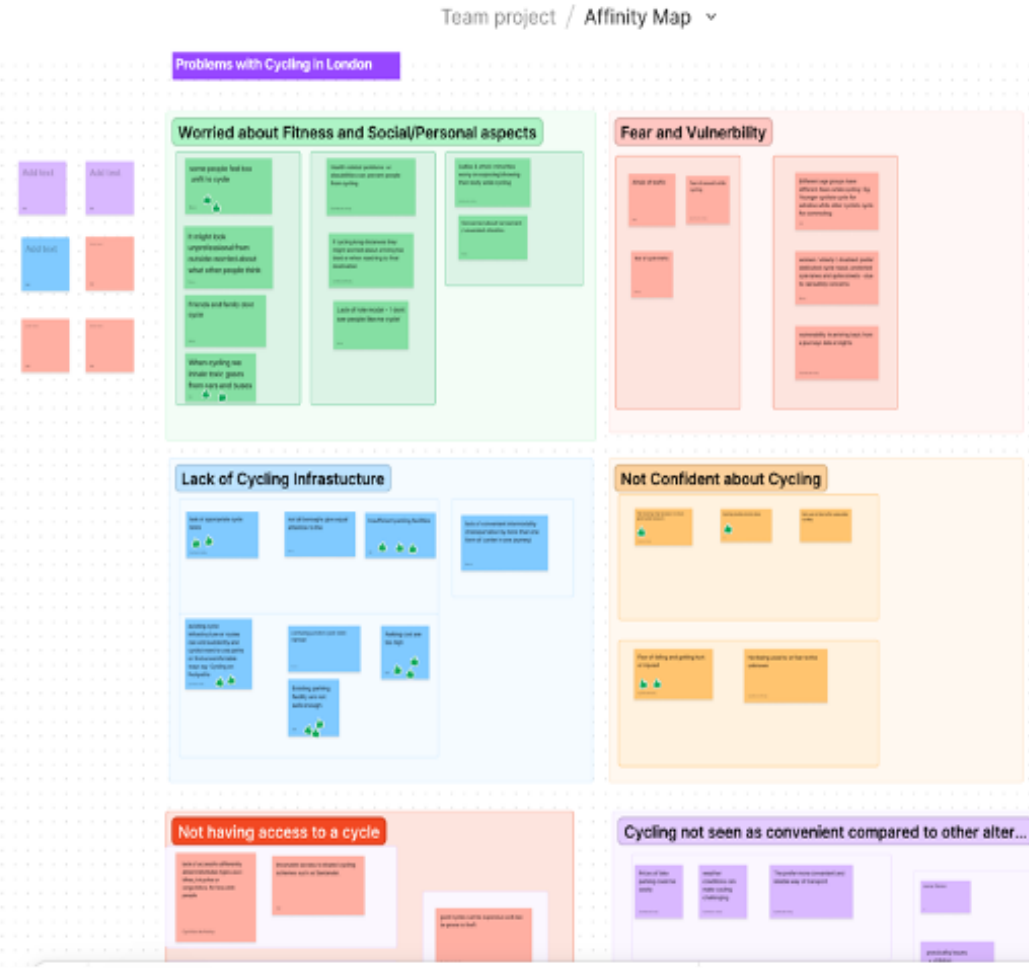
EMPLOYER PROJECT REPORT (TEAM 3)

The brief of the project was to provide recommendations to Transport for London on increasing the uptake of cycling in London.

The **Long Term Goal** identified is to ensure 80% of all journeys should be made by foot, cycle or public transport by 2041.

For the purpose of this analysis we identified a short term goal and developed a **problem statement** which is "**How to increase the number of people choosing to use cycles as their preferred mode of transport in London**"

We proceeded to understand the problem by identifying user concerns and their needs. We used an Empathy Map to group and form themes around the problems faced by cyclists in London. The themes that were identified were Infrastructural and Socio-Economic in nature.



To further substantiate these findings we conducted secondary research which suggested 78% of cyclists are concerned about cycle theft and 80%% are concerned about road safety and collisions(which we deduced could be a result of a lack of dedicated cycle lanes)

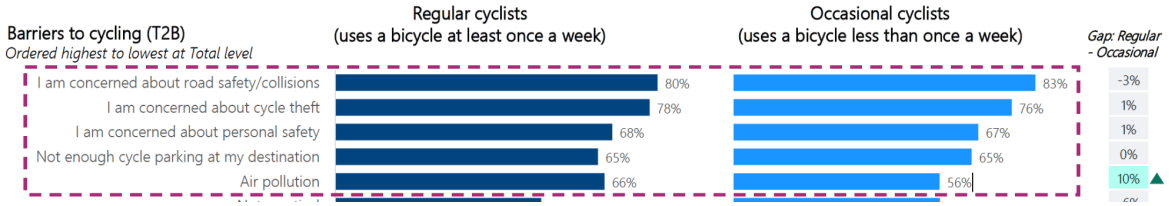
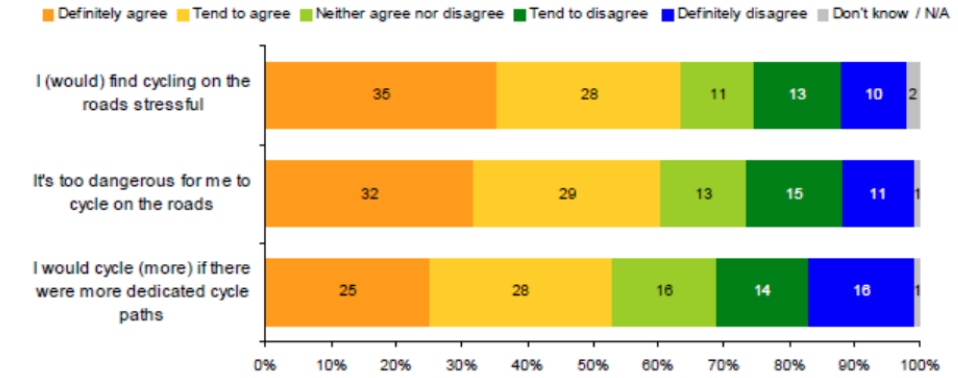


Figure 5.1. Attitudes towards cycling and safety

(i) Negatively phrased statements



Based on the above findings we proceeded to develop our hypothesis as:

- There is a correlation between cycle theft values and secure parking facilities
- There is a correlation between theft values and living standard
- There is a correlation between theft value and accommodation type
- There is a correlation between demographic factors and higher adoption of cycle usage
- There is a correlation between dedicated cycle lanes and higher adoption of cycle usage

Once our hypotheses were formulated, we decided to work around these hypotheses and get answers from the data provided. The approach taken to clean and analyse the data for initial data exploration was performed using excel. We firstly familiarised ourselves with the data using excel, pivot tables, excel data analysis tool and excel graphs. We found totals, subtotals and meaningful insights from columns and numbers on the initial given datasets.

After cleaning the excel sheets, we uploaded them to jupyter notebook for further analysis, concatenating, merging and removing unnecessary columns. Once the data was ready for further studies in python, we encountered discrepancies with the collection of the given data, which led us to further exploration for additional datasets from the public domains recommended on the course material. Some datasets found were in various different formats as json files, which needed to get converted and adapted to a readable format. Some additional calculations and conversions were needed such as conversion of northing and easting columns into longitude and latitude using a batch converter tools and also calculating distances between coordinates (The datasets have been attached in appendix)

Alongside the mining and transformation of complementary datasets, we performed secondary research from already evaluated studies, which aided our direction and future findings.

During the Initial data collection, we visualised the data with python, double checked with excel whether results were correct and performed simple correlation tests in R and further correlations in Python. Once we decided the data to be used for our analysis, we established the assumptions and considered the limitations of these data.

The assumptions made on the analysis were: The data was computed in 2019. The years 2020- 2021 were disregarded due to the covid pandemic and its implications on the data.The secure parking facilities data used to determine correlation between parking thefts (by value) and secure parking facilities was considered to be up to date.With regard to limitations with the data set , we were only able to access cycle theft value.

Once all our data was transformed and ready to draw insights, we built new datasets using python and ended up with only one data set, describing all the features considered for each London borough. With a fully featured detailed data set we further analysed correlations and visualisation in Tableau.

We have defined secure parking as those facilities that are gated and wheel-locked parking places, hangars, and lockers. We initially sought a pattern between existing secure parking numbers and cycle theft values by borough, but there seemed to be no existing correlation. The current secure parking numbers are significantly low and randomly distributed among the boroughs.

We then explored additional features and we encountered the followings:

We compared population density by living arrangements, and observed that theft rates were high in areas with high flats concentration, moreover, secure parking was very low. Westminster, Camden, and Tower Hamlets are boroughs with the highest flat concentration, where theft rates are also high and have very little secure parking facilities.

Then we looked at the number of enterprises per borough, analysed and compared them with bike theft. We have only taken into consideration companies with over 10+ employees, assuming that micro companies have their own solutions for secure parking (eg. have enough space for parking in the store). We then found out a pattern being Westminster, Camden, and Tower Hamlets, on the top list

Finally we checked the income distribution per borough, observing that higher income boroughs attract more cycle theft. In those findings we also see Westminster and Camden and additionally we found Wandsworth, Kensington & Richmond as the borough with highest theft within the high income group with not enough secure parking facilities.

Having all those features, we then summarised and visualised them on an interactive tableau workbook (see attached). The objective was to provide our analysis in a succinct and visually communicable way.

We then continue with cycle lanes. We defined dedicated cycle lanes as lanes which are protected tracks and are marked or separated for cycling purposes only. In our analysis we have established a pattern between the percentage length of dedicated cycle lanes in a borough and the percentage of cycling per week. In fact an increase of 30% in the length of dedicated cycle lanes will increase the average number of weekly routine cycles from 2 to 10 in 100.

We have also looked at the data from the social perspective and checked whether ethnicity, gender or age have any effect on the cycle usage. We found a pattern between age and the frequency of cycling in Boroughs where there are more adults than seniors and children cycling is more frequent.

We have prepared an insightful dashboard for TfL (pls see attached Tableau file) to guide them in their decision process and to assist with prioritising the boroughs in their selection process of implementing dedicated cycle lanes.

In our analysis, we have found out that in inner London boroughs, regardless of the length of dedicated cycle lanes people cycle.They live near the centre and they most probably work in the centre, the distances are short and they choose cycling as their mode of transport without considering the length of the dedicated cycle lanes.

Moreover, there are a few green boroughs (the ones that stand out in our data are Richmond, Kingston and Merton), which we labelled as outliers. In these boroughs, in addition to residents who cycle, people choose to come and cycle in the green regardless of the length of the dedicated cycle lanes on the streets.

Hence our focus in the prioritisation dashboard is outer London boroughs excluding the green boroughs.

TfL will be able to prioritise the boroughs to implement dedicated cycle lanes using the below data:

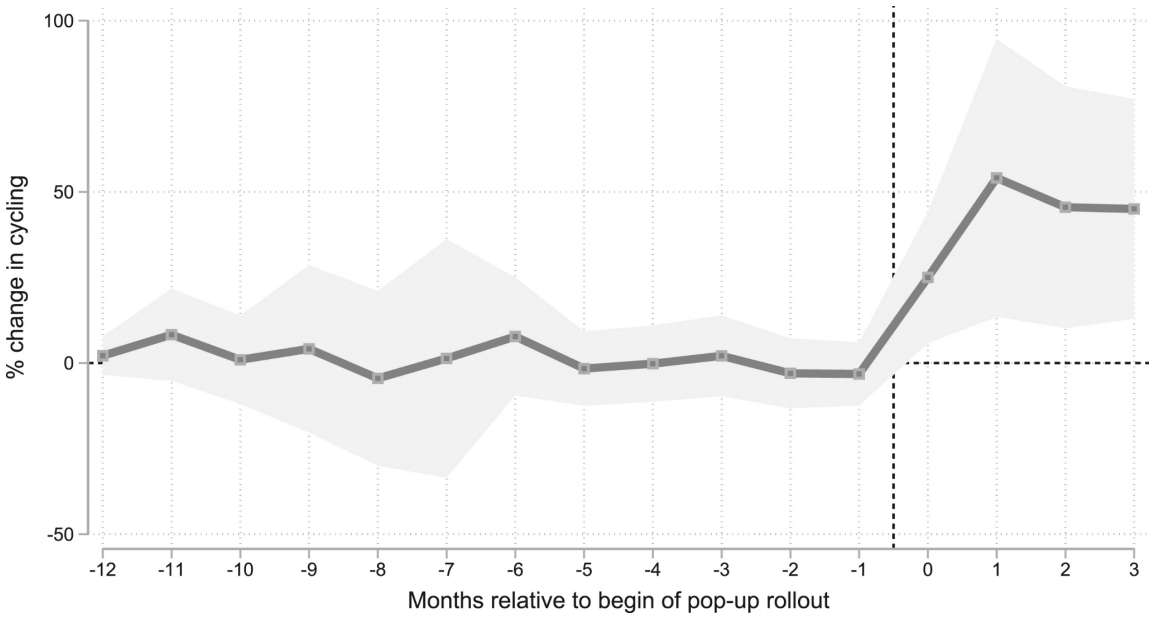
- · Dedicated cycle tracks
- · Weekly cycle usage
- · Age distribution of the residents

From our analysis we have established the need for a higher number of secured parking facilities, dedicated cycle names and more importantly the allocation of these facilities to be distributed in a more systematic manner.

As a short term measure to increase cycling uptake in London we can borrow measures from countries that have some success in implementing them.

One such example is the ‘Bike in Building Programme' implemented in New York, where employees can bring their cycles to work and securely park them in the office building. This programme has the backing of the law where a building that has a freight elevator has to allow for cycles to be carried in them. This programme in addition to the already existing Cycle to Work programme can encourage more people to cycle to work.

Another example is the Pop Up Cycle Lane programme implemented in 17 European countries such as Paris, Berlin. Here Pop UP Lanes were introduced during Covid and they saw an increase of about 40% in cycle uptake. (As seen in the graph below.)



Lastly TFL could ensure that cycle parking facilities be incorporated in the National Planning Policy Framework similar to provisions that allow for car parking being made mandatory. In addition, we can have private investment in building secure parking facilities.