

# Uber Barcelona Market Growth Plan

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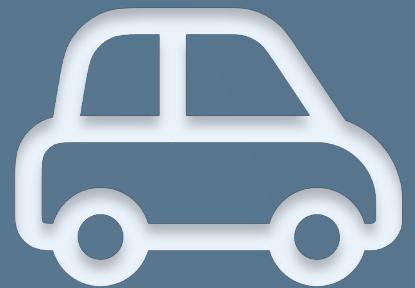
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# Situational Analysis

## Public Transportation in Barcelona

Barcelona, offers a convenient public transport system, including buses, trams, and an extensive metro network. However, the city grapples with traffic congestion and air pollution, which surpasses EU limits according to its emissions reduction goals.<sup>1</sup> While the city's public transport is efficient, it faces strains from the influx of tourists. The ridesharing market, with players like Uber and Cabify, offers an alternative but regulatory hurdles have served barriers.<sup>2</sup> While Barcelona's public transport is popular, other European cities have seen a rise in ridesharing due to its convenience.<sup>3</sup>



## Uber in Barcelona

Barcelona, with its bustling urban environment and steady stream of international tourists, offers a promising market for ridesharing platforms like Uber. The city's push towards sustainable and alternative transportation, coupled with occasional overloads on its public transport system, provides Uber an avenue to present itself as a timely and eco-friendly choice. After restrictions stating that 1/30th of the number of taxi vehicles would be permitted to drive for Uber were overruled by the EU Government earlier this year, incentivizing drivers has become more important now than ever before.<sup>4</sup> However, a mandated 15 minute mandated wait time by the Catalan Government has made Uber a less desirable choice.<sup>5</sup> Therefore, services like UberEats must be heavily expanded and promoted to increase market share.

## Opportunities

1. Sustainable transport (UberGreen/Pool)
2. Food/grocery delivery (UberEats)
3. Tourism industry
4. Increased number of eligible drivers



## Threats

1. Legal challenges
2. Well-established public transit system
3. Taxi service
4. Traffic and congestion



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3. Virtual Global Hackathon, Data Analysis Case, <https://drive.google.com/file/d/19z7PvWyOuvOUnwyA2MOsagwCIQoZhWi/view?usp=sharing>

4. Landauro, Inti. “Top EU Court Rejects Barcelona’s Ride-Hailing Restrictions.” Reuters, 8 June 2023. www.reuters.com, <https://www.reuters.com/business/autos-transportation/top-eu-court-rejects-barcelonas-ride-hailing-restrictions-2023-06-08/>.

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# Pre-Processing

## Air Quality Dataset

1. Identified missing values.
2. Missing values in NO<sub>2</sub>, O<sub>3</sub>, O<sub>2</sub> backfilled.
3. Non-missing rows used as training and test sets to fill the missing rows.

## Bus Stops Dataset

1. Longitude/latitude used in GeoPy to extract names of stop neighborhoods.
2. Coordinates in GeoPy were used to fill missing district name values.

# Data Analysis

1. Selected features needed to answer set questions & found external data to supplement analysis
2. Summarized and pivoted values for each variable by Neighborhood Name.
3. Generated dozens of visualizations for exploratory data analysis
4. PCA Analysis performed on neighborhood data (95% of variability retained)
5. Elbow method used to identify ideal number of clusters
6. Performed K-means clustering using ideal number of clusters (4)
7. Generated graphs and insights regarding each cluster to help with business recommendations

# Price Prediction (Uber Dispatcher)

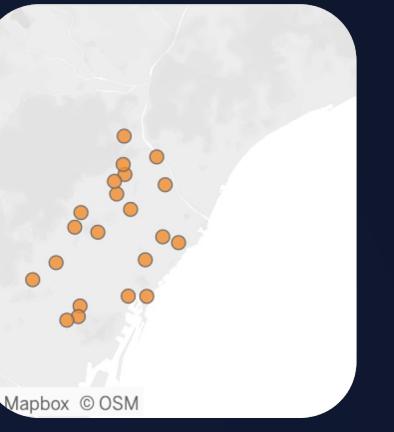
1. Divided the variables into positive factors (increase price) & negative factors (decrease price).
2. Used elbow clustering method to identify ideal number of clusters/categories.
3. Decided on 5 categories, best cluster quality without unnecessary increase in complexity.
4. Scaled data using Minmax method for simplicity (0-100).
5. Defined custom membership functions for each feature individually, created custom ranges based on data distribution and to account for outliers.
6. Created custom rule set to accommodate for custom membership functions.
7. Applied Dynamic Fuzzy Inference System to calculate ideal percent change in fare based on specified factors for positive & negative change individually.
8. Subtracted negative % change from positive % change to calculate net change.

# Questions

1. What would be the most important factors to consider for price adjustment?
2. How can we target specific neighborhoods in our ESG initiatives?
3. How can we maximize our market share using products that would be unaffected by the 15 minute wait time rule?
4. How can we incentivize drivers to drive for Uber? Which neighborhoods would be most affective to target in this campaign?
5. What companies would be most effective to partner with?

# Neighborhood Clusters

## Cluster Dashboard

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
General Information	 603k residents <b>13</b> neighborhoods Average 46,000 people/neighborhood in 2017. Population fluctuates each year, with a 100-person change between years.	 300k residents <b>21</b> neighborhoods Average 14,000 people/neighborhood in 2017. Linear population growth by more than 100 people/year.	 635k residents <b>23</b> neighborhoods Average 26,000 people/neighborhood in 2017. Linear population growth by more than 200 people/year.	 82k residents <b>16</b> neighborhoods Average 5,400 people/neighborhood in 2017. Linear population growth by more than 50 people/year.
Transportation	Balance between day and night buses. Over 30% of buses are nocturnal. Moderate distance (0.6-1km) between night buses. Long distance between metro stations.	Short distance between night bus stops. Less than 30% of buses are nocturnal. Far from other types of transportation. Higher number of transportation options in general.	High number of buses. High imbalance between day and night buses. Longer distance between day bus stops. Far from certain types of transportation.	Fewer buses. Less than 30% of buses are nocturnal. Short distance between day/night bus stops. Few metro stations.
Amenities	Greater number of hotels (3+ stars) Closer to the financial area. Almost surrounding the central area.	Second place in number of hotels. 5 km from the central area. Closer to the residential area.	Higher number of 5-star hotels. Farther from the financial area.	3 hotels (3-5 stars) Farther from the central area.
AQ	NO AIR QUALITY DATA.	Moderate air quality.	Air quality slightly worse than Cluster 2.	Reported worst air quality in the area.
Accidents	Low number of accidents in the area.	High number of accidents in the area.	High number of accidents in the area.	Low number of accidents in the area.

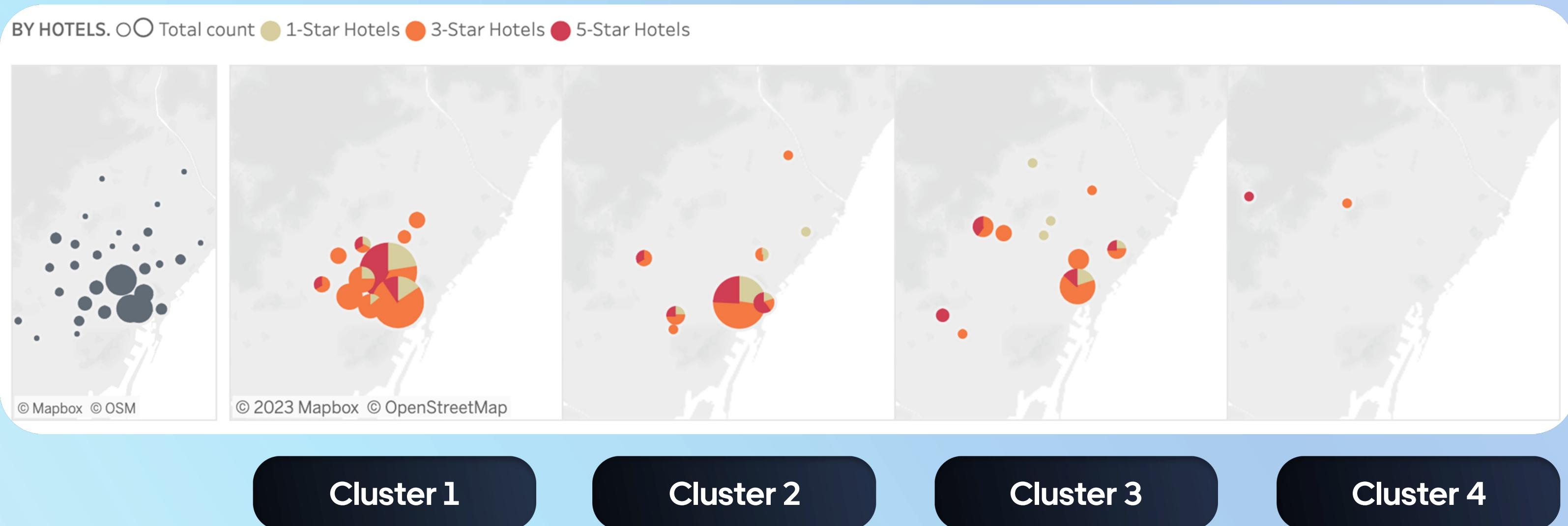


Figure 1: Hotels by Cluster



Figure 2: Neighborhoods with No Metro Stations

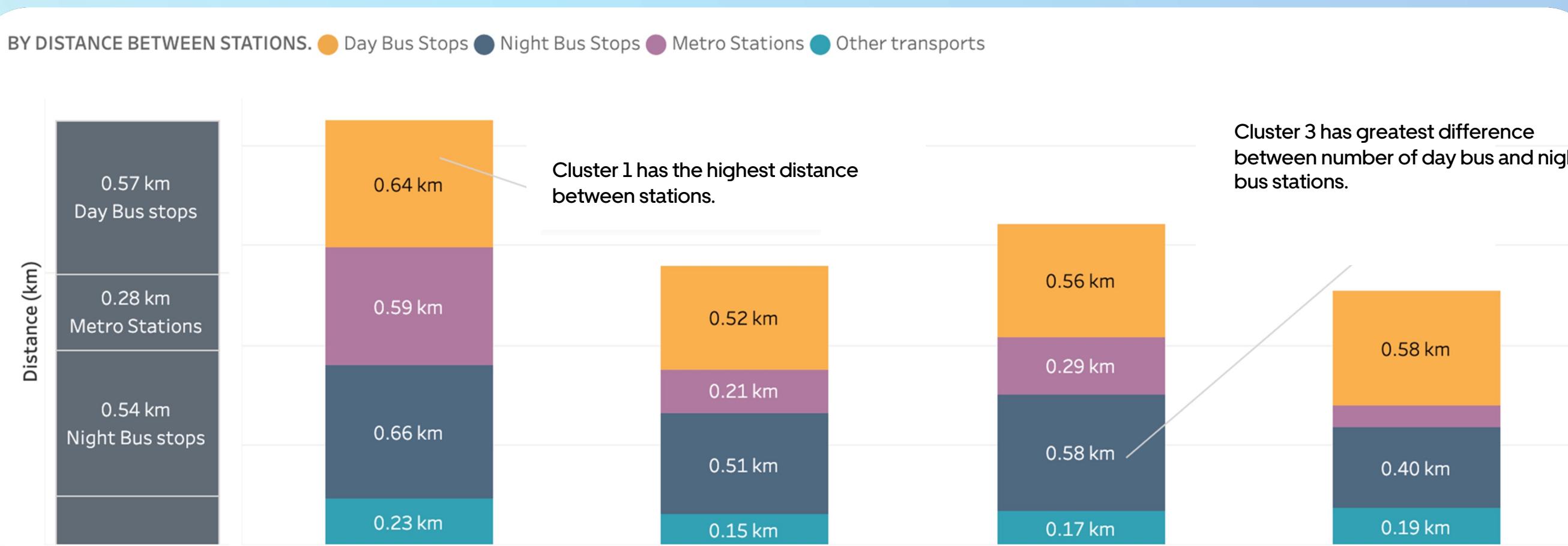


Figure 3: Distances Between Stations

## Summary

- Cluster 4 has the lowest available transportation. While there is bus accessibility, it becomes difficult at night. Cluster 4 is also furthest from the financial and central areas.
- Cluster 1 includes the central areas and has the highest number of hotels.
- Cluster 3 has most complex transportation and highest concentration of luxury hotels.
- Options for morning buses are greater, nighttime schedules are more difficult to navigate.

# Uber Dispatcher

## Price Map

### Concept

Dynamic Inference System designed using fuzzy logic, capable of synthesizing and analyzing hundreds of data dimensions. Takes specific inputs for each neighborhood, such as pollution levels and coverage of public transport, and calculates an optimal price adjustment to the base fare; given in percentage values. This will allow for optimal market share growth whilst improving brand image. To increase market share, we must consider many factors: number of immigrants, number of stations, and accident rates—to ensure that the prices are optimized for each neighborhood. This model was created by adding relevant parameters such as number of seniors (neighborhoods with high numbers of seniors will benefit from lower prices) and pollution level (prices will be increased for areas with high pollution to encourage green transport) in a neighborhood. The weight of the input factors were determined through initial data analysis, and the usage of business logic. Using a Fuzzy system to achieve this allows us to consider all factors using human-like reasoning, creating a robust model capable of tolerating a much greater range of conditions compared to using a traditional approach while also removing the need to idealize the data or reduce complexity.



### Results

Percentage changes are currently calculated per neighborhood; however, as the system is integrated into Uber's app and more widely supported, data specific to the exact location of the user may also be sourced and provided to the model from satellites, environment stations, and local authorities to calculate the ideal percentage change to their base fare.

Table 1: Positive Factors

Factor	Importance
Accident rates in neighborhood	0.5
Pollution rates in neighborhood	0.5

Table 2: Negative Factors

Factor	Importance
Number of public transit stations in neighborhood	1.0
Number of immigrants in the neighborhood	0.8
Number of senior citizens	1.0

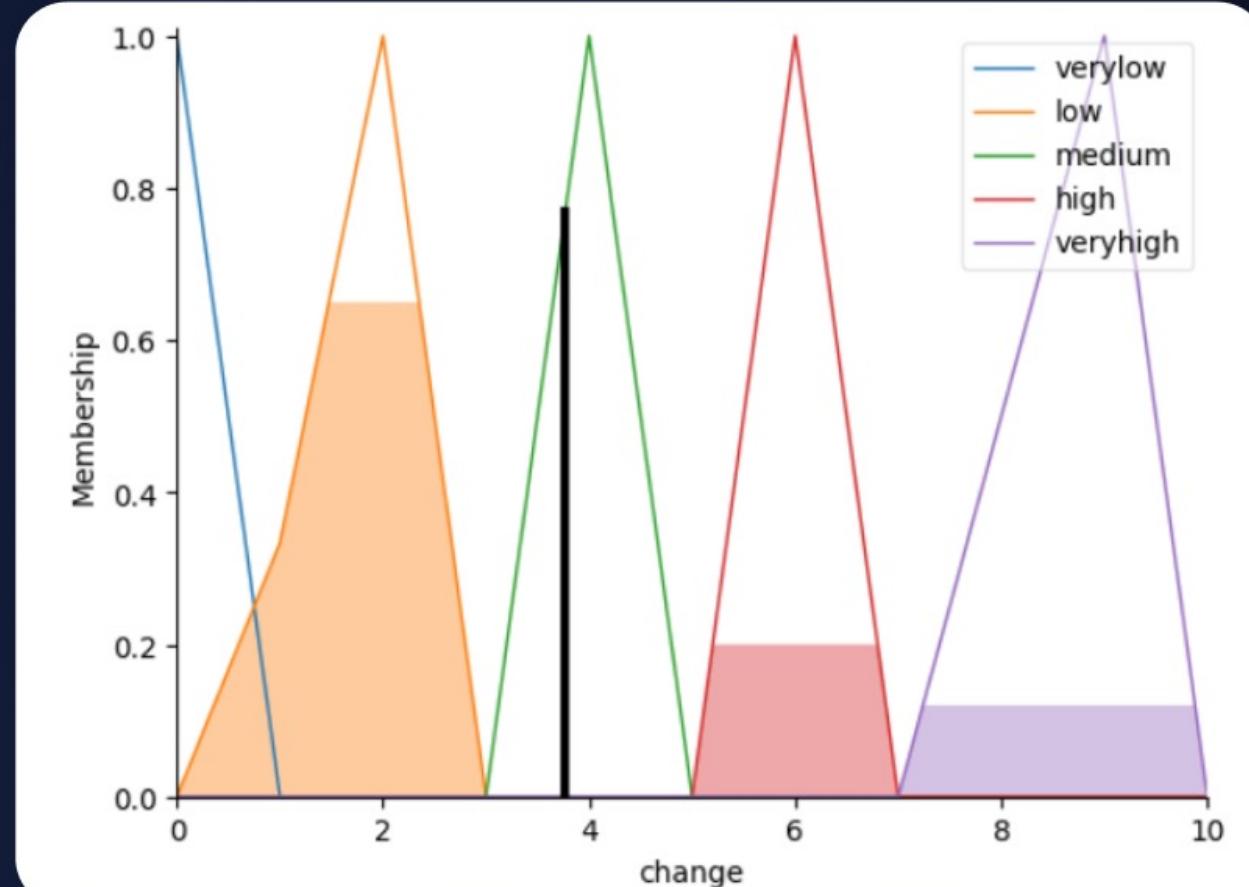


Figure 3: Percent Change Calculation Sample

Rule Surface Plot

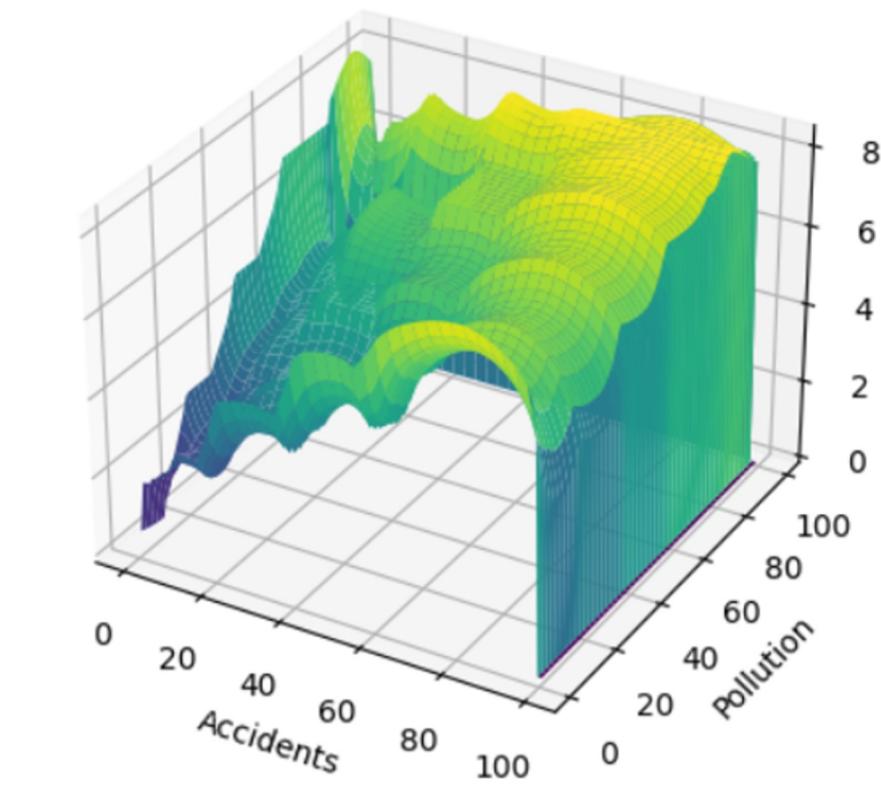


Figure 4: Rule Surface Plot Sample

# Marketing Strategy and ESG

## Partnerships

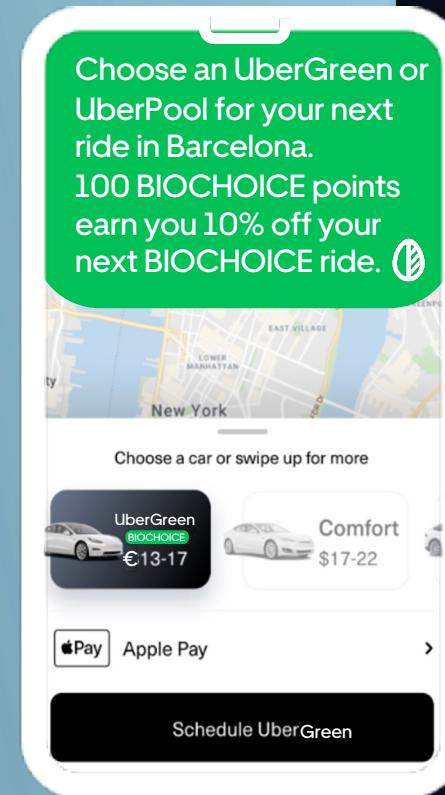
- Establish exclusivity contracts with chain restaurants in Cluster 1 to increase UberEats orders from employees in the central/financial areas.
- Large chain restaurants in Barcelona include Bocatta, a mediterranean sandwich shop; Telepizza, a pizza ordering service.<sup>6</sup>
- Employees can purchase food for delivery to their workplace during lunches.
- Form partnerships with hotel chains in Barcelona with greatest market share to have an Uber – designated waiting area, specifically in Cluster 1 with the greatest density of mid to upper-range hotels (Figure 3).
- Prospective Partners: Catalonia Hotels and Resorts, Expo Hotel Group
- Mass market, mid-range hotels that make up the largest part of Barcelona's hotel market: 8.1% and 4.9% respectively.<sup>7</sup>

## Driver Incentivization

- Incentivize drivers with green vehicles by offering rebates for VMT permits.
- Incentivize drivers to use the UberPool function by advertising the increased profits.
- With multiple riders, the total combined driver earnings will be higher.
- UberPool rides will result in greater availability for rides.
- UberPool should be promoted in neighbourhoods without metro stations to enable greater mobility for users (Figure 2).
- Commuting drivers should be incentivized to use the Driver Destinations feature of the Uber app when returning home from work because nighttime bus schedules are more difficult to navigate (Figure 3).

## BIOCHOICE Rewards

- For every 100 km traveled with UberGreen/UberPool, riders will receive a 10% off credit for their next BIOCHOICE ride (1km traveled = 1 point).
- Users will have to select their city in the app [Barcelona]. The BIOCHOICE credit can be used on rides within the chosen city. Tourists will be prompted to change their city of choice inside the app when their location updates with a pop up message.
- Targeted social media advertising will promote the BIOCHOICE rewards to residents of Clusters 2, 3, and 4 with reported worst air quality.
- Given that Barcelona spans ~15KM from corner to corner, we can estimate that the maximum loss is 1.5% with the discount.
  - However, increased customer loyalty and demand for sustainable rides will offset the losses incurred.



1. Partnership Outreach
2. Implement BIOCHOICE interface changes and loyalty rewards.
3. VMT Permit incentivization for green vehicle drivers.
4. Targeted UberPool promotional campaigns.
5. Targeted Driver Destination promotional campaigns.

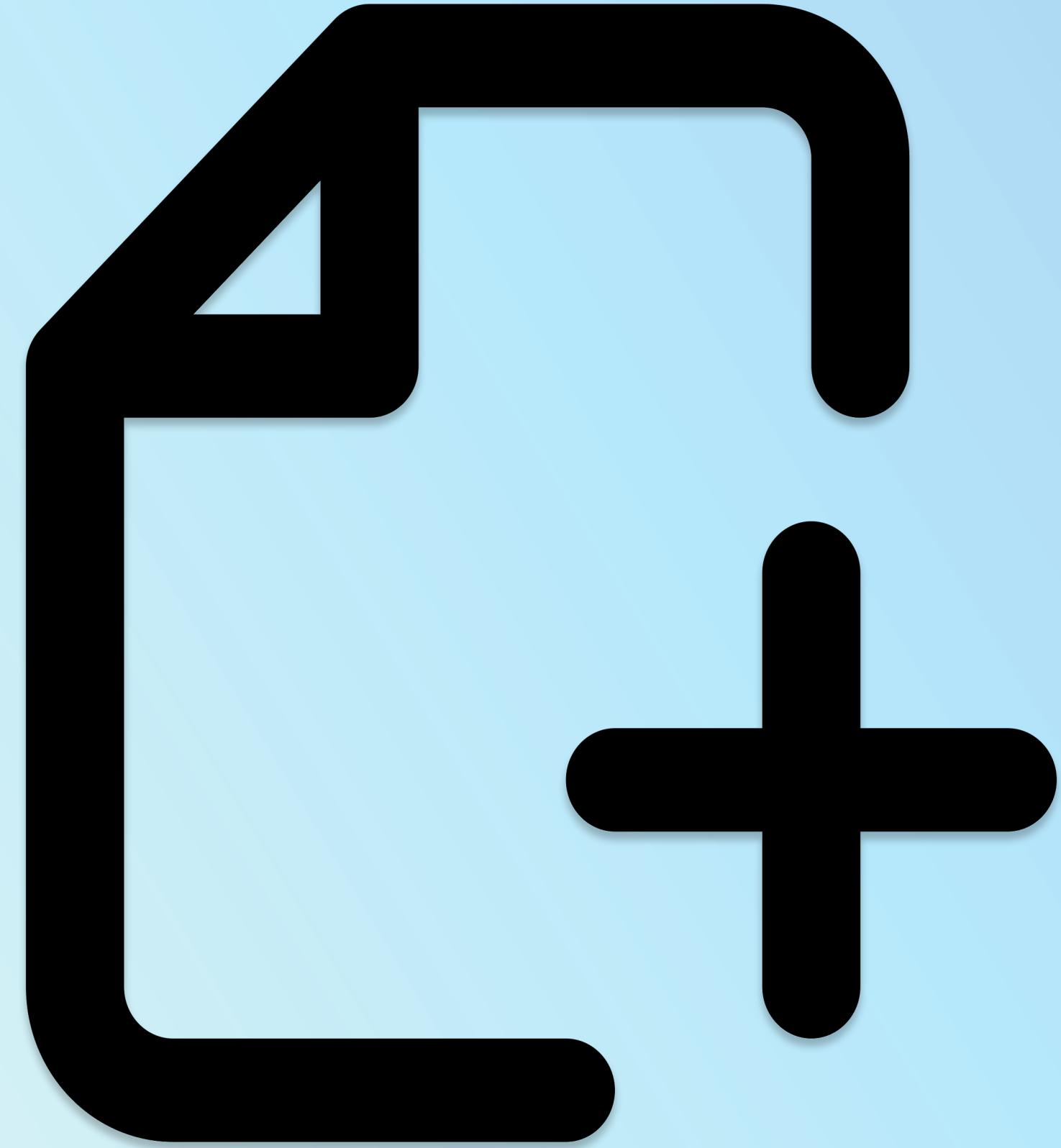
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2. "Hotel Chain Overview for Barcelona, Spain." Hotel Chain Overview for Barcelona, Spain - Hotel Chains, [www.hotelchains.com/en/spain/barcelona/](http://www.hotelchains.com/en/spain/barcelona/). Accessed 20 Sept. 2023.

# Thank you!

Uber

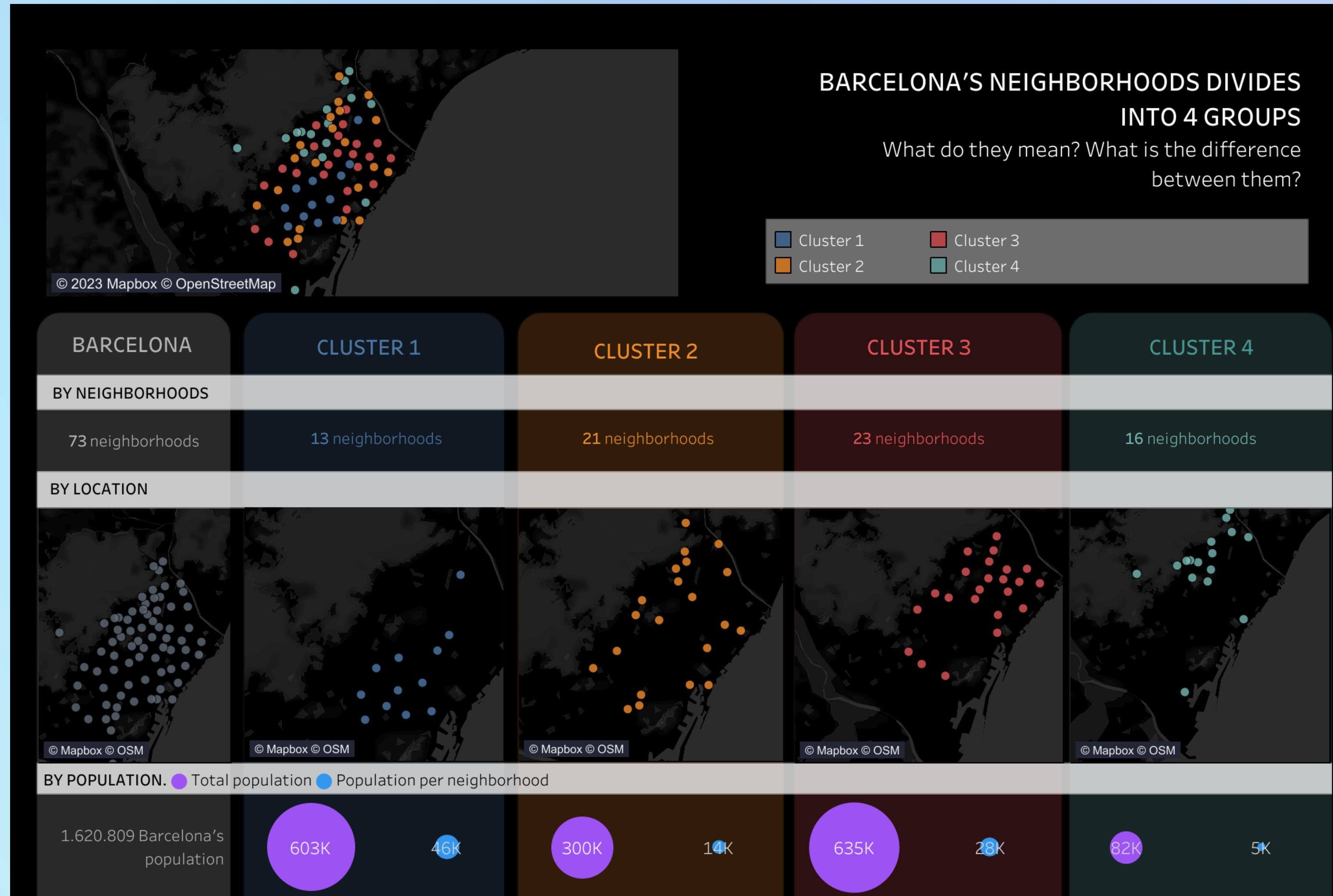




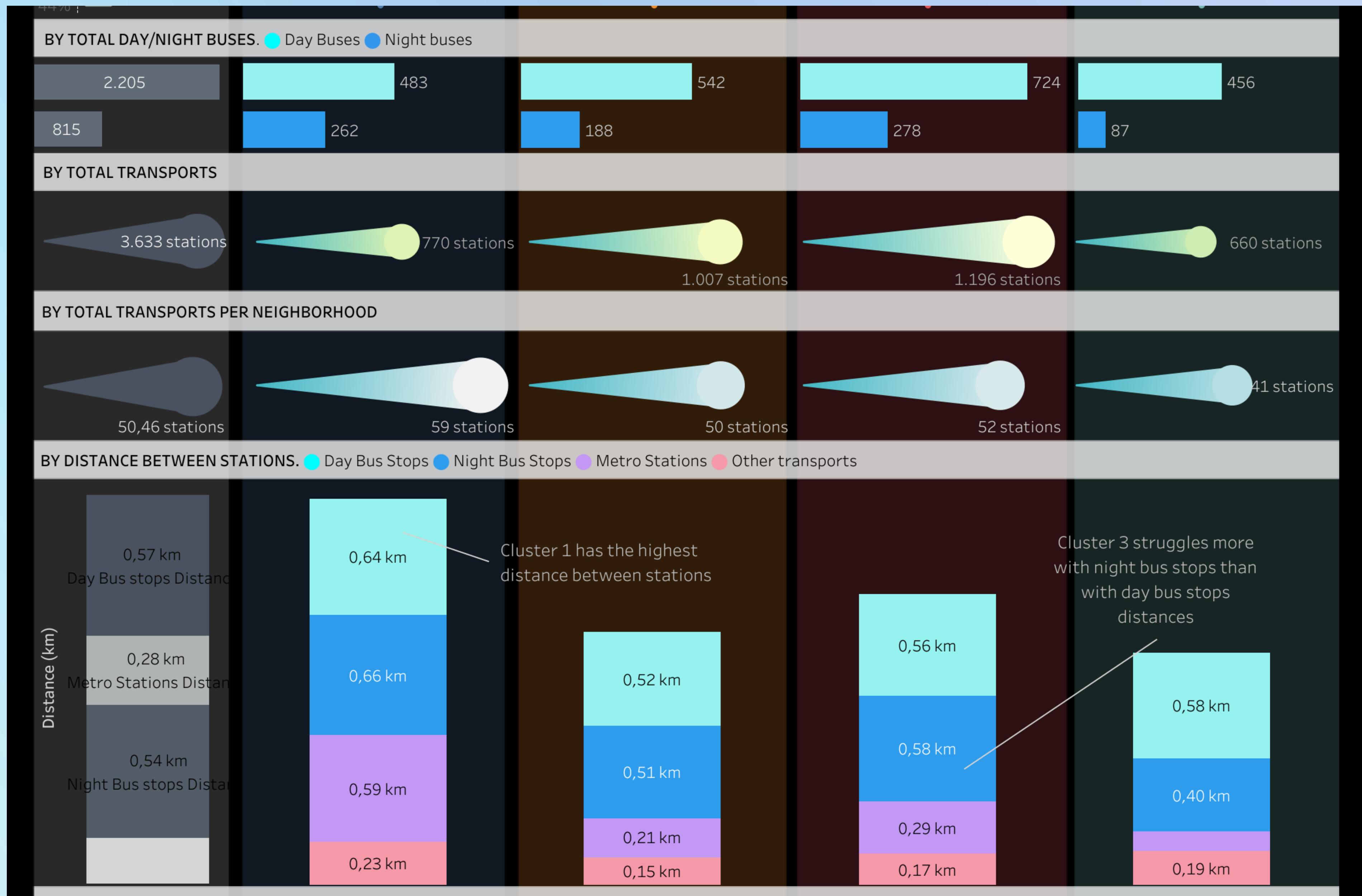
# Appendix

Uber

# Cluster Dashboard









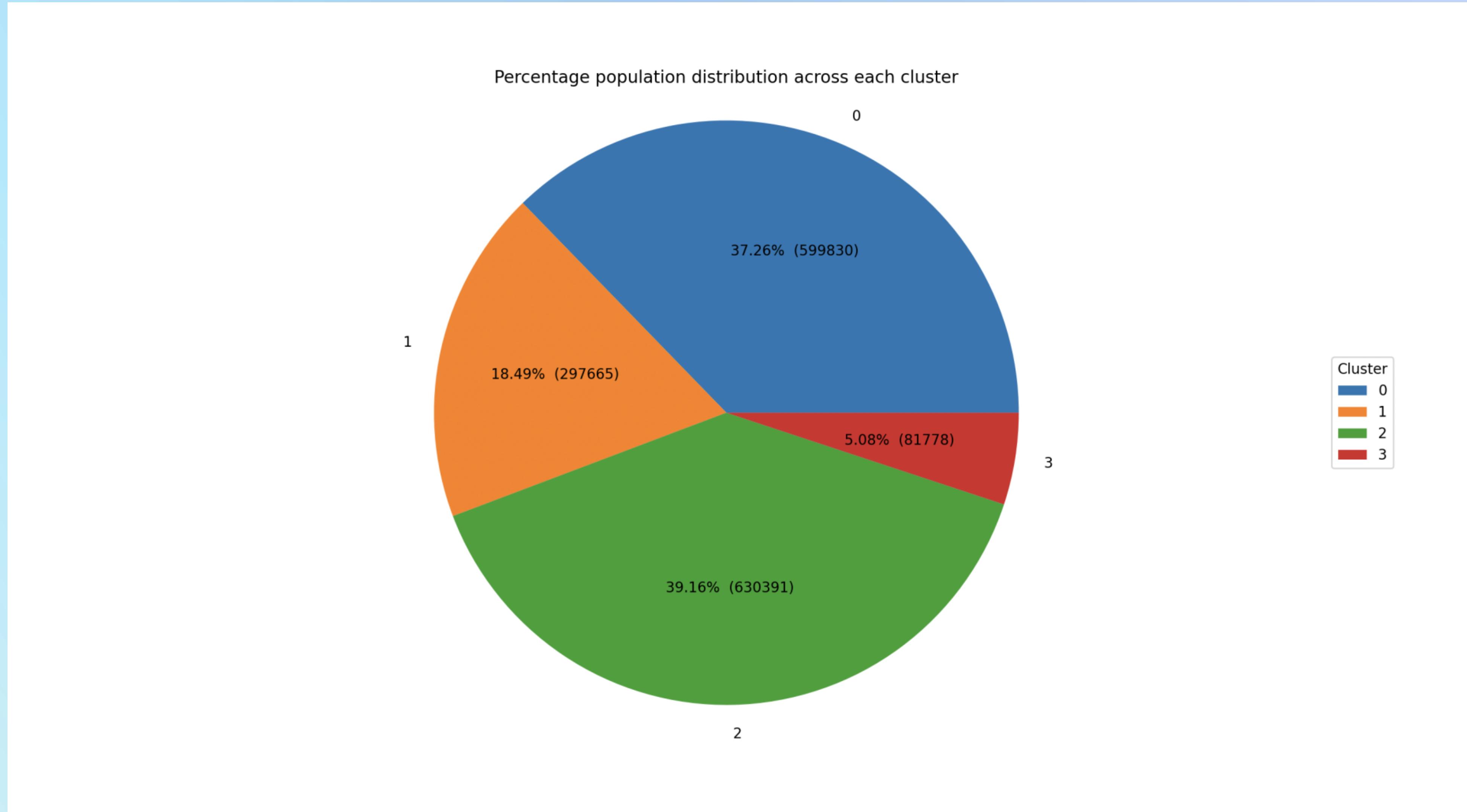


Figure 7: Percentage Population Distribution Across Each Cluster



Figure 8: Number of Transport Stations Per Neighborhood, Organized by Cluster

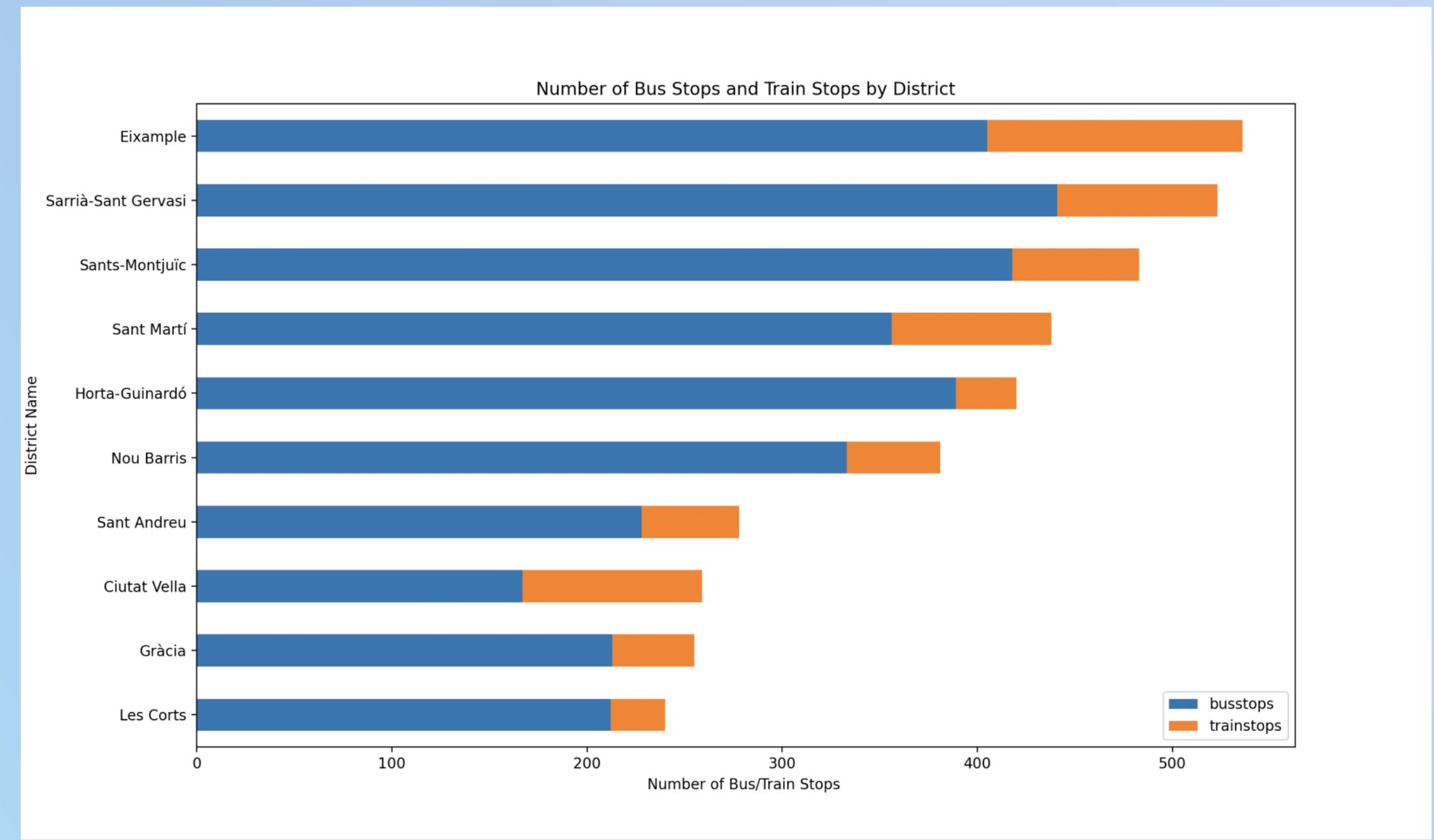


Figure 9: Number of Bus/Train Stops by District