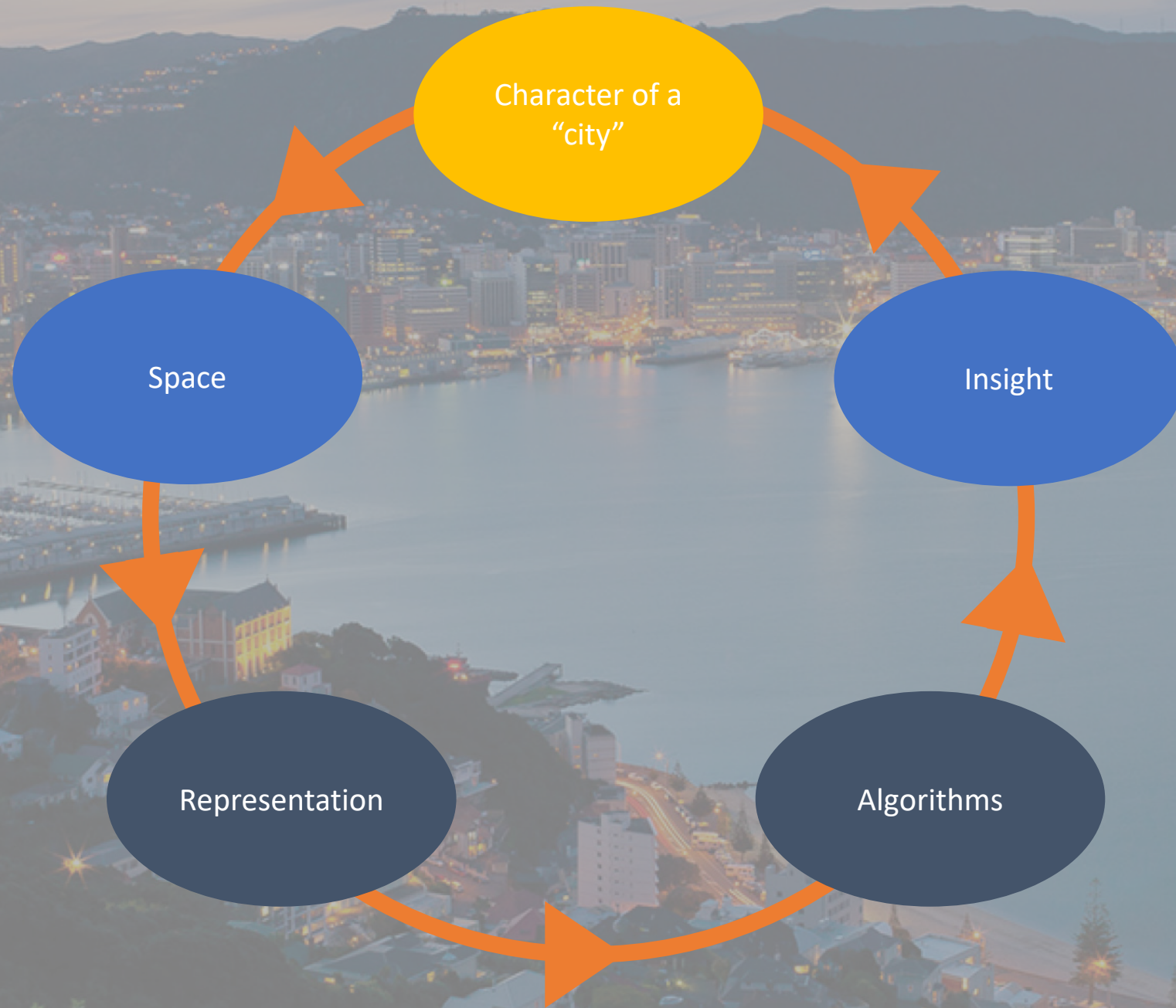




Image: <https://www.exportnz.org.nz/home/wellington>

Learning about Wellington with open data and open source tools

Shrividya Ravi
(Shriv)





Character of a
“city”

Space

Useful
Abstractions

Insight

Representation

Data
Science

Algorithms

Spatial Data Science
with
Open Data
and
Open Source tools

Land Information New Zealand
DATA SERVICE

Search for data & maps Search Help Sign in

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

Map of New Zealand showing major cities: Whangarei, Auckland, Hamilton, Gisborne, Napier, Palmerston North, Wellington, Nelson, Blenheim, Greymouth, Hokitika, Christchurch, Ashburton, Timaru, Queenstown, Oamaru, Dunedin, Invercargill.

Basemap © Mapbox © OpenStreetMap contributors

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

Land Information NZ

Welcome to Wellington City Council's Open Data

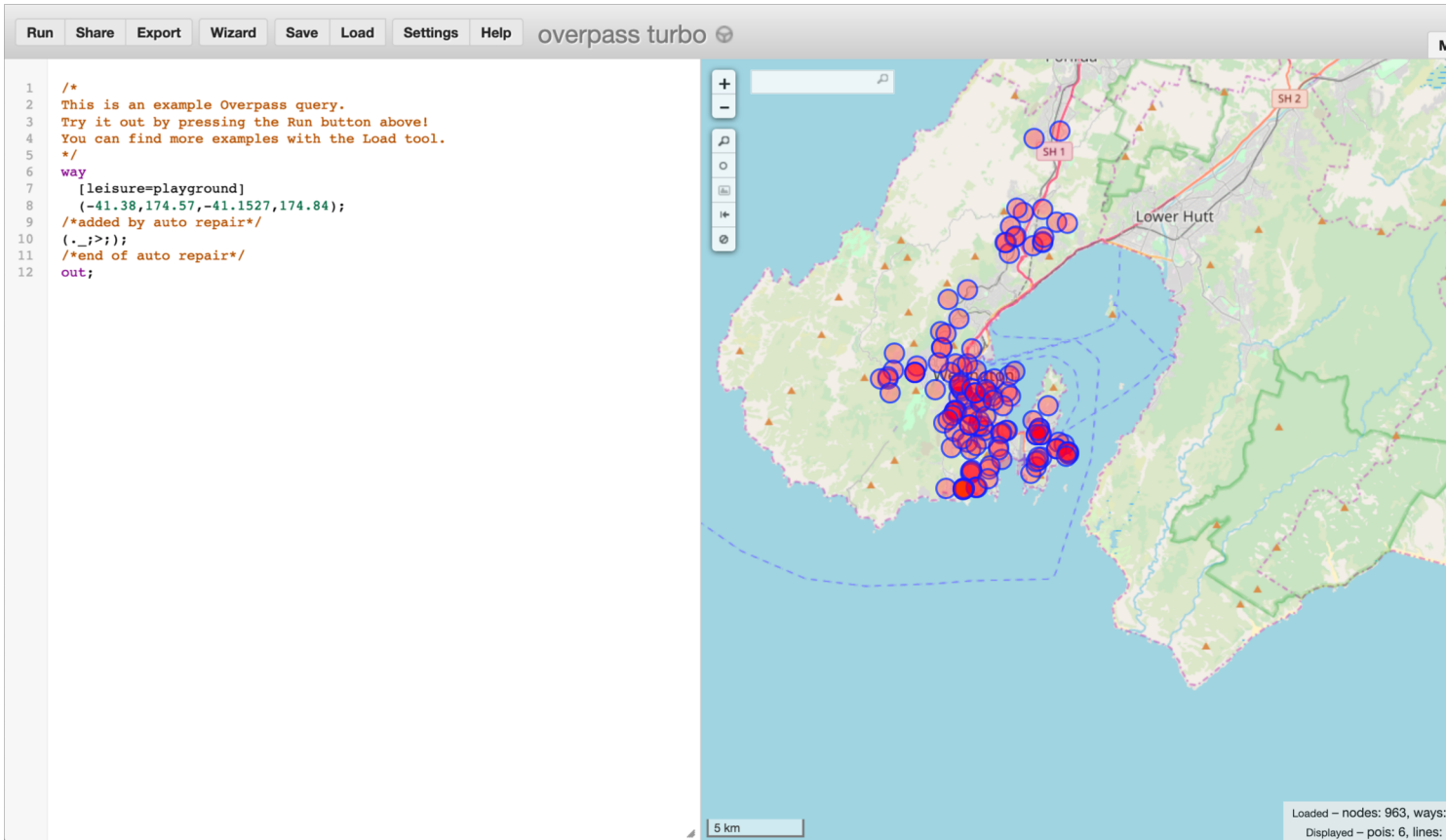
Search Our Data

The location search tool is not available for Internet Explorer users



Wellington City Council

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



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

OpenStreetMap

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.

Open Source Tools

- Osmnx
- Pandana
- Jupyter
- ...

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

Questions of (city) character

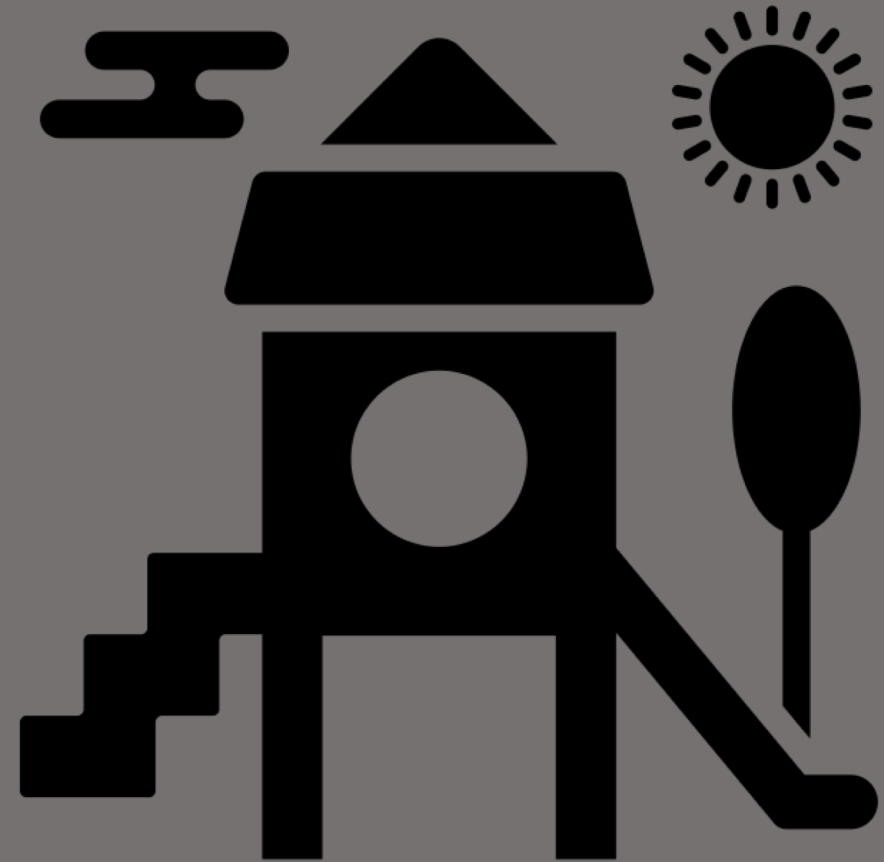
- Do I have the amenities I need nearby? Can I access them in more than one way?



- Do my journeys allow for an active transport option?

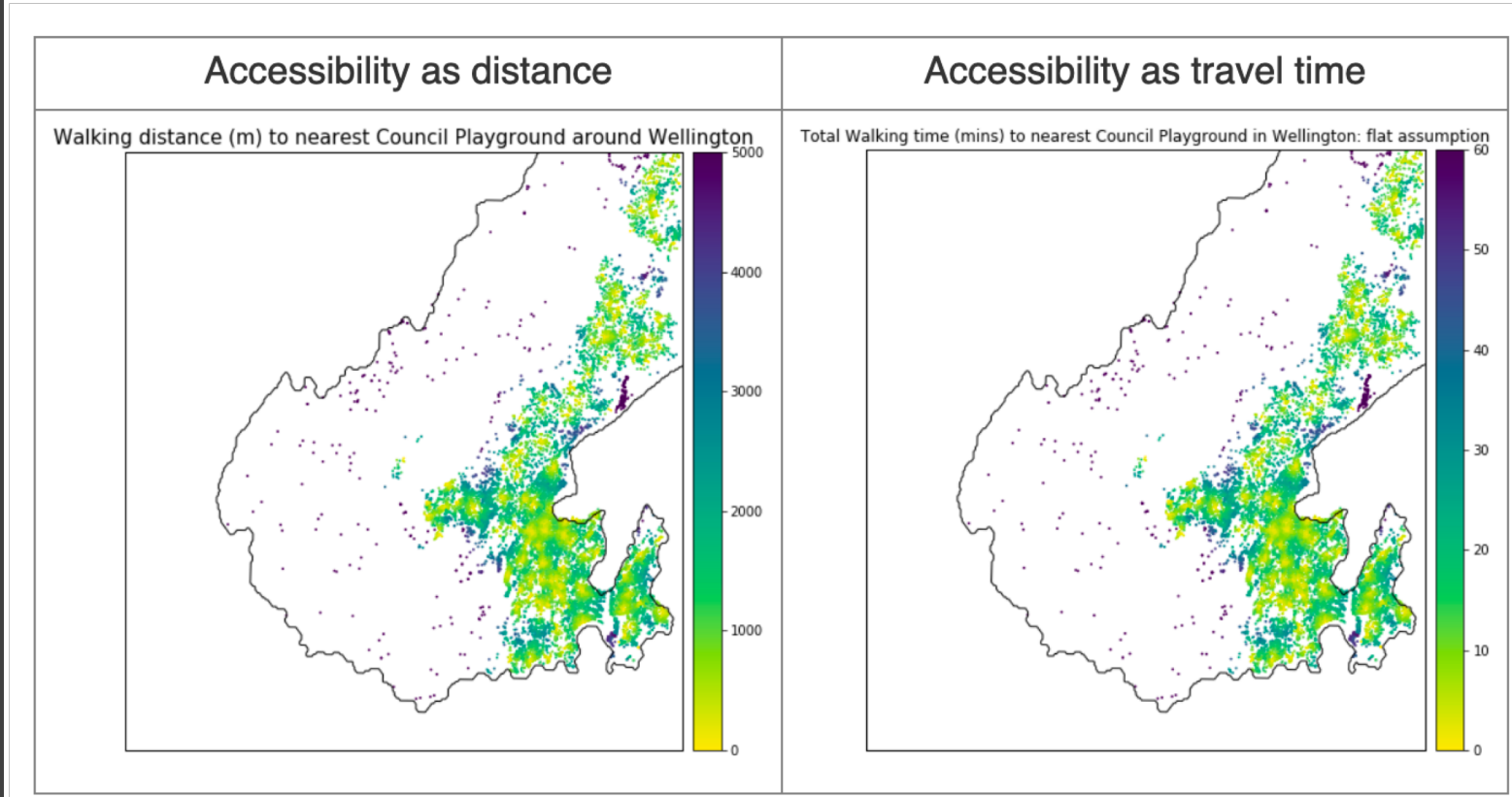
Playground accessibility as proxy for walkability

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



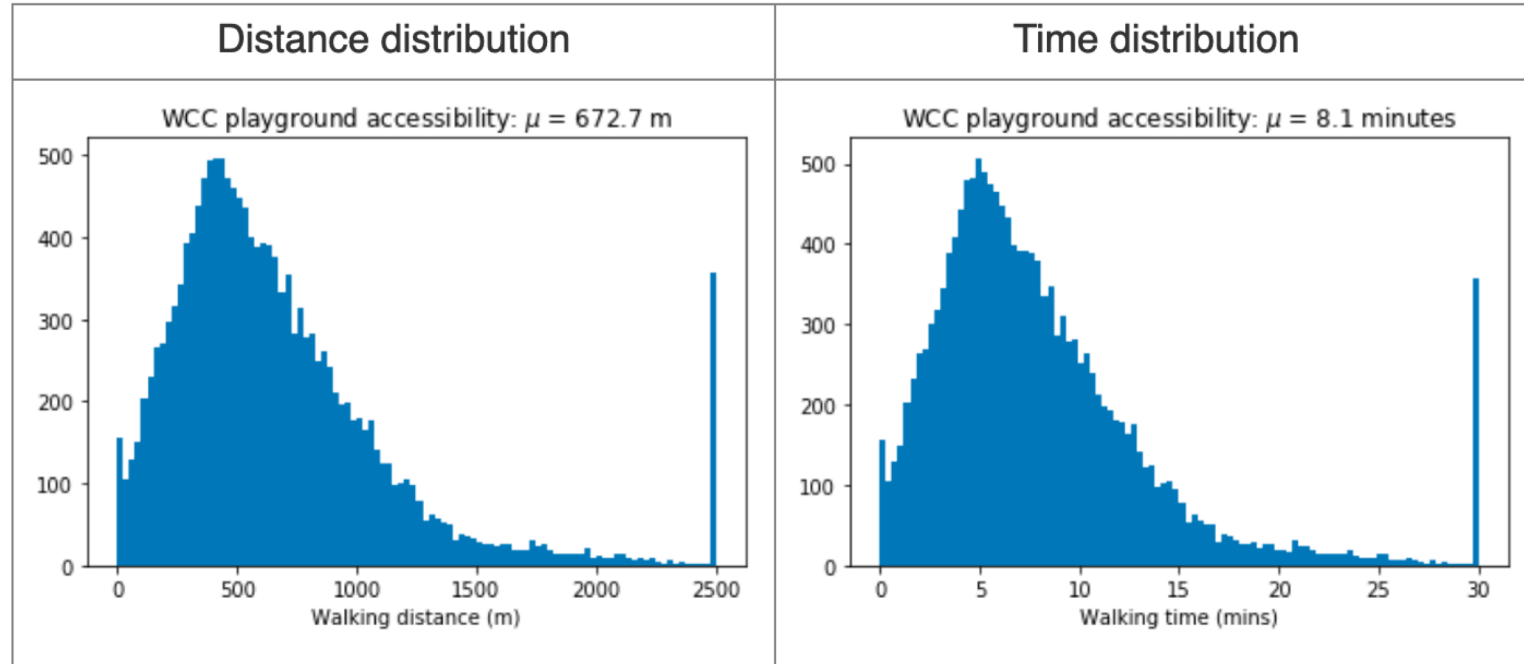
Accessibility to playgrounds

- 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.

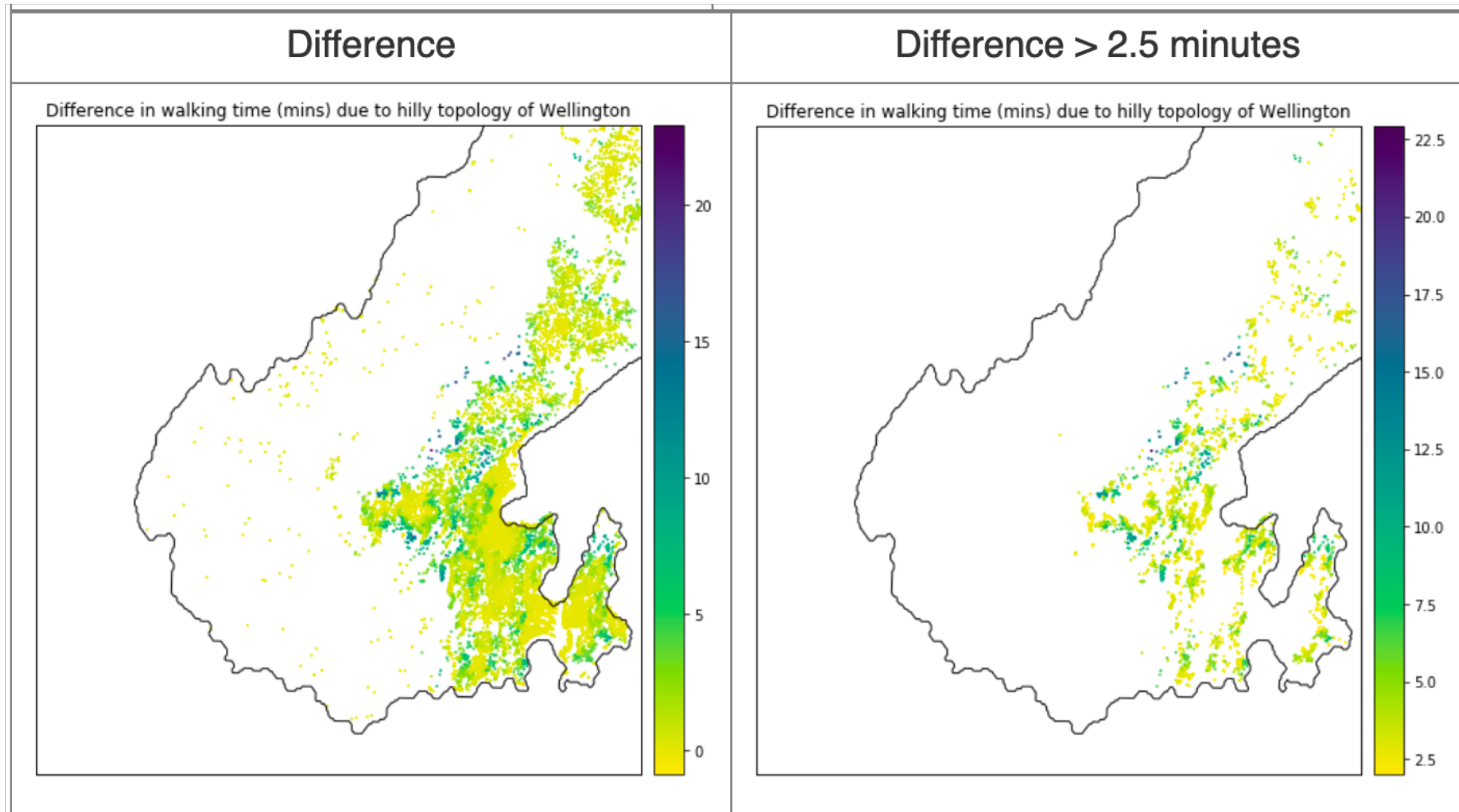


Accessibility to playgrounds

- 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.



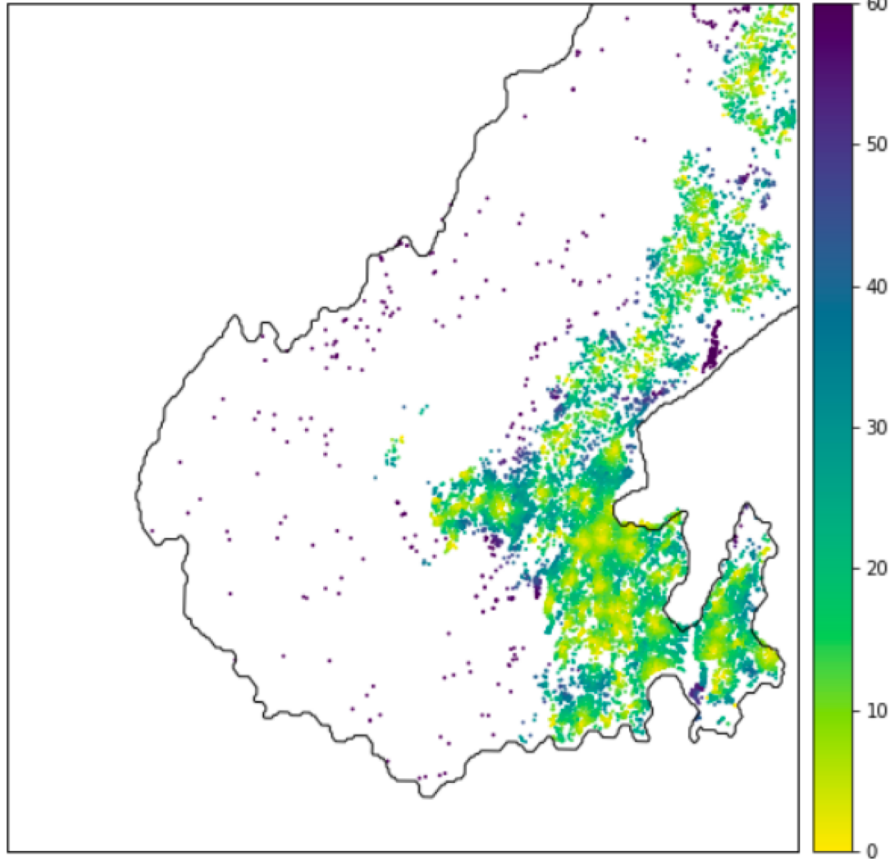
Impact of hills on travel time



Travel time to different options

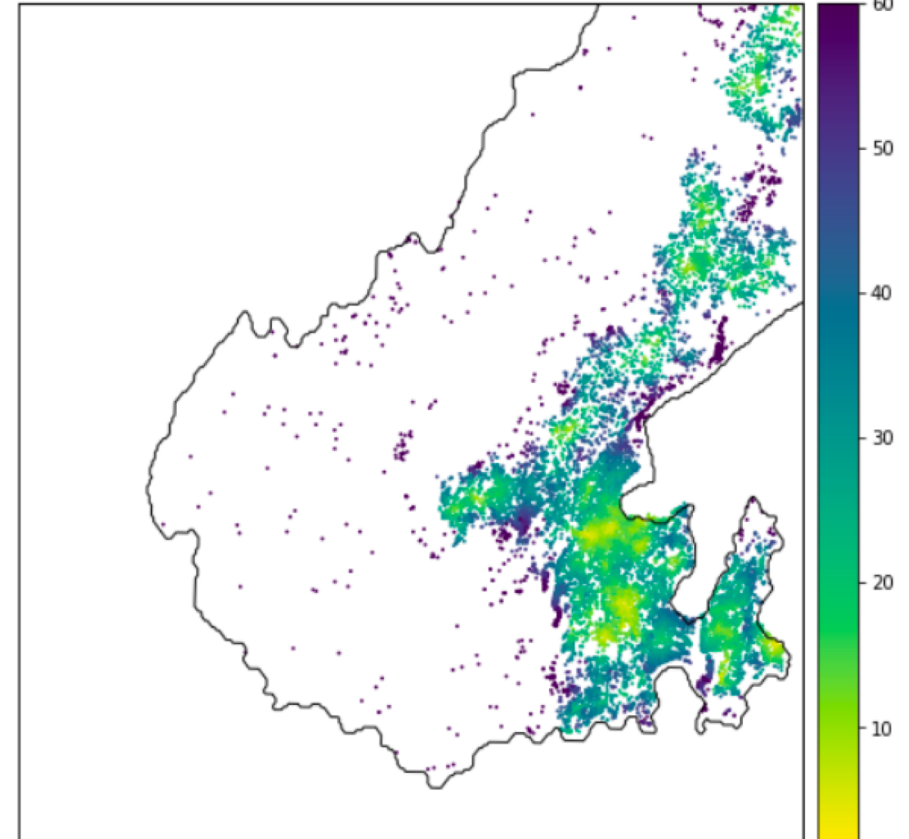
Nearest playground

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