Pollution and Mobility - Strategies to reduce the environmental and health impacts

Challenge Provider: PSE

PSE is a company expert in Data Science and Advanced Research, which has been on the market since 1994. Since the beginning of its activity, PSE has been dedicated to Advanced Analytics. Today, this materialises in the implementation of technology solutions, advanced market research, and providing consultancy and data science services.

Context

Following the European Commission, at least 60% of the European Union's population is currently living in built-up areas of over 10,000 inhabitants, and their mobility generates 40% of all CO2 emissions. Following the 2020 World Bank Report, by 2050 over two-thirds of the world's population will be living in cities responsible for over 70% of worldwide CO2 emissions and generate 80% of the global GDP.
Rapid urbanisation has resulted in increasing air pollution in major cities, particularly in developing countries. It is estimated that over 1 million premature deaths can be associated with urban air pollution.
Citizen mobility is one of the activities with the most significant impact on cities' air quality, and air quality is very closely bound up with citizen wellbeing and the sustainability and habitability of cities. Reducing the polluting emissions of vehicles, industries, and housing is now the top priority. Improving urban air quality is then one of the cities' top environmental challenges.

Goals

One of the goals established by the United Nations is to reduce the adverse per capita environmental impact of cities, including by paying particular attention to air quality. Inhalable particulates are one of the most severe air pollutants in terms of public health. In fact, in big cities like Porto and Lisbon, there are critical hours when there is a significant concentration of vehicles, and thus the air quality deteriorates. This is due to many people using the same road axes for the same period, especially in entries and exits of the work period.
Therefore, it would be interesting to relate the hourly levels of pollution with the Intensity Traffic Model of each Metropolitan Area (Lisbon and Porto) and modelling these two dimensions.

Outcome

Create a model that allows redistributing work periods to obtain a more equitable hourly distribution of the polluting gases emitted.

Available Resources

All the data resource can be found here: https://bit.ly/wdl-data
The following list of resources is available for you to use. As a reminder, you can also use any data that is open, free and legally available.

Hourly Average Traffic
Average traffic per parish in the Metropolitan Area of Porto and Lisbon.

OpenWeather Air Quality
You can use the OpenWeather air quality API to get the air quality data.

Submissions

Deadline: 29 - 05 - 2021 @ 14h00 GMT + 1

Don't forget that you will need to deliver the report **using the template provided** (see below) and a 1-minute summary.

Submission template: http://bit.ly/wdl-template

Tips

- Don't forget to check state of the art;
- If possible, don't forget to explain the outcome of your model.