

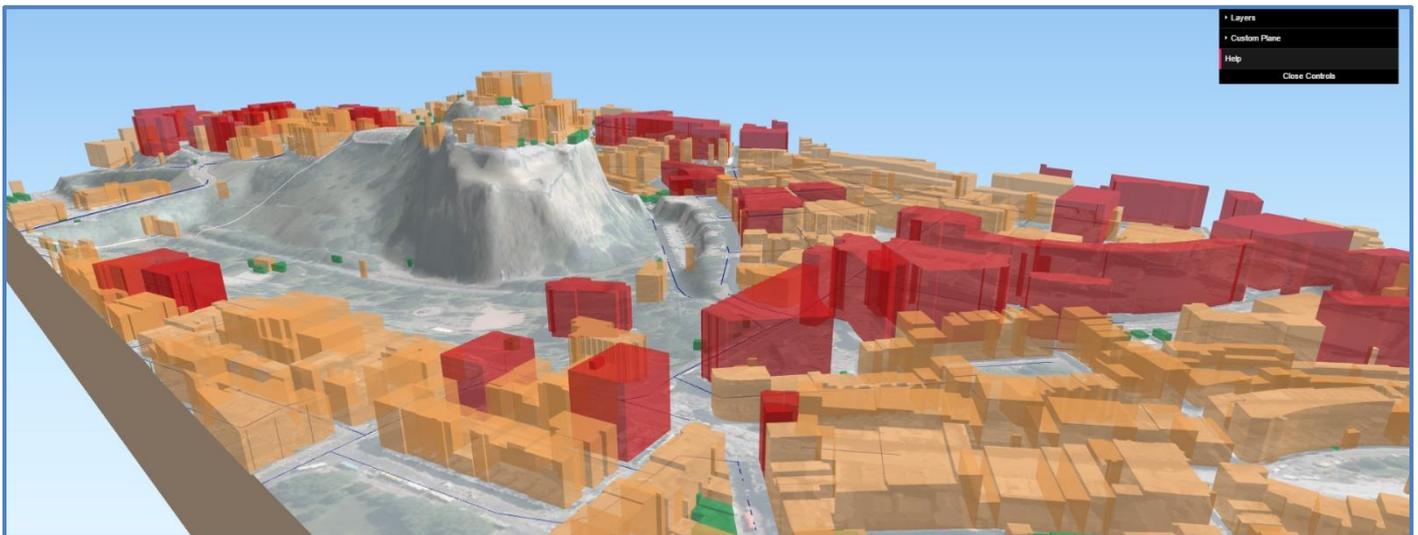


Creating 3D Maps in QGIS: Part 2 ‘Using Open Source Data’

by David Crowther

In March I published a blog on creating 3D maps in QGIS using Ordnance Survey datasets and you can view that blog in Cadline Community using this link:

<https://www.cadlinecommunity.co.uk/hc/en-us/articles/115001724629-Creating-3D-Maps-in-QGIS>



I wanted to now share with you how you can utilise ‘Open Source’ spatial datasets to create 3D Models in QGIS without having to pay a premium for your data. So, in this blog we will replace;

- OS MasterMap buildings with **Open Street Map**
- OS Imagery with **Google Maps Satellite**
- OS Terrain 5 with **LIDAR DTM**

For more information about Open Source datasets please view my *Exploring Open Data* Blog in our Cadline Community website:

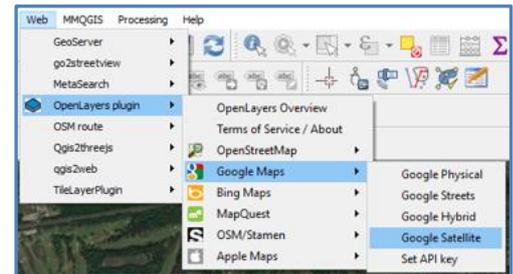
https://www.cadlinecommunity.co.uk/hc/en-us/articles/208320689-Exploring-Open-Data?preview_as_role=end_user





Source your Open Data - Basemaps

Firstly, we will source the Open Datasets that we need for the 3D Model. The first dataset we will use is the basemap which will be draped over our 3D Model. Using the QGIS **OpenLayers plugin** tool you can access a number of online web maps, such as OpenStreetMap, Bing and Google. Having loaded the OpenLayers plugin, simply choose the **Google Maps > Google Satellite** option and the imagery will open into your map window.



Please refer to Google maps licensing terms and conditions for using Google Maps for any Commercial purposes.

Source your Open Data - Terrain

Next we will source the terrain data for the Model. Here, instead of using OS Terrain 5, we will utilise free to use **LIDAR** terrain data, which can be accessed from the Environment Agency via this link: <http://www.geostore.com/environment-agency/survey.html#/survey>

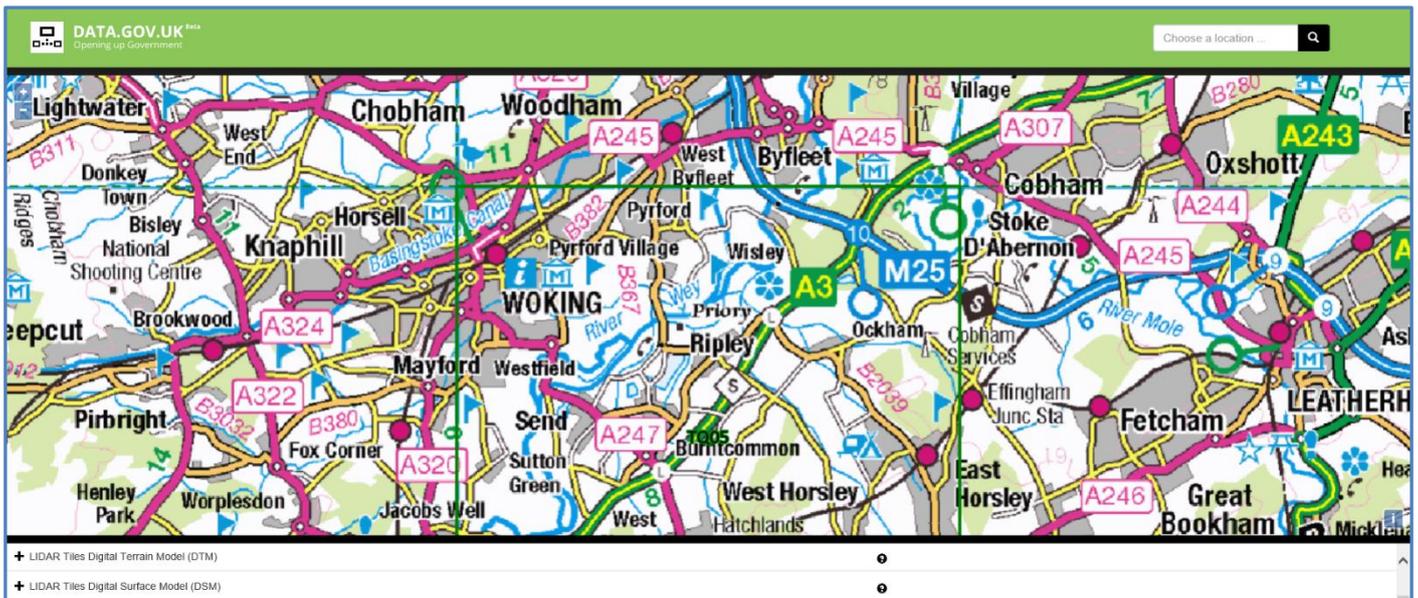
For more information about accessing LIDAR terrain data please view my **Using Open Source 1M Lidar Terrain Data within InfraWorks** Blog in our Cadline Community website:





<https://www.cadlinecommunity.co.uk/hc/en-us/articles/115002006145-Using-Open-Source-1M-Lidar-Terrain-Data-within-InfraWorks>

In this blog we will be creating a 3D Model near Woking. Using the EA data.gov.uk web map we can select your grid of interest and choose which LIDAR dataset to download.



Once the LIDAR terrain data (.asc files) have downloaded, the tiles can be opened into QGIS.

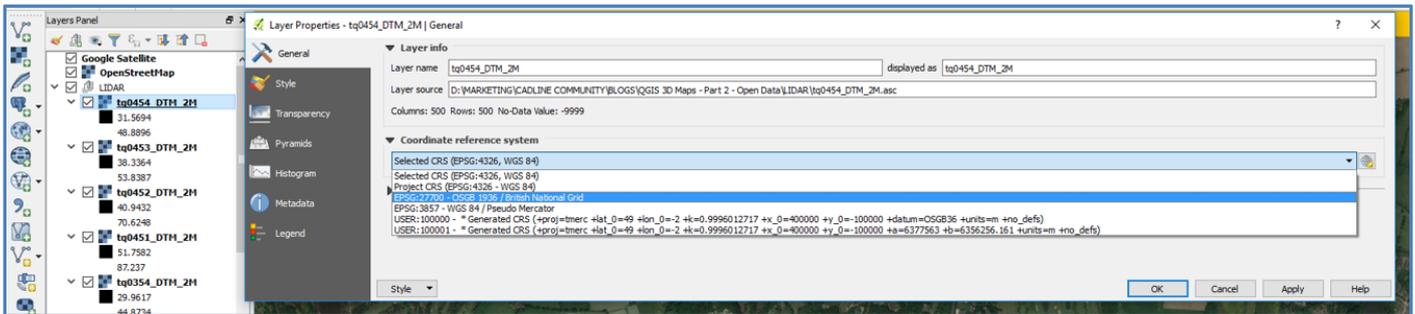
Tip! – When opening raster tiles that don't have predefined **Coordinate Reference Systems (CRS)** you will get an error message in QGIS and you may not be able to see the raster data.



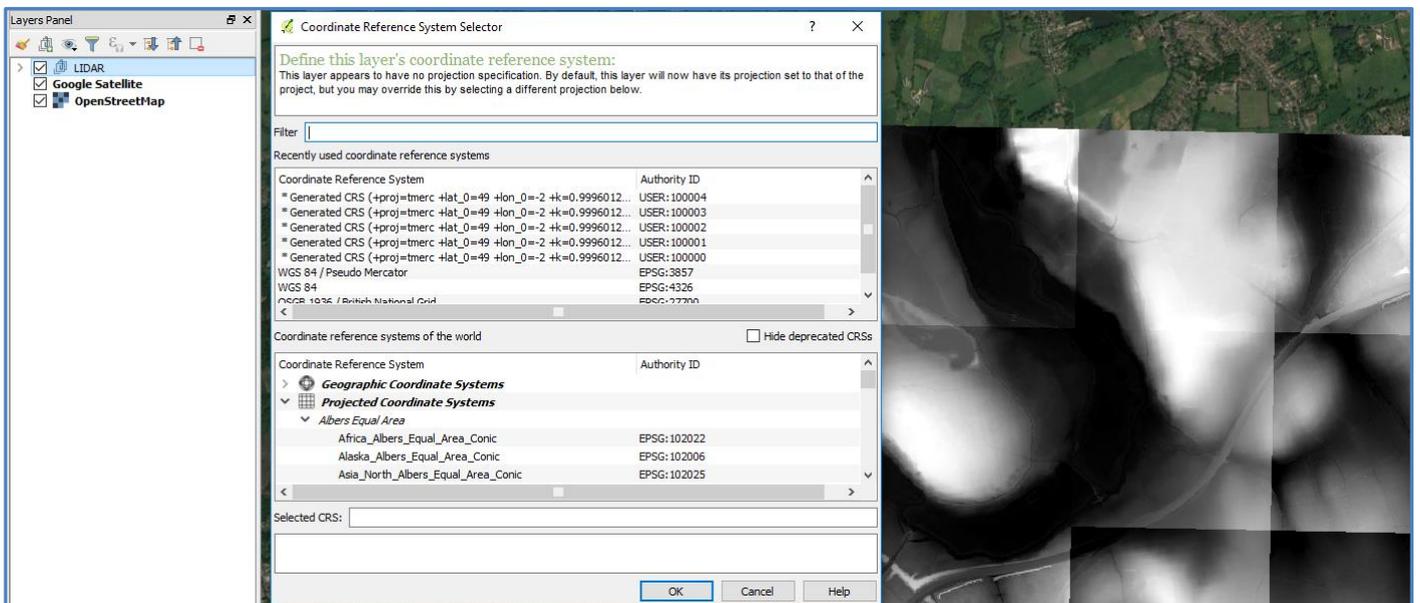
These LIDAR terrain tiles will need to be re-projected into British National Grid (BNG).



Tip! – If you have multiple raster tiles then it will take a long time to manually change the CRS of each tile using their properties, as per the below:-



Instead, the fastest way to change the CRS of multiple tiles is to create a **Group Layer** in QGIS, move the tiles into that Group Layer and then **assign a CRS to the Group Layer**. So, as below, I have created a Group Layer called LIDAR and have moved each tile into that folder and assigned the Groups CRS to be **BNG – 27700**.



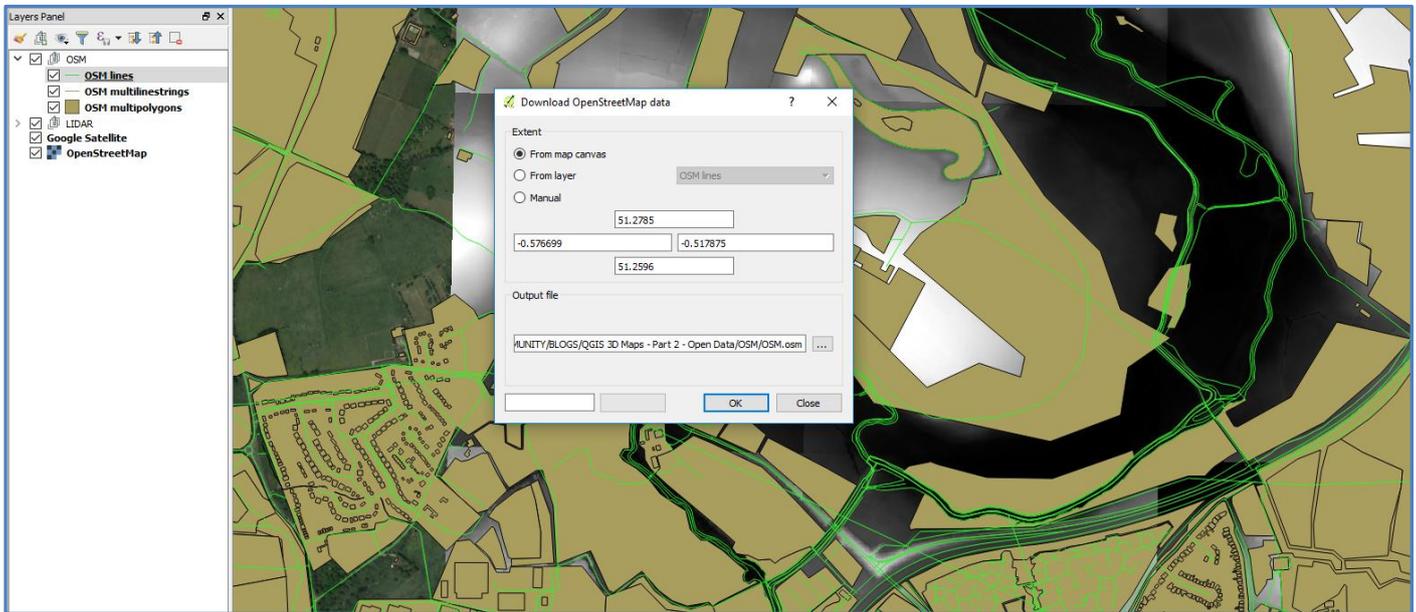
Source your Open Data - Buildings

Finally, we will source the building data for the Model. Here, instead of using OS MasterMap Buildings we will utilise free to use **OpenStreetMap** data.

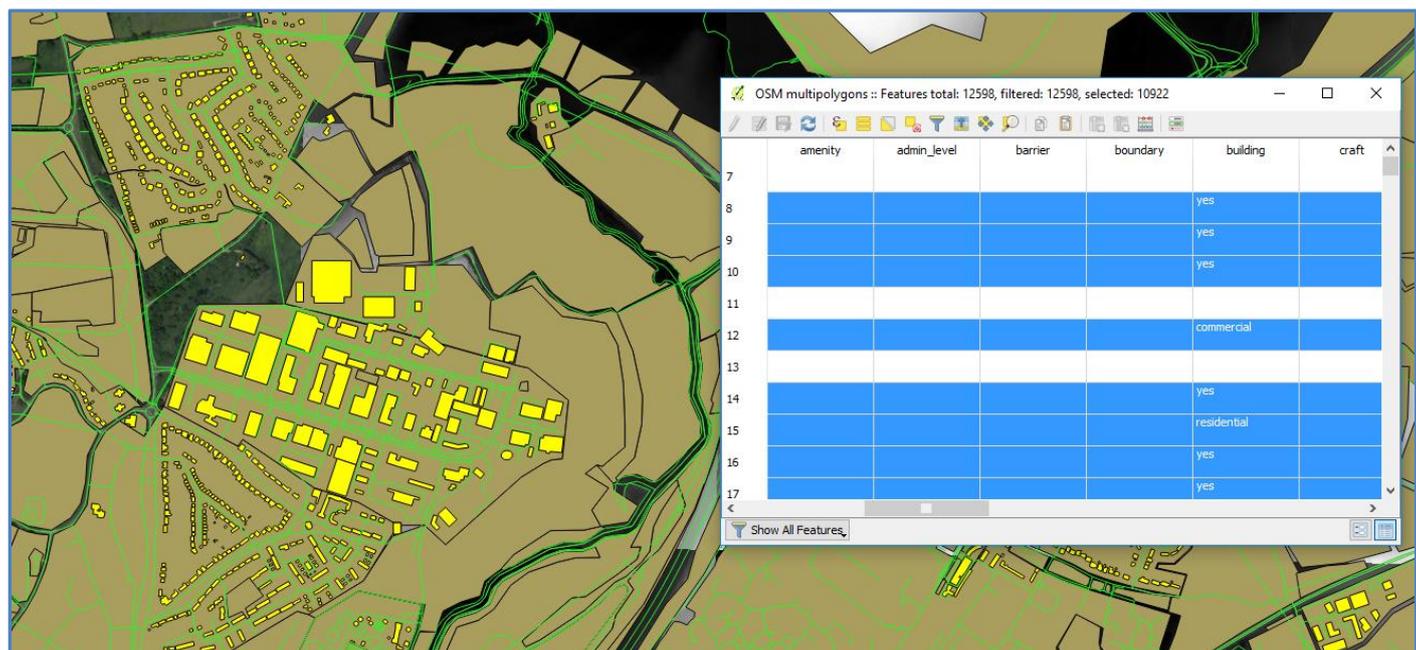




Using the QGIS **Vector > OpenStreetMap > Download Data** tool you can define an area of interest, or simply use the maps current extents and download OpenStreetMap data for any location in the world.

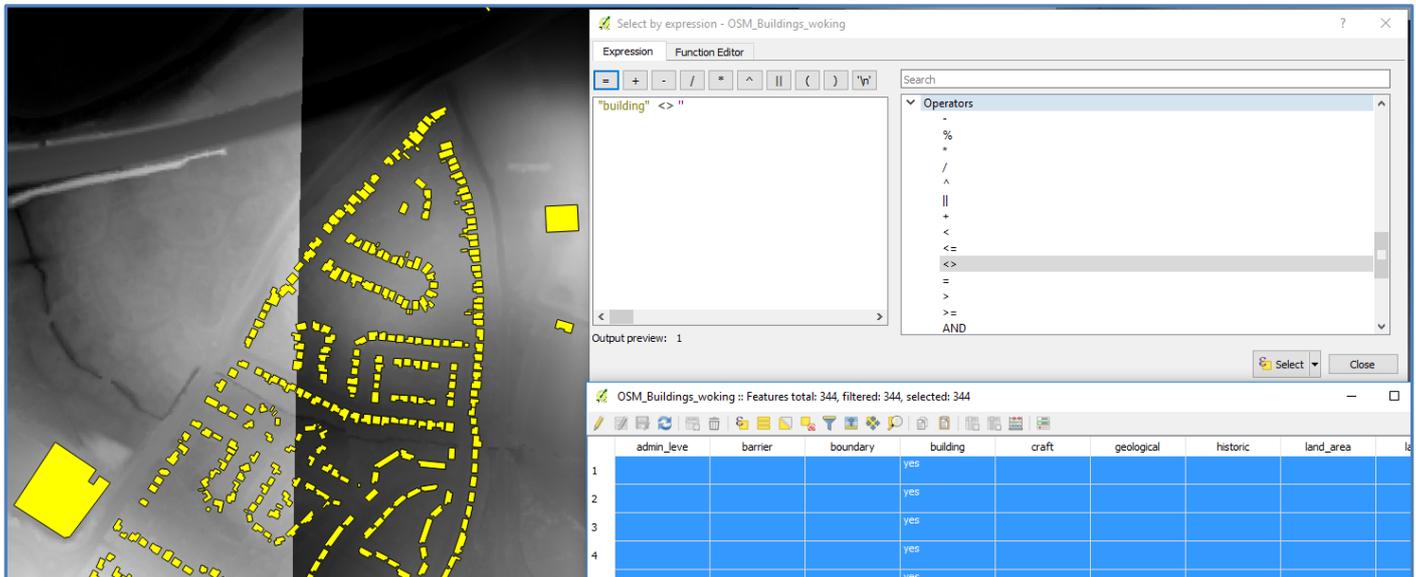


The OpenStreetMap data will be loaded into several layers, including lines, points and polygons. Each layer will have multiple records that have associated attribute information which can be queried, for example, the Polygons layer will enable you to identify which features are **'buildings'**.



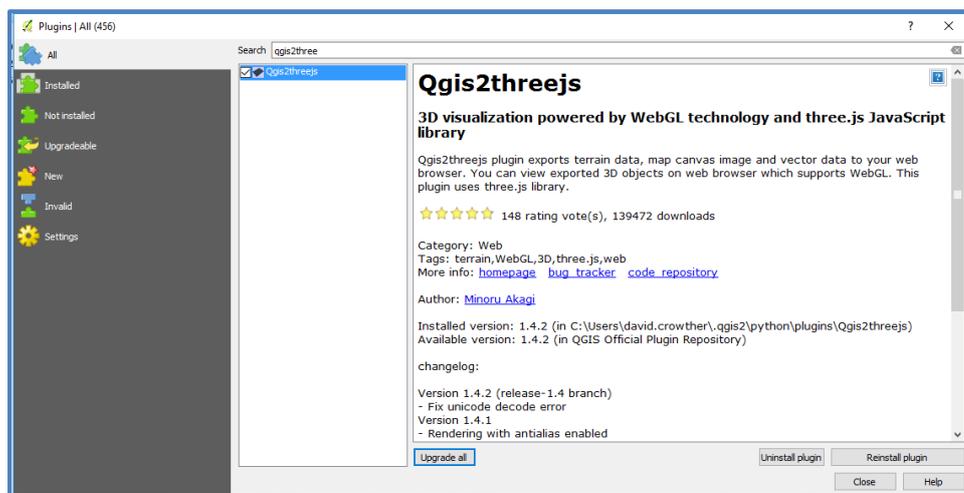


By saving those selected features into a new **Shapefile** you can easily create an OpenStreetMap Buildings layer for any location.



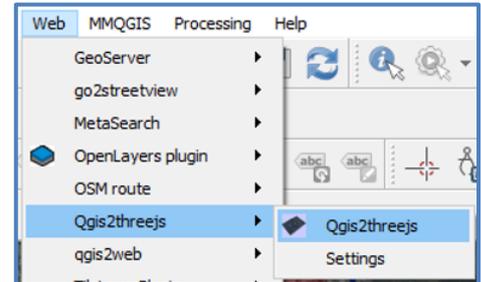
Create 3D Map

Having now added our Open Source datasets into QGIS we can use the **Qgis2threejs** plugin to create a 3D model of the map.



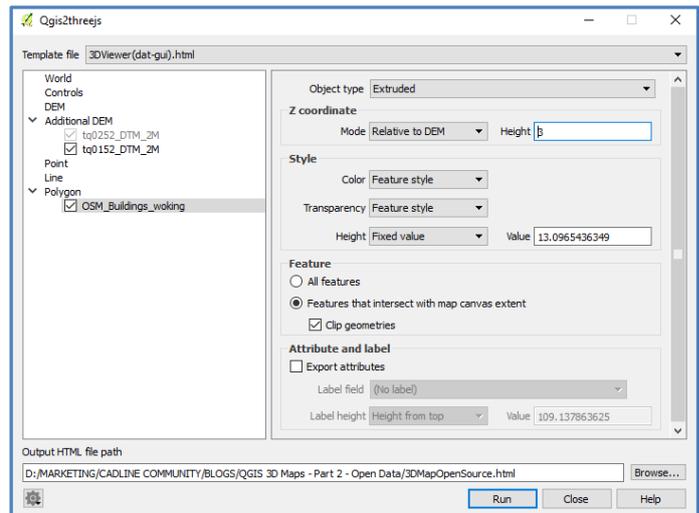
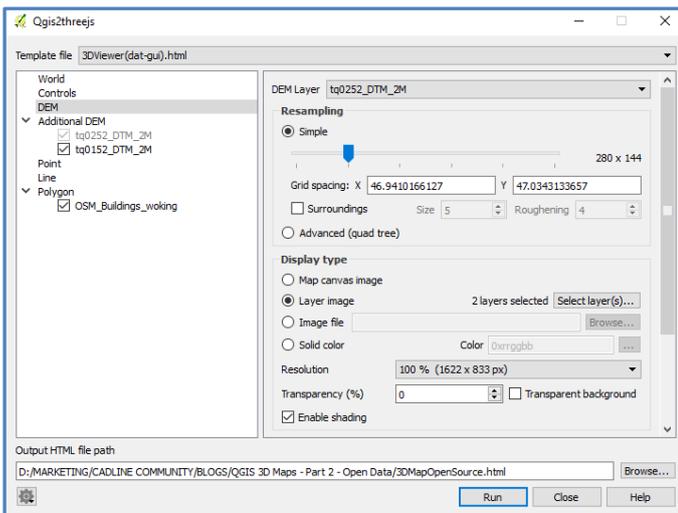


Once installed the **Qgis2threejs** plugin can now be accessed from the Web menu.



There are multiple settings which you can explore in detail in your own time, however the highlights for me are:

DEM – Choose the layer/s open within QGIS that will be used to generate the terrain for the 3D Model. In this case I have chosen the LIDAR tiles for the map extents, using the **Additional DEM** option to utilise more than one terrain tile.

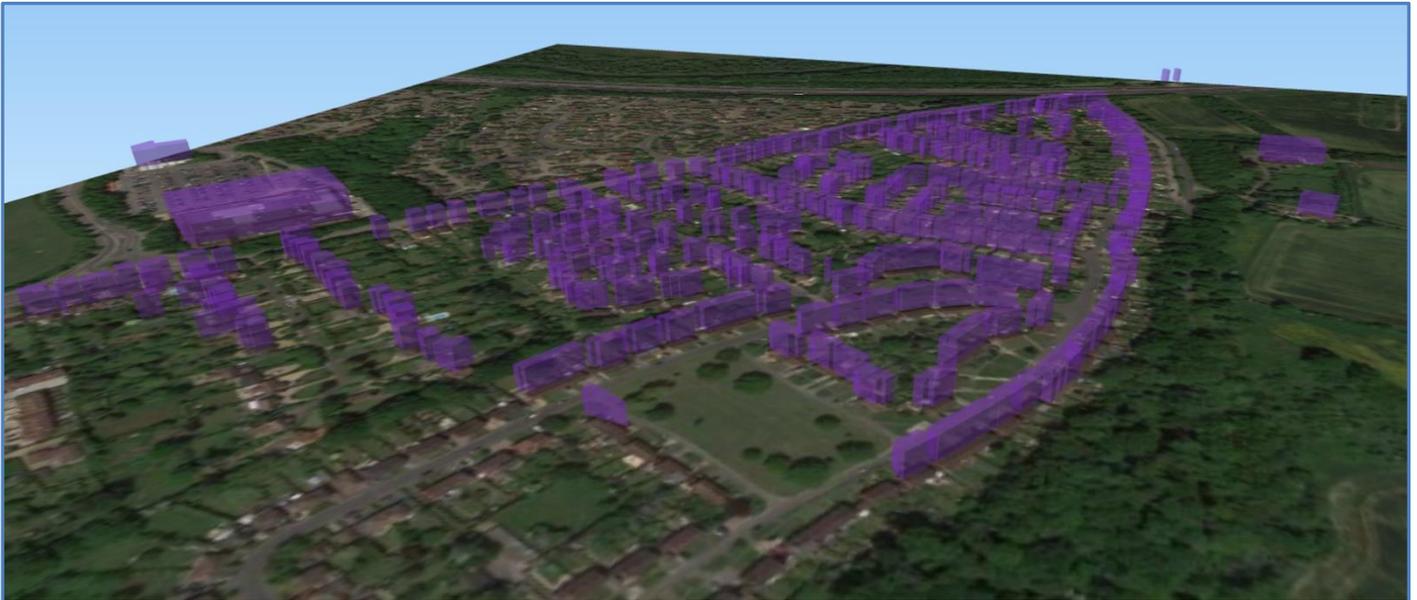


POINT, LINE, POLYGON – Depending on the layers you have open in QGIS, you can tick to choose which layers to display, define a colour style, decide to show/hide labels and choose how the layers are extruded within the 3D map.

Once you have defined those settings, simply type an output name and location for the HTML file and press **Run!**



The 3D Map will open into a new web browser.



Why not try this yourself! Utilise the power of Open Source spatial datasets to start to create 3D Maps which can aid your decision-making process.

