Free & Open Source Urbanism

SOFTWARE FOR URBAN PLANNING

NUS National University of Singapore

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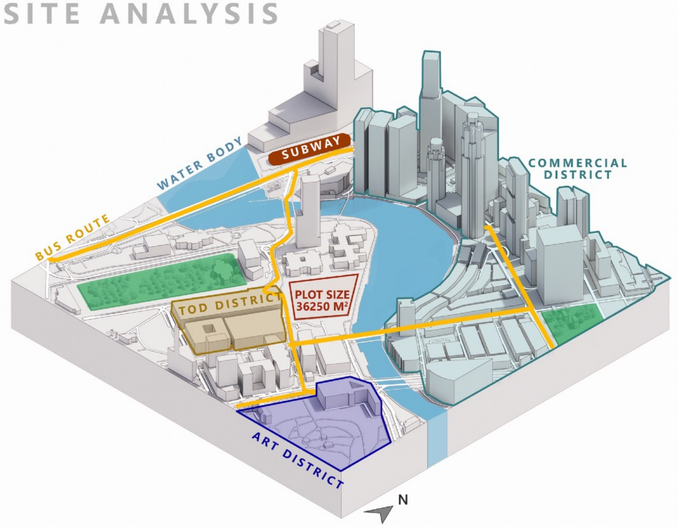
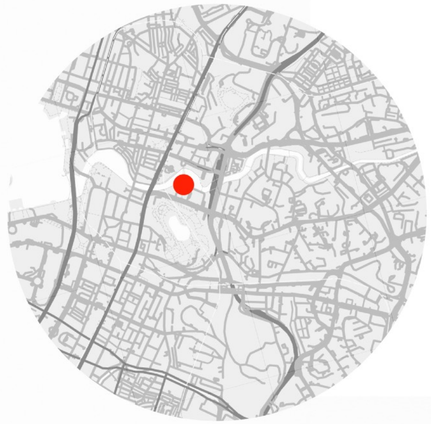
PUBLIC PARTICIPATION

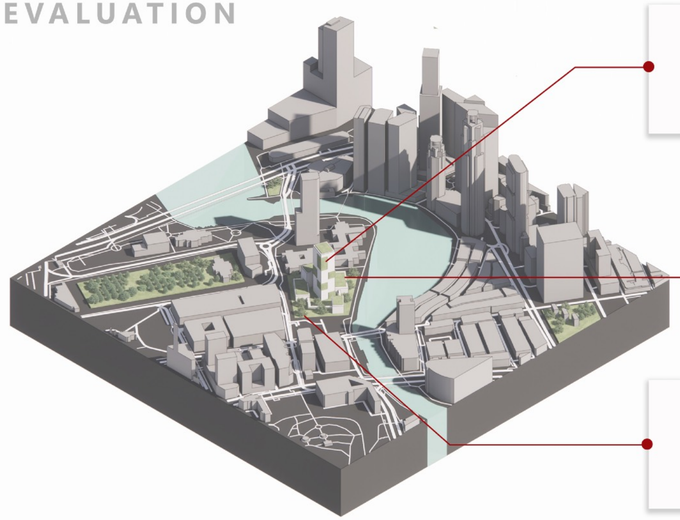
Public Voting

SITE ANALYSIS





MONITORING & EVALUATION

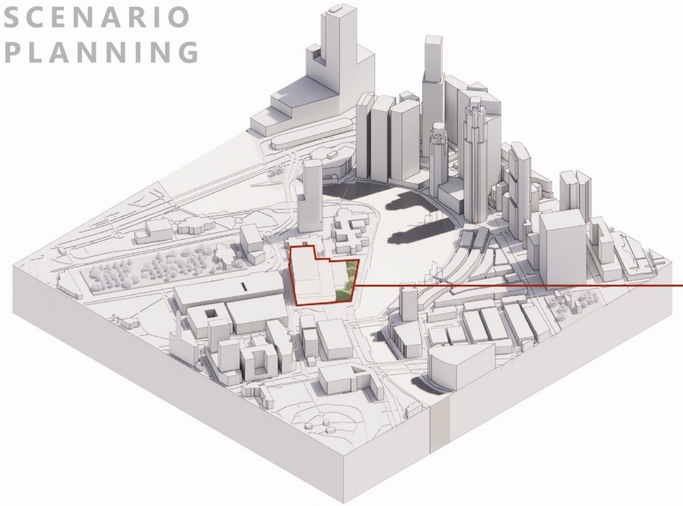


Sustainability and Energy Consumption

Greenery Coverage

Traffic and Accessibility

SCENARIO PLANNING



Design Analysis

Green Plot Ratio (GPR): **115%**
Maximum Height: **85 m**
Plot Ratio: **5.67**

Green Plot Ratio (GPR): **164%**
Maximum Height: **75 m**
Plot Ratio: **5.42**

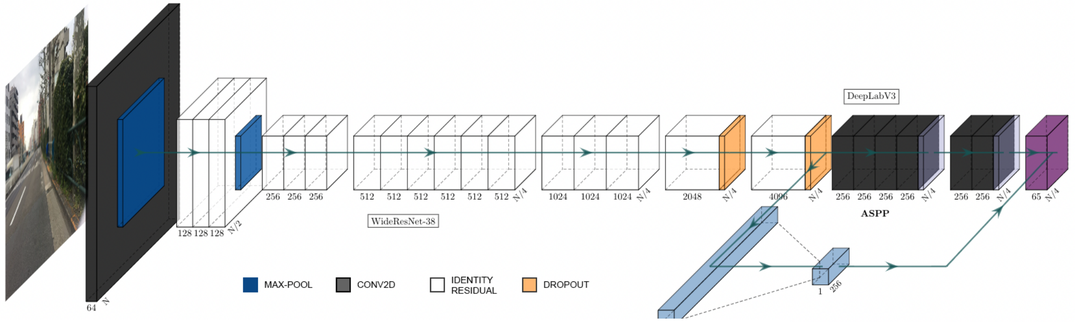
Green Plot Ratio (GPR): **215%**
Maximum Height: **35 m**
Plot Ratio: **3.20**

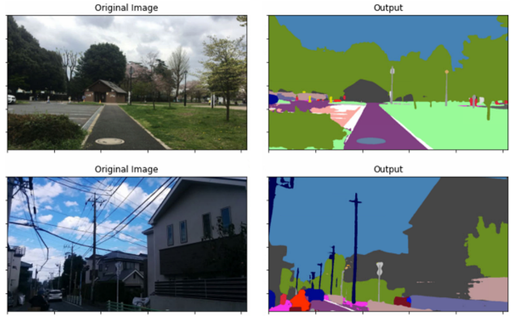
Green Plot Ratio (GPR): **250%**
Maximum Height: **60 m**
Plot Ratio: **4.15**

Yap, W., Janssen, P., & Biljecki, F. (2022). Free and open source urbanism: Software for urban planning practice. CEUS.

Active Mobility Decisions

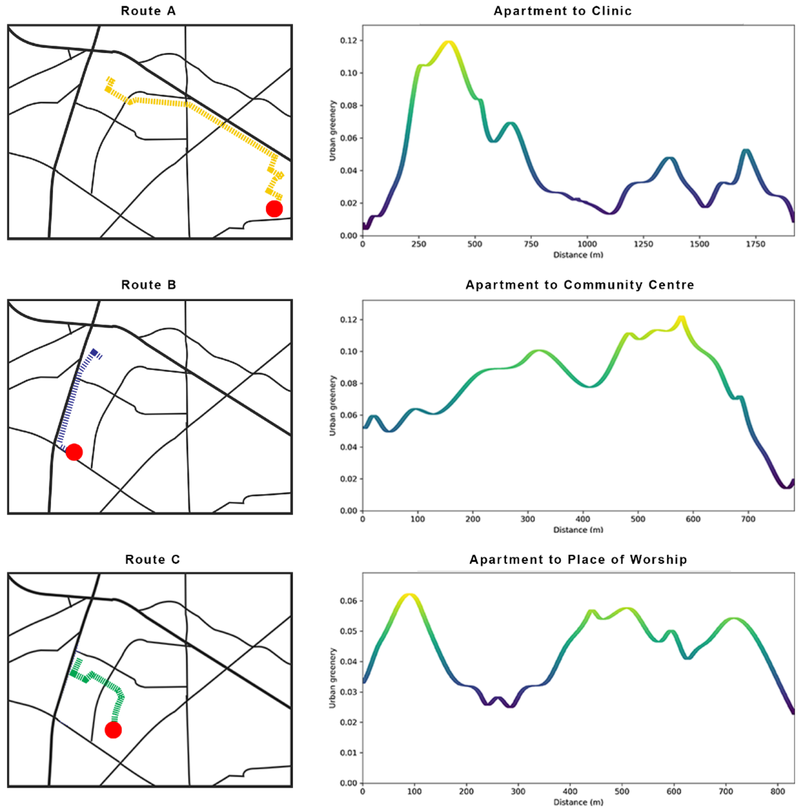
ASSESSMENT WITH CROWDSOURCED STREET VIEW IMAGERY

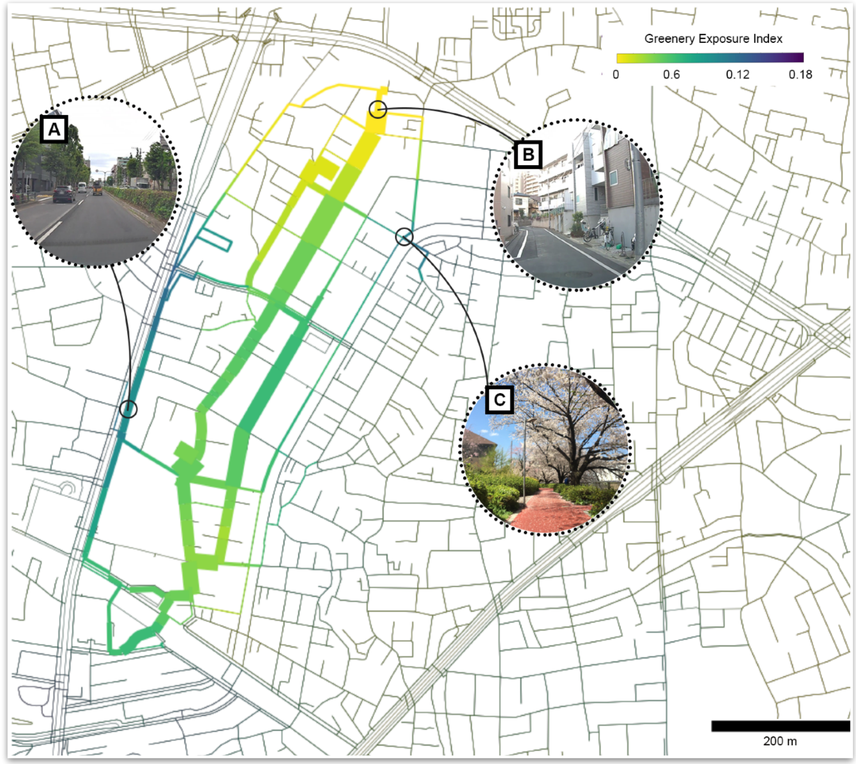


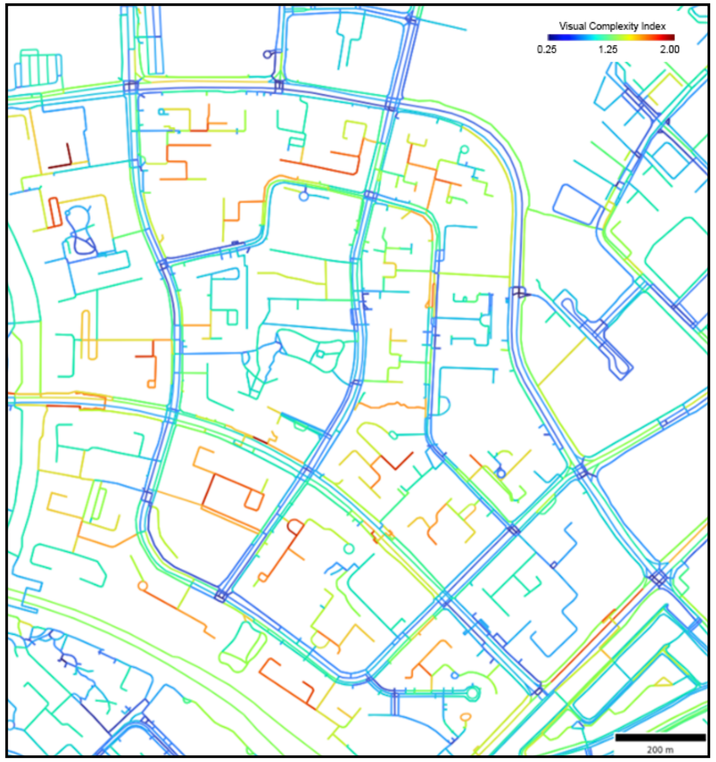


Visual exposure varies along routes

By accounting for semantic information, it is possible propose localised intervention measures and understand how streetscapes contribute to active mobility experiences for various use cases, population groups, and locations. Subject to data availability, our analysis can be replicated at any urban scale and is generaliseable across urban contexts. Visual complexity metric peaks within residential neighbourhoods and are lower along axial roads, Paris Ris estate in Singapore.







Yap, W., Chang, J. H., & Biljecki, F. (2023). Incorporating networks in semantic understanding of streetscapes: Contextualising active mobility decisions. EPB.

Urbanity

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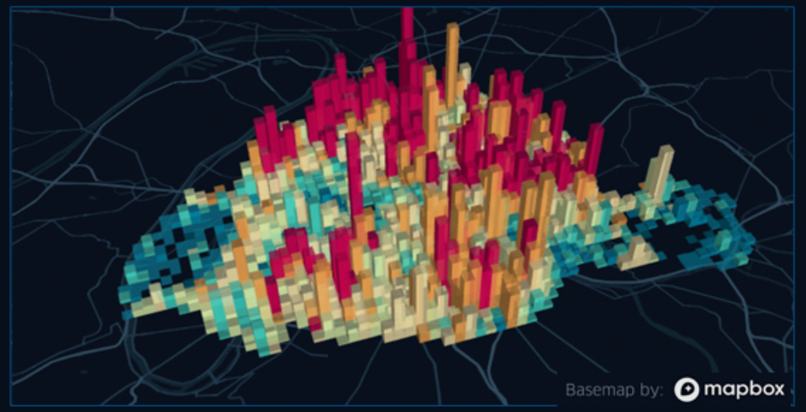
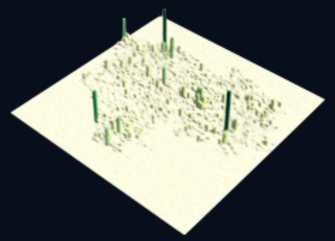
PARIS

POPULATION DENSITY

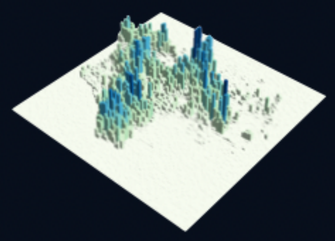


TOKYO

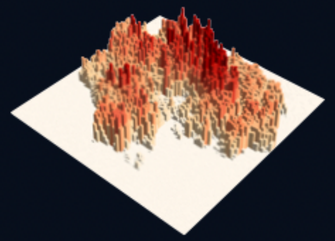
Recreational POI



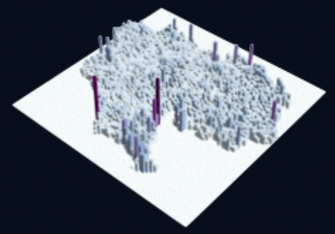
Building Count



No. Of Older Adults



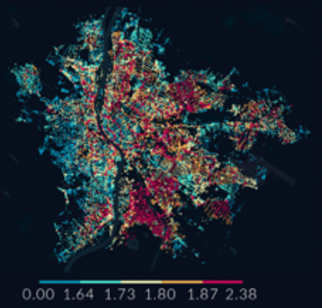
Node Density



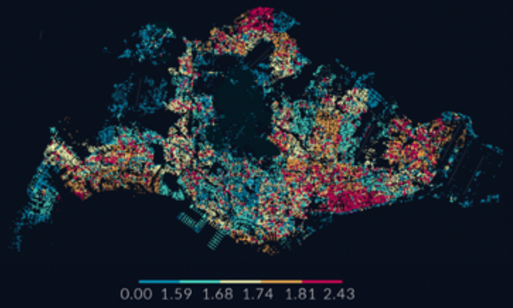
GLOBAL CITIES

DISTRIBUTION OF URBAN VISUAL COMPLEXITY

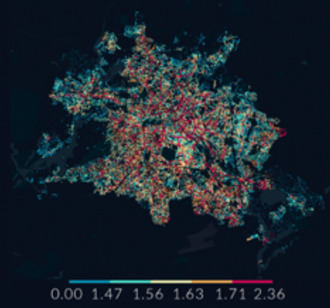
BUDAPEST



SINGAPORE



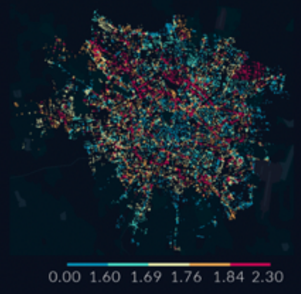
BERLIN



N

BOGOTÁ

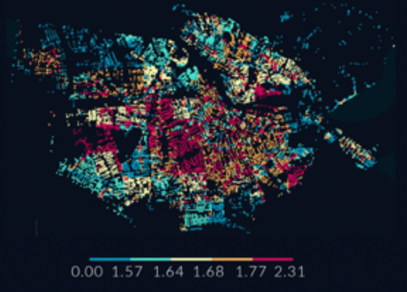
MILAN



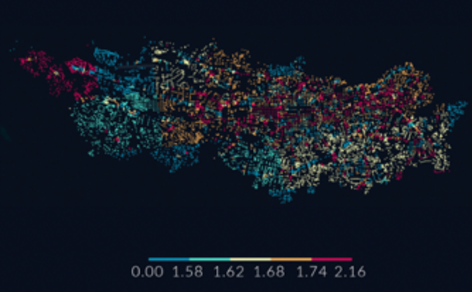
ZAGREB

EDINBURGH

AMSTERDAM



SAN JOSÉ



Yap, W., Stouffs, R., & Biljecki, F. (2023). Urbanity: automated modelling and analysis of multidimensional networks in cities. *npj Urban Sustainability.*

Global Network Dataset

50 CITIES ACROSS 29 COUNTRIES

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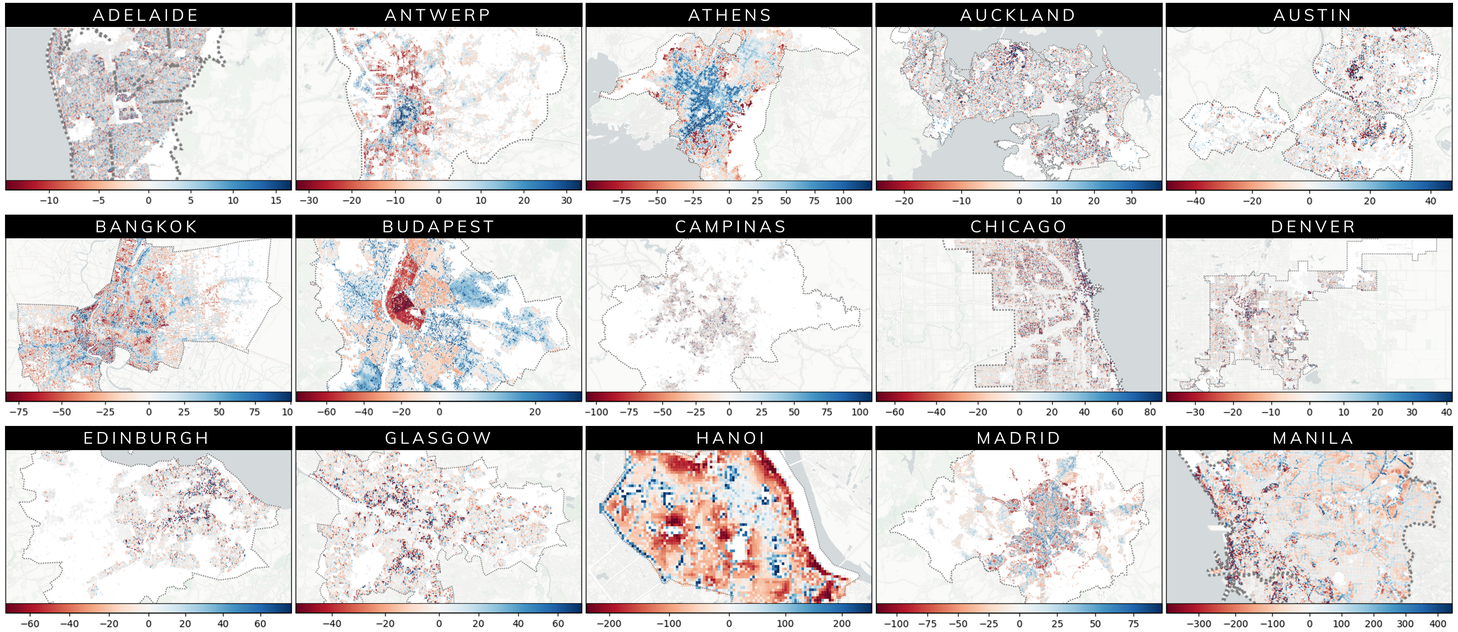

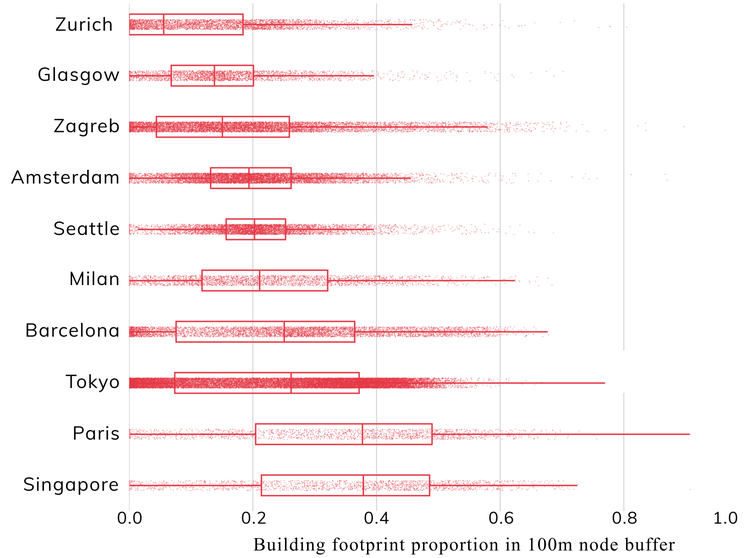

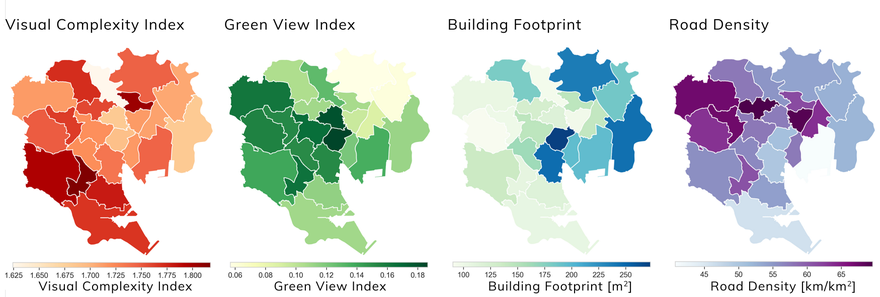

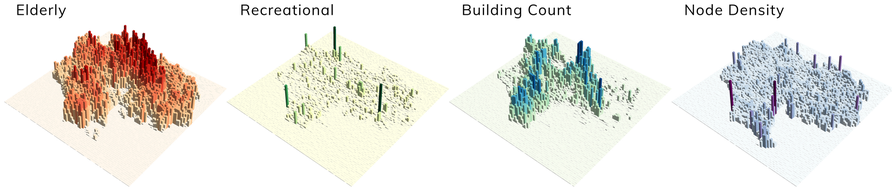

Yap, W., & Biljecki, F. (2023). A global feature-rich network dataset of cities and dashboard for comprehensive urban analyses. Scientific Data.

Decarbonising Cities

CITY-SCALE BUILDING EMISSIONS PREDICTION

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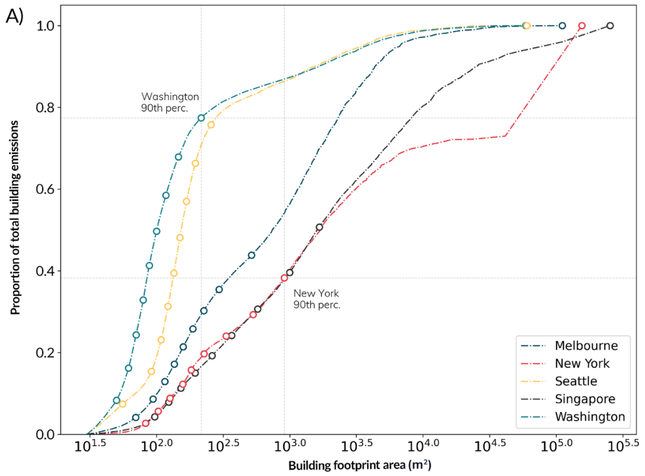
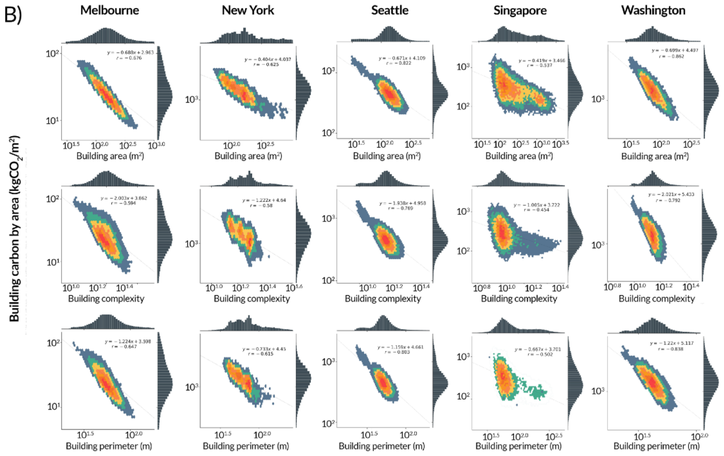
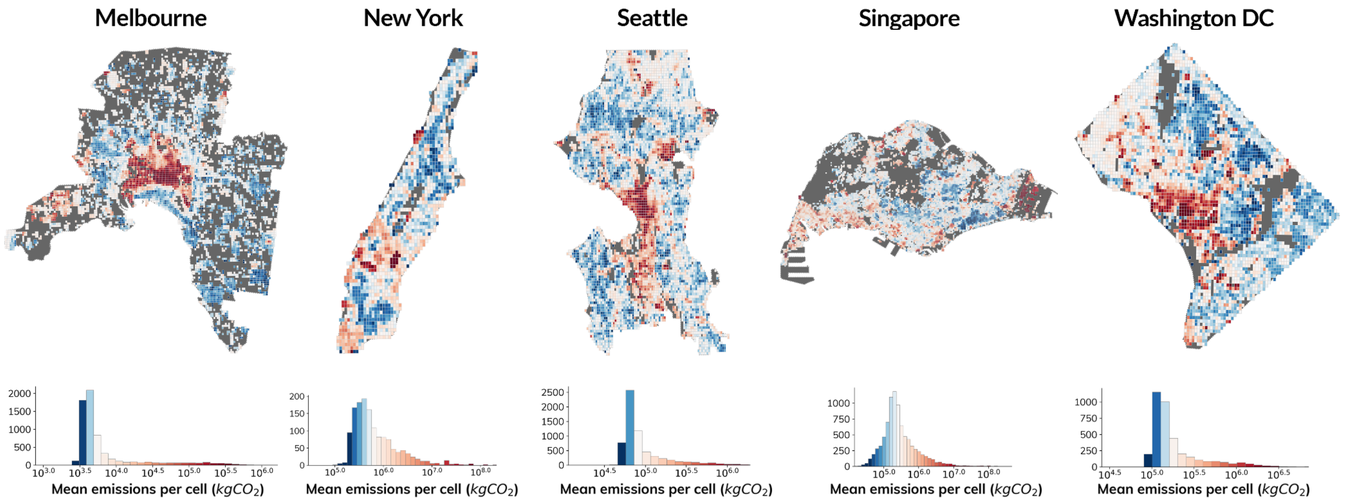
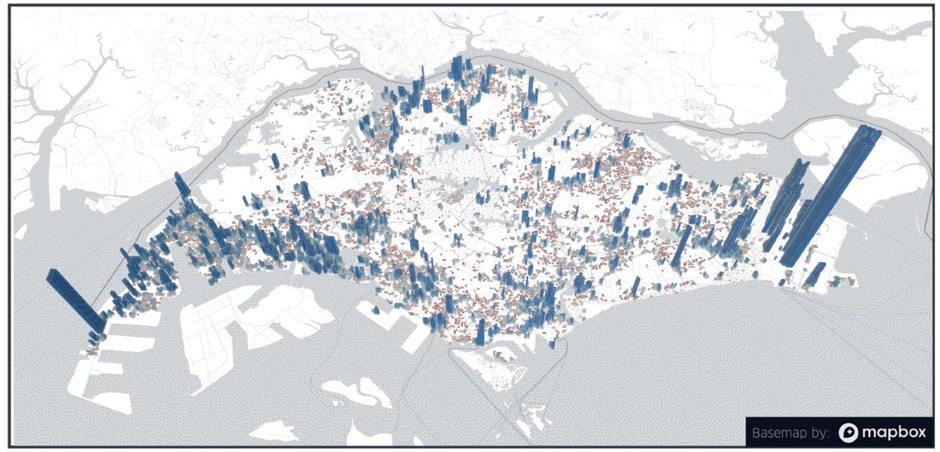
Carbon profile of cities matches their historical planning context

Small buildings make up the largest proportion of carbon emission for cities like Seattle and Washington which have a long history of low-rise development and expansive urban sprawl. Meanwhile Melbourne's carbon footprint grows proportionately with building size, reflecting the city's suburban to urban transition over the last century. Dense cities like Singapore and New York City (Manhattan) have most emissions concentrated in the largest buildings. Moreover, all cities exhibit "economies of carbon" with larger buildings being more carbon efficient.



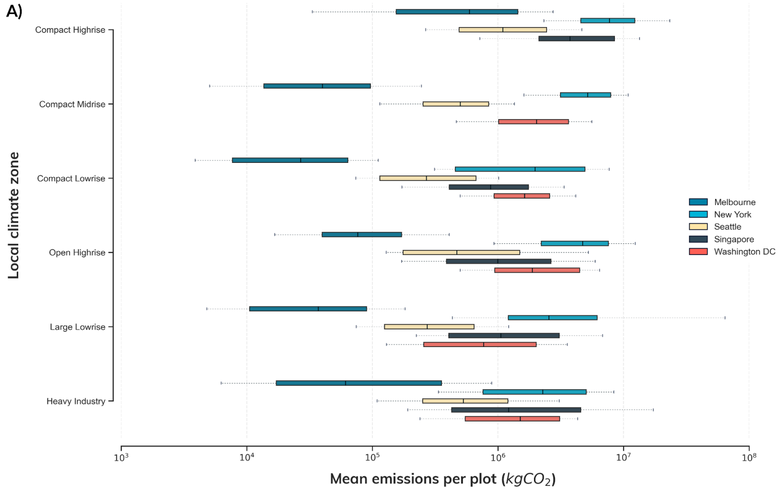






Urban economics and urban form affect building emissions

The types of urban and economic activities and typology of urban forms all play a significant role in explaining heterogeneity in building emissions across the built landscape. Better land use mix (as indicated by diversity of jobs) was found to be associated with lower emissions for urban districts. Local climate zones show a consistent trend across cities.



Yap, W., Wu, AN., Miller, C & Biljecki, F. (2024). Revealing city-scale building operating carbon dynamics across multiple cities with open science. Under review.