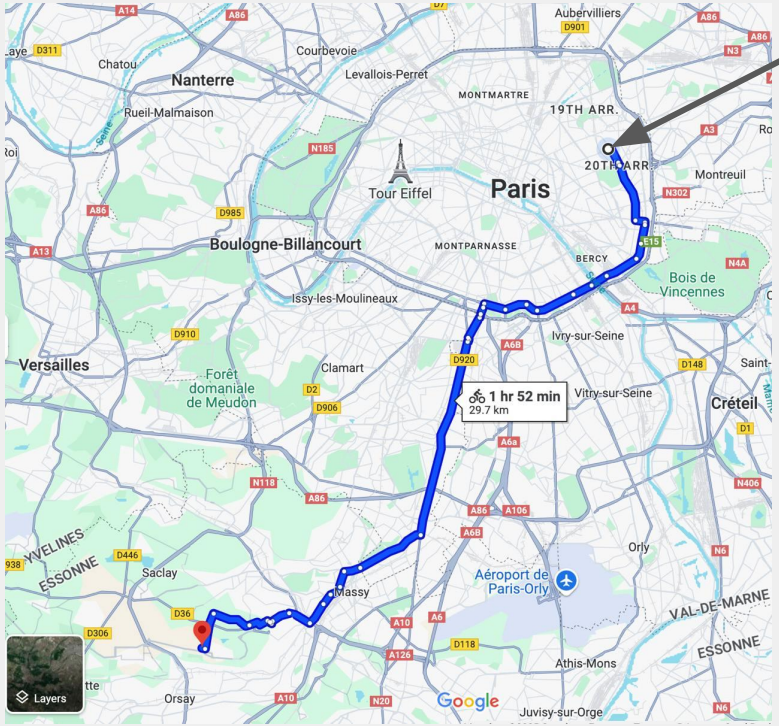
Weather impact on bike usage in Paris

By Mark Daychman

Motivation



Velib? More like Nolib! :(

Bike availability today at 8am

Data Sources

1. Vélib’ Métropole Open Data - GBFS Service
    a. Timestamp
    b. Station usage
    c. Station location

10M data points

2. Open-Meteo: Free Weather API for Historical and Forecast Data
    a. Real & apparent temperature
    b. Precipitation
    c. Wind speed
    d. Cloud coverage
    e. isDay

3.2K data points

Cleaning and Processing

1. Enrich bike records with temporally closest weather record

2. Reverse geocode with Google Maps
   e.g. 117 Rue de Menilmontant -> 75020 -> 20th

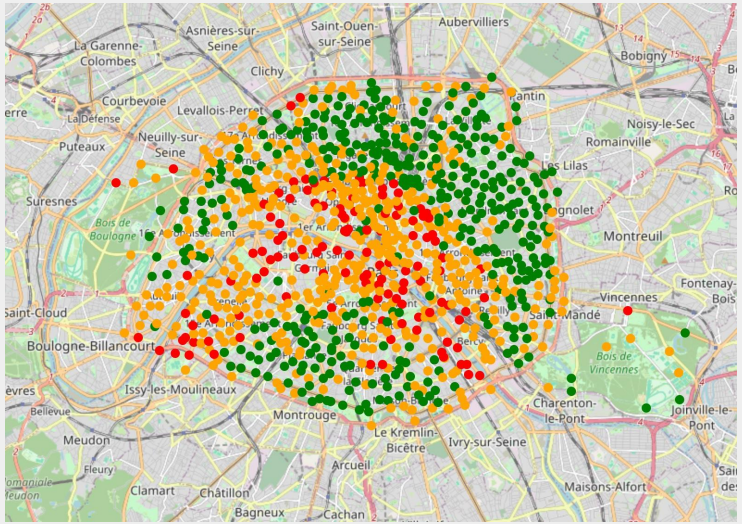
3. Calculate max capacity of each arrondissement

4. Group data by arrondissement and time

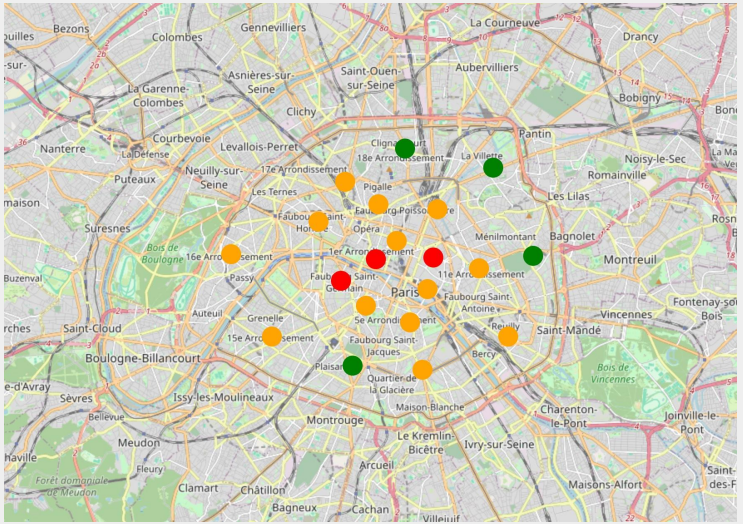
5. Calculate the usage

Cleaning and Processing

70%-100% empty

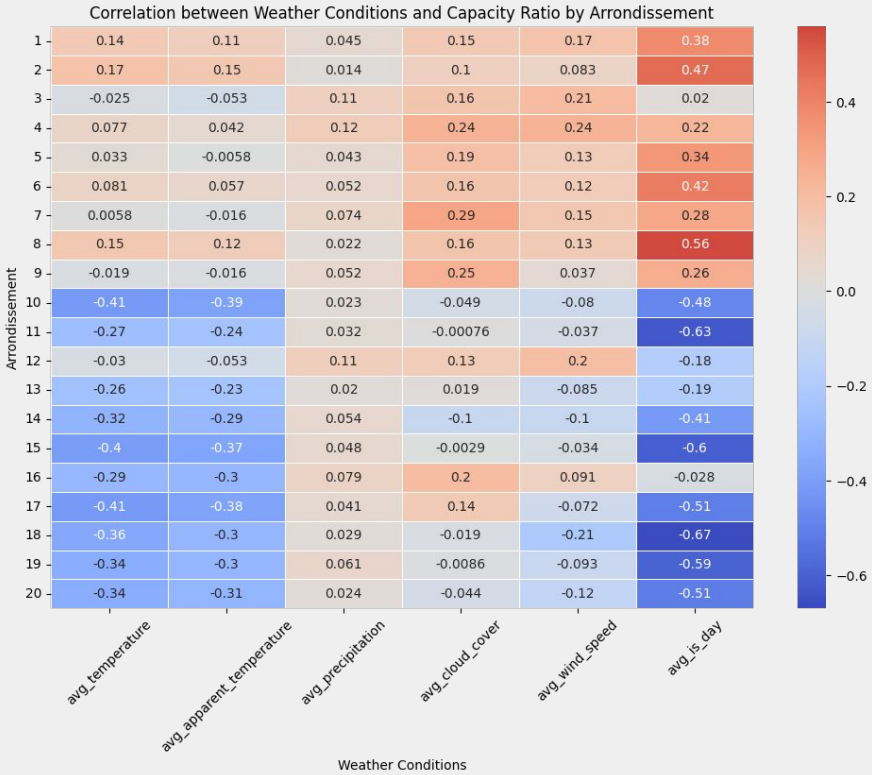


20-70% empty



0-20% empty

Results



Arrondissement	Total Capacity
15	3361
12	2630
13	2298
11	2252
16	2152
17	2131
20	1918
19	1860
18	1856
14	1849
8	1617
10	1573
5	1204
7	1135
9	1103
6	1003
2	742
1	712
4	706
3	390

Table 1: The total capacity of all Velib stations per arrondissement

Conclusions

- Outer arrondissements commute to the center during the day and back in the evening.
- People take **significantly fewer** bikes when it is cold.
- People take **fewer** bikes when it is windy or cloudy in the center.
- People take **slightly fewer** bikes when it is raining or snowing.