UKRI Policy Fellowships 2023: Fellowship Opportunity Description

Fellowship Title: DfT Urban Economics Fellow

Host Organisation: Department for Transport https://www.gov.uk/government/organisations/department-for-transport

Host Team: Transport Appraisal and Strategic Modelling Division, which sits within the Analysis Directorate

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Summary:

Bringing recent advances in urban economics and quantitative spatial modelling approaches to the heart of transport policy appraisal at the DfT. Undertake new research to build an open-source tool for transport modelling and appraisal which deploys these techniques.

Fellowship Theme: Data and Evaluation

Policy Topic: Levelling up, boosting productivity and growth, improving wellbeing

Research Council: ESRC

Academic Discipline/s: Economics, statistics, geography, data science

Research Career Stage: Mid-career preferred, but also consider early-stage

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Fellowship Structure

Inception Phase:

>**Estimated Start Date**: October 2023.
>**Duration:** 3 months
>**FTE:** 0.4 FTE

Main Placement Phase:

>**Duration:** 12 months
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>**FTE:** 0.6-1 FTE (1 FTE preferred)

Knowledge Exchange Phase:

>**Duration:** 3 months
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>**FTE:** 0.4 FTE

Work Arrangements

Location Requirements: Can be based in Birmingham, Hastings, Leeds, or London, but must be willing to travel to London semi-regularly (e.g., at least twice per month) to maximise interactions with the rest of the team. Eligible travel & subsistence costs are supported in the main UKRI grant. Please see full call text and guidance for more details.

Hybrid Working: Working 40% of time in the office (pro-rata).

Security Clearance: Baseline Personnel Security Standard, usually takes around 6 weeks. We would expect the successful applicant to start the security clearance application process, with support from the host team, as soon as their Fellowship has been confirmed by ESRC; and so, ideally, before the inception phase begins. See National security vetting: clearance levels - GOV.UK (www.gov.uk)

Fellowship Opportunity Description

This fellowship aims to bring recent advances in the urban economic literature to bear on several key policy priorities for the Department for Transport. This will be primarily directed through the lens of transport modelling and appraisal, which underpins the business case for many multi-billion-pound spending decisions by the DfT.

The Fellow will explore the use of quantitative spatial modelling approaches in transport policy appraisal, for a variety of potential project types, assessing its applicability, strengths, and weaknesses relative to pre-established techniques used by the Department. These include traditional four-stage transport models, land-use transport interaction models and computable general equilibrium models. The fellow will have the opportunity to define and shape the specific research outputs during the inception period, but these are likely to focus on:

- Developing proposals for a rigorous, practical appraisal framework for a range of transport projects which builds upon insights from urban economics and uses quantitative spatial modelling. We expect this could lead to a published academic paper.

- In collaboration with DfT economists, transport modellers and data scientists. building open-source quantitative spatial modelling (tool)s, within the Department's IT environment, which can be used in future for reproducible, high quality policy analysis. This would include (but may not be limited to):
  a) model specification and documentation – identifying the key relationships between variable which need to be reflected, in order to address DfT policy needs;
  b) calibration – identifying relevant data sources and statistical methods to parameterise the model, including consideration of 'big data' and data science techniques; and
  c) empirical validation – testing the model's predictions against outturn data, using techniques such as back-casting and out of sample predictions, to provide assurance around the appropriateness of the model for ex-ante appraisal work.

- This model(s) will primarily be used to understand a variety of economic and social impacts of transport investment, including accessibility improvements, employment, property prices, households' utility (e.g., wellbeing) and productivity. This would be publishable, and directly inform DfT policy development and appraisal.

The candidate should be aware that DfT has recently advertised for a co-funded PhD scholarship on 'Assessing socio-spatial and economic impacts of large transport infrastructure', which subject to being successful filled will provide further opportunities for collaboration. That PhD will seek to draw together insights from land-use transport interaction, and spatial computable general equilibrium models, both of which are relevant to this fellowship.

Finally, the fellow will also use their urban economics expertise to challenge and develop the approach to economic impact appraisal more generally, which may include activities such as:

- Responsively identifying evidence gaps in specific areas of policy interest; developing evidence summaries, literature review and synthesis to support emerging policy priorities; identifying and advocating for 'use cases' of advances in urban economics across DfT policy appraisals.
- Strengthening the links between accessibility measurement and transport appraisal, especially via the use of spatial economic modelling.
- Quality assuring, critiquing, and shaping work carried out by other analytical teams at DfT, and by their contracted consultants on specific projects.
- Presenting the findings of their work to relevant policy and analytical colleagues across the DfT, helping to forge new and long-lasting links between DfT analysts and specialists in urban economics.
- Input into ongoing debates and discussions on these topics, both within DfT and across its stakeholder network which spans local government, sub-national strategic transport bodies, arm's length bodies, and think tanks.

The fellow will have the opportunity to co-design clear research tasks in collaboration with officials in government based on policy needs and the fellow's interests/skills during the inception phase of the fellowship.

By being placed at DfT, the fellow will:

- Have access to a range of senior public sector officials at the heart of investment appraisal and decision making, and the ability to influence them with cutting edge analysis.
- Working directly with policy professionals and analysts from multiple DfT divisions, giving direct exposure to how evidence is developed and deployed to inform decisions.
- Exposure to a significant number of highly skilled transport analysis professionals, within DfT and across its stakeholder network, thereby having opportunities to develop high level expertise in transport modelling and appraisal.
- Accessing secure license versions of transport datasets which are otherwise cumbersome to obtain (e.g., National Travel Survey (NTS)) as well as commercially sensitive data (e.g., public transport operators' demand and revenue data) which is often unavailable to external researchers. We will strive to support and

sponsor similar levels of access to data held by the ONS and other Government Departments, where beneficial.

Person Specification

Applications will be assessed against the following opportunity-specific requirements in addition to the generic eligibility and call criteria.

Essential Criteria:

- The applicant must have a PhD in urban economics, transport economics, econometrics, or a very closely related field.
- An appreciation of the wider context, benefits and risks associated with various forms of spatial economic modelling, beyond just quantitative spatial modelling. For example, land-use transport interaction and computable general equilibrium modelling.
- Have direct experience of either building or using and modifying quantitative spatial models for real-world analyses.
- Some experience with coding languages. Ability and interest to develop this as required to develop open-source modelling tools at DfT and/or work with DfT's in-house coding experts to achieve this. The expectation is that the fellow would work closely with DfT analysts (including data scientists) to develop their modelling platform,
- Experience presenting highly technical work in an accessible, but rigorous, manner to a range of audiences, with demonstrable examples of this having a real impact.

Desirable Criteria:

- Ability to undertake economic and statistical work in coding packages such as R, Python, MATLAB, and Julia (with a preference for R or Python).
- Experience collaborating with public sector transport bodies (e.g., DfT, sub-national strategic transport bodies, local government).
- Knowledge and/or experience working with transport relevant datasets (such as NTS, Traveline data, Association of Train Operating Companies data, geospatial data), transport modelling or appraisal problems.