

Open Research Case Study

(The First) Ten Years of the Newcastle Urban Observatory

4000 sensors, 20 billion data points. Evidence for change. Data for Everyone

Philip James

Professor of Urban Data, School of Engineering.

Introduction

The Newcastle Urban Observatory stands as a beacon of innovation in urban research, showcasing the power of open science and data in unravelling the complexities of modern urban environments. For the last 10 years Newcastle University's pioneering initiative has transformed the landscape of urban studies through its comprehensive data collection, collaborative ethos, and commitment to open access principles. By harnessing cutting-edge technology and interdisciplinary collaboration, the Observatory has not only propelled forward our understanding of urban dynamics but has also made significant contributions to teaching, societal engagement, and policy formulation.

Research Funding

Central to the success of the Newcastle Urban Observatory is its robust funding structure, which has enabled the undertaking of large-scale data collection and analysis initiatives. Through strategic partnerships with governmental bodies, private corporations, and research grants, the Observatory has secured substantial financial support, ensuring the sustainability of its operations. These funds have been instrumental in the deployment of sensor networks, development of data analytics tools, and maintenance of infrastructure, thereby facilitating ground-breaking research endeavours that transcend traditional disciplinary boundaries. The UO is integral to recently awarded £30m of funding including the AI Hub for real data, The national hub for Decarbonised, adaptable, climate resilient transport for a sustainable future (DARe) and NERC's Digital Solution Programme. The UO has supported over 50 research projects across many disciplines totalling more than £60m of research funding.

Contribution to Open Science & Data

At the heart of the Newcastle Urban Observatory lies a commitment to open science and data principles, characterized by transparency, accessibility, and collaboration. By openly sharing its vast repository of urban data, comprising real-time sensor readings, demographic information, and spatial datasets, the Observatory fosters an environment conducive to scientific inquiry and innovation. Researchers from diverse backgrounds have unrestricted access to this wealth of information, facilitating cross-disciplinary collaborations and the exploration of novel research avenues. Moreover, the Observatory actively promotes data literacy and engagement within the wider community through workshops, seminars, and public outreach initiatives, democratising access to scientific knowledge and empowering citizens to participate in the co-creation of urban solutions.

Contribution to Teaching

Beyond research, the Newcastle Urban Observatory plays a pivotal role in shaping the educational landscape by integrating cutting-edge research into teaching curricula. Through collaborative projects, student projects, and experiential learning opportunities, the Observatory provides students with first-hand exposure to real-world urban challenges and equips them with the skills necessary to navigate complex data ecosystems.

By bridging the gap between academia and practice, the Observatory nurtures the next generation of urban scholars and practitioners, instilling in them a deep appreciation for interdisciplinary collaboration and evidence-based decision-making. The UO data is used across the HASS, and SAGE faculties and supports UG, PG and PhD projects.

Contribution to Society

The societal impact of the Newcastle Urban Observatory extends far beyond the confines of academia, permeating into the fabric of urban governance, community development, and environmental sustainability. By generating actionable insights derived from empirical data, the Observatory empowers policymakers, urban planners, and community stakeholders to make informed decisions that enhance the liveability, resilience, and inclusivity of cities. Whether it be optimizing transportation networks, mitigating environmental risks, or addressing socio-economic disparities, the evidence-based approach championed by the Observatory fosters holistic solutions that prioritize the well-being of urban residents. Concrete realisations include the SenseMyStreet programme, the safer schools programme (leading to policy changes on school streets). Local action groups use the data to promote healthier living and active travel policy. The UO has also partnered with the NHS in monitoring our hospital sites for air quality. Data from the UO has been used to improve Met Office high resolution temperature modelling in cities.

Contribution to Policy

In recognition of its expertise and credibility, the Newcastle Urban Observatory serves as a trusted advisor to policymakers at local, national, and international levels, shaping the discourse on urban policy and governance. By bridging the gap between research and policy, the Observatory catalyses positive change, driving forward an agenda of urban resilience, equity, and innovation. The UO has contributed evidence for local government pedestrianisation schemes, the Newcastle Clean Air Zone and has been a long-term partner of the city council on its digital transformation journey and the award of smart city of the year in 2019. During COVID-19 the UO contributed real-time evidence to the city council, public health England and the SAGE committee through repurposing data for assessing real-time policy impacts on pedestrian and vehicle movements.

In conclusion, the Newcastle Urban Observatory stands as a testament to the transformative potential of open science and data in addressing the multifaceted challenges of urbanization. By leveraging collaborative partnerships, innovative technologies, and open access principles, the Observatory not only advances our understanding of urban dynamics but also catalyses positive societal change, shaping the cities of tomorrow.