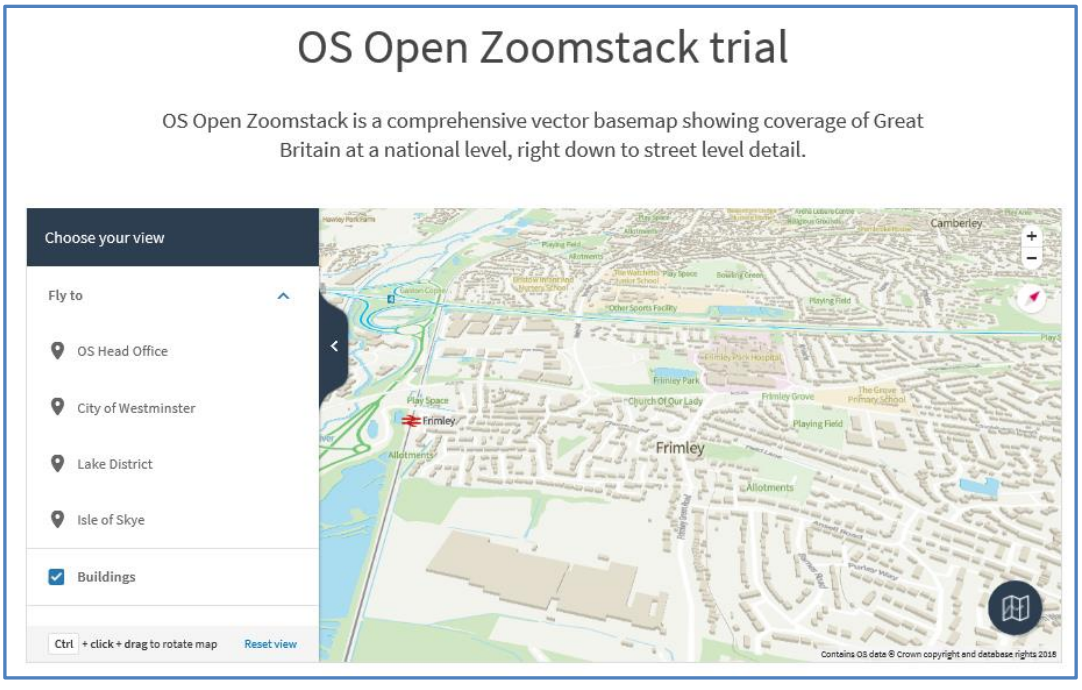
In this White Paper we will explore how to download, access and then style the new **OS Zoomstack** from the Ordnance Survey. This paper explores how to access OS Zoomstack as **Vector Tiles** served from both a source dataset on your network as a **MBTile** service and via your **MapBox** web account as a Web Map Tile Service (WMTS) for faster rendering and greater styling options.

Objectives

- Download OS Zoomstack data – Vector Tiles
- Connect QGIS to the OS Zoomstack data – Using Tile Reader
- Apply OS Styling using QML Files
- Utilising MapBox to upload and style OS Zoomstack data
- Connect QGIS to the OS Zoomstack data – as a WMTS via MapBox

1 - Download OS Zoomstack data:

At the time of writing this paper (Dec 2018) the OS Zoomstack data was available as a trial download from - [OS Open Zoomstack trial]



Before getting started these help and **support guides** published by the Ordnance Survey are very useful:

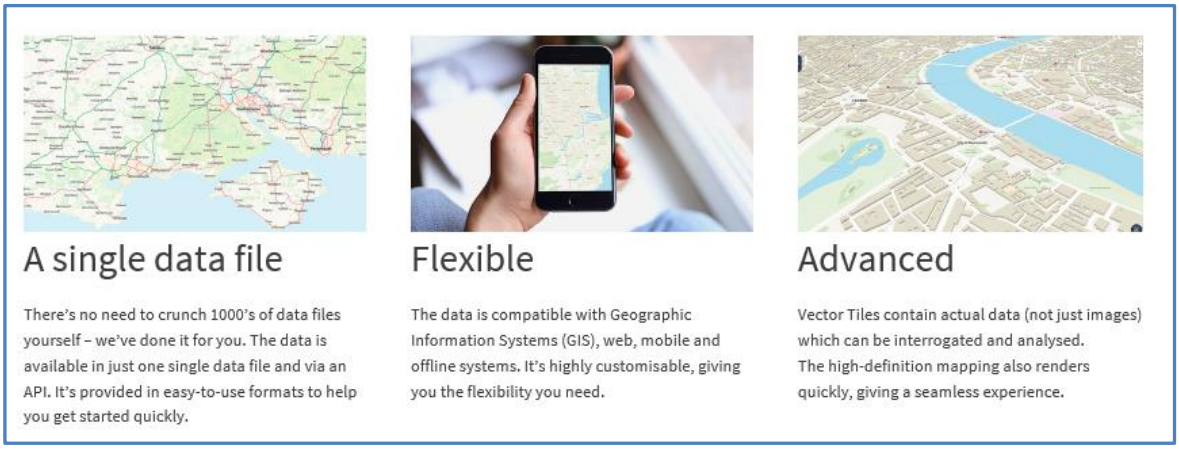
- OS Zoomstack Vector Tiles - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf
- OS Zoomstack PostGIS Vector File - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf
- OS Zoomstack GeoPackage - https://www.ordnancesurvey.co.uk/docs/user-guides/os-open-zoomstack-vector-tiles.pdf

This White Paper will utilise the OS Zoomstack Vector Tiles, although in further papers we will also look at the PostGIS and GeoPackage options.

Note – much of this paper has been sourced from the advice available in the first OS guide above –
"A guide to getting started with the OS Open Zoomstack Vector Tiles"

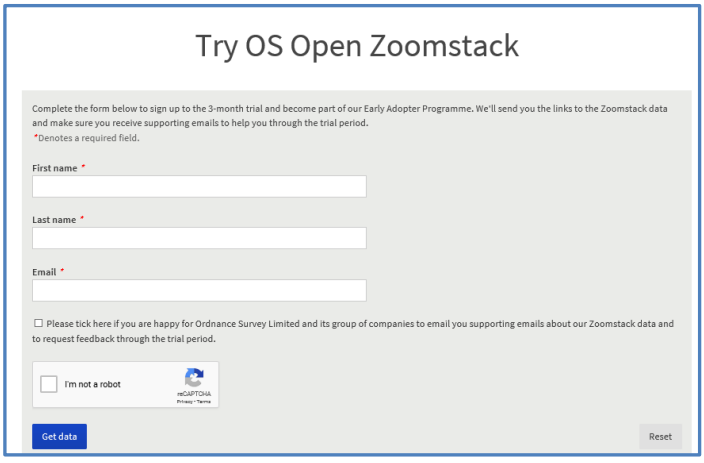
What are the benefits? ….. the Ordnance Survey list these as:

- Ease of use – Easy to integrate Ordnance Survey mapping into your application
- Zero data management – We manage all the data, you just use it
- Automatic updates – Data will be refreshed seamlessly (unlikely to happen during the trial period)
- Web and mobile ready – Pixel perfect maps on any device
- Seamless user experience – Vector Tiles pan, zoom, tilt and pitch beautifully
- 4 beautiful cartographic styles – Choose the map which best fits your requirements

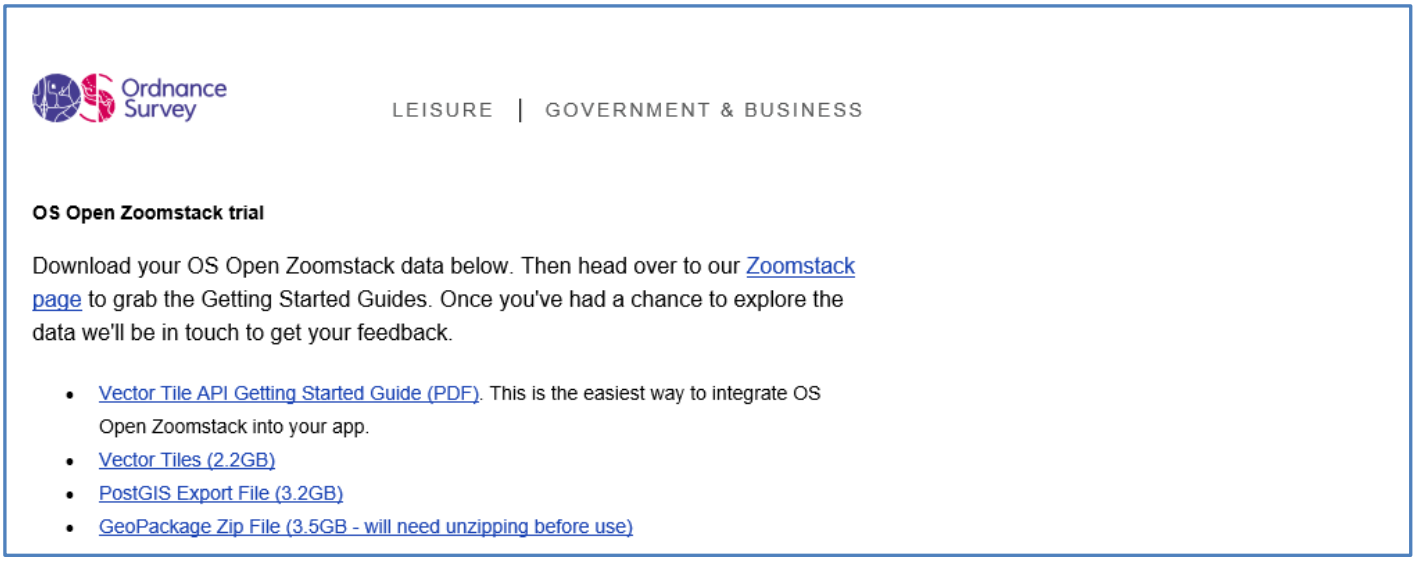


This means that the OS Zoomstack can be accessed in both a desktop and webGIS without the need to process and manage 1000's of data files!

To download the latest OS Zoomstack Vector Tiles simply **sign up to the trial** using the online form:



Once signed up you will receive an **email** with links to the datasets:



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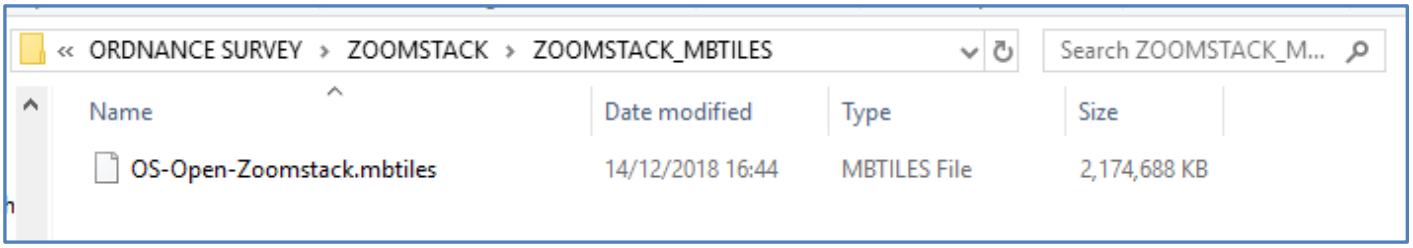
OS Open Zoomstack trial

Download your OS Open Zoomstack data below. Then head over to our Zoomstack page to grab the Getting Started Guides. Once you've had a chance to explore the data we'll be in touch to get your feedback.

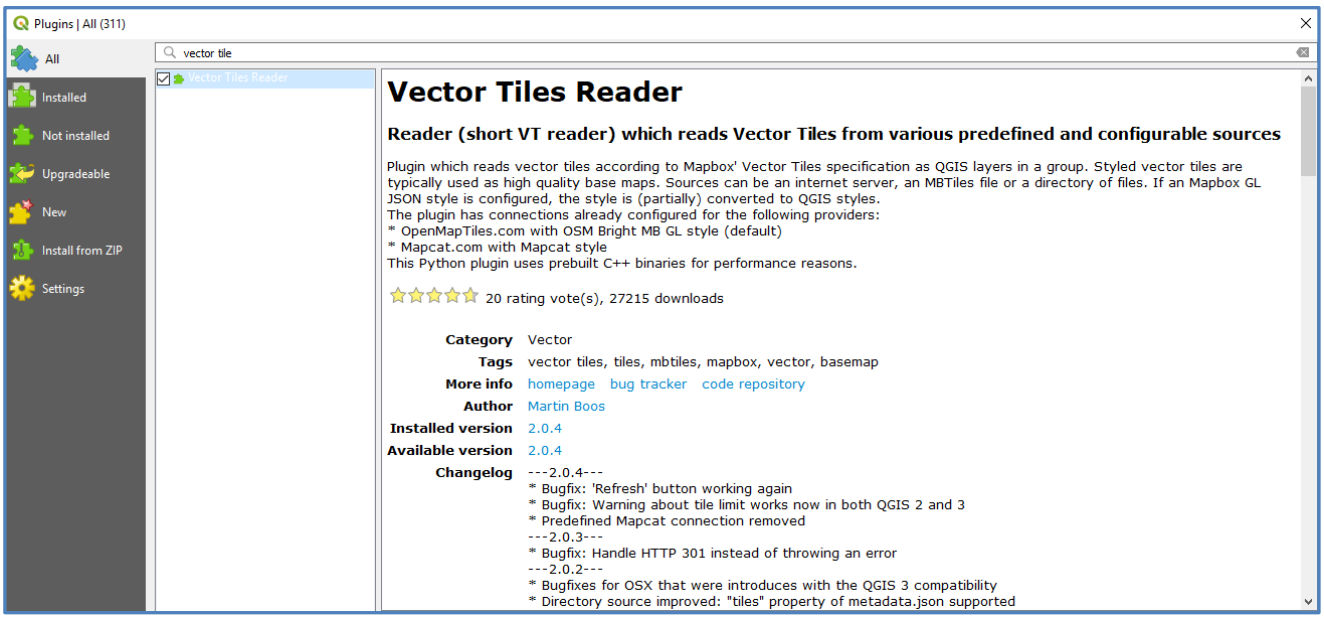
- Vector Tile API Getting Started Guide (PDF). This is the easiest way to integrate OS Open Zoomstack into your app.
- Vector Tiles (2.2GB)
- PostGIS Export File (3.2GB)
- GeoPackage Zip File (3.5GB - will need unzipping before use)

Using the **links provided** you can then download the source files. In this paper we will download and utilise the **Vector Tiles**. Once downloaded, copy the files to a shared folder location where QGIS can access them.

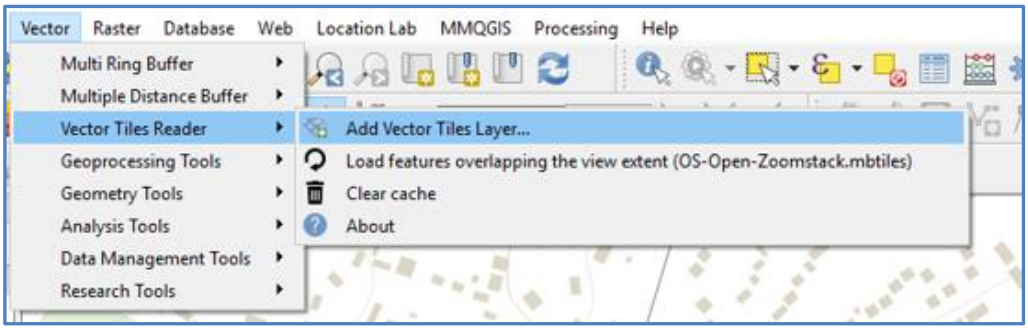


2 – Open OS Zoomstack Vector Tiles in QGIS:

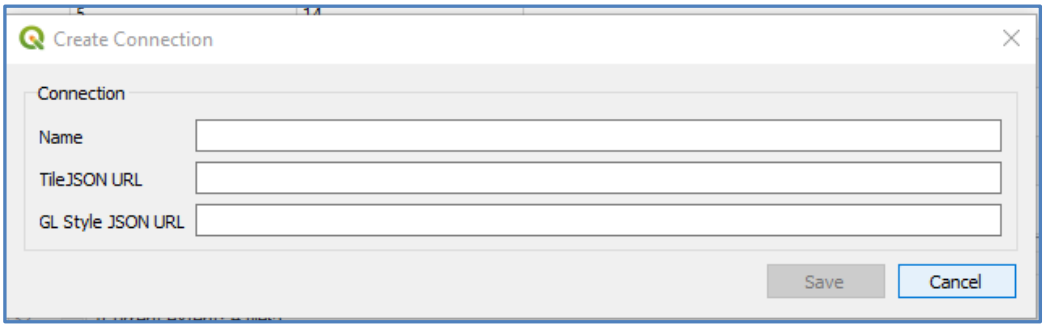
In order to view the native OS Zoomstack Vector Tiles (.mbtiles) in QGIS you will need to download a plugin which can load this data format. Again, at the time of writing this guide, there is a plugin called **'Vector Tiles Reader'** which you can search for and install in QGIS.



Having installed the Vector Tiles Reader Plugin, it will now be available via the **Vector** menu > **Vector Tiles Reader**:



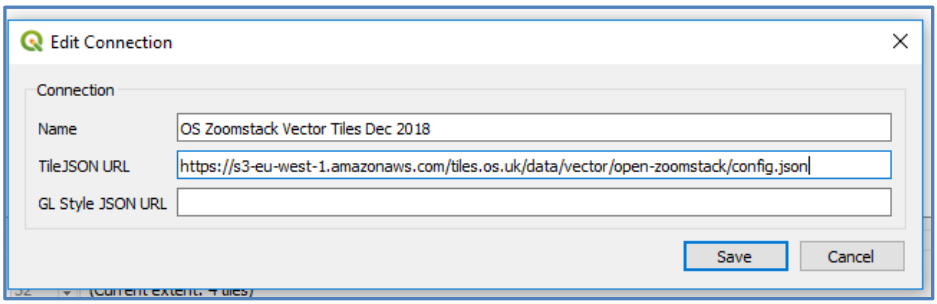
Choose to Add a Vector Tiles Layer and from the **Server** Tab choose **New:**



Choose a **Name** for the Service e.g. OS Zoomstack Vector Tiles Dec 2018

Set the Connection **Tile JSON Url** to be:

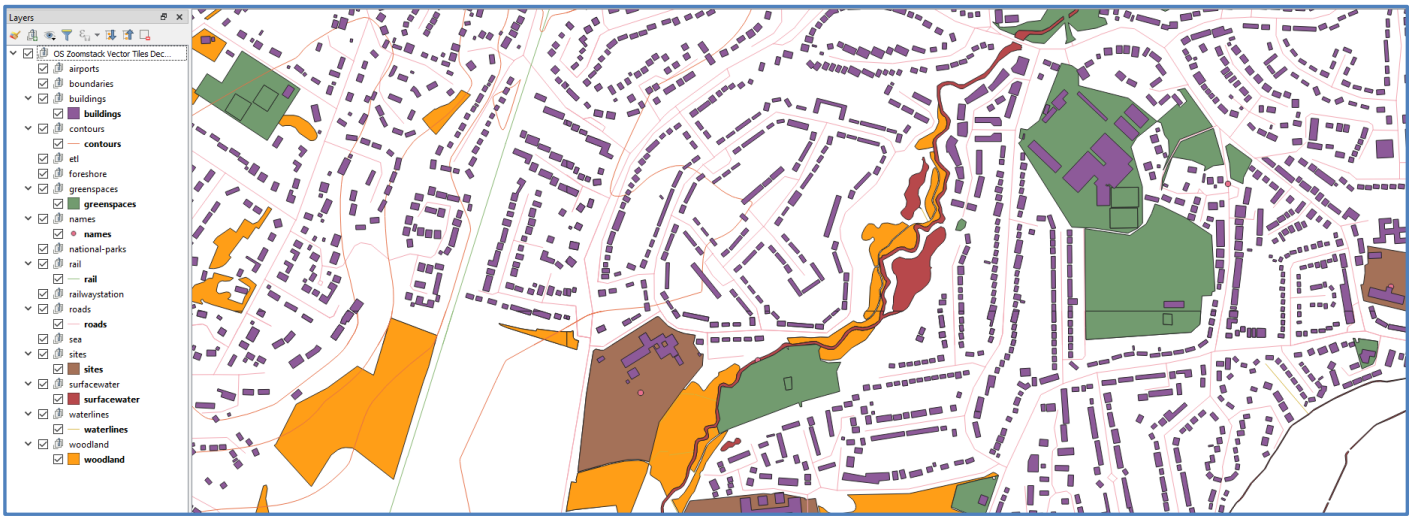
https://s3-eu-west-1.amazonaws.com/tiles.os.uk/data/vector/open-zoomstack/config.json



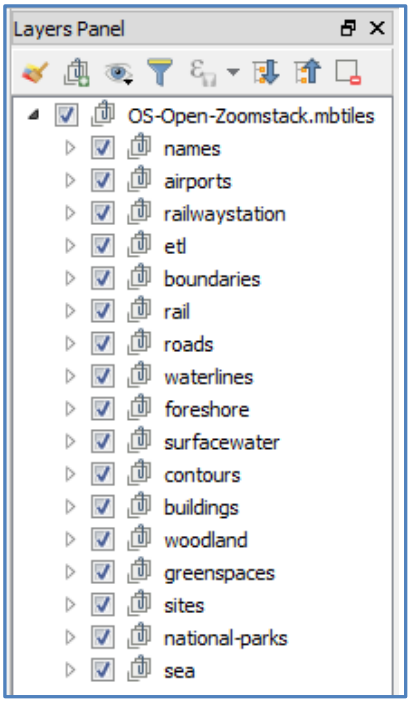
Then choose **Save** and **Connect.**

Next, hold down the **CTRL key** and select all the layers, and when highlighted in blue choose the **'Base map defaults'** and click **Add.**

The OS Zoomstack Vector Tiles are then added to your map window **– *unstyled.***



Re-Order the layers, with the OS suggesting the optimum order being:

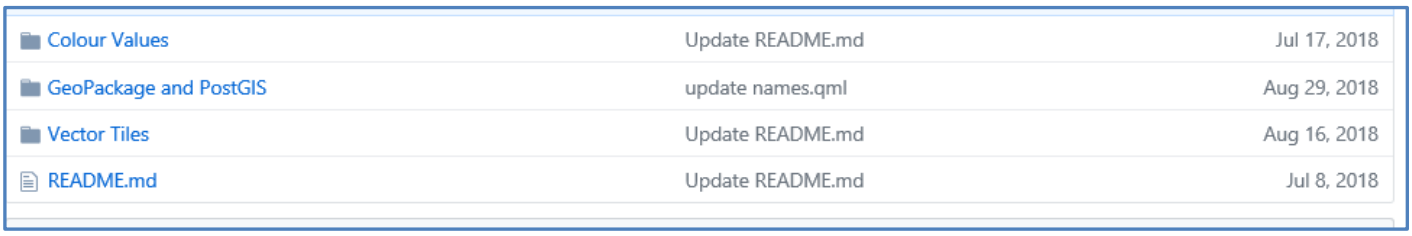


3 - Apply OS Styling using QML Files:

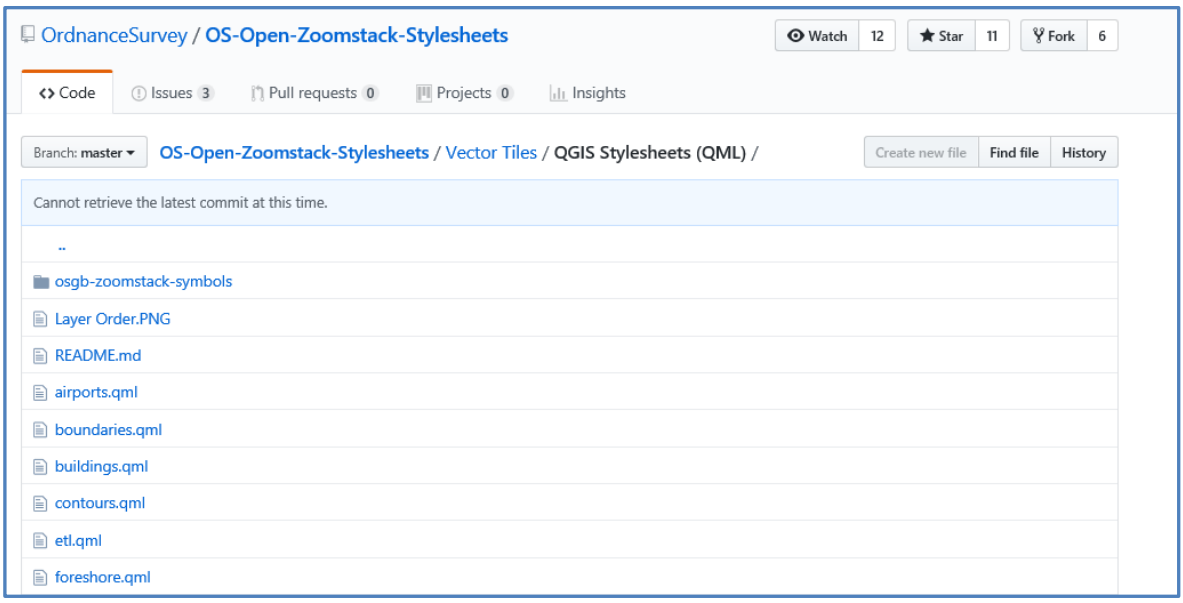
The following web pages provide download links to access the **OS Zoomstack Style Files** for QGIS:

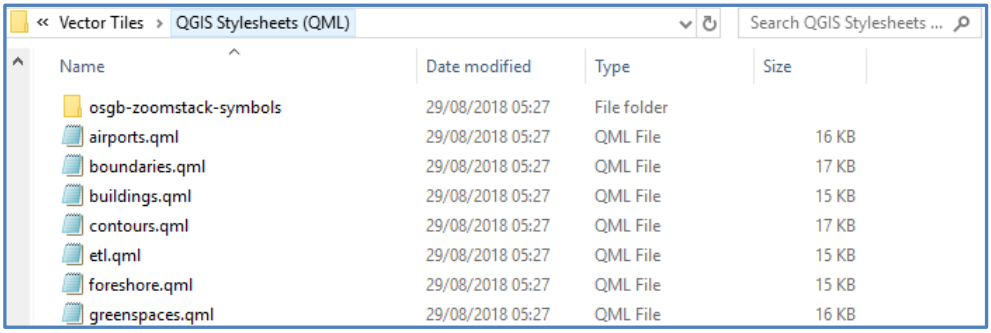
https://github.com/OrdnanceSurvey/OS-Open-Zoomstack-Stylesheets

The links will provide access to download the style files in several formats, including SLD (GeoServer), MapBox GL Styles, and QML for QGIS:

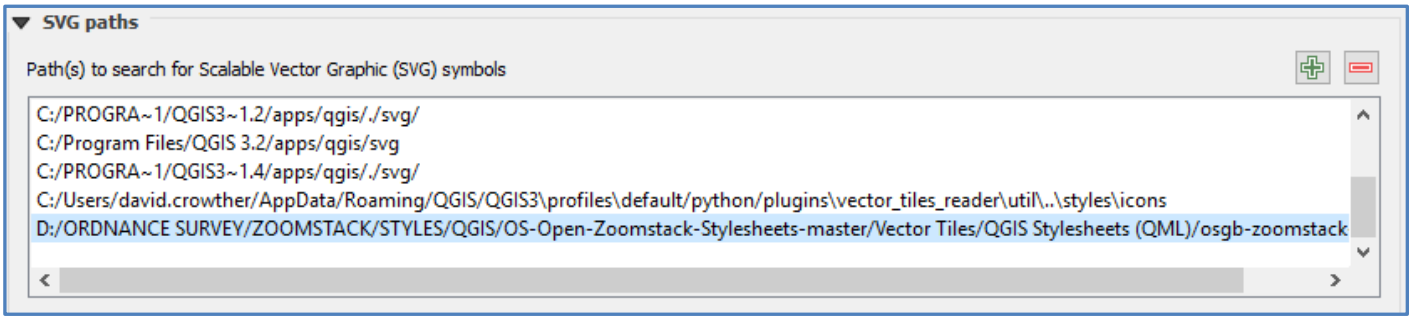


Downloading the **Vector Tiles** > **QGIS Stylesheets** will provide all of the required QML style files:



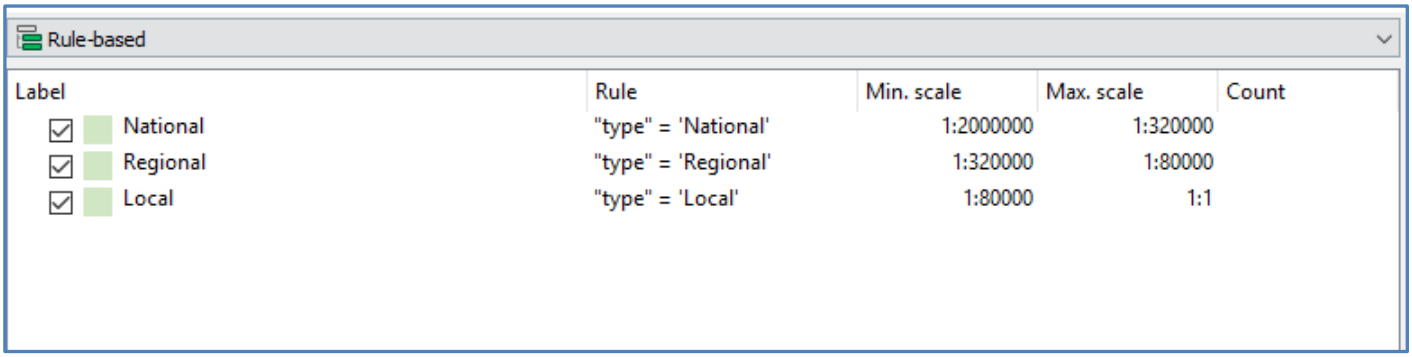


For more complicated styling QGIS uses **SVG files** to render textures within polygon features (e.g. woodland features in OSMM) and to show images for points of interest (e.g. rail stations). To utilise these SVG files ensure that you copy the folder of SVGs called 'osgb-zoomstack-symbols' into your **QGIS SVG paths:**

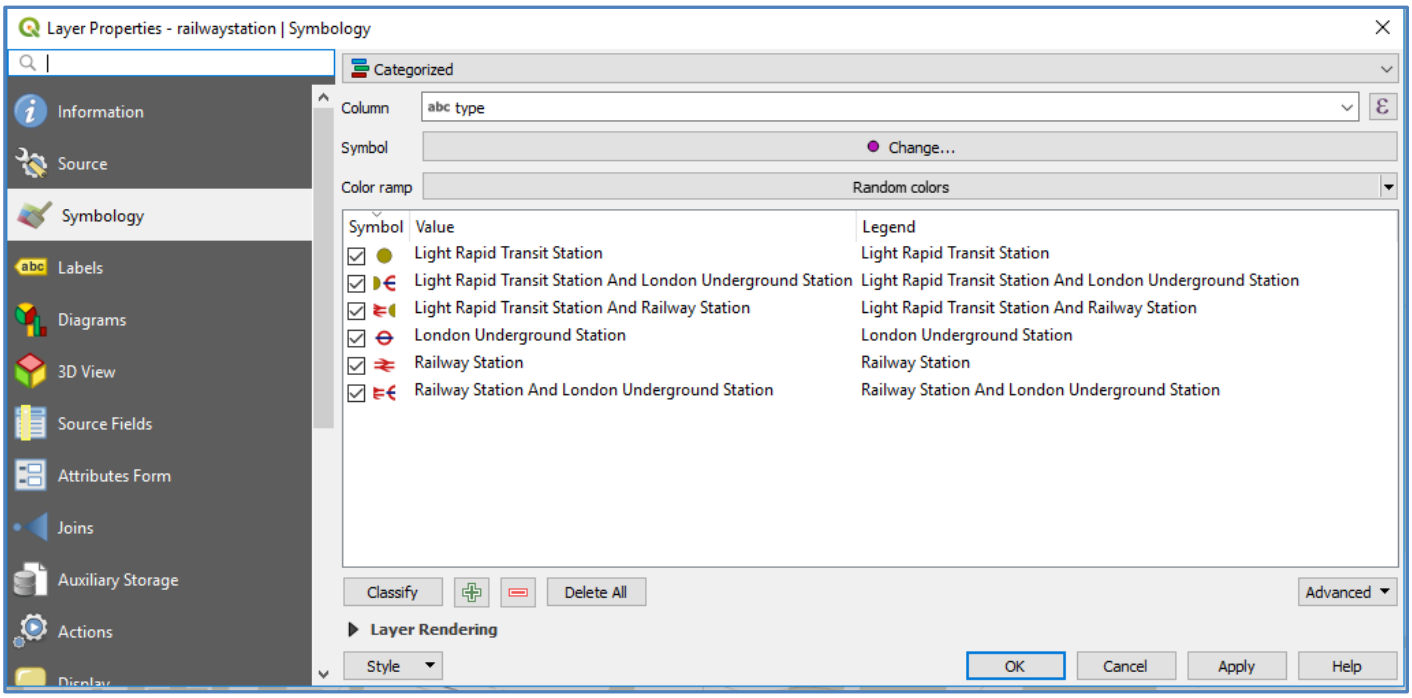


Now in QGIS, choose each of the OS Zoomstack layers from the layers panel in turn and select the **Properties** Tab**.** In the **STYLE** tab choose Style > **Load Style** > **Load from File** > selecting each of the QML files that relate to that layer.

The QML style file may simply render one type of fill colour, or in some cases apply **Rule Based** styling so that the features change as the user zooms in and out of the map.

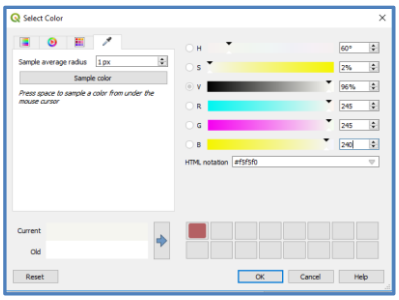


In the case of the Railways Stations the **SVG images** are used to define railway stations, tube stations etc…



Once you have loaded the QML notice how QGIS auto styles the OS Zoomstack data into each **Feature Type**.

To add a land tint to your map, from the top menu select **Project** > **Project Properties** and change the background colour to **R245 G245 B240.**



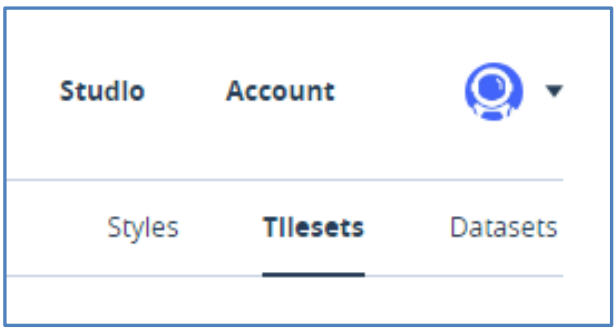
4 – Utilising MapBox to Upload and Style OS Zoomstack Vector Tiles:

In addition to loading OS Zoomstack as Vector Tiles, you can use the MapBox service to publish the same datasets as a Web Map Tile Service (WMTS), which can then be consumed within your desktop GIS or web mapping application for faster and more stylised rendering.

With the OS Vector Tiles, you get one single MBTiles file that is 2.1GB, light enough to be fast on the web and to be used offline. The OS have pre-selected the right content for each zoom level and supply four styles to utilise within your client application:

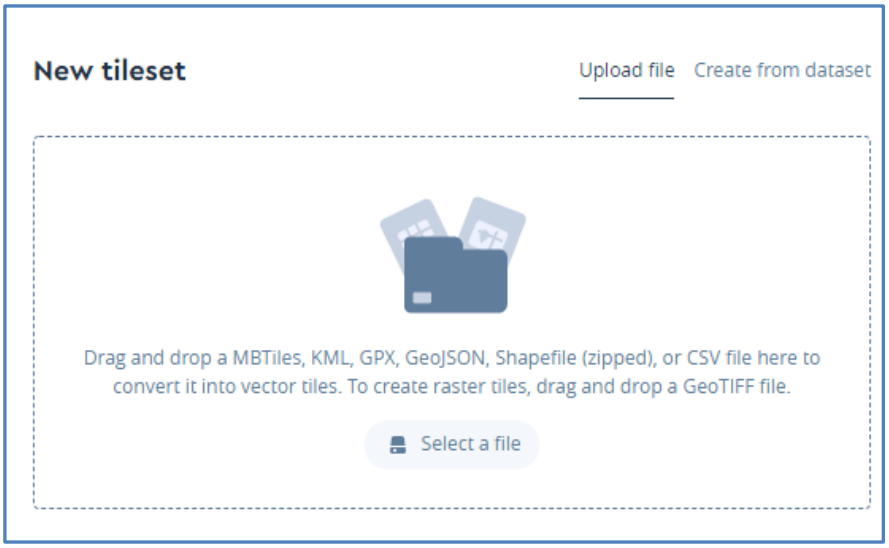
Firstly, you will need to create a **MapBox Account**: https://www.mapbox.com/

Once you have an account you can then access the **MapBox Studio** web pages you upload your own **Tilesets** – which are effectively a data source.

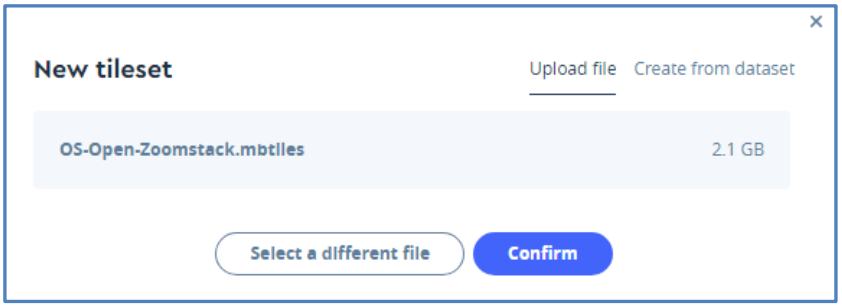


From the Tilesets pages choose to create a **New tileset:**

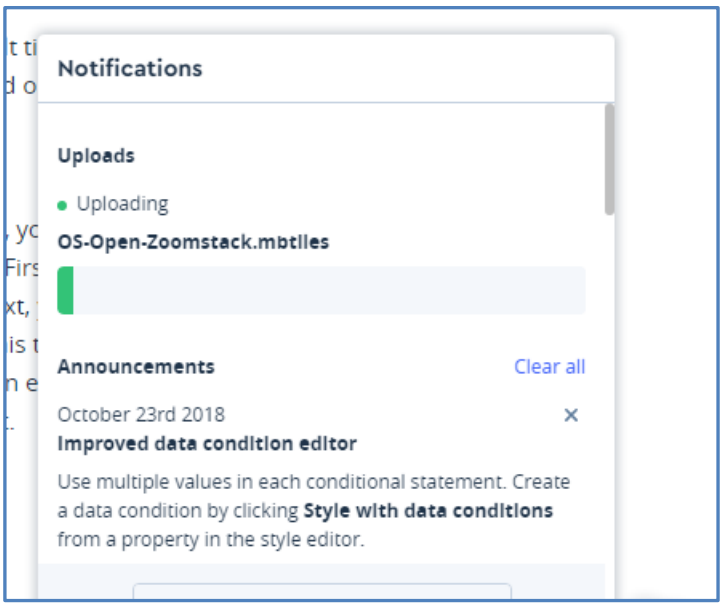
In the **New Tileset** window, click the **Select a File** and choose the location of the Mbtiles file that you downloaded from the OS Zoomstack.



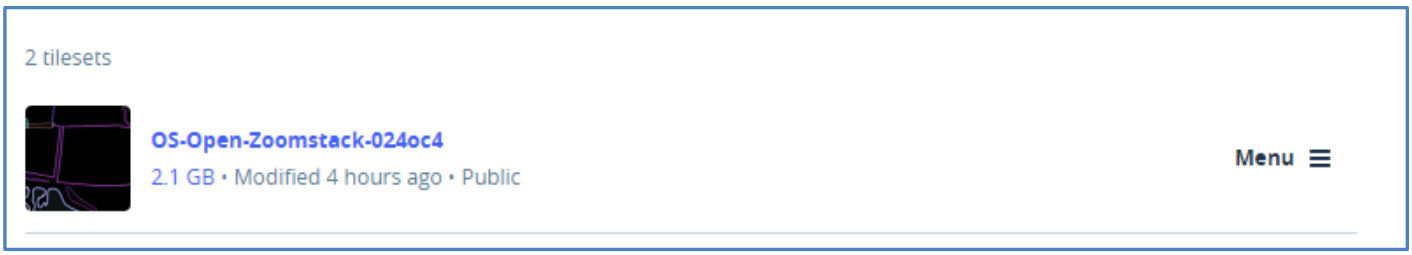
Having located the .mbtiles file choose **Confirm** and the upload process will begin.



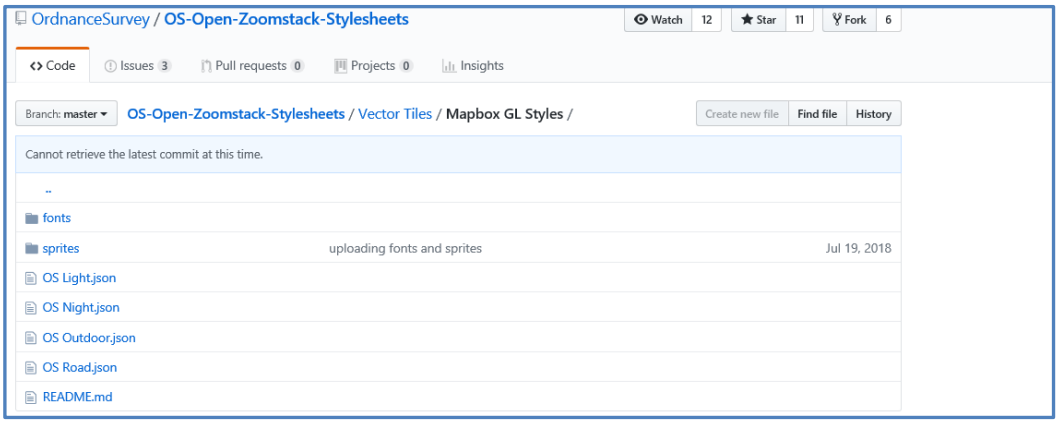
The **upload process** will take a little while as it uploads the 2-gig file to your MapBox account:



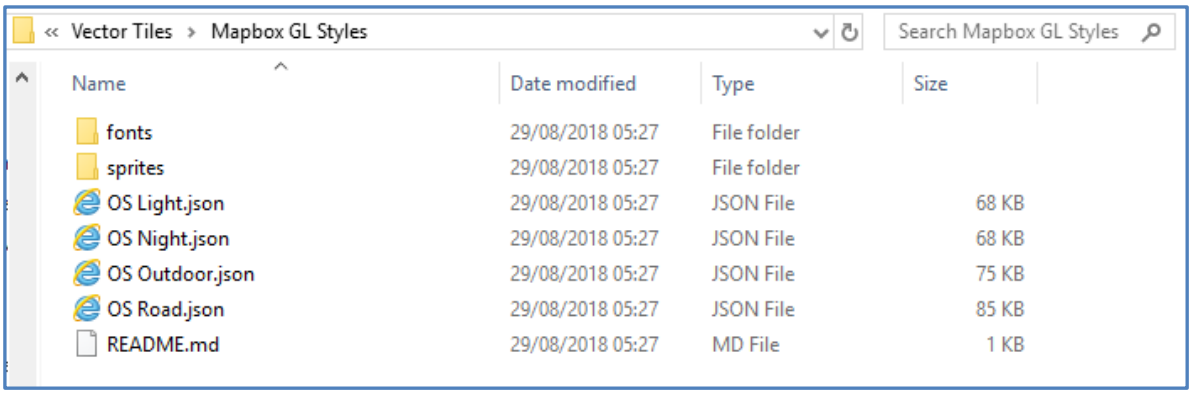
Once the upload is complete there will now be a new Tileset within your MapBox Account.



Before publishing this data you can create Styles using the supplied XML from the OS GitHub pages - https://github.com/OrdnanceSurvey/OS-Open-Zoomstack-Stylesheets



Download the **JSON** style files to your machine:



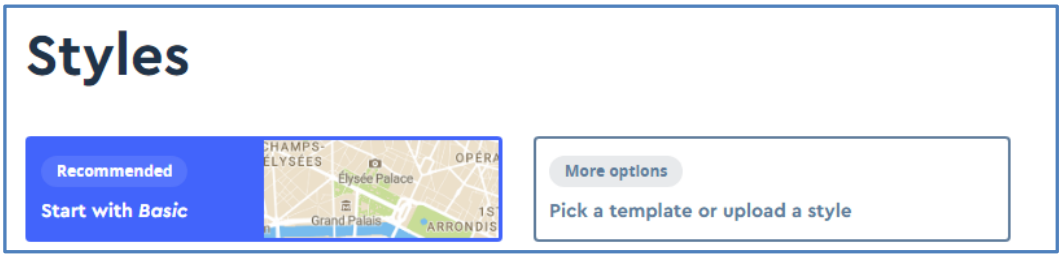
One by one you will need to edit them in notepad and replace the default map id value with the map id value of your newly uploaded MapBox Tileset. From the **Tilesets** page find your Tileset and on the right click on the menu button and choose to Copy the **Map ID** value.

Open each of your JSON style files and replace the line **ADD SOURCE URL HERE**

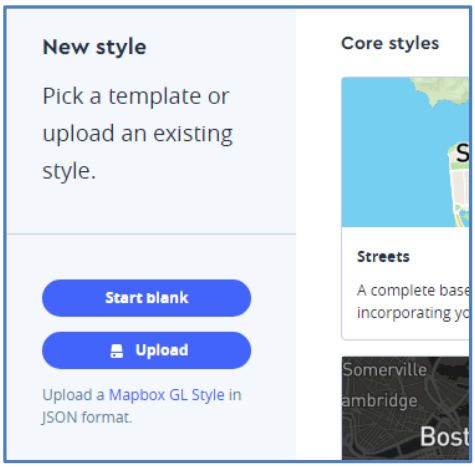
```
},
"sources": {
    "composite": {
        "url": "ADD SOURCE URL HERE",
        "type": "vector"
    }
},
```

With your copied map ID value.

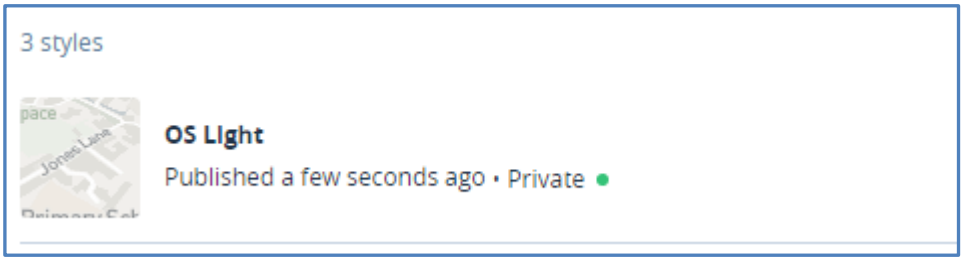
Now within the MapBox Styles page you can upload New Styles based on the 4 JSON style files. Choose the **Pick a template or upload a style button.**



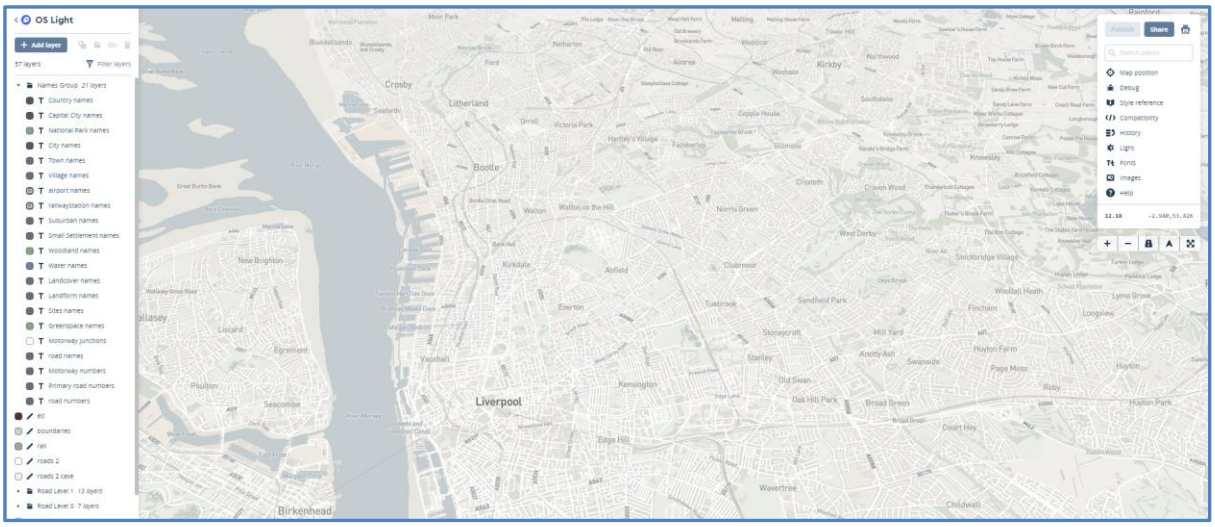
In the **New Style** window choose to **Upload.**



A new Style will be added to your library, referencing the data from the OS Zoomstack Tileset and using the chosen JSON style.



Viewed in the MapBox design window it will appear like this:

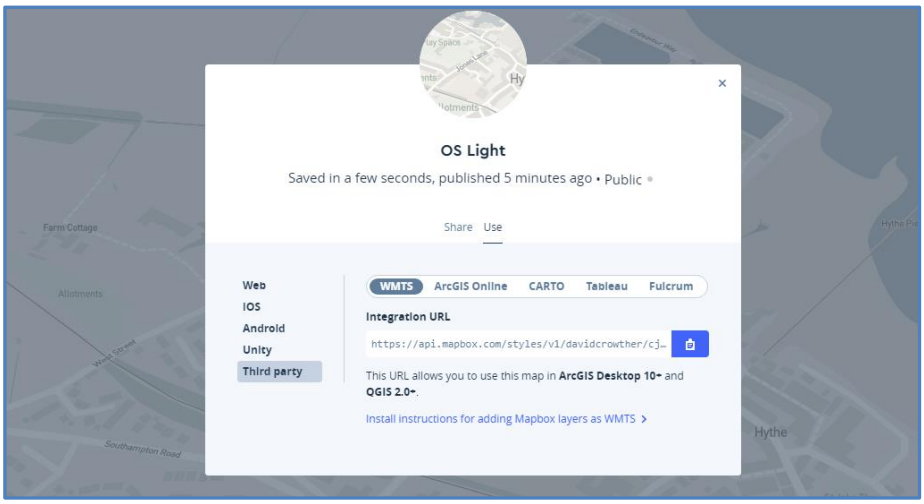


To publish the map for public consumption, in the top right corner click the **Publish** button.

5 –Connecting QGIS to the OS Zoomstack data – as a WMTS via MapBox

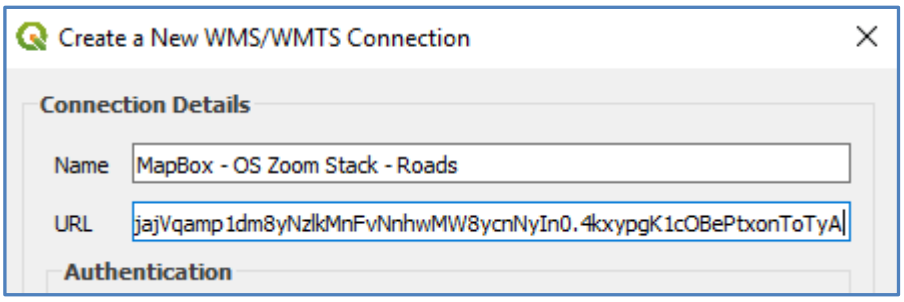
From the same window as above choose the Share button and you have a number of options for generating a URL to share the Map with other applications.

To allow access via QGIS, set the options to **Public**, choose the **Use** tab and the **Third-Party option.**

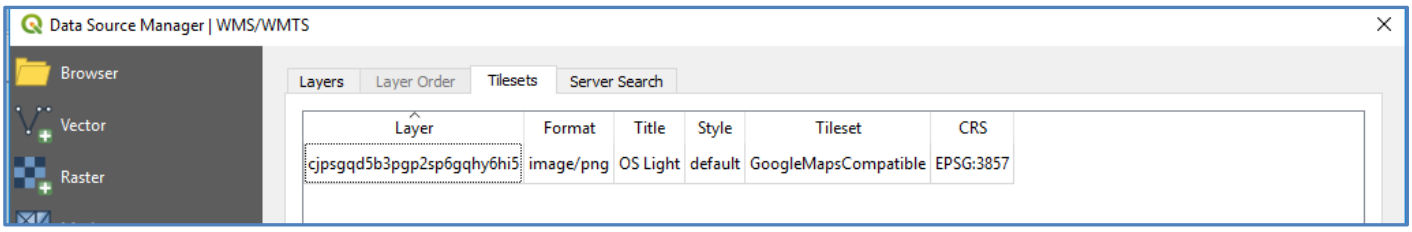


This will generate a URL which you can copy and use within QGIS to add a **WMS/WMTS layer.**

In **QGIS** choose to Add layer via a **WMS** and create a **New Connection**. Give the Connection and **Name** and then paste in the **URL** that was copied from MapBox.

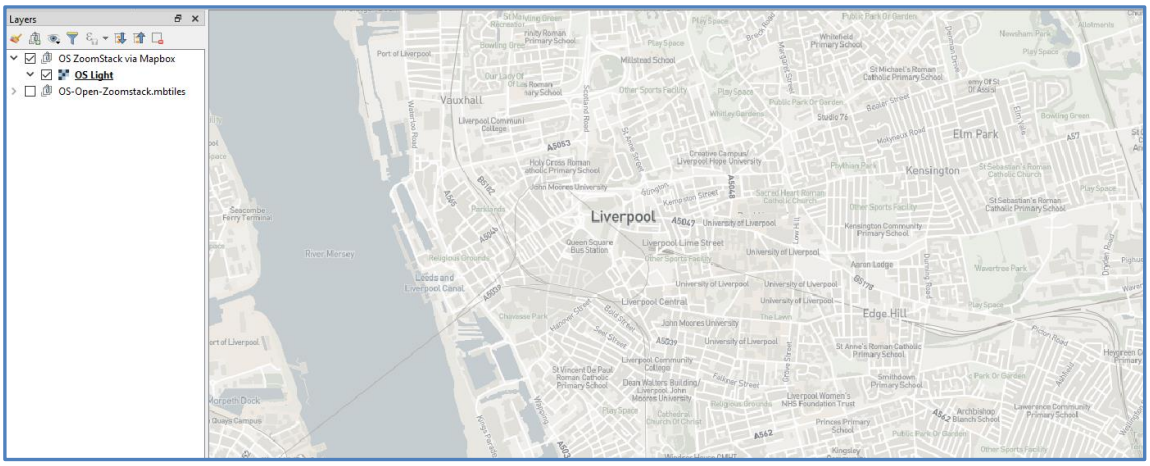


Press **Connect** and the WMTS is added.



Select the WMTS and **Add** into your QGIS project.

Your OS Zoomstack data is now in QGIS as a **WMTS** service being published and styled by MapBox.



Repeat the steps to upload and create the **3 remaining styles:**

Add those as WMTS layers into QGIS.