Research Proposal: Relationship between cycle share trips and slopes

Word Count (excluding list of references):	*242*

Research Question

Is there a correlation between the quantity (or duration) of cycle hire trips and the slope of the physical environment?

Literature Review and Explanation of Value

Rodríguez and Joo (2004) explored the impacts of the physical environment to the choice of mode of transport, and has shown there is a negative correlation between the sloping terrain and the share of bicycle and pedestrians. There is limited research on the effect of terrain on cycle share journeys, thus investigating this pattern can contribute to predicting cycling behaviour.

Methodology

The journey data for the Santander Cycles scheme in London from Transport for London (2023) includes the origin, destination, date and time, duration, and type of bicycle for every journey taken, which count up to roughly 30,000 per day. By categorising into groups using the spatial or categorical values (such as particular origin-destination combinations or trips made by type), summary statistics for each category can be calculated for further analysis.

The terrain data will be evaluated by the difference of elevation between origin and destination. By adding this factor to other explanatory factors such as weather and time in a multiple linear regression model, the factor of the terrain to the character of the journey can be measured. The potential dependent variables are the duration, number of journeys, and the type of bicycles. Although the characteristics of each neighbourhood

must be taken into consideration, this analysis will provide insight to the cycling behaviour.

References

Rodríguez, D. A. and Joo, J. (2004). 'The relationship between non-motorized mode choice and the local physical environment'. *Transportation Research Part D: Transport and Environment*, 9 (2), pp. 151–173. doi: 10.1016/j.trd.2003.11.001.

Transport for London. (2023). 'TfL Cycling Data'. Available at: https://cycling.data.tfl.gov.uk/ (Accessed: 3 December 2023).