

Figure 1. Timeline of Transport-Relevant Policies (Data sourced from: Mayor of London, 2023; the C40 Knowledge Hub, 2019; Institute for Government Analysis, 2022)

Table 1. Hypothetical variables and descriptive statistics

Variables	Description	Data source	
Transport Data			
Weekly cycle distance	Weekly per-capita cycle travel distance of each spatial unit	Cycle Hire trip data (TFL open data)	
Weekly cycle count	Weekly per-capita cycle travel count of each spatial unit		
Socio-economic environment			
Residential density	By each spatial unit	Index of multiple deprivation 2019 / Census 2021 data	
Income deprivation	Income rank of each spatial unit	Index of multiple deprivation 2019 / Census 2021 data	
Education deprivation	Education rank range from GCSEs to higher degree	Index of multiple deprivation 2019 / Census 2021 data	
Employment deprivation	continues data of each spatial unit	Index of multiple deprivation 2019 / Census 2021 data	
Built environment			

Cycle accessibility	Considering distance to transit stops,	BikePoint data, etc. (TFL open
	frequency, capacity of transport	data)

Bibliography

Abegaz, T., Berhane, Y., Worku, A. and Assrat, A. (2014). 'Effectiveness of an improved road safety policy in Ethiopia: an interrupted time series study'. *BMC Public Health*, 14 (1), p. 539. doi: 10.1186/1471-2458-14-539.

Allen, R., Bennett, and, H., Cooper, C. and Haggar, P. (2023). 'Moving on: greener travel for the UK'.

Cabrera-Arnau, C., Zhong, C., Batty, M., Silva, R. and Kang, S. M. (2023). 'Inferring urban polycentricity from the variability in human mobility patterns'. *Scientific Reports*, 13 (1), p. 5751. doi: 10.1038/s41598-023-33003-7.

C40 Cities Climate Leadership Group, Greater London Authority, C40 Knowledge Hub. (2019) 'How road pricing is transforming London and what your city can learn'. Available at: https://www.c40knowledgehub.org/s/article/How-road-pricing-is-transforming-London-and-what-your-city-can-learn?language=en_US. (Accessed: 18 March 2024).

Chng, S., White, M., Abraham, C. and Skippon, S. (2016). 'Commuting and wellbeing in London: The roles of commute mode and local public transport connectivity'. *Preventive Medicine*, 88, pp. 182–188. doi: 10.1016/j.ypmed.2016.04.014.

Ding, H., Sze, N. N., Guo, Y. and Lu, Y. (2023). 'Effect of the ultra-low emission zone on the usage of public bike sharing in London'. *Transportation Letters*. Taylor & Francis, 15 (7), pp. 698–706. doi: 10.1080/19427867.2022.2082005.

Dorais, S. (2024). 'Time series analysis in preventive intervention research: A step-by-step guide'. *Journal of Counseling & Development*, 102 (2), pp. 239–250. doi: 10.1002/jcad.12508.

Gao, Q.-L., Yue, Y., Zhong, C., Cao, J., Tu, W. and Li, Q.-Q. (2022). 'Revealing transport inequality from an activity space perspective: A study based on human mobility data'. *Cities*, 131, p. 104036. doi: 10.1016/j.cities.2022.104036.

Institute for Government (2022) 'Timeline of UK government coronavirus lockdowns and restrictions'. Available at: https://www.instituteforgovernment.org.uk/data-visualisation/timeline-coronavirus-lockdowns (Accessed: 18 March 2024)

Lopez Bernal, J., Cummins, S. and Gasparrini, A. (2016). 'Interrupted time series regression for the evaluation of public health interventions: a tutorial'. *International Journal of Epidemiology*, p. dyw098. doi: 10.1093/ije/dyw098.

Lopez Bernal, J., Cummins, S. and Gasparrini, A. (2018). 'The use of controls in interrupted time series studies of public health interventions'. *International Journal of Epidemiology*, 47 (6), pp. 2082–2093. doi: 10.1093/ije/dyy135.

Mayor of London, (2023). 'Inner London Ultra Low Emission Zone One Year Report'.

Prieto-Rodriguez, J., Perez-Villadoniga, M. J., Salas, R. and Russo, A. (2022). 'Impact of London Toxicity Charge and Ultra Low Emission Zone on NO2'. *Transport Policy*, 129, pp. 237–247. doi: 10.1016/j.tranpol.2022.10.010.

Ramsay, C. R., Matowe, L., Grilli, R., Grimshaw, J. M. and Thomas, R. E. (2003). 'INTERRUPTED TIME SERIES DESIGNS IN HEALTH TECHNOLOGY ASSESSMENT: LESSONS FROM TWO SYSTEMATIC REVIEWS OF BEHAVIOR CHANGE STRATEGIES'. *International Journal of Technology Assessment in Health Care*, 19 (4), pp. 613–623. doi: 10.1017/S0266462303000576.

Shannon, T., Giles-Corti, B., Pikora, T., Bulsara, M., Shilton, T. and Bull, F. (2006). 'Active commuting in a university setting: Assessing commuting habits and potential for modal change'. *Transport Policy*, 13 (3), pp. 240–253. doi: 10.1016/j.tranpol.2005.11.002.

Verbeek, T. and Hincks, S. (2022). 'The "just" management of urban air pollution? A geospatial analysis of low emission zones in Brussels and London'. *Applied Geography*, 140, p. 102642. doi: 10.1016/j.apgeog.2022.102642.

Welch, T. F. and Mishra, S. (2013). 'A measure of equity for public transit connectivity'. *Journal of Transport Geography*, 33, pp. 29–41. doi: 10.1016/j.jtrangeo.2013.09.007.

Zhai, M. and Wolff, H. (2021). 'Air pollution and urban road transport: evidence from the world's largest low-emission zone in London'. *Environmental Economics and Policy Studies*, 23 (4), pp. 721–748. doi: 10.1007/s10018-021-00307-9.

Zhang, F., Wagner, A. K. and Ross-Degnan, D. (2011). 'Simulation-based power calculation for designing interrupted time series analyses of health policy interventions'. *Journal of Clinical Epidemiology*, 64 (11), pp. 1252–1261. doi: 10.1016/j.jclinepi.2011.02.007.

Zhang, W. and Ning, K. (2023). 'Spatiotemporal Heterogeneities in the Causal Effects of Mobility Intervention Policies during the COVID-19 Outbreak: A Spatially Interrupted Time-Series (SITS) Analysis'. *Annals of the American Association of Geographers*, 113 (5), pp. 1112–1134. doi: 10.1080/24694452.2022.2161986.