



Arc GIS PRO Introduction Tutorial

Introduction | Data Acquisition | Basic Functions | Industry Applications

March 2024

What is ArcGIS Pro

- ArcGIS is a **Geographic Information System (GIS)** for working with maps and geographic information, created by Esri.
- ArcGIS Pro is the latest professional desktop GIS application from Esri.
- It is the **new version of ArcMap**.
- With ArcGIS Pro, you can:
 - explore, visualize, and analyze data;
 - create 2D maps and 3D scenes; and
 - share your work to your ArcGIS Online or ArcGIS Enterprise portal.

Data Acquisition

Useful links to find Geographic Data:

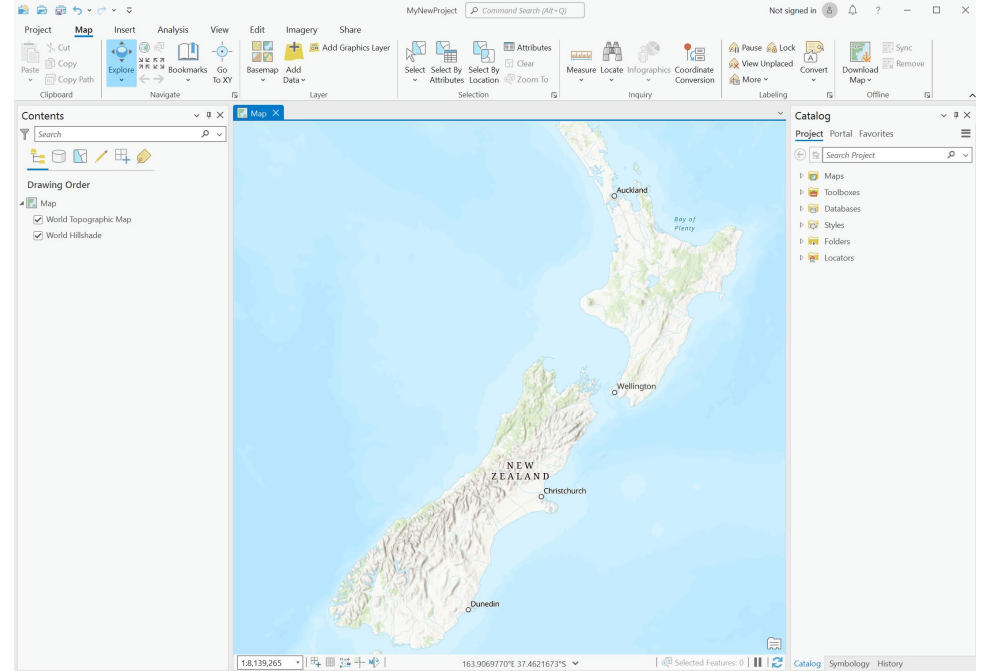
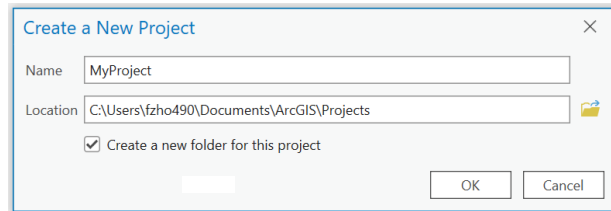
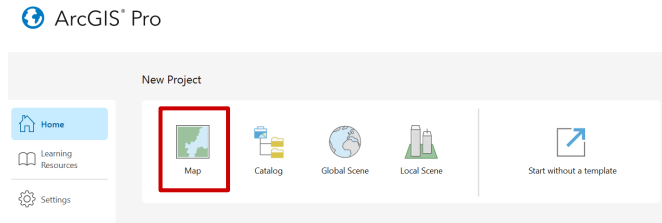
- Koordinates - <https://koordinates.com/>
- Auckland Council GeoMaps - <https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html>
- Auckland Council Open Data- <https://data-aucklandcouncil.opendata.arcgis.com/>
- Land Information New Zealand - <https://data.linz.govt.nz/>
- Waka Kotahi open data - <https://opendata-nzta.opendata.arcgis.com/>
- Auckland Transport Open GIS Data - <https://data-atgis.opendata.arcgis.com/>
- Other Councils' Open Data Portals:

E.g. Hawke's Bay Regional Council - <https://hbrcopendata-hbrc.opendata.arcgis.com/>

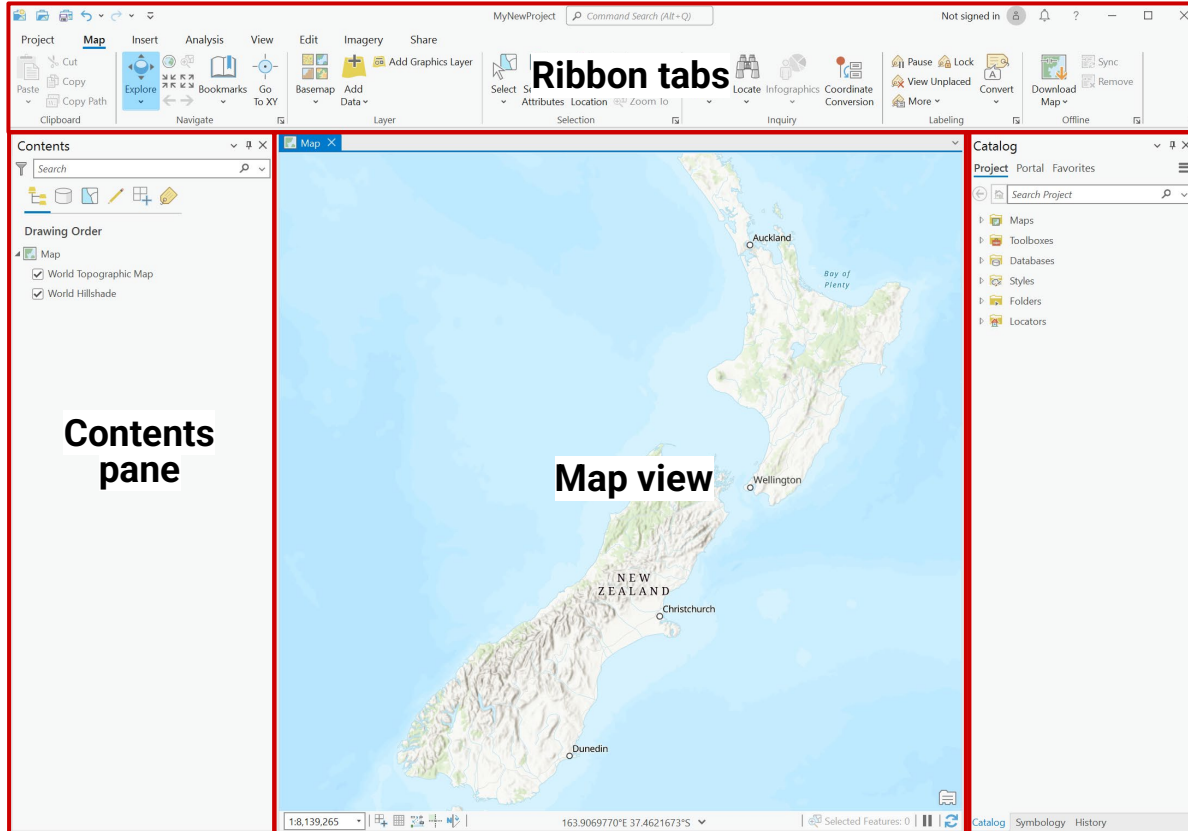
DRH Tutorial - Data Acquisition Finding Spatial (Map) Info:

<https://www.drh.nz/2022/12/09/data-acquisition-finding-spatial-map-info/>

Launch ArcGIS Pro & Create a New Project

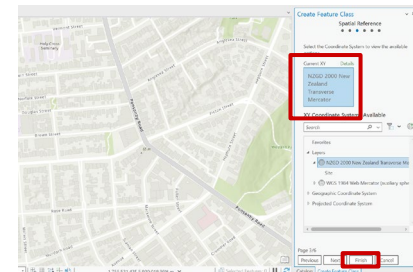
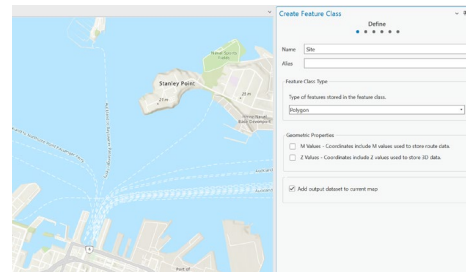
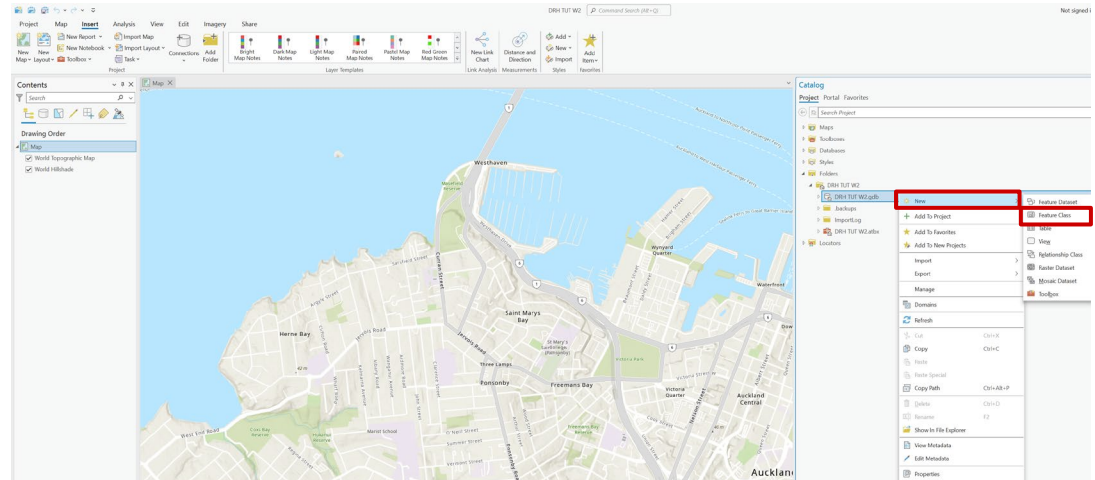


ArcGIS Pro User Interface



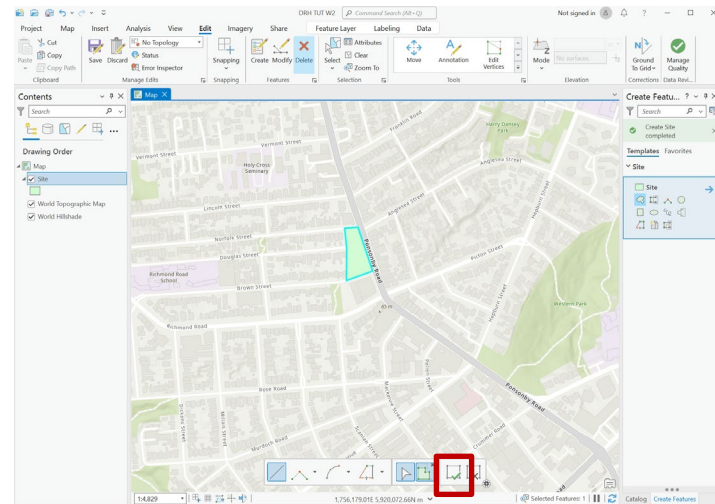
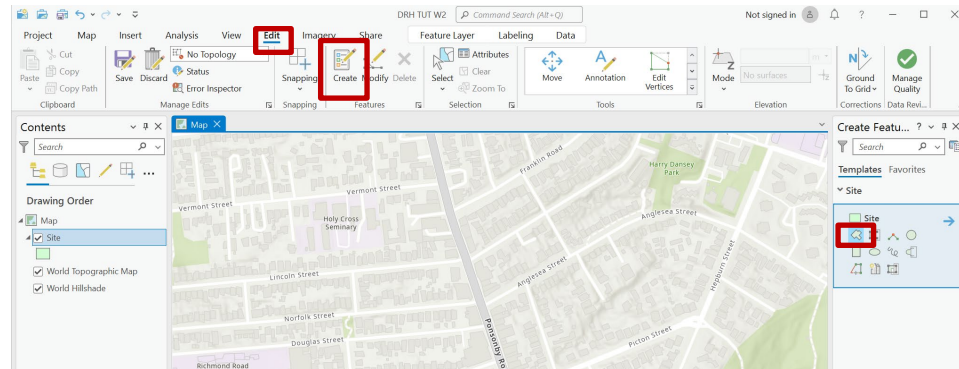
Creating Features

- *Catalog > Folders > .gdb*, right click *New > Feature Class*
- Name your feature, **uncheck Z values** (used for 3D data), then make sure Spatial Reference is on **NZGD2000** before clicking finish.
- You should now have a new layer in the contents page with your feature name.



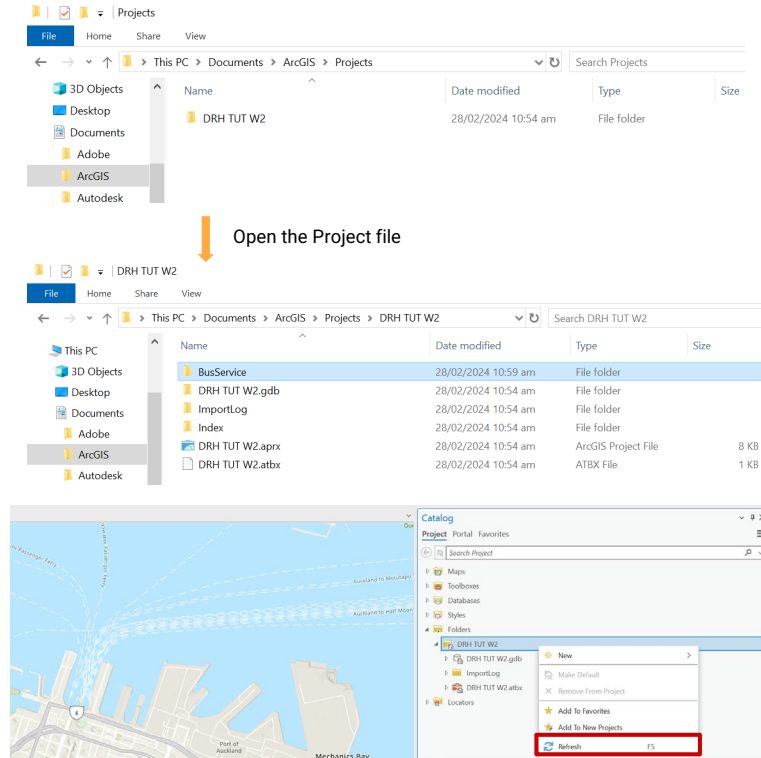
Editing Features

- To create a shape: *Edit* > *Create* > *Feature name* (double click)
- Select the first polygon shape and you can start drawing on your site boundary.
- Draw by clicking points and double clicking to close the shape.
- Once finished, **hit done**.



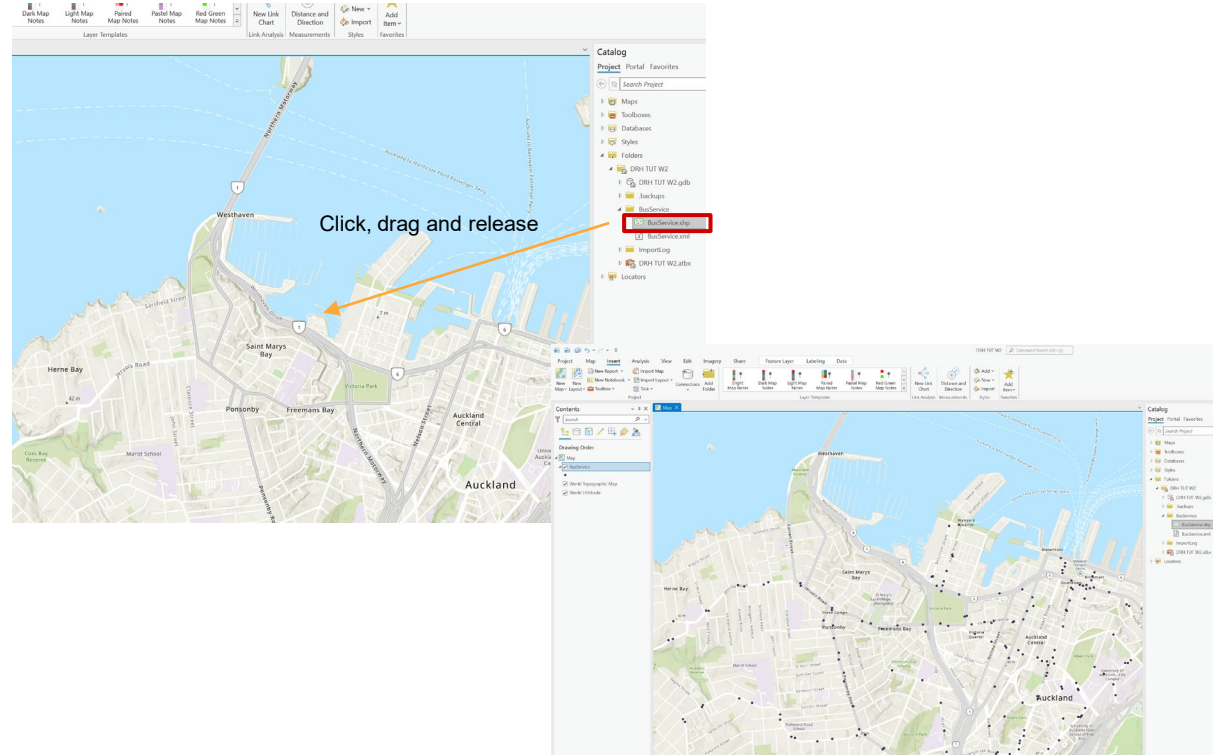
Importing Data

- Your project data is automatically saved into a profile file located: *Documents > ArcGIS > Projects > Project file name*
- Paste** your data file into the project folder.
- Open ArcGIS and under *catalog > folders > (project name)*, **right click** and **refresh**.
- Your file should now be showing.



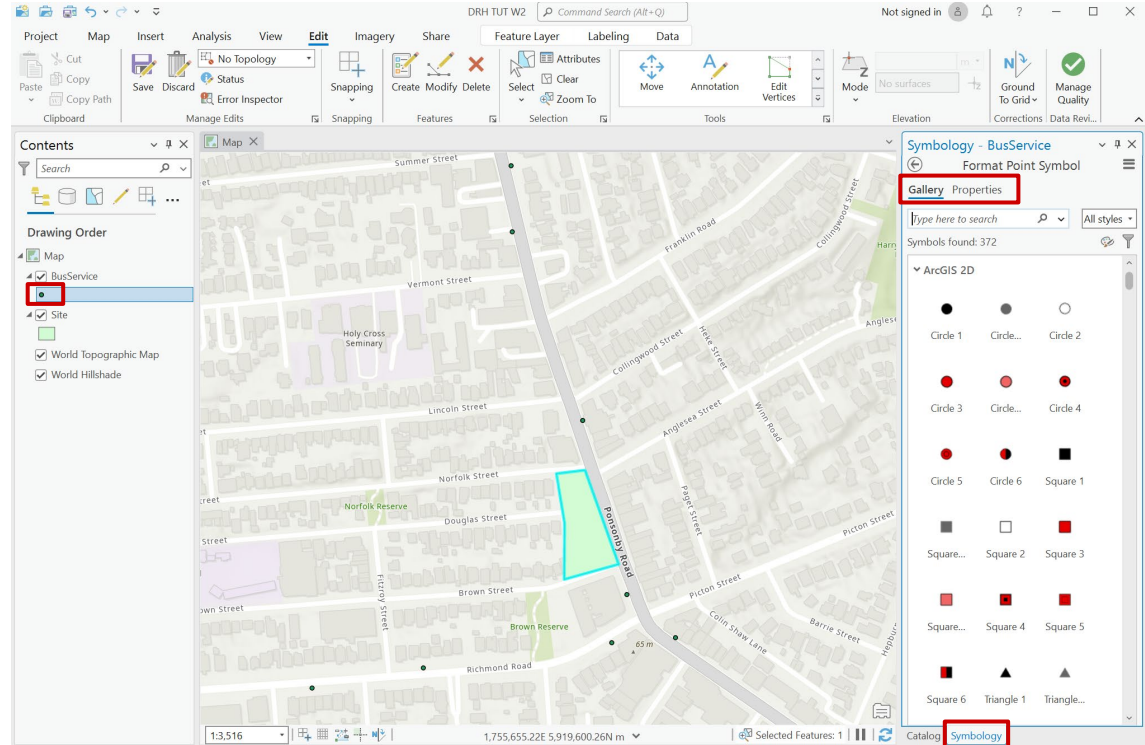
Adding Data onto the map

- **Expand** the imported folder and **drag** the .spp file towards your map.
- This should create a new layer under **contents** and display data on the map



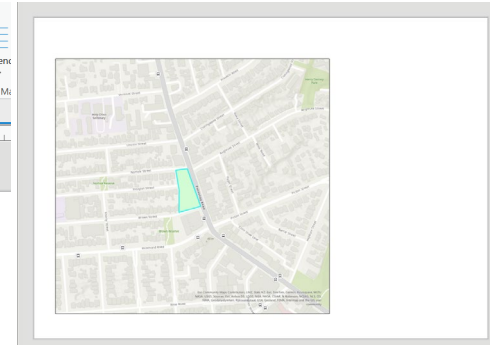
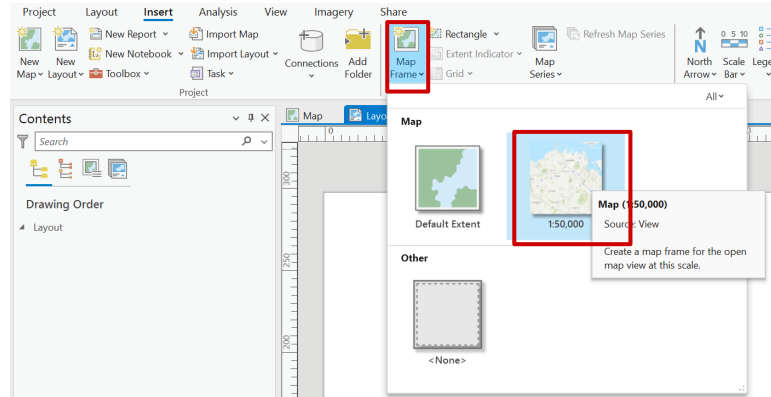
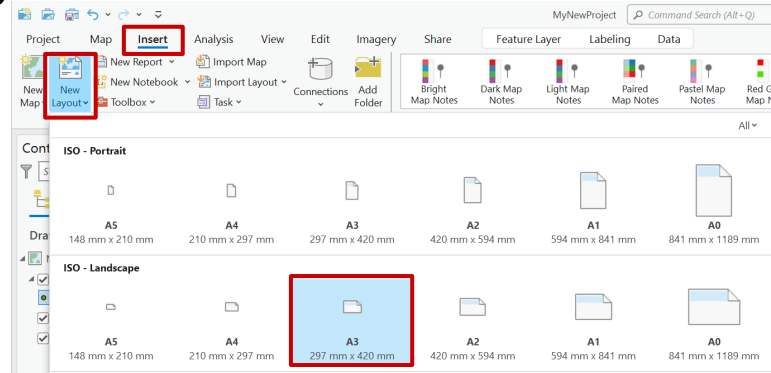
Editing Symbology

- Once you have imported your data, clicking on the icon underneath the name of the layer.
- This will bring up the **Symbology** tab on the right hand side.
- **Gallery** – Search a Symbol
- **Properties** - to edit the colours, line weights, and styles etc.
- Make sure to click '**Apply**' to see the changes.



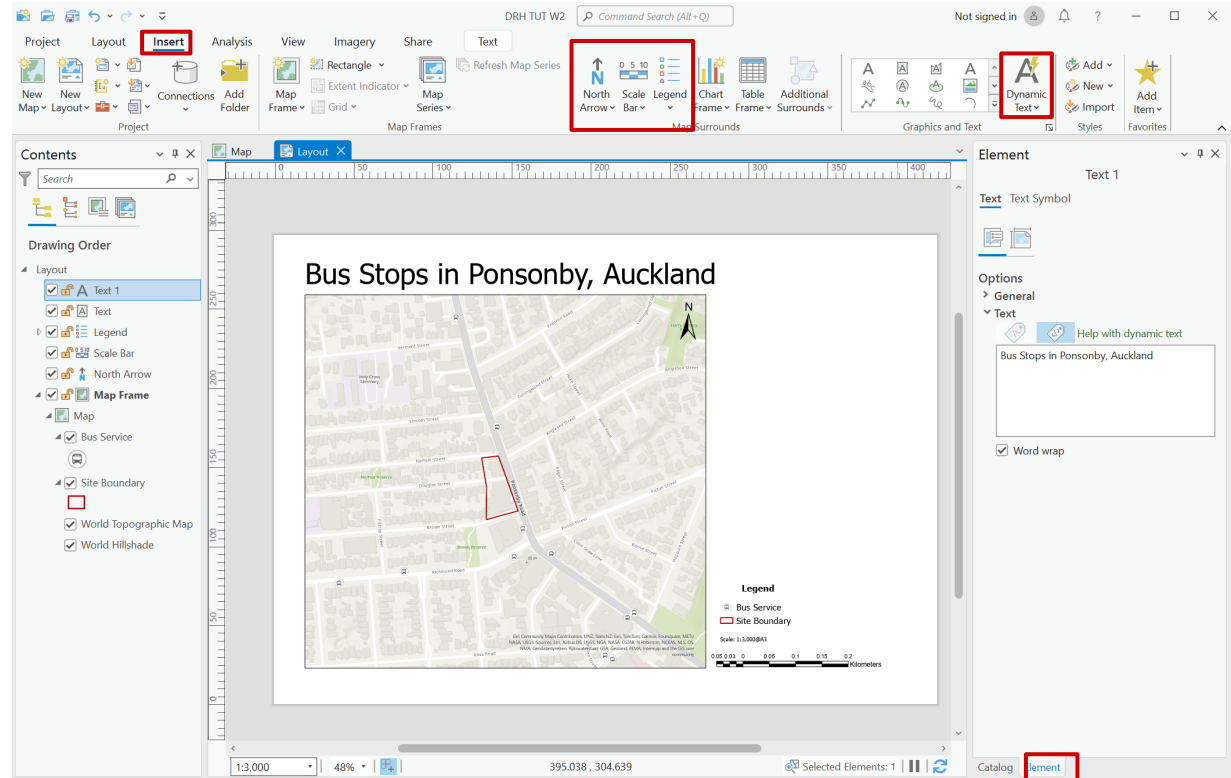
Adding a new Layout

- Under the **Insert** tab, select **New Layout**. Choose your desired size and orientation (typically A4/A3).
- Once the page appears, navigate to **Insert > Map Frame**, and select the map you want to add to your page.
- Click and drag on the page to create a frame within which your map will appear.



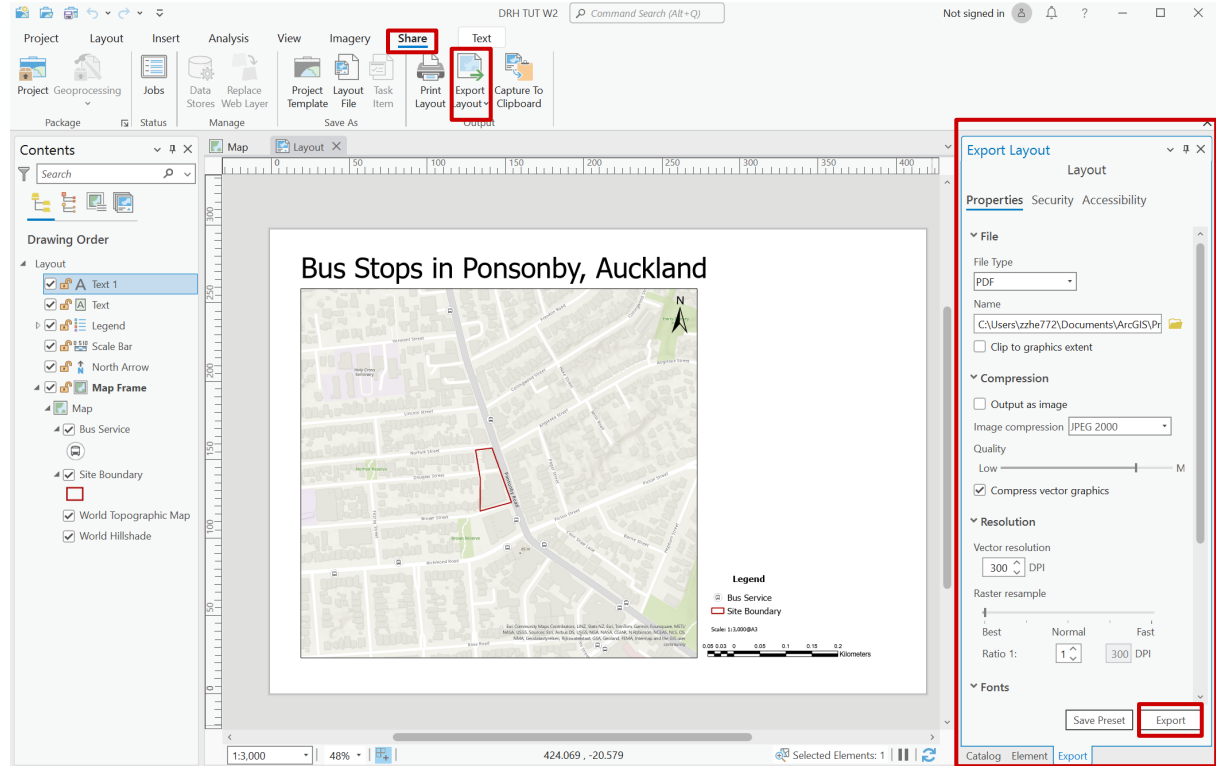
Adding Map Components

- Under the **Insert** tab, you can add a **North Arrow**, **Scale Bar**, and **Legend**.
- Add a **Map Title** by inserting **straight text**.
- Add a **Scale** by inserting **Dynamic Text**.
- Double click the elements on the map to edit their properties in the **Element** tab.



Saving and Exporting

- Once your map is ready to export as a different file type (e.g. PDF), go to the **Share** tab.
- Select **Export Layout**.
- Click **Export** at the bottom right.
- All done!



The screenshot shows the ArcGIS Pro interface with the 'Share' tab selected in the ribbon. The 'Export Layout' dialog box is open, showing the following settings:

- File Type:** PDF
- Name:** C:\Users\zjzhe772\Documents\ArcGIS\Pr...
- Compression:** Output as image, Image compression: JPEG 2000, Quality: Low to High, Compress vector graphics
- Resolution:** Vector resolution: 300 DPI, Raster resample: Best, Normal, Fast, Ratio 1: 1, 300 DPI
- Fonts:** Save Preset, **Export**

Industry Applications and the Capabilities of ArcGIS Pro



Potential application to studio assignments: Examples

1. Site Context



Figure 10: Location of Ranui in Henderson (Designed by Author, 2023)

- ArcGIS Pro and Illustrator

2. Urban Form v.s. Flood Plains

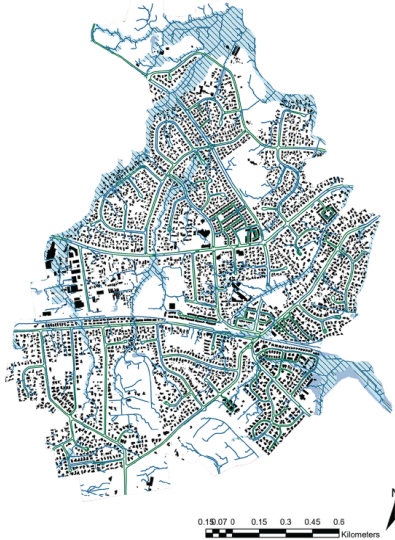


Figure 11: Ranui Nolli Map and Flood plains (Designed by Author, 2023)

- ArcGIS Pro and Photoshop

3. Ecosystems

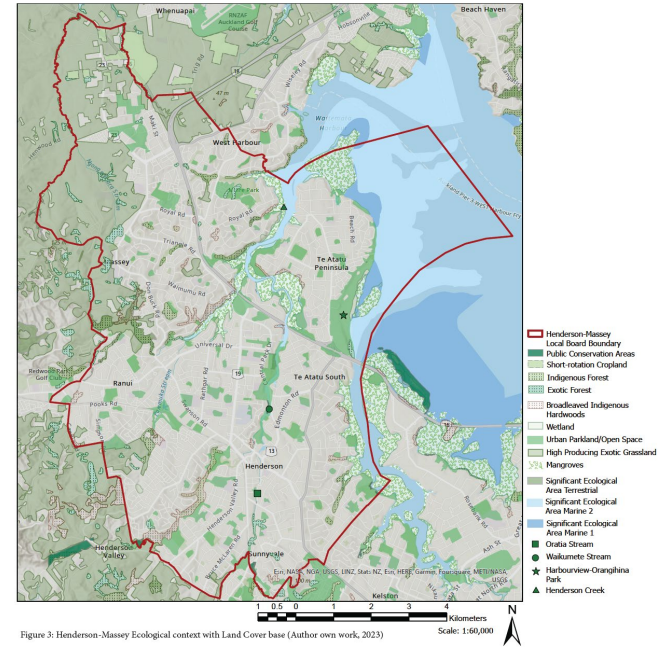
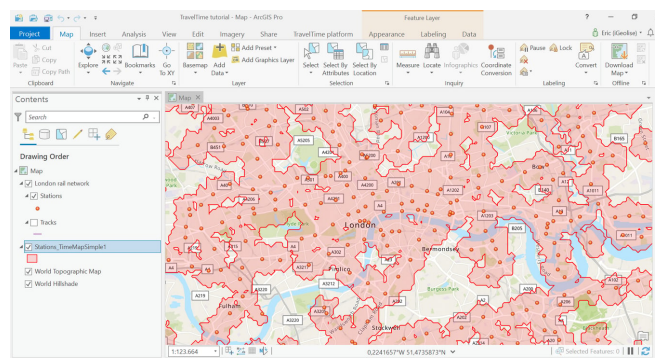


Figure 3: Henderson-Massey Ecological context with Land Cover base (Author own work, 2023)

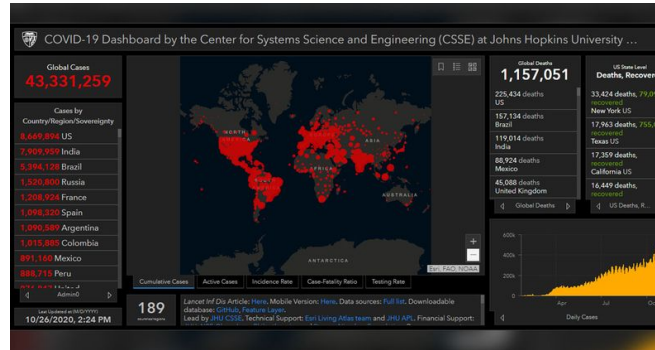
- ArcGIS Pro

Industry Applications

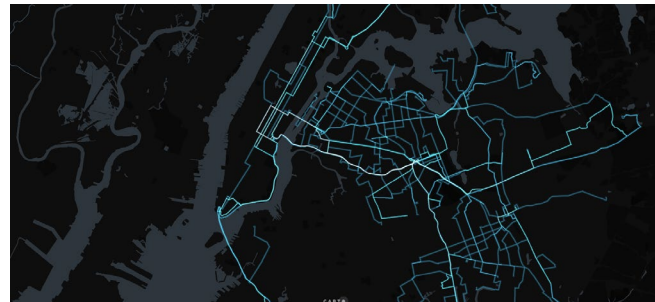
- ArcGIS Pro has a wide array of uses in various industries, especially in **Urban Planning**:
- These include:
- Creation of **Walkable Catchments** for cities/suburbs of the future (based on population & employment predictions)
- **ArcGIS Dashboards** to display data for a more general and wider audience.
- Displaying and analyzing **GTFS Data** (General Transit Feed Specification) or the data that Google/AT Mobile use to display routes, timetables etc. for P.T



Walkable Catchments



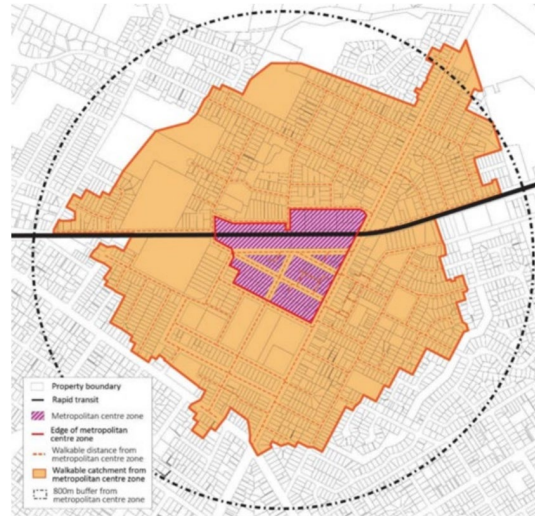
ArcGIS Dashboards



GTFS

Walkable Catchments

- **More accurate tool used to calculate how far Pedestrians can walk within specified time/distance.**
- More realistic than a buffer (although this maybe more apt in other circumstances).
- **Geocredits:** Needed to run geoprocessing tools that “grab” data from ArcGIS’s cloud servers.

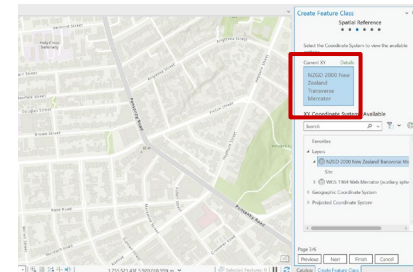
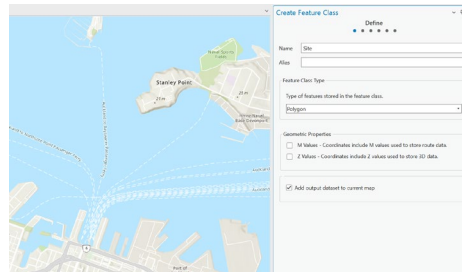
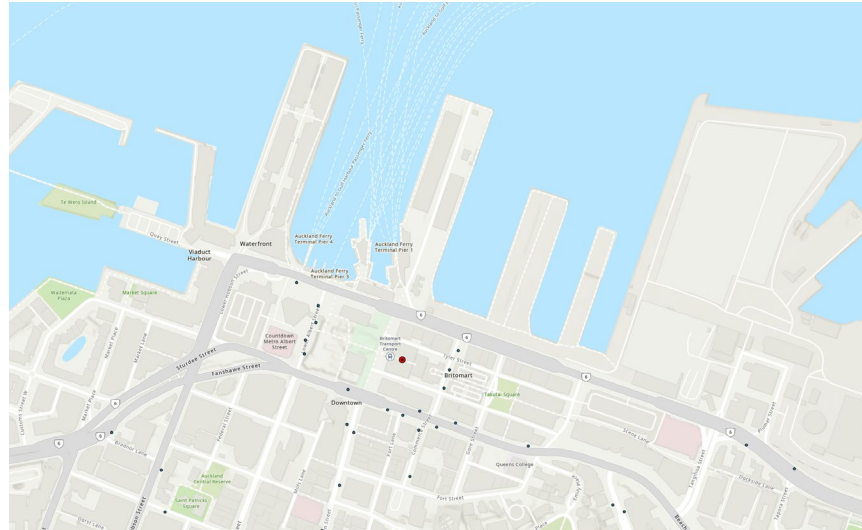


Walkable Catchments around CRL Stations



Walkable Catchments

- First create a centre **point** on **Britomart**: *Catalog > Folders > .gdb*, right click *New > Feature Class*. Type is **Point data**.
- Name your feature, **uncheck Z values** (used for 3D data), then make sure Spatial Reference is on **NZGD2000** before clicking finish.
- You should now have a new point data layer in the contents page with your feature name.



Walkable Catchments

- Create a Pairwise Buffer by going to the **Analysis Tab**.
- Buffers show much distance can be covered as the “crow-flies”/direct distance.
- **Typical Distances for pedestrians (and this is the same for walkable catchments as well):**
 - 400m= a 5 min walk**
 - 800m= a 10 min walk**
 - 1200m= a 15 min walk**
- Cyclists cover much more distance.

Geoprocessing ✕

← Pairwise Buffer +

Parameters Environments ?

Input Features
Britomart

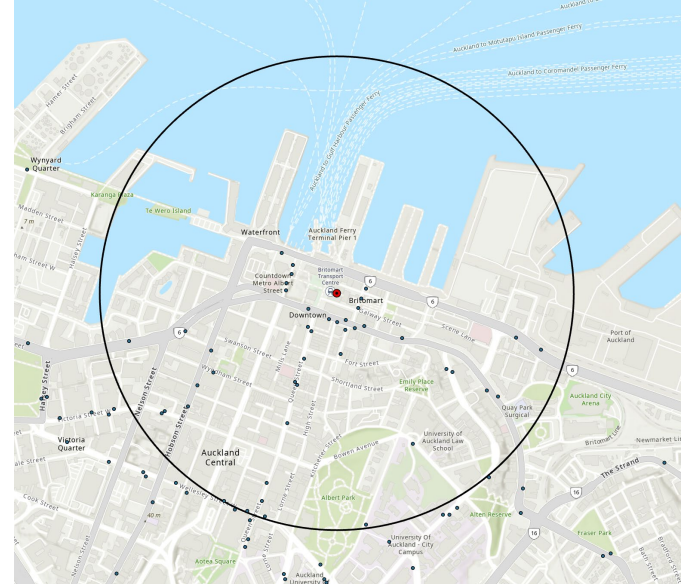
Output Feature Class
Britomart_PairwiseBuffer

Distance [value or field] Linear Unit

Method
Planar

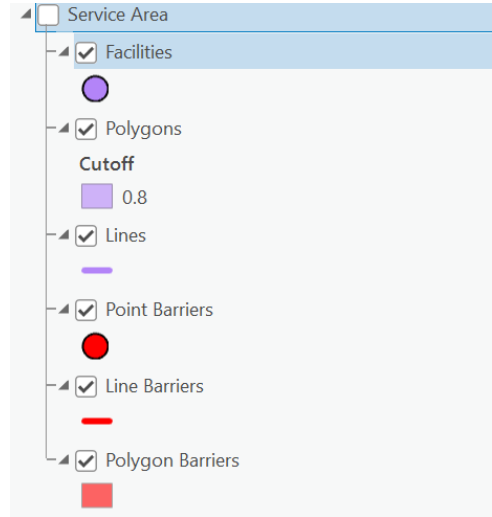
Dissolve Type
No Dissolve

Maximum Offset Deviation

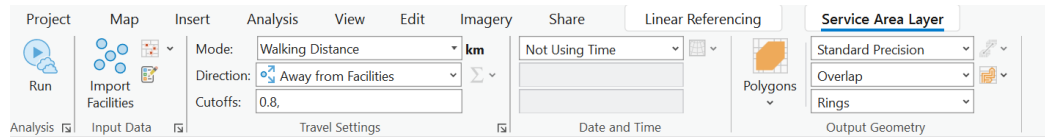


Walkable Catchments

- Go to **Analysis Tab > Network Analyst > Service Shed** (Note ArcGIS Online account is required)
- New Service Area layer will appear:
- **Facilities:** starting point of the walkable catchment
- **Polygons and lines:** these are from your resulting walking catchment
- **Points/Line/Polygon Barriers:** Barriers on the ground that will hinder pedestrians walking.

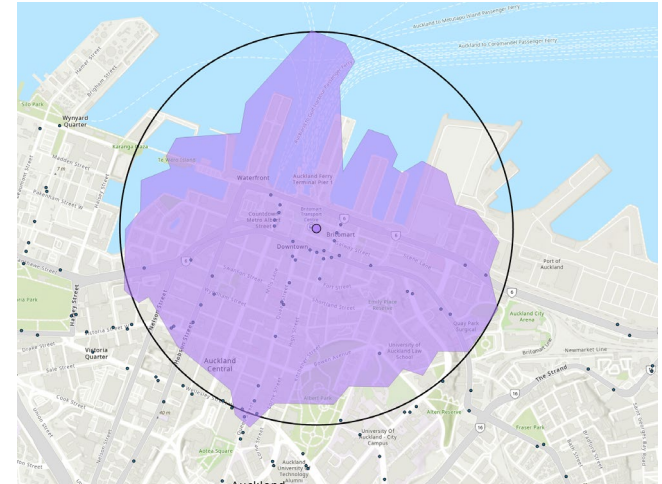
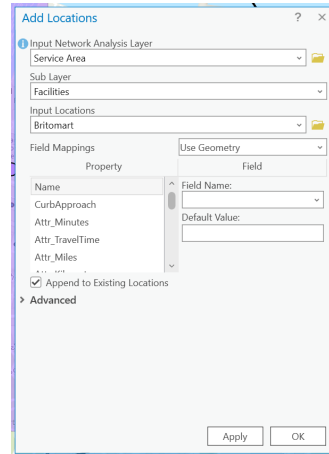
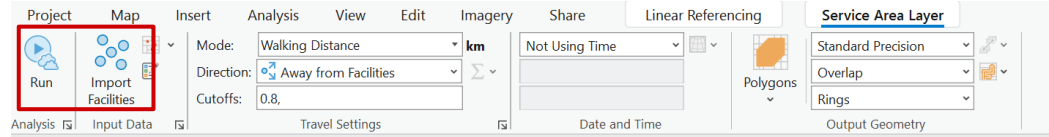


- Click on the **Service Area** in the contents pane and go to the new **"Service Area Layer"** in the **Ribbon Tabs**.
- Fill out the options with those as shown below: Walking Distance, 0.8 (for 800m or 0.8km).

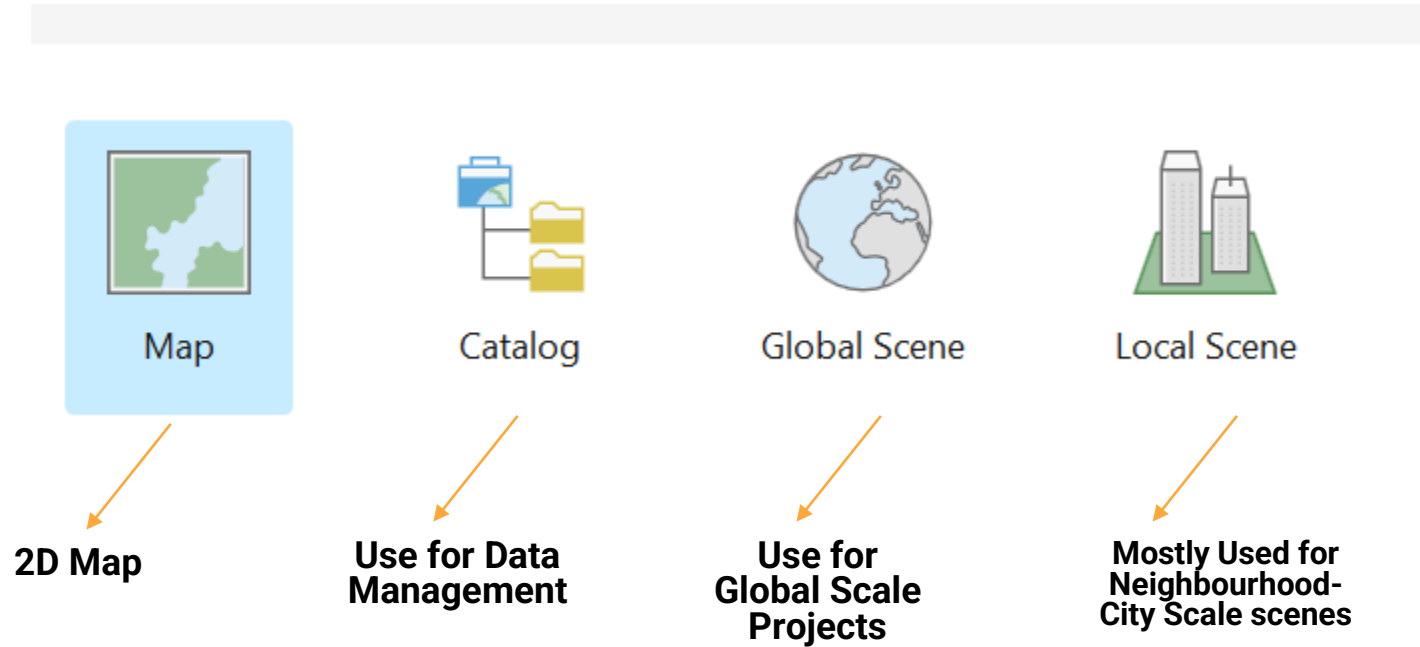


Walkable Catchments

- Click **Import Facilities** and key in the Britomart point as the input location.
- Hit Run
- It may take time to execute the function based on the location and the internet speed etc.
- In the end, you should have a Polygon walkable catchment as shown on the right-hand side.
- Turn on your buffer to **compare** these two analysis tools.
- Change **Symbology** as needed.



Scenes

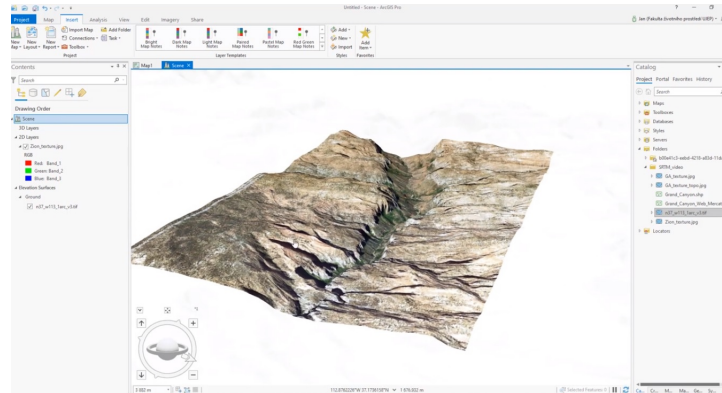


Interesting Capabilities of ArcGIS Pro

- **3D Scenes**- Global Scene to visualize how a future rail line will impact its citizens.
- Importing of DEMs (Digital Elevation Models) to create more accurate terrain for rainwater catchment calculation – **Catchment Planner/Water Engineering.**
- We will try to provide exposure to these in the Sem 2 tutorials!



3D Scenes



DEMs

Helpdesk

Architecture Building Level 2, Room 218 (421E-218).

drh@auckland.ac.nz

Opening Hours:

Mon-Fri: 9:30am-4:30pm (Architecture Helpdesk and other services)

Planning Helpdesk :Tues & Wed- 9:30 am -1:00pm

We do not open during public holiday

Appointments only during school breaks

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