



# ArcGIS CityEngine

Introduction | Online Sources | Create a project and Scene | Get Map Data

2022 November



# What is ArcGIS CityEngine

- ArcGIS CityEngine is an advanced 3D city design software for modelling massive, interactive, and immersive urban environments.
- It is a stand-alone desktop application created by Esri, and fully supports the Esri file geodatabase and Esri shapefile format.
- ArcGIS CityEngine can create cities based on real-world geographic information system (GIS) data.


More information from <https://www.esri.com/en-us/arcgis/products/arcgis-cityengine/overview>



# Online Sources

- **Access Tutorial Projects and Examples in CityEngine:**

1. Open **CityEngine** program
2. Click **Help > Download Tutorials and Examples** in the main menu.
3. After choosing a tutorial or example, the project is automatically downloaded and added to your CityEngine workspace.

**1**  CityEngine 2022.0

File Edit Select Layer Terrains Graph Shapes Analysis Search Scripts Window ArcGIS Urban **Help**

Navigator × Welcome ×

**2**

Window ArcGIS Urban Help

- CityEngine Help
- CGA Reference
- Python Reference
- Tutorials
- Download Tutorials and Examples...**
- Online CGA Reference
- Offline Python Reference
- Download CityEngine Help (PDF)
- CityEngine Resources
- What's New
- Forum
- Training
- Blog
- Ideas
- Social Media
- Show Key Assist Ctrl+Shift+L
- About CityEngine

**3**

**Download Tutorials and Examples**

- CityEngine Examples
  - CityEngine Tutorials
    - CityEngine Tour 2021.1
    - Tutorial 01 Essential Skills 2020.0
    - Tutorial 02 Terrain and Dynamic City Layouts 2019.1
    - Tutorial 03 Map Control 2019.1
    - Tutorial 04 Import Streets 2019.1
    - Tutorial 05 Import Initial Shapes 2019.1
    - Tutorial 06 Basic Shape Grammar 2021.0
    - Tutorial 07 Facade Modeling 2019.1
    - Tutorial 08 Mass Modeling 2019.1
    - Tutorial 09 Advanced Shape Grammar 2019.1
    - Tutorial 10 Python Scripting 2019.1
    - Tutorial 11 Reporting 2019.1
    - Tutorial 12 Scripted Report Export 2019.1
    - Tutorial 13 Facade Wizard 2019.1
    - Tutorial 14 Behavioral Modeling 2020.0

**Tutorial 01 Essential Skills 2020.0**

Download Cancel

Useful link to access free CityEngine tutorials:

<https://doc.arcgis.com/en/cityengine/latest/tutorials/introduction-to-the-cityengine-tutorials.htm>



# Navigating CityEngine





The screenshot shows the CityEngine 2022.0 interface. The central 3D Viewport displays a wireframe model of a city block. The interface is annotated with red boxes and arrows:

- Toolbar:** A horizontal bar at the top containing various navigation and editing tools.
- Scenes:** A panel on the left side showing a list of scene objects, including 'Streetwork' and 'Blocks'.
- Navigator:** A panel on the left side showing a hierarchical tree of project files, including 'Tutorial\_01\_Essential\_Skills\_2020\_0' and 'Essential\_Skills\_Part\_2.cgj'.
- Viewpoint (3D View):** The central area where the 3D model is rendered.
- Scenario:** A button in the top toolbar used to switch between different simulation scenarios.
- Bookmarks:** A button in the top toolbar used to save and manage specific viewpoints.
- Inspector:** A panel on the right side used to view and edit the properties of the selected object in the 3D view.



# Navigating CityEngine



<p><b>1</b> Tumble or rotate the scene.</p>	<ul style="list-style-type: none"> <li>● Click the Tumble/Rotate button </li> <li>● Press <b>Alt+click</b>.</li> </ul>
<p><b>2</b> Move the view left, right, up, or down.</p>	<ul style="list-style-type: none"> <li>● Click the Pan/Track button </li> <li>● Press <b>Alt+click</b> the wheel button.</li> <li>● Press the arrow keys.</li> </ul>
<p><b>3</b> Dolly/zoom the camera toward or away from the point of interest.</p>	<ul style="list-style-type: none"> <li>● Click the Dolly/Zoom button </li> <li>● Press <b>Alt and right-click</b>.</li> </ul>
<p><b>4</b> Rotate the view from the current camera position. This can help create bookmarks that 360 VR exports.</p>	<ul style="list-style-type: none"> <li>● Click the Look around button </li> <li>● Press <b>B+click</b>.</li> </ul>



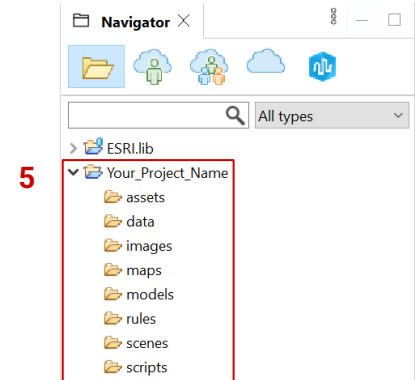
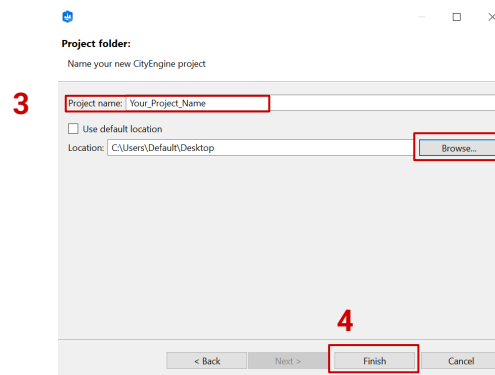
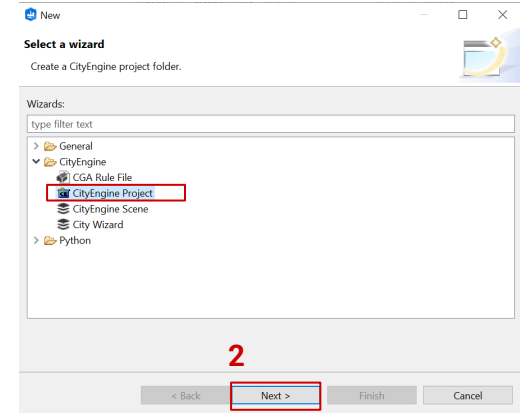
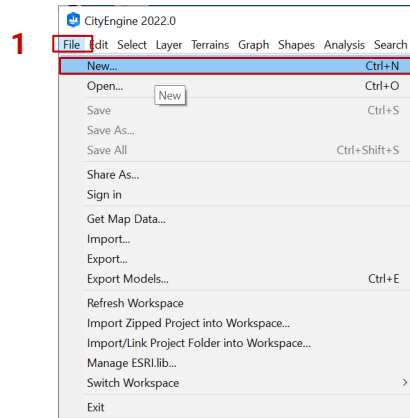
# Create a project

1. Click **File > New > CityEngine > CityEngine Project** to open the Select a wizard dialog box.
2. Click **Next**.
3. In the **Project name** box, type `Your_Project_Name`.

- a. Click **Browse** to select a folder location or *Use default location*

*\* make sure to remember where you saved*

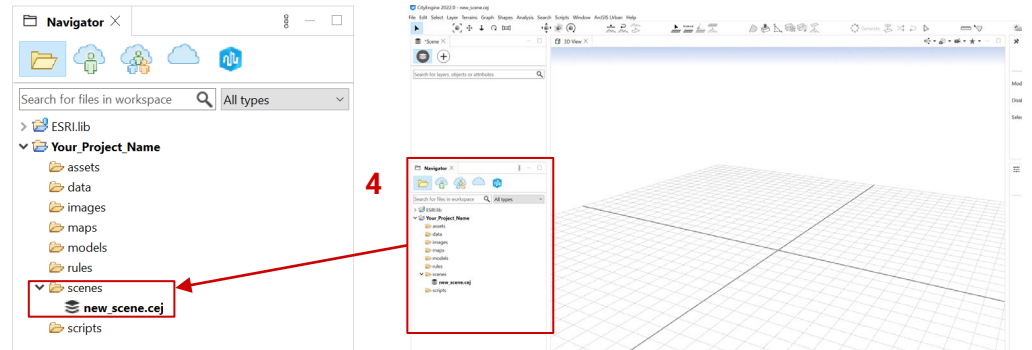
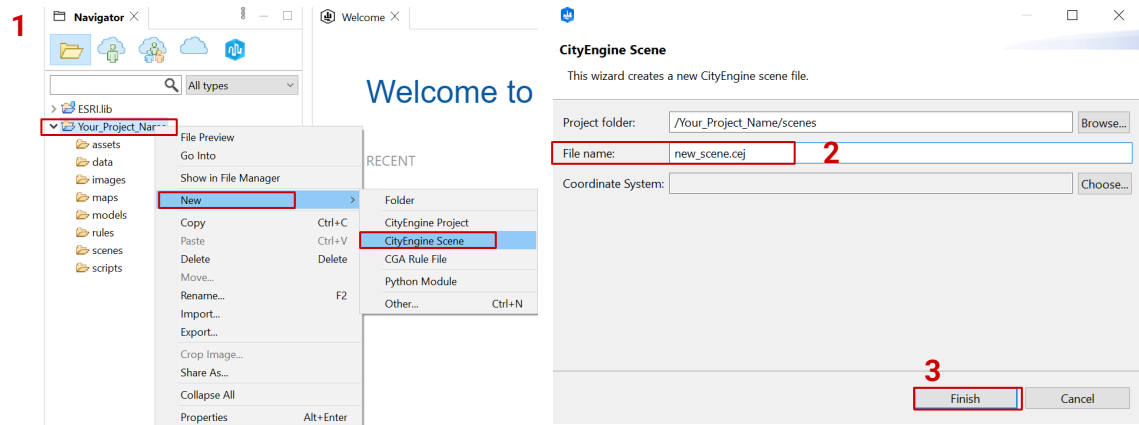
1. Click **Finish**.
2. The project is created in the Navigator.





# Create a scene

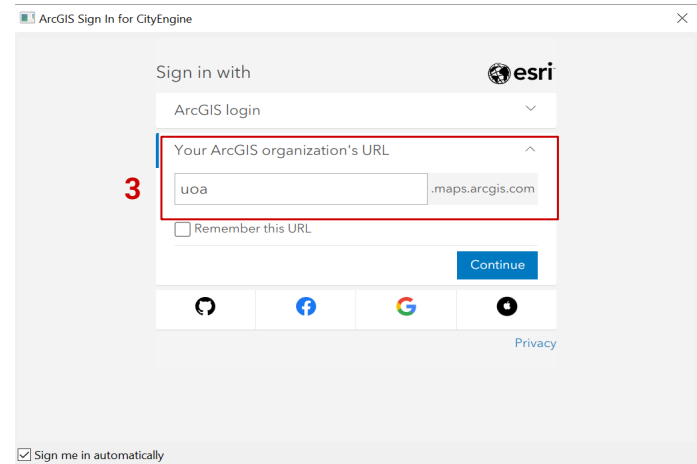
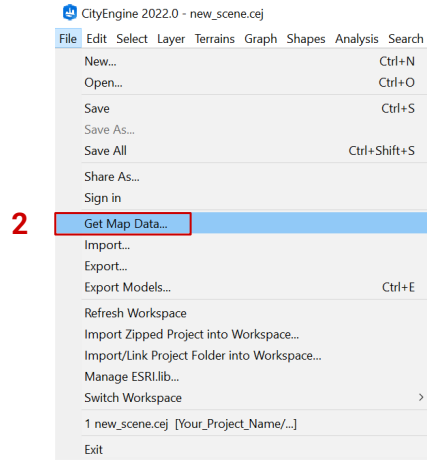
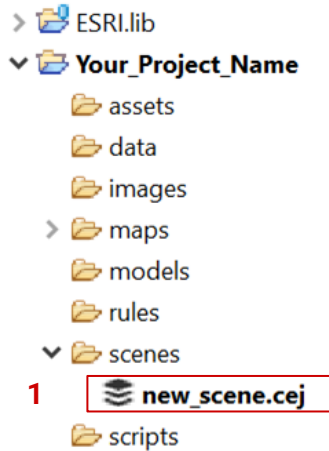
1. Click **File > New > CityEngine > CityEngine Scene** or **right-click** the `Your_Project_Name` folder and select **New > CityEngine Scene** to open the Select a wizard dialog box again.
2. In the **File name** box, type `Your_Scene_Name.cej`. Keep the **Coordinate System** box empty.
3. Click **Finish**.
4. The new scene is created under the project folder.





# Get map data

1. Select an existing scene
2. Click **File > Get map data...**
3. 'Your ArcGIS organization's URL' > Type "**uoa**" and Click **Continue**
4. Sign in with your UPI *Please email [drh022@aucklanduni.ac.nz](mailto:drh022@aucklanduni.ac.nz) if you have any issue with sign in*

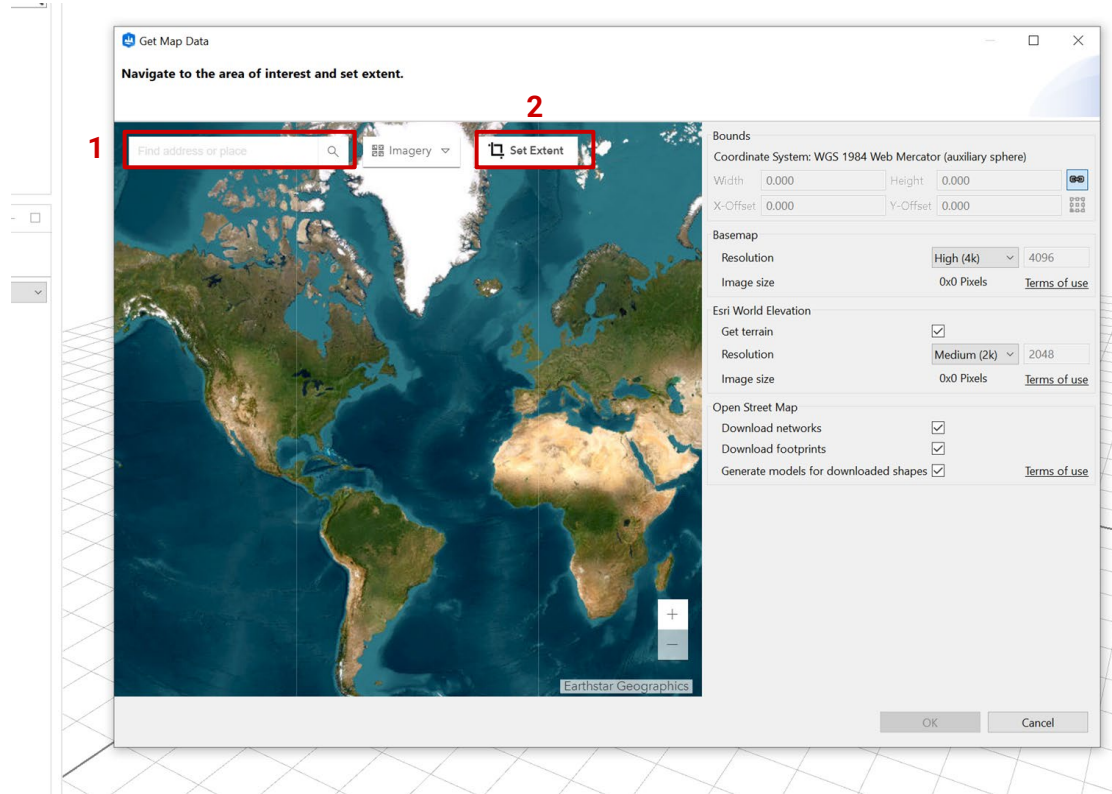






## Get map data (con.)

- The **Get map data** dialog opens.
  - Search for an area and then zoom in or out OR
  - Pan with the left mouse button to navigate around the map.
- Click **Set extent**.



More Information CityEngine Help:

<https://doc.arcgis.com/en/cityengine/2019.0/help/cityengine-help-get-map-data.htm>

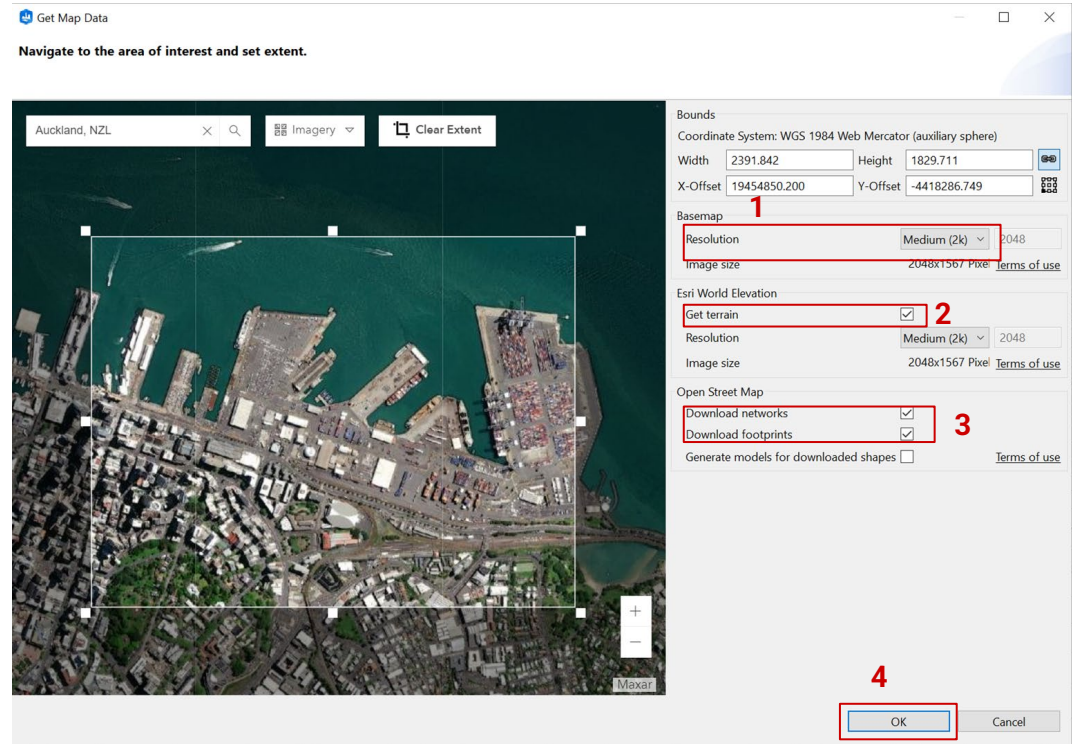


# Get map data (con.)

1. Select the basemap resolution.

*Note: Recommend to select **Medium (2k)** for smooth downloading.*

1. Tick **Get Terrain** to include elevation data with your map.
2. Add **Open Street Map (OSM)** data to your scene.
  - Select **Download networks** for street data
  - **Download footprints** for building footprints data.
1. Click **OK**.





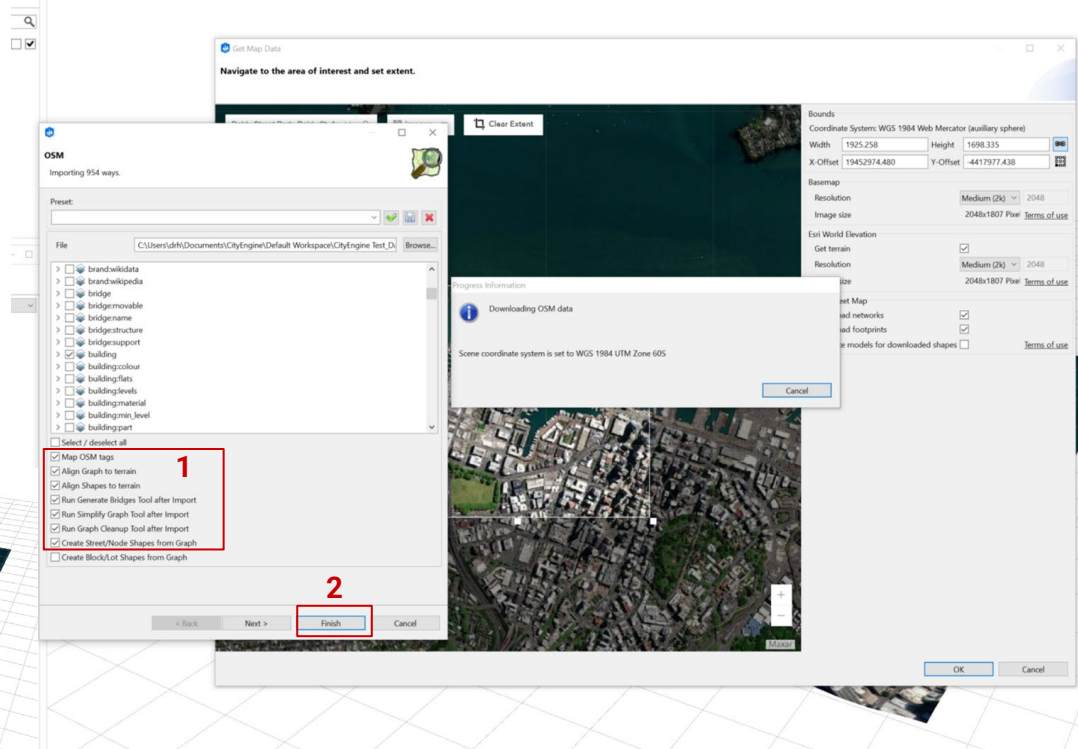
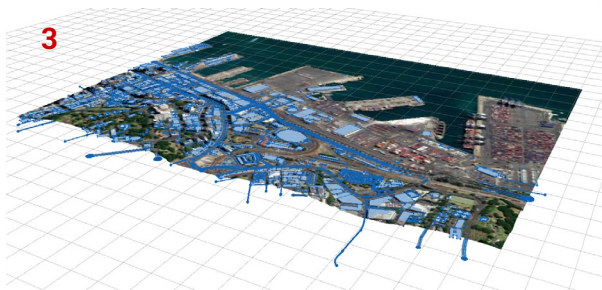
## Get map data (con.)

1. OSM dialog opens

We recommend to tick all the boxes highlighted.

1. Click **Finish**.

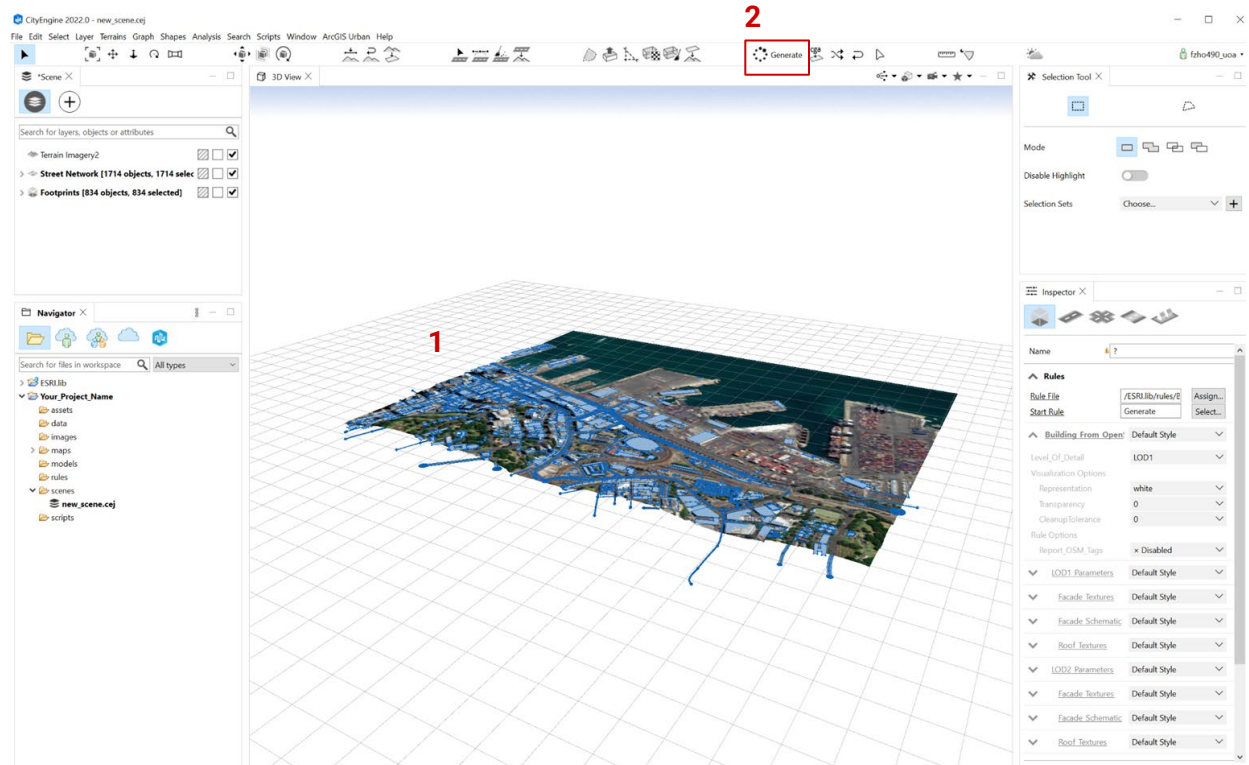
2. The map with *terrain, streets, and building footprints* aligned to the elevation data is added to your CityEngine scene.





# Building Generation

1. Select all shapes and objects in your scene. (Drag and select *OR* Control + A)
2. Click **Generate**
  - This will create buildings and street networks based on the ArcGIS data AND CityEngine own built in algorithm.

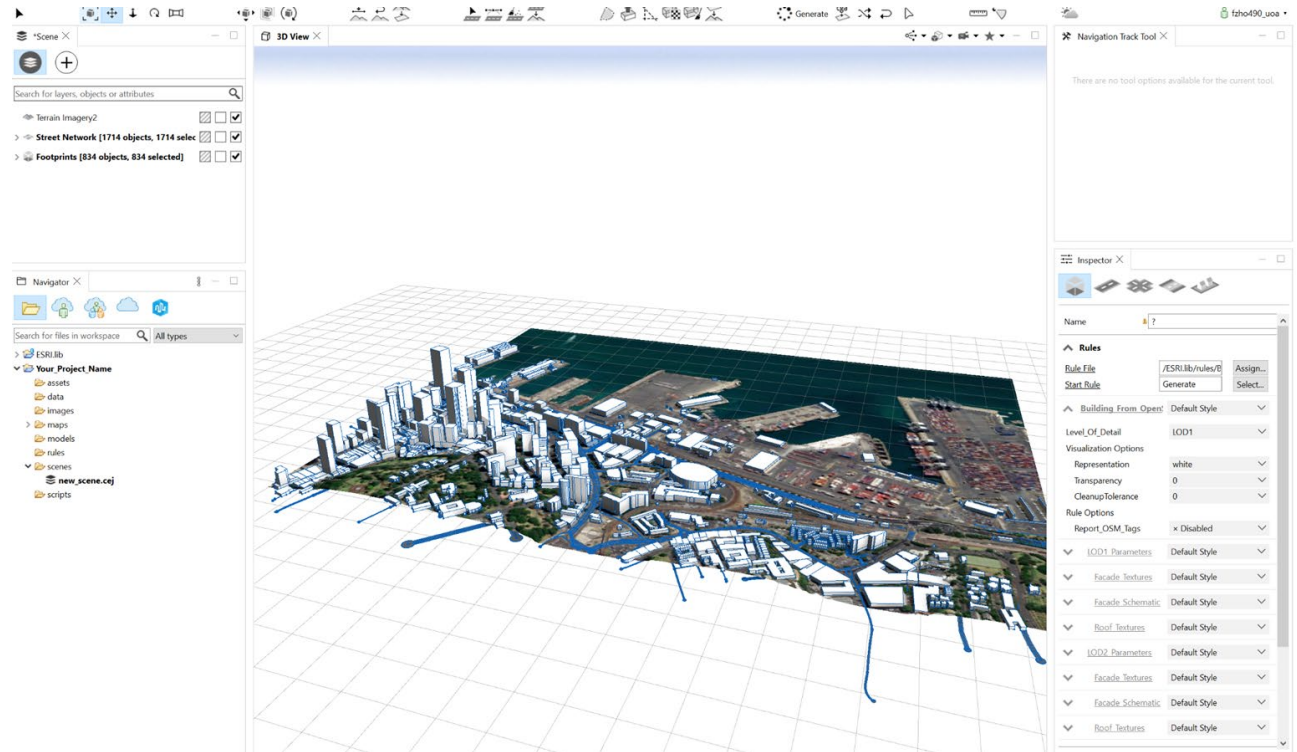




# Building Generation

Note:

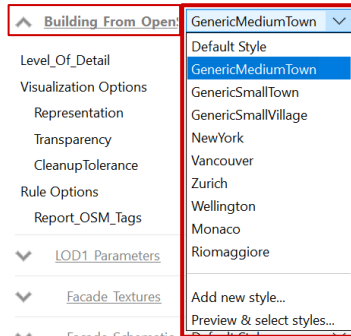
- *The heights and sizes of the building footprints are **NOT 100% accurate**.*
- This is designed to help you with generating quick, conceptual context and shadow studies for your works.



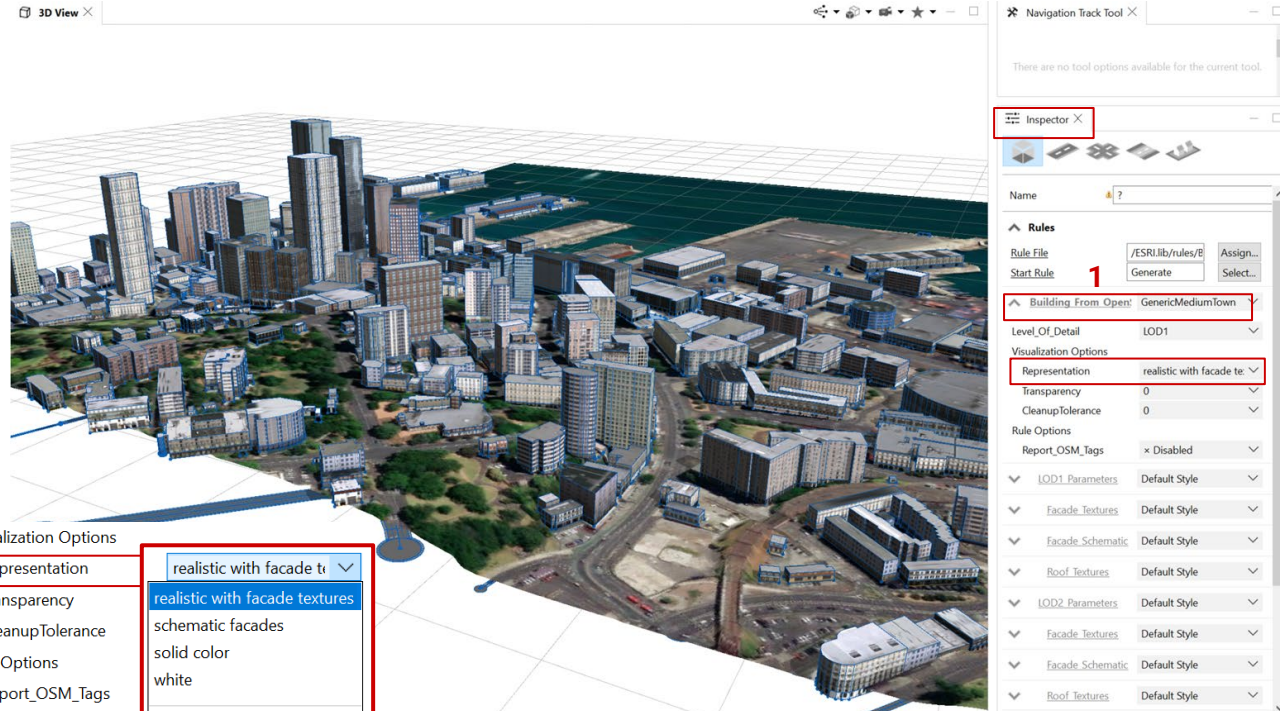
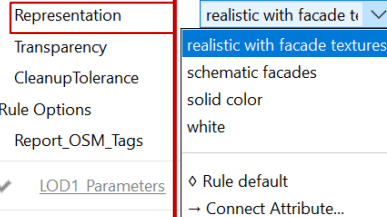


# Building Generation

1. For more realistic buildings, select an appropriate style for the building footprints in the **Inspector**.



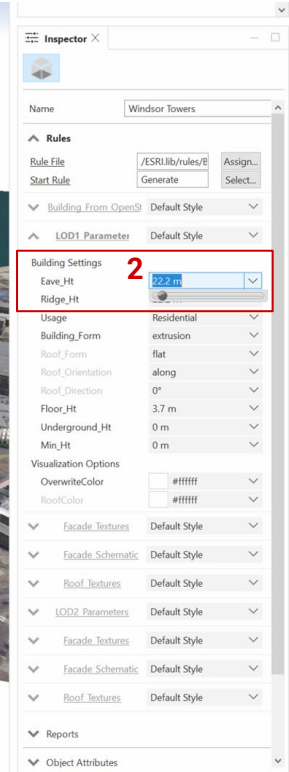
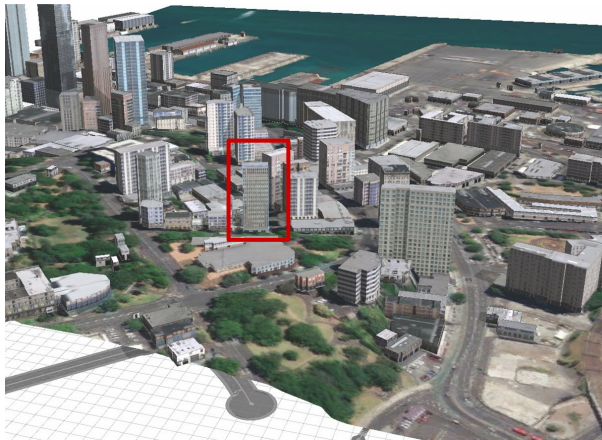
Visualization Options





# Building Height

1. Select a specific building
2. Change *building height* from **Building Settings**



**Helpdesk**

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**Opening Hours:**

Mon-Fri: 9:30am-4:30pm

*We do not open during public holiday*

*Appointments only during school breaks*

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