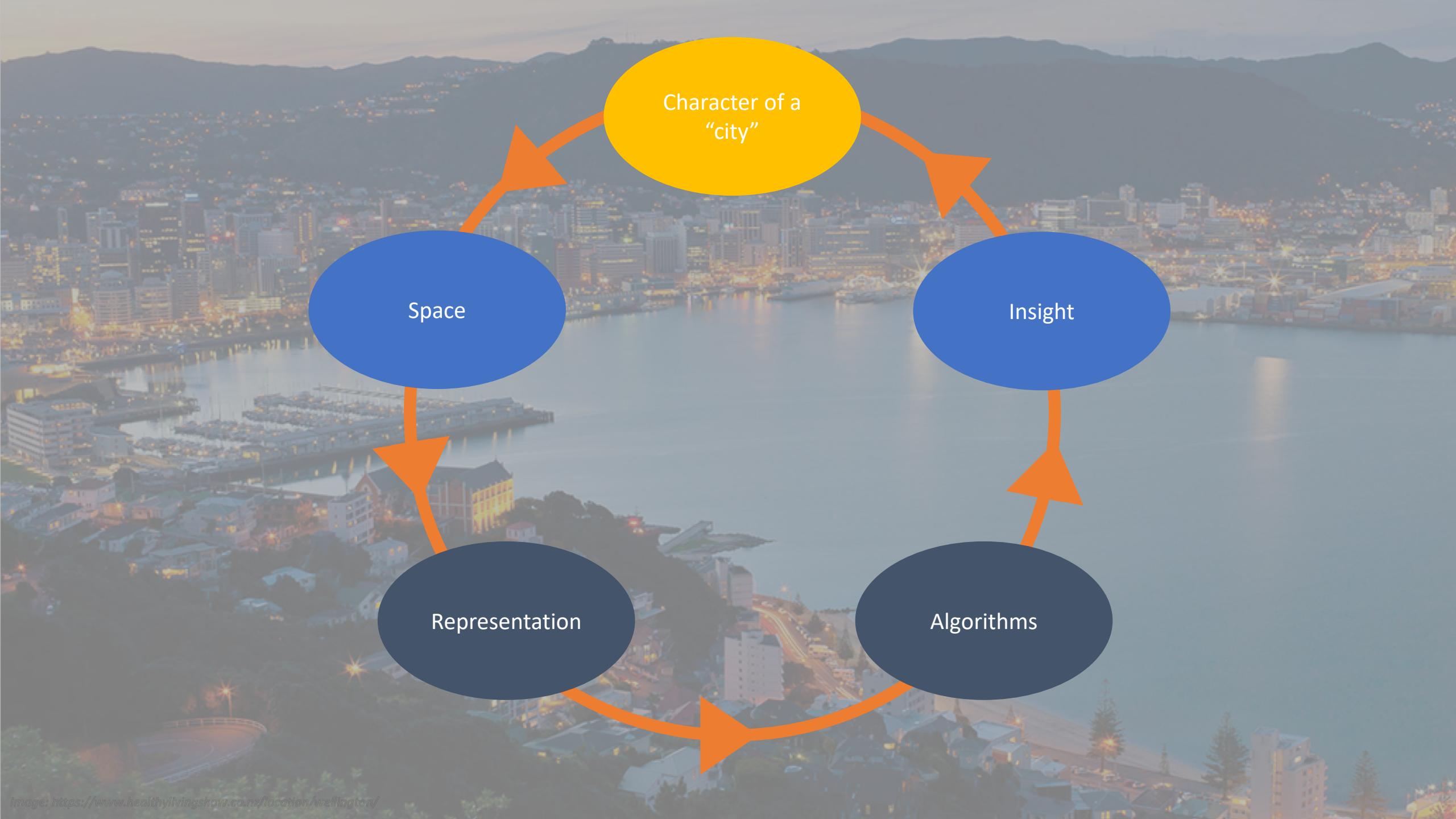


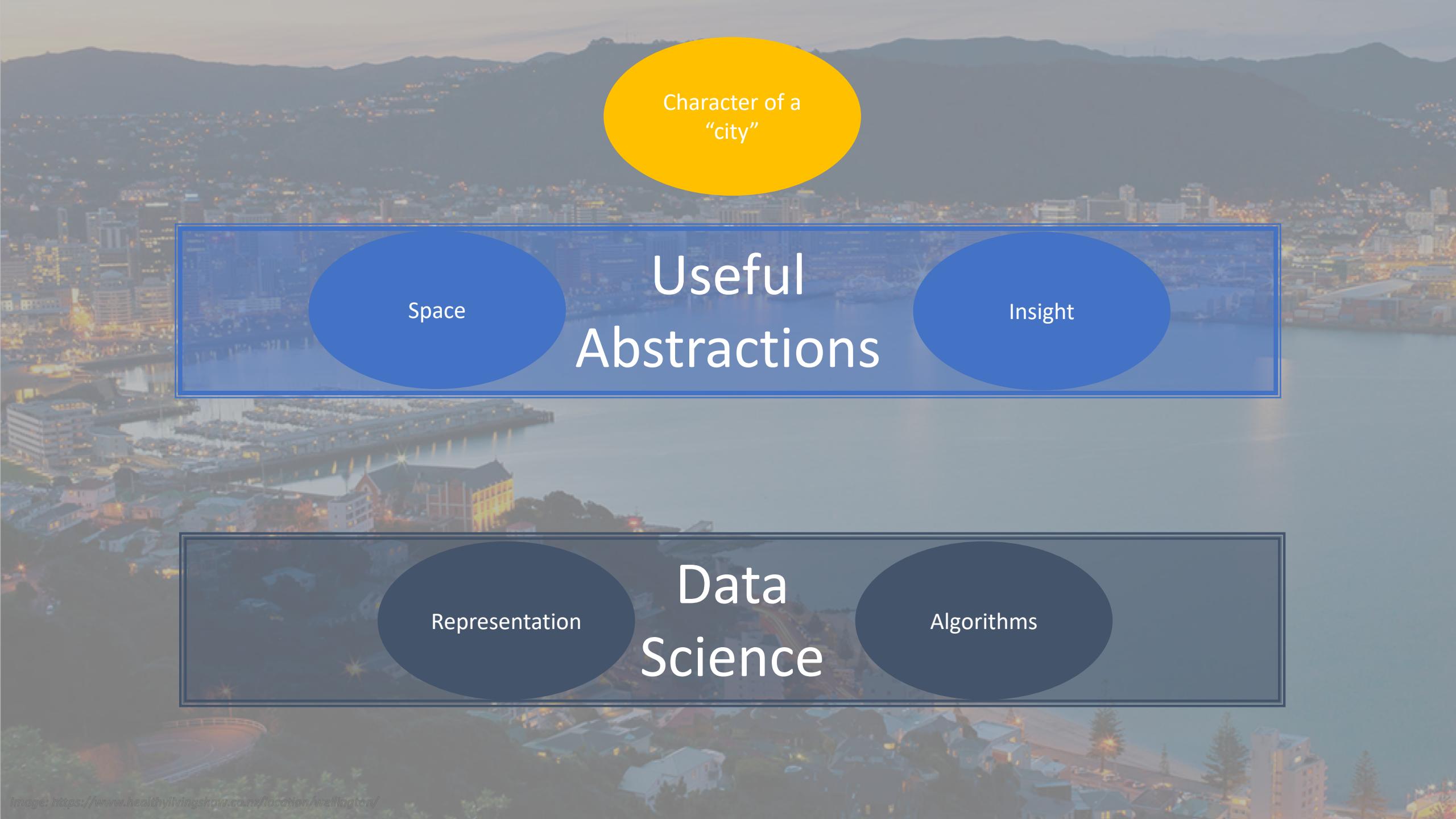


Image: <https://www.exportnz.org.nz/home/wellington>

*Learning about Wellington with
open data and open source tools*

Shrividya Ravi
(Shriv)





Character of a
“city”

Space

Insight

Useful Abstractions

Representation

Algorithms

Data Science

*Spatial Data Science
with
Open Data
and
Open Source tools*

Search for data & maps **Search** Help Sign in Download or

NZ Topo 50 Data Sets

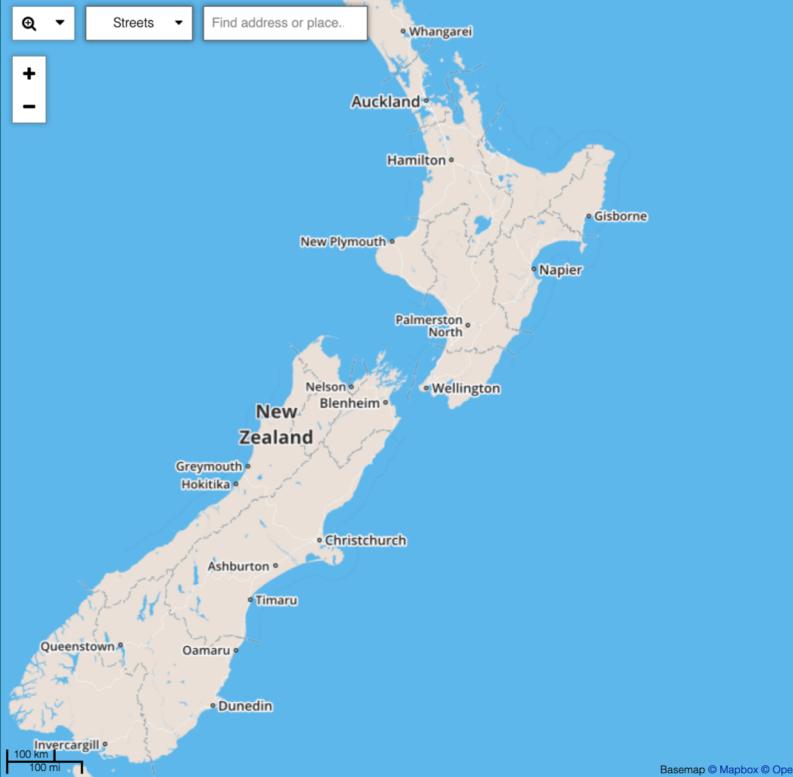
DATA TYPE
All 205
Layers 197
Sets 8

CATEGORY
All 36
Basemaps 2
Full Landonline Dataset 9
Hydrographic & Maritime 12
Roads and Addresses 2
Topographic 11
NZ Topo 250 Data 2
NZ Topo 50 Data 8
Topo50 Antarctic 1

GROUP

REGION

- NZ Topo50 Structure Data** LINZ / National Topographic Office
- NZ Topo50 Hydrography Data** LINZ / National Topographic Office
- NZ Topo50 Vegetation Data** LINZ / National Topographic Office
- NZ Topo50 Landcover Data** LINZ / National Topographic Office
- NZ Topo50 Relief Data** LINZ / National Topographic Office



The map displays the coastline and interior of both the North and South Islands of New Zealand. Labeled cities include Whangarei, Auckland, Hamilton, Gisborne, Napier, Palmerston North, Wellington, Blenheim, Nelson, Greymouth, Hokitika, Ashburton, Timaru, Christchurch, Queenstown, Oamaru, Dunedin, and Invercargill. A scale bar indicates 100 km/100 mi. The map interface includes a search bar, zoom controls, and a legend.

- Land parcels
- Building polygons
- Surfaces
- Multiple format downloads (zip, gdb etc.)

Land Information NZ

Welcome to Wellington City Council's Open Data

Search Our Data

The location search tool is not available for Internet Explorer users

Search for Data

Location



Wellington City Council

- Searchable interface for available spatial data
- Multiple format downloads (zip, gdb etc.)

Run Share Export Wizard Save Load Settings Help overpass turbo ⚙

```
1  /*
2   This is an example Overpass query.
3   Try it out by pressing the Run button above!
4   You can find more examples with the Load tool.
5 */
6 way
7   [leisure=playground]
8   (-41.38,174.57,-41.1527,174.84);
9 /*added by auto repair*/
10 (._;>););
11 /*end of auto repair*/
12 out;
```

Loaded – nodes: 963, ways: 963
Displayed – pois: 6, lines: 0

OpenStreetMap

- An *open source* map
- Has API and query language
- Wrappers in Python

Open Source Tools

OSMNX for street networks

Retrieve, model, analyse, and visualize street networks from OpenStreetMap

PANDANA implements more general *aggregations along the street network* (or any network). [...] can be used to *characterize the local neighbourhood* around each street intersection.

PROJECT JUPYTER exists to develop open-source software, open-standards, and services for *interactive computing* across dozens of programming languages.

- Osmnx
- Pandana
- Jupyter

...

- *Matplotlib*
- *Geopandas*
- *Folium*



Questions of (city) character

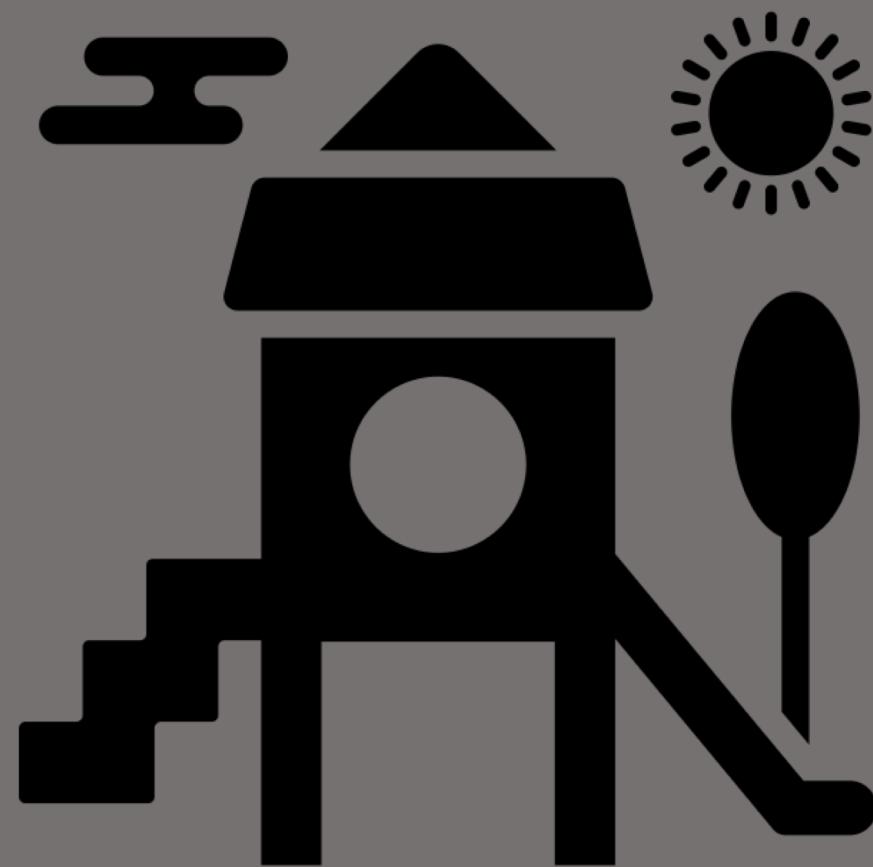
- Do I have the amenities I need nearby? Can I access them in more than one way?



- Do my journeys allow for an active transport option?

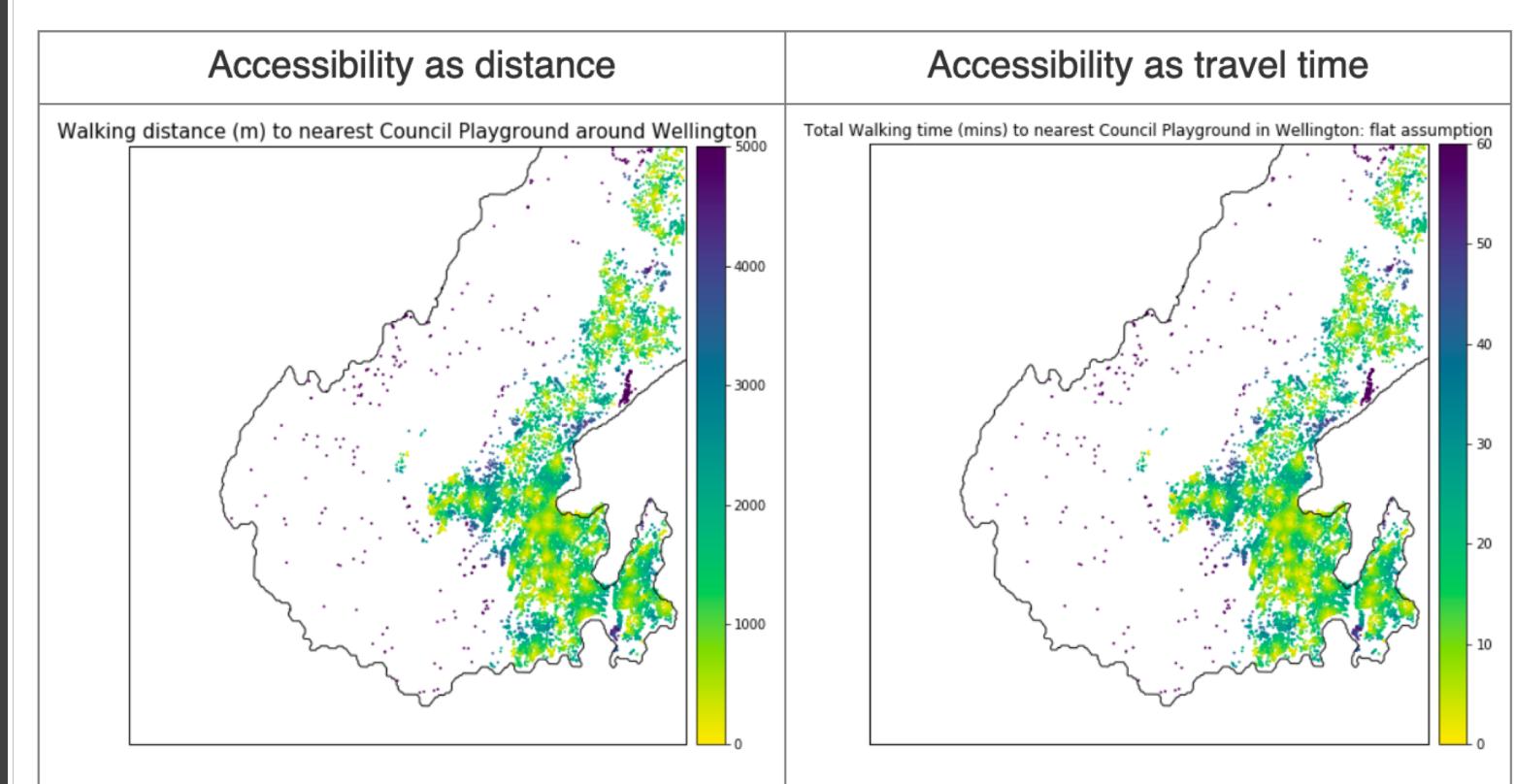
Playground accessibility as proxy for walkability

- *Are playgrounds in Wellington accessible by foot?*
- *How prohibitive is Wellington's topology on pedestrian accessibility to playgrounds?*



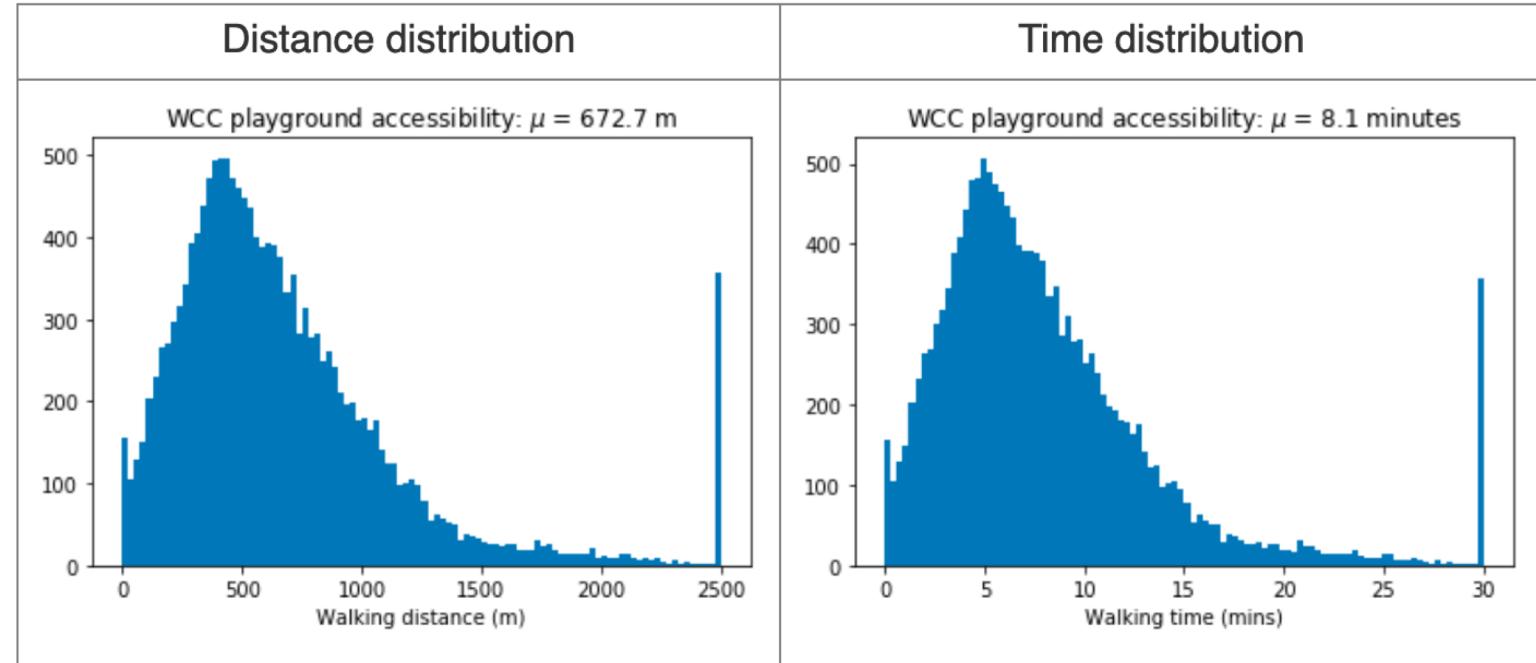
Accessibility to playgrounds

- We can calculate accessibility from any street in Wellington to the nearest playground with:
 - Walking distance
 - Travel time
- Here, we're looking at total distances and travel times - to and from a playground.

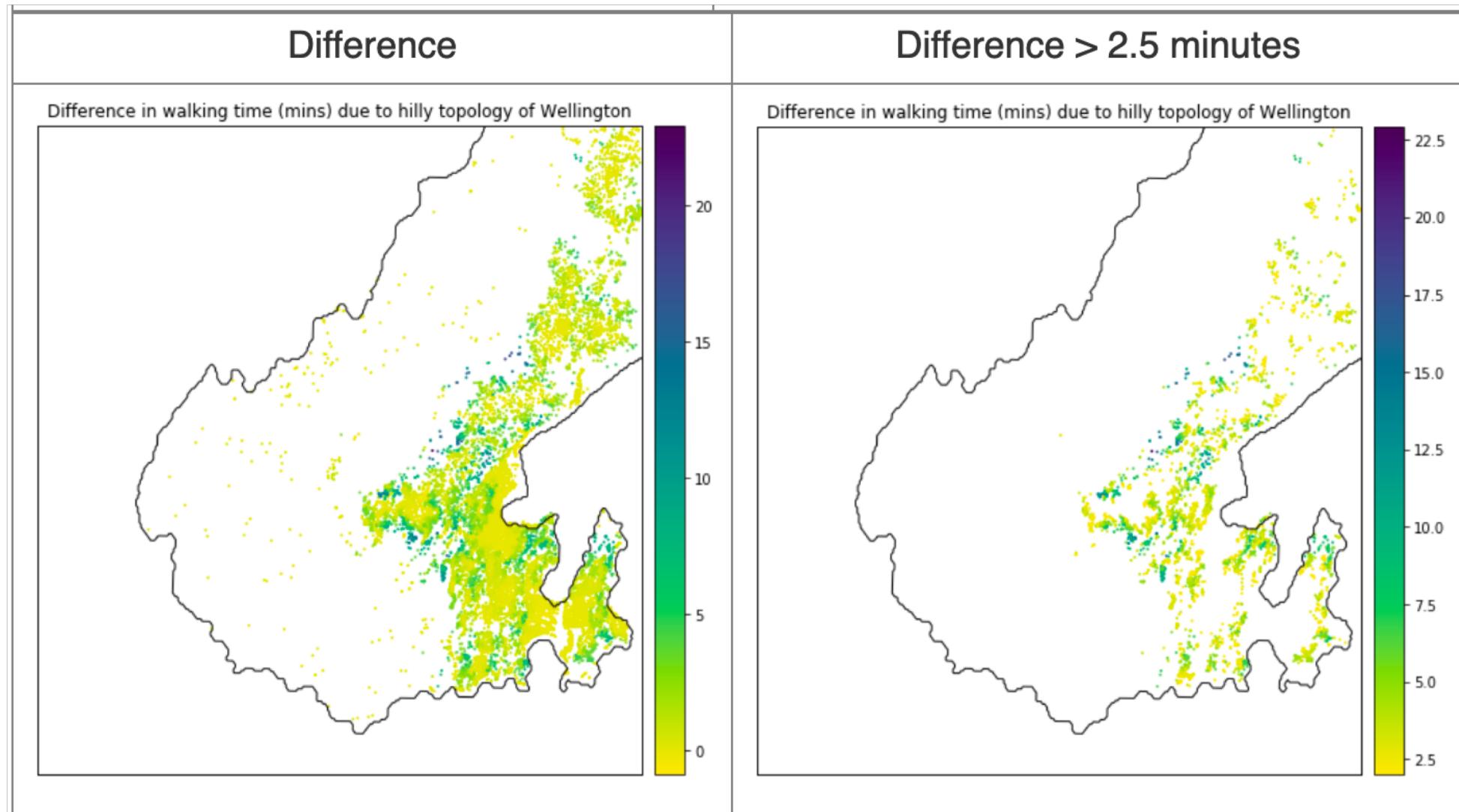


Accessibility to playgrounds

- On average, it appears that a typical playground is accessible within 10 minutes.
 - Assuming flat ground walking speed of 5km/h
 - One way trip values
- But, the distribution is quite wide!
- Some areas are more than 30 minutes away – though most are industrial areas like Kaiwharawhara, Ngauranga and Wellington Airport.



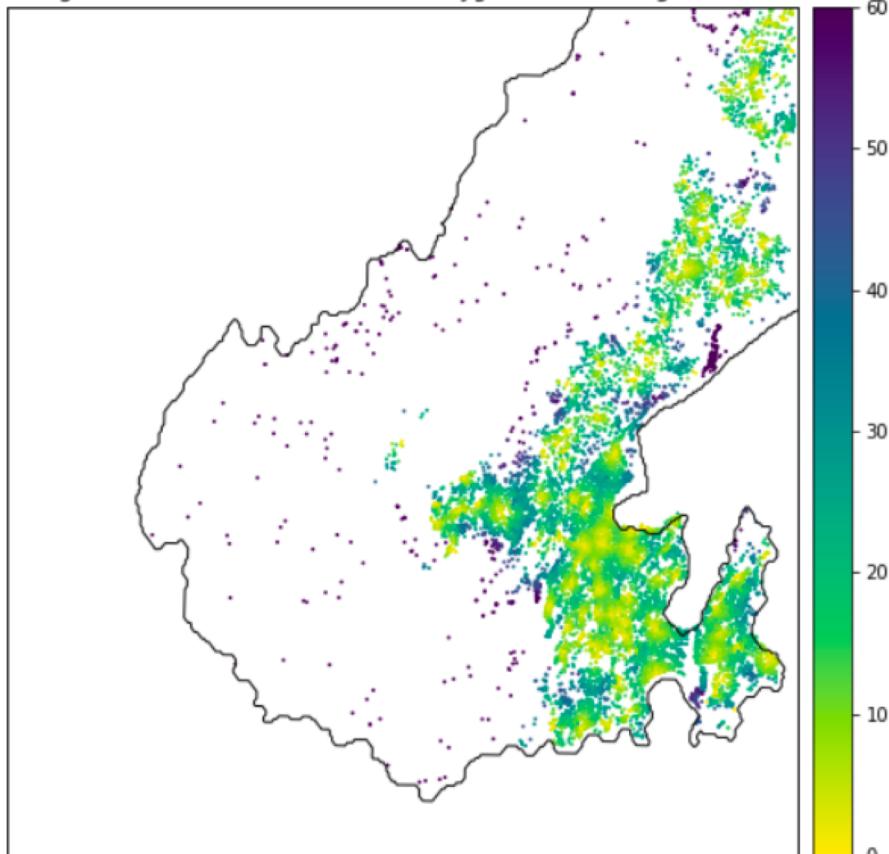
Impact of hills on travel time



Travel time to different options

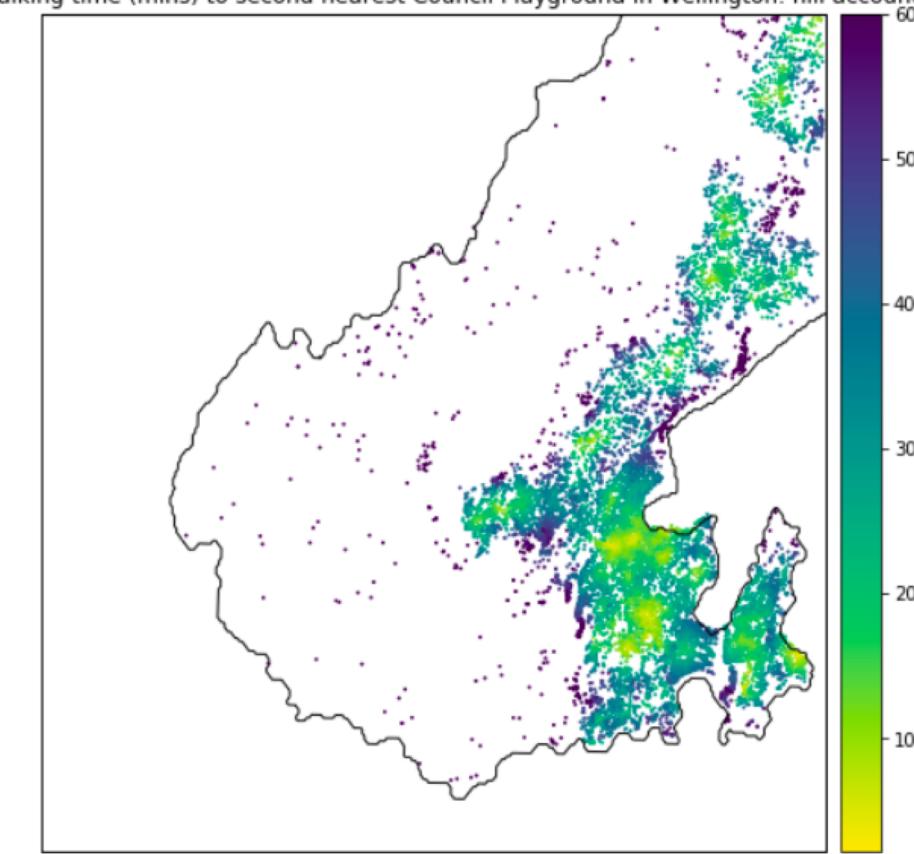
Nearest playground

Total Walking time (mins) to nearest Council Playground in Wellington: hill accounting



Second nearest playground

Total Walking time (mins) to second nearest Council Playground in Wellington: hill accounting



Resources

- *Write up as a blog post*
- *Code to run the analysis*
- *Work that inspired me*