Creating 3D Maps in QGIS

by David Crowther

I have used desktop GIS for over twenty years and in that time we have seen their usability, capability and price change dramatically. When I historically trained desktop GIS software I always tried to gloss over the module which tried to generate 3D Maps, because the 3D mapping would either take forever to render, look gimmicky or simply fall over and crash the machine!

Over time desktop GIS software has however started to embrace 3D mapping and the increased capabilities that it brings; but with increased usability and stability came an increased price, where users would have to purchase add-on software to enable 3D mapping.

Today, the GIS user (and Trainer ☺) have the benefit of Open Source GIS software such as **QGIS**, which has its very own 3D mapping plugin which is free to use and easy to configure. So in this Blog we are going to explore how simple it is to create a 3D map using QGIS.

But before we do that,…… if you're looking for 3D mapping that combines GIS, CAD, 3D Model Files and Point Cloud datasets, as well as advanced Road, Bridge and Drainage design, I would highly recommend having a look at **Infraworks** from Autodesk. For me, it's CAD meets GIS in an advanced 3D mapping environment.

The example 3D Infraworks Model below was generated using accurate Ordnance Survey datasets, including; OS Terrain, OS Imagery and OS MasterMap buildings with building heights. Using Cadline's OS Model Builder application you can generate a 3D Model for any location in GB within 2 minutes.

If you want to explore Infraworks and how to easily access OS data then please have a look at this video:

https://www.cadlinecommunity.co.uk/hc/en-us/articles/207452885-Cadline-OS-Model-Builder-and-Infraworks

So that's what we can do using software with a Licensing cost, and highly accurate but premium OS datasets. What about making a 3D map quickly, using Open Source software and a number of free to use datasets?..... let's open up QGIS and get started.

Open QGIS and now add the datasets that will be used within your 3D map. The datasets I have sourced for this Blog are;

OS MasterMap Buildings – Based on the OS MasterMap dataset. An Open Source alternative could be to use OpenStreetMap buildings, which can be accessed via the OSM download tool within QGIS.

OS Imagery – The OS Aerial Imagery layer.

OS Open Local Roads – An Open dataset supplied by the OS of Road centerlines.

5M OS Terrain Data – The OS Terrain dataset. The Environment Agency supply access to 1M Lidar Terrain data via this link: http://www.geostore.com/environment-agency/survey.html#/survey

For more information about Open Source datasets please view my *Exploring Open Data* Blog in our Cadline Community website:
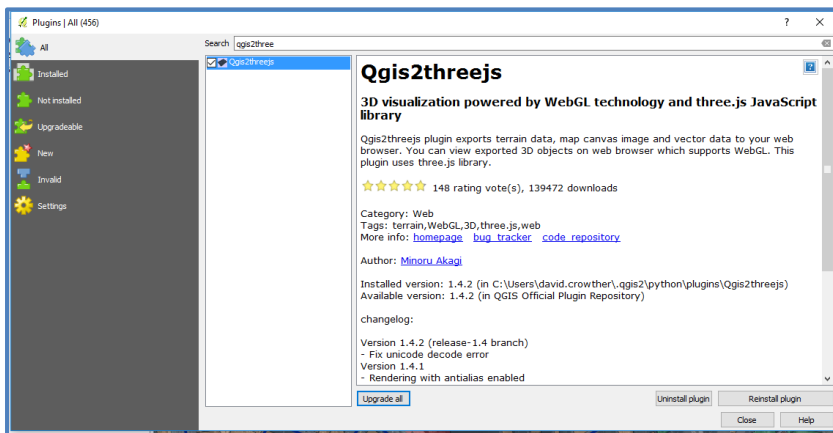
https://www.cadlinecommunity.co.uk/hc/en-us/articles/208320689-Exploring-Open-Data?preview_as_role=end_user

With those datasets now open within QGIS we have a 2D map which looks like the below, where the OS MasterMap Buildings have been colour coded to show their building heights.

To generate a 3D map, you simply install the **Qgis2threejs** plugin!

Once installed the **Qgis2threejs** plugin can now be accessed from the Web menu.
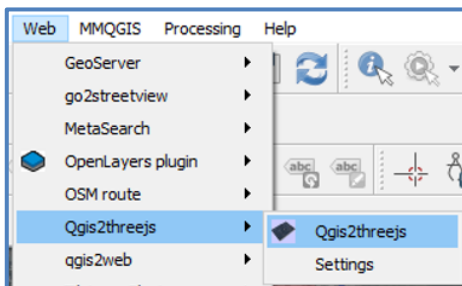
There are multiple settings which you can explore in detail in your own time, however the highlights for me are:

DEM – Choose the Layer open within QGIS that will be used to generate the terrain for the 3D Model. In this case I have chosen the **OS Terrain** layer.
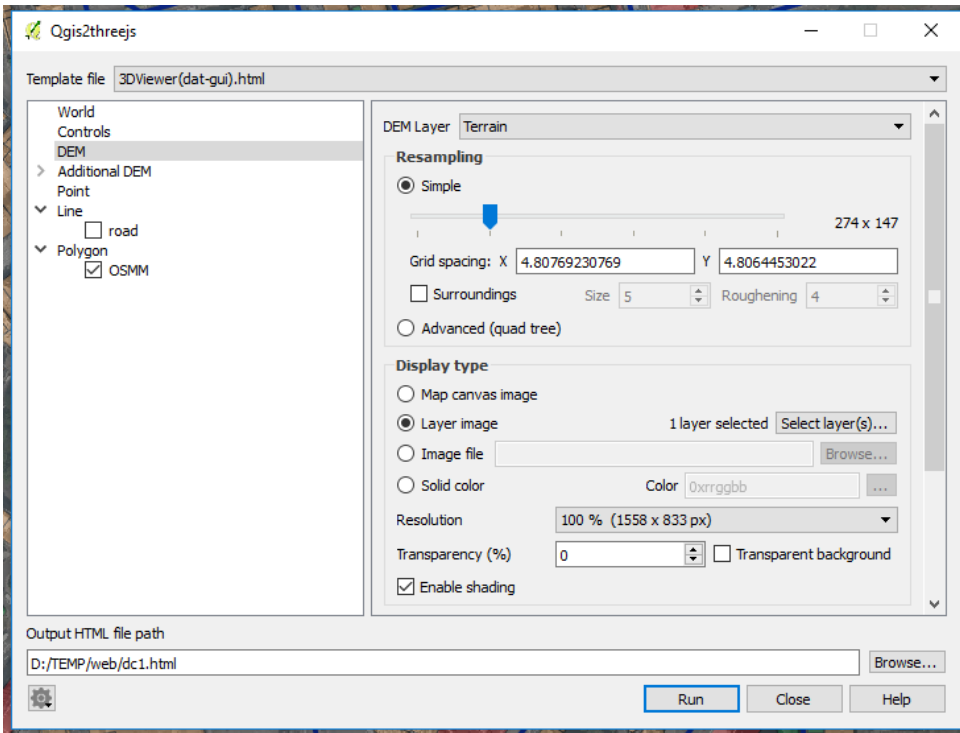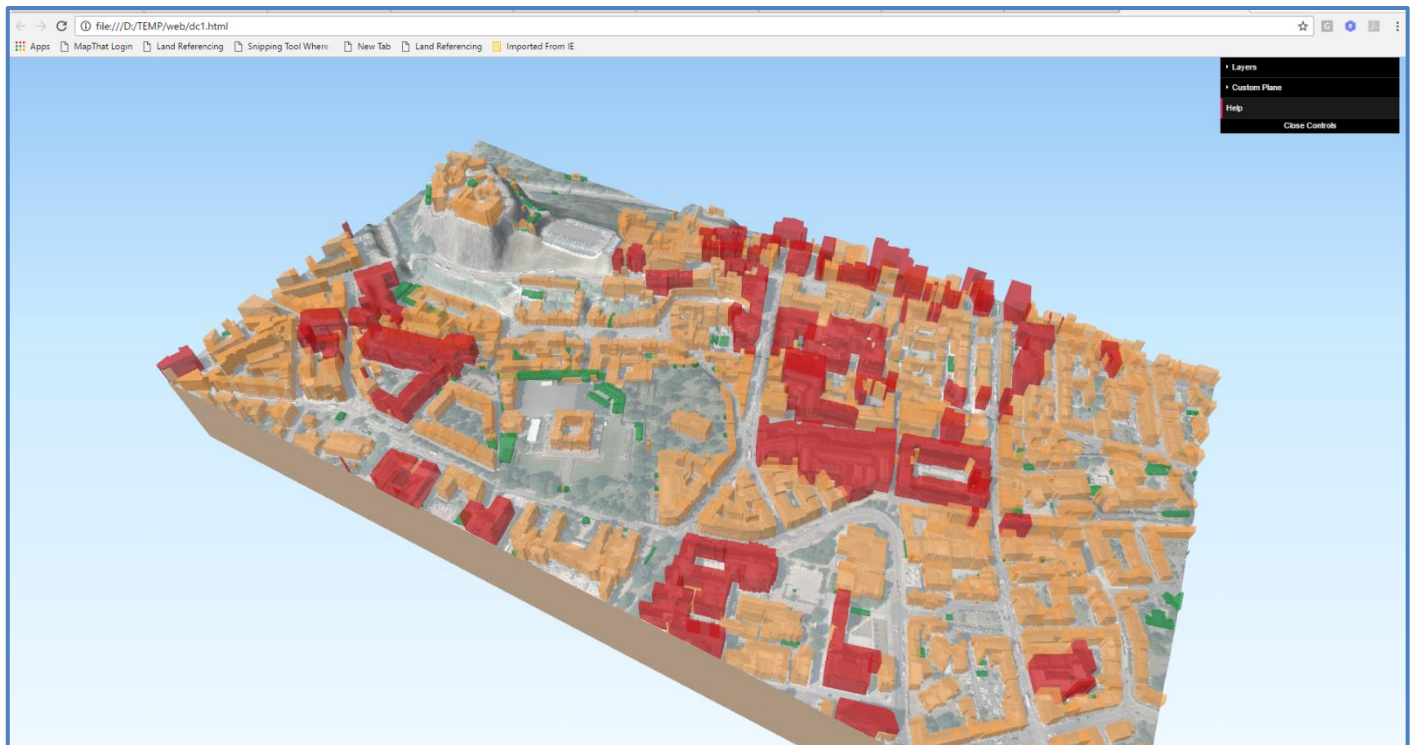
POINT, LINE, POLYGON – Depending on the layers you have open in QGIS, you can tick to choose which layers to display, define a colour style, decide to show/hide labels and choose how the layers are extruded within the 3D map.
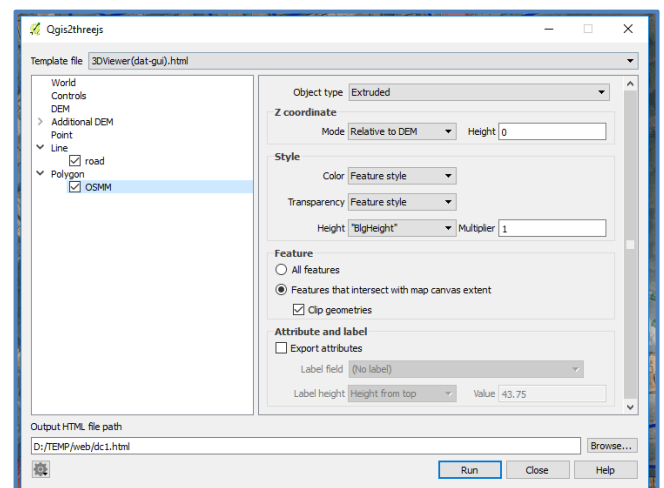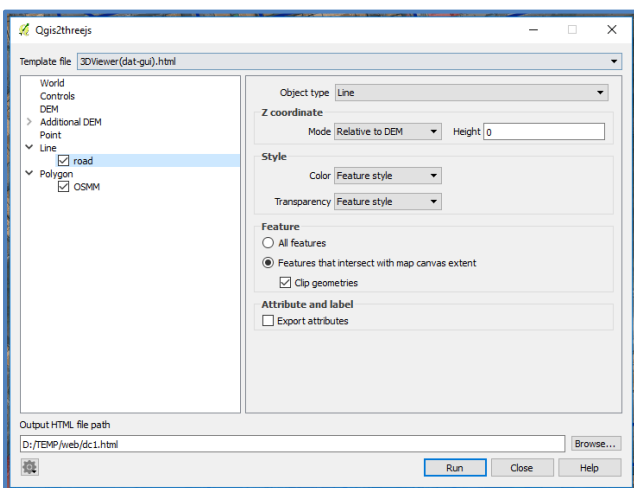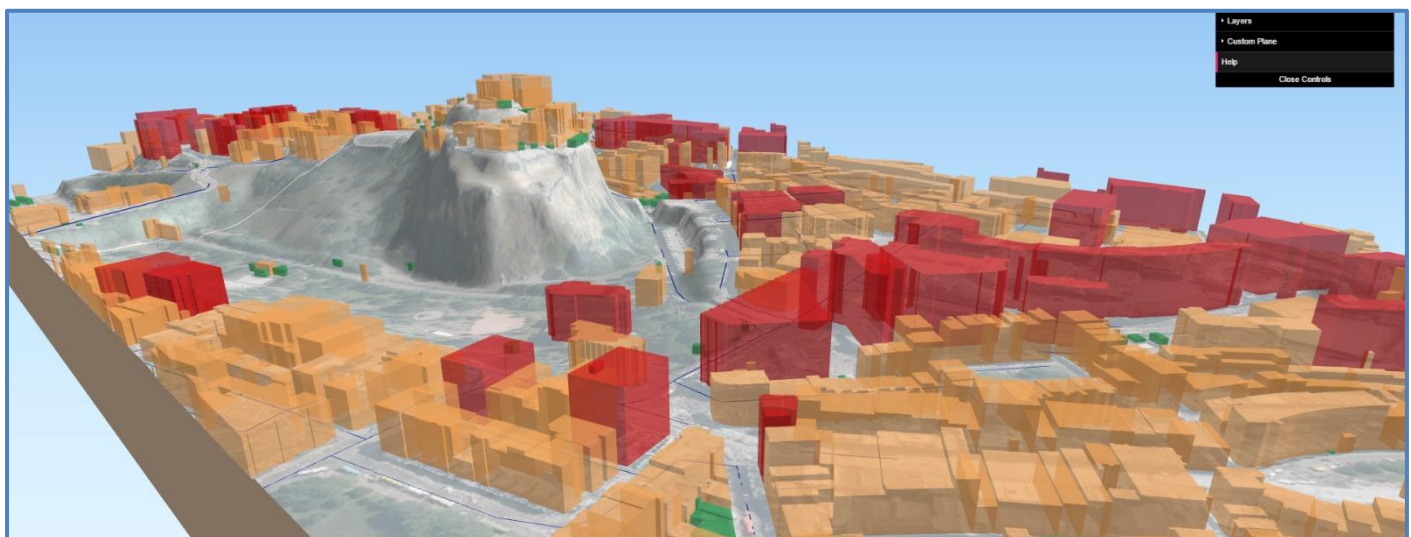

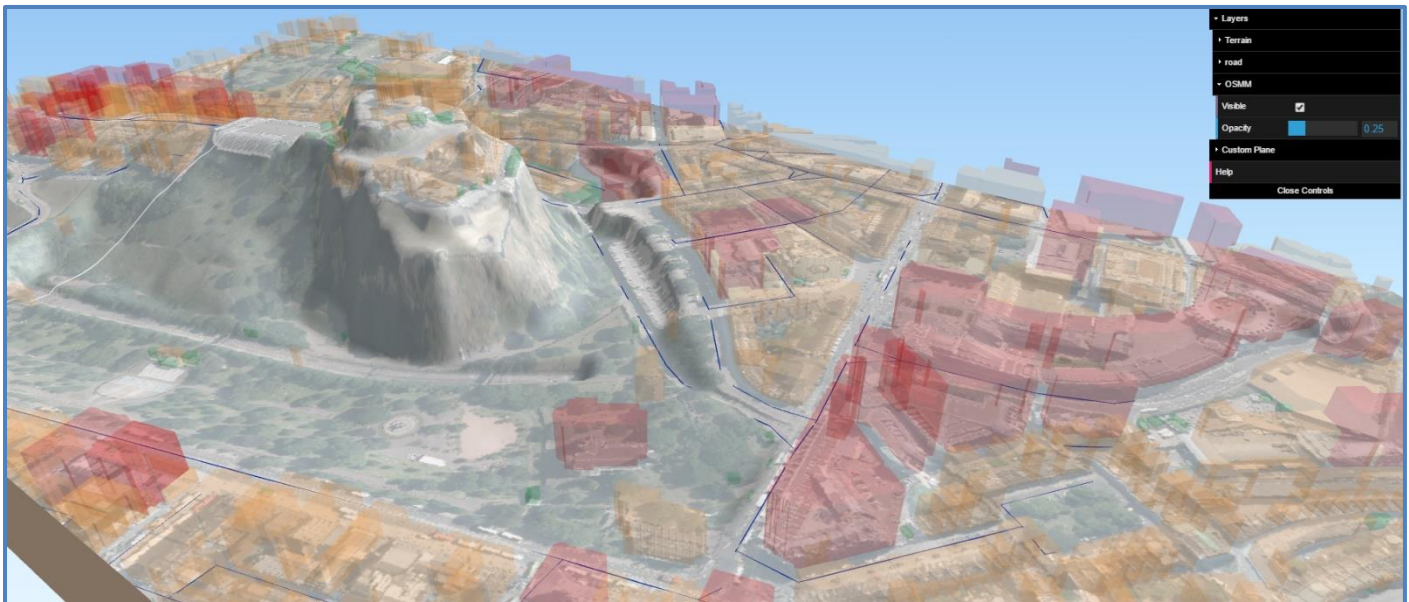Once you have defined those settings, simply type an output name and location for the HTML file and press **Run**!

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

Using the **mouse,** you can now navigate around the 3D Map to see the changes in terrain.

Using the **Layers** tool you can turn layers off and on, as well as make them transparent.

Why not try this yourself! See what 3D Maps you can generate and what layers can be added to the 3D Model in order to start making more informed decisions using your spatial datasets.