

Project Title:

Assessing socio-spatial and economic impacts of large transport infrastructure

Principal Supervisor: Dr Jens Kandt

Secondary Supervisor: Prof Michael Batty

Department & Institution:

The Bartlett Centre for Advanced Spatial Analysis (CASA), University College London (UCL)

Collaborative Organisation:

UK Department for Transport (DfT)

Project Description:

Large transport investments are expected to generate economic and social benefits, such as job creation, higher productivity, housing development and urban regeneration; and they thus may contribute to growing and levelling up the economy. Yet, social welfare impacts of transport infrastructure appear to be highly dependent on geographical context, such as local socio-economic and labour market conditions. In addition, the moderating and sometimes confounding effects of displacement – the relocation of households and firms – are still poorly understood.

This PhD project will develop a novel, integrated modelling framework that is grounded in social and economic theory to robustly assess the wider spatial, social and economic impacts of large transport investments. The primary research questions will be:

- How do transport projects generate land use change; how do these changes co-constitute and advance agglomeration of activity and translate into wider social and economic impacts?
- Under what geographical conditions do transport projects inhibit or support progress towards economic prosperity, equal opportunities and environmental sustainability?
- How can wider welfare impacts of transport investments be estimated, forecast and predicted in an evidence-based and robust manner?
- How can welfare impacts be critically examined, unintended consequences be identified and social welfare be separated from economic impacts?
- What novel data sources are available and what metrics can be developed to advance research, policy and appraisal practice?

As part of addressing these questions, we envisage that the research will bring together and advance insights from Land Use Transport Interaction (LUTI) and Computable General Equilibrium (CGE) modelling, building on the research in this space at CASA. In so doing, the PhD is expected to contribute to the fields of transport geography, economics and mobility research. The project will also inform

transport policy and appraisal practice, thus promising strong cross-sectoral impact.

With the Department for Transport (DfT) as partner and co-sponsor, this project will provide a rare opportunity to conduct research with an influential government department, advance social and economic theory on the socio-spatial impacts of transport, translate theories into modelling applications and lead on cross-sector knowledge exchange on pressing policy challenges, such as reducing environmental impacts, increasing social welfare and reducing spatial disparities.

Candidate Requirements:

We are seeking a highly motivated individual who has a strong interest in transport geography, spatial analysis, economic geography and urban modelling.

The candidate should have a background in economic geography, economics, quantitative geography or another quantitative social science, ideally with some experience in spatial analysis. Prior work on or experience with economic models, specifically GCE modelling, will be of particular advantage. Candidates with a background in planning, engineering or ecology with solid quantitative and analytical skills will also be considered.

[Baseline Personnel Security Standard](#) (BPSS) will need to be secured prior to the research. This process is expected to take approx. 6 weeks.

Please also note the requirements by ESRC regarding the award of the studentship: <https://www.ukri.org/wp-content/uploads/2022/09/ESRC-29092022-ESRC-Postgraduate-Funding-Guide-September-2022-FINAL.pdf>

Key References:

- Batty, M., & Milton, R. (2021). A new framework for very large-scale urban modelling. *Urban Studies* 58(15), 3071–3094.
- Batty, M. (2013). The New Science of Cities. *The MIT Press*.
- Department for Transport (2018). *TAG Unit M5-3 supplementary economic modelling*. London: Department for Transport
<https://www.gov.uk/government/publications/webtag-tag-unit-m5-3-supplementary-economic-modelling-may-2018>
- Hansen, W., & Johansen, B. G. (2017). Regional repercussions of new transport infrastructure investments: An SCGE model analysis of wider economic impacts. *Research in Transportation Economics* 63, 38–49.
- Jin, Y. et al. (2019) *UK2070 Futures Modelling*, Technical Report, The Martin Centre, University of Cambridge. <https://uk2070.org.uk/wp-content/uploads/2019/05/UK2070Commission-MODELLING-TECHNICAL-REPORT.pdf>
- Kandt, J. (2018) “Heterogeneous Links Between Urban Form and Mobility: A Comparison of São Paulo, Istanbul and Mumbai.” *Journal of Transport and Land Use* 11(1), 721–745.
- Laird, J. J., & Venables, A. J. (2017). Transport investment and economic performance: A framework for project appraisal. *Transport Policy* 56, 1–11.

Wegener, M. (2014). Land-Use Transport Interaction Models. In: Fischer, M. & Nijkamp, P. (Ed.). *Handbook of Regional Science*. Springer Berlin Heidelberg, 229–246.

Further details about the project may be obtained from:

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Deadlines and how to apply:

The deadline for application is: 28 February 2023, 23:59

Applications should use the application portal available at this link:
<https://ucl.smapply.io/acc/l/?next=/prog/>

Interviews will be held in mid-March.