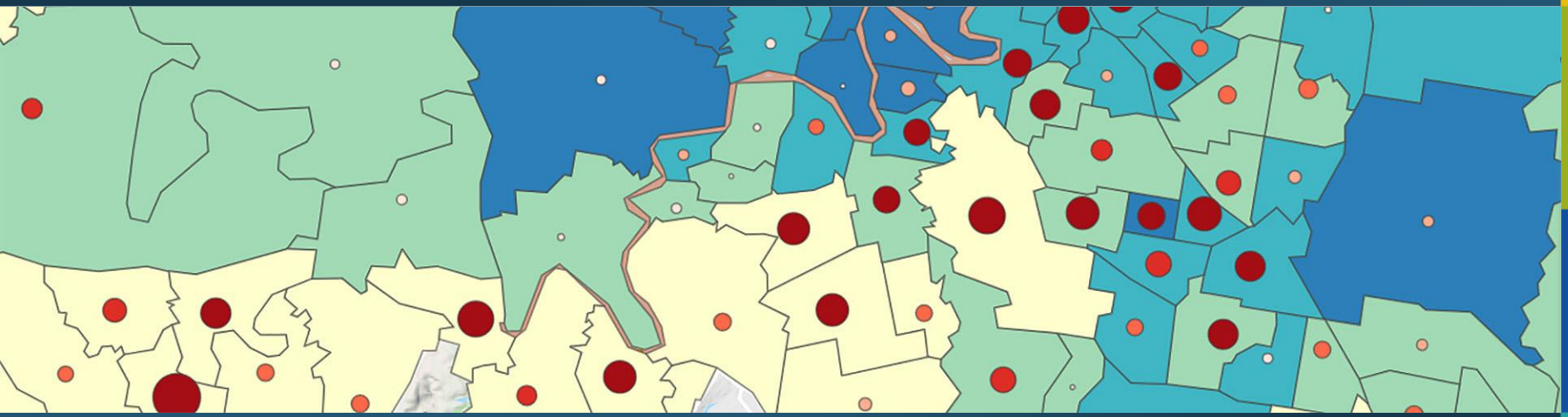
Future Directions of the Australian Urban Research Infrastructure Network



AURIN
aurin.org.au

Jane.Hunter@unimelb.edu.au

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

THE UNIVERSITY OF MELBOURNE

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

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

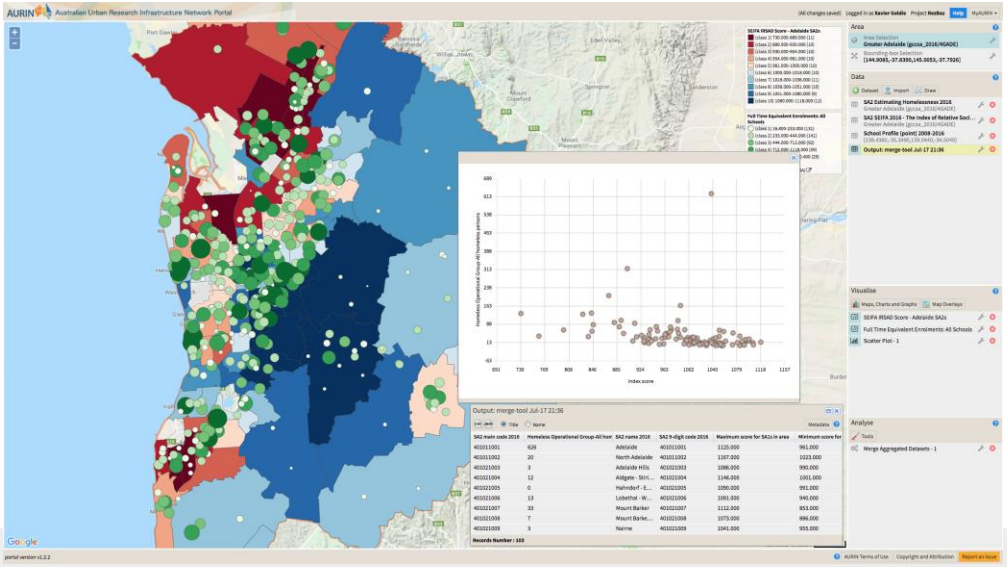
AURIN Network

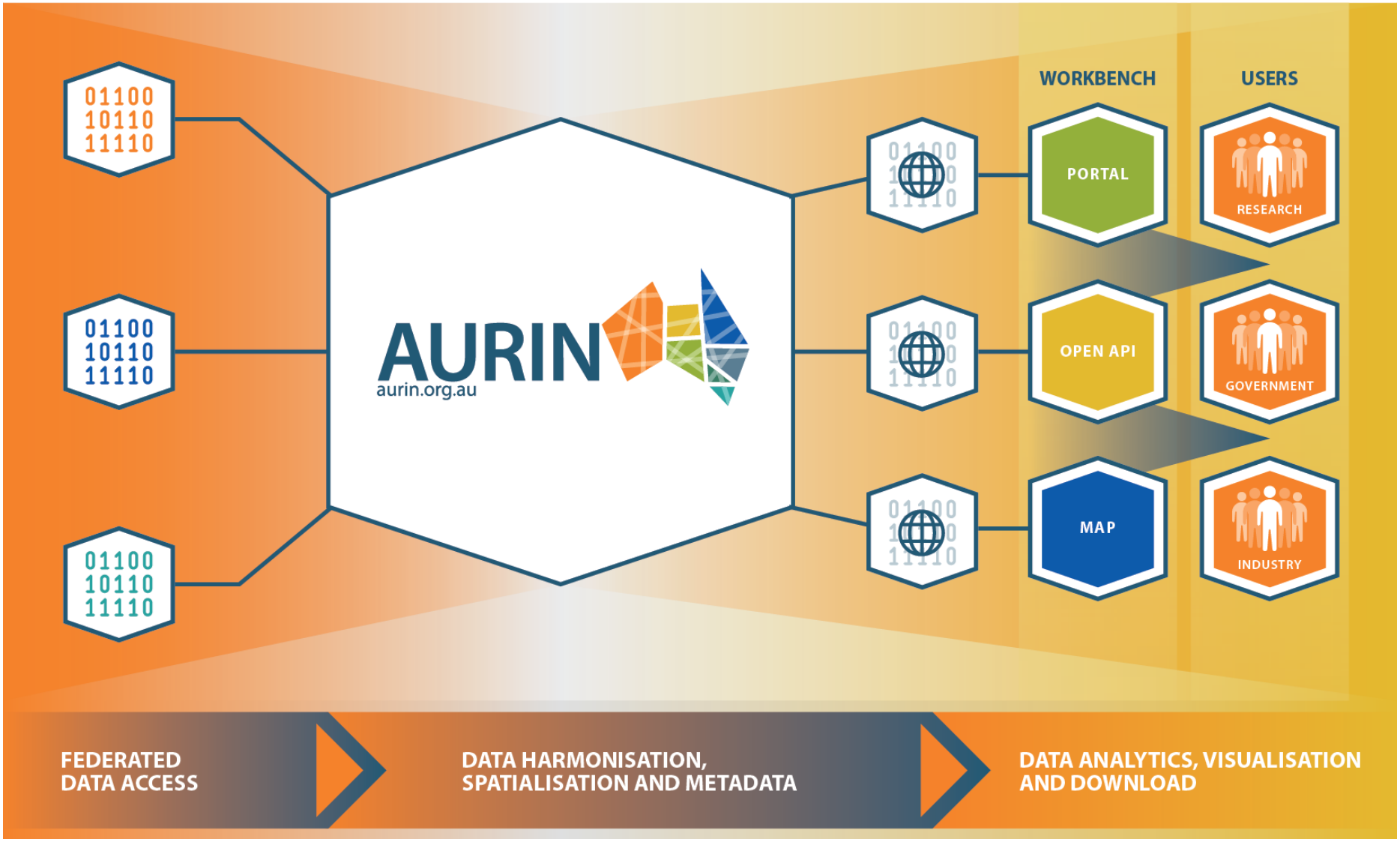
AURIN Workbench

> 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

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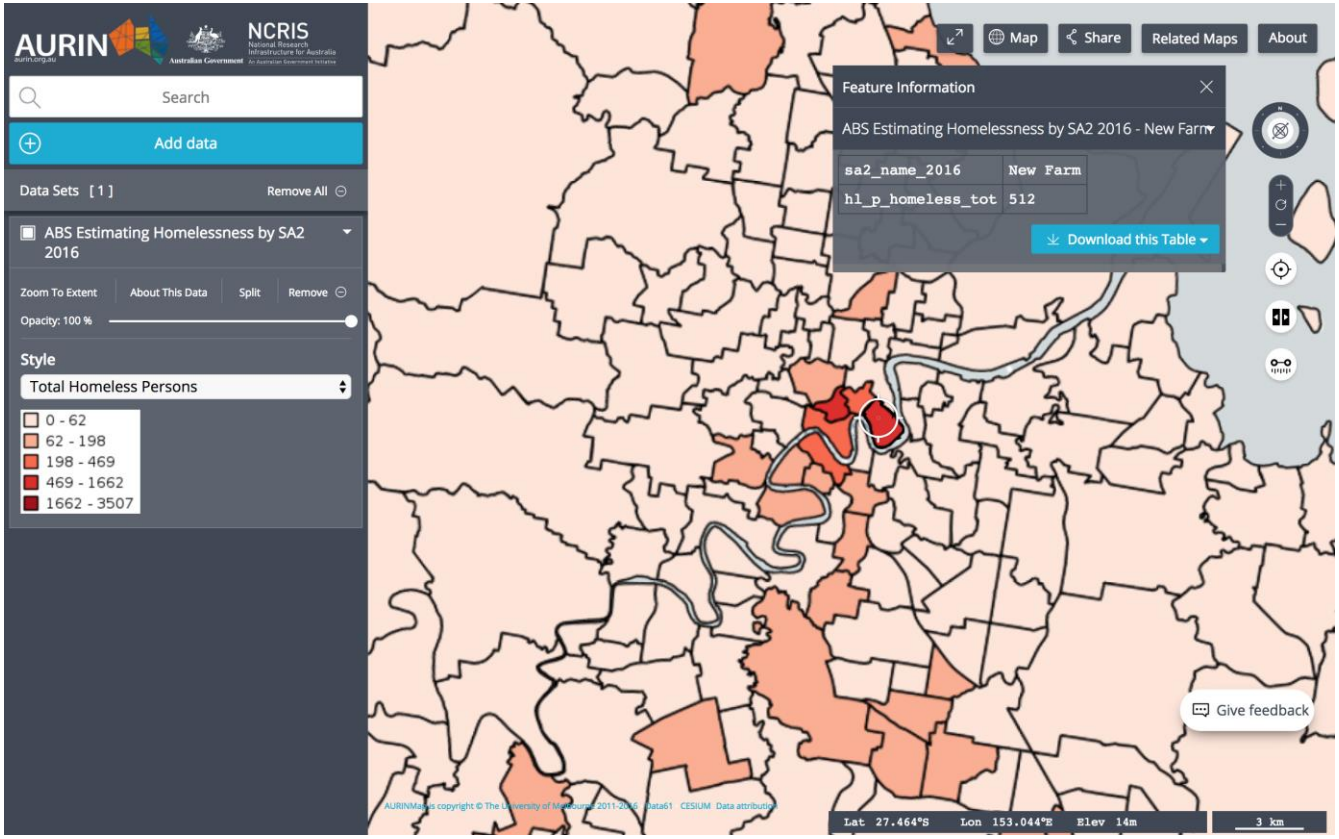
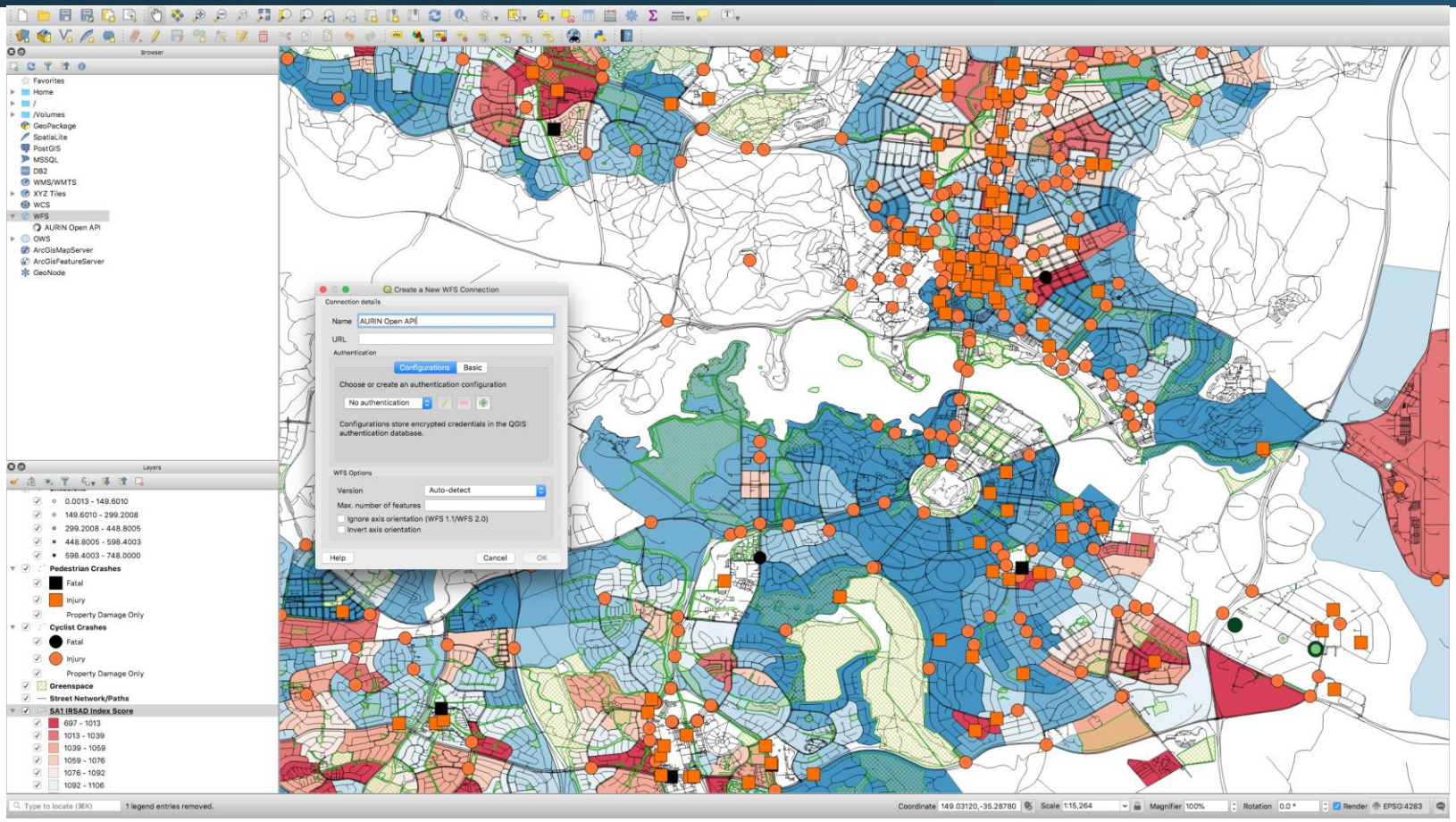
AURIN
aurin.org.au
WORKBENCH
USERS
PORTAL
RESEARCH
OPEN API
GOVERNMENT
MAP
INDUSTRY
FEDERATED
DATA ACCESS
DATA HARMONISATION,
SPATIALISATION AND METADATA
DATA ANALYTICS, VISUALISATION
AND DOWNLOAD

The AURIN Map



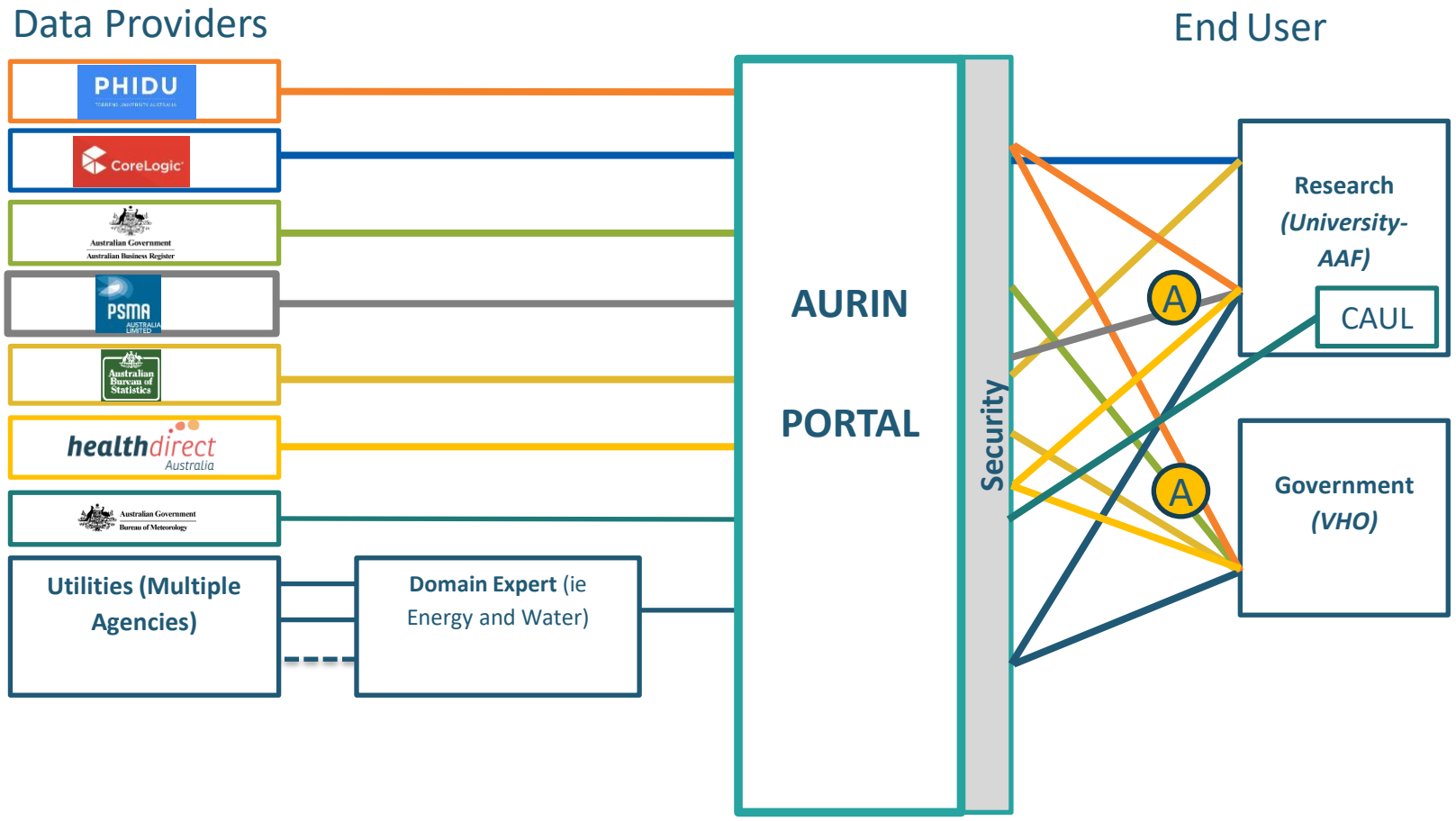
- Free and open source, fast data viewer
- Displays the distribution of a range of indicators/indices across Australia
- www.map.aurin.org.au

The AURIN APIs



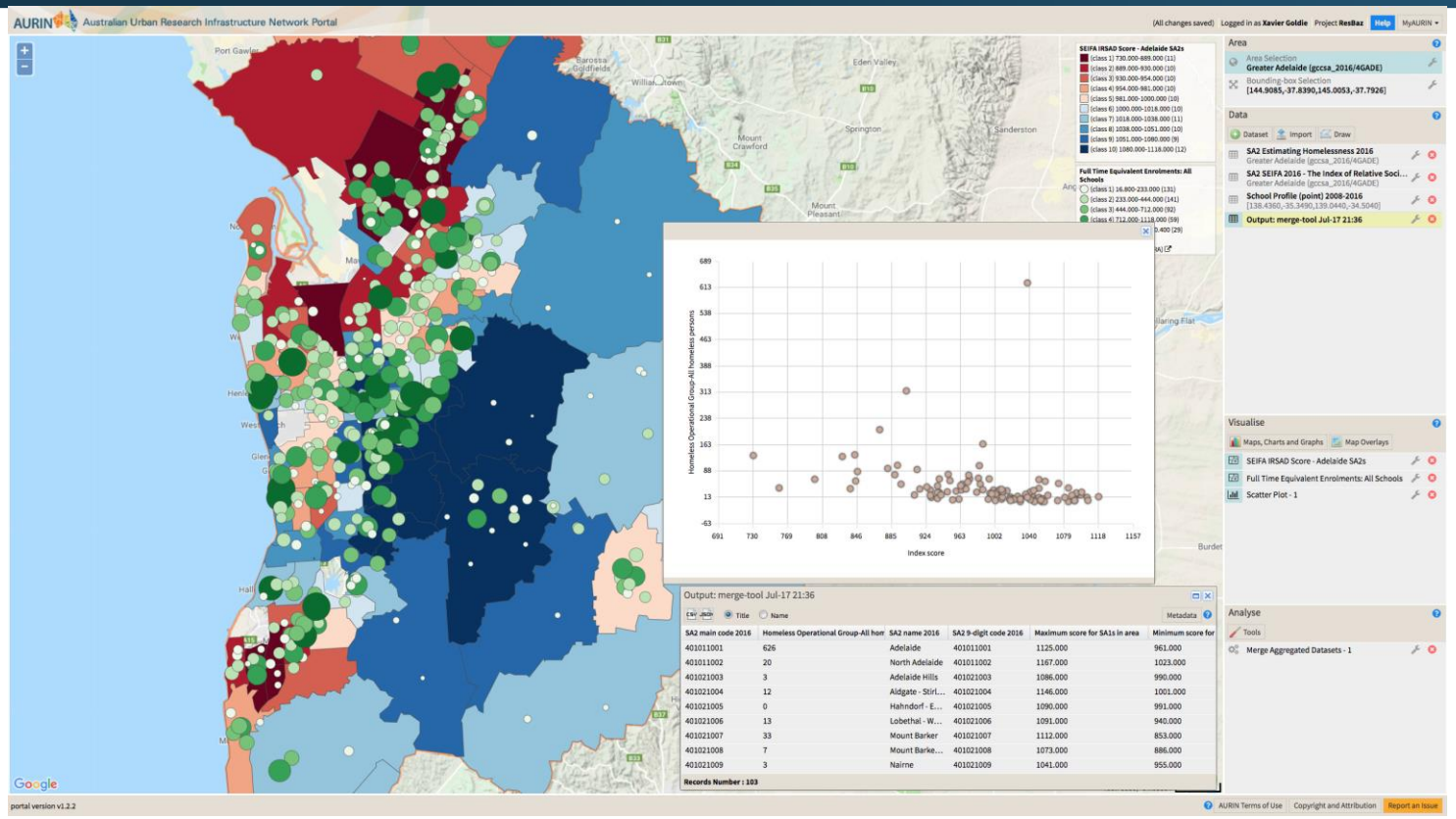
- Allows programmatic access to data – from desktop GIS, Web, mobile apps, R tools
- http://www.aurin.org.au/aurin-apis

The AURIN Portal



- AAF - Authenticated Access
- Free to university staff/students & govt employees, across Australia
- Enables researchers to download/upload local datasets

The AURIN Portal



- 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?

RESEARCH IMPACT

Housing affordability and stress in Sydney

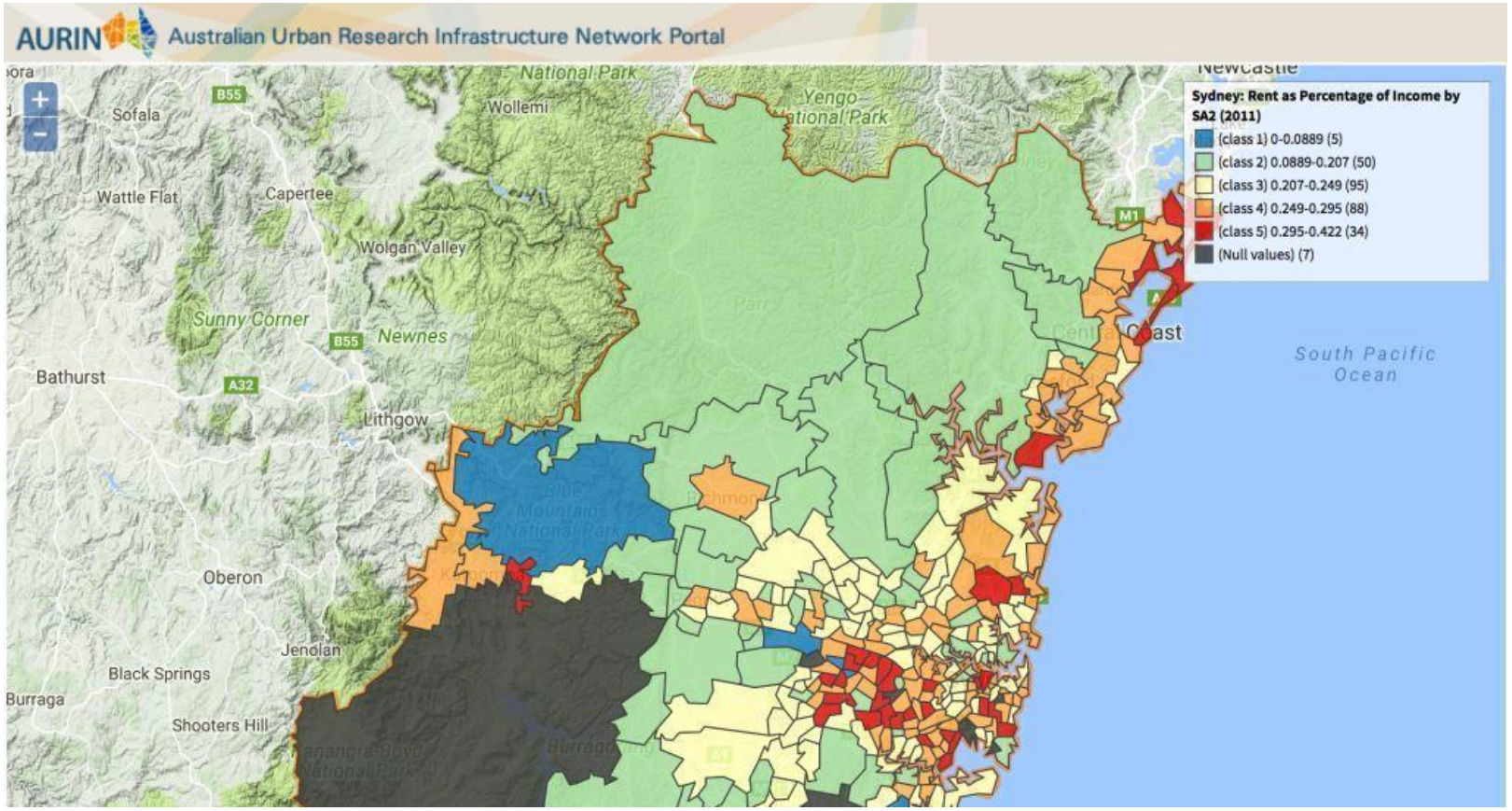
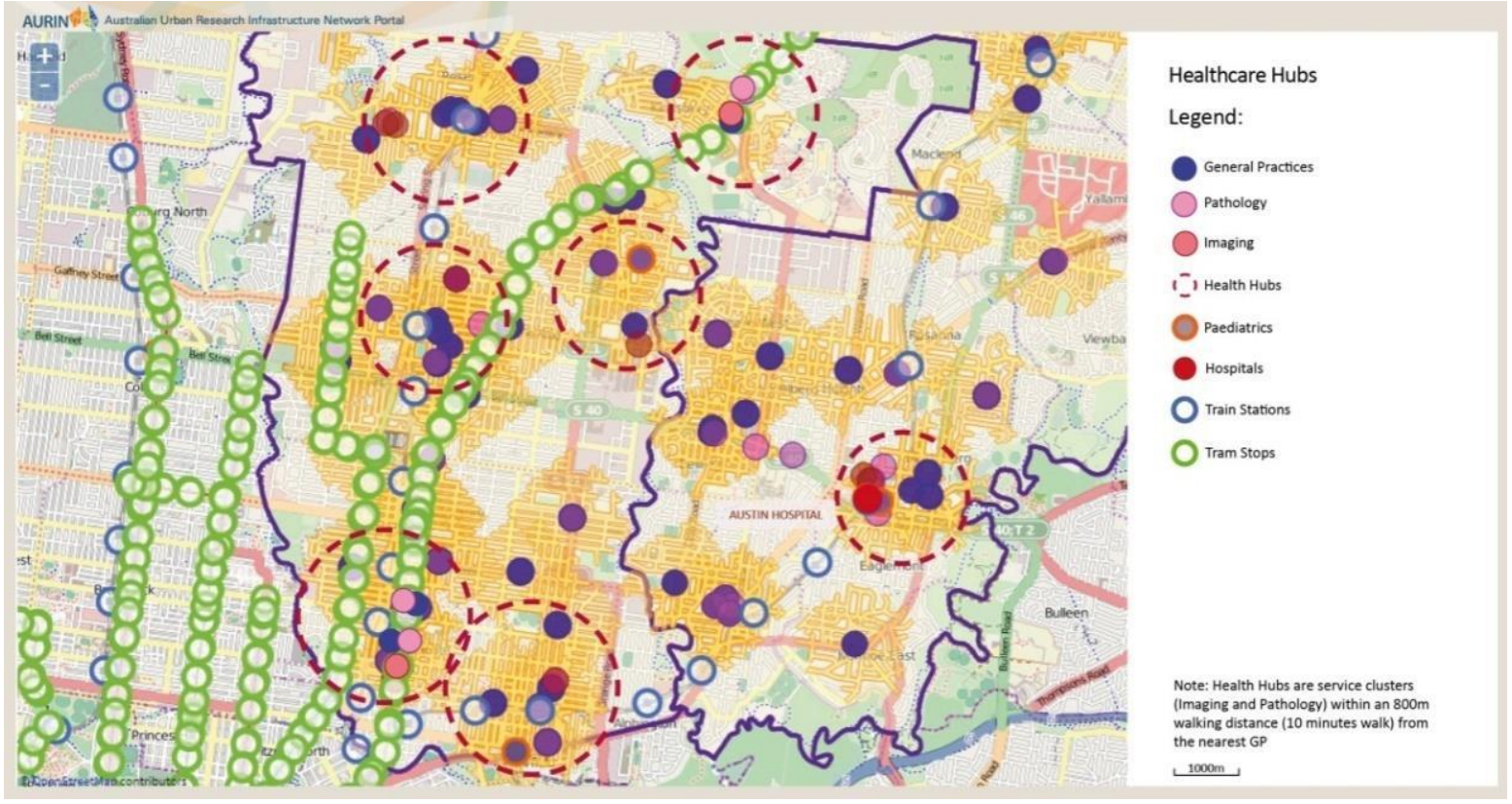


Image sourced from Pettit, Tice & Randolf (2017). Contact: Prof. Chris Pettit <c.pettit@unsw.edu.au>

Optimum Location of Healthcare Hubs

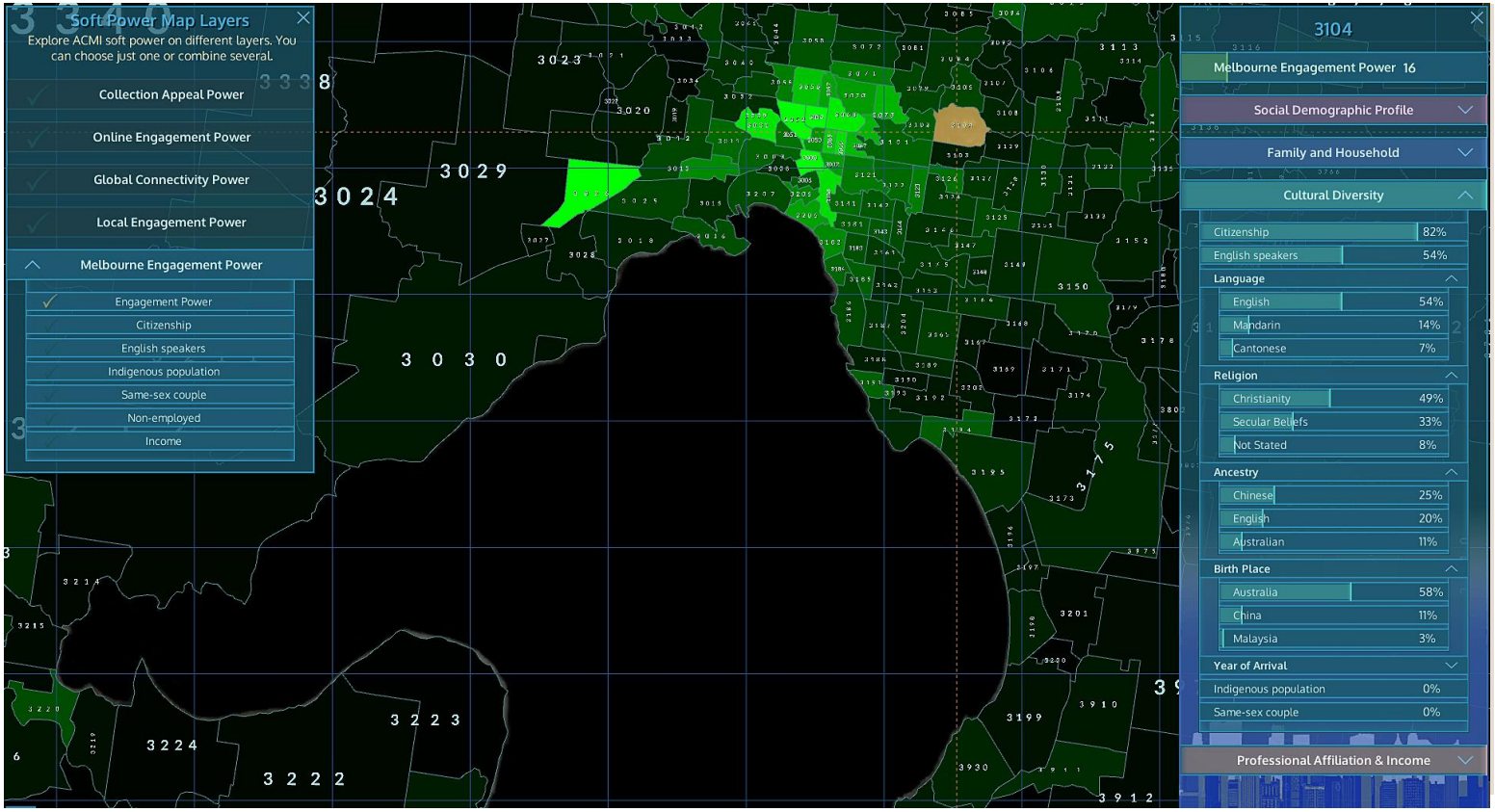


Identify optimum location of healthcare hubs within walking distance of train/tram stops

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

RESEARCH IMPACT

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 TOOLS

Walkability of train stations in City of Moonee Valley

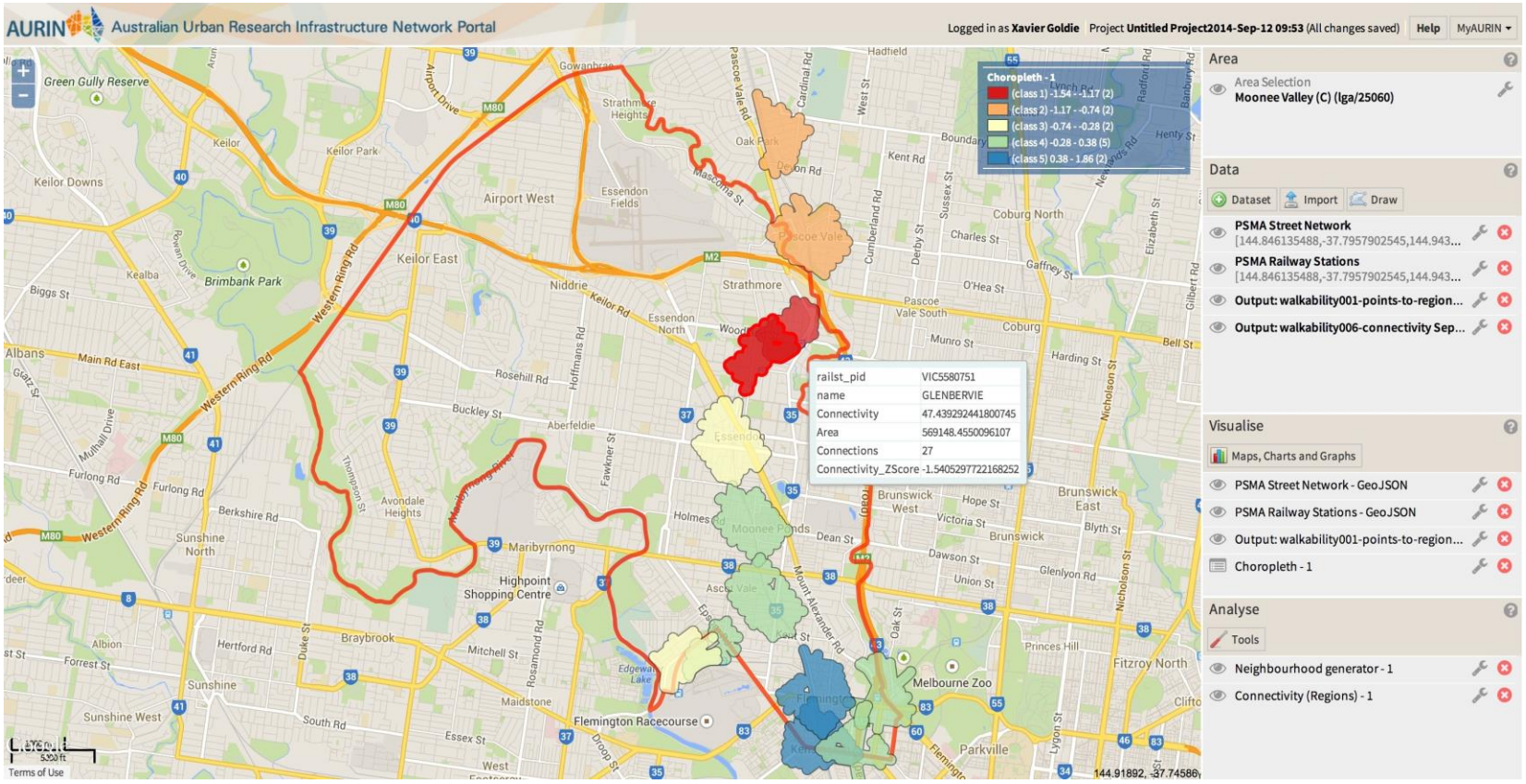


Image produced by AURIN via the AURIN portal. For more information contact: outreach@aurin.org.au

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

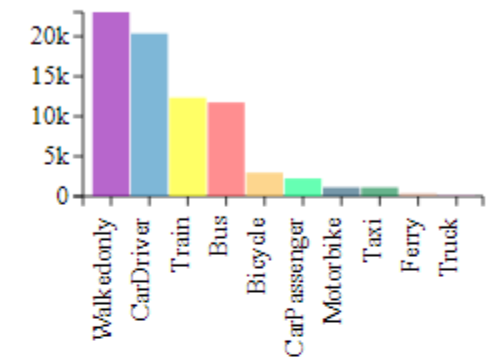
- New technological platforms
  - Cloud, Terria.JS (3D globe), MAGDA/CKAN
- New partners - Govt depts and NGOs
- New data types/case studies & services
  - Sensors/IoT, Twitter (real-time data streams)
  - 3D/4D
  - Machine learning/AI – data mining, pattern detection – video/audio/image recognition
  - Predictive spatio-temporal & scenario modelling

3D/4D City Models

Graphs

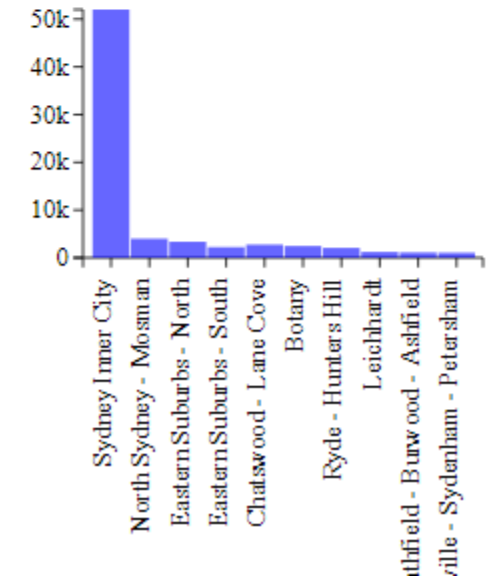
* This graph shows the number of commuters using each mode of transport to get to work.

Modes:



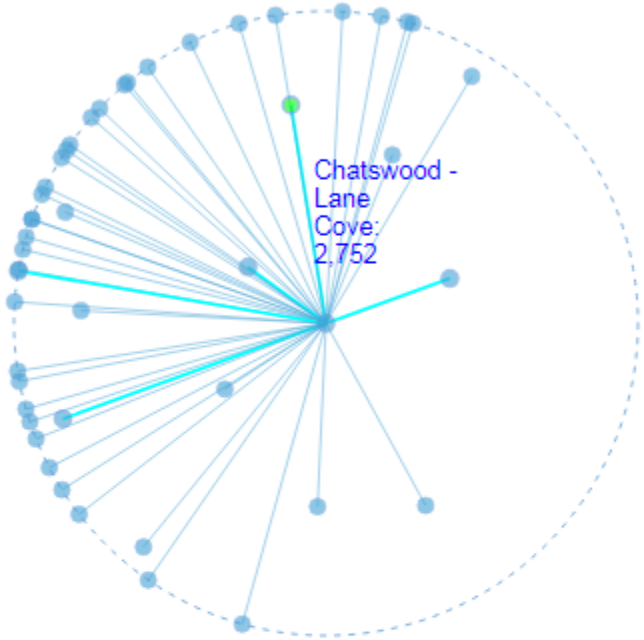
* This graph shows the top 10 origins with the highest number of commuters.

Top 10 Origins:



Journey to Work Data Visualization

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



Maximum distance between origin and destination: 12.5 km

Number of people living in **Sydney Inner City** : **2752**
Median Commute Distance: **30 (km)**
Median Commute Time: **14.49 (min)**
Average CO_2 Emissions (Car only): **0.6(g)**

Active Transport Indicator (walk or cycling): **80%**
Number of people commuting from **Chatswood - Lane Cove** :**5**

Label indicators:

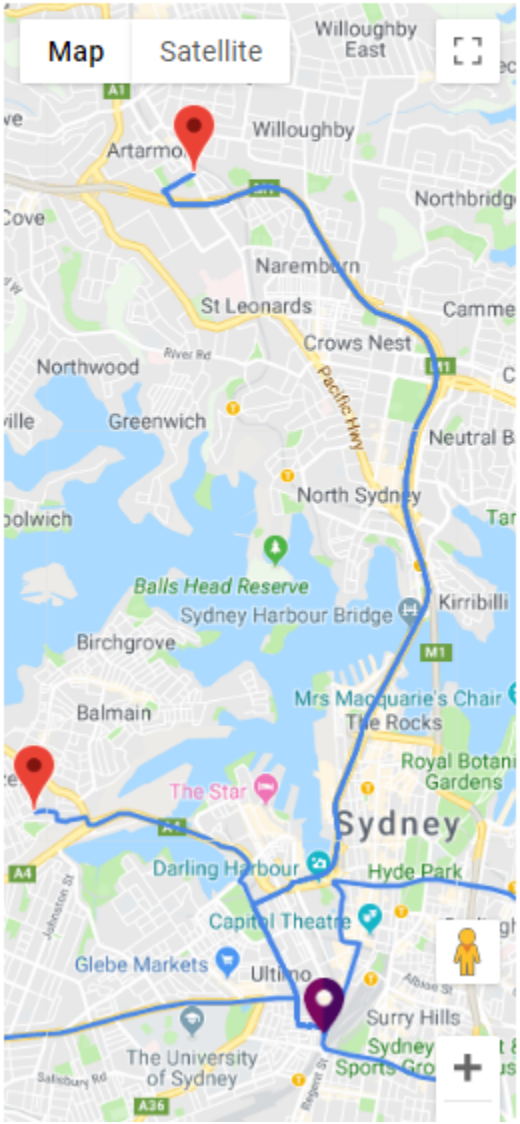
Origin / Destination

Linear distance

Map

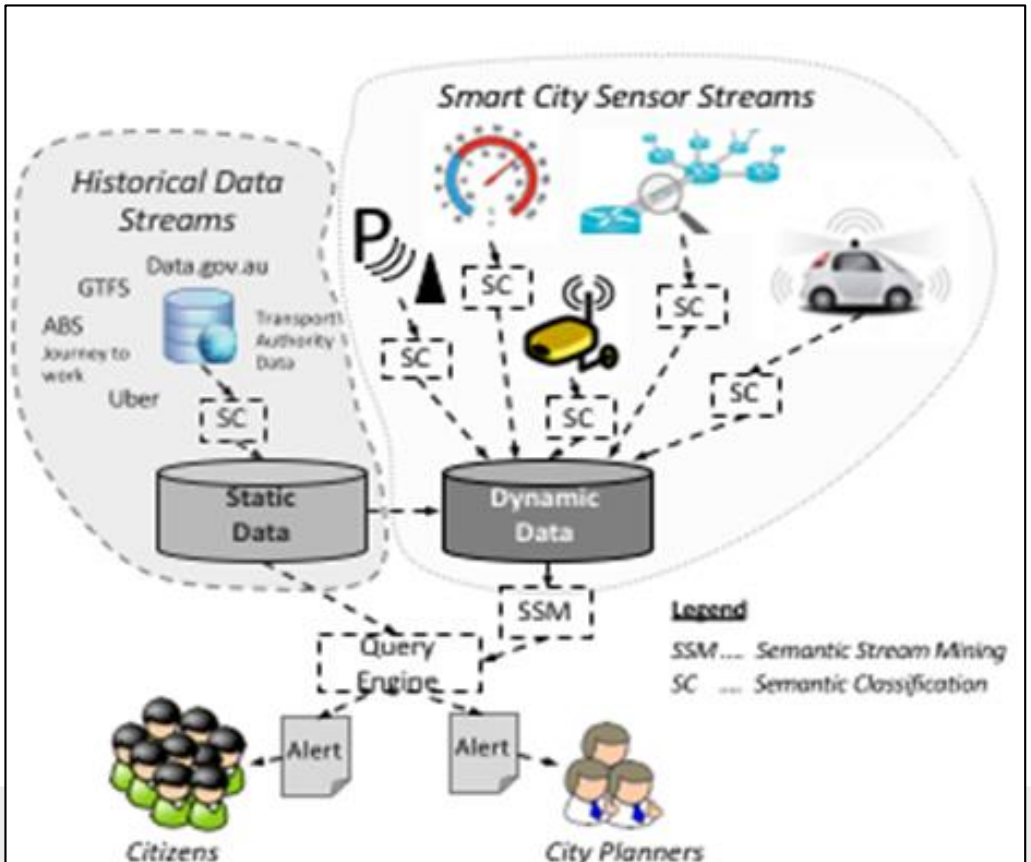
* This map shows the actual route between a given origin and destination.

Linear distance: **Under construction**
Real distance: **Under construction**



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

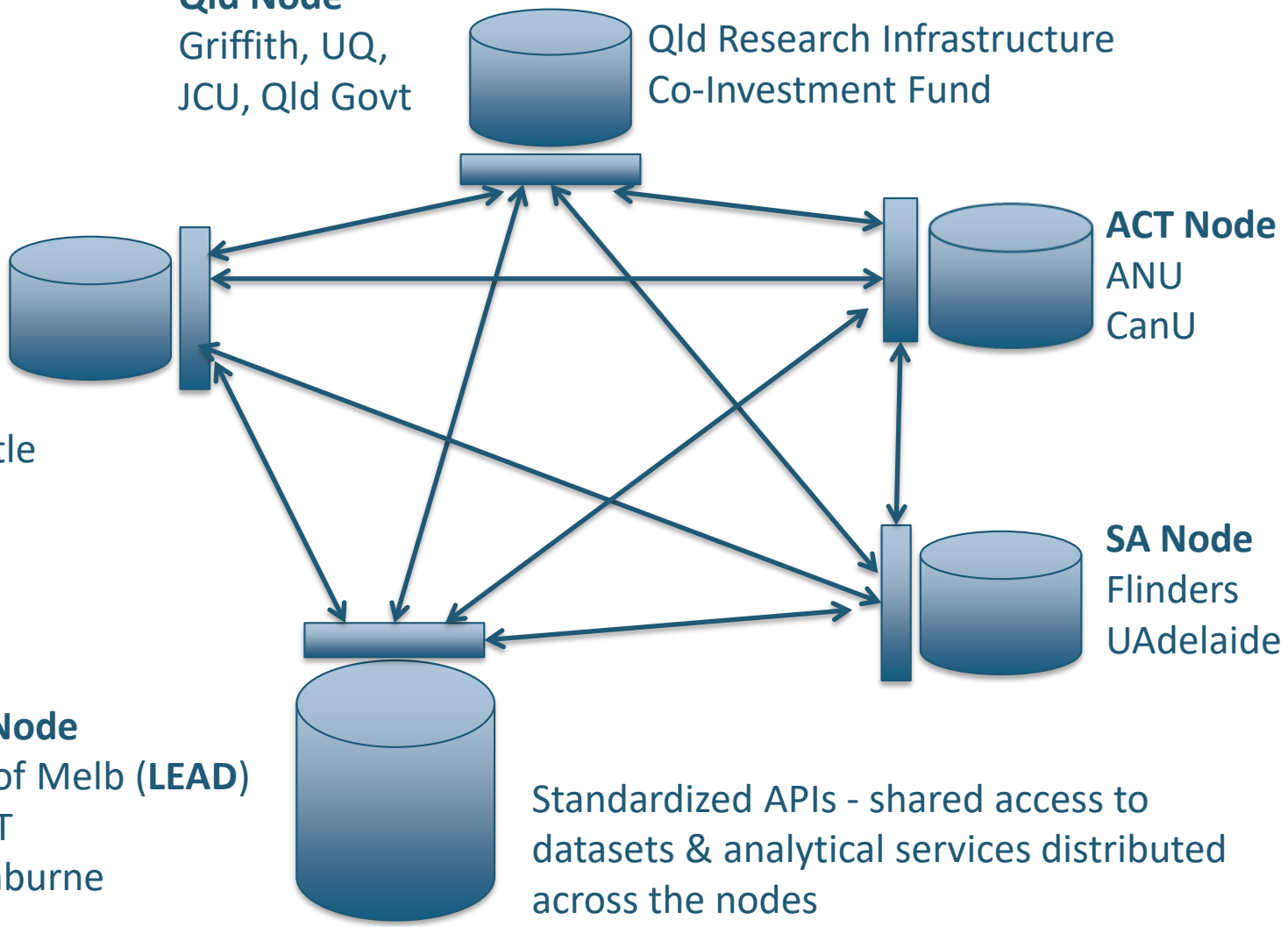


New Directions

- 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



Future Research

Augmented Reality – delivering real time city data

http://www.enukesoftware.com/

Acknowledgements

Funding for AURIN has been provided by the Australian Government under the National Collaborative Research Infrastructure Strategy (NCRIS) and associated programmes.

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