

JOSEPHINE ROPER

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Prior to transport research I have a background in mathematics, civil engineering and worked in road construction. My years in industry were focused on the 'how' of building transport infrastructure. Over time my interest in the 'why' has grown. Pursuing this, I undertook a transport engineering masters and then a PhD scholarship. My passion is to undertake research that creates outputs of practical value to citizens, planners and industry, thus influencing future urban environments. I contribute a broad perspective, energy and pragmatism to the teams I work in.

EDUCATION

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|----------------|--|--------------------------|
| PhD | University of New South Wales, Built Environment
Thesis : "Measuring the potential for walking for transport: development of approaches based on theories of accessibility and mapped perception data"
Supervision: Christopher Pettit (primary), Matthew Ng | 2020-2024 |
| | <ul style="list-style-type: none">• Research elements include:<ul style="list-style-type: none">○ Development of an accessibility index applicable to any mode, using a gravity approach with diminishing returns to opportunities and destination selection based on travel surveys○ Comparison of access between different modes in cities across Australia and some internationally○ Hedonic price modelling using property prices in Sydney for relationship inference with accessibility measures○ Qualitative study of residents' perceptions of perceived walkability using an online participatory mapping questionnaire to capture imprecise knowledge in a rapid and scalable way• Tools: Python open-source GIS ecosystem, R, QGIS. Committed to releasing my work open source. | |
| ME | University of New South Wales, Transport Engineering
Average: 85 (High Distinction)
Core study in traffic management and control, transport planning practice, logistics, transport modelling. Electives in programming, industrial ecology, and engineering ethics. | 2018-2019
(part time) |
| MPE-BSc | University of Sydney, Civil Engineering
BSc majors: Computational science and pure mathematics
MPE major: Structural engineering
Masters thesis: Prediction of extreme wind speeds in Australia using historical thunderstorm data and Weibull distributions | 2008-2013 |

RESEARCH EXPERIENCE

Postdoctoral Researcher, University of Zürich 10/2025-current

As a member of the new Urban Analytics group in the Department of Geography, I will focus on measurement, tracking, and integrating diverse urban datasets to quantify and understand inequalities. A primary responsibility is the Urban Data Hub with the Digital Society Initiative, which aims to bring together a wide range of urban data sources to support multi-dimensional monitoring of cities.

Research Fellowship, Greater Cities Commission, NSW Government 2023

6 month part-time fellowship, producing a [discussion paper](#): "Accessibility to great local places: Understanding the promise of proximity based planning for the Six Cities Region"

Research Assistant, City Futures Research Centre, UNSW 2020-current

- AHDAP (Australian Housing Data Analytics Platform) project
 - contributed data to and presented on the Colouring Australia knowledge exchange platform, which co-ordinates housing and transport data from multiple government agencies and the public.
- Value Australia project – a collaboration with the government Valuer General, one of Australia's major banks, and City Futures to develop automatic property valuation models
 - My PhD was partially funded by this project, and I was able to attend meetings with senior government and industry partners, and learn from researchers with extensive property value modelling experience
- iMove consulting project creating an open data platform for Willoughby City Council to share transport, accessibility, parking and traffic data with their constituents
- Too hot to play: quantifying the impacts of urban climate change on playground activity
 - Ethics application and project startup assistance

Research Assistant, University of Sydney Medical School 2013-2014

- Analysing health data using R and designing maps and graphs for a consulting project for a government health organization
- Assisting other researchers with running statistical tests

TEACHING EXPERIENCE

University of New South Wales 2020-2022

Teaching Assistant, Built Environment and Electrical Engineering

- *GSOE9510 Ethics and Leadership in Engineering*
- *BENV2938 Transport Planning*
- Guest lecturer for *BENV2938 Transport Planning* and *BENV7504 Digital Cities*

- Rated 5.56/6 in student feedback surveys (university-wide average is 5.35)

ENGINEERING INDUSTRY EXPERIENCE

- Lendlease Engineering** 2014-2020
 Prior to my PhD I worked for the civil construction arm of Lendlease, one of the largest Tier 1 contractors in Australia.
- Project Engineer – National Delivery** 2018-2020
- My role within this senior team was to lead the standardisation of project cost forecasting and planning tools across Australia. This involved:
 - Liaising with stakeholders from across the business
 - Creation of new project control tools (primarily spreadsheets involving a high level of VBA programming)
 - Travelling to interstate projects to rollout and train over 100 engineers in the use of the tools I had developed
- Estimator** 2017-2018
- Responsible for estimating on tenders and variations up to \$100 million value, and on much larger projects as part of a team of estimators
- Graduate Engineer** 2014-2016
- Green & brownfield road construction on a 23km section of the Pacific Highway Upgrade - Oxley Highway to Kundabung.
 - Rotating through site engineering roles - earthworks, bridge construction, piling
 - Managing quality assurance, cost forecasting and driving safety, productivity and program day to day on site

PUBLICATIONS

Roper, Josephine, Matthew Ng, Jonathan Huck, and Christopher Pettit. 2024. 'A participatory mapping approach to capturing perceived walkability'. *Transportation Research Part A: Policy and Practice* 186: 104133.

<https://doi.org/10.1016/j.tra.2024.104133>

Roper, Josephine, Matthew Ng, and Christopher Pettit. 2023. 'Incorporating diminishing returns to opportunities in access - development of an open-source walkability index based on multi-activity accessibility'. *Journal of Transport and Land Use* 16(1): 361–387. <https://doi.org/10.5198/jtlu.2023.2308>

Roper, Josephine, Polly Hudson, Henry Petersen, Christopher Pettit, Thomas Russell, and Matthew Ng. 2022. 'Colouring Australia: a participatory open data platform'. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences* X-4/W3-2022 (October): 229–35. <https://doi.org/10.5194/isprs-annals-X-4-W3-2022-229-2022>.

Ng, Matthew Kok Ming, **Josephine Roper**, Chyi Lin Lee, and Christopher Pettit. 2022. 'The Reflection of Income Segregation and Accessibility Cleavages in Sydney's House Prices'. *ISPRS International Journal of Geo-Information* 11 (7): 413.
<https://doi.org/10.3390/ijgi11070413>.

Roper, Josephine, Christopher Pettit, and Matthew Ng. 2021. 'Understanding the Economic Value of Walkable Cities'. In *Urban Informatics and Future Cities*, edited by S. C. M. Geertman, Christopher Pettit, Robert Goodspeed, and Aija Staffans, 277–99. The Urban Book Series. Cham: Springer International Publishing.
https://doi.org/10.1007/978-3-030-76059-5_15.

Jorm, Christine, Chris Roberts, Renee Lim, **Josephine Roper**, Clare Skinner, Jeremy Robertson, Stacey Gentilcore, and Adam Osomanski. 2016. 'A Large-Scale Mass Casualty Simulation to Develop the Non-Technical Skills Medical Students Require for Collaborative Teamwork'. *BMC Medical Education* 16 (1): 83.
<https://doi.org/10.1186/s12909-016-0588-2>.

SELECTED CONFERENCES & MEDIA

Conference Paper, "Capturing Local Market Dynamics with Spatiotemporal Machine Learning: A Case Study of Sydney House Prices", Ng, M., Pettit, C., Lin, Y., **Roper, J.**, Fisk, N., Shabrina, Z., 9th Smart Data Smart Cities (upcoming), University of Tokyo.

Presentation, "A PPGIS approach to capturing citizen's views on perceived walkability", **Roper, Josephine**, Matthew Ng, and Chris Pettit, RGS-IBG, 31st August 2023, London (online).

Conference Paper and Presentation, "Validating walkability indices – a pilot approach," **Roper, Josephine**, Matthew Ng, and Chris Pettit, Universities Transport Study Group, 10th July 2023, Cardiff University.

Workshop, "Colouring Australia: a new open-data platform for Australian cities", Ng, M., Hudson P., **Roper J.** 7th Smart Data Smart Cities and 17th 3D GeoInfo Joint International Conference, 18th October 2022, UNSW.

Poster, "Using the Colouring Australia platform to collect data on perceived walkability", 7th Smart Data Smart Cities and 17th 3D GeoInfo Joint International Conference, 18th October 2022, UNSW. **Awarded runner-up PhD poster prize.**

Presentation, "Walkability: person-scale measurement," **Roper, Josephine**, Chris Pettit, and Matthew Ng, International Geographers Union (UGI-IGU) Congress, 20th July 2022, Paris-Sorbonne.

Conference Paper and Presentation, “Walking accessibility: a new method and comparison of two capital cities,” **Roper, Josephine**, Matthew Ng, and Chris Pettit, Universities Transport Study Group, 5th July 2022, Edinburgh-Napier University.

Presentation, “The real estate value of walkability”, **Roper, Josephine**, Chris Pettit, and Matthew Ng, 17th International Conference on Computational Urban Planning and Urban Management, 9th June 2021, Aalto University (online).

Radio, “How can we make Sydney more walkable?”, ABC Sydney - Mornings program segment, 8th December 2022,
<https://www.abc.net.au/sydney/programs/mornings/walkability/101748922>

Report, “Putting our best foot forward: A checklist for walkable density”, Committee for Sydney, WalkSydney, 12th March 2025, <https://sydney.org.au/wp-content/uploads/2025/03/Doing-density-well-walkable-final.pdf>

Report, “Accessibility to great local places: Understanding the promise of access-based planning for the Six Cities Region”, **Roper, J.** and Pettit, C., City Futures Research Centre, 12th May 2025, <https://doi.org/10.26190/unsworks/31115>

VOLUNTEER AND ADVOCACY WORK

WalkSydney Committee member - Technologist, 2023-2024

Sydney’s peak advocacy body for walking, we prepare submissions, meet with state and local government members and are sought by the media for comment on walking issues in Sydney. My position was also responsible for website and technology management.

Parramatta City Council Active Transport Advisory Committee, 2018-2019

LANGUAGES

English: Native Language

French: approx. CEFR B1