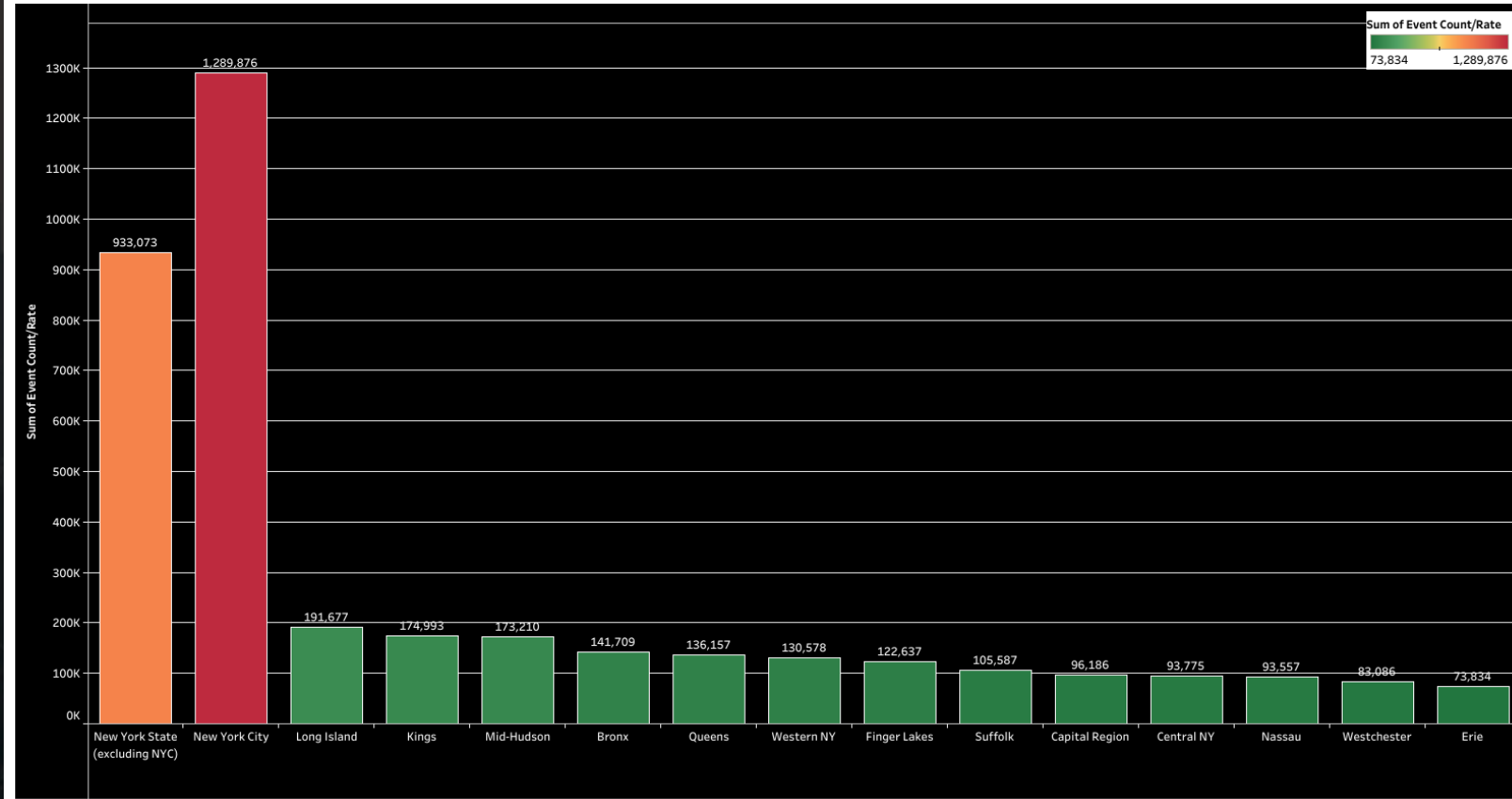# What are you breathing in?

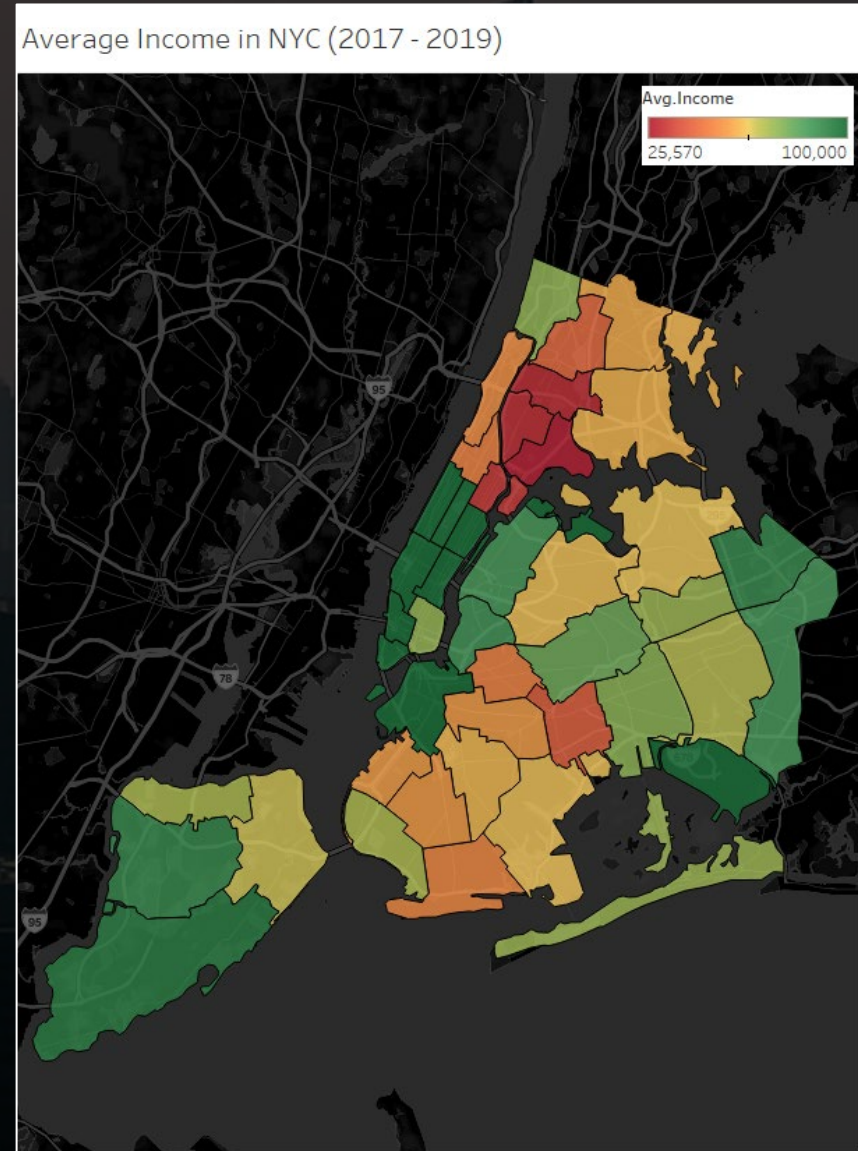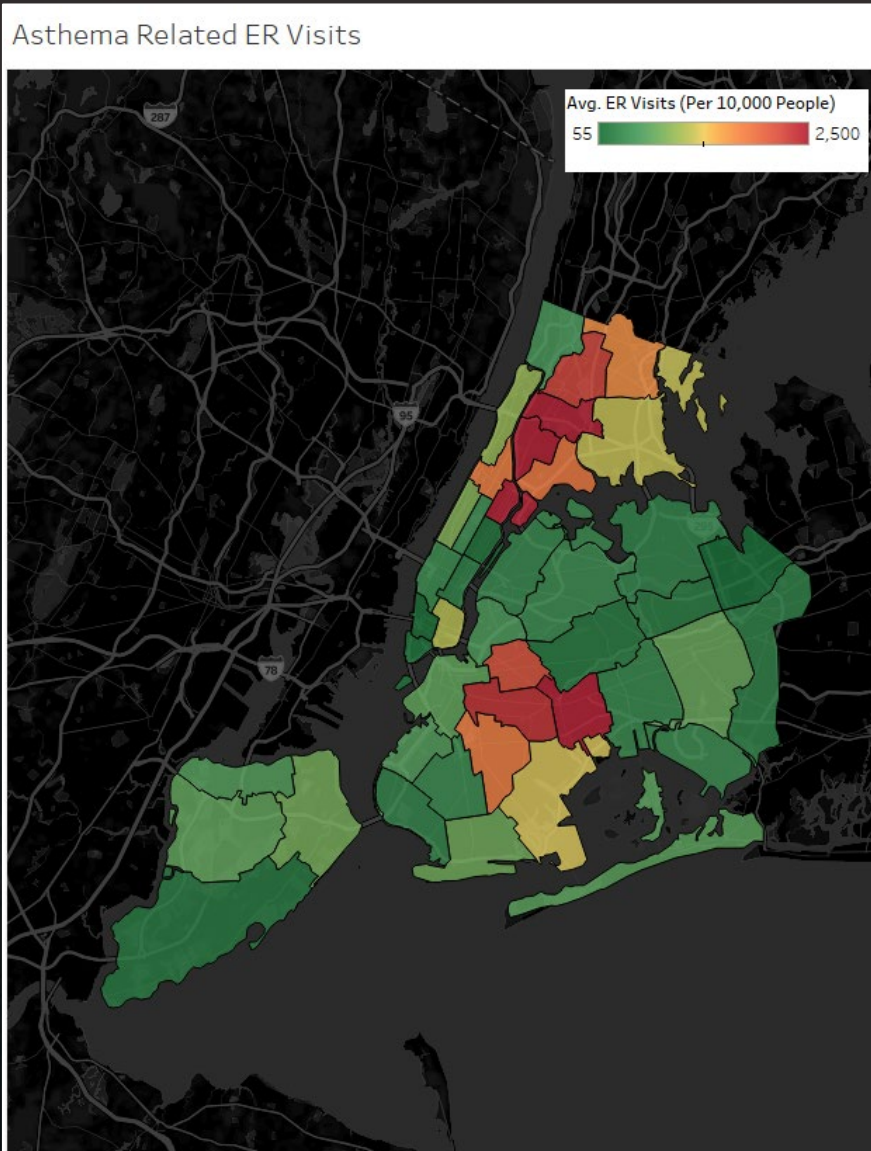By: Adrian Ramirez | Data Analyst

Asthma Prevalence in Adults

- Did you know NYC alone has more Asthma cases than the rest of State combined.

- NYS has the highest Asthma prevalence in the country.

- Why is this?

- What are you breathing in?
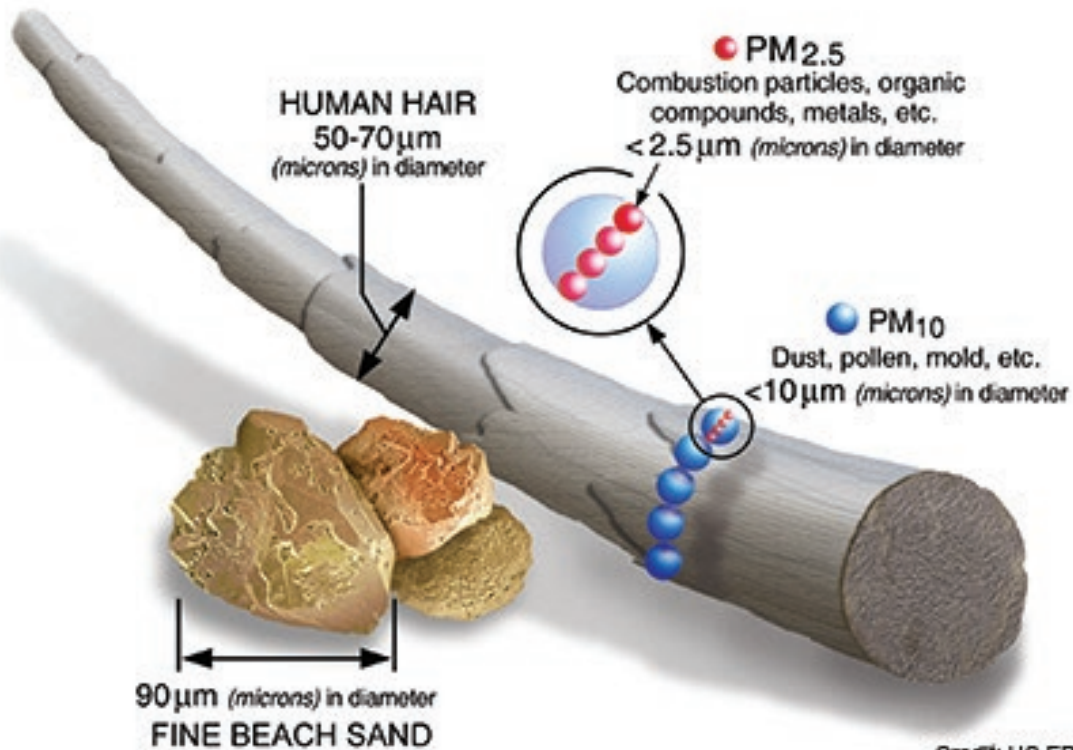

Adults Asthma Prevalence (2017-2019)

Asthma In NYC (Per 10k People)

Asthema Related ER Visits

Avg. ER Visits (Per 10,000 People)
55 — 2,500

Average Income in NYC (2017 - 2019)

Avg. Income
25,570 — 100,000

What's In The Air? (Fine Particulate Matter or PM2.5)

HUMAN HAIR
50-70μm (microns) in diameter

● PM2.5
Combustion particles, organic compounds, metals, etc.
<2.5 μm (microns) in diameter

● PM10
Dust, pollen, mold, etc.
<10 μm (microns) in diameter

90μm (microns) in diameter
FINE BEACH SAND

Credit: US EPA

- They are very small airborne particles less than 2.5 microns in diameter.
- UG/M³ = Micrograms per cubic meters
  - Levels below 12 UG/M³ is healthy.
  - 13 - 35 UG/M³ is unhealthy.
  - 35 – 50+ UG/M³ is dangerous.

What's In The Air? (Black Carbon)

- A type of Particulate Matter which is a black sooty material emitted from engines and the burning of fossil fuels.

- Makes up about 20% of Fine Particulate Matter in NYC.
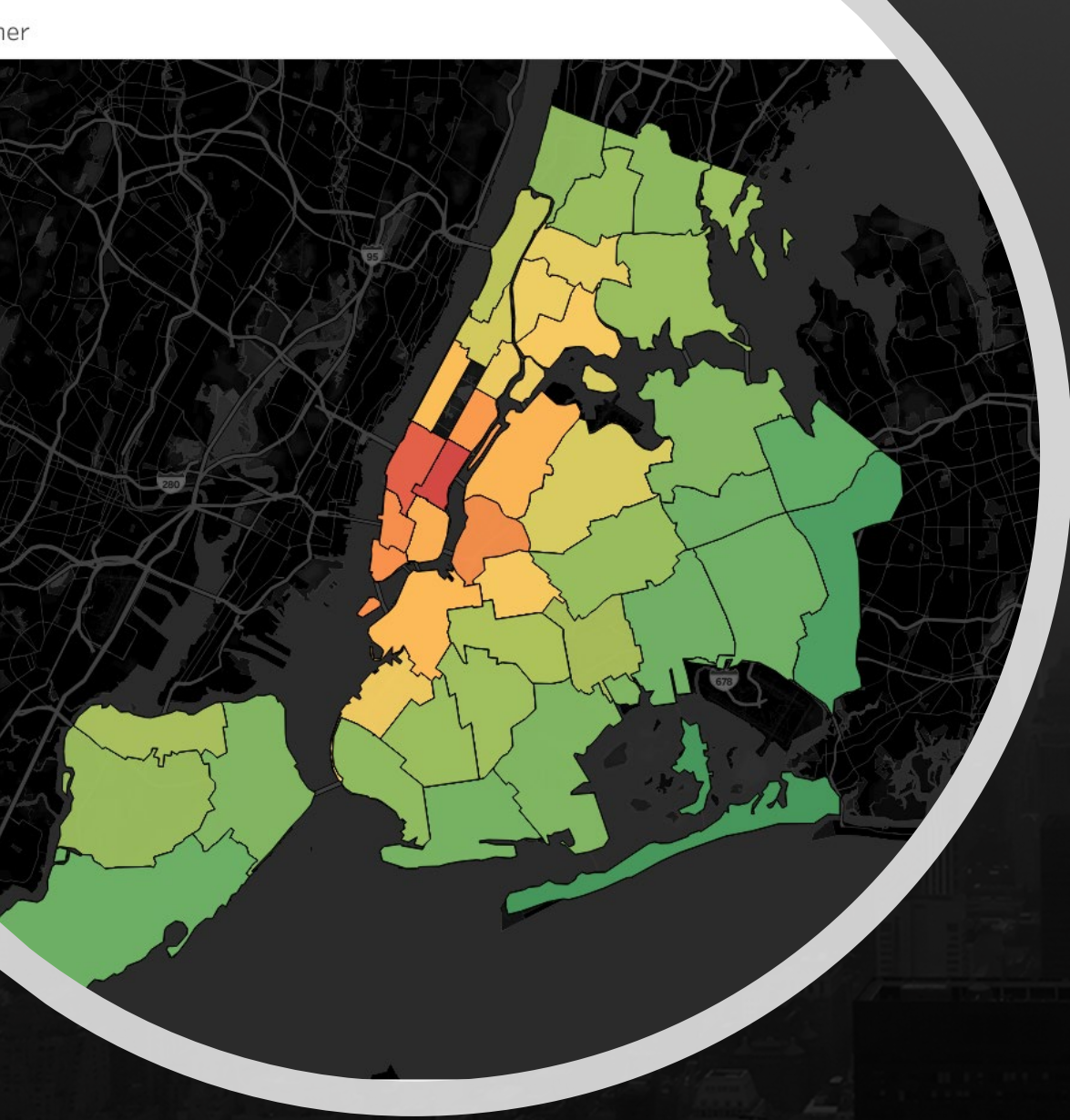
- A major contributor to climate change.

What's In The Air? (Nitric Oxide & Nitrogen Dioxide)

- A group of pollutants known as Oxides of Nitrogen.

- Exposure to this is linked to emergency visits and hospitalizations for respiratory illnesses.

- PPB = Parts per billion
  - Levels below 25 ppb is healthy.
 - 25-50 is unhealthy.
  - 50 + is dangerous.

Particulate Matter in NYC (U/GM³)

- The primary concentration of PM2.5 is in Midtown Manhattan.

- High to Moderate levels are spread around in areas such as:
  - Lower Manhattan
  - Lower East Side
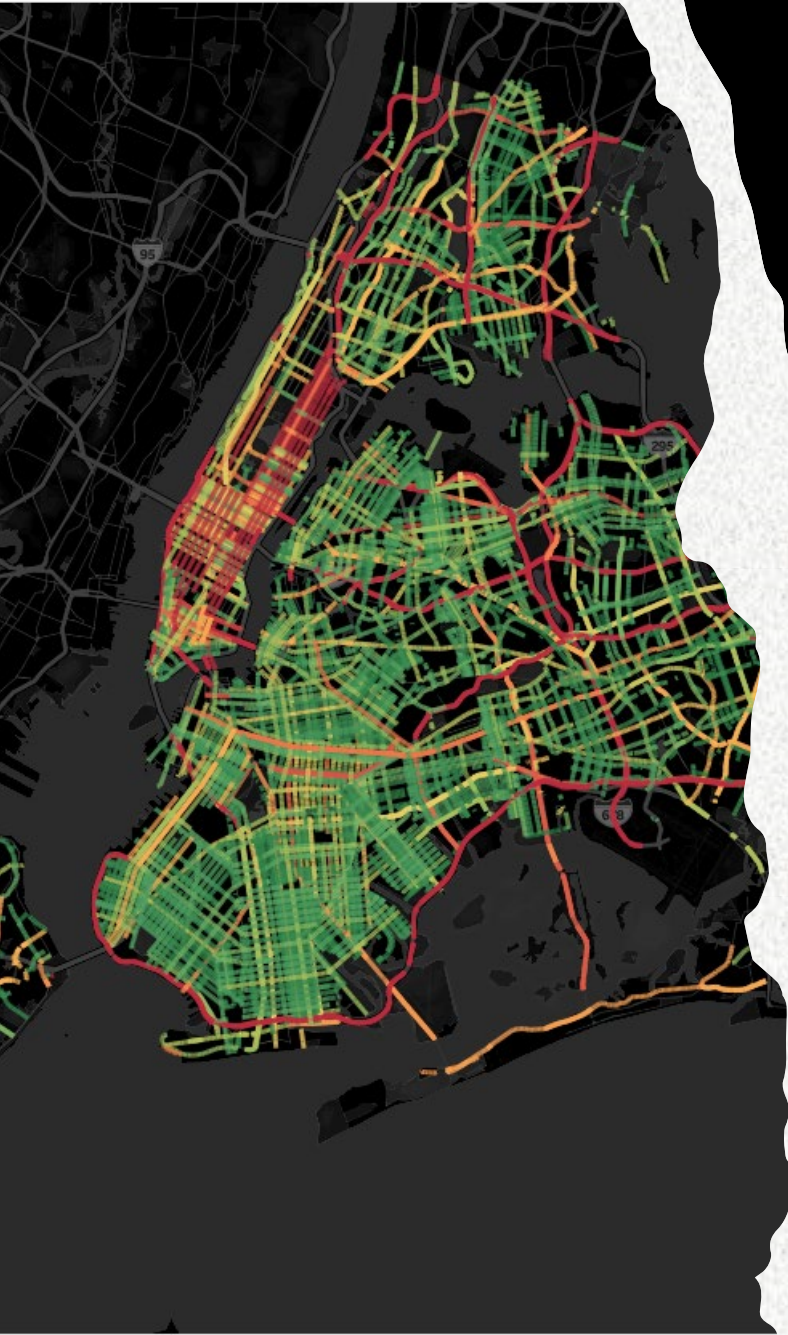 - Long Island City
  - Williamsburg

Link to the Tableau Workbook for the interactive map

Change Over Time & Top Polluted Neighborhoods

- The top 5 neighborhoods with the highest levels of PM2.5 are all in Manhattan.

- Higher levels of NO & NO2 occur in the winter.

- Higher Levels of PM2.5 & Black Carbon occur in the Summer.
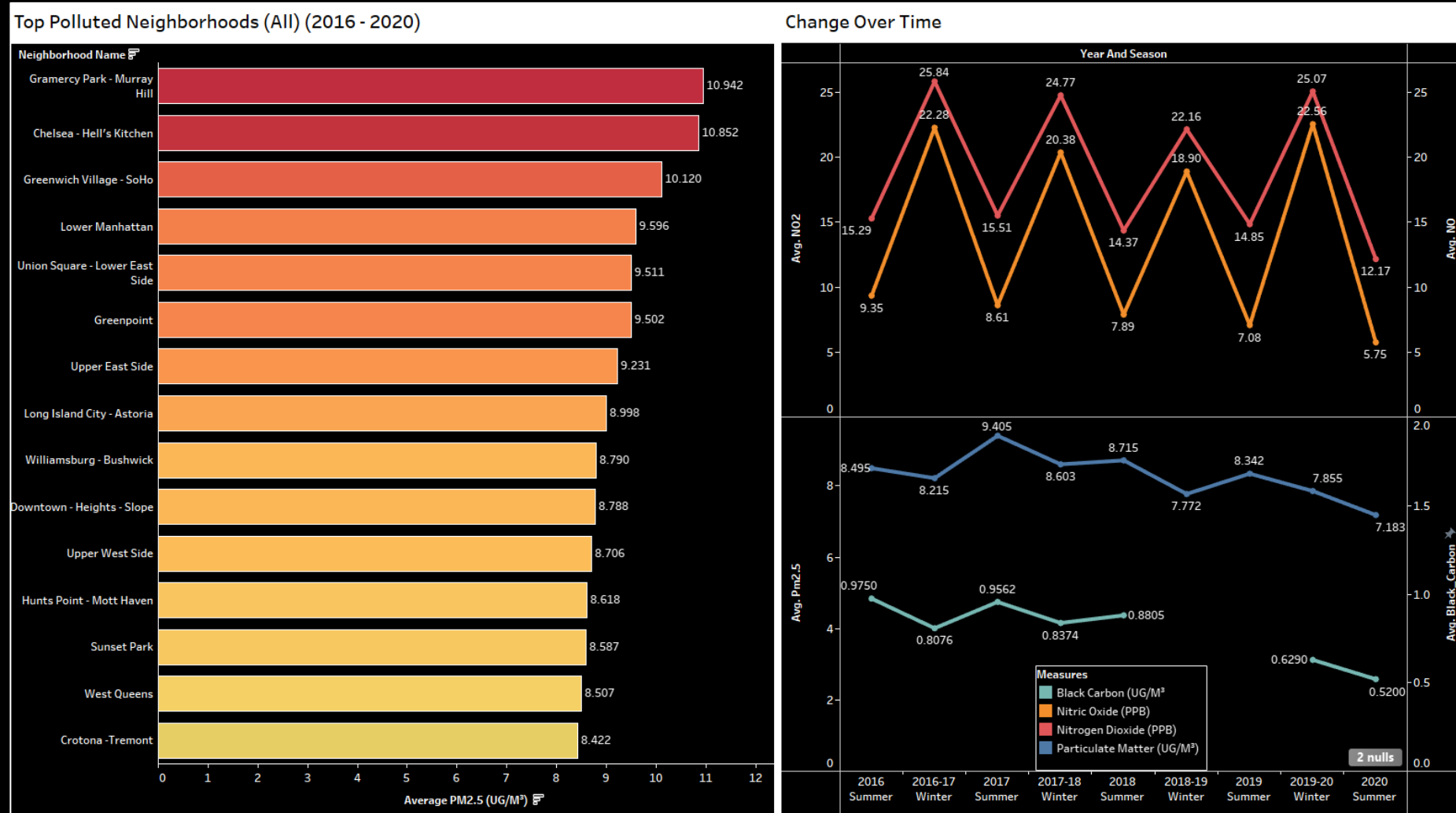
Car Volume In NYC

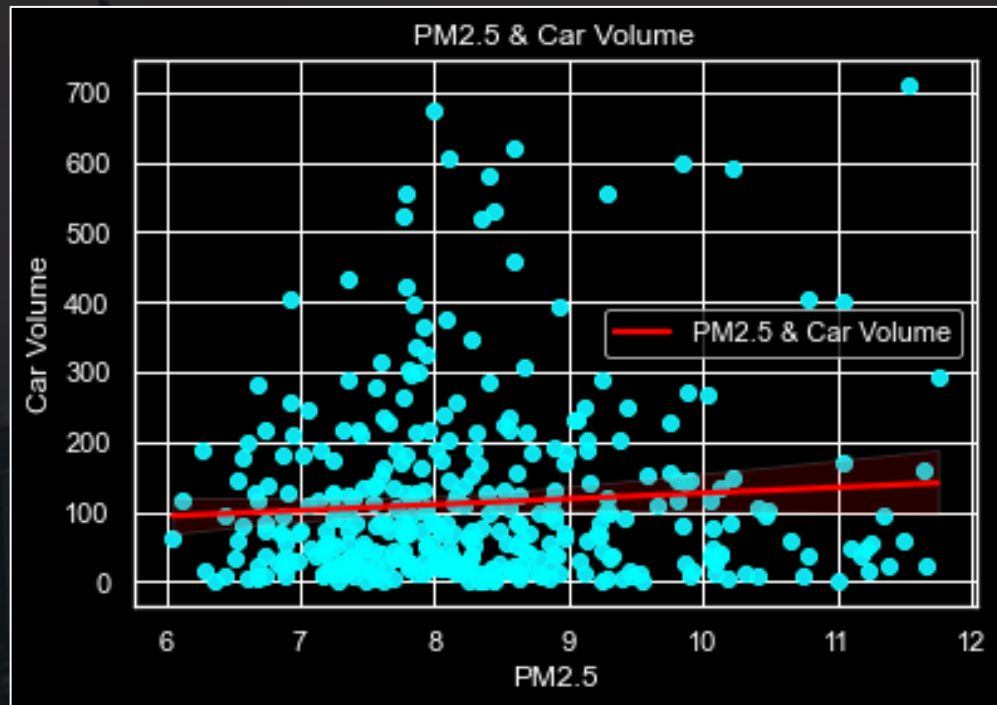Link to the Tableau Workbook for the interactive map
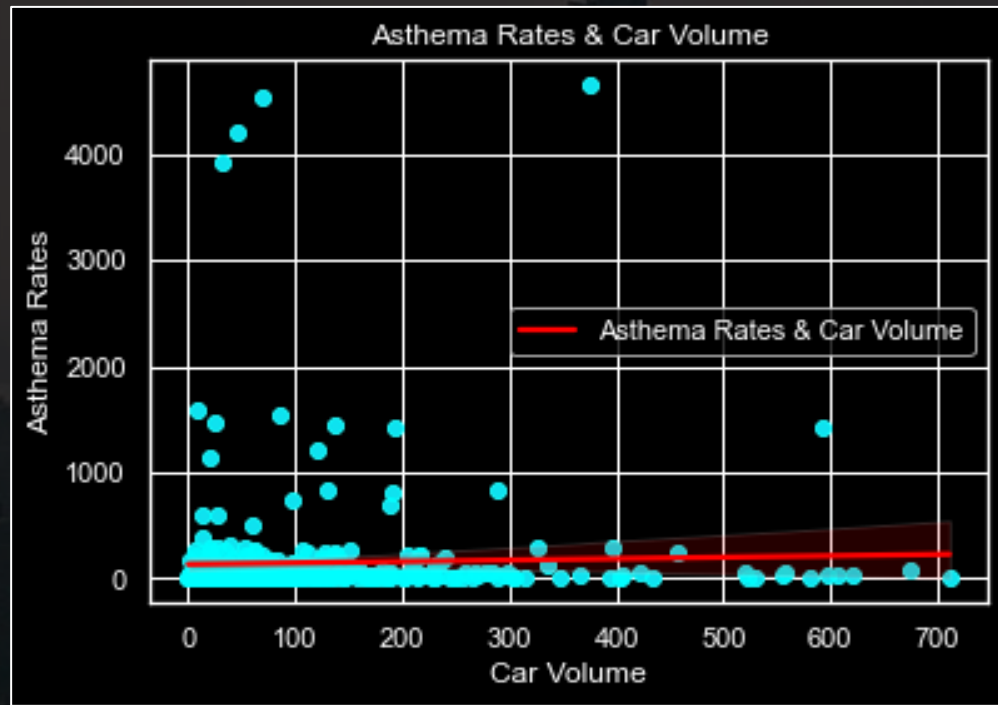
What do we know?

- The COVID lockdown significantly reduced levels of air pollutants.

- Summer is when Particulate Matter is at its highest point.

- Winter is when NO & NO_2 levels are at their highest.

- Manhattan has the highest average levels of air pollution out the 5 boroughs.

Is there a Correlation?

Somewhat

Yes

Recommendations

TRANSITION TO MORE EFFICIENT, LESS POLLUTING VEHICLES.

REDUCE FOSSIL FUEL COMBUSTION IN BUILDINGS.

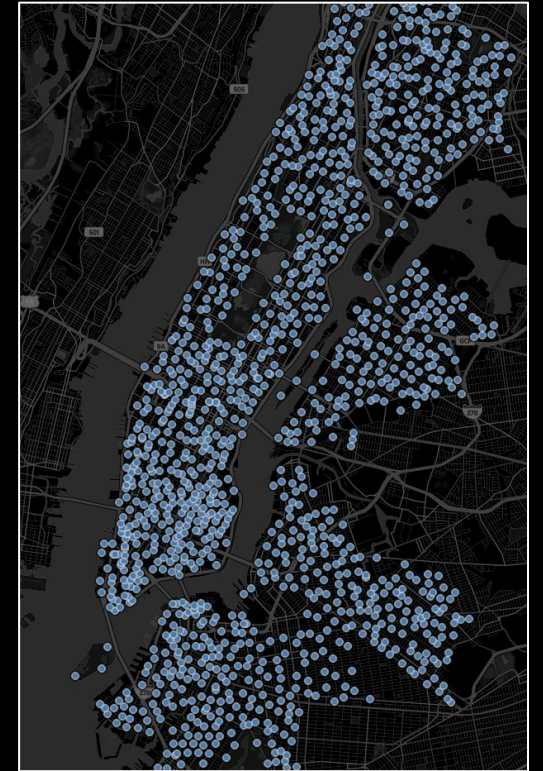USE PUBLIC TRANSPORTATION.

RIDE A BIKE OR WALK, IT'S HEALTHIER.
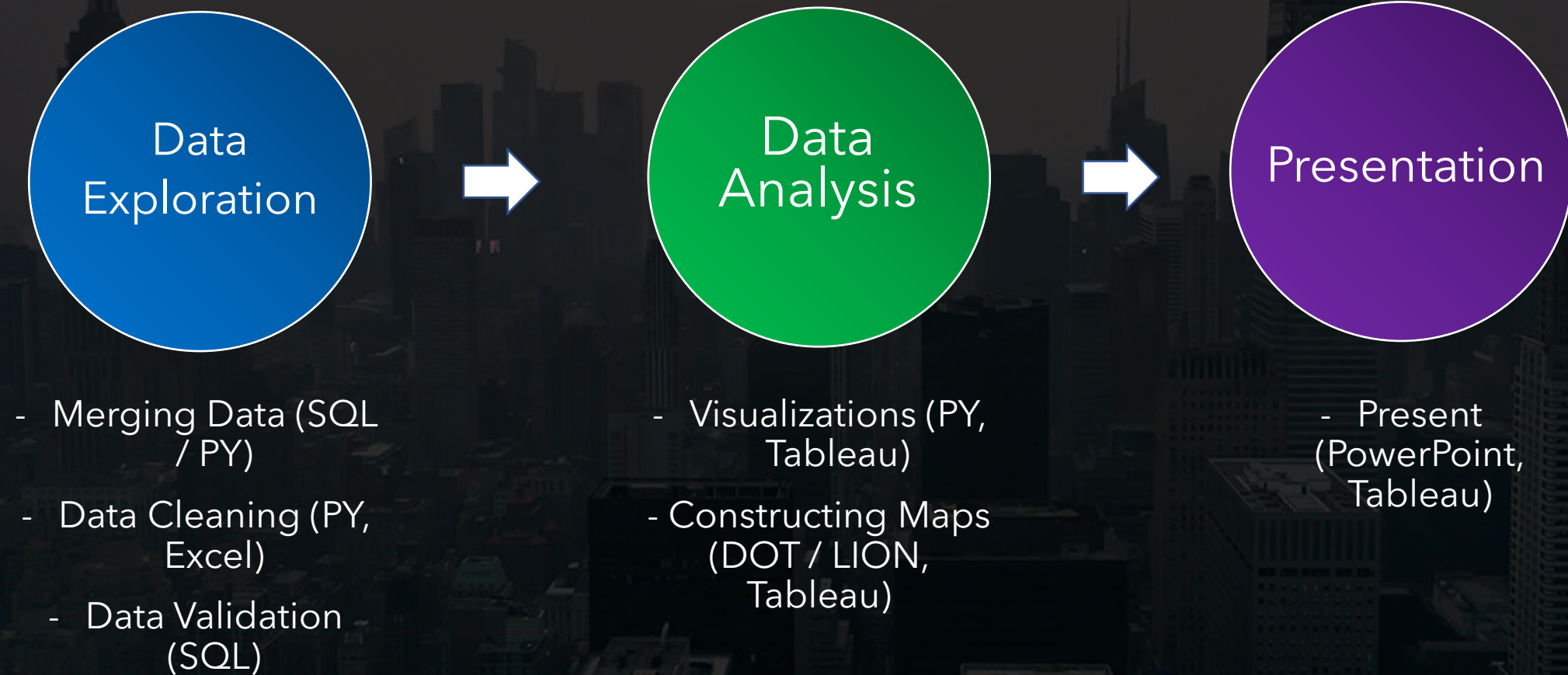
Citibike Stations

2013

2022

Datasets Used

- Department of City Planning, LION Single Line Street Base Map, LION; retrieved from https://www1.nyc.gov/site/planning/data-maps/open-data/dwn-lion.page.

- Department of Transportation, NYC Open Data, Automated Traffic Volume Counts; retrieved from https://data.cityofnewyork.us/Transportation/Automated-Traffic-Volume-Counts/7ym2-wayt.

- NYC Health, Environmental & Health Data Portal, Air Quality (2016-2020), Asthma (2017-2019); retrieved from https://a816-dohbesp.nyc.gov/IndicatorPublic/BuildATable.aspx.

- Citibike System Data, Citibike Trip History Data, Citibike-tripdata (06/13), Citibike-tripdata(05/22); retrieved from https://ride.citibikenyc.com/system-data

Project Steps

Process:

Data Exploration → Data Analysis → Presentation

- Merging Data (SQL / PY)
- Data Cleaning (PY, Excel)
- Data Validation (SQL)

- Visualizations (PY, Tableau)
- Constructing Maps (DOT / LION, Tableau)

- Present (PowerPoint, Tableau)

Thank You!

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Project: Tableau Workbook