

BÉATRICE MONVOISIN 13.06.2025

by NGO Social Equality in the USA

Agenda

1. Background
2. Data
3. Social indicators W 3 & 8
4. EDA
5. KPI
6. Mapping
7. Using Bikeshare W 3 & 8
8. ML Regression
9. Recommendations

1. Background

Goals

- To address traffic congestion.
- To promote sustainable transportation
- To encourage physical activity.
- To enhance tourism.
- To improve accessibility.

Context

- The most economical mode of transportation: 95\$ per year.
- CBS for All: state assistance program for qualified individuals: 5\$ per year.
- Capital Bikeshare offers 860 bike stations and over 6,000 electric and classic bicycles.

2. Data

Capital Bikeshare Full Data

- from 01.01.2021 to 31.12.2023
- 13 features: ride_id, rideable_type, started_at, ended_at, start_station_name, start_station_id, end_station_name, end_station_id, start_lat, start_lng, end_lat, end_lng, member_casual
- Missing values dropped

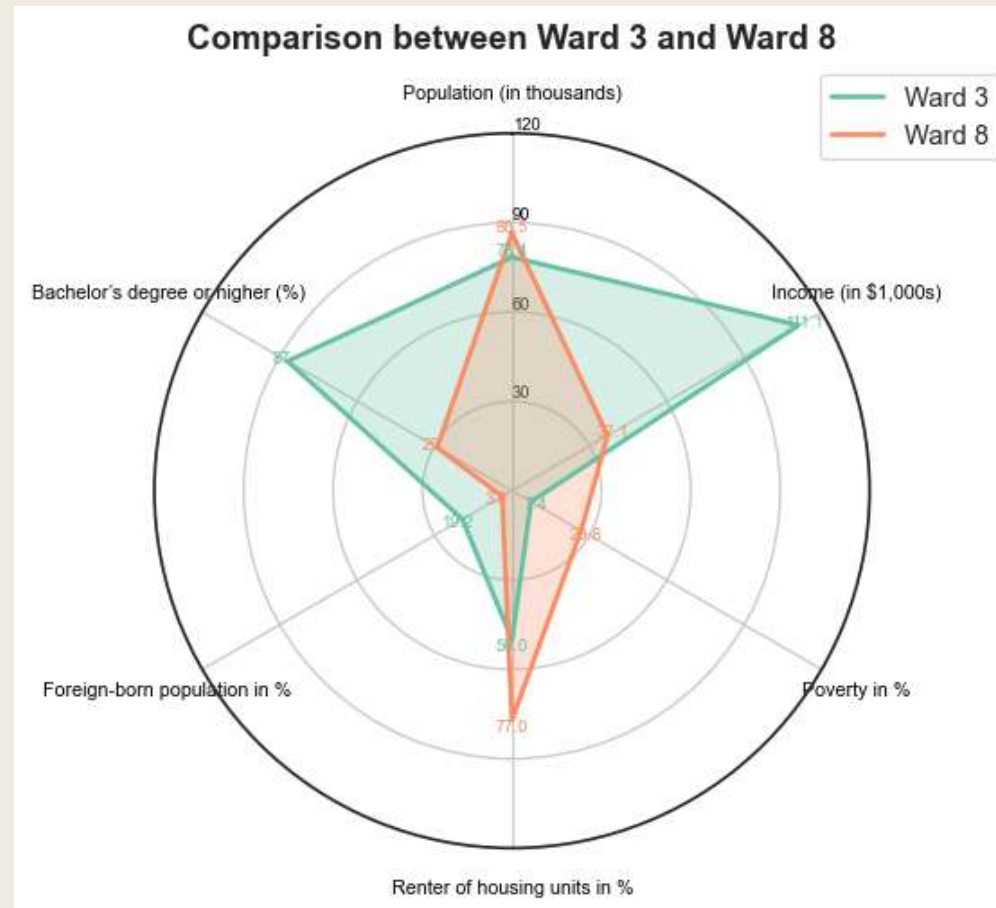
Open Data DC: Wards from 2022

- 2 features: Ward, geometry polygon

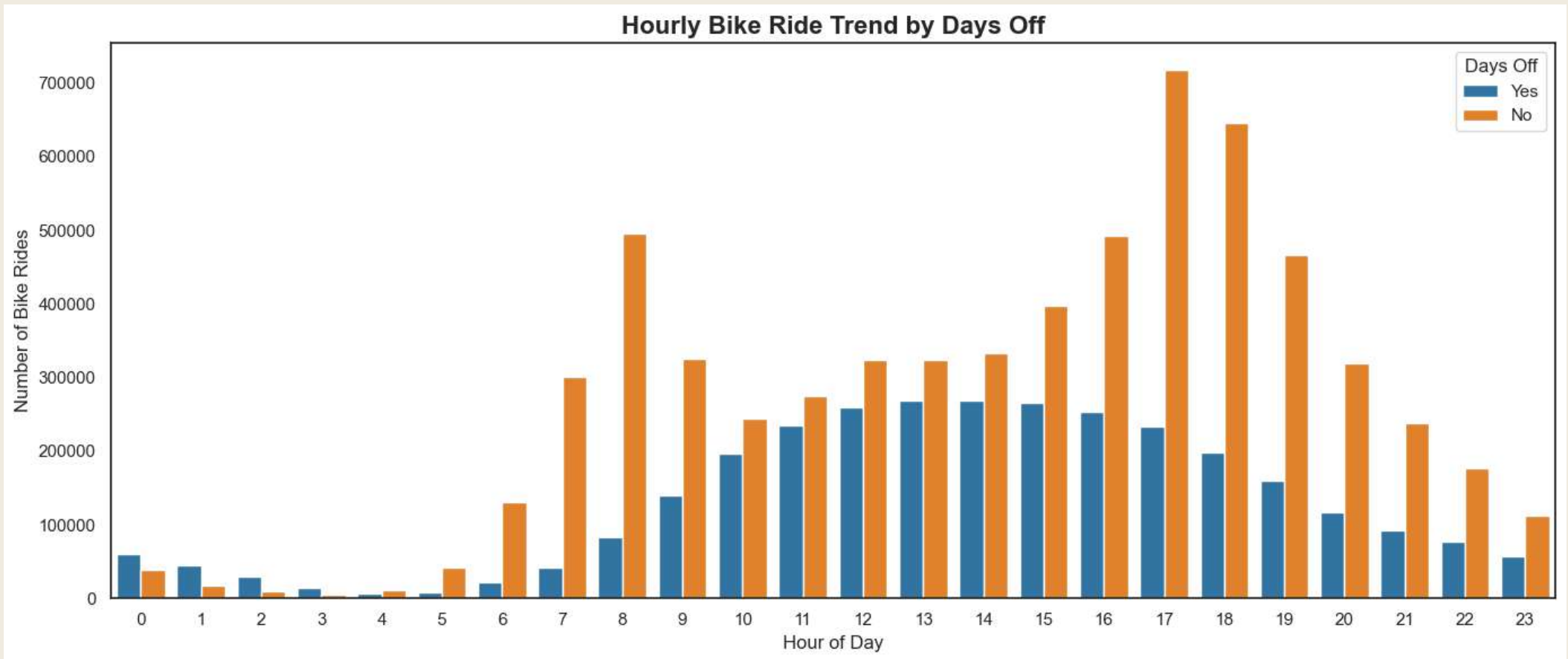
Census Reporter 2023

- 10 features: Ward, Population, Median Age, Female in %, Income in \$, Poverty in %, Transportation to work in min., Renter of housing units in %, Bachelor's degree or higher, Foreign-born population in %

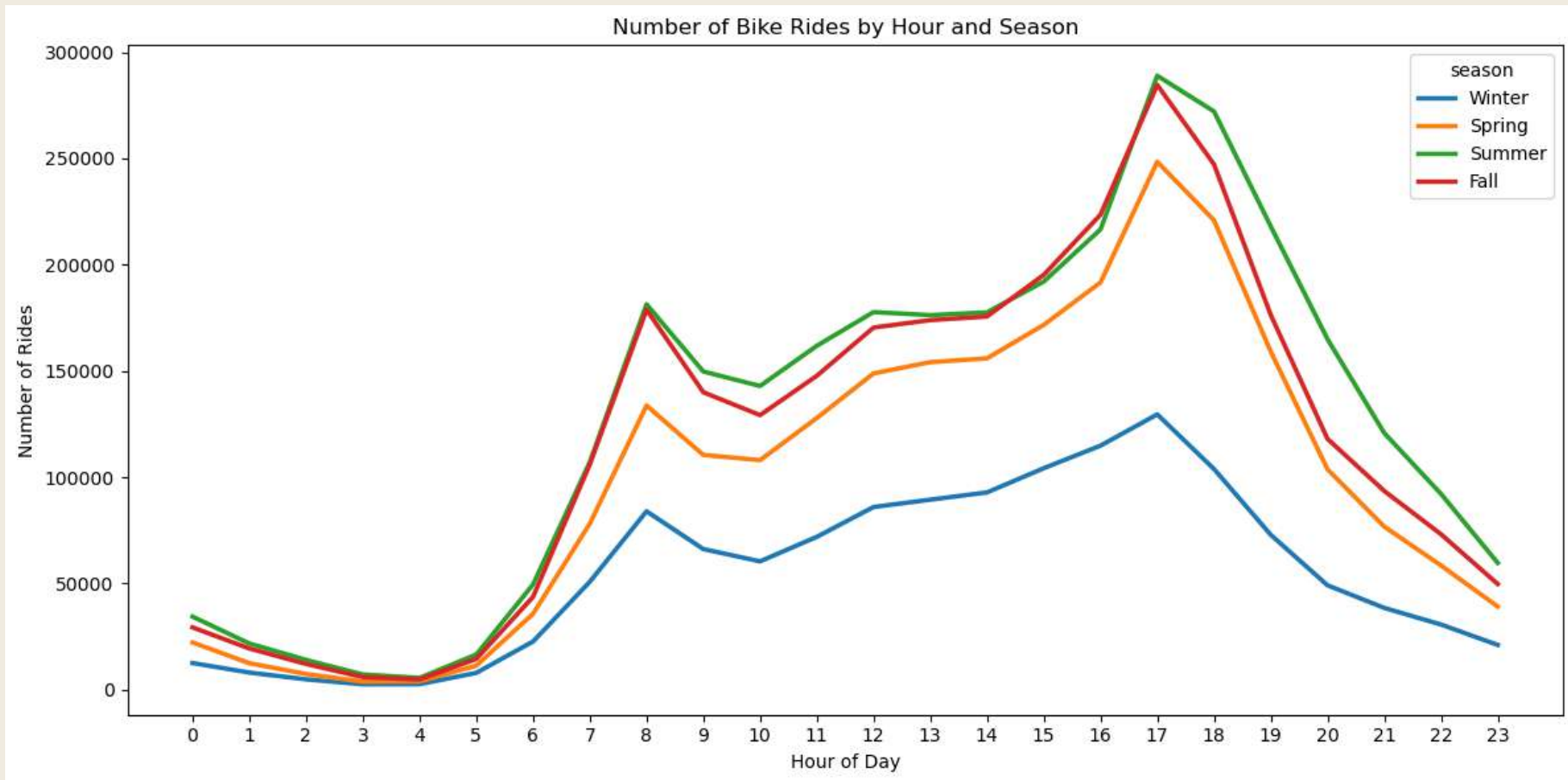
3. Social differences between Ward 3 & Ward 8



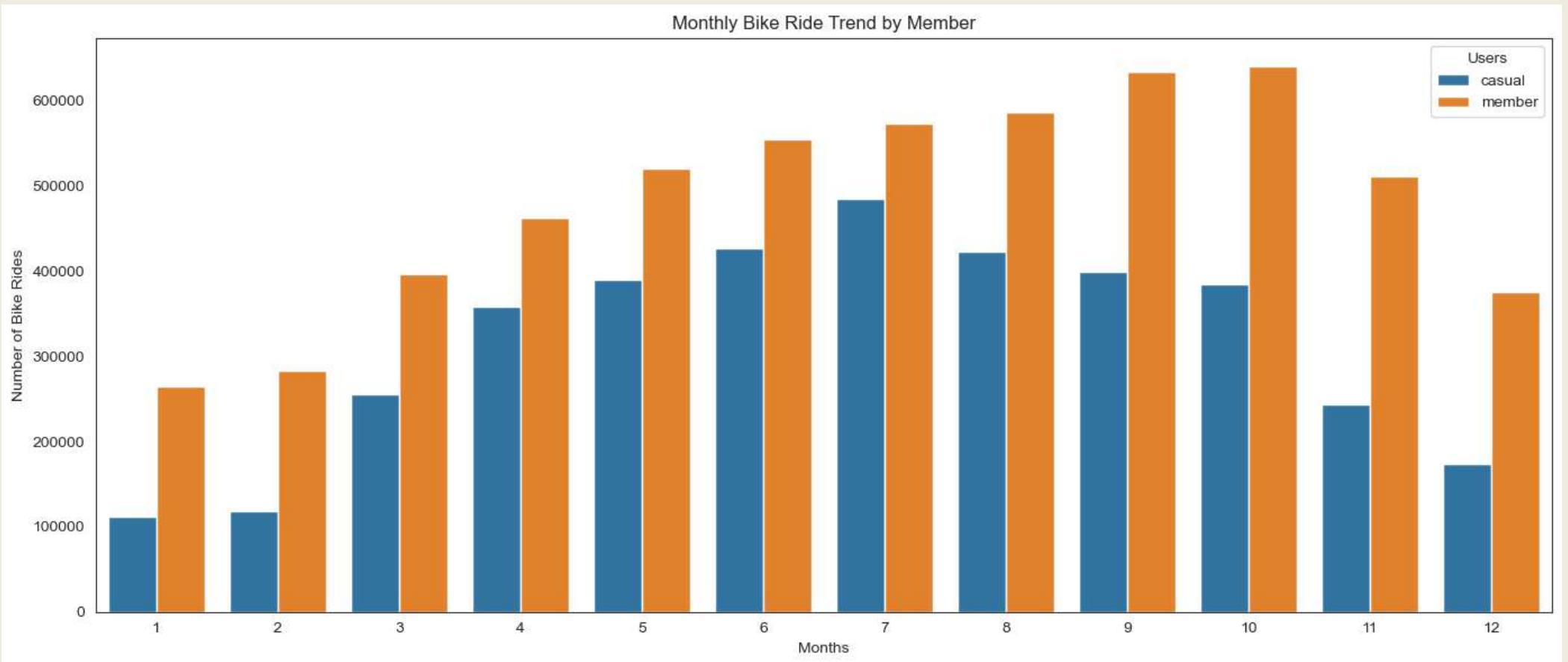
4. EDA: Solve peak-time traffic congestion problems



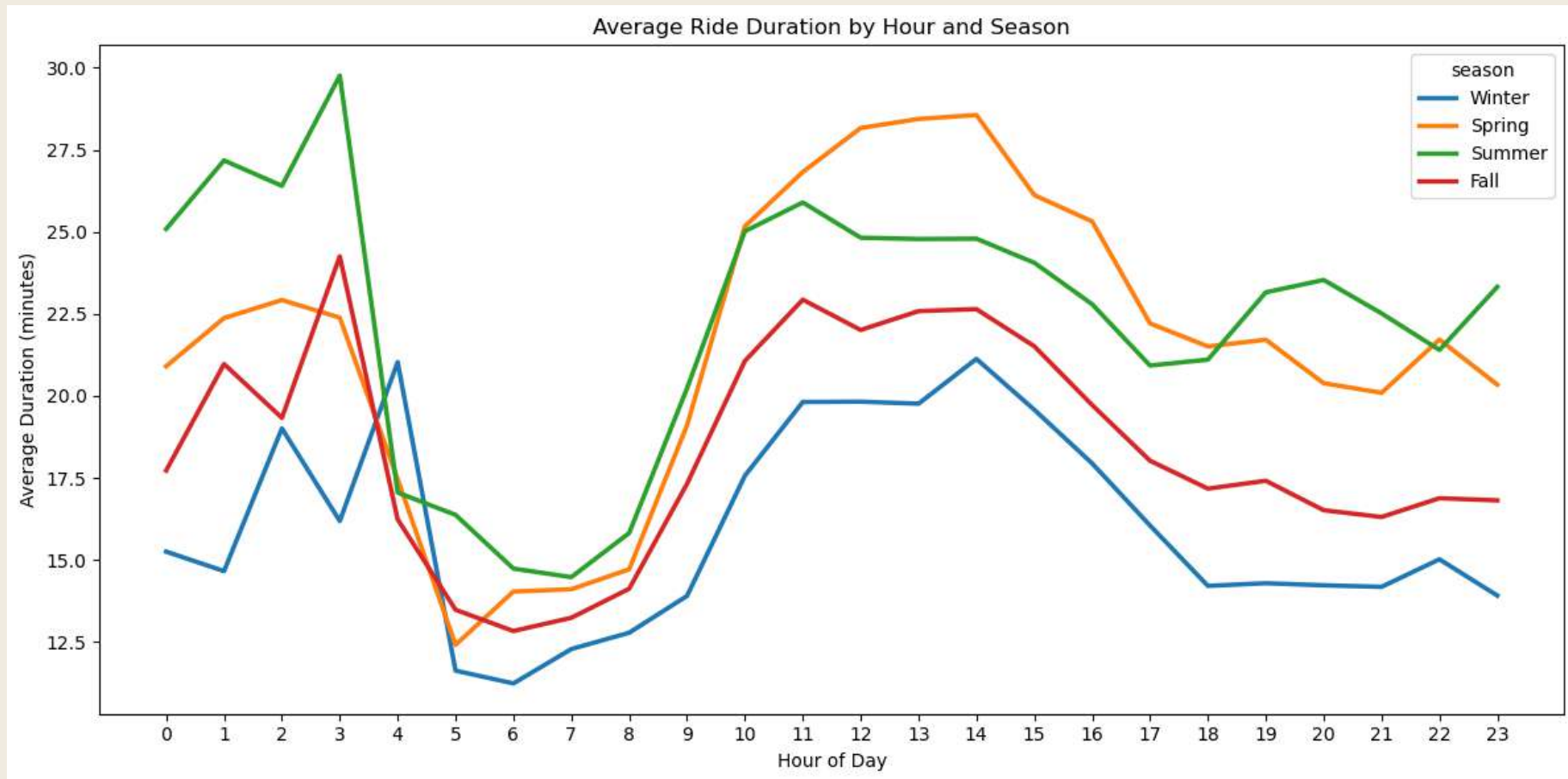
4. EDA: Season-dependent use



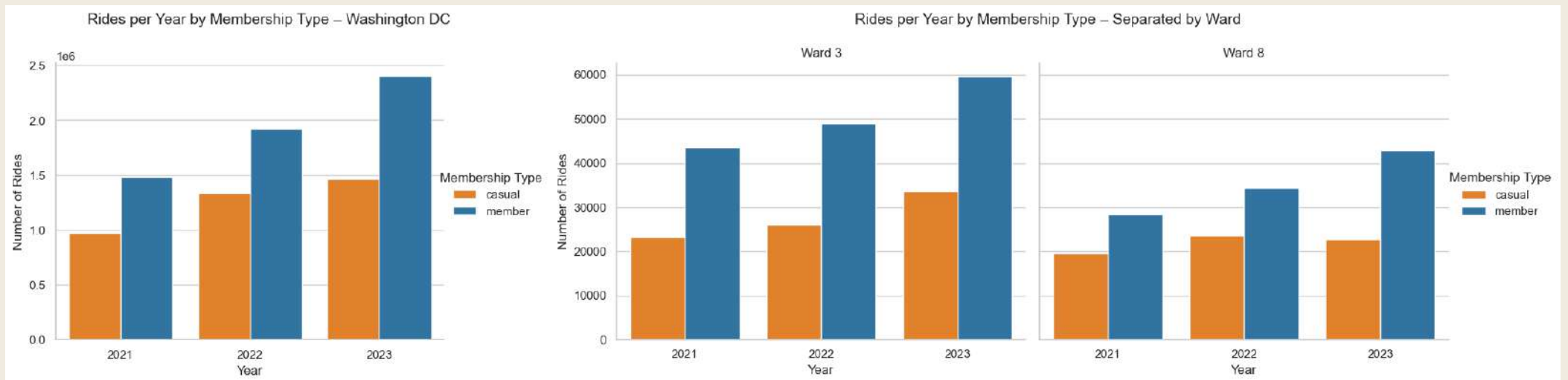
4. EDA: Members also cycle in the cold.



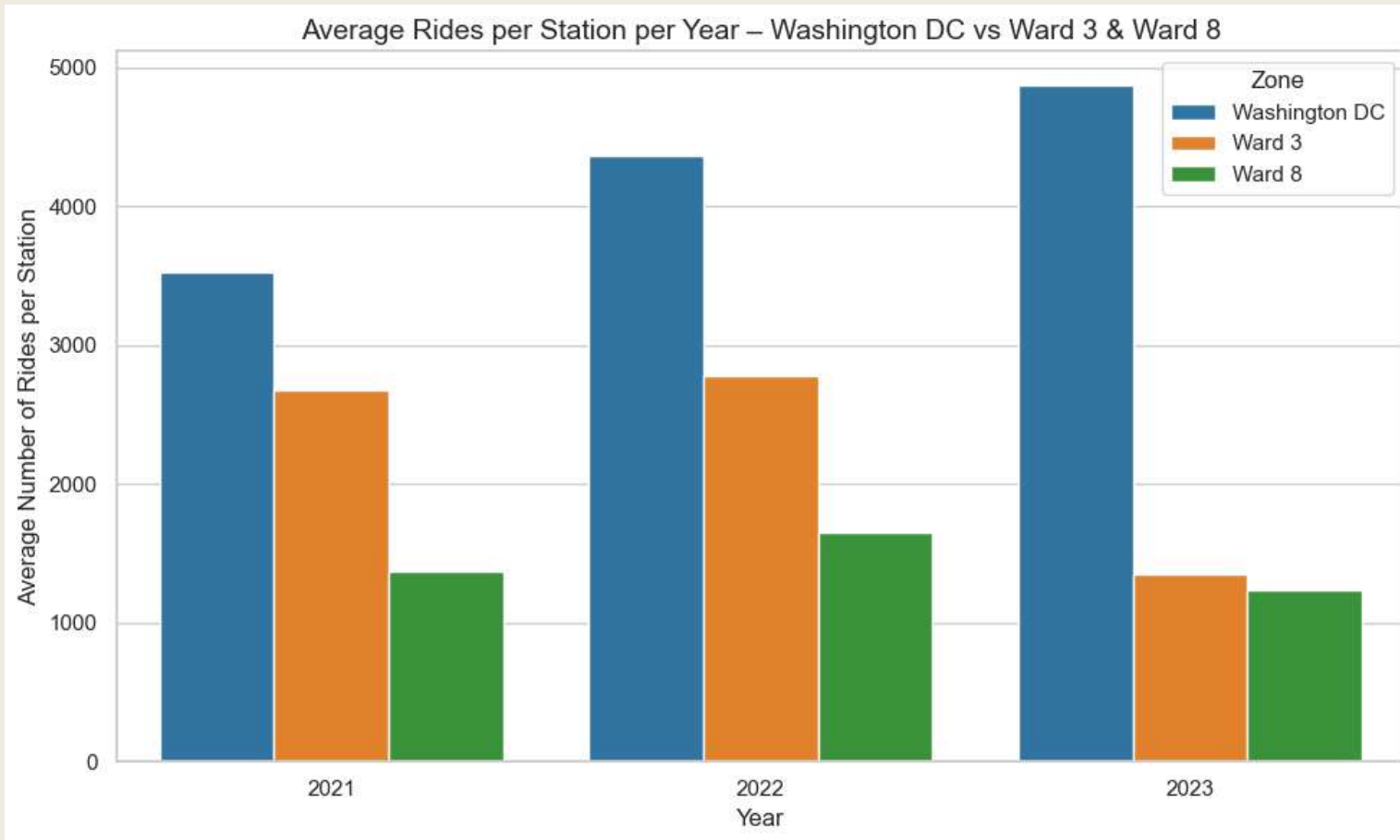
4. EDA: How to get around without a metro?



5. KPI: More and more users

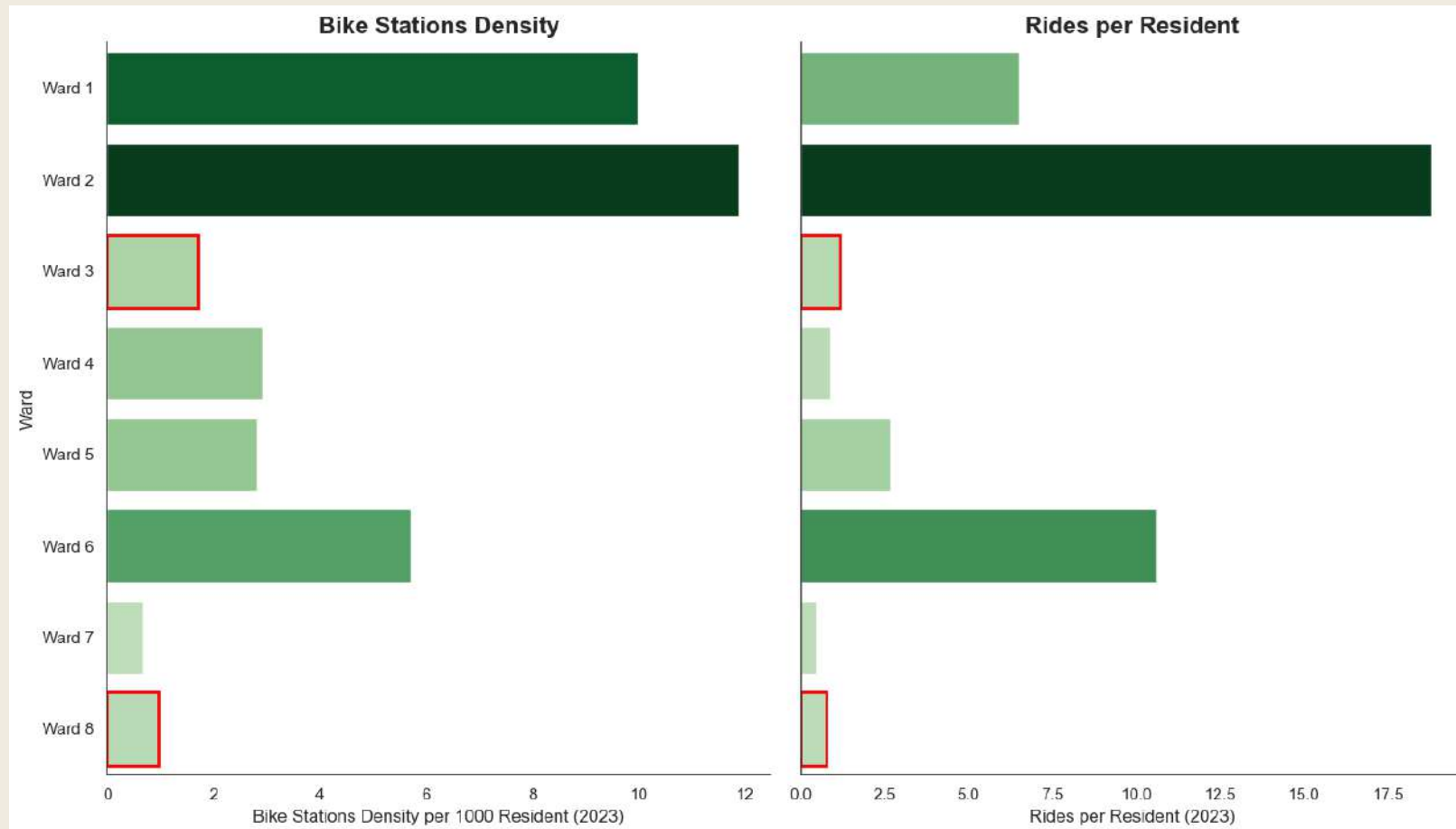


5. KPI: How intensively are the bike stations used?

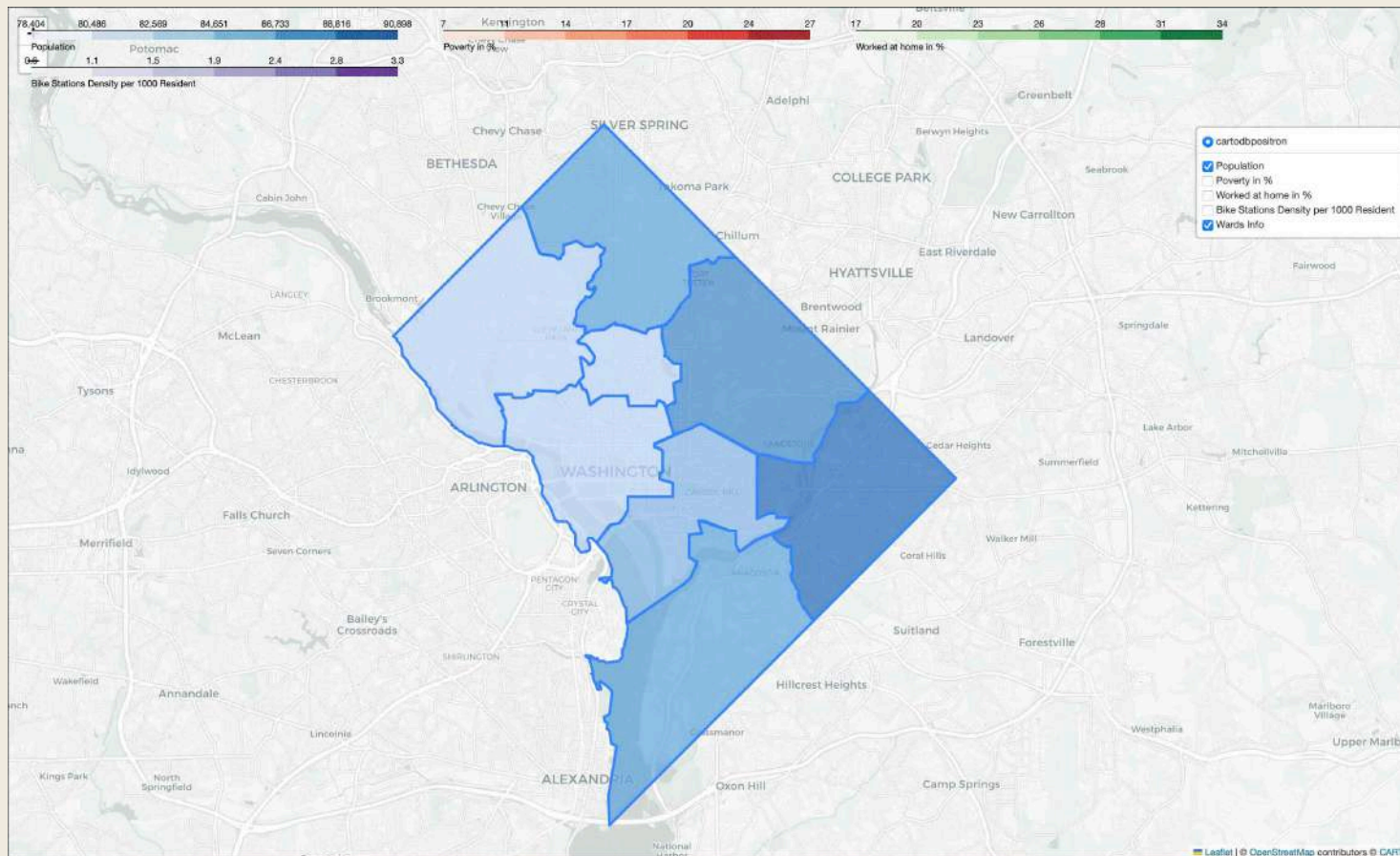


Stations	DC	Ward 3	Ward 8
2021	697	25	35
2022	745	27	35
2023	793	69	53

5. KPI: Does the accessibility of bike stations influence their use?



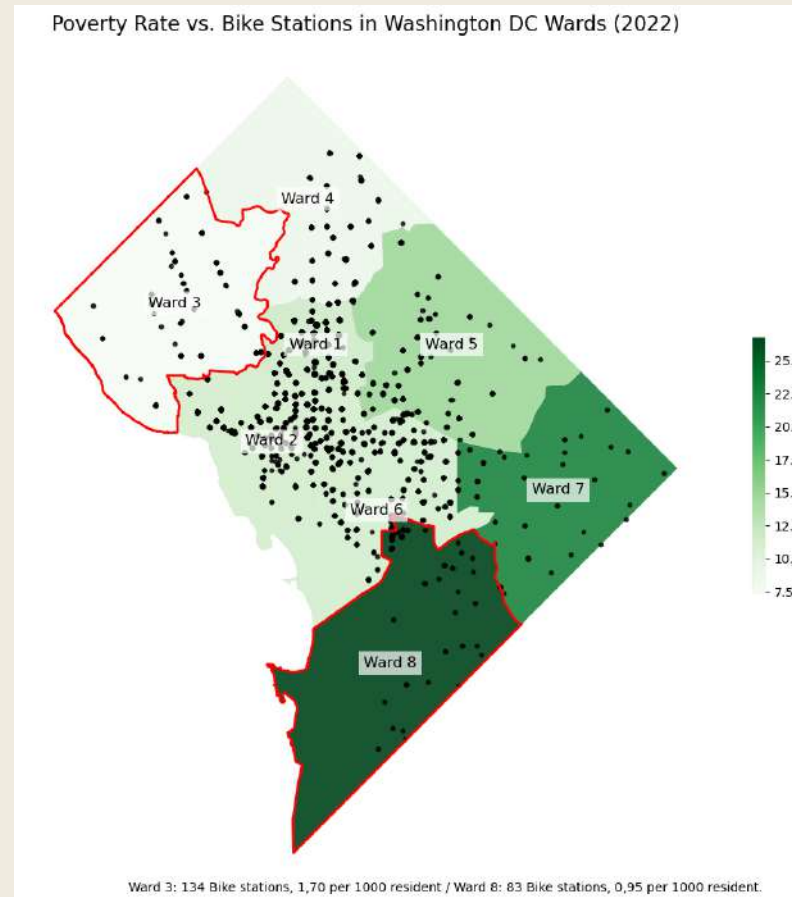
6. Map: Is the installation of bike stations adapted to the needs of local residents?



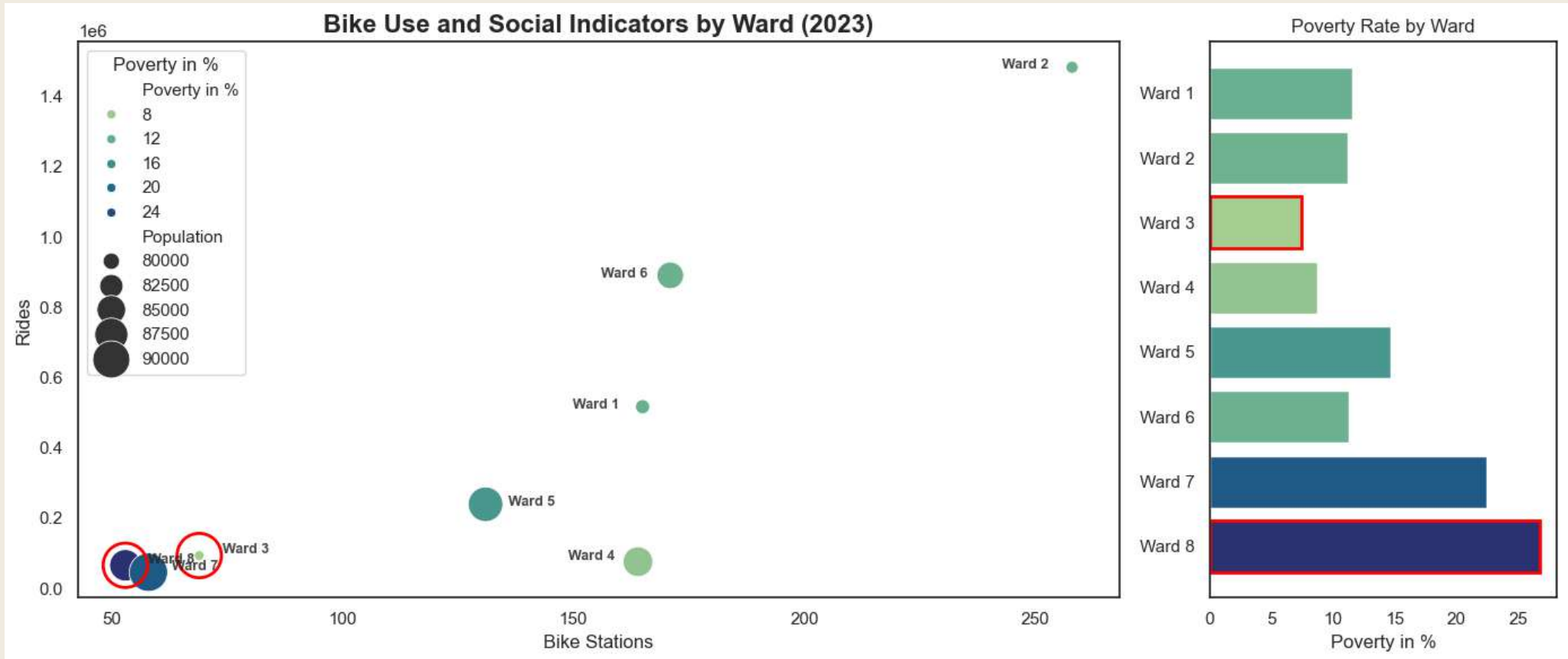
	Ward 3	Ward 8
Poverty	7,4 %	26,8 %
Home Office	34 %	17 %
Stations Density	0,88	0,61

Interactive map: https://beatricem476.github.io/Bikeshare-project/dc_wards_map.html

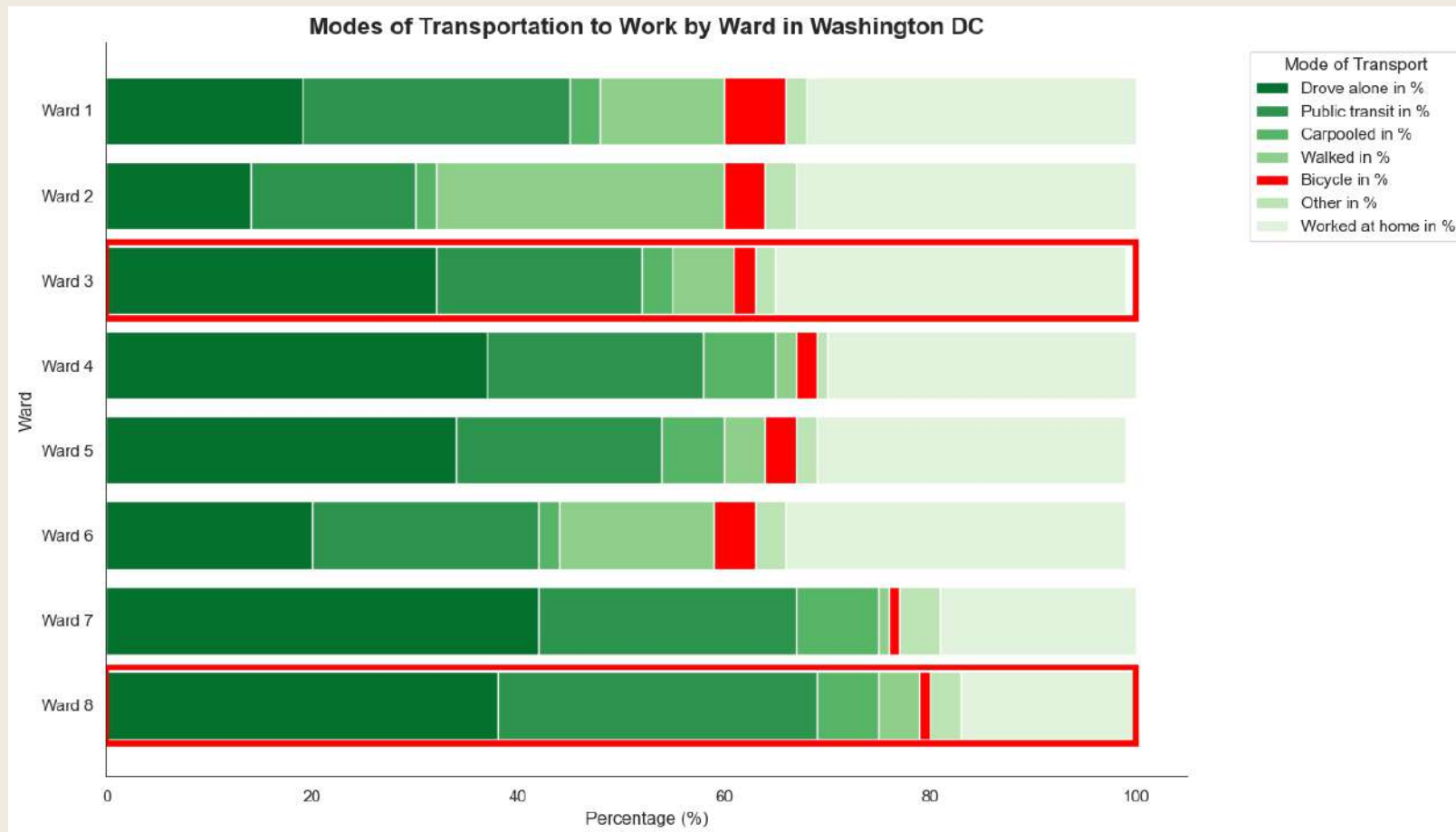
6. Map: Station locations in the Wards



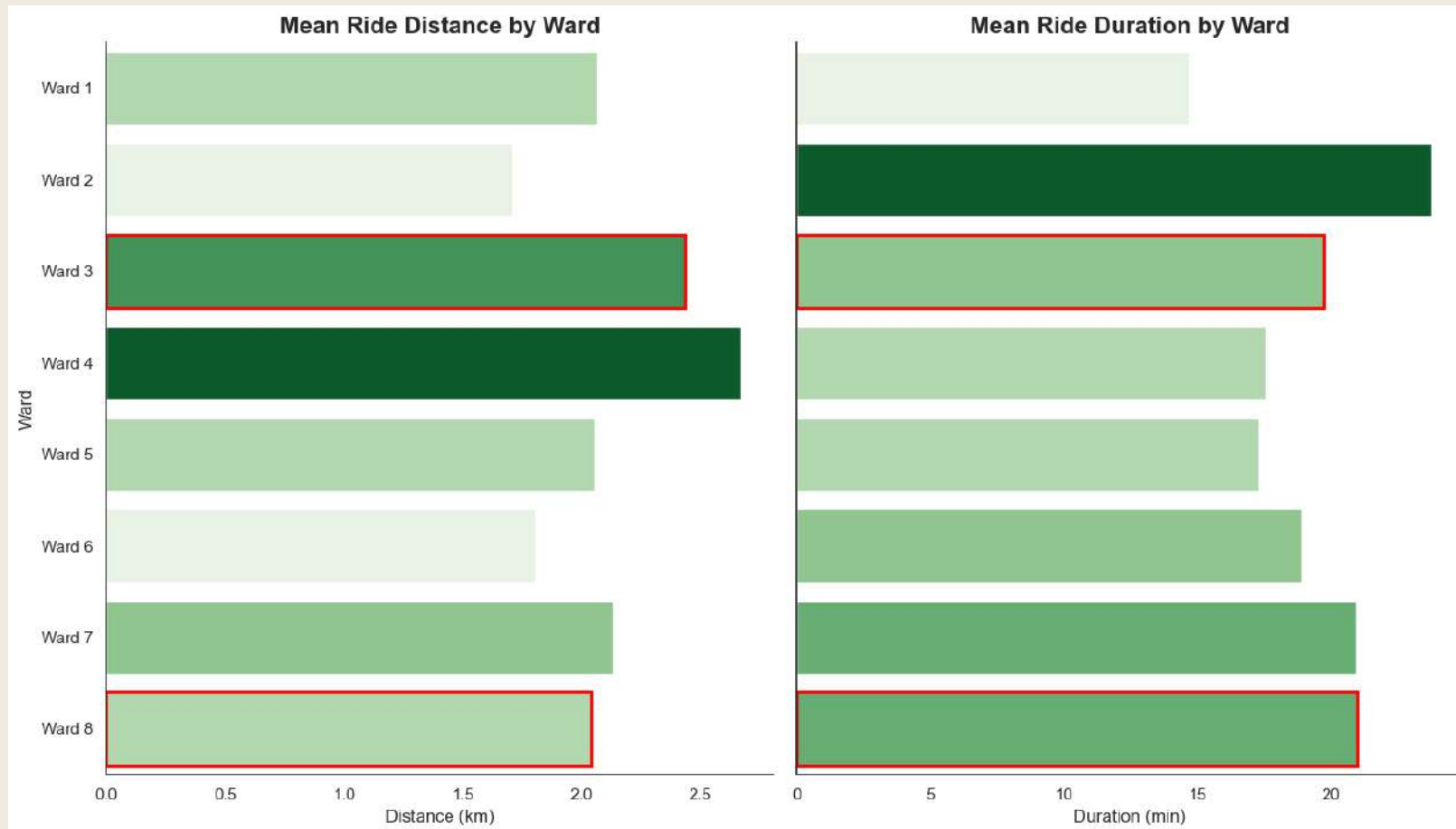
7. The result of bike station distribution



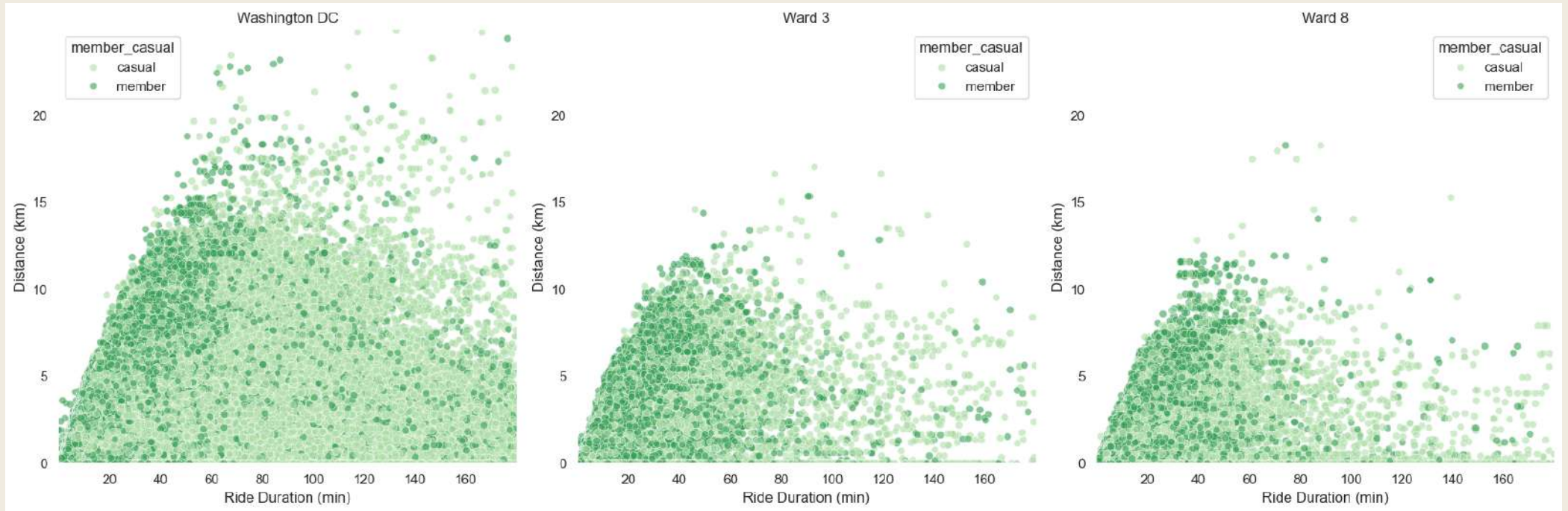
7. How People Commute to Work in Washington, D.C.



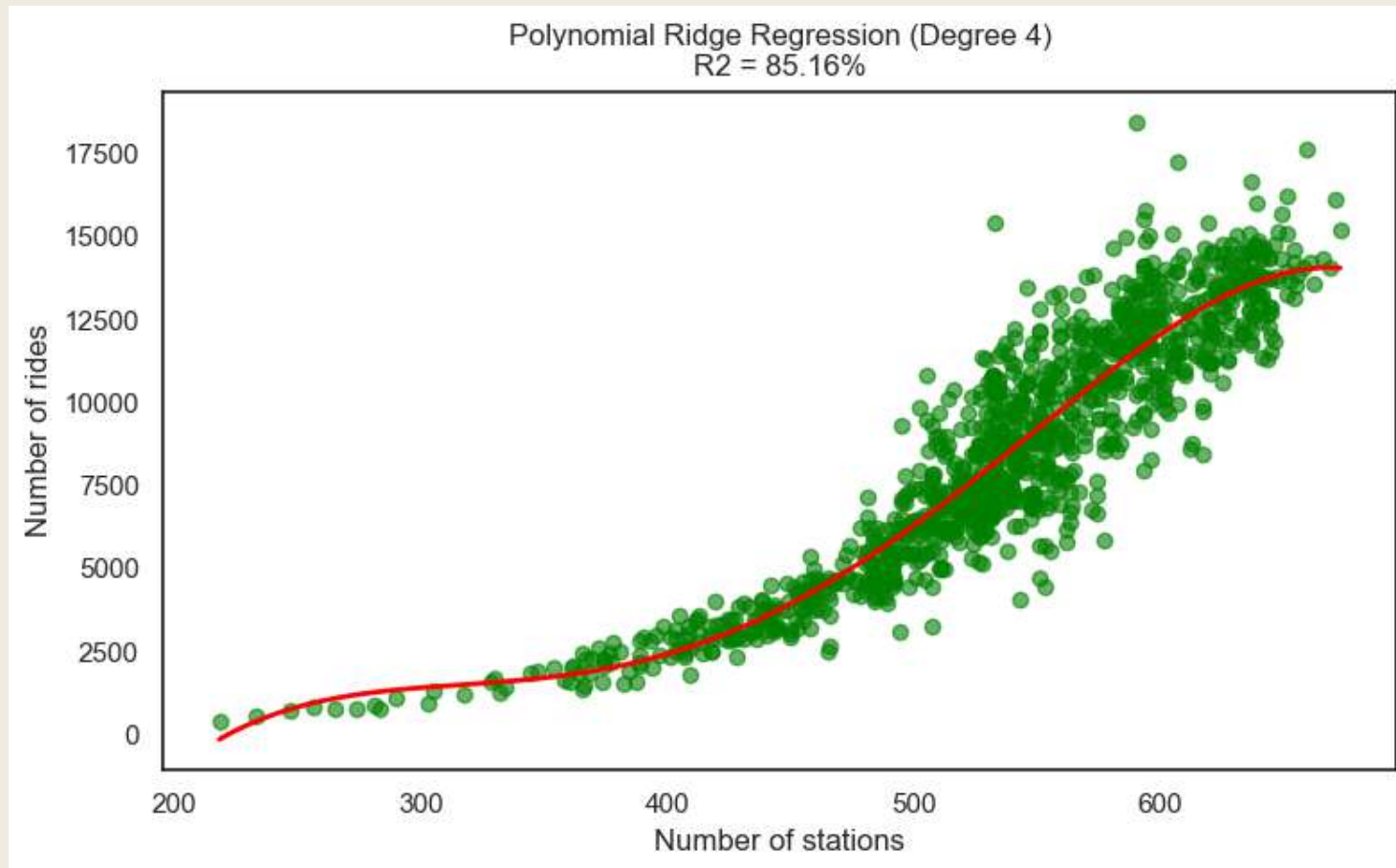
7. How fast do you ride?



7. Do members ride faster?



8. The effect of increasing the number of bicycle stations



9. Recommendations

Most of Capital Bikeshare's goals directly affect the lives of the residents, including reducing traffic congestion, promoting sustainable transportation, encouraging physical activity and improving accessibility.

To achieve these goals, Washington, DC should:

- Adjust the **distribution of bike stations** according to the needs of residents in each ward.
- Adopt the same **Bike for All Program** as Montgomery County, which has a **\$0** fee for qualified individuals. Montgomery County has a poverty rate of 7%.
- Encourage residents in targeted wards to purchase annual **memberships**.

Thank you for your attention !
Do you have any questions?

