

London School of Economics

Data Analytics Accelerator Programme – Summer Cohort CO3

Course: CO4 LSE Employer Project
Assignment: Low-fi recommendation pitch
Prepared by: Team A
Prepared for: Thoughtworks
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Meeting brief

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Context

Transport for London (TfL) is a local government body responsible for most of the transport network in London and guided by the Mayor's Transport Strategy 2018 (MTS).

The central aim of MTS is for 80% of all trips in London to be made on foot, by cycle or using public transport by 2041.

Business Questions

What are the main factors which influence cycling uptake?

How can improving these factors help contribute to achieving the goal of 80% of all trips in London to be made on foot, by cycle or using public transport by 2041?

Key Points of Presentation

- Cycling trends have changed post Covid-19
- No significant connection between earnings and cycling rates
- Infrastructure is important and needs improving in Outer London
- Infrastructure investment can increase Female cycling

Socio-economic factors are expected to contribute to cycling uptake

- Is cycling uptake higher in areas of London where the average income is higher?
- Is cycling higher where the Education level is higher?

Cycling uptake will vary between different **demographics**

- How does cycling uptake change amongst different demographics?
- Is there a difference in uptake between male and female?

Cycling **Infrastructure** will play a role in cycling appetite

- How does infrastructure affect uptake in cycling?
- Does improving infrastructure increase the cycling rate?
- How safe is cycling in London?

Weather

- How does the weather affect cycling uptake?
- Does an increase in temperature mean an increase in cycling?
- What do seasonal changes affect cycling uptake?
- Could availability / price of PAYG change during high seasons?

Edge hypothesis

- Has the introduction of electric bikes increased cycling uptake?
- How has WFH affected cycling uptake?
- How can government initiatives (Cycle to Work) help increase cycling uptake?

How we approached the analysis

1. Looking at the descriptive statistics
2. Understanding patterns and trends within the datasets provided
3. Analysed external data to provide insights and context to patterns and trends
4. Testing our hypothesis to provide recommendations

What were the key data considerations

1. Date range spans 2014-2021
2. In some instances, for the aim of the research data 2020 onwards was excluded due to effects of COVID pandemic
3. Information presented for three main areas: Central, Inner and Outer London
4. Additional resources used includes TFL, ONS, GOV.UK

Initial Findings

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General Cycling Trends

Hire vs Private Cycles

Dynamics between Boroughs

Cycling Times and Dates

Cycling Accidents

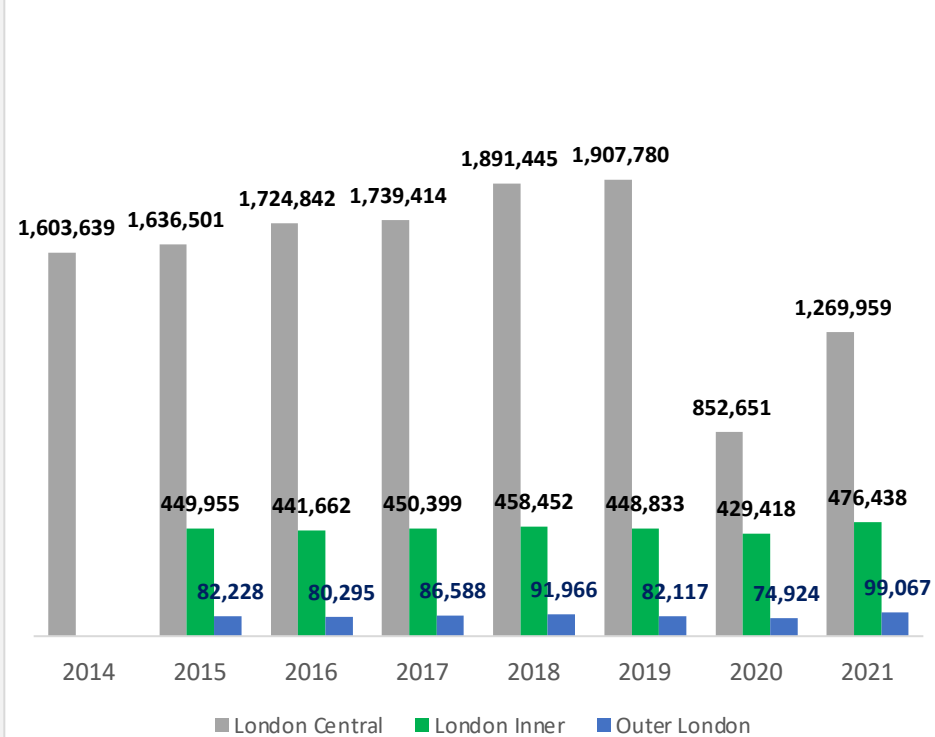
Cycling Infrastructure

Initial Findings on Cycling Trends

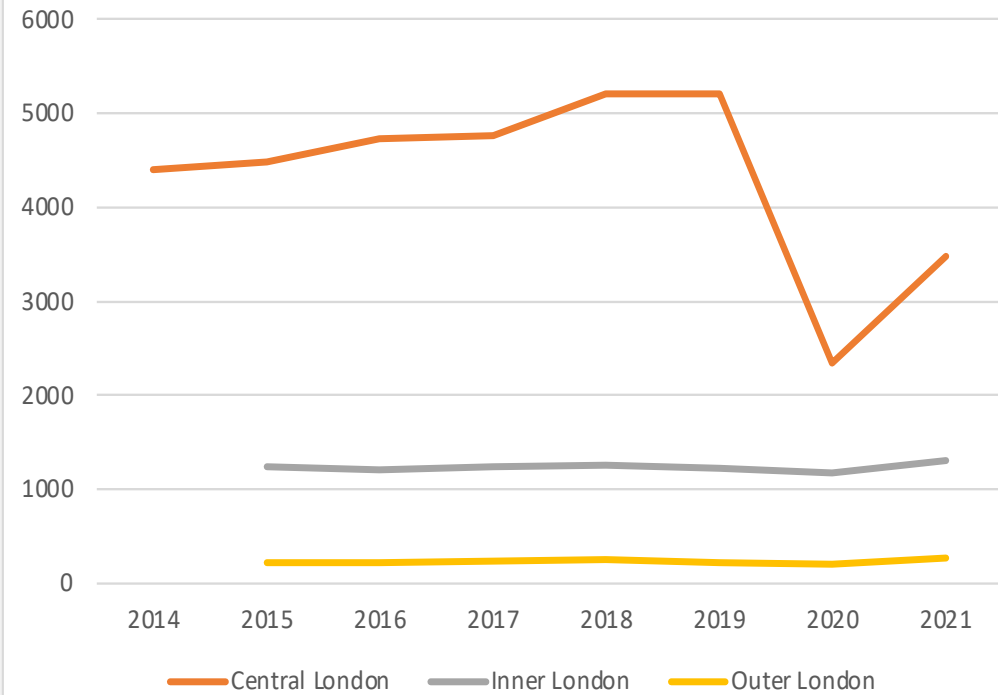
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Cycling Trends in London

TOTAL CYCLES



Daily Average for Total Cycles



Initial Findings on Hire vs Private Cycles

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Hired Cycles in Central London

Quarterly Number of Hire Cycles for Top Ten Locations in Central London



Private Cycles in Central London

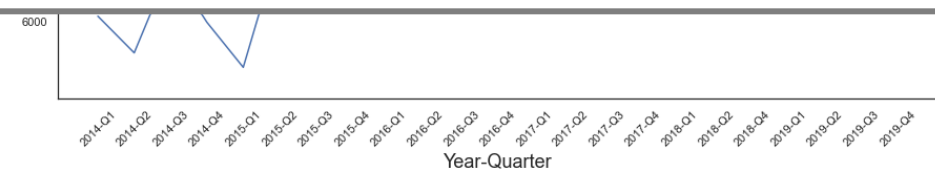
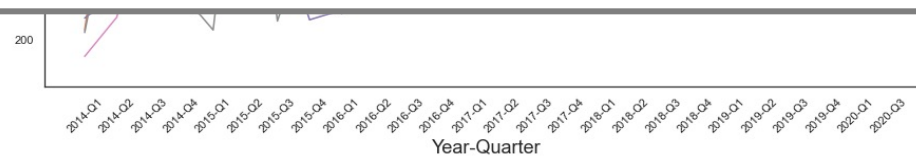
Quarterly Number of Private Cycles for Blackfriars Bridge



Private vs Hired Cycles in London

| Year | Number of private cycles | Number of cycle hire bikes | Total_cycles | % private change | % hire change |
|------|--------------------------|----------------------------|--------------|------------------|---------------|
| 2014 | 1436361 | 166636 | 1602997.0 | NaN | NaN |
| 2019 | 1687339 | 214662 | 1902001.0 | 0.175 | 0.288 |

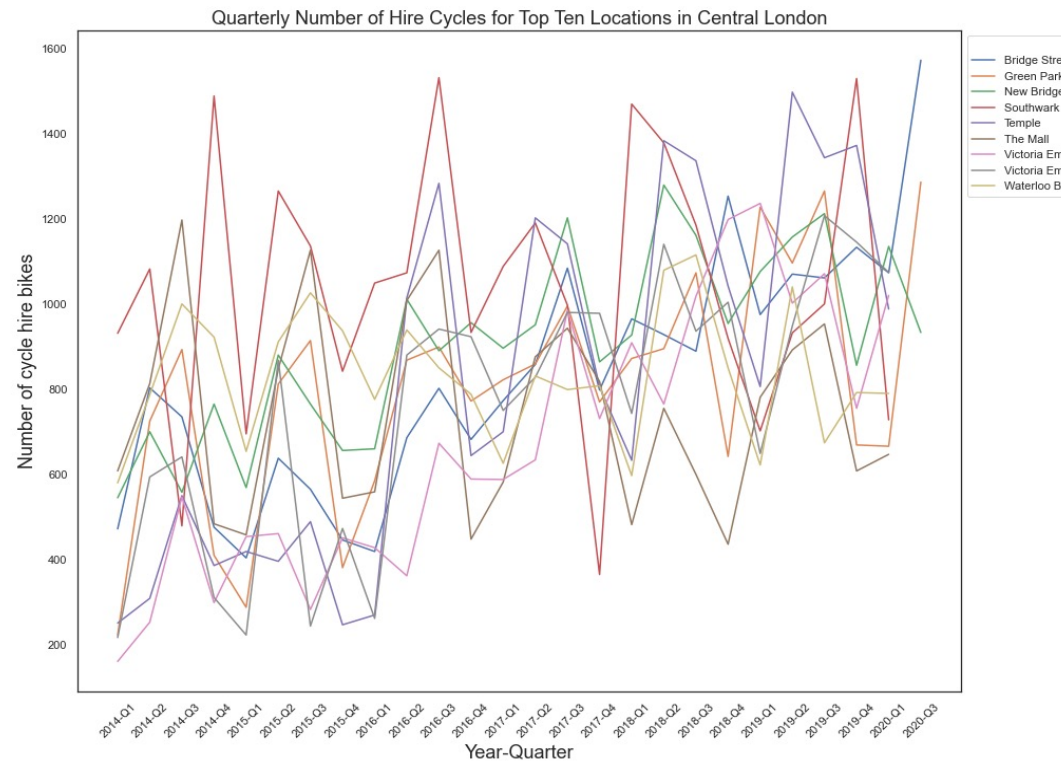
Pre Covid-19 both private and hire cycles experienced a positive growth
Hire cycles particularly experienced a health increase
Blackfriars Bridge and cycle highways



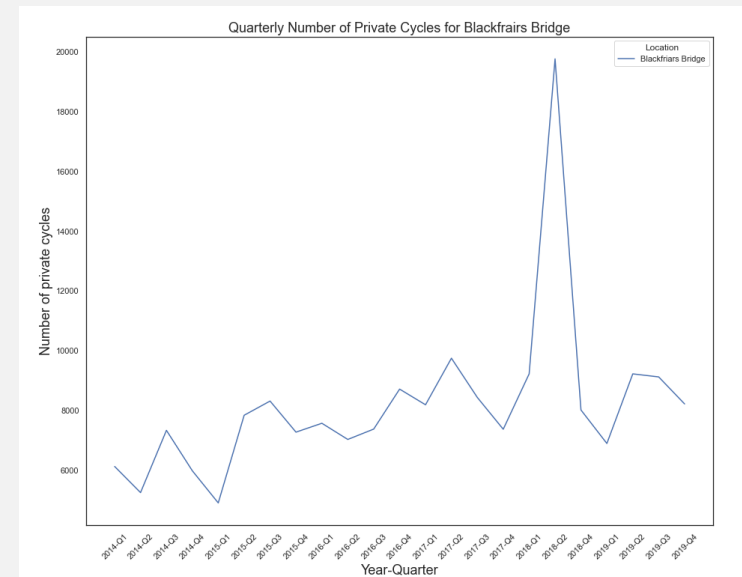
Initial Findings on Hire vs Private Cycles

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Hired Cycles in Central London



Private Cycles in Central London



<https://www.london-se1.co.uk/news/view/8851>

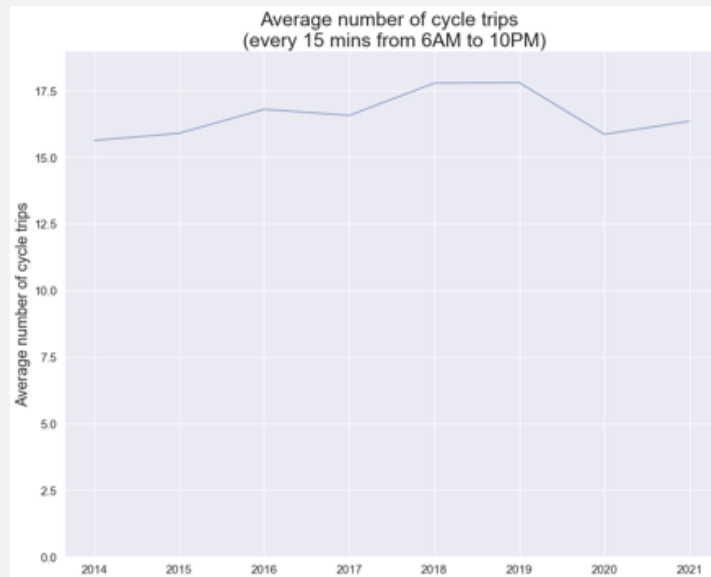
[london.gov.uk/press-releases/mayoral/](https://www.london.gov.uk/press-releases/mayoral/)

Initial Findings on Time and Dates

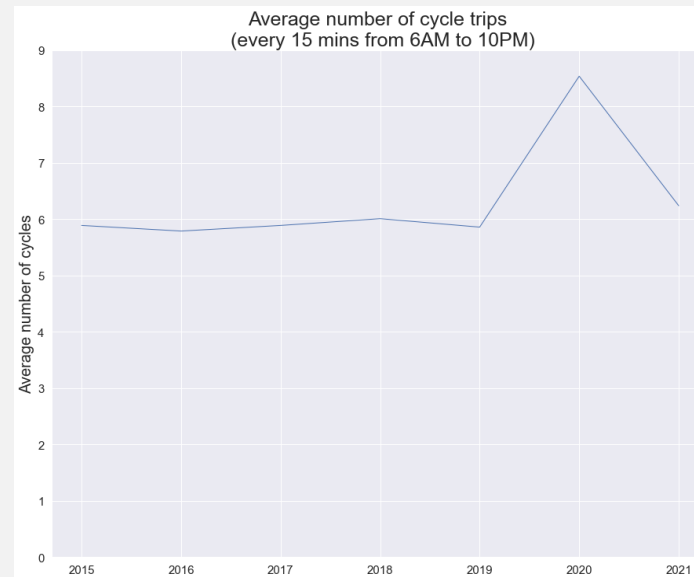
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Average Number of Cycles (Central, Inner and Outer London)

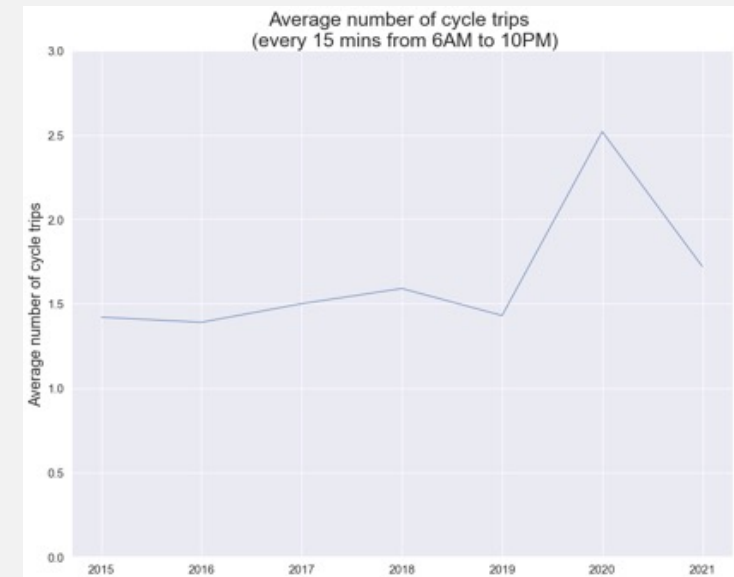
Central



Inner



Outer

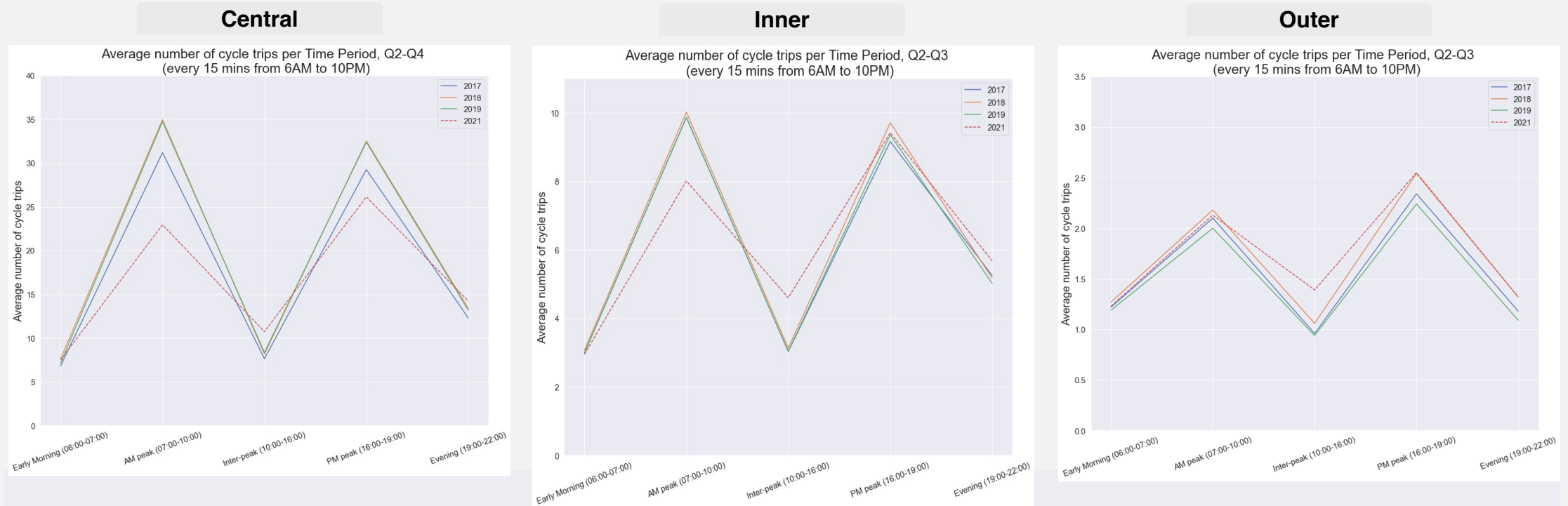


1. During the pandemic years of 2020 and 2021, cycling in London underwent lots of changes with substantial shifts in the purpose, locations and timing of cycle trips.
2. Here we can see that in Inner and Outer London follow different trend, increasing number of trips during the pandemic. It can be explained by people working from home during lockdowns.

Initial Findings on Time and Dates

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Average Number of Cycle Trips (every 15 minutes from 6AM to 10PM) for Central, Inner and Outer London



Peak times for travel are the same 7-10 AM and 4-7pm. However, pandemic changes this pattern as well and in 2021 we can see decrease in morning and evening peak times, due to hybrid working, and increase of inter-peak and evening trips, what can be explained by more leisure cycling.

Earnings & Cycling

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Relationship of Earnings to Cycling

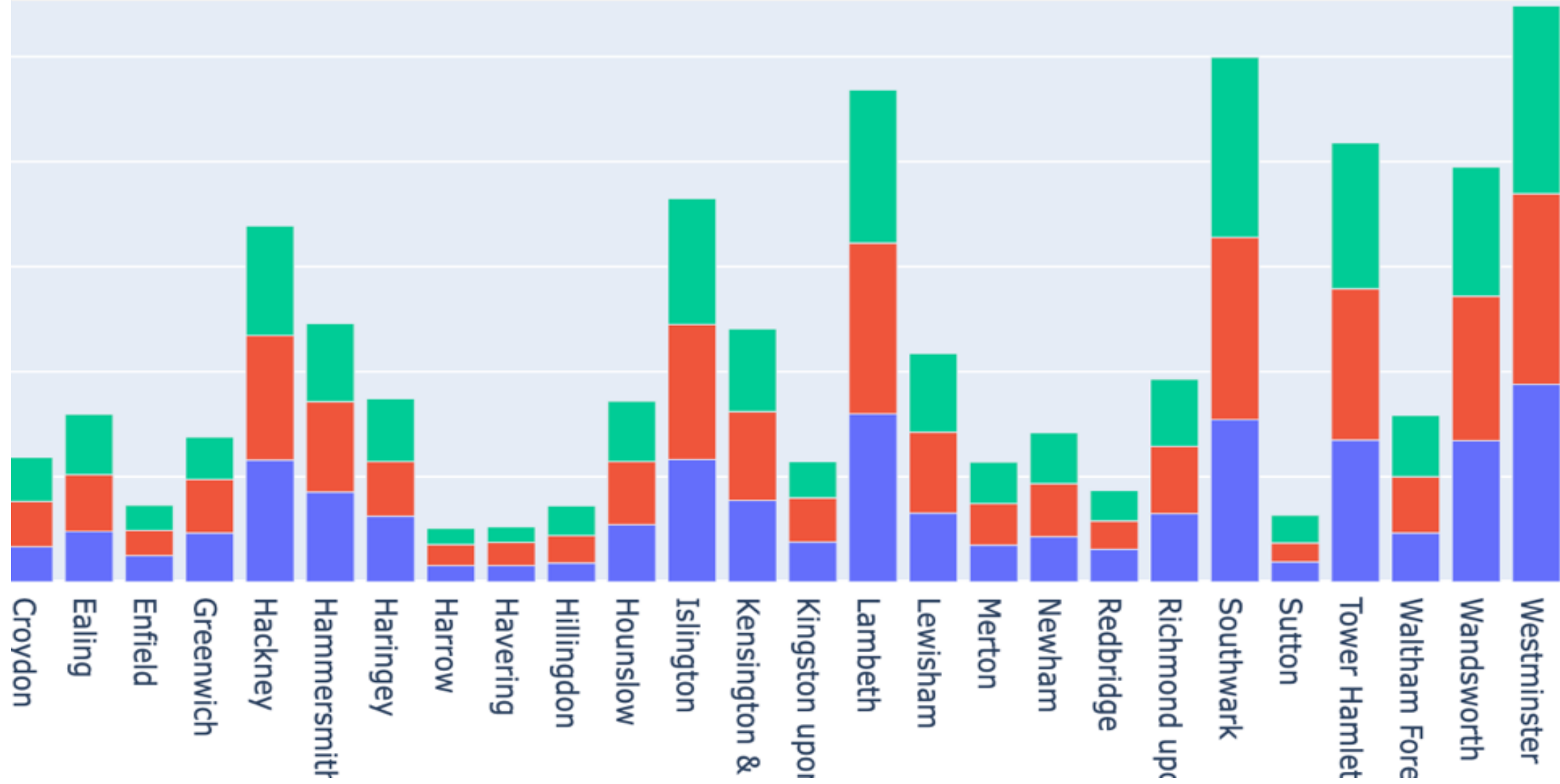
| Borough | % Change in private cycles | % Change in hire cycles | % Change Total Cycles | 14_19% |
|-----------|----------------------------|-------------------------|-----------------------|--------|
| Camden | 0.10 | 0.08 | 0.10 | 0.08 |
| Hackney | 1.13 | 0.44 | 1.04 | 0.12 |
| Islington | 0.10 | 0.08 | 0.10 | 0.14 |
| Lambeth | -0.06 | 0.20 | -0.04 | 0.16 |
| Southwark | 0.38 | 0.48 | 0.39 | 0.19 |

Outer Earnings to Cycling

| Borough | Number of male cycles | Number of female cycles | Total cycles | 2021 Pay (£) |
|----------------------|-----------------------|-------------------------|--------------|--------------|
| Wandsworth | 79 | 14 | 93 | 842.9 |
| Richmond upon Thames | 9303 | 2549 | 11873 | 812.5 |
| Bromley | 3087 | 351 | 3439 | 787.1 |
| Kingston upon Thames | 5082 | 809 | 5922 | 766.6 |
| Harrow | 651 | 209 | 875 | 748.6 |
| Lambeth | 237 | 26 | 263 | 746.4 |
| Greenwich | 3316 | 542 | 3888 | 740.0 |
| Redbridge | 2532 | 342 | 2876 | 732.4 |
| Waltham Forest | 4199 | 1360 | 5562 | 727.7 |
| Lewisham | 4420 | 622 | 5053 | 721.4 |
| Bexley | 979 | 59 | 1038 | 709.4 |
| Croydon | 2701 | 282 | 3002 | 707.8 |
| Havering | 1168 | 162 | 1345 | 705.4 |
| Haringey | 4693 | 930 | 5624 | 703.1 |
| Hillingdon | 3448 | 616 | 4089 | 697.5 |
| Sutton | 2597 | 359 | 2970 | 695.8 |
| Barnet | 2930 | 854 | 3787 | 685.2 |
| Merton | 4890 | 680 | 5604 | 681.7 |
| Newham | 7211 | 1056 | 8273 | 677.6 |
| Hounslow | 5796 | 1353 | 7151 | 675.2 |
| Ealing | 6401 | 2028 | 8462 | 670.7 |
| Enfield | 1296 | 339 | 1636 | 670.4 |
| Barking & Dagenham | 1269 | 168 | 1437 | 643.4 |
| Brent | 3929 | 860 | 4805 | 623.8 |

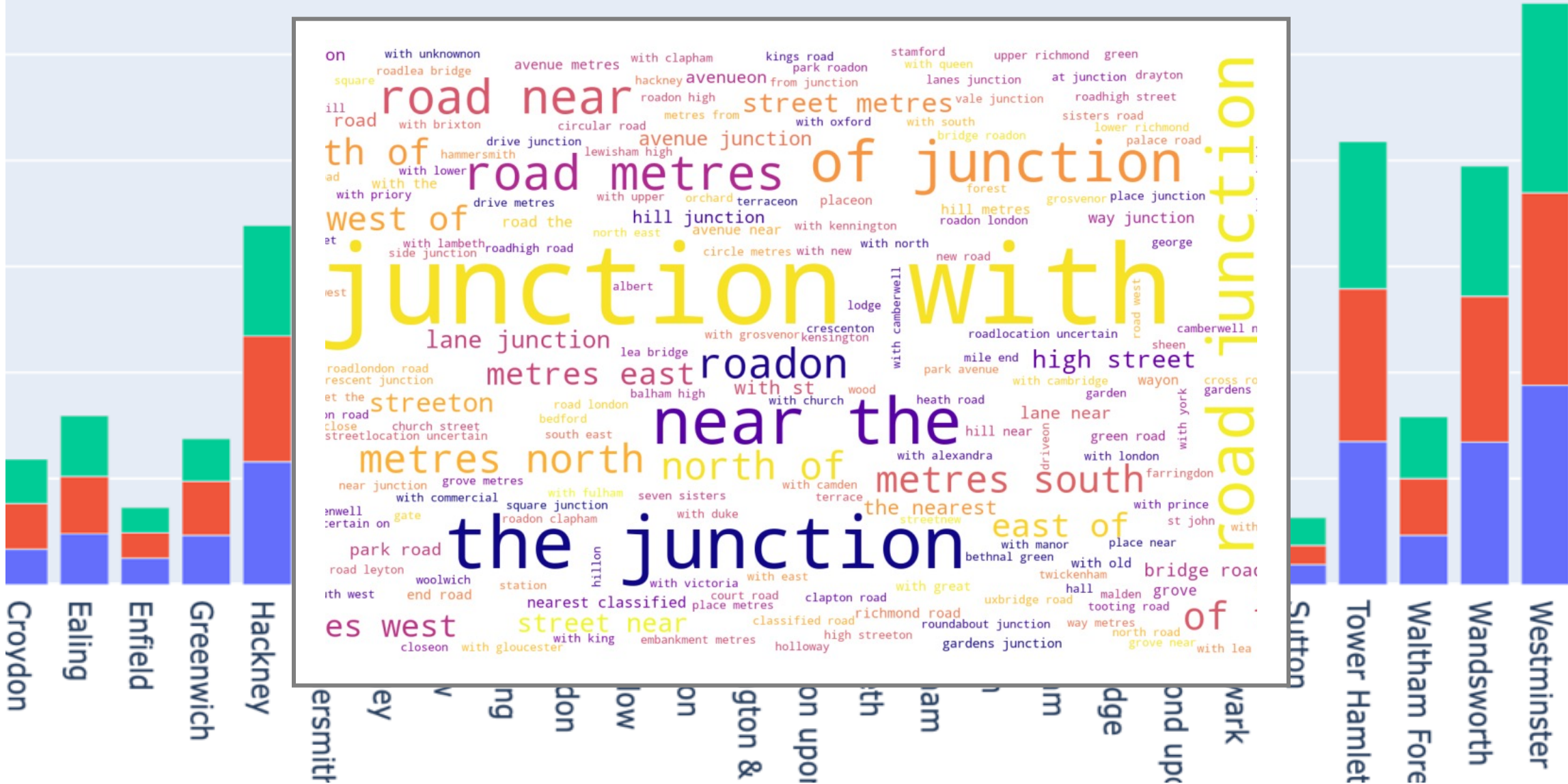
Initial Findings on Cycling Accidents

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Initial Findings on Cycling Accidents

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Line and Point Features

Infrastructure Summary

| Line features: | Point features: |
|--|---|
| Cycle lanes and tracks: 24,690 lanes with total length 2,860 km | Cycle parking: 23,758 sites and total capacity of 145,942 accessible. |
| Advanced Stop Lines (ASLs): 3,775 sites with total length 17,32 km | Traffic calming: 65,288 sites. Usually speed humps (vertical) or horizontal (road narrowing). |
| Restricted routes: 1,378 sites. Cyclists may use if dismount only. | Signals: 438 sites. Allows cyclists move before the traffic on junctions. |
| Crossings for cyclists: 1,758 sites. Signal controlled crossings for cyclists. | Restricted routes: 175 sites. Stairs or lifts along the cycle path. |
| | Signs: 118,834 sites. Any signs or road marking including route information for cyclists. |



Initial Findings on Time and Dates

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Distribution of Cycling Infrastructure

Cycle lanes and tracks



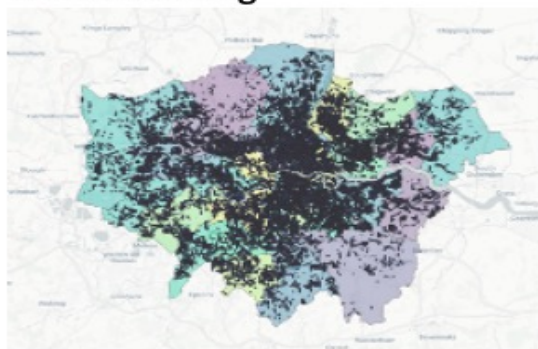
ASL



Crossings



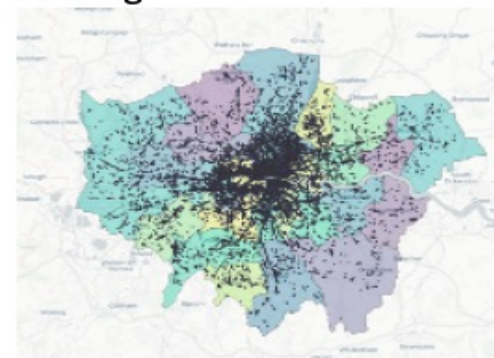
Traffic calming



Signals



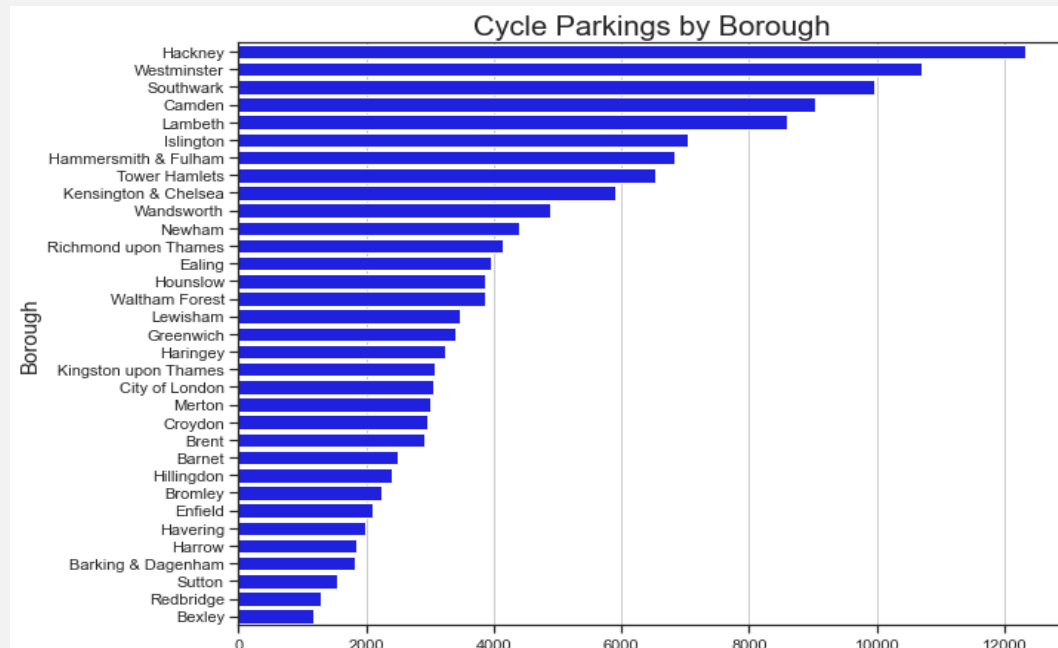
Parking



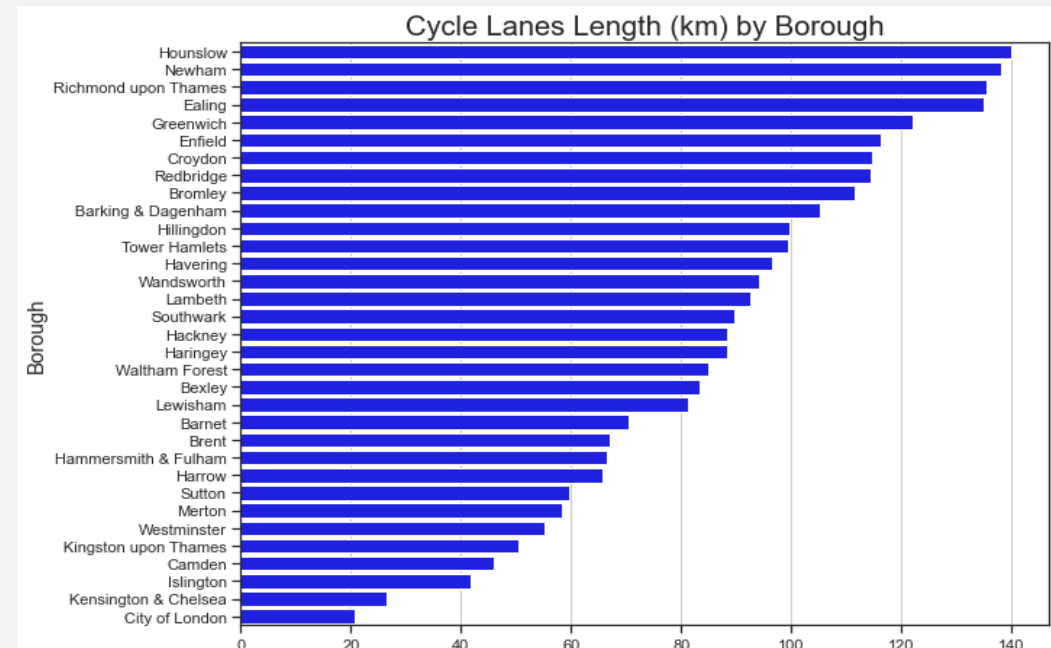
Initial Findings on Cycling Infrastructure

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Cycle Parking by Borough



Cycle Lane Length by Borough

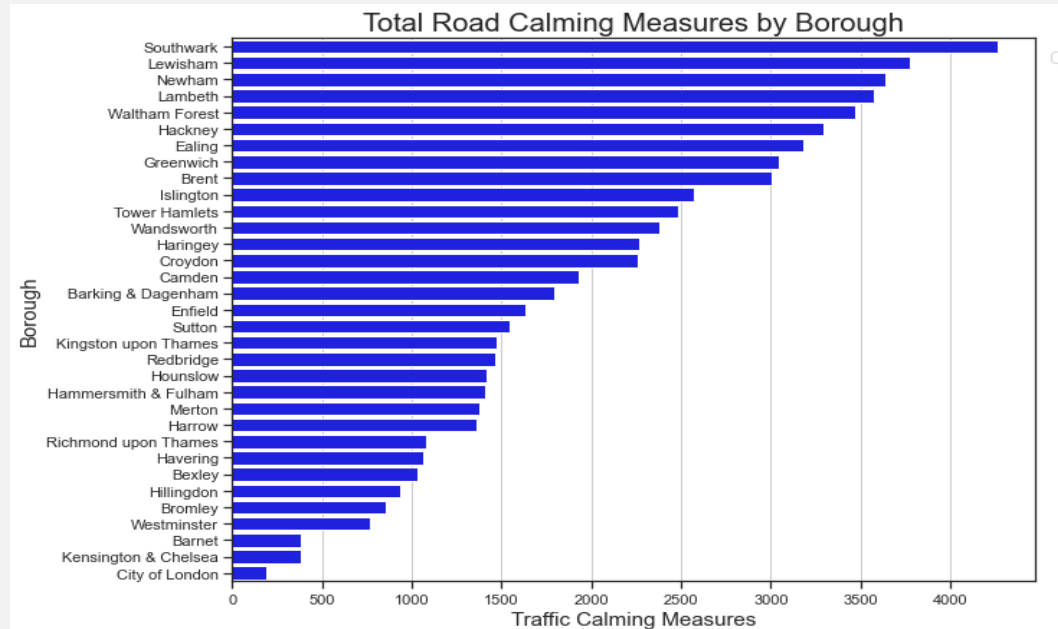


- Parking spaces are mostly located in Inner London boroughs. Hackney has the highest number, followed by Westminster and Southwark.
- Hounslow (Outer), Newham (Inner), Richmond (Outer) has the longest cycles lanes available.

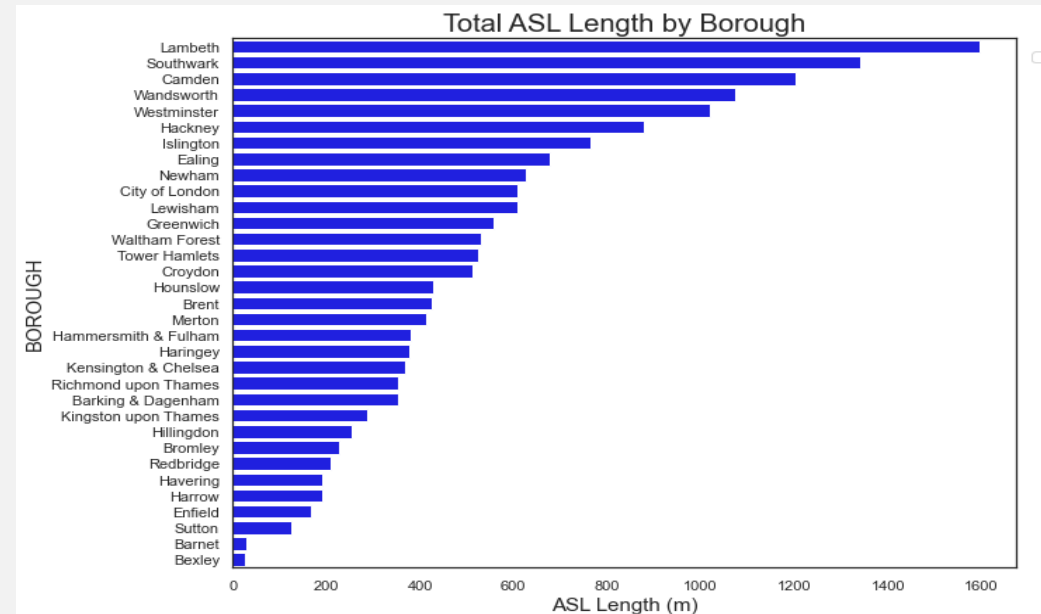
Initial Findings on Cycling Infrastructure

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Traffic Calming by Borough



ASL Length by Borough

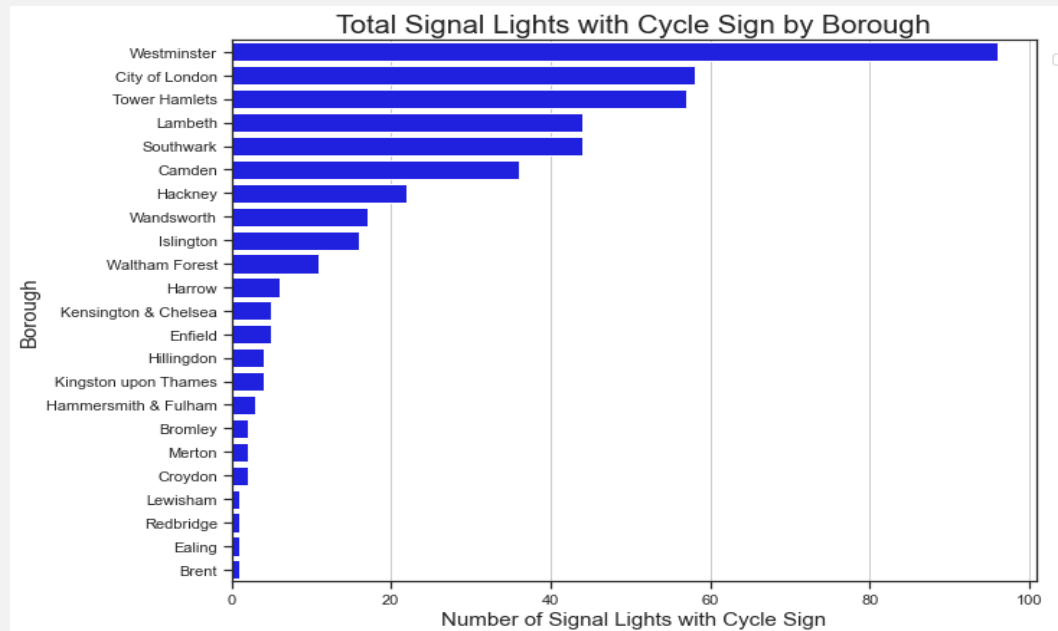


- Highest number of traffic calming measures found in the boroughs with high population density, mostly in Inner London, followed by Waltham Forest in Outer.
- ASL lines mostly presented in Inner London as well: Lambeth, Southwark, and Camden.

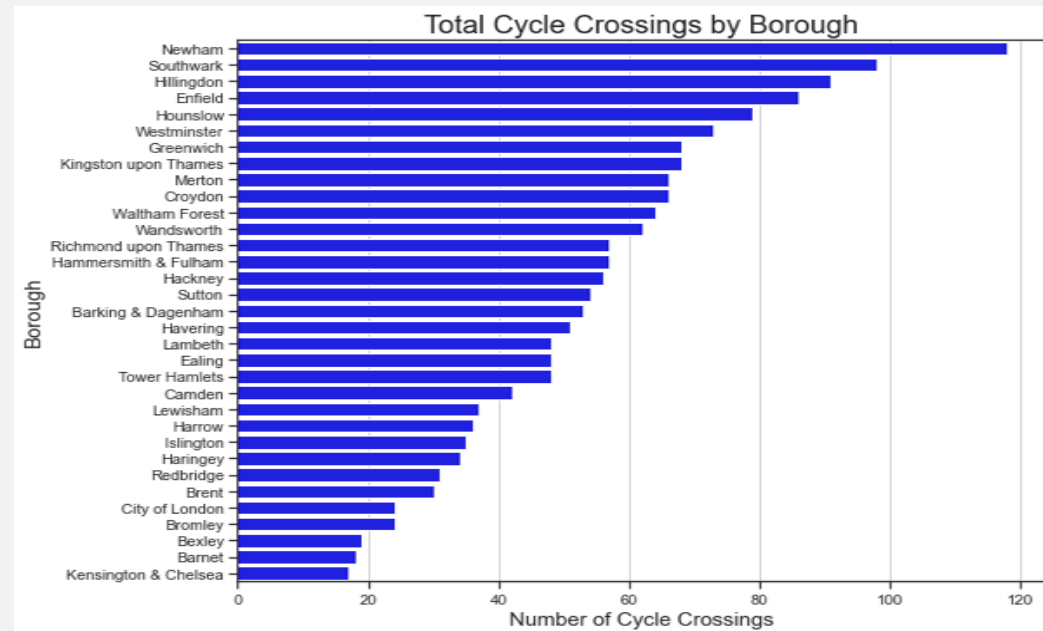
Initial Findings on Cycling Infrastructure

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Signal Lights by Borough



Cycle Crossings by Borough

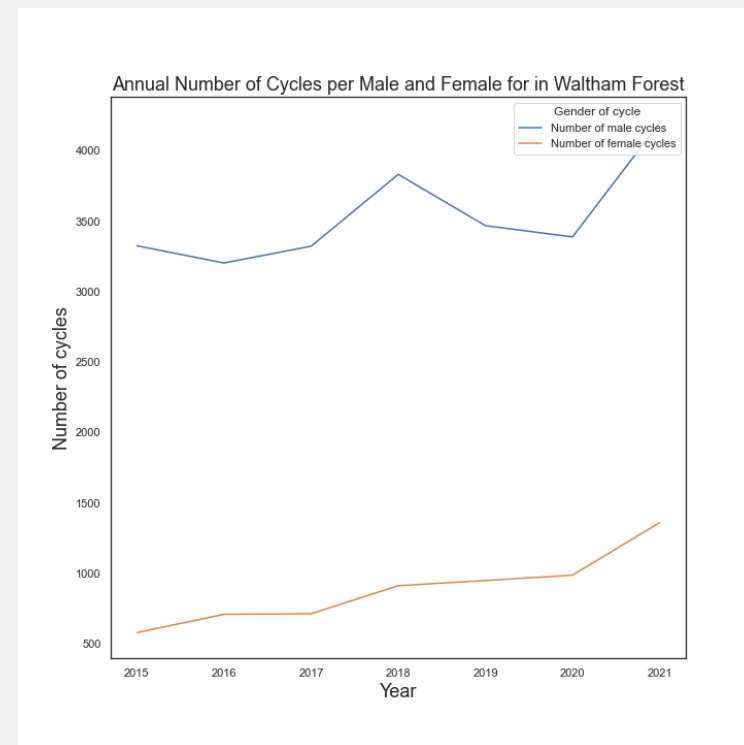


- Special traffic lights predominantly located in Westminster, City of London, and other Central London boroughs, and almost don't exist in Outer London.
- Newham, Southwark (both Inner) and Hillingdon (Outer) and Enfield has the highest number of cycle crossings.

Percentage Change

| Survey wave (year) | Number of male cycles | Number of female cycles | Total cycles | Male change % | Female change% | Total change% |
|--------------------|-----------------------|-------------------------|--------------|---------------|----------------|---------------|
| 2015 | 3325 | 579 | 3912 | NaN | NaN | NaN |
| 2016 | 3203 | 709 | 3920 | -0.036692 | 0.224525 | 0.002045 |
| 2017 | 3322 | 713 | 4040 | 0.037153 | 0.005642 | 0.030612 |
| 2018 | 3832 | 912 | 4755 | 0.153522 | 0.279102 | 0.176980 |
| 2019 | 3468 | 949 | 4421 | -0.094990 | 0.040570 | -0.070242 |
| 2020 | 3388 | 987 | 4394 | -0.023068 | 0.040042 | -0.006107 |
| 2021 | 4199 | 1360 | 5562 | 0.239374 | 0.377913 | 0.265817 |

Male and Female Split



- Waltham Forest consistently ranks high in terms of infrastructure
- Performs well in terms of the number of female cyclists

And at this stage we can preliminary suggest...

- Investment required in outer London to improve infrastructure
- Mini Hollands can work and investment should be increased to develop more – help increase female and new cyclists
- Offer subsidies like similar to Cycle to Work scheme to incentivise cycling in London
- Improvements to infrastructure at junctions to improve safety

Future analysis

- Deeper analysis into hire cycles
- Analyse ethnic groups and cycling rates
- Deeper look into cycle parking infrastructure for busiest locations in central London