City Analytics, Smart cities and sustainability

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City Analytics

Is a digital toolkit comprising a set of frameworks and methods to support collaborative city planning and user centred design.
City Analytics

“This course will play an integral role in growing the skill set and culture of data driven evidence based policy and decision making across our cities, both in Australia and Internationally.”

Professor Chris Pettit, Director of Discipline

https://www.be.unsw.edu.au/postgraduate-degrees/city-analytics/about
City Analytics

Digital Planning
Decision Support
Scenario planning
Geodesign
Big Data
Open data
Dashboard
Data analytics
Modelling
Simulation
Usability
Visualisation
Virtual Reality
City Analytics
Supporting Smart Cities

Open data solutions

Value capture

30 minute cities

Smart Cities Plan for Australia (2016)
CityData
Store, discover and share - data for city analytics and decision-making

44 Layers
Click to search for geospatial data published by other users, organizations and public sources. Download data in standard formats.

15 Maps
Data is available for browsing, aggregating and styling to generate maps which can be shared publicly or restricted to specific users only.

34 Users
CityData allows registered users to easily upload geospatial data in several formats including shapefile and GeoTiff.

https://citydata.be.unsw.edu.au/
Bicycle Air Quality Monitoring: VOCs (0-25pm sensor), Sir Joseph Banks Park, 26 August 2017

https://citydata.be.unsw.edu.au/
Smart Buildings

Eye-catching myair devices display CO₂.

Each device has a unique public URL to explore the data.

At the centre of each myair is a precision Telair T6713 CO₂ sensor.

The myairs report continuous data from 65 rooms in the Red Centre.
City Dashboards

http://citydashboard.be.unsw.edu.au/
Dashboards for City Resilience

Geodesigning future cities

Geodesign is a design and planning method which tightly couples the creation of design proposals with impact simulations informed by geographic contexts.

Flaxman (2010)
Sydney South East Catchment
Geodesigning future cities
Living, Breathing Plan
Greyfields urban regeneration

Lower Carbon

- Reduced travel distances/ accessible amenities
- Better, more accessible public transport
- Lower energy consumption housing forms

HASSELL, 2015

Financially attractive

- Better utilization of existing infrastructure
- Unlocking underutilized land value.

2 x no dwellings/ floor area
2 x public space
Greening the Greyfields
Greening the Greyfields

This is what WILL occur
(BAU: lot-by-lot development)

This is what COULD occur
(precinct-scale development)
Greening the Greyfields
Greening the Greyfields

The study promotes...

- **Data-driven approaches**
- **Development Transparency**
- **Environmental Performance**
- **Collaborative Planning & Design**

Importance of the study
RAISE Project Collaboration
RAISE Objectives:

- Develop open, cloud-based architecture to combine data, models, and visualisation.
- Develop an interactive scenario explorer ‘toolkit’.
- Explore collaborative visualisation methods.
- Apply toolkit to automated valuation modelling.
- Apply toolkit to land value uplift modelling.
Value uplift from transportation infrastructure
Value uplift modelling – transit infrastructure

Rapid Analytics Interactive Scenario Explorer (RAISE)
RAISE data driven Approach

Rapid Analytics Interactive Scenario Explorer

Analysis

Collaboration

Location

Intelligence
Property valuation model
Value uplift Functionality
Parramatta Light Rail options
Sydney Metro North West
RAISE workshop
Randwick Living Lab Co-design exercise
PLuS ALLIANCE

ARIZONA STATE UNIVERSITY
PHOENIX

KING'S COLLEGE
LONDON

UNSW
AUSTRALIA
SYDNEY
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Indicator 11.2.1: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities

Monitoring: This indicator will be monitored by the proportion of the population that has convenient access to public transport. The access to public transport is considered convenient when an officially recognized stop is accessible within a distance of 0.5 km from a reference point such as a home, school, workplace, market, etc. Additional criteria for defining public transport that is convenient include:

a. Public transport accessible to all special-needs customers, including those who are physically, visually, and/or hearing-impaired, as well as those with temporary disabilities, the elderly, children and other people in vulnerable situations.
b. Public transport with frequent service during peak travel times.
c. Stops present a safe and comfortable station environment.

Total public transport stations/stops within 500m

Sydney
Population
~5 million (Metro)

London
Population
~9 million (Greater London)

Phoenix
Population
~4.5 million (Metro)

Pune
Population
~6.75 million (Metro)
Total public transport stations/stops within 500m

London

Scale 1:100,000
Projection British National Grid EPSG:27700
Stop Source OpenStreetMap (OSM)
Total public transport stations/stops within 500m

Sydney

Scale 1:100,000
Projection Map Grid of Australia – Zone 56
Stop Source Transport for NSW GTFS
Total public transport stations/stops within 500m

Phoenix

Scale 1:100,000
Projection Arizona State Plane EPSG:26949
Stop Source Valley Metro GTFS
Total public transport stations/stops within 500m

Pune

Scale 1:100,000
Projection Indian Grid IND-IIIA-M
Stop Source OpenStreetMap (OSM)
Concluding thoughts

- **City data stores** and **dashboards** can support **community engagement** and transparency in decision-making – smart city 3.0

- **Digital planning tools** need to be part of the smart city agenda.

- **Rapid Analytics** can be use for exploring **What if? city scenarios**.

- **Open source** and **open data** can deliver be **very costed effective** solutions.

- **Training and Education** – absolutely critical we train the next generation of city planners, policy-makers with skills in smart cities, big data, city analytics…. 
Thank-you!

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