

AURIN

Delivering Modern Digital Infrastructure to the Urban Research Community

eResearch Australasia 2023 - National Collaborative Endeavours

Dr Loren Bruns Jr



AURIN's Context



Australian
Urban
Research
Infrastructure
Network



National
Collaborative
Research
Infrastructure
Strategy

AURIN's Context



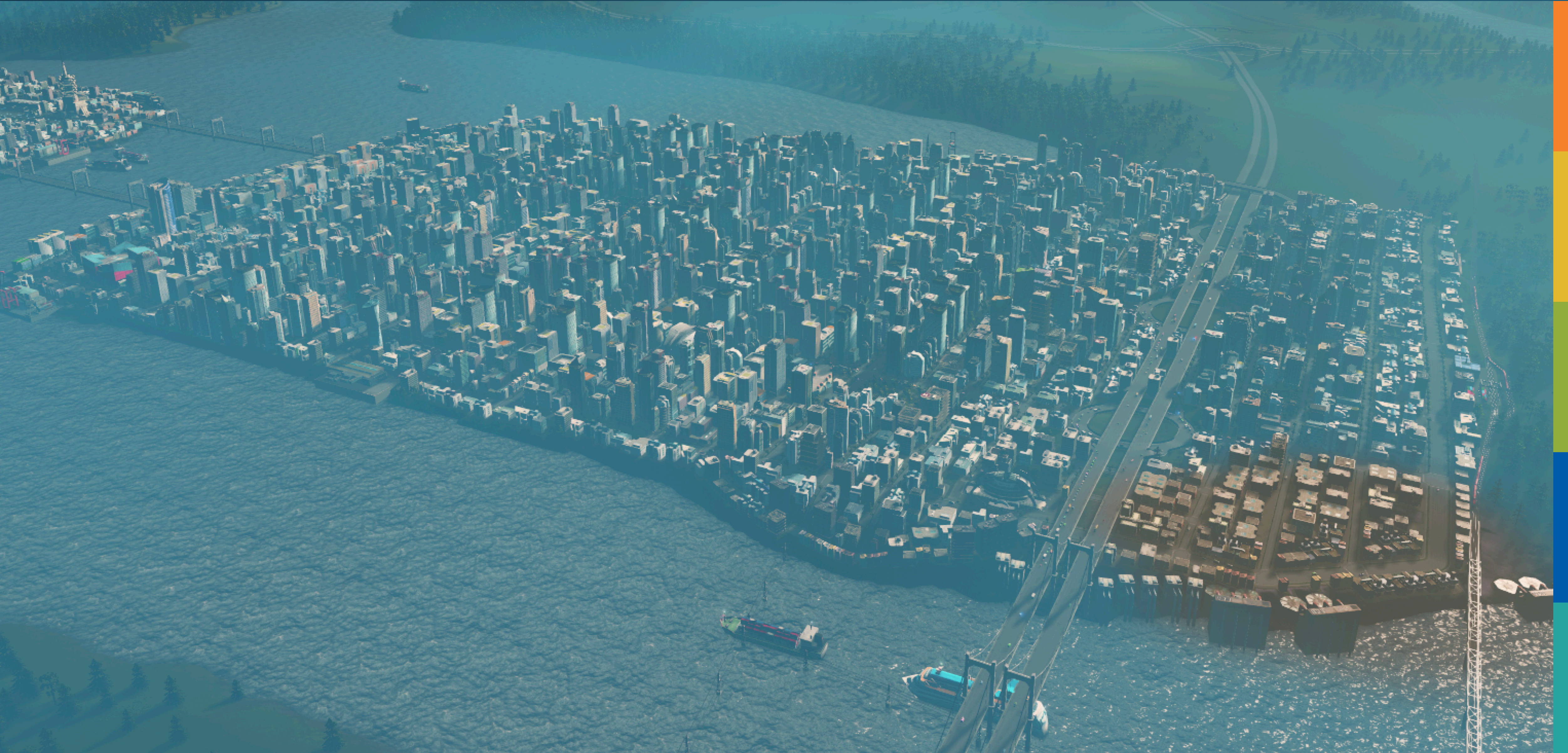
Australian
Urban
Research
Infrastructure
Network



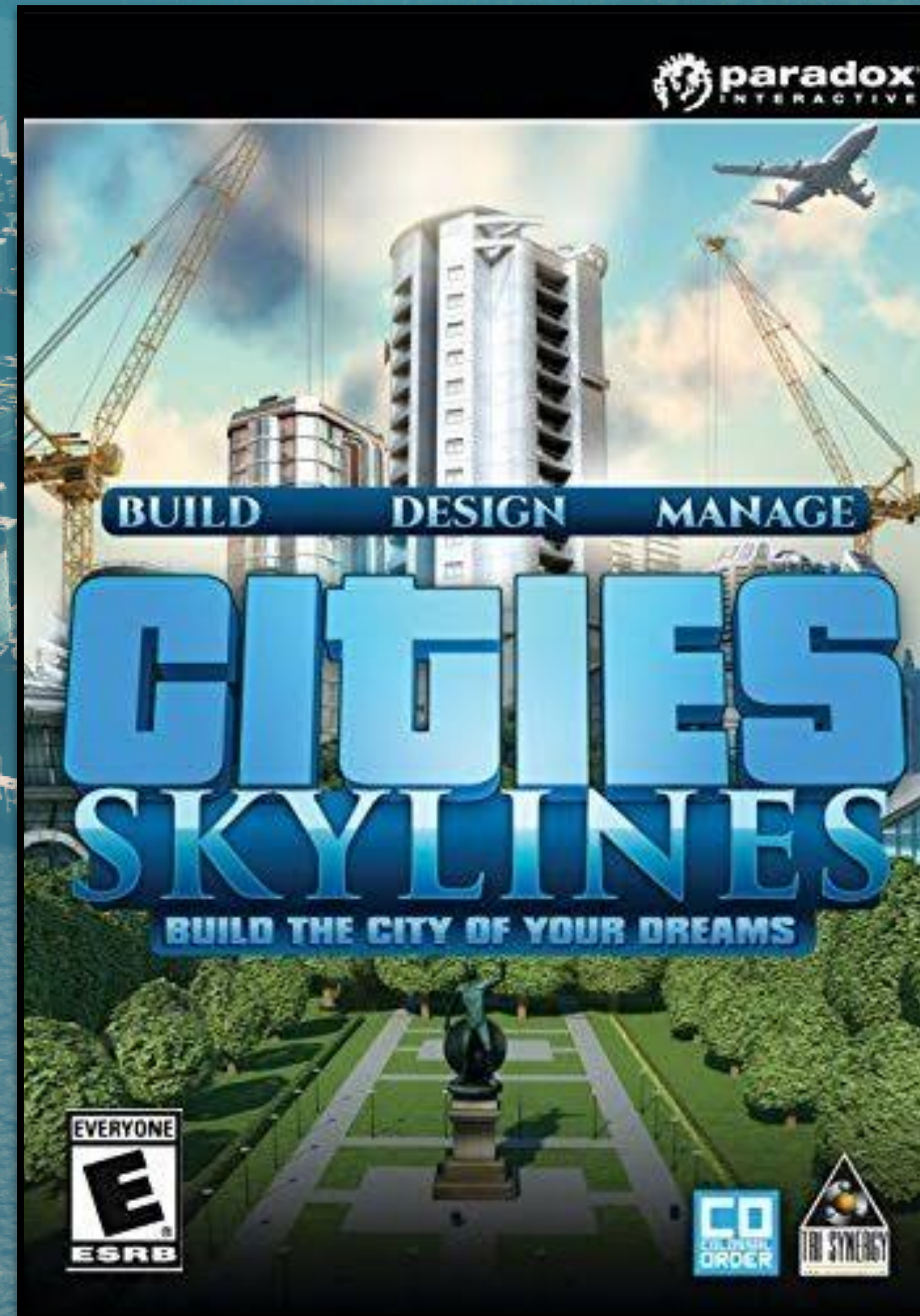
National
Collaborative
Research
Infrastructure
Strategy

“AURIN provides crucial data and digital infrastructure to support ***evidence-based*** urban and regional research, and ***policy development***.”

AURIN's Context



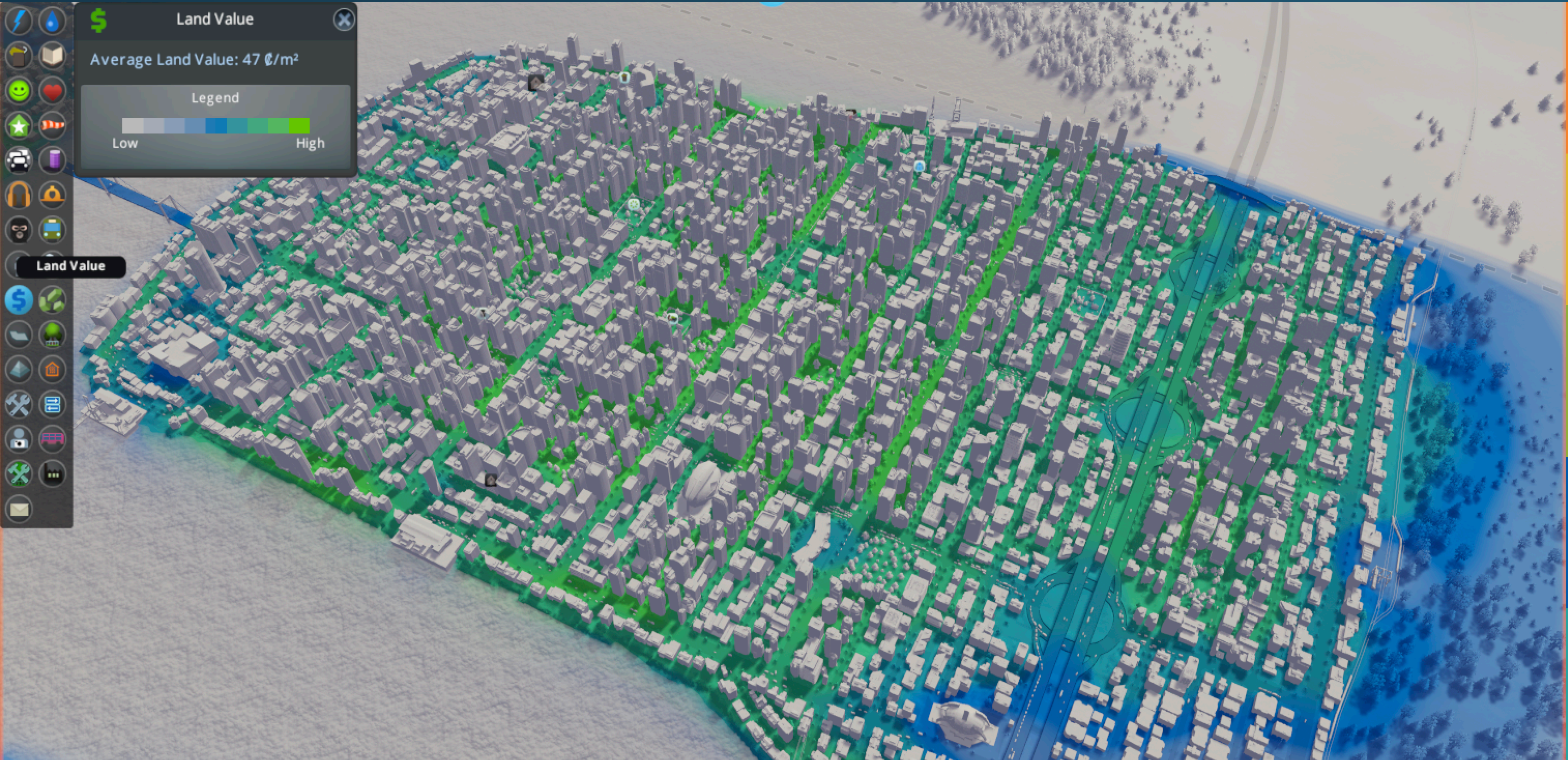
AURIN's Context



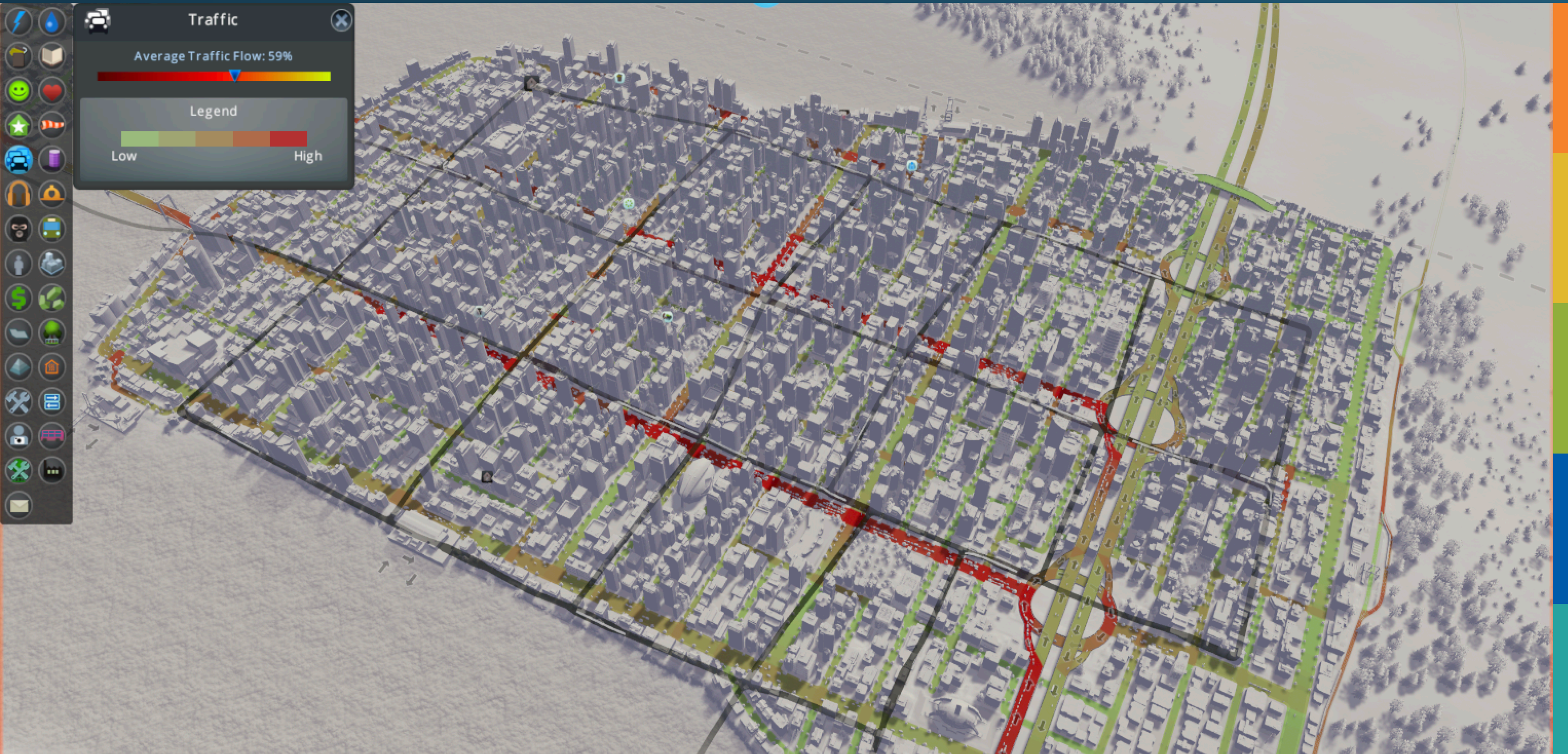
AURIN's Context



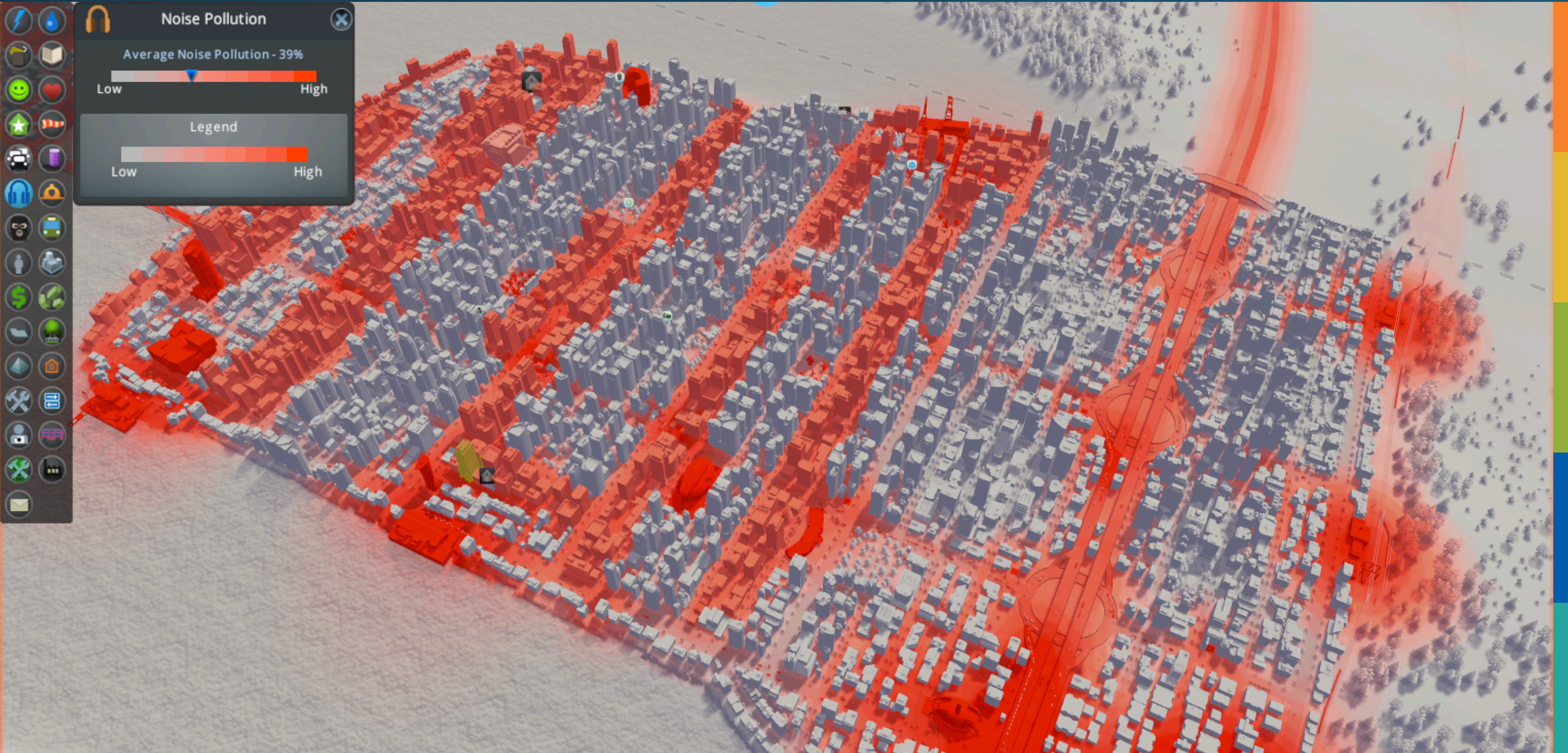
AURIN's Context



AURIN's Context



AURIN's Context



AURIN's Context

Search for locations

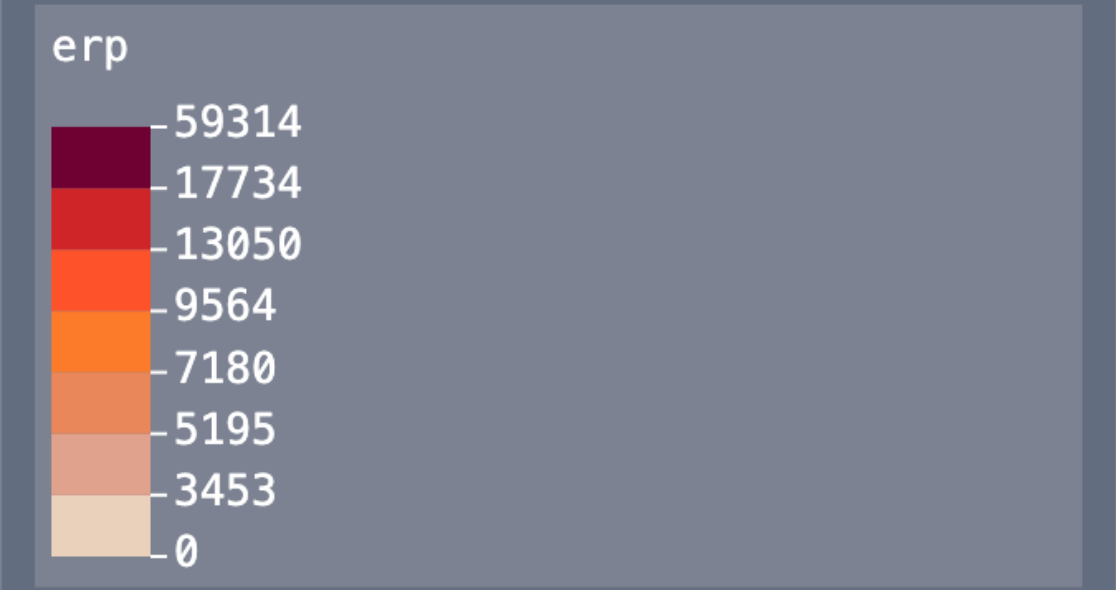
Explore Data

DATA SETS [1] Remove All

ABS Estimated Residential Population (SA2) 2004-2015

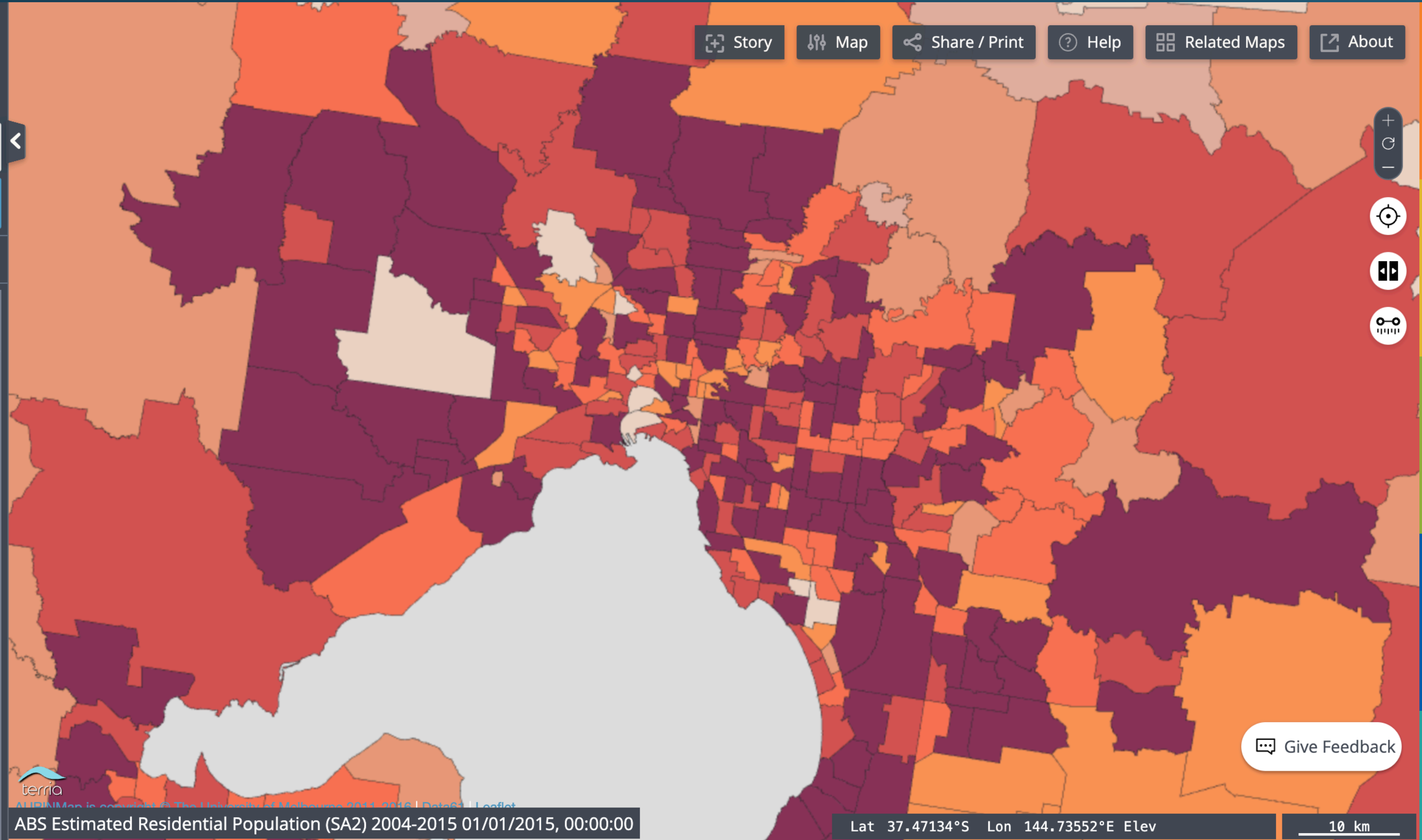
About This Data Split Remove
Opacity: 80 %

Time:
01/01/2015, 00:00:00



Display Variable

- ID
- sa2_name_2011
- erp



ABS Estimated Residential Population (SA2) 2004-2015 01/01/2015, 00:00:00

Lat 37.47134°S Lon 144.73552°E Elev

10 km

30/12/2007 29/12/2011 28/12/2015

AURIN's Context

Search for locations

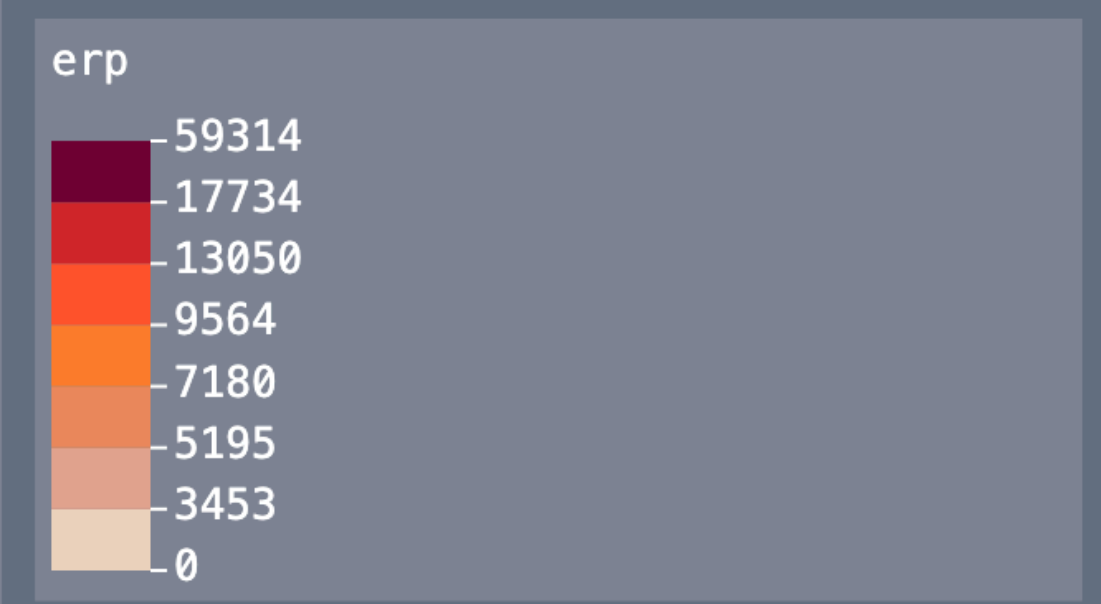
Explore Data

DATA SETS [1] Remove All

ABS Estimated Residential Population (SA2) 2004-2015

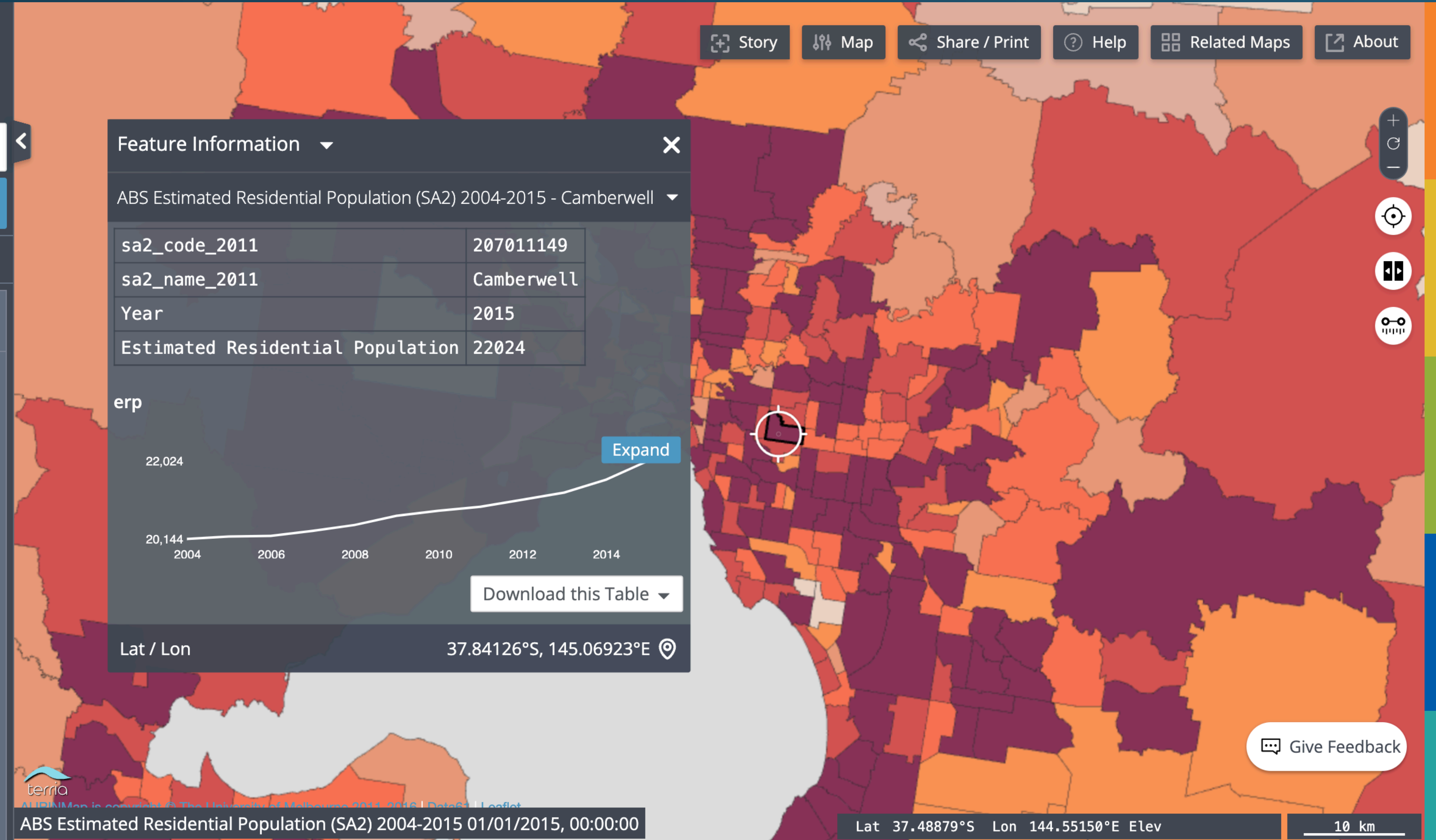
About This Data Split Remove
Opacity: 80 %

Time: 01/01/2015, 00:00:00



Display Variable

- ID
- sa2_name_2011
- erp



AURIN's Context

Provide urban researchers and practitioners access to...

Geospatial Data

Analytics

Visualisation

... that is compatible with their ways of working.

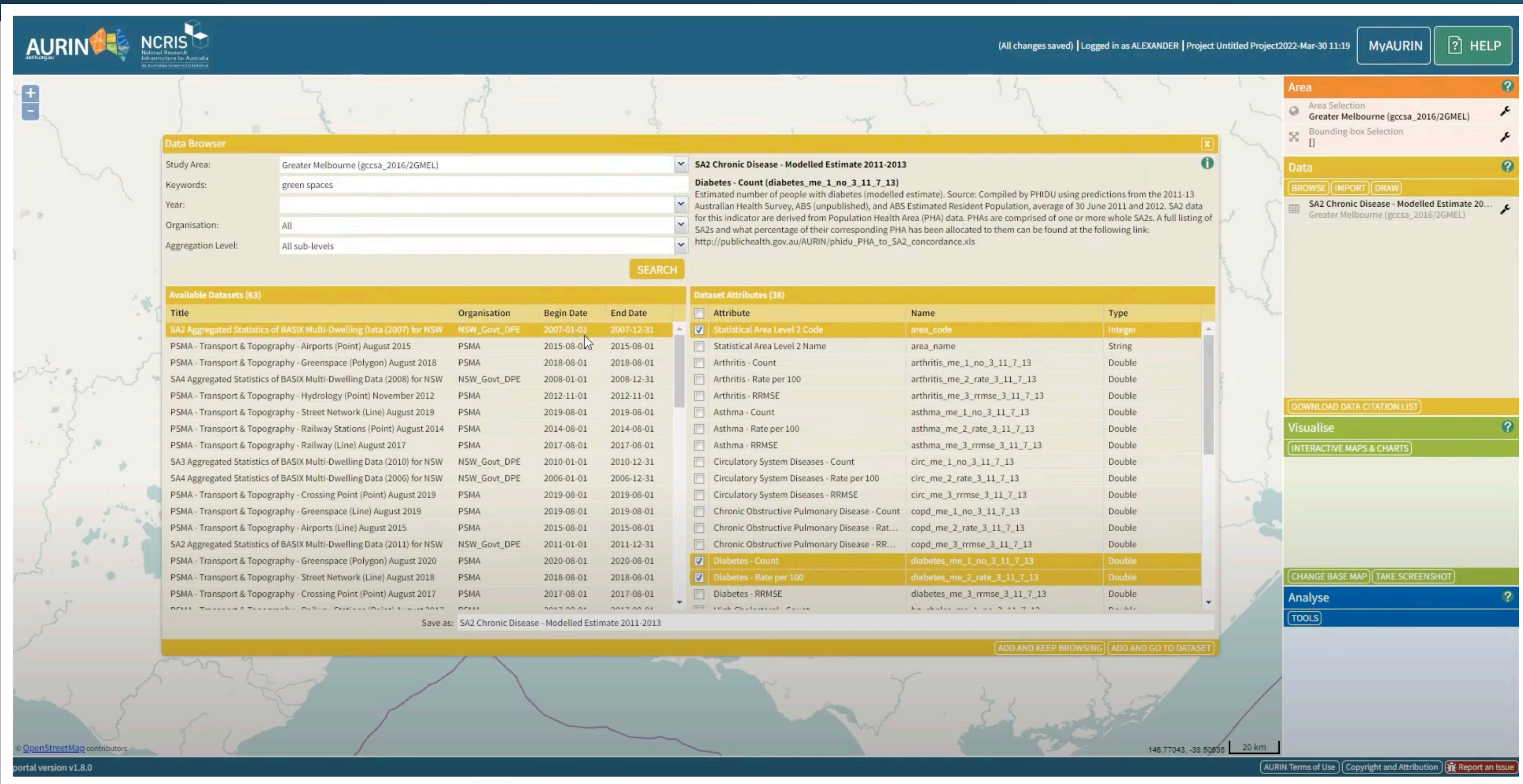
AURIN's Past



AURIN Portal Era

2012 - 2022

AURIN's Past



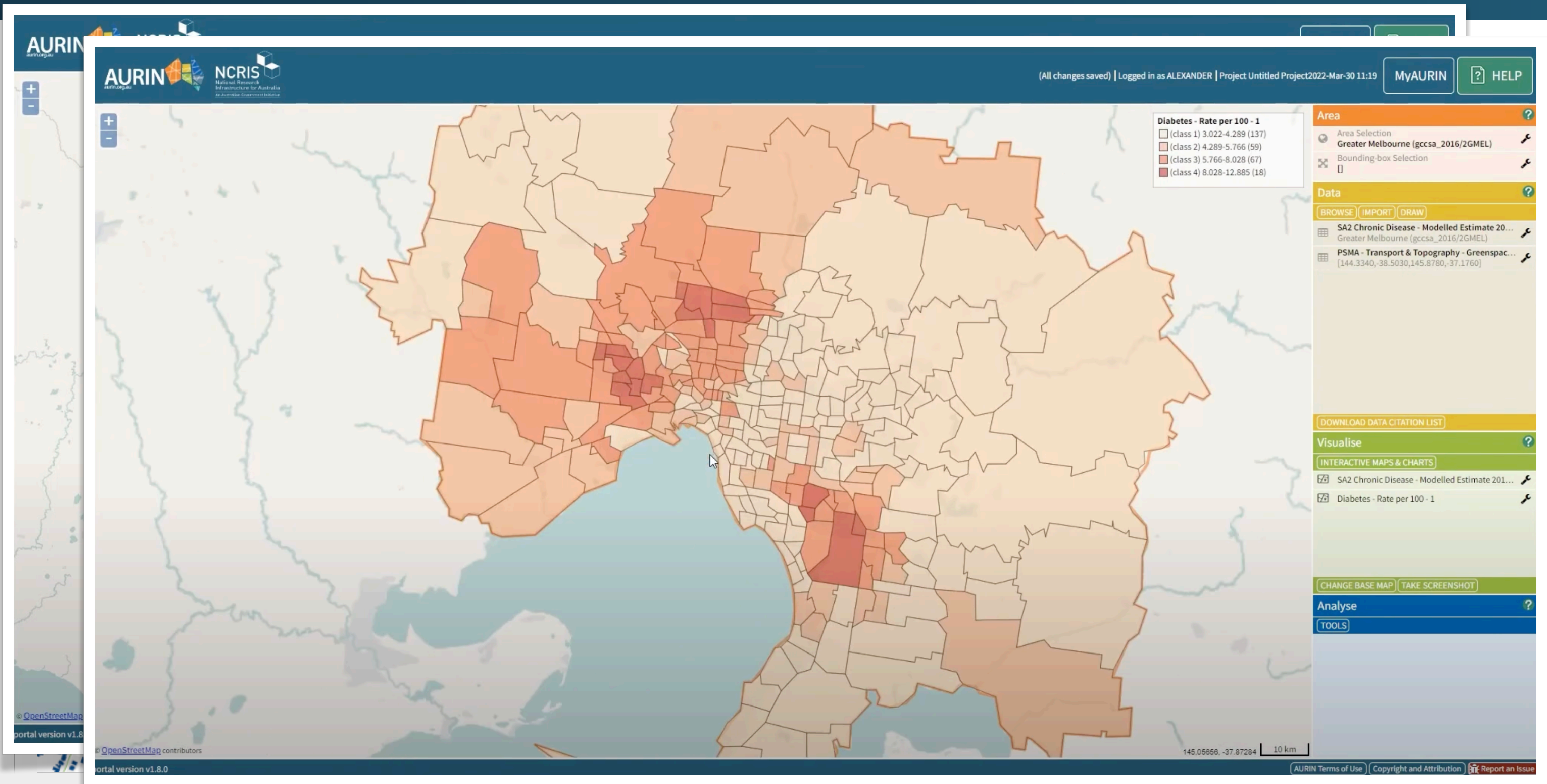
The screenshot shows the AURIN Data Browser interface. At the top, there are logos for AURIN and NCRIS, and a navigation bar with 'MyAURIN' and 'HELP' buttons. The main content area is divided into several sections:

- Data Browser:** A search bar with 'Greater Melbourne (gccsa_2016/2GMEL)' in the 'Study Area' field and 'green spaces' in the 'Keywords' field. Other filters include 'Year', 'Organisation' (set to 'All'), and 'Aggregation Level' (set to 'All sub-levels'). A 'SEARCH' button is present.
- Available Datasets (63):** A table listing various datasets with columns for Title, Organisation, Begin Date, and End Date. The selected dataset is 'SA2 Chronic Disease - Modelled Estimate 2011-2013'.
- Dataset Attributes (38):** A table listing attributes for the selected dataset, including 'Statistical Area Level 2 Code', 'Arthritis - Count', 'Asthma - Count', 'Circulatory System Diseases - Count', 'Chronic Obstructive Pulmonary Disease - Count', 'Diabetes - Count', and 'Diabetes - Rate per 100'. The 'Diabetes - Count' and 'Diabetes - Rate per 100' attributes are checked.
- Area Selection:** A panel on the right showing 'Greater Melbourne (gccsa_2016/2GMEL)' as the selected area.
- Data:** A panel with 'BROWSE', 'IMPORT', and 'DRAW' buttons.
- Visualise:** A panel with 'INTERACTIVE MAPS & CHARTS' options.
- Analyse:** A panel with 'TOOLS' options.

At the bottom of the interface, there are links for 'AURIN Terms of Use', 'Copyright and Attribution', and 'Report an Issue'. The map background shows a geographical view of the Greater Melbourne area.

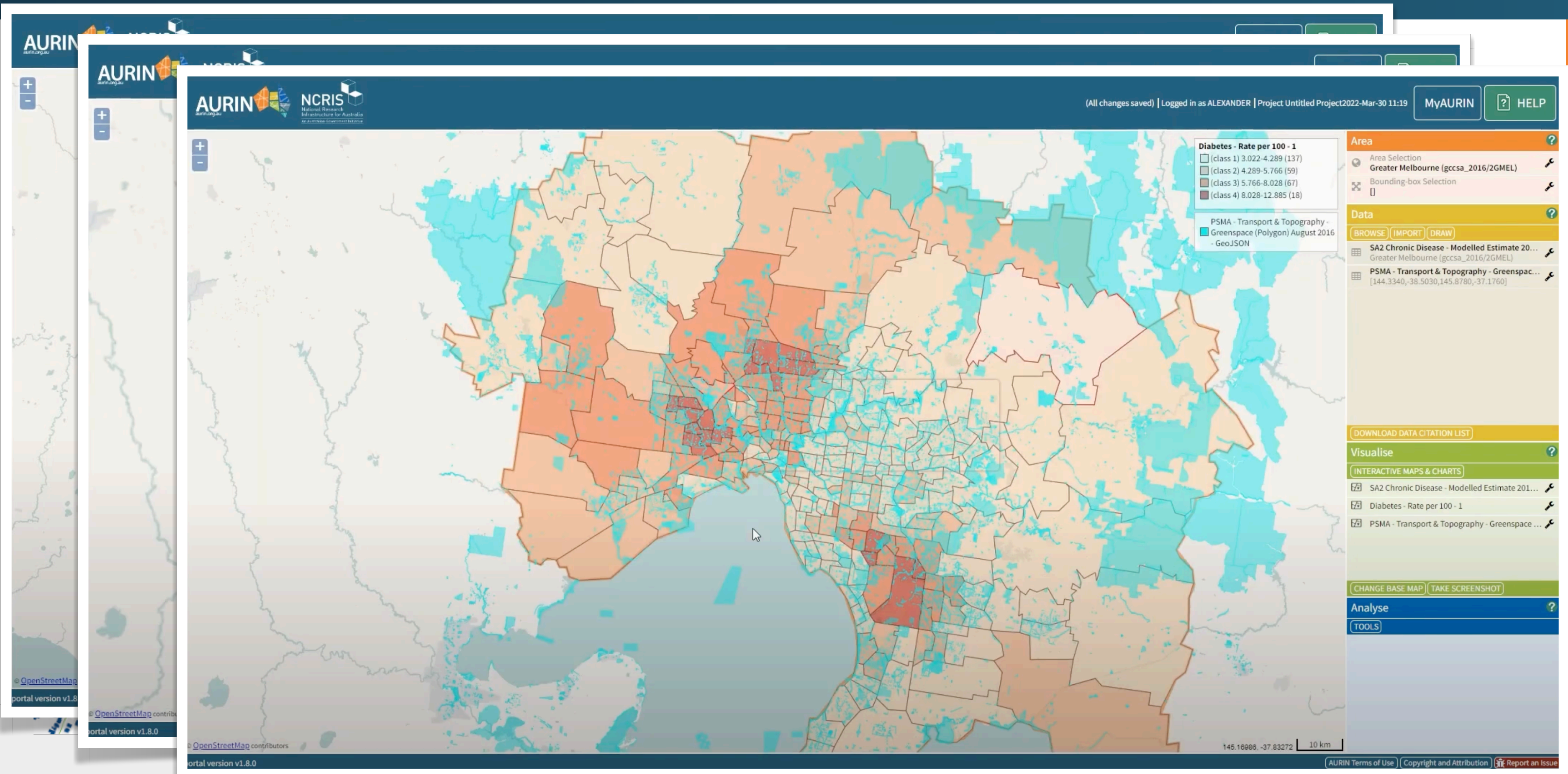
2022

AURIN's Past



22

AURIN's Past



AURIN Portal

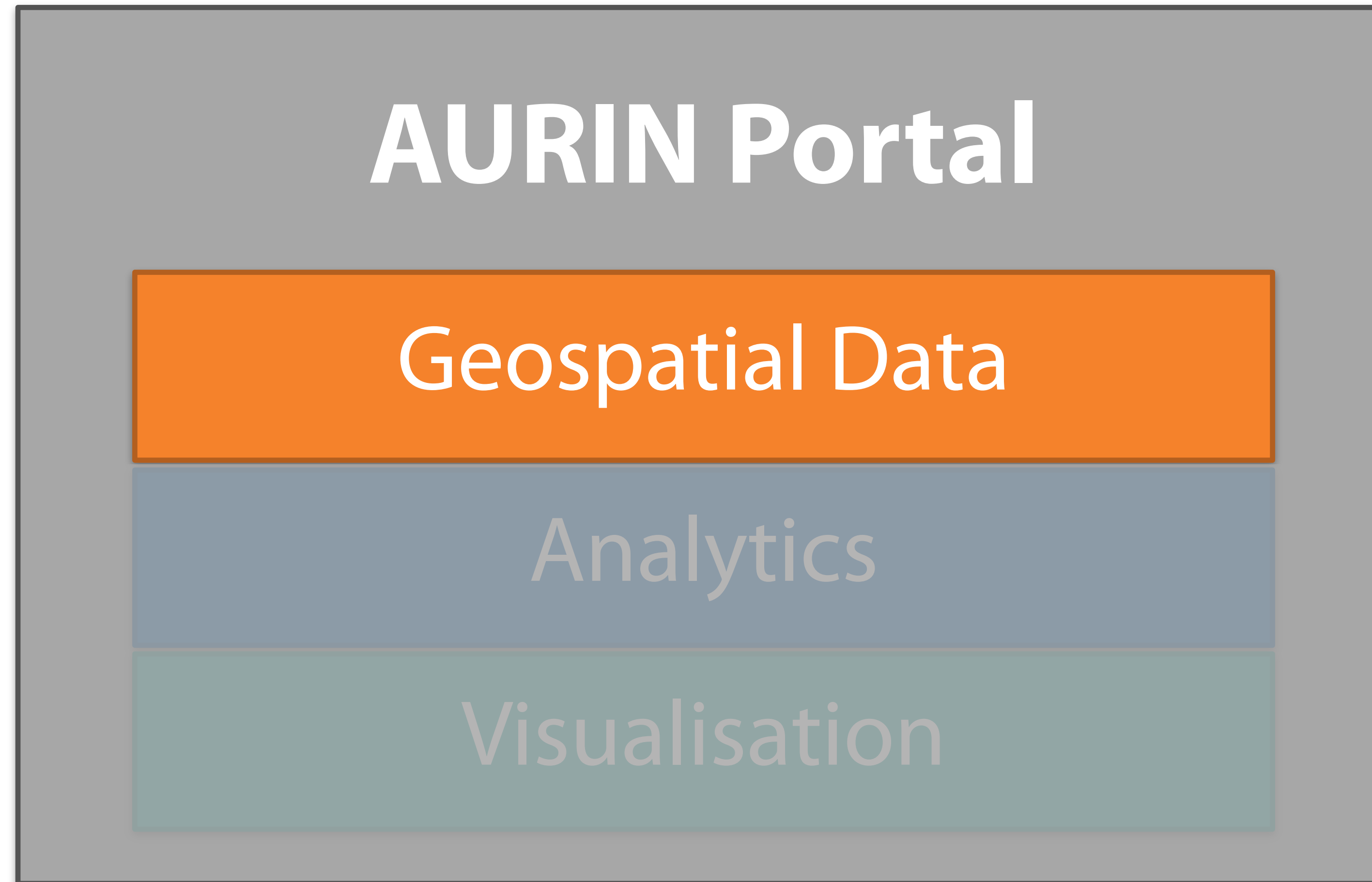
Geospatial Data

Analytics

Visualisation

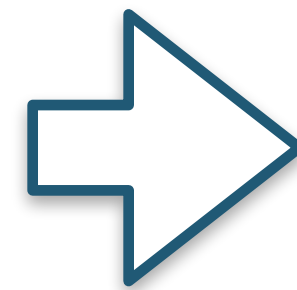
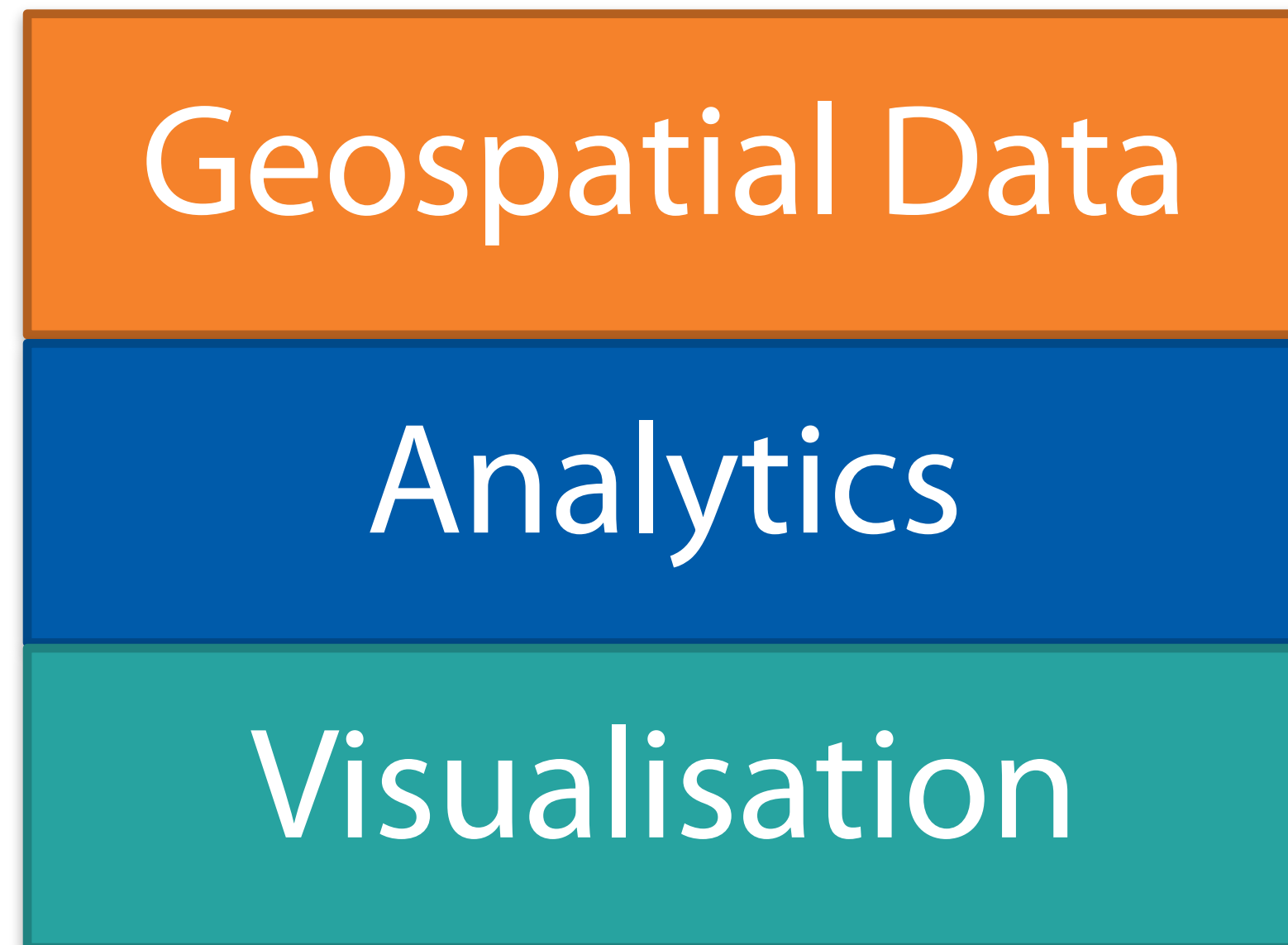
AURIN's Past

Provide urban researchers and practitioners access to...

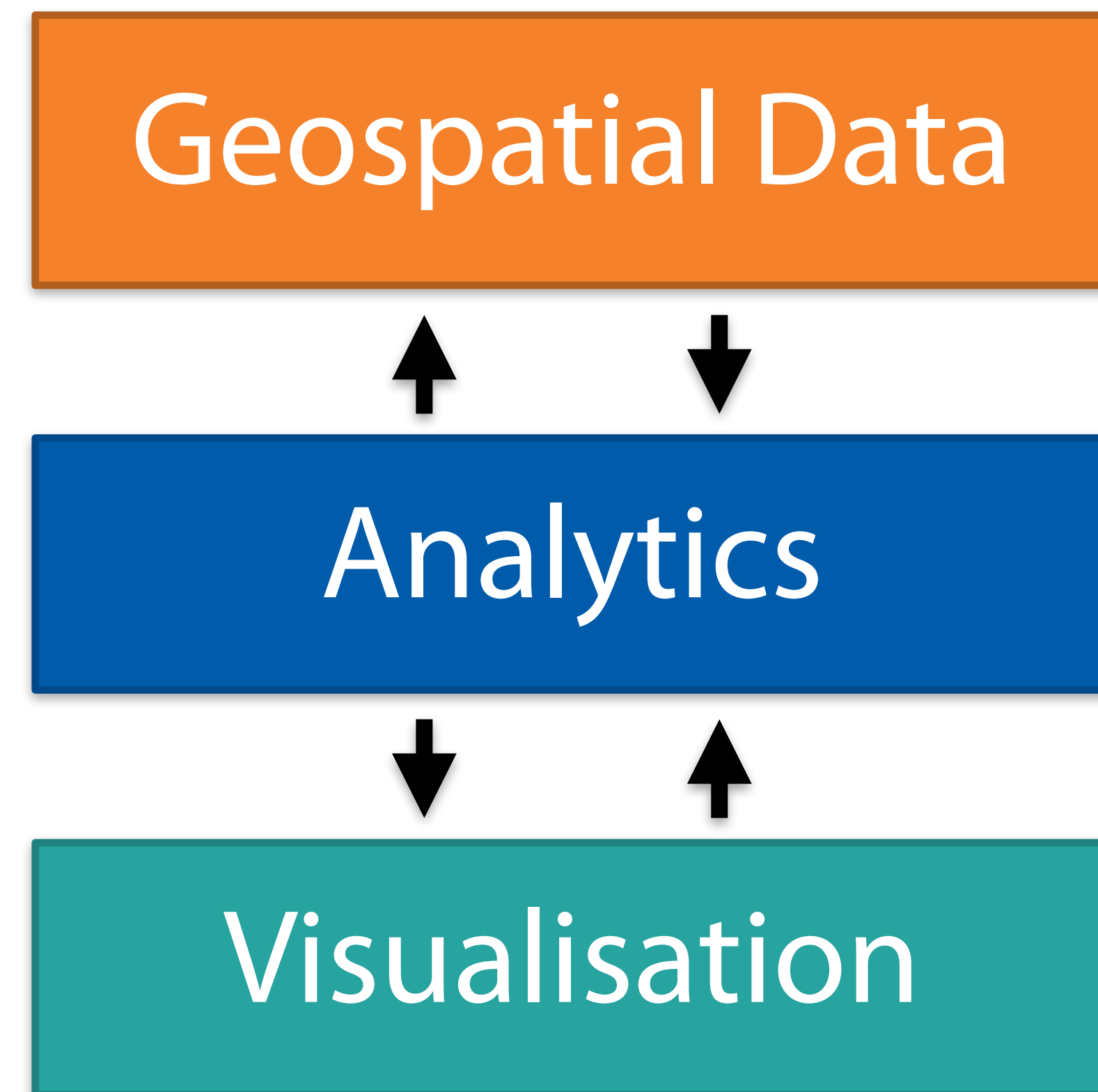


... that is **compatible with their ways of working.**

Set Menu



À La Carte





**Urban
DaaS**

Urban Data-as-a-Service

Unlocking, generating, curating, cataloguing, and sharing high value and hard-to-get data for urban and regional research and planning.



**Urban
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Urban Analytics-as-a-Service

Designing, developing and maintaining a modular, cloud-first digital research infrastructure to support urban and regional analytics and modelling.



UDT

Foundations for Australian Urban Digital Twins

Understanding the needs of UDTs to inform decisions and positively impact lives. Applying, testing, prototyping and sharing best practice standards, semantics, workflows and cutting-edge technologies for use in UDTs.

“The ***AURIN Data Provider (ADP)*** facilitates ***programmatic access*** to AURIN's Data Catalogue, over Web Feature Services (WFS), for authenticated Australian researchers, streamlining access to health, transport, housing, economic, land use, demographic, and an extensive catalogue of other data.”

<https://aurin.org.au/resources/einfrastructure/>



Search datasets

Search data: estimated residential population

Try searching by:

- property
- urban
- human society
- health sciences
- parks
- built environment
- employment
- transport
- infrastructure
- income
- indigenous studies
- bicycle
- demographics
- migration

5081 datasets

106 organisations



Search datasets

Datasets

Filter by location Clear

©MapTiler ©OpenStreetMap contributors

- Organisations
- Torrens University Australia - Public Health Information Development Unit 355
 - Government of the Commonwealth of Australia - Australian Bureau of Statistics 168
 - Government of the Commonwealth of Australia - Australian Institute of Health and Welfare 96
 - Government of the Commonwealth of Australia - Department of Education, Skills

estimated residential population

704 datasets found for "estimated residential population"

Order by: Relevance

- ABS - Usual Residential Population and Dwelling Count (MB) 2016**
This dataset contains counts of the total usual resident population and total dwelling count from the 2016 Census of Population and Housing for Mesh Blocks. Data is current for...
[HTML](#)
- ABS - Usual Residential Population and Dwelling Count (MB) 2011**
This dataset contains counts of the total usual resident population and total dwelling count from the 2011 Census of Population and Housing for Mesh Blocks. Refer to the...
[HTML](#)
- ABS - Regional Population - Population Estimates by Age and Sex (LGA) 2020**
This dataset contains the population estimates of the usual resident population by age and sex for each LGA in 2020. The data is current for 2020.



Organisation



Government of the Commonwealth of Australia - Australian Bureau of Statistics

Social

Twitter

Facebook

License

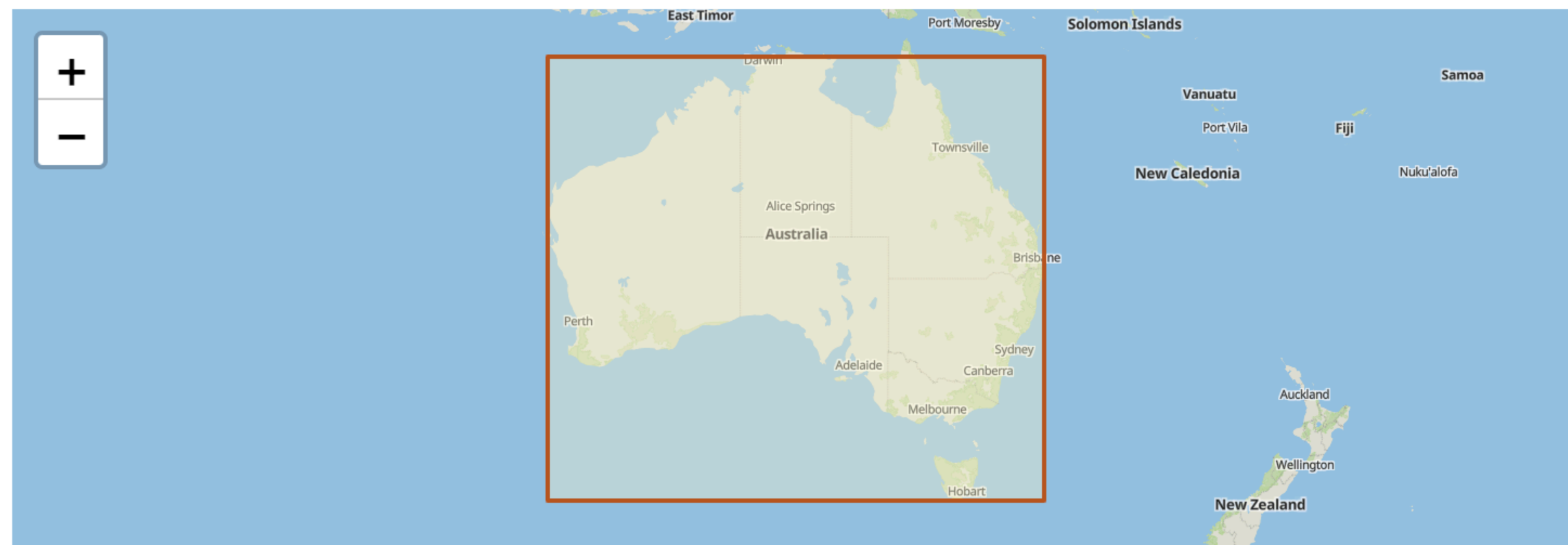
Creative Commons Attribution 2.5 Australia (CC BY 2.5 AU)



ABS - Usual Residential Population and Dwelling Count (MB) 2016

Download this Dataset

Dataset extent



©MapTiler ©OpenStreetMap contributors

Description



Organisation



Government of the Commonwealth of Australia - Australian Bureau of Statistics


Social

Twitter

Facebook

License

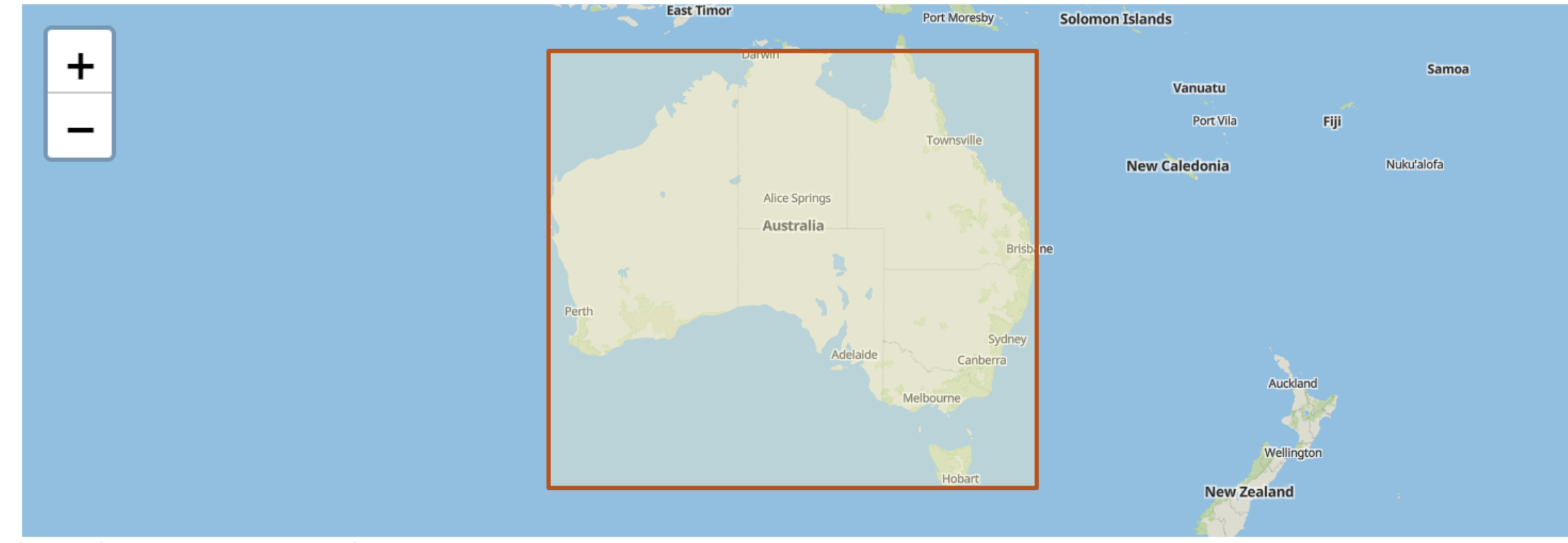
Creative Commons Attribution 2.5 Australia (CC BY 2.5 AU)



ABS - Usual Residential Population and Dwelling Count (MB) 2016

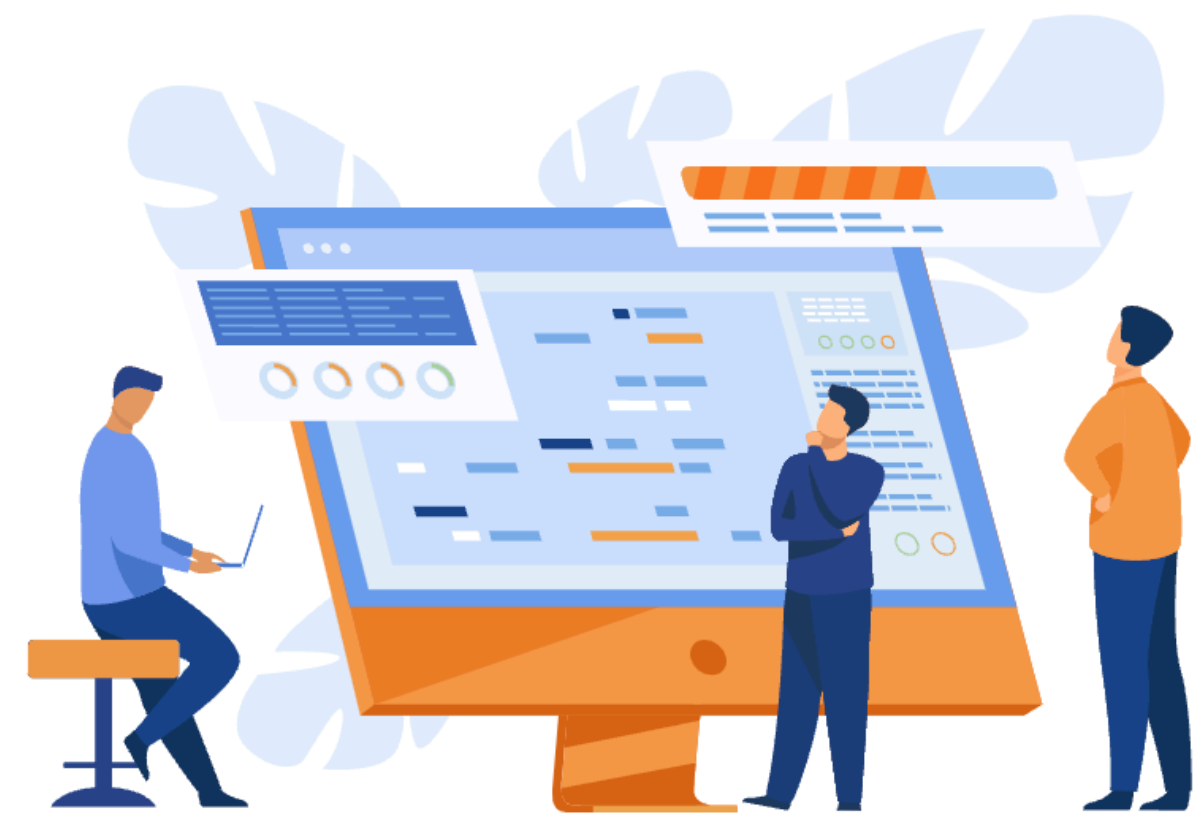
Download this Dataset

Dataset extent



©MapTiler ©OpenStreetMap contributors

Description



Login

If you're having issues logging in, click [here](#)

Login to AAF Central

AAF central provides authentication and identity bridging between disparate authentication protocols such as SAML IdP to OpenID Connect RP.

Please select your organisation below, you will be redirected to complete the login process.

The University of Melbourne

[Continue to your organisation](#)

Remember my organisation



ABS - Usual Residential Population and Dwelling Count (MB) 2016

This dataset contains counts of the total usual resident population and total dwelling count from the 2016 Census of Population and Housing for Mesh Blocks.

Data is current for Census Night 9 August 2016 and describes geographic Australia; including Norfolk Island, the Territory of Christmas Island and the Territory of Cocos (Keeling) Islands, but does not include any other external Territory. Due to the small size of Mesh Blocks, data is confidentialised and only describes basic dwelling counts and number of persons usually resident.

For more information, refer to the Australian Bureau of Statistics' [Census of Population and Housing: Mesh Block Counts, Australia, 2016](#).

WFS Data URL

Format

Download



ABS - Usual Residential Population and Dwelling Count (MB) 2016

This dataset contains counts of the total usual resident population and total dwelling count from the 2016 Census of Population and Housing for Mesh Blocks.

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For more information, refer to the Australian Bureau of Statistics' [Census of Population and Housing: Mesh Block Counts, Australia, 2016](#).

WFS Data URL

```
https://adp.aurin.org.au/geoserver/wfs?request=GetFeature&typename=datasource-AU_Govt_ABS-UoM_AURIN_DB_3:abs_urp_and_dwellings_mb_2016
```

Format

GeoJSON





API Access

Credentials i

Username [REDACTED]

Password *****

Show

Copy

Delete

ADP Architecture

Authentication

Authorisation

Data APIs

DevOps

ADP Architecture

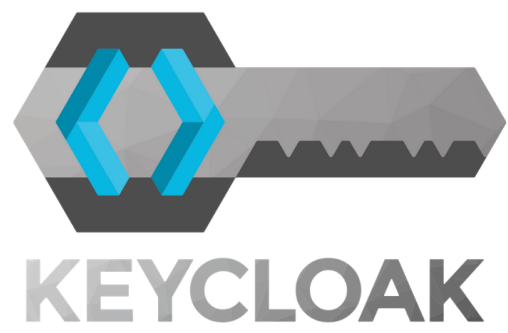
Authentication

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ADP Architecture

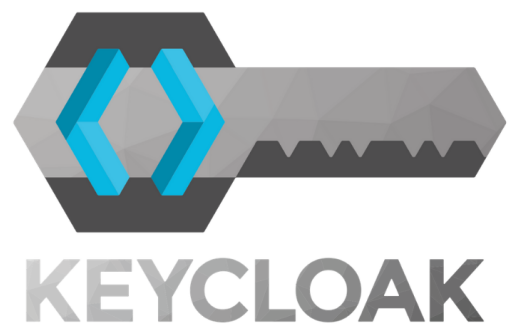


Authorisation

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ADP Architecture

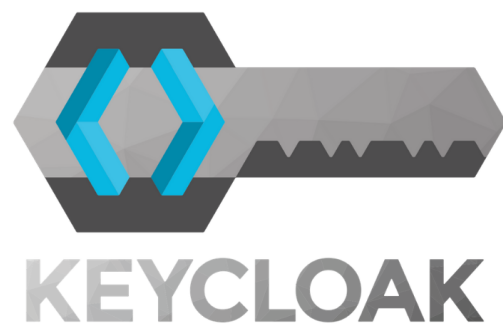


Authorisation

Data APIs

DevOps

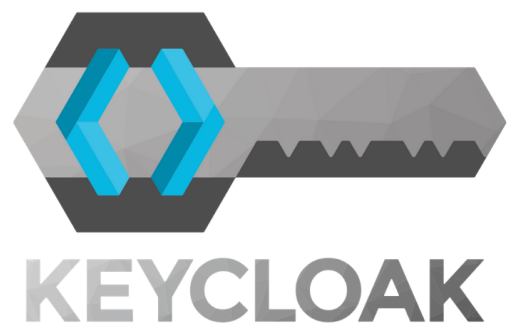
ADP Architecture



Data APIs

DevOps

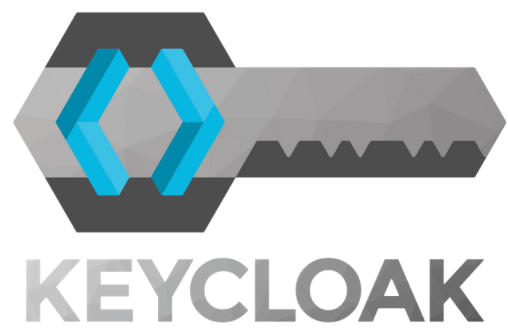
ADP Architecture



Data APIs

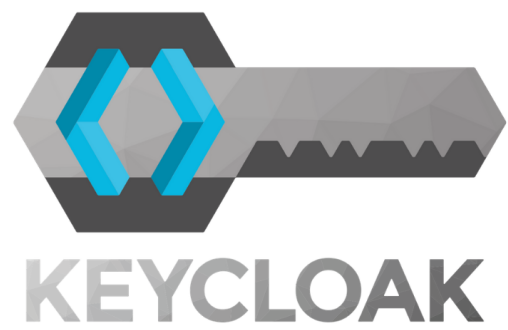
DevOps

ADP Architecture



DevOps

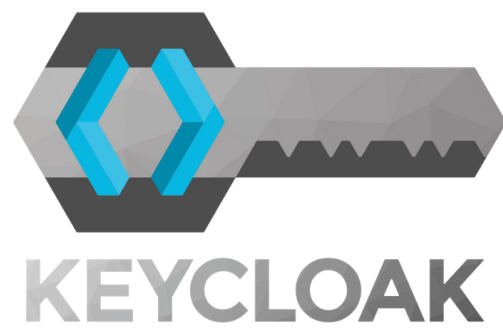
ADP Architecture



DevOps

AURIN's Present

ADP Architecture



kubernetes



Urban DaaS

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Urban Analytics Container

Model Name: Fibonacci Generator

Version: 3.1.4

DOI: 10.1000/xyz123

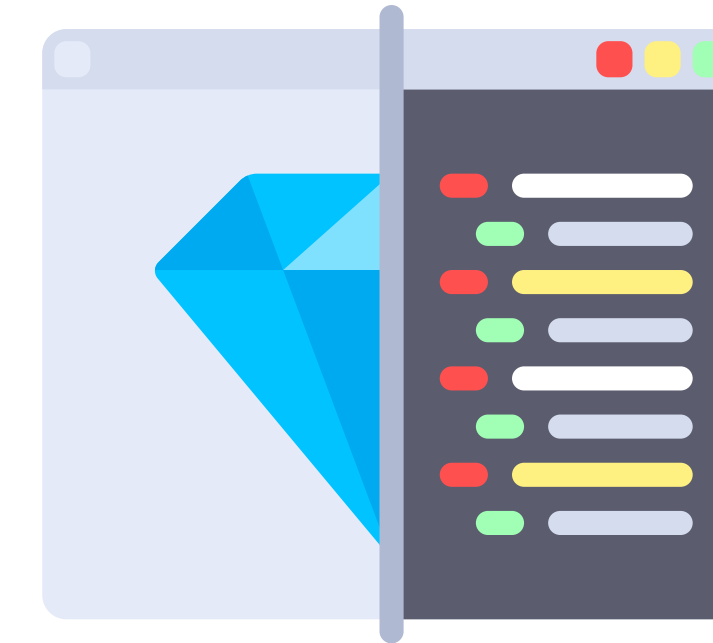
Description: A simple model that generates a list of numbers based on the rules of the Fibonacci Sequence.

Author(s): R. Alpher, H. Bethe, and G. Gamow

Model Schema:

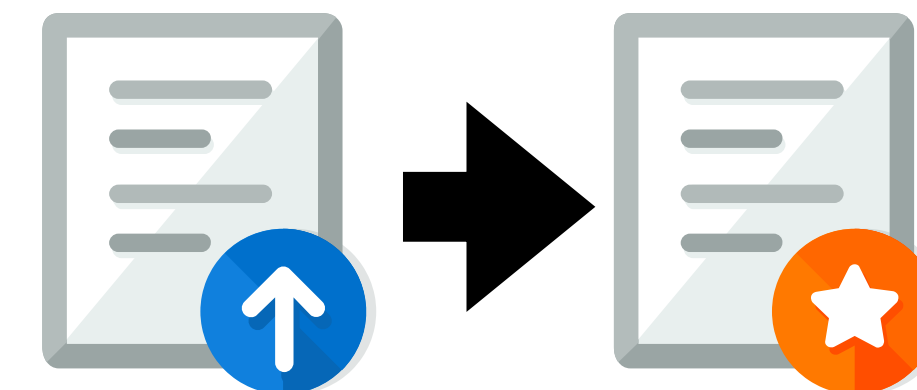
```
inputs:
- name: 'sequence_f0'
  description: 'The first value in the sequence.'
  type: 'integer'
  required: true
- name: 'sequence_f1'
  description: 'The second value in the sequence.'
  type: 'integer'
  required: true
- name: 'sequence_length'
  description: 'The length of the sequence to build.'
  type: 'integer'
  required: true
outputs:
- name: 'result_sequence'
  type: 'JSON'
```

Containerised Code:

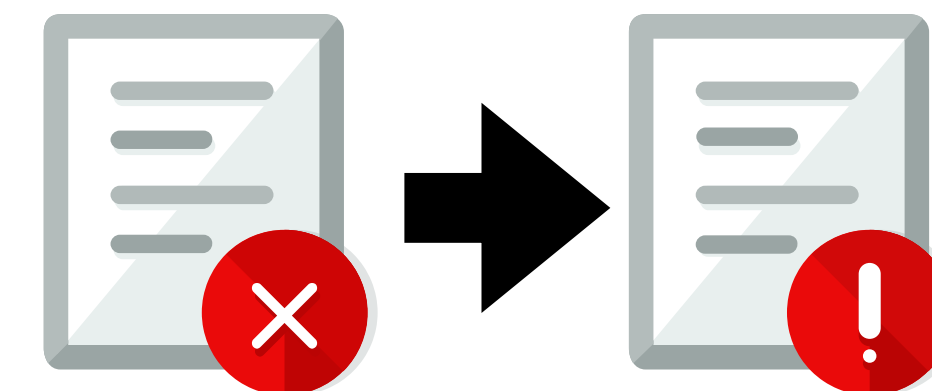


Example Input & Output Data:

1.)

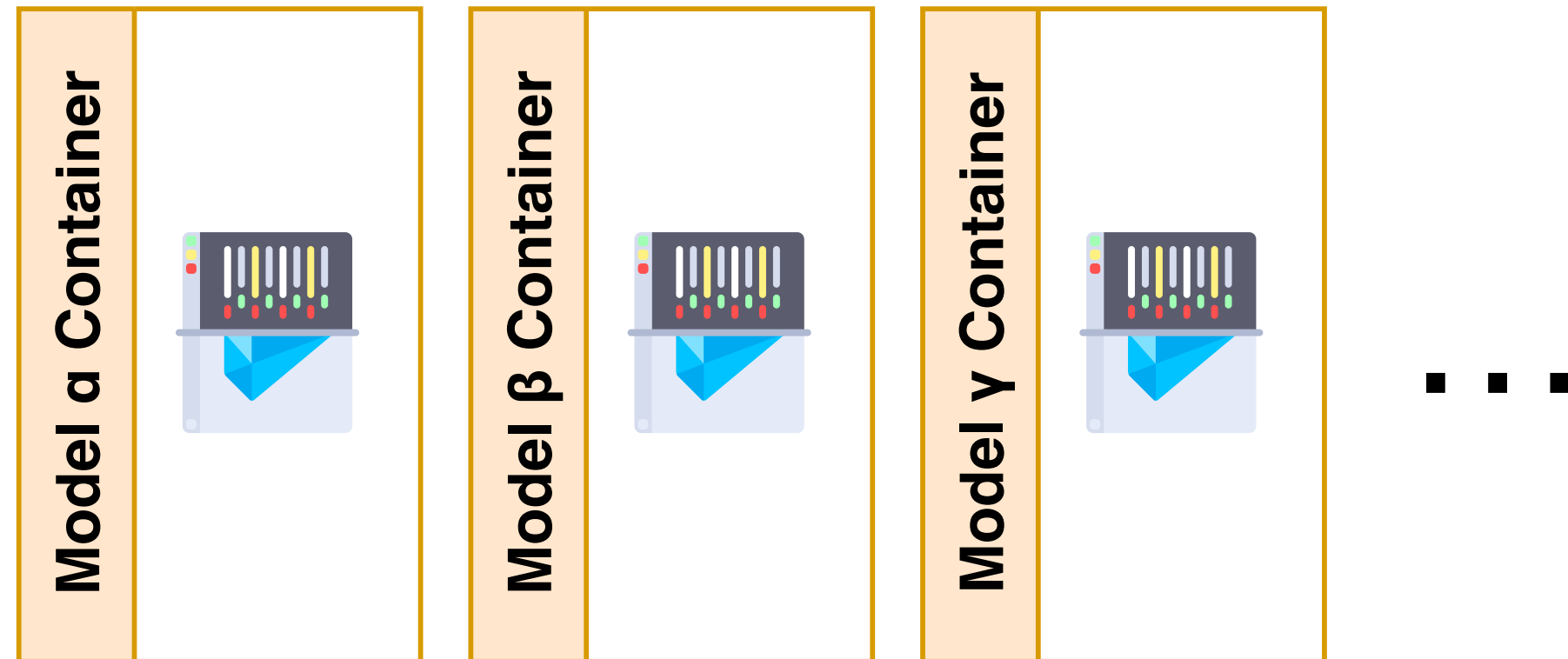


2.)



Urban Analytics as a Service Platform

Urban Analytics Exchange



The Urban Analytics Exchange acts as a repository and discovery service for the containerised urban analytics. Selected models can be executed using the Urban Analytical Engine, or else downloaded and run locally on a laptop or configured institutional infrastructure.

Urban Analytical Engine

The Urban Analytical Engine executes all containerised models stored in the Urban Analytics Exchange via a common API. This execution includes: verifying inputs, executing the code containers with that input, and providing the results.

API

Examples of UAaaS Empowered Tools

Urban Digital Twins

Online platforms capable of representing built environments at multiple scales, ranging from building to precinct to city, leveraging many different services. They make use of all the major models in the UAaaS Platform.

Strategic Urban Planning and Monitoring Tools

Online tools to track and forecast change in the built environment, They are focused on a narrower range of models, but need to use up-to-the-minute versions of models as new research is conducted.

Local Government Development Assessment Tools

Online tools that can be created and maintained by a local council, usually making use a single model to prepare a specific report. The tools need to make use of modern urban modelling but also be maintainable by contracted programmers without urban domain understanding.



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AURIN at eResearch 2023

Thursday 19 October, 2.20pm
Building a Collaborative Foundation
for Australian Urban Digital Twins:
Enhancing Interoperability
as the First Step
(Birds of a Feather Session)



Dr Masoud Rahimi
(AURIN)



Ana Belgun
(CSIRO)



Prof Pascal Perez
(AURIN)



Christopher
Blackstock
(Woolpert)



Dr Nicholas Car
(KurrawongAI)



Rob Atkinson
(OGC)

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

AURIN Administrative Office

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The University of Melbourne VIC 3010

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au.linkedin.com/company/aurin



Scan to join our Urban Digital Twins community!