Future Directions of the Australian Urban Research Infrastructure Network

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AURIN

• Established in 2010, funded through NCRIS

• Led by the University of Melbourne

• Funding of ~$17mill over the next 5 years (2018-2022)

  • Urban planners, Demographers, Social Scientists,

  • Economists, Political Scientists, Behavioural Scientists, Public health scientists,

  • Policy makers, Infrastructure planners
AURIN Network

Hugo Centre for Migration and Population Research
AURIN Workbench

- **4800 Datasets**
  - 85% licensed under Creative Commons
  - Demographic & Social Indicators; Economic Activity; Land Use; Urban Design; Housing; Health & Livability; Infrastructure & Transport; Industry & Employment

- **100 Data Providers**

- **100 Spatio-statistical analysis, modelling and visualization tools**
  - Walkability analyses
The AURIN Map

- Free and open source, fast data viewer
- Displays the distribution of a range of indicators/indices across Australia
- [www.map.aurin.org.au](http://www.map.aurin.org.au)
The AURIN APIs

- Allows programmatic access to data – from desktop GIS, Web, mobile apps, R tools
The AURIN Portal

- AAF - Authenticated Access
- Free to university staff/students & govt employees, across Australia
- Enables researchers to download/upload local datasets
• Where are particular jobs or industries clustering? How do these clusters change over time?
• How does health and well-being vary from one suburb to another?
• What will be the impact of a new policy change - on different socio-economic indicators?
Housing affordability and stress in Sydney

Image sourced from Pettit, Tice & Randolf (2017). Contact: Prof. Chris Pettit <c.pettit@unsw.edu.au>
Optimum Location of Healthcare Hubs

Identify optimum location of healthcare hubs within walking distance of train/tram stops

Image sourced from Sanci et al. (2015). Contact: Prof. Lena Sanci <l.sanci@unimelb.edu.au>
Measuring Museum Soft Power

Combines ticket sales data and socio-demographic ABS Census data sourced through the AURIN Workbench to understand museum patronage at ACMI.

Image sourced from Grincheva et al. (2018). Contact: Dr. Natalia Grincheva <natalia.grincheva@unimelb.edu.au>
Walkability of train stations in City of Moonee Valley

Image produced by AURIN via the AURIN portal. For more information contact: outreach@aurin.org.au
Walkability to bus stops on bus routes

Image produced by AURIN via the AURIN portal. Contact AURIN for more information: outreach@aurin.org.au
Future Directions

• New technological platforms
  – Cloud, Terria.JS (3D globe), MAGDA/CKAN

• New partners - Govt depts and NGOs

• New data types/case studies & services
  – Sensors/IoT, Twitter (real-time data streams)
  – 3D/4D
  – Machine learning/AI – data mining, pattern detection
    – video/audio/image recognition
  – Predictive spatio-temporal & scenario modelling
3D/4D City Models
**Graphs**

- This graph shows the number of commuters using each mode of transport to get to work.

**Journey to Work Data Visualization**

- This circular plot shows the linear commute distance and the corresponding number of commuters for each origin/destination.

**Top 10 Origins:**

- This graph shows the top 10 origins with the highest number of commuters.

**Map**

- This map shows the actual route between a given origin and destination.

**Maximum distance between origin and destination:** 12.5 km

**Sydney Inner City: 2752**

- Median Commute Distance: 30 (km)
- Median Commute Time: 14.49 (min)
- Average CO₂ Emissions (Car only): 0.6(g)
- Active Transport Indicator (walk or cycling): 80%

**Number of people commuting from Chatswood - Lane Cove:** 2,752

**Label indicators:**

- **Origin / Destination**
- **Linear distance**
Real-time Smart City Apps

• **Smart Parking** – monitoring and notification of parking spaces
• **Smart Lighting** – intelligent, weather adaptive LED street lights
• **Smart Roads** – alerts based on roadworks, accidents, major events,
• **Smart waste management** – optimize rubbish collection routes
New Directions

• New functionalities
  – Indicators & indicator registries
    • Walkability, QualityOfLife, Affordability
  – Reproducability of indicators underpinning decisions
  – Predictive spatio-temporal & scenario modelling

• New disciplines/application areas
  – Evidence-based policy making & programs, Nudge theory
  – Infrastructure planning & service provision
  – Social & environmental determinants of population health
  – Immigration, population growth
  – Disruptive technologies e.g., Airbnb, autonomous vehicles, drones
Federated Architecture

Qld Node
Griffith, UQ, JCU, Qld Govt

Qld Research Infrastructure Co-Investment Fund

NSW Node
UNSW
UoW
Uni Newcastle

ACT Node
ANU
CanU

SA Node
Flinders
UAdelaide

Vic Node
Uni of Melb (LEAD)
RMIT
Swinburne

Standardized APIs - shared access to datasets & analytical services distributed across the nodes
Future Research

Augmented Reality – delivering real time city data

http://www.enukesoftware.com/
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