

Impact case study (REF3)

Institution: The University of Manchester		
Unit of Assessment: 14 (Geography and Environmental Studies)		
Title of case study: Mobilising urban living labs to create sustainable infrastructure		
Period when the underpinning research was undertaken: 2008 – 2016		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
James Evans	Professor of Human Geography	2007 – present
Jana Wendler	Lecturer	2012 – 2020
Period when the claimed impact occurred: 2014 – 2019		
Is this case study continued from a case study submitted in 2014? No		
<p>1. Summary of the impact University of Manchester research on Urban Living Labs has transformed sustainable infrastructure provision in Manchester, and enhanced capacity in DAC (Development Assistance Committee) list countries. The Urban Living Labs approach has:</p> <ol style="list-style-type: none"> shaped GBP26,000,000 of infrastructure investment by Manchester City Council, which has doubled cycling rates in targeted areas and replaced 20,000km of delivery van trips with e-cargo bikes informed training for governments across East Africa, South America and the Philippines to deliver walkability action plans and improved road safety for 5,800,000 citizens, in partnership with global mobility NGO Walk21 and the United Nations 		
<p>2. Underpinning research Cities will be home to three quarters of humanity by 2100, but must transform rapidly to address a range of social, environmental and economic challenges. Sustainable solutions to urban challenges are required quickly and at scale. University of Manchester research was foundational in developing the Urban Living Lab (ULL) approach, which uses partnerships to address place-based challenges by experimenting with different kinds of sustainable infrastructure. This impact case study draws on 17 funded research projects worth more than GBP30,000,000, work with >100 non-academic organisations, and >40 publications. It builds on two core sets of findings.</p> <p>1. The emergence of ULLs to test sustainability solutions in cities. University of Manchester research has been foundational in understanding the importance of testing, monitoring and learning from real world trials in order to adapt solutions to local conditions and maximise their benefits. A 2010 EPSRC pilot project provided one of the first accounts of how living labs were being used in urban contexts in the US and Europe to test a broad range of sustainability solutions. These range from new kinds of greywater capture and waste recycling to cycle lanes and community maintained green infrastructure. The significance and originality of this work lay in showing how experiments in real world settings could be used to generate evidence to support broader uptake of solutions [1]. A subsequent in-depth study of urban innovation in Manchester showed that shared priorities among partners and clearly defined locations for testing new infrastructure made the process of experimentation more effective [2]. These conditions made it easier to gain permission to run trials, generated more robust findings and, crucially, increased the likelihood of the partners applying the findings to shape their infrastructure design more broadly. Formas-funded research with more than 70 municipalities, businesses, universities and third sector organisations across Europe, identified municipal leadership and capabilities to establish ULLs as key success factors [3].</p>		

2. How to apply ULLs to innovate for urban sustainability in practice.

A series of applied projects with end users built upon this earlier body of work to develop a distinctive University of Manchester ULL approach. A global survey of 70 ULL initiatives [4] informed the establishment of the University of Manchester Living Lab, which connected local end users with research capacity across the University. The lab produced findings about how to scale up the ULL approach through portfolios of research projects that provide more complete stakeholder engagement and more effective resulting solutions to urban challenges [5]. The ULL approach was piloted and adapted through action research with Manchester City Council on sustainable logistics, which was conceived and conducted with more than 60 local organisations including a range of local businesses [6]. The work highlighted the importance of municipalities and user communities coproducing solutions to ensure they are linked to needs, and involving a full range of stakeholders to ensure they are scalable.

3. References to the research

(citations from Google Scholar, 12/01/2021)

1. **Evans, J.** and Karvonen, A. (2011) Living laboratories for sustainability: exploring the politics and epistemology of urban adaptation. In: H. Bulkeley, V. Castán Broto, M. Hodson, and S. Marvin (eds.) *Cities and Low Carbon Transitions*, Routledge, London. 126-141. (175 citations)
2. **Evans, J.** and Karvonen, A. (2014) Give me a laboratory and I will lower your carbon footprint! – Urban Laboratories and the Pursuit of Low Carbon Futures. *International Journal of Urban and Regional Research* 38 (2), 413-430. DOI: [10.1111/1468-2427.12077](https://doi.org/10.1111/1468-2427.12077). (292 citations)
3. Voytenko Palgan, Y., McCormick, K., **Evans, J.** and Schliwa, G. (2015) Urban Living Labs for Sustainability and Low Carbon Cities in Europe: Towards a Research Agenda. *Journal of Cleaner Production*. 123, 45-54. DOI: [10.1016/j.jclepro.2015.08.053](https://doi.org/10.1016/j.jclepro.2015.08.053). (369 citations)
4. Trencher, G., Bai, X., **Evans, J.**, McCormick, K. and Yarime, M. (2014) University partnerships for co-designing and co-producing urban sustainability: a global survey. *Global Environmental Change* 28, 153-165. DOI: [10.1016/j.gloenvcha.2014.06.009](https://doi.org/10.1016/j.gloenvcha.2014.06.009). (166 citations)
5. **Evans, J.**, Jones, R., Karvonen, A., Millard, L. and **Wendler, J.** (2015) Living labs and co-production: university campuses as platforms for sustainability science. *Current Opinion in Environmental Sustainability* 16, 1-6. DOI: [10.1016/j.cosust.2015.06.005](https://doi.org/10.1016/j.cosust.2015.06.005). (199 citations)
6. Schliwa, G., **Evans, J.**, Rhoades, J. and Aziz, S. (2015) Sustainable city logistics – Making cargo cycles viable for urban freight transport. *Research in Transportation Business & Management* 15, 50-57. DOI: [10.1016/j.rtbm.2015.02.001](https://doi.org/10.1016/j.rtbm.2015.02.001). (192 citations)

4. Details of the impact

Our findings [3] have been disseminated through >10 invited keynotes at major policy and practitioner events in the UK, Europe and Africa (including The Public Sector Show and Smart to Future Cities, both 2018), end-user reports (hosted at <http://www.urbanlivinglabs.net/p/publications.html>), and a MOOC on Sustainable Cities that has enrolled >60 000 participants globally [A]. Insights on how to scale up ULLs [6] were shared widely through invited keynotes at KU Leuven (Belgium), Makerere (Uganda), Sodermalm (Sweden), Exeter, Sheffield and Leuphana (Germany), and expert advisory roles with leading educational environmental organisations including the International Sustainable Campus Network (ISCN) [B] and the Environmental Association of Universities and Colleges (EAUC) [C].

The application of this research has created significant impacts for local and global beneficiaries.

a) Delivering major sustainability impacts in Manchester

University of Manchester research on ULLs was applied in Manchester through the ESRC IAA award 'Shaping the Future City'. This project worked closely with Manchester City Council to shape their GBP20,000,000 VeloCity investment in cycling. The research team developed and managed a multi-stakeholder experimental ULL approach that significantly enhanced the sustainability impacts of the VeloCity investment and changed the city's approach to cycling. Steve Turner, project partner and former Head of Future Cities at Manchester City Council, states, "the Shaping the Future City project helped transform our approach to cycling and shape

nationally unique Dutch style cycling infrastructure investments worth GBP20,000,000. Evans' research showed demand from local SMEs for low cost delivery solutions like cargo bikes and supported the need for segregated bike lanes, which has increased the number of cyclists across the city. The value of this collaboration was clear in supporting the overall doubling of cycling on the Oxford Road Corridor while helping to attract a further GBP6,000,000 of smart city investment" [D]. Following this success, the University of Manchester ULL approach was adopted as the basis for monitoring and assessment in the GBP22,000,000 EU Horizon 2020 Triangulum project, which aimed to demonstrate, disseminate and replicate solutions and frameworks for Europe's future smart cities. Mark Duncan, Project Lead and Strategic Lead for Resources and Programmes at Manchester City Council, stated that University of Manchester research on ULLs helped *"win the funding and enable partners to frame and generate insights and benefits from more than GBP20,000,000 of innovation activities"* [E]. These benefits included avoided emissions of >2500 tCO₂e and >EUR50,000,000 of leveraged investment across the project [F]. The University of Manchester's contribution was critical to the deployment of 6 e-cargo bikes that replaced >20,000 km of van deliveries between 2017 and 2019, the adoption of 9 e-vehicles that generated a 97% positive user experience and interest from three Manchester organisations in completely electrifying their fleets [F].

Our research on ULLs has also transformed municipal capabilities in Manchester. Mark Duncan [E] identifies how the research has *"developed our understanding of how to frame and monitor real world experiments, resulting in wider engagement within the City Council... [The] approach builds trust, encourages collaboration, and develops and drives genuine value in shared benefits and outcomes. This has generated major benefits in terms of shared data solutions and knowledge transfer, drawing mainstream services into joint work with the University"*. Most notably, the University of Manchester work on ULLs led to a GBP1,000,000 EPSRC investment to establish the Manchester Urban Observatory, which is using sensors and data to support sustainable infrastructure trials. For Steve Turner [D], the research *"changed the way in which Manchester City Council and its partners engage and collaborate with the University"*. Beyond Manchester our approach *"fundamentally shaped"* the EAUC's Living Labs initiative [G]. The initiative has 117 educational establishments signed up who use the ULL principles of addressing real-world sustainability challenges through formal participation and stakeholder partnerships [C] to guide sustainability activities with their host cities [G].

b) Enabling cities in the Global South to develop more sustainable infrastructure

Our research on ULLs has been used by municipal organisations around the world to develop and deliver benefits from sustainable infrastructure. In partnership with Walk21, an international charity dedicated to ensuring the right to walk for people across the world, the ULL approach was used to design and deliver training workshops to 205 urban decision-makers. Attendees included transport managers, police, investors, engineers and planners, across East Africa, South America and the Philippines. The workshops communicated findings concerning the co-production of solutions with communities and the value of testing and monitoring new solutions for walkability in real world settings (framed as 'signature projects').

Attendance at the workshops helped participants to *"establish how they could re-organise their shared responsibilities to be more effective as a city delivery team; clarify how investment in... walking could help deliver more of their country commitments to the Sustainable Development Goals; and better understand where and how to use pilot projects to support walkability across their cities"* [H]. As a result, the workshops delivered walkability action plans that have improved quality of life of a combined population of 5.8 million people across cities in the global south [H]. Feedback surveys conducted at the Philippines workshop confirmed that 94% of 51 participants found the workshop contents relevant [I], and attendees have subsequently used this knowledge to shape new infrastructure. As Jim Walker, founder of Walk21, states: *"the Mayor of Kampala has adopted the action plan and is now implementing the recommendations. In Nairobi the signature project proposed by the group has been implemented improving the safety and security of more than 1 million people at a key [transport] intersection. Without Evans' research and support these changes would not have been imagined let alone made possible"* [H].

5. Sources to corroborate the impact

- A. Enrolment figures from Coursera for Greening the Economy: Sustainable Cities MOOC, August 2020. (Course overview available at https://www.iiee.lu.se/sites/iiee.lu.se/files/sustainable_cities_28_april_2017.pdf)
- B. Testimonial from the Working Group 3 Chair, International Sustainable Campus Network. Received October 2019.
- C. EAUC (2017) A Revolution for Post-16 Education - Part 2: How do Living Labs Work?
- D. Testimonial from the former Head of Future Cities, Manchester City Council. Received October 2019.
- E. Testimonial from the Strategic Lead for Resources and Programmes, Manchester City Council. Received October 2019.
- F. Triangulum Deliverable 2.6: Synthesis Impact Report (January 2020). Available at: <https://ec.europa.eu/research/participants/documents/downloadPublic?documentId=080166e5d0889970&appId=PPGMS> [This output was reviewed by all the Triangulum partners and peer reviewed by Fraunhofer Institute IAO before being approved by the EU]
- G. Testimonial from the CEO of the Environmental Association of Universities and Colleges. Received August 2020.
- H. Testimonial from the founder of Walk21 Foundation. Received October 2019.
- I. Analysis of feedback from STEPS workshop participants, February 2019.