

1a. Initialize OSM data

This notebook:

- Loads the polygon defining the study area and then creates a grid overlay for the study area.
- Downloads street network data for the study area using OSMnx.
- Creates a network only with bicycle infrastructure (with queries defined in `config.yml`).
- Creates additional attributes in the data to be used in the analysis.

Sections

- [Load data for study area and create analysis grid](#)
- [Download and preprocess OSM data](#)

Load data for study area and create analysis grid

This step:

- Loads settings for the analysis from the configuration file `config.yml`.
- Reads data for the study area.
- Creates a grid overlay of the study area, with grid cell size as defined in `config.yml`.

Load data for study area

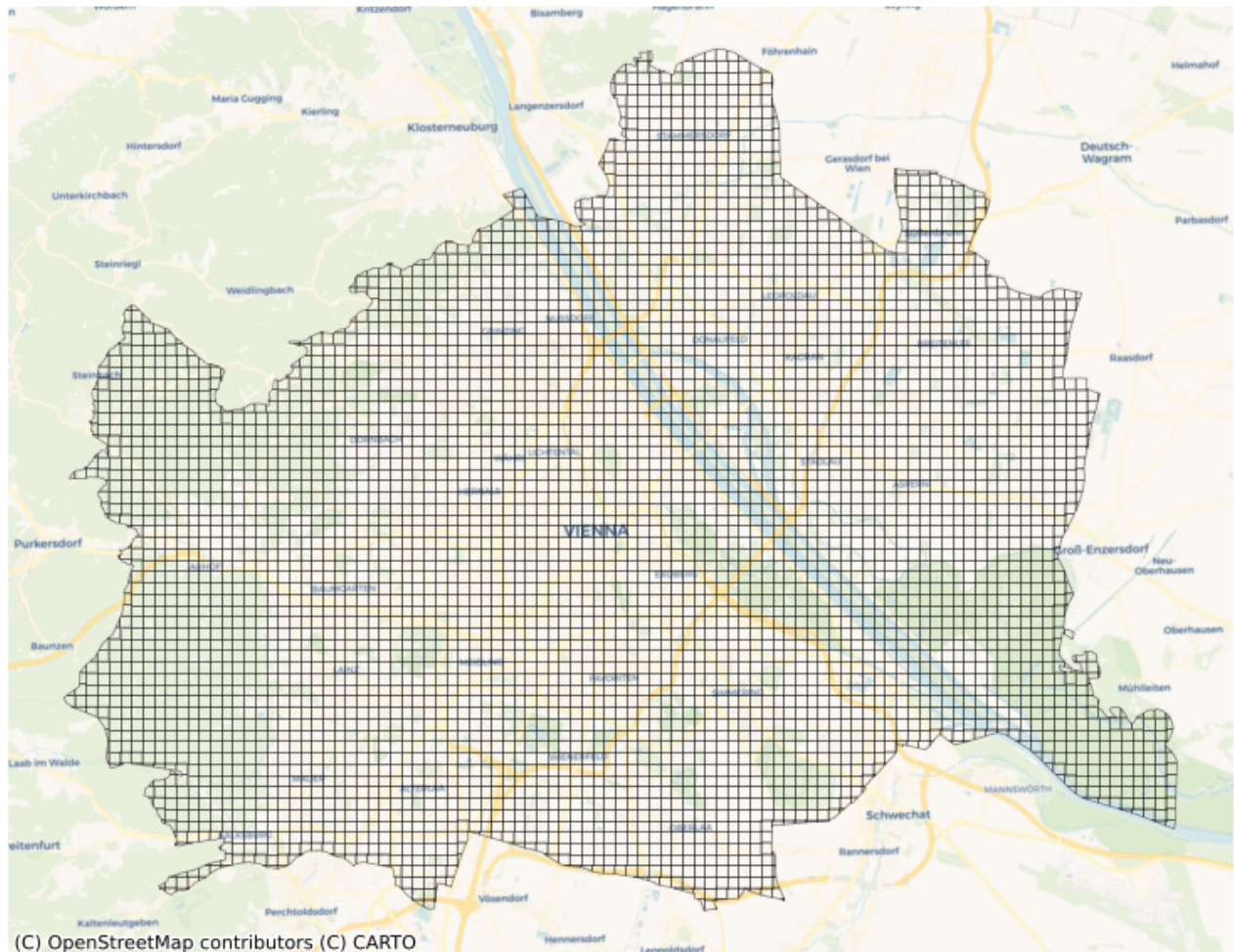
The study area is defined by the user-provided polygon. It will be used for the computation of **global** results, i.e. quality metrics based on all data in the study area.

The size of the study area is 414.64 km².

Create analysis grid

The grid contains 4929 square cells with a side length of 300 m and an area of 0.09 km². This grid will be used for local (grid cell level) analysis:

Vienna study area (4929 grid cells, side length 300m)



Download and preprocess OSM data

This step:

- Downloads data from OpenStreetMap using OSMnx.
- Projects the data to the chosen CRS.
- Creates a subnetwork consisting only of bicycle infrastructure.
- Classifies all edges in the bicycle network based on whether they are protected or unprotected bicycle infrastructure, how they have been digitized, and whether they allow for bidirectional travel or not.
- Simplifies the network.
- Creates copies of all edge and node data sets indexed by their intersecting grid cell.

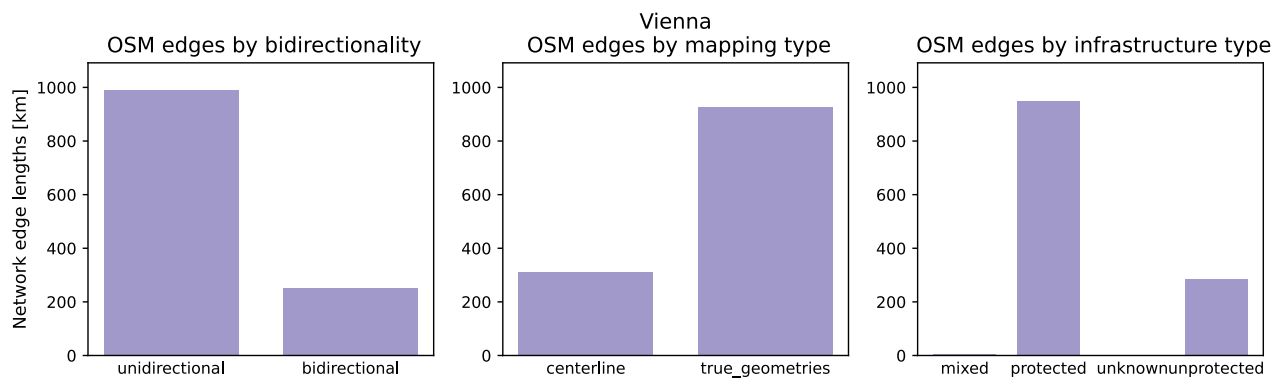
OSM data model

In OSM, street network data are stored using *nodes* (points) and *ways* (lines). In BikeDNA, OSM data are converted to a network structure consisting of *nodes* and *edges* (we use the terminology used in OSMnx). Edges represent the actual infrastructure, such as bike lanes and paths, while nodes represent the start and end points for the edges, as well as all intersections. For further details, read more about the [OSM data model](#) and the [network data model](#).

Edges where 'bicycle_bidirectional' is False: 41407 out of 49891 (82.99%)
 Edges where 'bicycle_bidirectional' is True: 8484 out of 49891 (17.01%)

Edges where the geometry type is 'true_geometries': 38603 out of 49891 (77.37%)
 Edges where the geometry type is 'centerline': 11288 out of 49891 (22.63%)

Edges where the protection level is 'protected': 39028 out of 49891 (78.23%)
 Edges where the protection level is 'unprotected': 10223 out of 49891 (20.49%)
 Edges where the protection level is 'mixed': 624 out of 49891 (1.25%)
 Edges where the protection level is 'unknown': 16 out of 49891 (0.03%)



The network covers an area of 356.27 km².

The length of the OSM network with bicycle infrastructure is 909.70 km.

