

Does the Weather Affect NYC's Rail Traffic?

**Exploratory Data Analysis of NYC's MTA Data and NOAA's
Weather Data for Mobile Food Vender**

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Go Toward the People, No Matter the Weather

Introduction

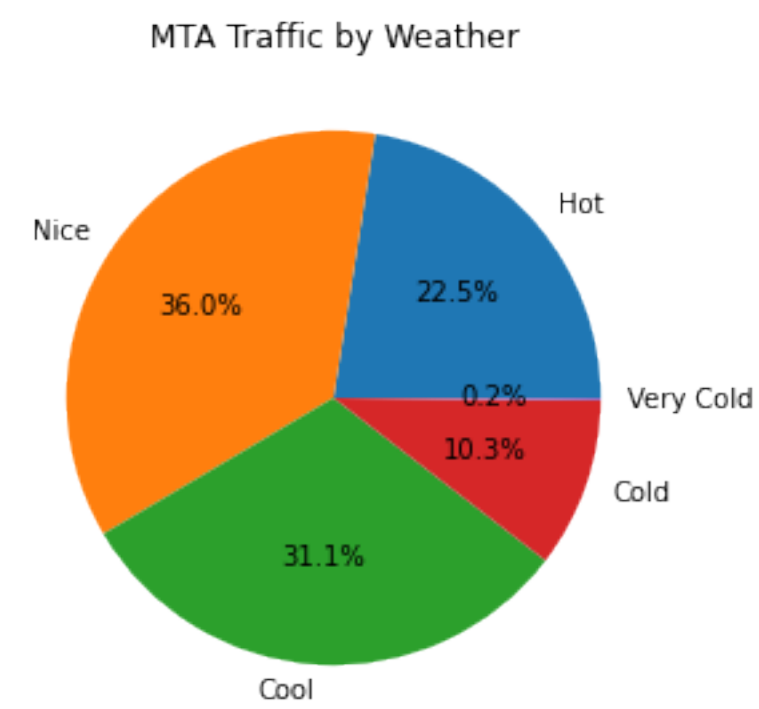
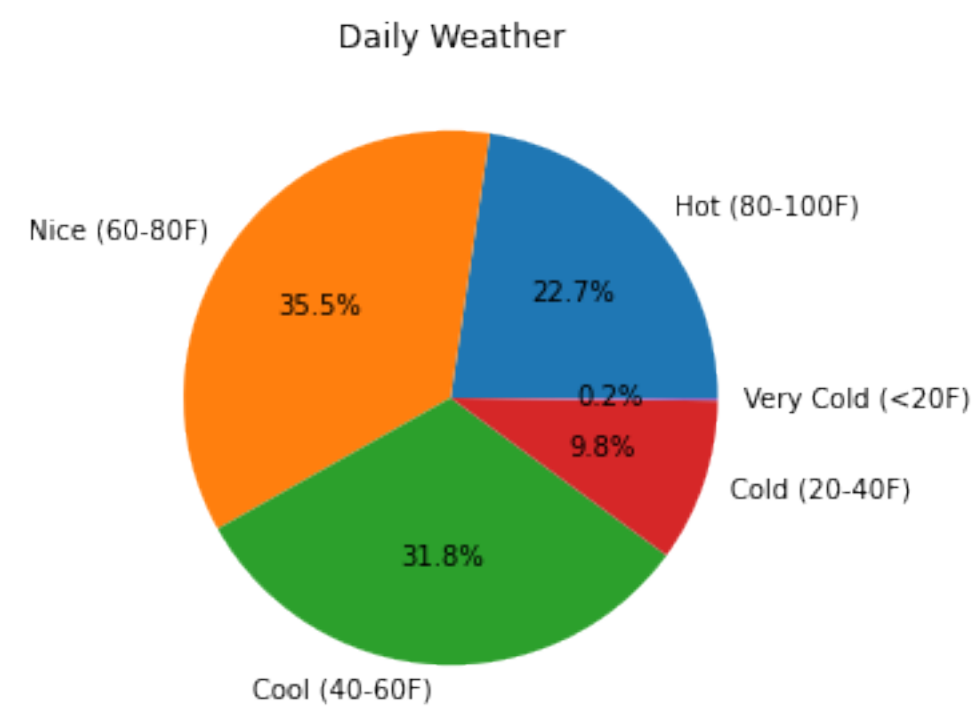
- NYCider Merchant:
 - Mobile vender of locally grown apple cider treats with small fleet:
 - Cider icees in the hot months
 - Hot cider in the cold months
 - They want to target transit passengers. **They have asked me:**
- **Which stations have the most traffic when the weather is cold, hot, mild?**
- **Is there less traffic on weekends and which stations experience the Mose weekend traffic?**
- **Which stations have the most traffic on holidays?**
- **Target areas with higher concentration of families and where food trucks are permitted.**

Methodology

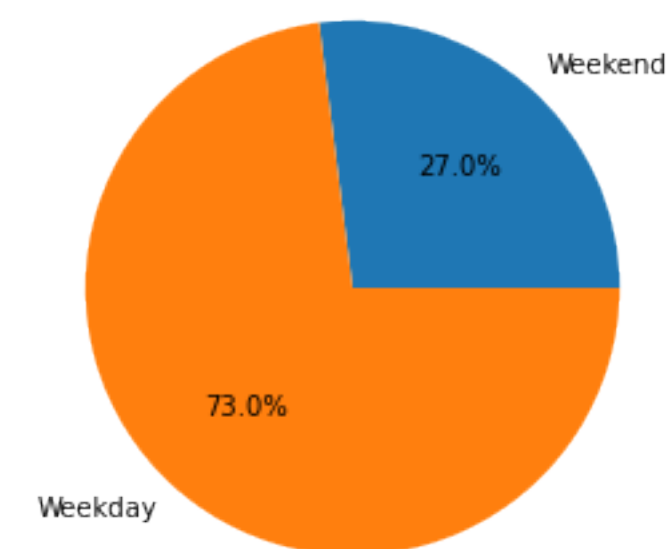
- Obtain and clean NYC MTA turnstile data
- Sum all entry and exit traffic from all turnstile units at each station
- Incorporate NOAA aggregated historical daily weather data from Central Park weather station
- Compare transit traffic trends for different kinds of weather
- Normalized the data to account for difference in numbers of days with different weather
$$x_{\text{normalized}} = (x - x_{\text{minimum}}) / \text{range of } x$$
- Plot to observe trends
- Check against demographic data and zoning rules

Results

- Traffic does not change depending on the weather pie chart.



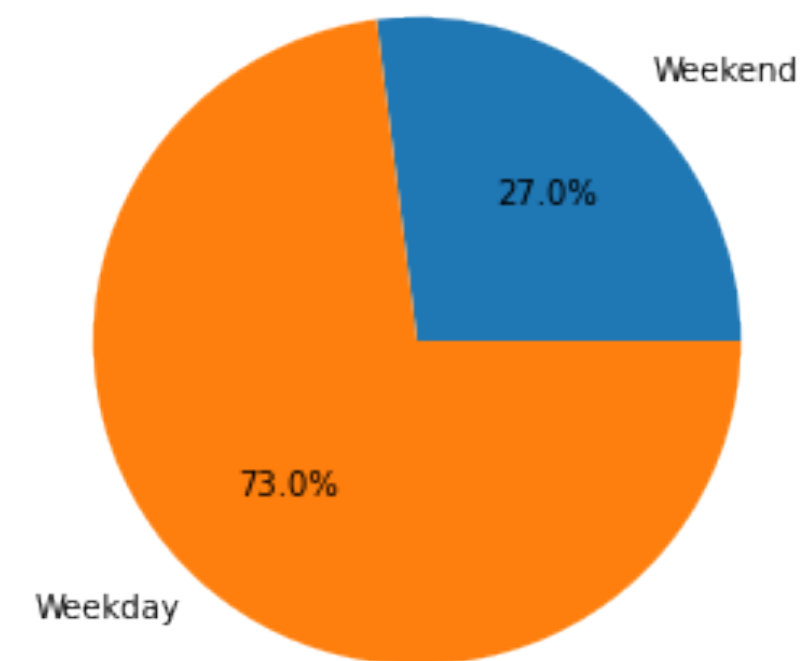
Traffic by Weekend vs Weekday, 2019-2021



Results

- Weekday Traffic vs Weekend traffic

Traffic by Weekend vs Weekday, 2019-2021



Results

- Bar graph with normalized charts for station traffic by weather days
 - 2019, 2020, 2021 data on one bar chart. 5 bar charts based on weather types (keep small list in corner with top 5 stations)
- Stations with highest traffic by weather by year
- Map with best stations circled



Results

Results - Conclusions - Future Work- Appendix

Conclusion

- The weather does not affect traffic a lot.
- A stronger signal may have been the effects of COVID on traffic
- Recommend that NYCider Merchant does not change position based on the weather. The highest traffic locations are:
- World Trade Center, Grand Central Station, Fulton, Chambers,
- Reducing the fleet or inventory on weekends by 25% may be advised. Follow up research on spending trends recommended.

Future Work

- Precipitation
- Holidays
- Further market research how people spend on days with different weather, or holidays, or weekends.
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Appendix