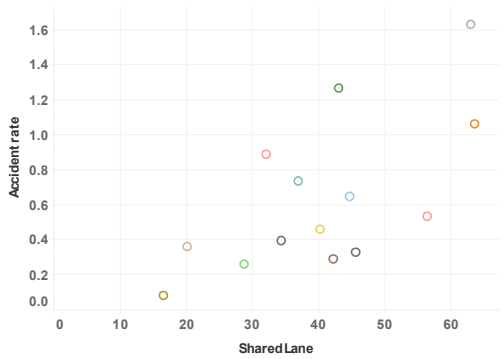


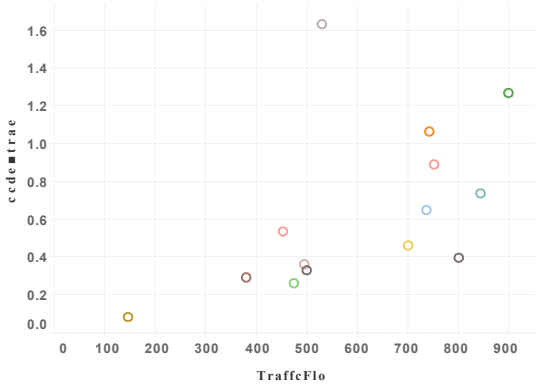
Bike Accidents are a multifactorial issue and London Areas behave very different

OPTIMAL ROUTE INITIATIVE

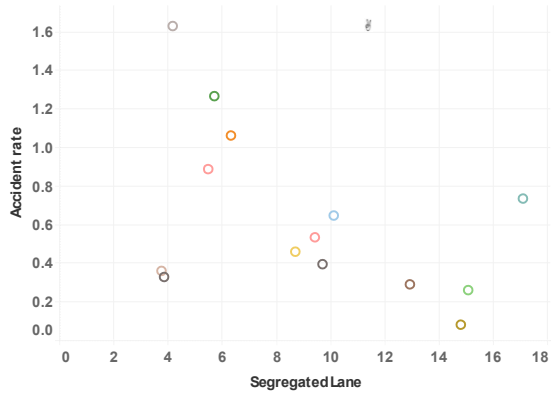
Inner London

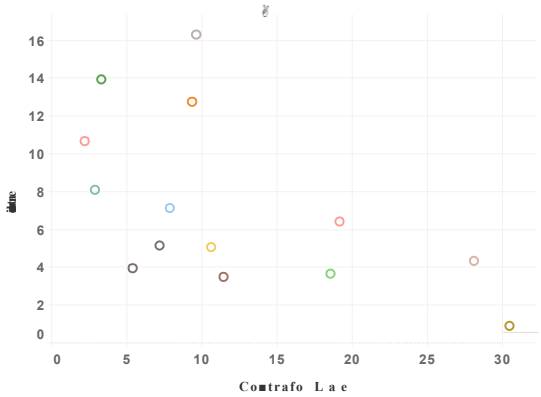
Positive correlation



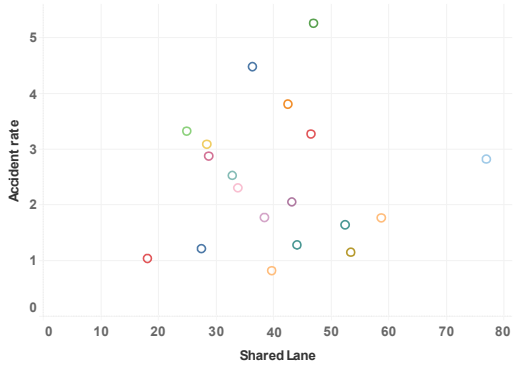


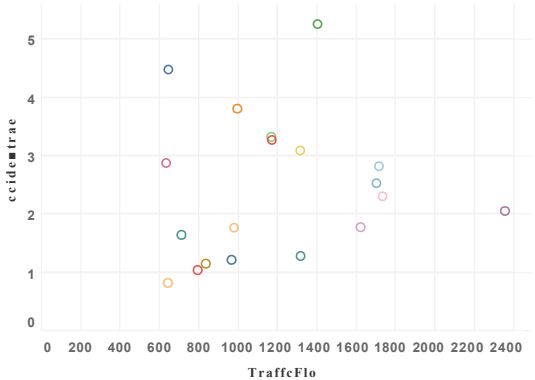
Negative correlation

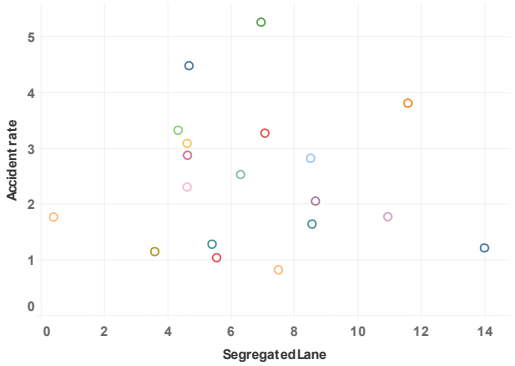


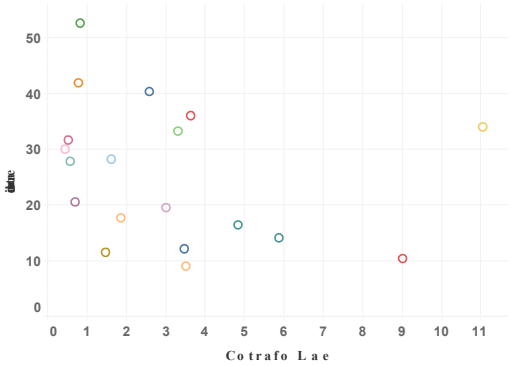


Outer London



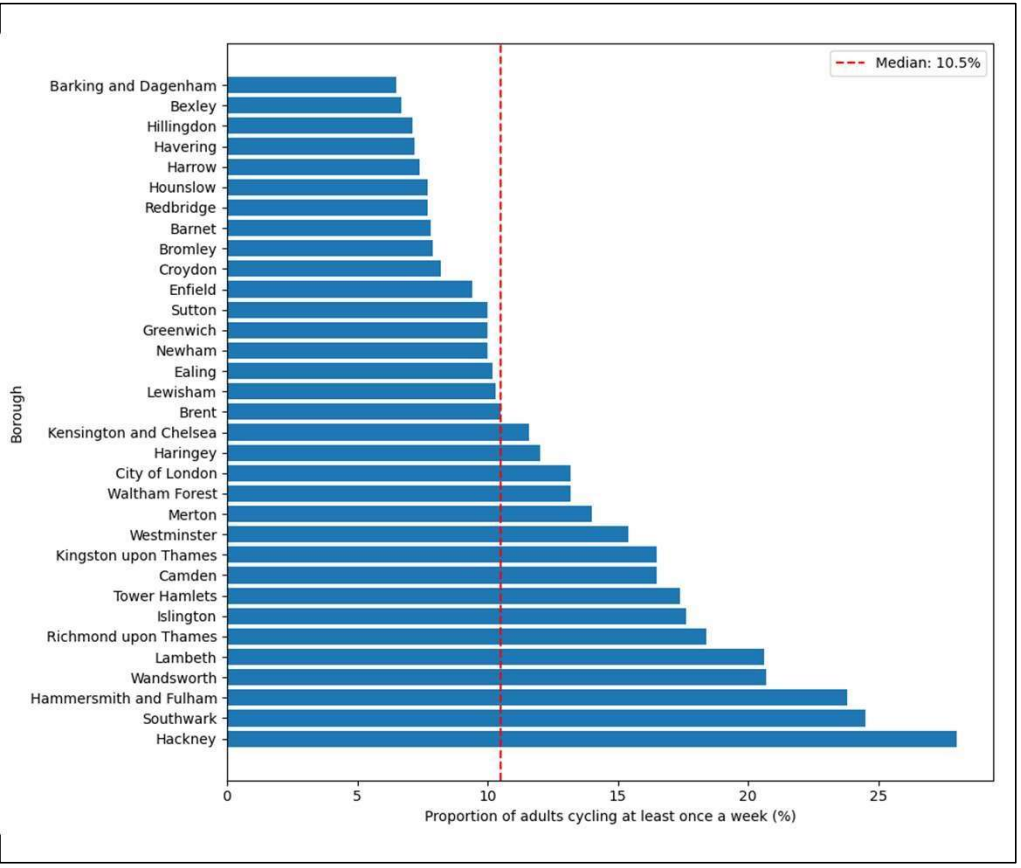




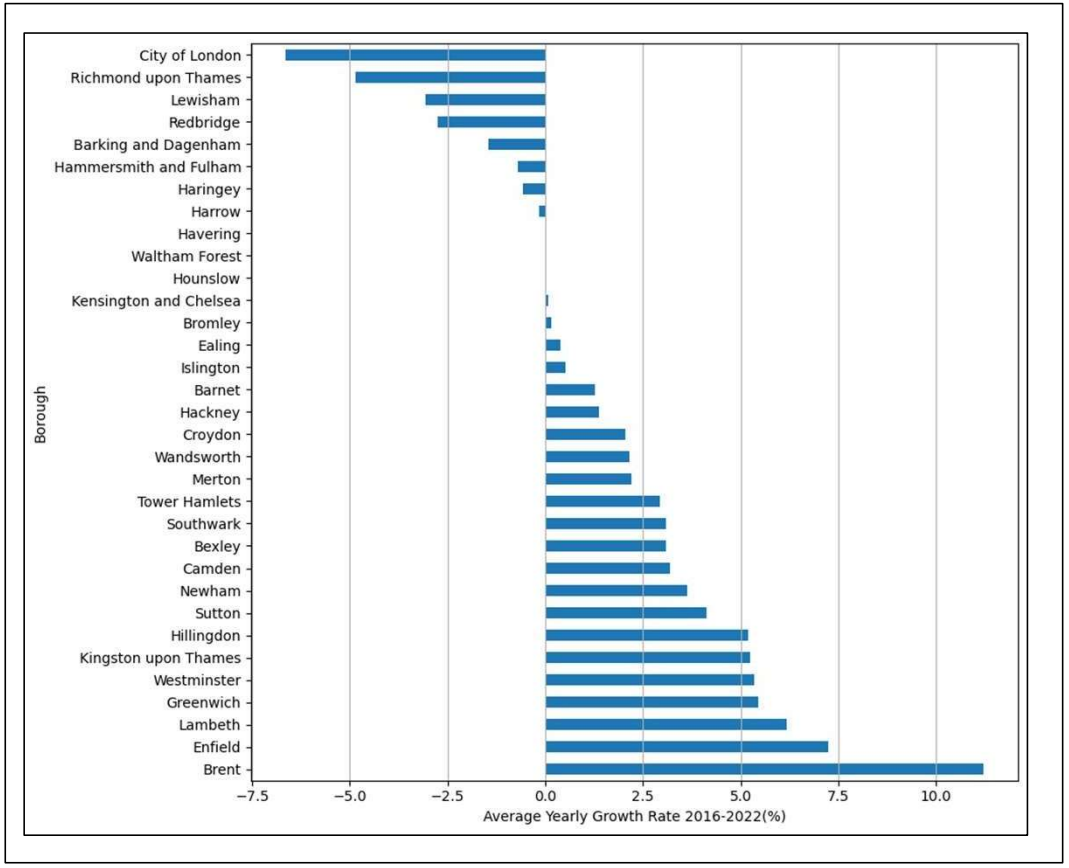


Cycling uptake: London boroughs 2016-2022

2022 – Cycling participation at least once a week



Average yearly growth rate in cycling participation 2016-2022



https://assets.publishing.service.gov.uk/media/64ee10386bc96d000d4ed24f/cw0302-proportion-of-adults-that-cycle-by-frequency-purpose-and-local-authority.ods

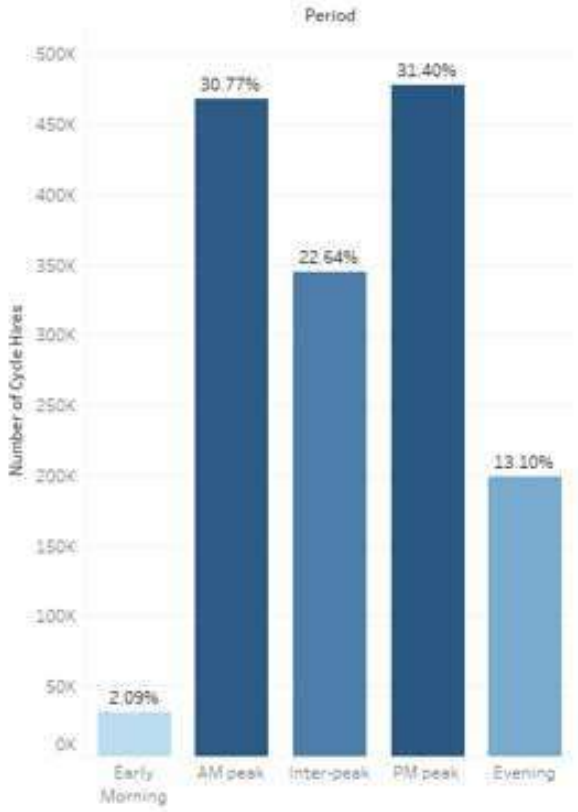
Powering London's Commute

OPTIMAL ROUTE INITIATIVE

Central London Cycle Hire Trend Analysis (2015-2021)

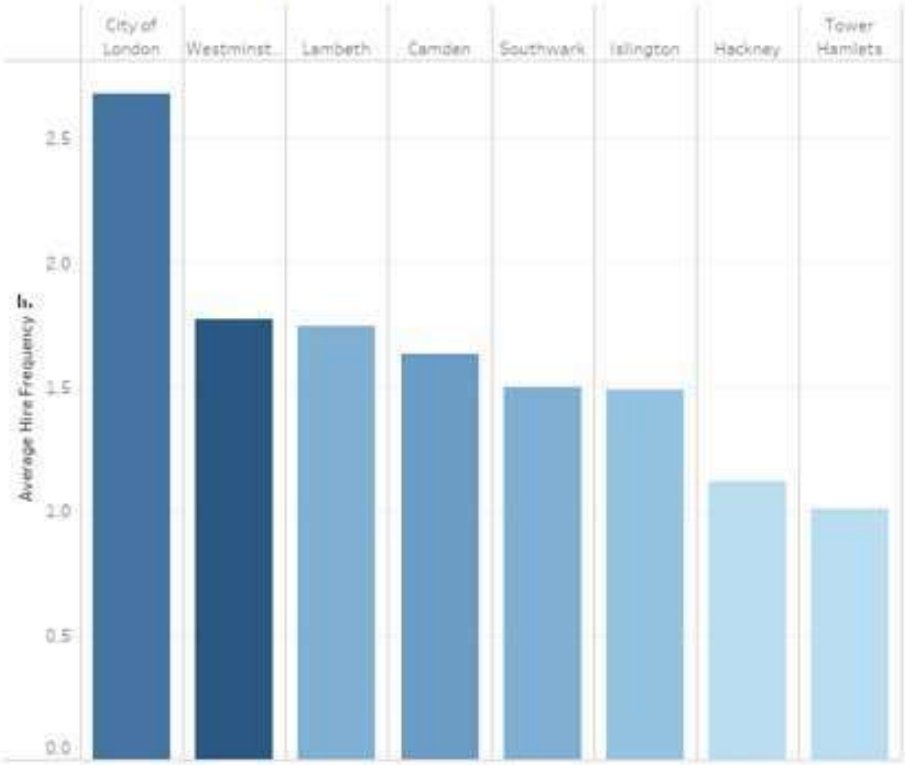
Cycle Hire % by Period

Coherence with general peak periods indicates Hire to Commute



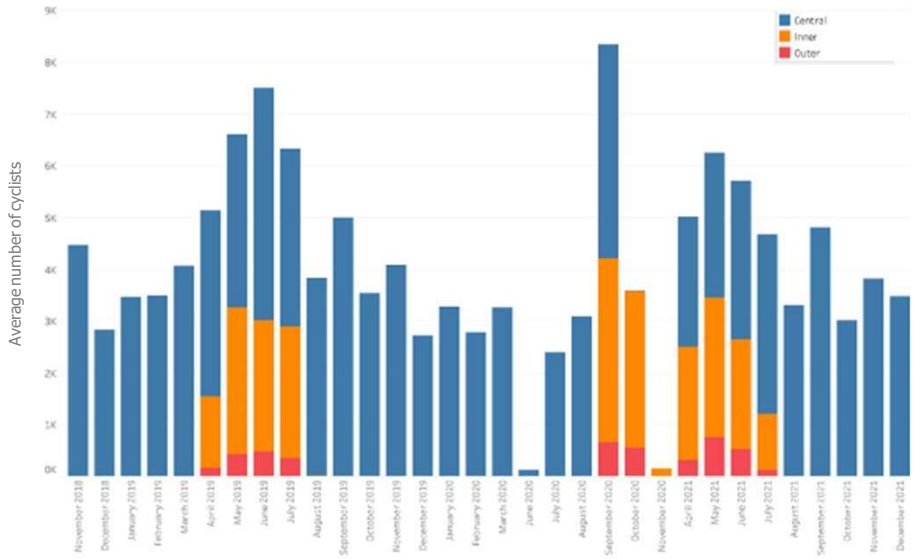
Average Cycle Hires by Borough

Colour represents the total number of Cycle Hires for comparison



Understanding Data Gaps

Average number of cyclists
Central/Inner/Outer London



- There is no accurate data of the number of cyclists for Inner/Outer London, as it was collected during spring / summer months only
- There is no full data for 2020-2021 as the data collection was affected by COVID-19