Analysis of NYPD Motor Vehicle Collision Data - Brooklyn

Summary of findings:

- *Three driver-related factors play a part in 50% of all Brooklyn collisions.*
- *Nearly half of all serious* collisions occur on just 3% of Brooklyn streets.*
- *Collision volume in Brooklyn is seasonal and may be correlated with the volume of other parties (cyclists and pedestrians) sharing the road at the same time.*
- *The rise of ride-sharing services may help explain a recent year over year reduction in collision volume.*
- *The times of peak of collision volume are weekdays during rush-hours and weekends from mid-afternoon to early evening.*

*'Serious' collision is defined throughout analysis as any collision where at least one person is injured or killed

Collisions by Contributing Factor

Insights

- Driver Inattention/Distraction is a factor in ~27% of total collisions and ~26% of serious collisions. Failure to Yield Right-of-Way is a factor in ~14% of total collisions but ~22% of serious collisions.

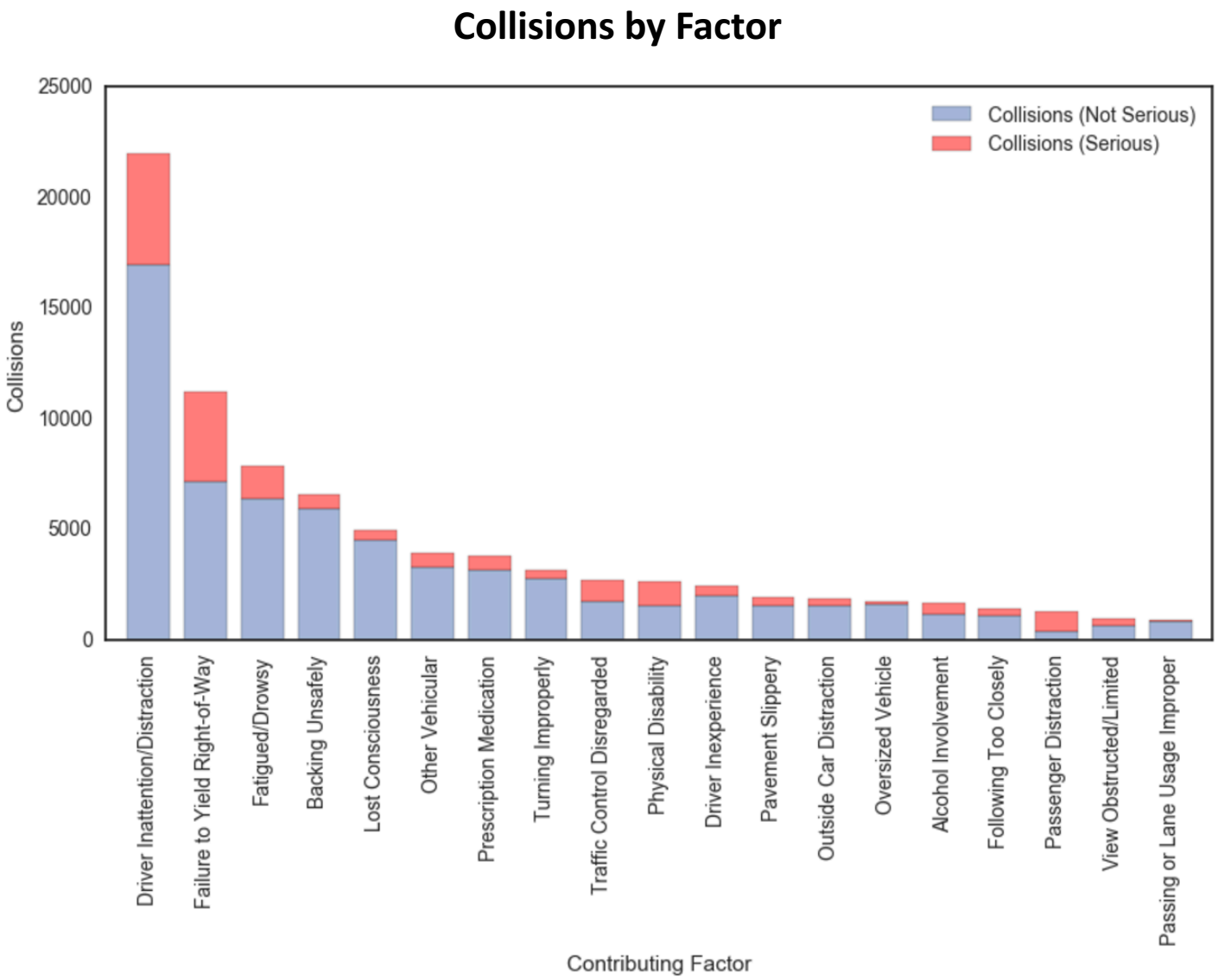
- Cumulatively, just three factors play a part in ~50% of total collisions and ~56% of serious collisions:
  - Driver Inattention/Distraction
  - Failure to Yield Right-of-Way
  - Fatigued/Drowsy

Recommendations

- Increase penalties for driving while using a mobile phone and other distracting behaviors while behind the wheel.

- Confirm that all locations requiring drivers to yield provide highly visible signs and other visual aids. Increase penalties for failing to yield right-of-way.

- Run awareness campaigns about the danger of distracted driving and driving while tired.



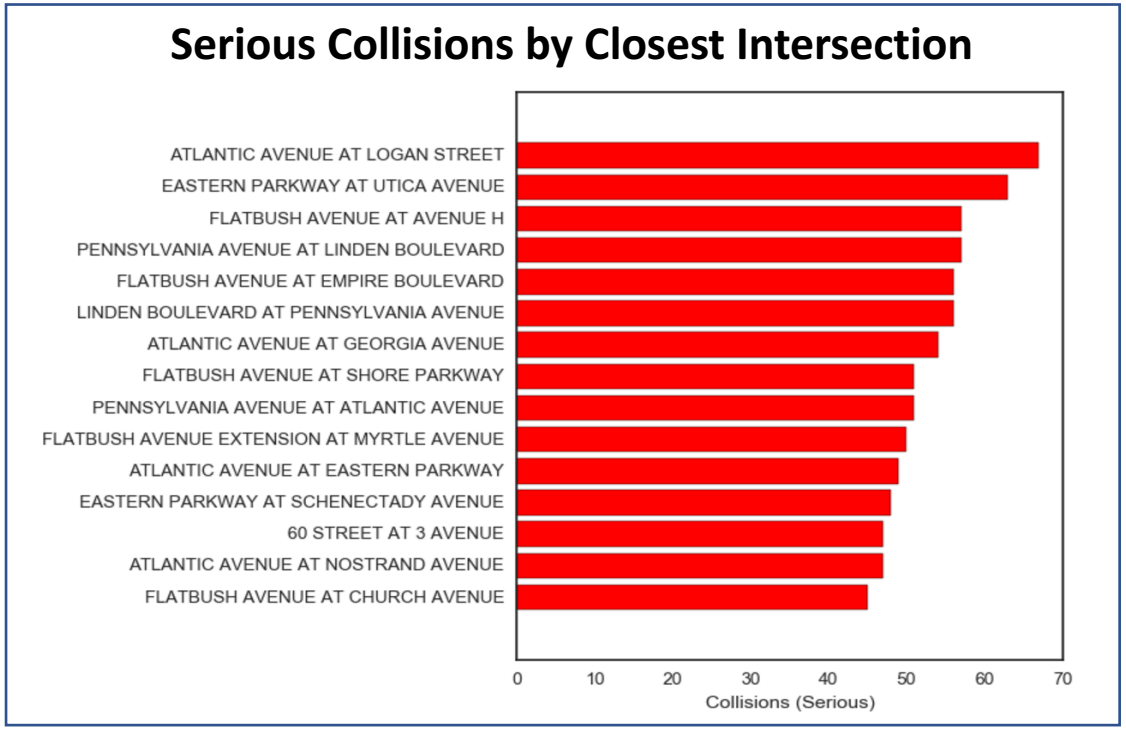
Collisions by Street/Intersection

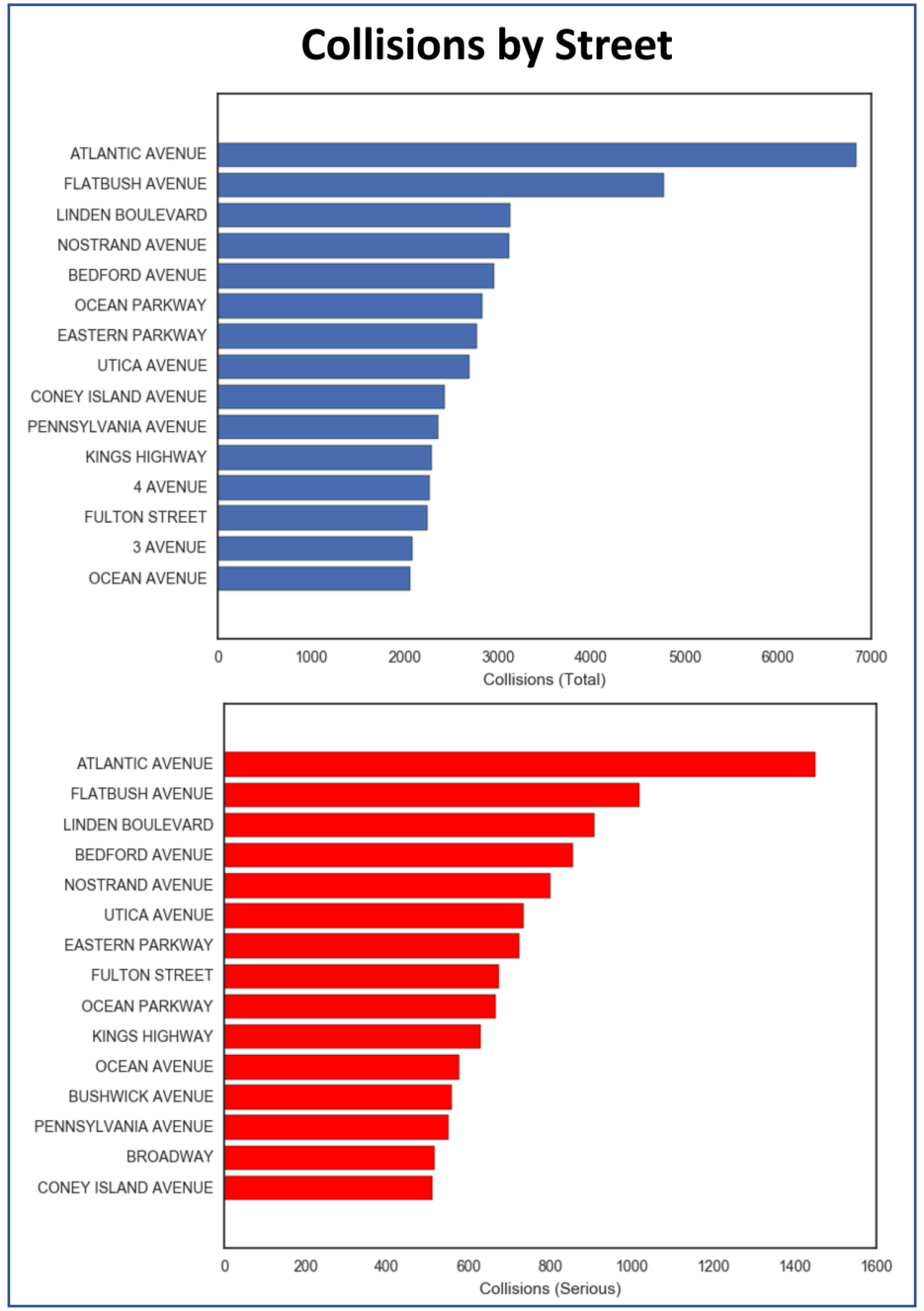
Insight

- ~45% of *serious* collisions, and ~40% of *total* collisions, occur on just ~3% (50) of Brooklyn's streets. Atlantic Ave and Flatbush Ave are especially problematic.

Recommendation

- Raise traffic violation fines on the streets where collisions are highest and center more traffic law enforcement near the intersections (below) where serious collisions are highest.





Collisions Over Time

Insights

- Apparent seasonality in collision volume: decreases during winter and levels out from spring through fall. Serious collisions seem adhere to this seasonality somewhat more closely than non-serious collisions.

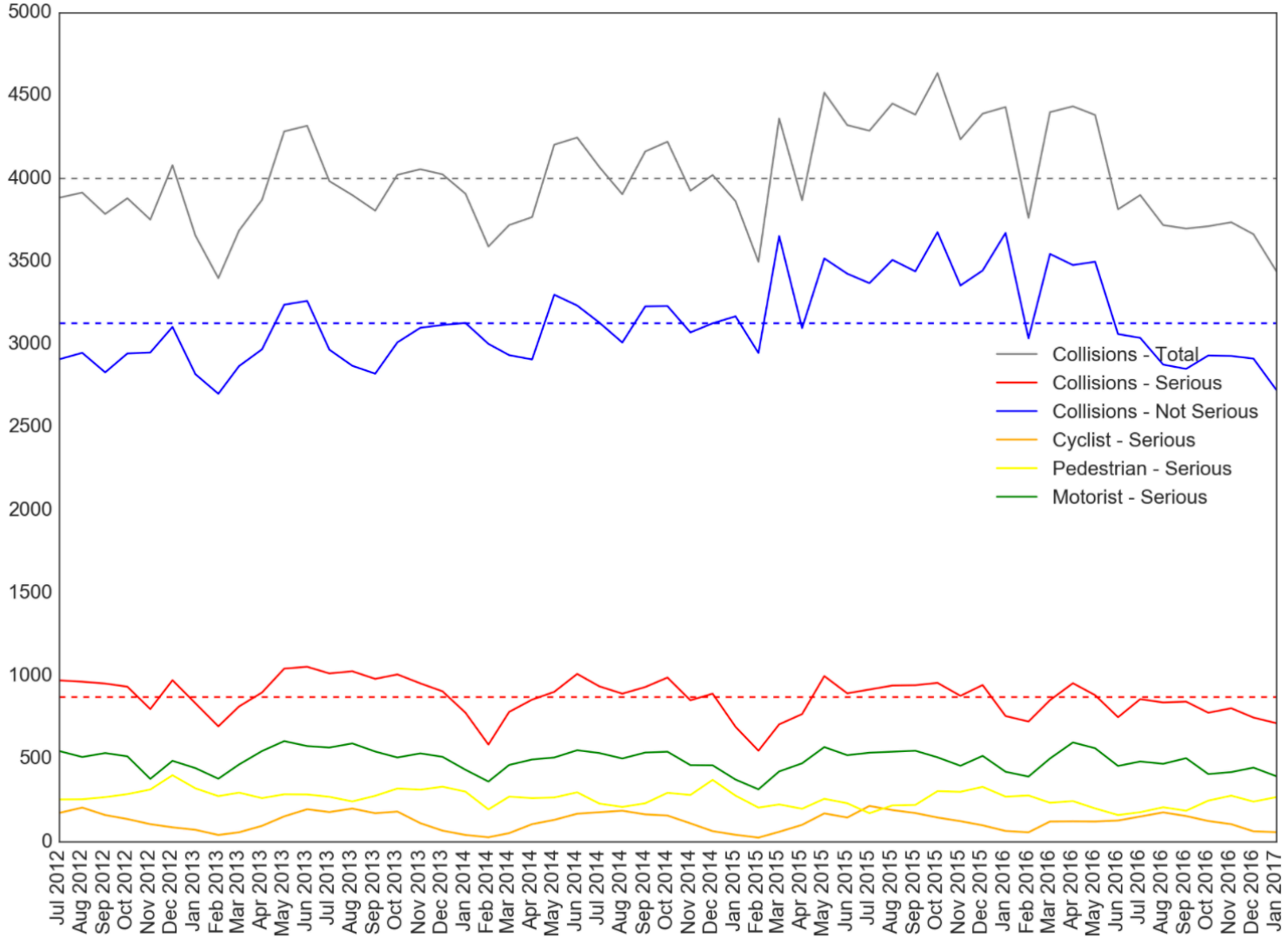
- Pedestrians and cyclists are involved in ~1/2 of serious collisions.

- There was a notable spike in non-serious collisions from early-2015 to mid-2016. Volume of serious collisions did not increase relative to its baseline during this period.

Recommendations

- Time road-safety campaigns to run in the late winter/early spring months in order to have maximum impact. Speak to cyclists and pedestrians in these campaigns, not just motorists.

- Further investigation into why there was such a large spike in collisions from early 2015 to mid 2016



Collisions by Vehicle Type

Insights

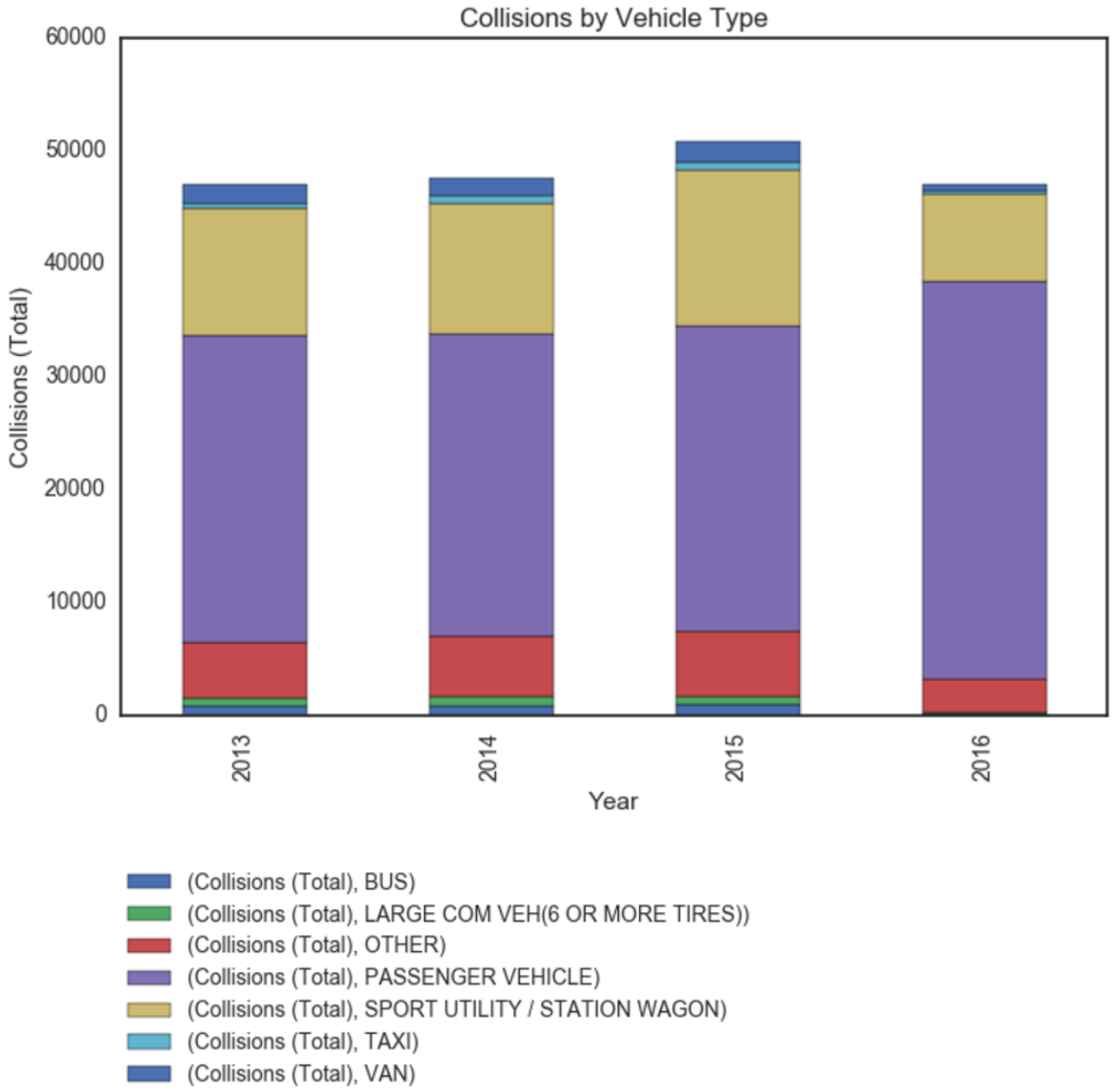
- The collision spike in 2015 (mentioned on previous slide) is in line with the collision growth of the sport utility/station wagon category of vehicle. This is an indicator that they may have been more vehicles in this category on the road in 2015, and that this category might have a higher propensity for collisions.

- Sport utility/station wagon category collisions decreased substantially in 2016, and passenger vehicle collisions rose substantially in 2016 over 2015. One possible explanation is an increase in drivers for ride-sharing services (which tend to use passenger vehicles). This could also explain some of the 2016 y/y drop in collisions by personal vehicles, as ridesharing decreases aggregate need for personal car ownership.

Recommendations

- Reference DMV data to determine how many vehicles in each category were on the road each year. If there is a relationship between vehicle type and propensity for collisions, there may be justification for new taxation on certain vehicles and registration.

- The DMV data will also provide an understanding of vehicle density, which is likely correlated with collisions. If so, measures to reduce overall car ownership (eg. increased costs) could be enacted.



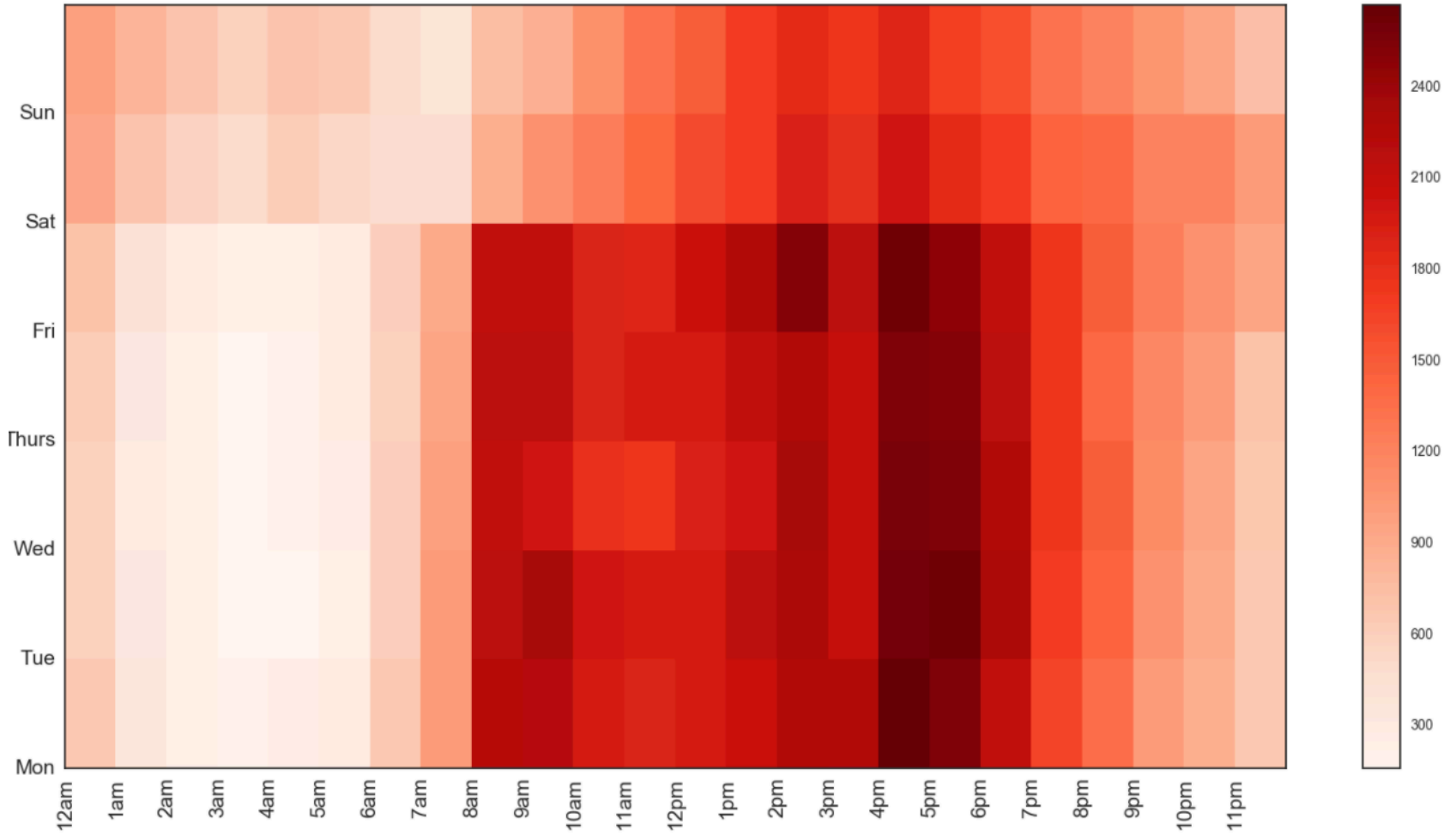
Collisions by Day of Week and Hour

Insights

- Peak collision volume occurs on weekdays, from 8am to 10am and from 4pm to 7pm.
- Highest *weekend* collision volume occurs from 1pm to 5pm.
- Minimal collision volume from 1am to 6am on weekdays, though higher on weekends during this same period.

Recommendations

- Allocate more traffic law enforcement resources during times of peak collision volume.
- Raise fines for traffic violations during times of peak collision volume.



Appendix: Ideas for future analysis

- Append third party data for additional analysis...
    - WEATHER BY DAY: Overlay weather data onto each record in the Brooklyn collision data set, joining by collision date and hyper-local location where possible.
    - TRAFFIC DENSITY BY DAY: Determine whether measurements of traffic (eg. metered bridges, roads, tunnels) can serve as a proxy for traffic patterns in Brooklyn
    - VEHICLE DENSITY: Look at DMV registration data to understand the impact of overall vehicle density and density by vehicle category.