

# METROPOLIS OpenStreetMap converter

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July 2, 2019

## 1 The OSM Format

There exists multiple formats for OSM data, to build the OSM converter tool we decided to support the .osm format for the following reasons:

- The file format is based on the XML format which makes it easy to read by humans but that also means that we can use pre-made XML parsers to parse the data.
- This file format is the default file format used by OpenStreetMap when you download a map.

We also added support for the .osm.pbf format in order to convert large maps (Example: Paris, Amsterdam).

## 2 The OSM\_to\_METROPOLIS Tool

This tool converts an OpenStreetMap network file into a crossings.tsv and a links.tsv files that can be imported into METROPOLIS. They respectively contain the nodes and the links of the OpenStreetMap network. The user still needs to add zones to the network in the METROPOLIS interface.

The tool was built using Python 3 using the PyOsmium library to support all OpenStreetMap network formats. The PyOsmium library is also already optimized for large networks which made development easier and the tool much faster.

Disclaimer: The tool currently only works with Python3!

## 3 Exporting an OpenStreetMap network

There are multiple ways to export an OpenStreetMap network depending on the size of the network. If possible, please export the network in the .pbf format as it is the fastest format to work with.

Here are a couple of options for locating and downloading OpenStreetMap networks:

- OpenStreetMap.org website: Go to <http://www.openstreetmap.org>, locate the area you want to export and click on the export button. You will now be able to export everything you see on the screen or you can select a specific area. However, the network has to have less than 50000 nodes so it is not ideal for large cities such as Paris.
- Planet OSM: Go to <http://www.planet.openstreetmap.org>. There, you will find pre-made network files of different areas around the world. However, it is not ideal if you want to export a specific area.
- BBBike.org: Go to <https://extract.bbbike.org/>, locate and select the area you want to download.

## 4 Tutorial

### 4.1 Installing Python and PyOsmium

1. Download and install Python3 from the Python.org website.
2. Install the pip3 Python3 package manager. Look online for the install instructions corresponding to your operating system.
3. Install the PyOsmium library with the following command:

```
$ pip3 instal osmium
```

### 4.2 Running the tool

1. Download the file from this link and place it in the folder you want the METROPOLIS network files to be generated. For this tutorial, we will place the file in a folder named "Tutorial".
2. Download your OpenStreetMap network from the source of your choice and place it in the "Tutorial" folder.
3. Open a command prompt/terminal in the "Tutorial" folder.
4. Run the following command:

```
$ python3 osmtometro.py your_osm_file
```

Disclaimer: The tool currently only works with Python3!

5. After the program has finished running, 2 files will appear in your folder("intersections.tsv" and "links.tsv") and you can now import these into METROPOLIS.

## 5 Limitations

While the tool has great potential, it is limited by the following factors:

- OpenStreetMap data is often not as complete as Google Maps data. OpenStreetMap tends to have missing information on certain roads. However, for popular roads, the data tends to be there. Unfortunately, there is no way to go around this issue except using Google Maps data instead.
- OpenStreetMap data tends to have missing information for some roads such as number of lanes, capacity and top speed. To counter this, the tool defaults the road parameters to a two way road, with a max speed of 50km/h. Capacity is estimated by the length of the road.
- Using .osm files instead of the more compact .osm.pbf format may result in extremely long conversion time for large maps.

## 6 Tasks

- Adapt or re-build the tool in order to support the *Here* network database.
- Reduce the number of intersections and links in the converted files.
- Detect zones in the OpenStreetMap network and output them in a zones.tsv file.