

M7 Project Work

Traffic Tickets Issued: Four Year Window

Project Sponsor

Sponsor: DMV Commissioner & GTSC Chair

The New York Governor's Traffic Safety Committee (GTSC)

Motivation:

- The goal of the GTSC is to improve law enforcement operations' efficiency and public safety. Its main goal is to alleviate traffic-related issues and enhance community well-being by applying data-driven initiatives. The GTSC seeks to create focused tactics that support safer roadways and more efficient law enforcement techniques by examining patterns of traffic violations. Their goal is to lower the number of traffic-related fatalities and injuries by engineering, enforcement, and education. The GTSC aims to promote a culture of safety for all users on the roads in New York State.

Big Idea

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Our Big Idea is to carefully examine data on traffic violations in order to identify patterns across various demographic groups, the kinds of violations committing, and the timings. By understanding the "who," "what," "where" and "when" of traffic violations, we aim to provide the New York Governor's Traffic Safety Committee (GTSC) with actionable insights. Through the use of this information, GTSC will be able to better target its educational campaigns, refine its enforcement strategies, enhance its infrastructure, and develop its policy and driver education programs. Encouraging a more knowledgeable and proactive approach to road safety that addresses the underlying causes of traffic violations is the ultimate goal. With this information, GTSC can launch specific programs by determining which groups are most prone to specific types of violations and by identifying temporal trends. By implementing these measures, there might be a significant reduction in traffic violations, an improvement in road safety for all users, and an efficient allocation of resources to affected areas.

3 min Story:

- We found that most traffic penalties issued in the past four years have been for speeding, particularly in specific locations. These tickets are often issued to young males in their early thirties. Same pattern can also be seen in the other traffic rule violations. **Interestingly, while the ‘speed in zone’ pattern holds for both genders, females list 'Speed over 55 zone' as the second most frequent infraction, differing from males, who tend to disregard traffic devices more.** According to our data, most traffic rule violators are in their twenties. As people age, this lowers. The top spot on the list for where these violations occur is New York City, followed closely by the counties of Suffolk and Nassau. This indicates that there are more traffic citations issued in cities and the surrounding areas. An additional layer of understanding is provided by the temporal analysis, which highlights the midweek—particularly Wednesdays and Fridays—as well as the months of March, January and May as hotspots for violations. This suggests that a combination of regular commuter patterns and seasonal factors influence driver behavior. The year 2020 is notable because of a decrease in infractions brought on by the pandemic, highlighting outside influences on driving behaviors.
- Nearly 20% of the violators do not belong to New York State. With a significant percentage of outsiders, The New York Governor's Traffic Safety Committee (GTSC) also needs to concentrate on the out-of-staters, mainly the neighboring states, by finding new ways to educate out-of-staters.
- Based on all this data, we propose that young male drivers should receive particular attention in an effort to lower traffic violations. We can more effectively plan how to train drivers to follow the rules and determine where more police should watch for violations. This approach seeks to address the primary causes of traffic rule violations in order to make the roads safer for all users.

Violation type frequency:

Violation type Frequency table

Violation Description	Count of Violation Descripti..	% of Total Count of Violation..	Average age of Violator	Male Percentage along Viola..	Female Percentage along Vi..
SPEED IN ZONE	1,148,386	10.80%	35	7	4
DISOBEYED TRAFFIC DEVICE	673,121	6.33%	40	5	2
UNLICENSED OPERATOR	599,337	5.64%	33	4	1
SPEED OVER 55 ZONE	596,497	5.61%	35	4	2
UNINSPECTED MOTOR VEHICLE	568,586	5.35%	36	4	2
SPEED IN ZONE 11-30	348,888	3.28%	37	2	1
UNREGISTERED MOTOR VEHICLE	316,574	2.98%	36	2	1
OPER MV WHILE USING PORTABLE EL..	294,700	2.77%	37	2	1
FLD TO STOP AT STOP SIGN	276,322	2.60%	38	2	1
OPERATING W/O INSURANCE	245,995	2.31%	35	2	1
AGGRAVATED UNLIC OPER 3RD MISD	238,872	2.25%	34	2	1
NO/INADEQUATE HEADLAMPS	231,320	2.18%	36	1	1
NO SEAT BELT ADULT	219,653	2.07%	38	2	0
PLATE MISSING/INSECURE/DIRTY	215,980	2.03%	36	2	0
SIDEWINGS/SIDEWINDOWS/NON/TR..	190,729	1.79%	30	1	0
OPERATING MV MOBILE PHONE	176,756	1.66%	41	1	1
INADEQUATE OR NO STOP LAMPS	163,337	1.54%	38	1	0
FLD YIELD PEDEST NYC	156,372	1.47%	44	1	0
MOVED FROM LANE UNSAFELY/WEAV..	143,047	1.35%	36	1	0
NYC REDLIGHT	128,260	1.21%	40	1	0
NO LAP/SHOULDER HARNESS OR DJ V..	122,603	1.15%	40	1	0
IMPROPER SIGNAL	108,943	1.02%	38	1	0
OPERATING REGISTRATION SUSP/RE..	105,037	0.99%	36	1	0
DRIVING WHILE INTOXICATED	103,202	0.97%	38	1	0
NO/INSUFFICIENT TAIL LAMPS	100,060	0.94%	37	1	0
UNLICENSED GT 60DAYS	97,923	0.92%	34	1	0
SPEED NOT REASONABLE AND PRUDE..	97,470	0.92%	33	1	0
MOTR CARRIER OPER VEH IN VIOLATI..	96,004	0.90%	42	1	0
IMPROPER TURN	84,622	0.80%	42	1	0
NO/INADEQUATE PLATE LAMPS	83,592	0.79%	36	1	0
PASSED RED SIGNAL	80,716	0.76%	37	1	0
FOLLOWING TOO CLOSELY	74,297	0.70%	35	0	0
SPD-UNPSTD 11-30 NYC	72,813	0.68%	39	1	0
IMPROPER PLATES	72,507	0.68%	34	1	0

Violation demographics by age group

Violations demogrphics by age group (2)

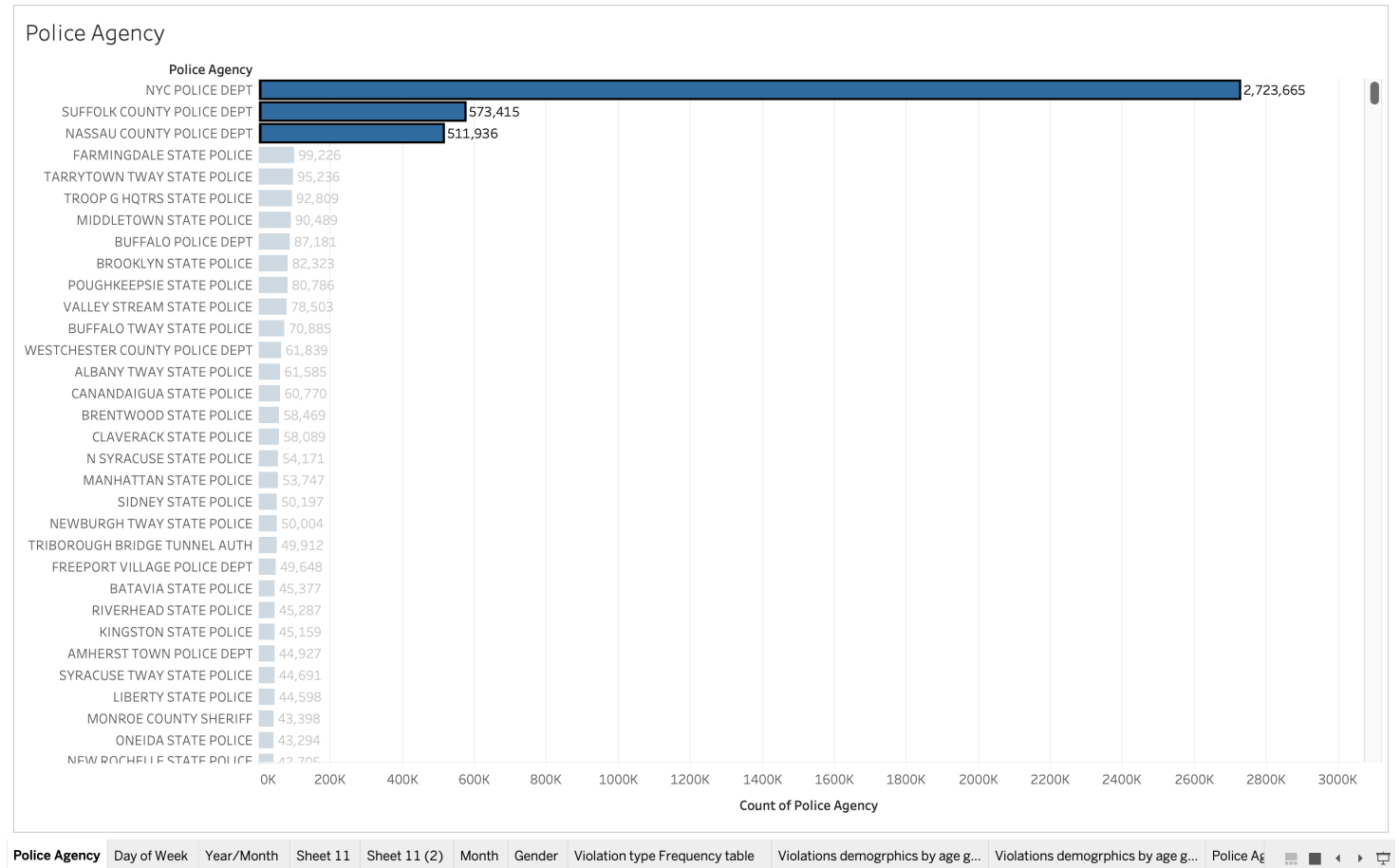
Age at Violation (bin)	% of Traffic Violations	Male Percentage	Female Percentage
10-19	5.80%	4.34	1.47
20-29	32.80%	24.06	8.74
30-39	25.21%	18.41	6.79
40-49	16.28%	11.96	4.32
50-59	12.13%	9.04	3.09
60-69	5.94%	4.54	1.40
70-79	1.59%	1.16	0.42
80-89	0.24%	0.17	0.07
90-99	0.02%	0.01	0.00

Change Point:

- Column headers are improved.
- Age at violations bins are properly indicated.
- Number of violations changed to % of violations for better readability along with the Male & Female percentages

**** After slide****

Violations Count & Percentage in the area of Police agency



Change point

This can be better represented in graph rather than as a table

****Before****

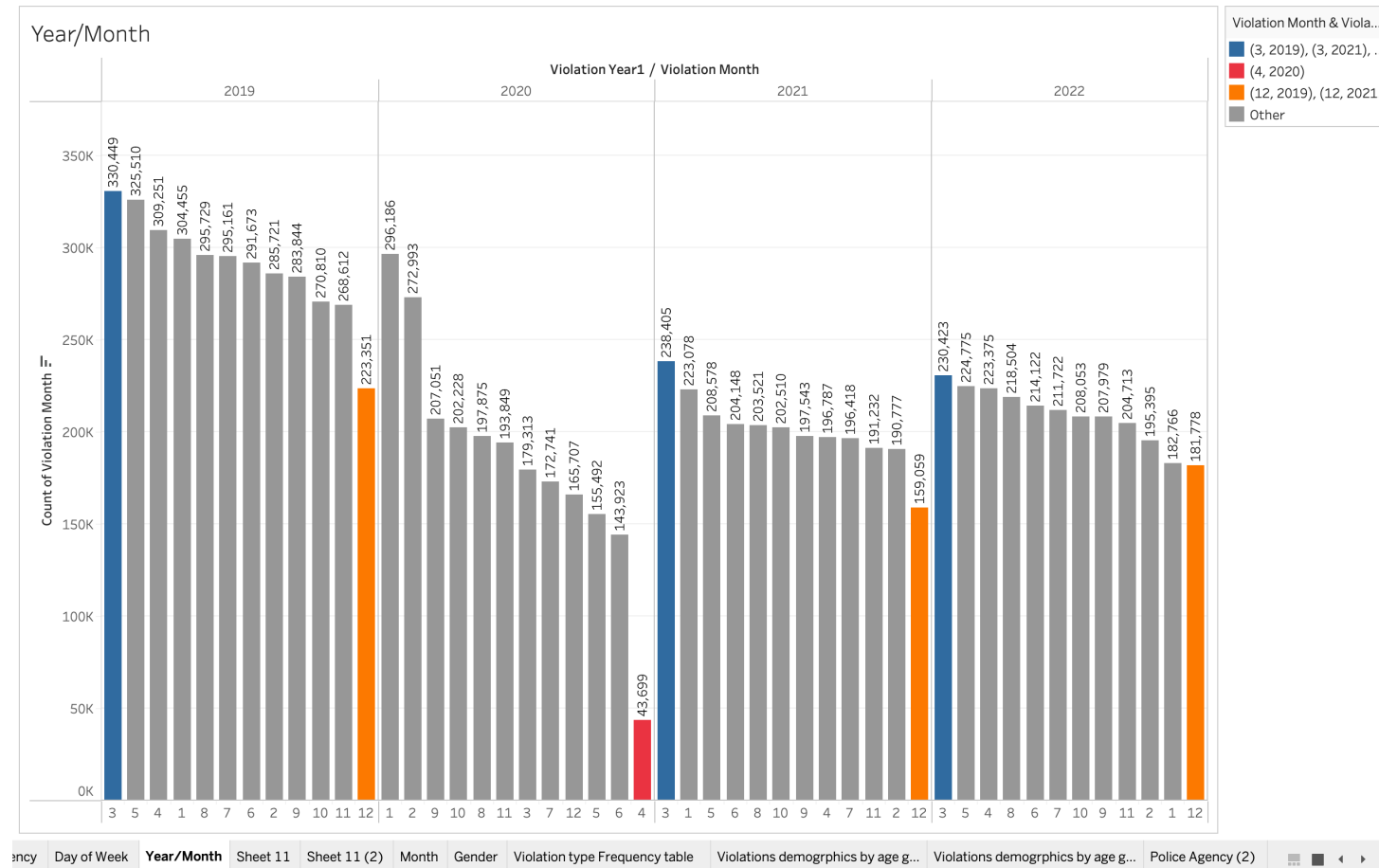
Year by month Violations:

Supporting explanation:

This year by month bar chart can be visualized with a line chart but year by month is best visualized in bar chart.

In line graph is good for single year. But for multiple years bar graphs are best for comparing, year to year, months in different years etc..

- Highlighted the peak and lowest violations of months in every year
- Blue:** March has the highest number of violations in every month except pandemic year 2020
- Orange:** December has the least number of violations in every year except the pandemic year 2020
- Red:** April 2020 has the least number of violations of all due to the Covid Lock down

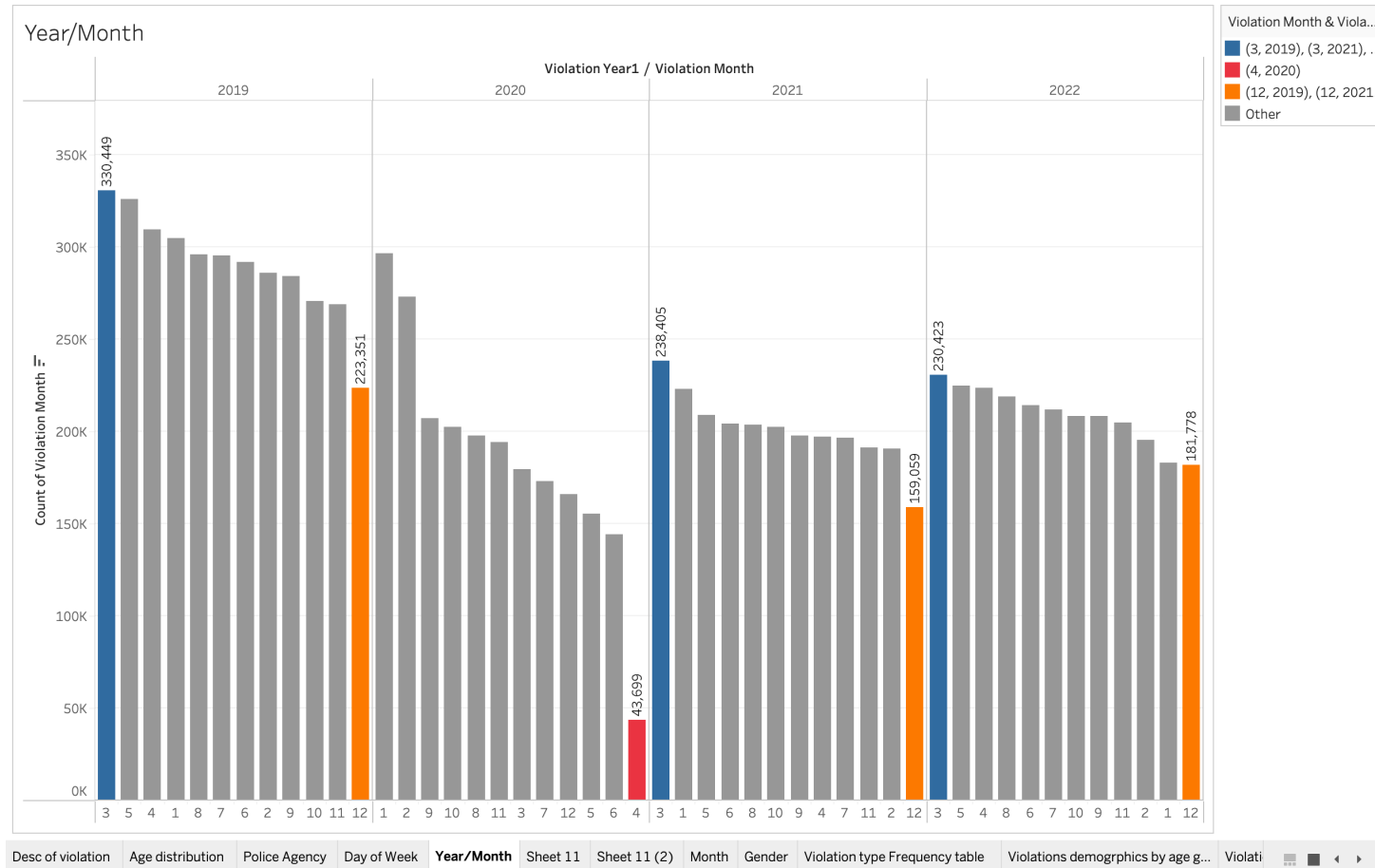


****After****

Year by month Violations:

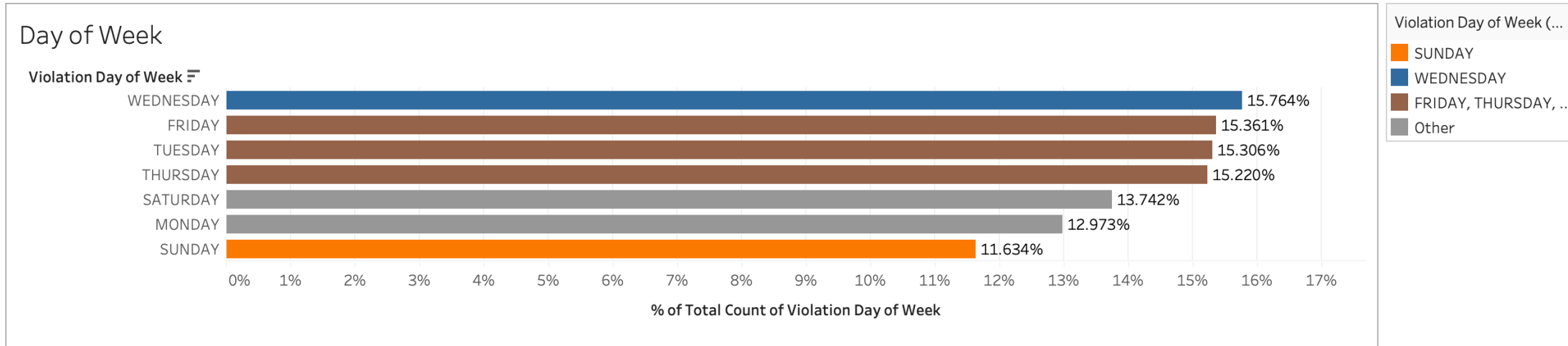
Change point :

Removed the unnecessary labels for the bars.



- Highlighted the peak and lowest violations of months in every year
- **Blue:** March has the highest number of violations in every month except pandemic year 2020
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Count of violation day of week



Supporting explanation:

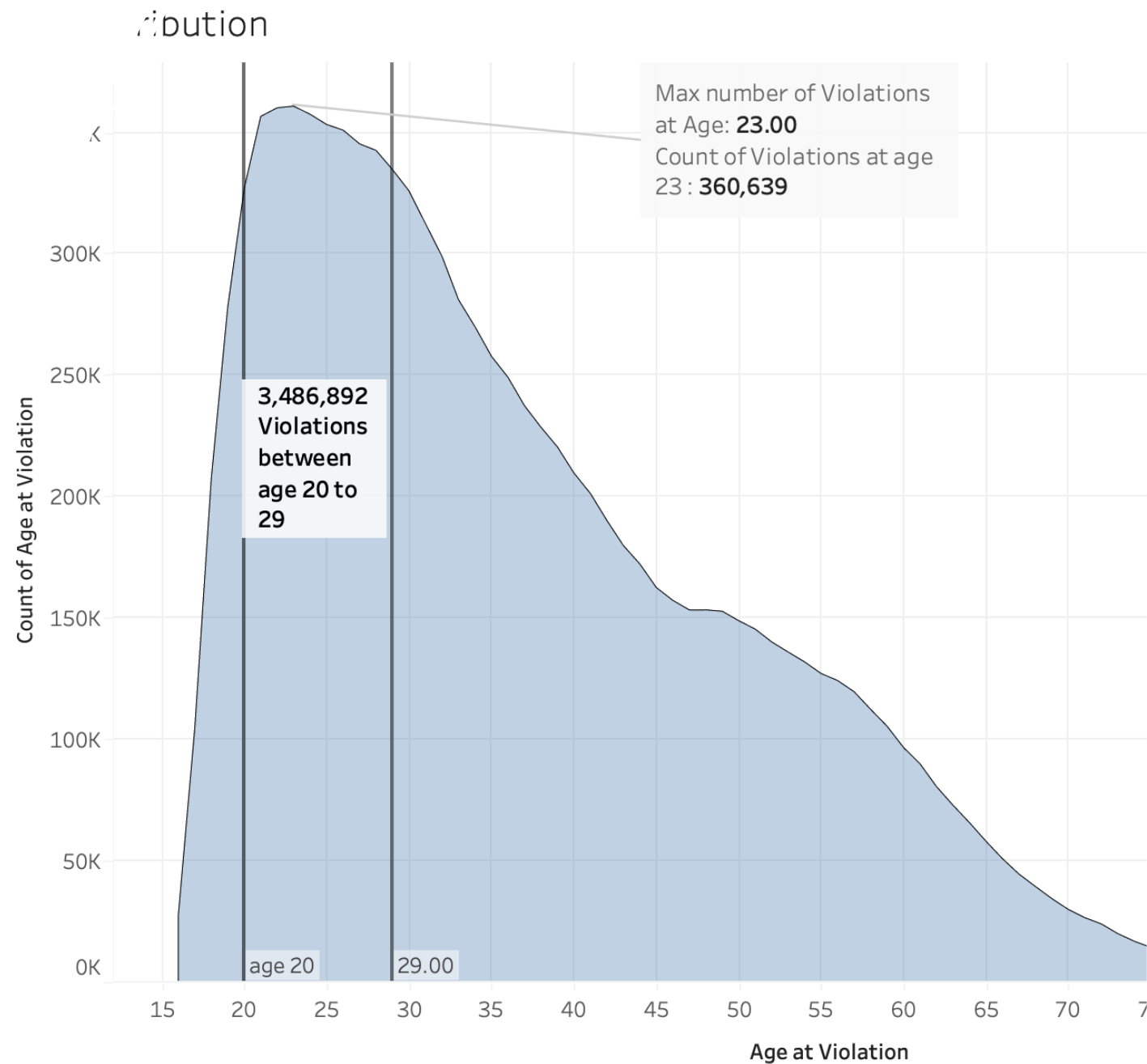
Weekly patterns are very important for observing the violations, because people's behaviors' are almost similar in every week.

Bar graph is more suitable over line graph since there are only seven categories, and each category and bar can be labeled. Line graph is not the best here.

- Histogram bars are labeled with the percentage instead of numbers for easy readability.
- And Grouped the days of the week by color highlighting.
- Highest number of violations are on **Wednesday**, which is the mid of the week.
- **Friday, Tuesday & Thursday** can be seen under same group because they almost have similar percentages and they are around mid of week.
- **Sunday has the least number of violations**

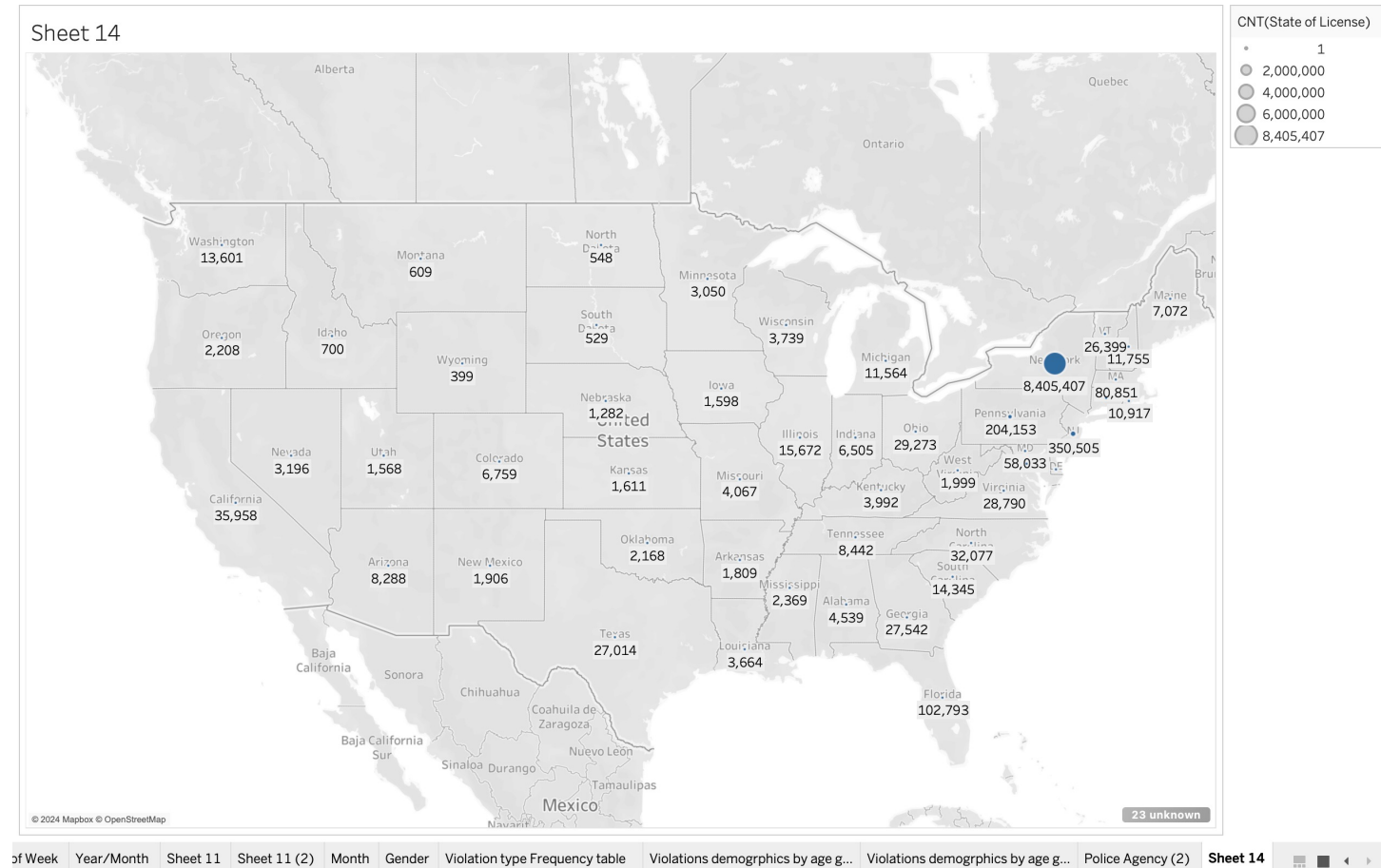
Distribution of Age at Violation

- The 20-29 Age group committed highest number of violations compared to the other age groups.



****Before****

New York State Traffic Violations by Driver's License Origin

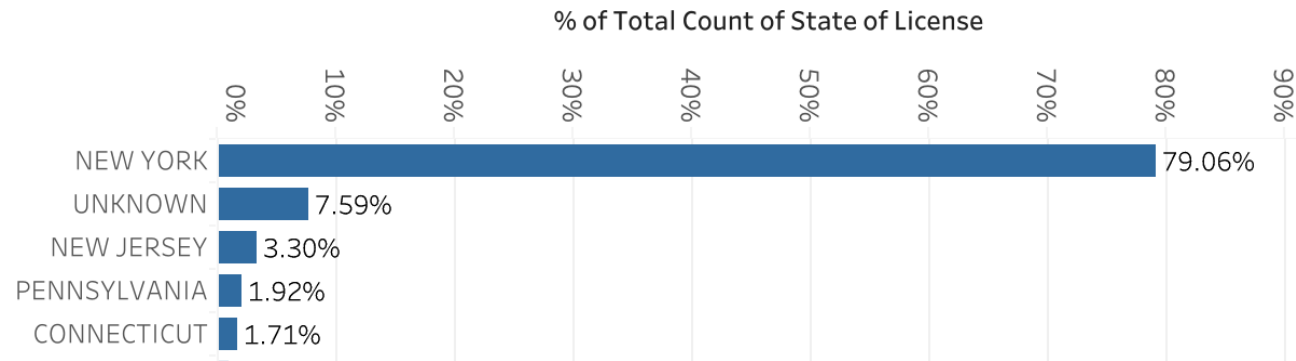


From this geo-graphical visualization, it can be seen that there are nearly 20% percentage of the violators who does not belong to the New York State.

With a significant percentage of outsiders, The New York Governor's Traffic Safety Committee (GTSC) also need to concentrate on the out staters, mainly the neighboring states by finding a new ways to educate outstaters.

****After****

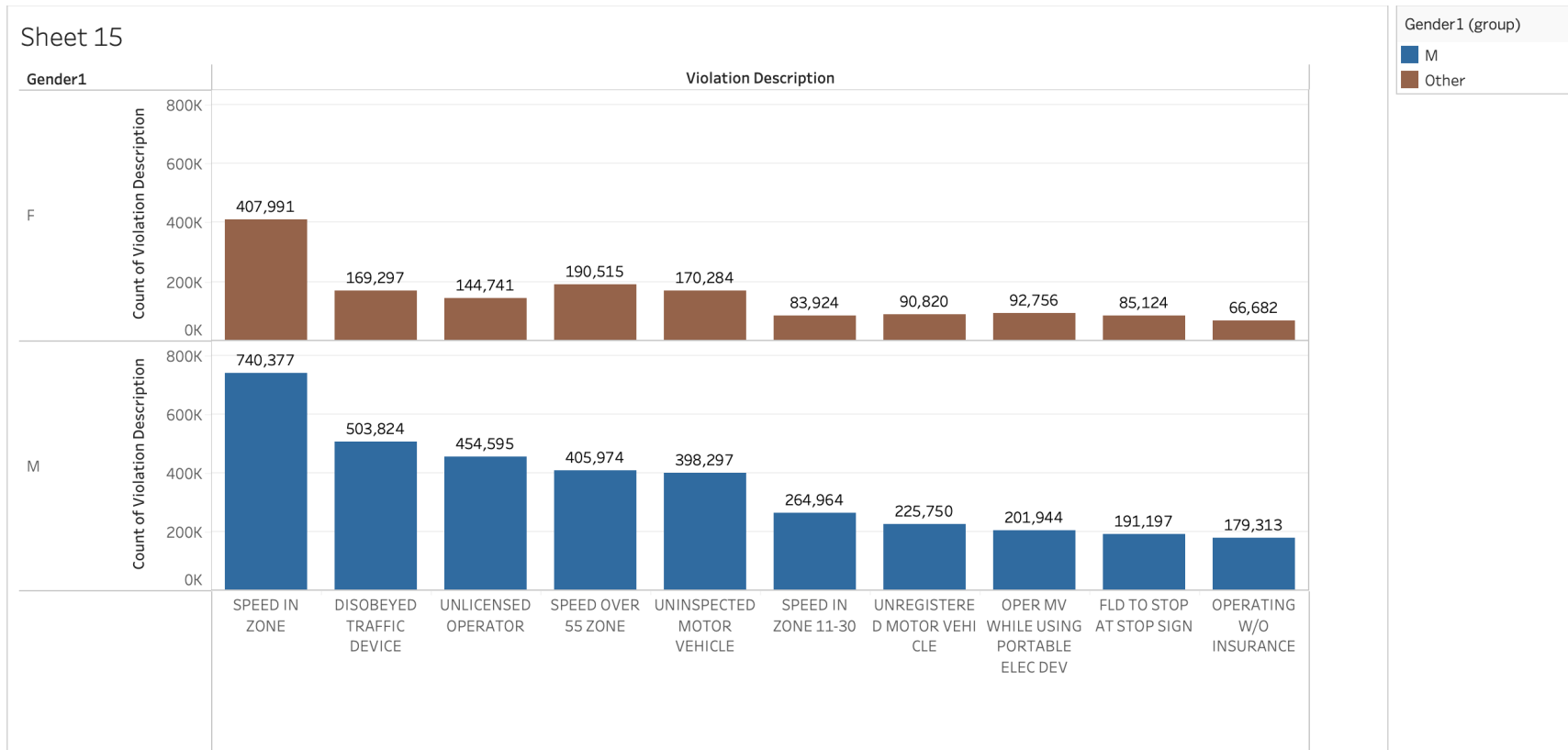
New York State Traffic Violations by Driver's License Origin



- It can be seen that there are nearly 21% percentage of the violators who does not belong to the New York State.
- And there are 7.59% of violators with unknown identification of state
- With a significant percentage of outsiders, The New York Governor's Traffic Safety Committee (GTSC) also need to concentrate on the out staters, mainly the neighboring states by finding a new ways to educate outstaters.

****New****

Top 10 Violations by Gender:



- In both Males and Females, 'Speed in zone' is the top violation
- The second top violation by females is speed over 55 zone unlike disobeying traffic device in males.
- With proper educational outreach programs these violations can be reduced



Thank
you