Data Ethics & Open Data Project

WcForYou

performed on

**UAS bachelor's degree program
Business Informatics**

**Version 1.0
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1 Introduction

In this document the final project WcForYou from Data Ethics & Open Data is documented. In addition to the executive summary that gives an overview of the entire project, the use case is explained, the process to the final structure and the planned and final architecture is described and justified.

2 Use Case

The goal of this project was to implement a full-featured website in Django to show the locations of public restrooms on a map and display information about them. Furthermore, we also wanted to draw routes from the current location to get the fastest way to the desired toilet. The idea was that everyone knows the feeling of having to go to the bathroom while traveling in town. But unfortunately, you do not have in mind where the next functioning public toilet is located. Thus, as part of the final project in OpenData, an idea has developed to solve this problem. For this purpose, the individual locations of the toilets are shown on the map with a color-coded icon. The choice for the color of this label was made by closely analyzing usage data from other sites and usability testing on purple. Important information such as the category of the toilet, opening hours, the condition of the toilet or the exact address are displayed by clicking on the desired toilet icon. This display was presented as compactly and clearly as possible in a popup bubble.

To enable the best possible routes to these facilities, the exact location is determined up to one meter. Here, various algorithms come into play to calculate the fastest and most efficient route.

3 Dataset

The following section describes the data set used in the project. The dataset is a publicly accessible dataset of the City of Vienna.

The data set was created and maintained by the Municipality of Vienna - Municipal Department 48 - Waste Management, Street Cleaning and Vehicle Fleet. They are also the main data responsible in cooperation with the City of Vienna. The dataset is published via https://www.data.gv.at/katalog/dataset/146384fc-3f64-4482-a78a-2f082411a27d with the title "Public toilets in Vienna" and is missing under the category Administrations and policies.

The data is retrieved in JSON format via a provided REST API https://www.data.gv.at/katalog/api/3/action/package_show?id=146384fc-3f64-4482-a78a-2f082411a27d of https://www.data.gv.at/.

3.1   Dataset description

The general dataset contains information about all publicly accessible WC facilities in Vienna, Austria. The language of the metadata set is German. The complete dataset contains the following information:

- WC_ID: Identification of the location
- District: Vienna district number
- Street: street location: more detailed description of the location (in the park, ...)
- Addition: possible additional information
- Active: Y/N depending on whether the WC is open or not
- Opening time: times when the WC is open
- Restrictions: Restrictions on opening hours
- Staff support:times when staff is on site
- Category: types and number of facilities
- Equipment: additional equipment
- Contact: Telephone number for contacts
- Department: service responsible for the WC facility
- Information: link to the website

Due to the size of the dataset, the project team focused only on the following information to implement their project:

- Geometric coordinates of the WC facility
- The street with more detailed location
- Opening hours
- Category: types and number of facilities

This data was used to display the WC facilities on a map and to provide additional information for the user.

4 Architecture

The following section describes the architecture of the project and explains how the various technologies and frameworks in the project are interconnected and function.

The Python programming language was used to implement the project. To create a stable and secure web server environment, the Python framework Django was used. Django takes a lot of the tedious web development out of your hands, so you can focus on writing your application without having to reinvent the wheel. It's free and open source and it is designed to help developers get applications from concept to completion as quickly as possible. Django takes care of user authentication, content management, sitemaps and RSS feeds. Django's ability to scale quickly and flexibly makes it the perfect framework to meet even the largest traffic demands. Using Python's Requests library, data is retrieved from a REST API when the page is loaded (See chapter Dataset). For displaying the map, we used the library HereMap. You can visit the documention on this Site https://developer.here.com/documentation/maps/3.1.24.0/dev_guide/index.html for more Informations. For routing and visualization of the map and dataset, an open source and free REST API from Here Developer is used.

5 Added value of the project for society

The value of this project is that it provides tourists who are sightseeing in Vienna with a way to go to the bathroom no matter where they are, instead of having to wait until they get back to the hotel or pass by a restaurant.

Furthermore, the site benefits the youth, who travel a lot. By being able to find out in advance which toilets are active, for example, to organize the next football match or other sporting activities nearby.

The pictures below give a little insight into the site and explain some of the functionality.
As you can see, your own location is marked as a green marker. And the purple colored boxes with the lettering WC in white mark the toilets. And the blue radius on the map around the location shows the radius you have set. This will be explained in more detail in the following pictures and their descriptions.

In the following picture we see a set range of 355 meters. In this range there are 2 toilets and one is on the edge.
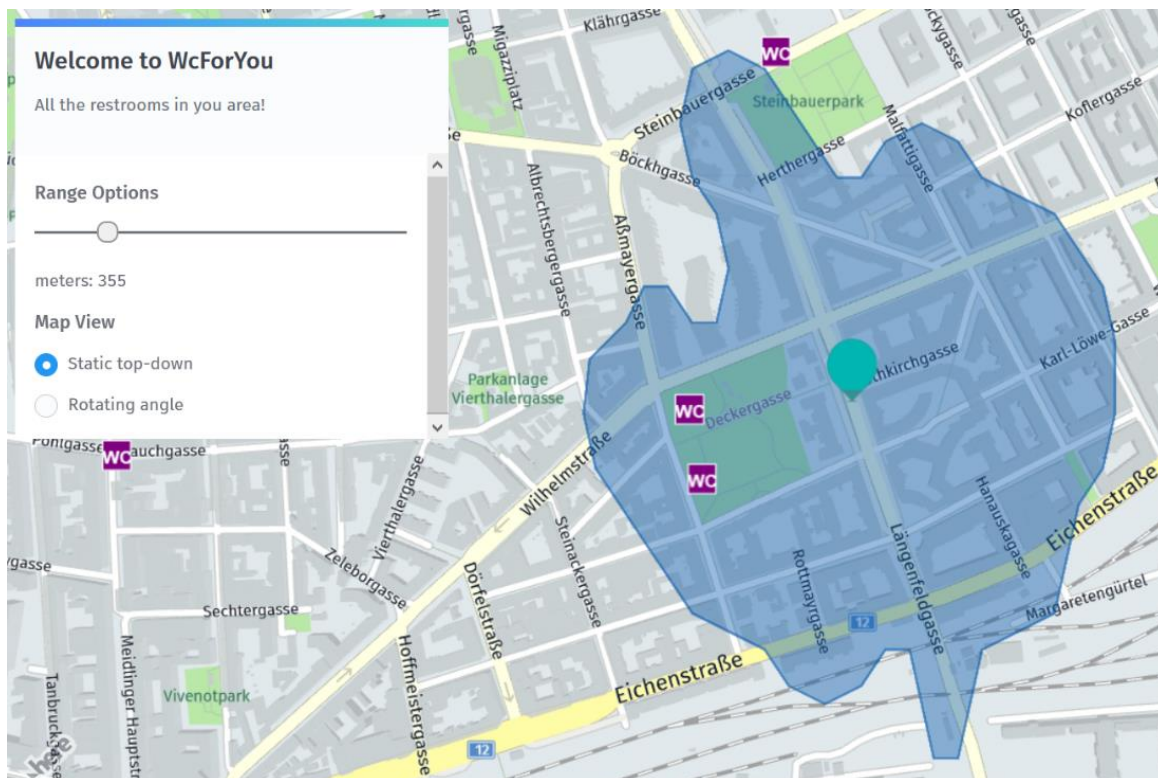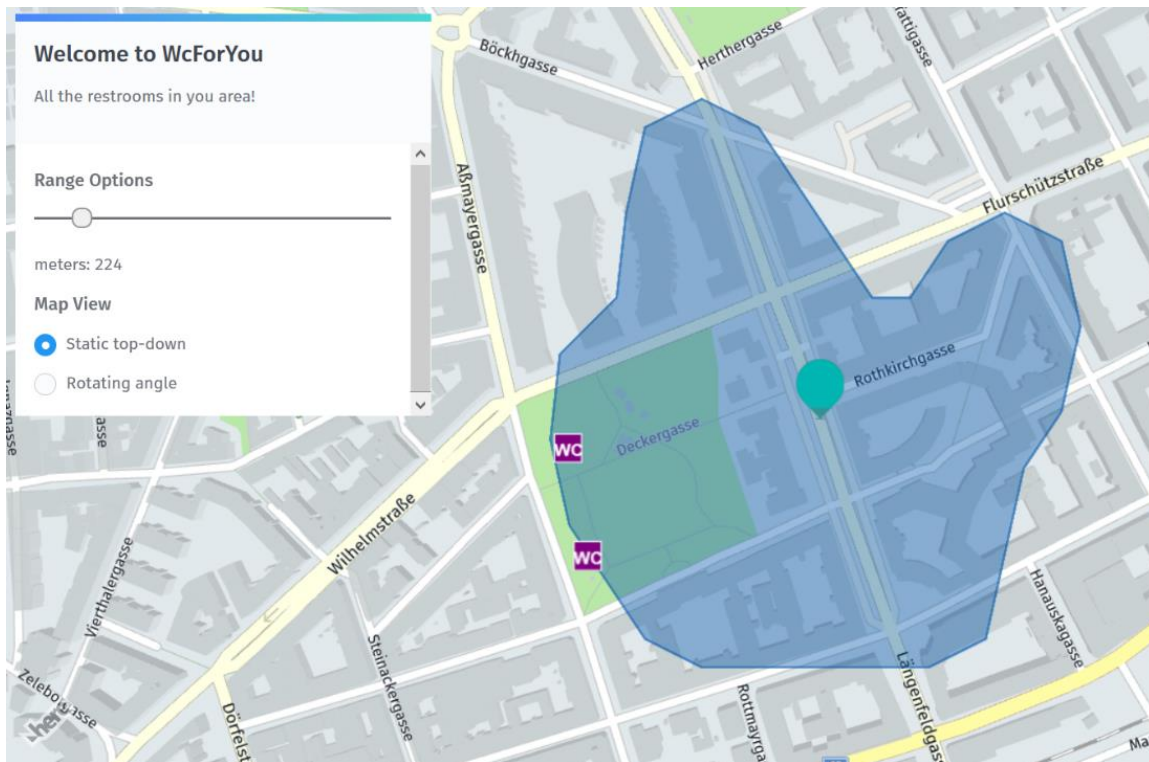

Figure 1 Range with 355 meters

Now we change the range to 224 meters and see that now one toilete in the perimeter and one on the edge. Thus, you can set the radius according to your needs and display toilets in this desired area.

Figure 2 Range with 224 meters

If you click on the desired toilet icon opens a bubble with details such as opening time, address and category. In the following two pictures we see in yellow marked, that there are different categories. So everyone can use the toilet he needs.
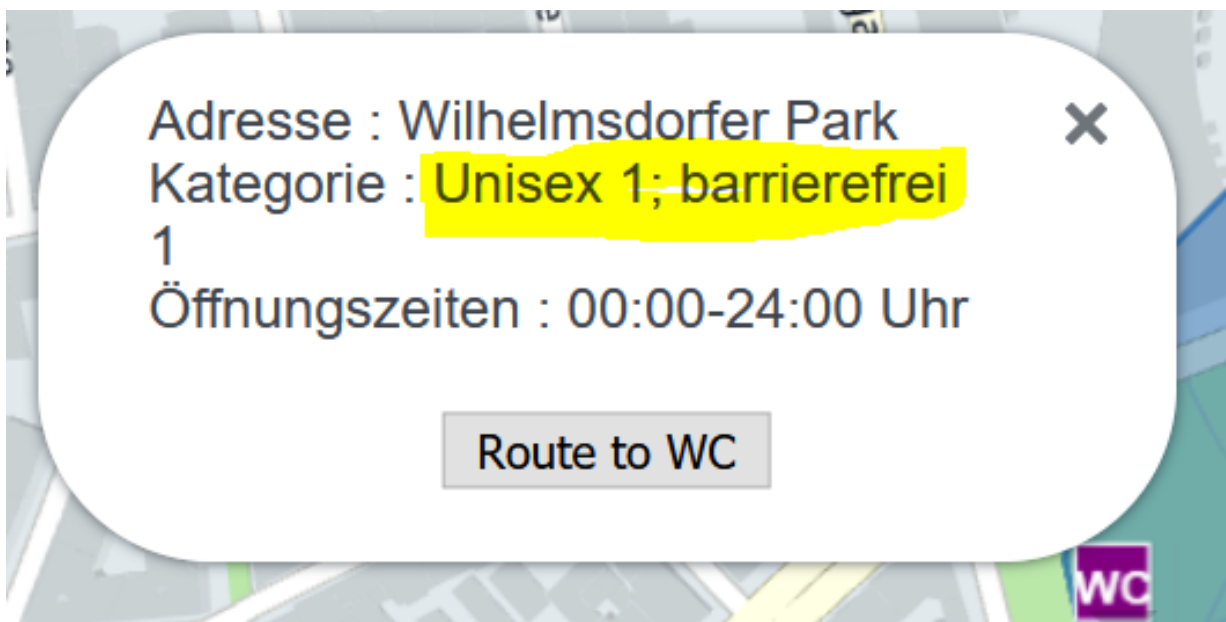
Picture 3 Category Unisex Toilet
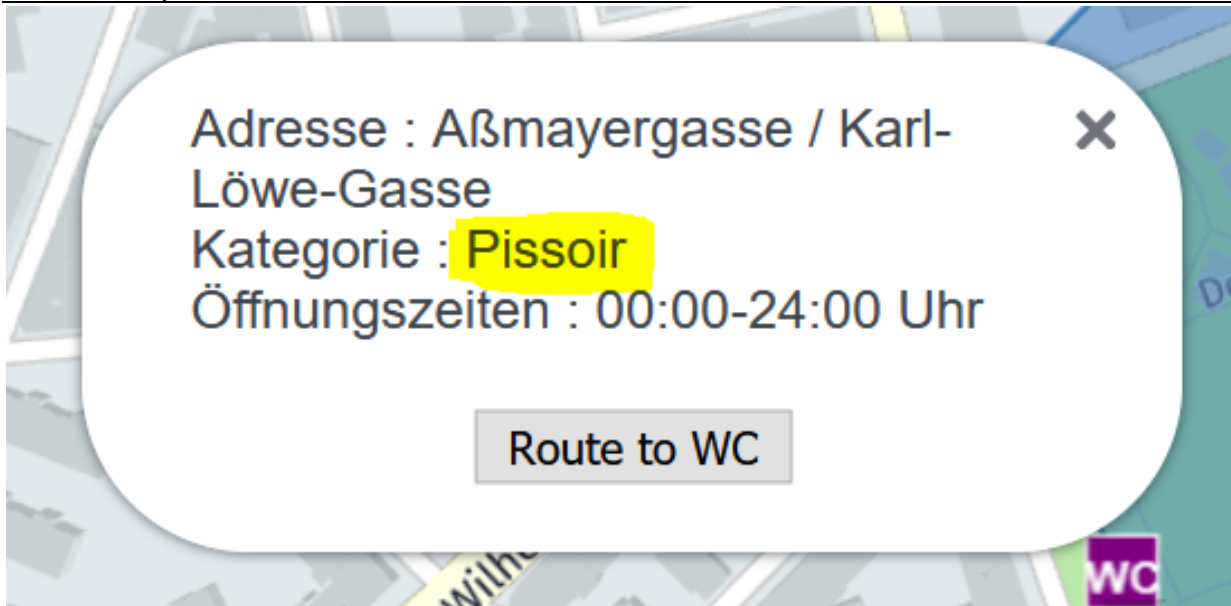
Figure 4 Category Pissoir Toilet

Furthermore, you can call the function of routing by means of a button in the details bubble. You can leave the bubble open or close it. The following two images show this very well.
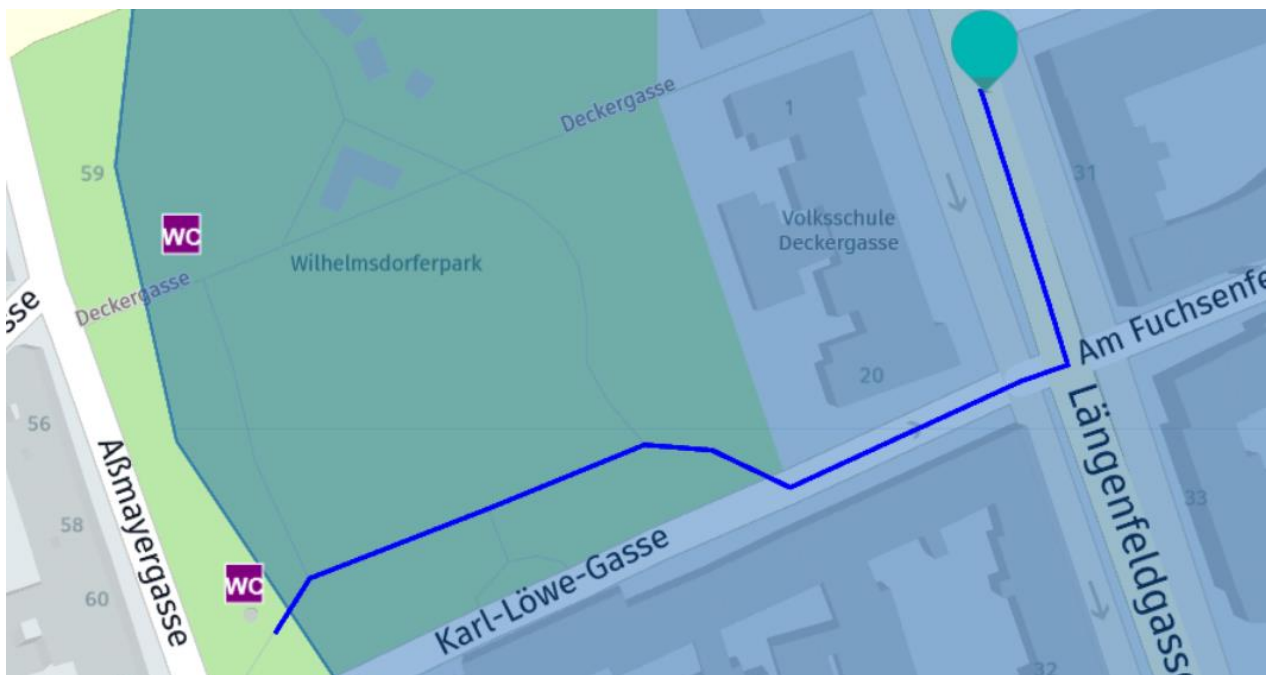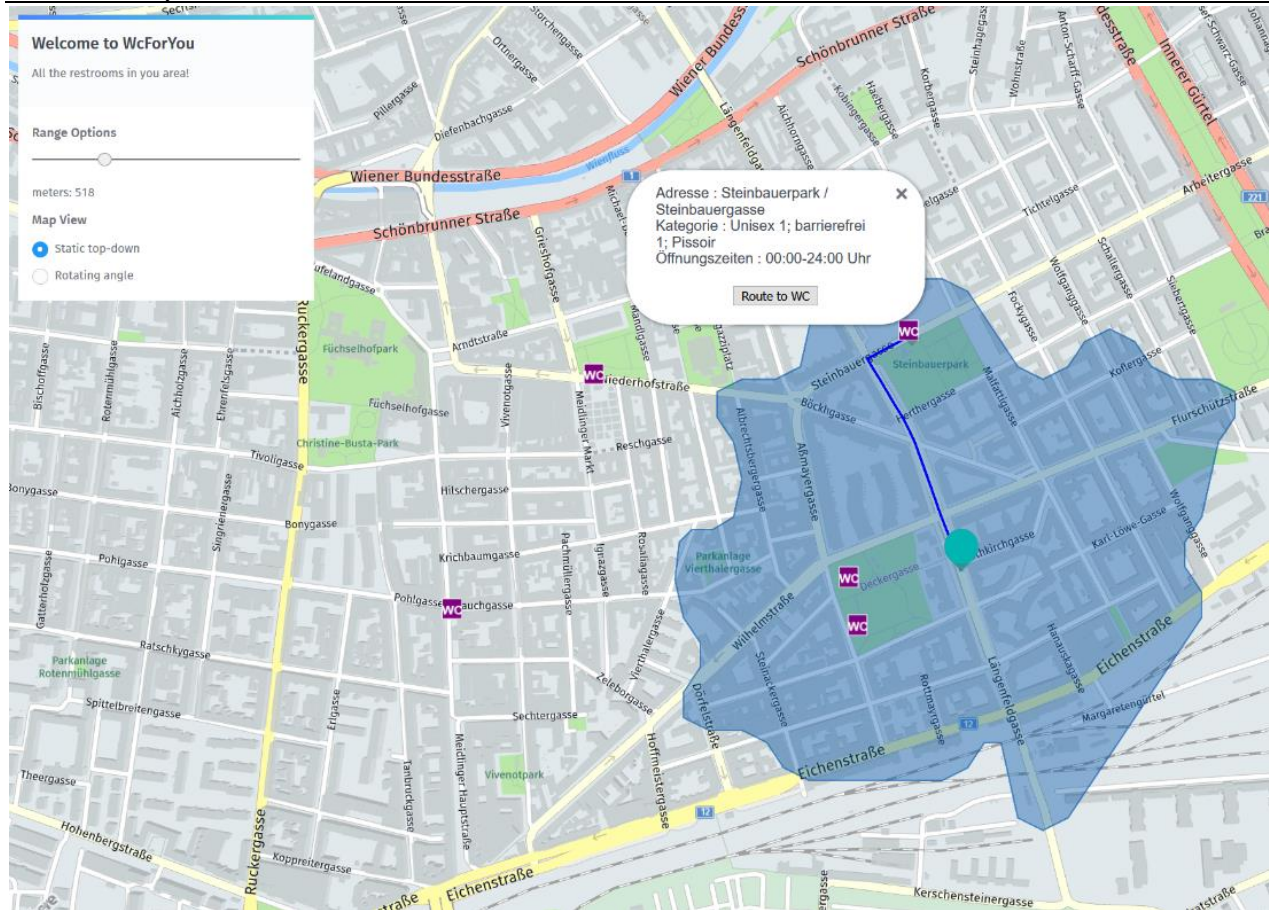

Figure 5 Route without Details

Figure 6 Route with Details

Also we offer three different views. The standard, the sateliiten and the 3D view. We implemented this to be able to address as many people as possible. The following images show the other two view options.
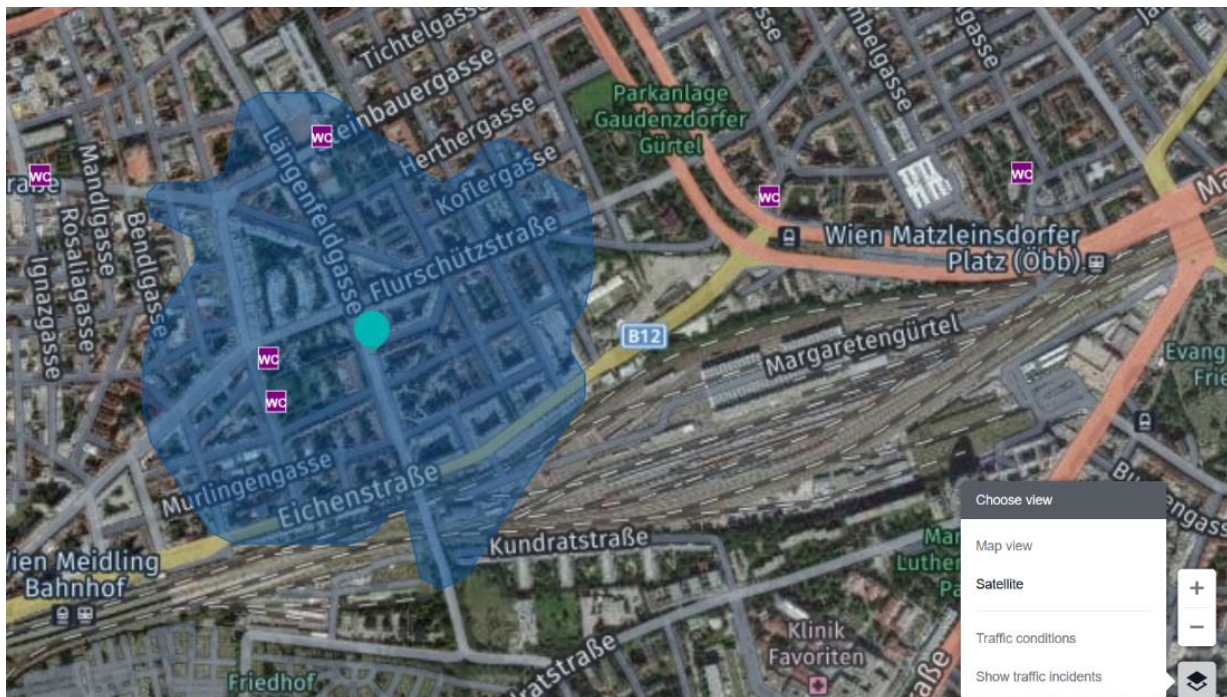

Figure 7 Satellite view of the Map

Figure 8 3D View of the Map

6 Setup to run the Site

To start the project, Python3 and the Django framework must be installed on the machine. After that, the project can be started with the terminal in the "OpenData-Endprojekt\wcforyou" folder with the command "python manage.py runserver". The page can be accessed under the URL http://127.0.0.1:8000/WcForYouApp/ . To access the page, we recommend using a FireFox browser.

7 List of Figures