



## Capstone Project

### The Battle of Neighborhoods

#### Introduction/Business Problem

Madrid is the capital of Spain and the most populous city in the country that has an expanding metropolitan area that includes more than 6.5 million inhabitants that place it among the top 5 of the European Union.

It is a city with a long history and therefore its morphology has evolved through the ages. It presents a great variety of urban paths. It is divided into districts, which are subdivided into neighborhoods. It has 21 districts and 131 neighborhoods.

The personal transport vehicle has been one of the distinctive elements of urban transport due to the dispersion of the population and the historical difficulties in accessing work and leisure centers by public transport. The city traffic jams are famous.

In recent years, sustainable mobility plans have been enhanced to facilitate the lives of its citizens and help prevent climate change.

One of the key elements in this new mobility model is personal transport using electric vehicles, which enjoy great environmental and fiscal advantages.

The objective of this project is to analyze the charging points of electric vehicles available in the city of Madrid, to help an investor find the best location between the neighborhoods of Madrid to install a new charging point.

# Data

For this project we need the following data:

- **Data of the city of Madrid containing the list of Districts and neighborhoods containing their latitude and longitude.**

- Data source: <https://es.wikipedia.org/wiki/Madrid#Distritos>
- Description: On this page we find the list of districts and neighborhoods linking each of them a page with their geographical data.

- **Electric vehicle charging points in the city of Madrid.**

- Data Source: Gogle Earth Pro. Search “electric vehicle charging station madrid”. Provide the file
- Description: Using Google Earth we can download a file in kml format with the location of the current charging points. A kml file is an xml file that contains the coordinates of the current points.

- **Places near each charging station.**

- Data Source: Foursquare API
- Description: By using this api we will get all the venues in each neighborhood. We will use these places to look for patterns in current locations and apply those patterns to find new locations.

# Approach

- Collect the Madrid city data from <https://es.wikipedia.org/wiki/Madrid#Distritos>
- Collect the Madrid station charge of electrical vehicles from Google Earth.
- Using FourSquare API we will find all venues for each station charging.
- Using FourSquare API we will find all venues for each neighborhood.
- Cluster the data to find the ideal location of a charging station.

Questions that can be asked using the above mentioned datasets

- What is best location in Madrid for stations charging electrical vehicles?
- Which areas have potential station charging electrical vehicles market?

## ***References:***

- <https://es.wikipedia.org/wiki/Madrid>
- <https://transparencia.madrid.es/UnidadesDescentralizadas/Sostenibilidad/CalidadAire/Ficheros/PlanACalidadAire2019.pdf>
- <https://www.google.es/maps/search/estaci%C3%B3n++carga+veh%C3%ADculo+el%C3%A9ctrico+madrid/@40.4329913,-3.7168539,14z/data=!3m1!4b1?hl=es>