Urban Mobility challenge

by UPC Sostenible

UPC Sostenible is the sustainability office of the Universitat Politècnica de Catalunya (Catalan Polytechnic University). Our mission covers the areas of Climate action, Energy transition, Responsible consumption, Health and Sustainable mobility. **We aim to transform the UPC campuses** and **encourage the** university **community towards sustainability**.

UPC Sostenible believes that students, professors, and specialists should work together to make the University a leading institution that can meet today's social, economic, and environmental challenges. **The role and empowerment of students is essential to us: we want you to take part in our challenge.**

We typically divide urban mobility in the following categories:

- active mobility (walking and cycling)
- public transportation (metro, bus, train, tram…)
- private transportation (car, motorcycle…)

The challenge consists in:

1. Explain which factors determine whether students use public or private transportation systems to go to the university. You can also consider active mobility.
2. Create a data visualization solution that summarizes the people flow generated daily by UPC students, by transportation category. A user of your solution should be able to answer some of the following questions:
    - How do people exactly move from their home to their school? Which public transport lines do they use?
    - How long does it take them?
    - Which zones are better served in terms of public transportation?
    - Are there any discontinuities in bike-lanes or bike-friendly streets that stop people from coming by bike?
    - Are the bike-sharing systems (Bicing, AMBici…) convenient and reliable? Do they have the right capacity?
3. Propose which actions should be taken to the public transport system with the goal of minimizing carbon emissions.
    - You can propose the creation of new lines, modify the frequencies of existing ones or other improvements to make the network more robust.
    - You can also focus on improvements to be made to bike-sharing systems!
    - Make sure that your proposal is attractive to the potential users. Analyze the deal-breaking issues that need to be addressed.

You should start with the first part of the challenge, later you can either solve part 2 or 3 (or both), choose the one which motivates your team the most!

Before starting, some brief insights you need to know about UPC:

The technical university of Catalonia has nine campus spread around the territory (Barcelona province). Four of them are located in Barcelona - Diagonal Nord, Diagonal Sud, Diagonal Besòs and Nàutica-, and the rest are found in different cities - Sant Cugat del Vallès, Terrassa, Castelldefels, Vilanova i la Geltrú i Manresa. Each campus has a unique context that influences the mobility patterns of their students when travelling to university. The fun of this challenge is guaranteed!

You are provided with two spreadsheets:

- One of them contains the list of origin municipalities during course (Course), family municipalities (Familiar) for each student and destination UPC faculties.

- The other one is a mobility poll from last years' course answered by students from the UPC community and contains relevant information of the origin of the commute (postal code) and the modes of transport involved.

Some interesting data sources that you can use:

https://opendata-ajuntament.barcelona.cat/data/en/organization/transport

https://omc.cat/en/w/demand-at-railway-stations

https://omc.cat/en/w/municipalities-of-catalonia-with-public-transport-service-by-type-and-operator

Conjuntos de datos - Renfe Data
    Avisos sobre modificaciones planificadas del servicio
    Horarios cercanías
    Estaciones Rodalies Barcelona

https://developer.tmb.cat/data#

https://www.fgc.cat/opendata/

https://dadesobertes.fgc.cat/explore/?sort=modified

https://omc.cat/ca/w/enquesta-emef

https://opendata.tram.cat/

Many datasets contain GTFS files. Find more information about it here: https://gtfs.org