Five Year Analysis

Traffic Group

June 10, 2018

This part of the analysis deals with finding trends over a 5 year period in the Bay Area. For finding trends over 5 years, we looked at the data on Highway 101 North going towards San Francisco from January-March, 2014-2018. We first looked at daily flow (number of vehicles that crossed over sensor) patterns over the years. Note that we used only the highway sensor stations that existed in 2014. More sensors were built later, and those sensors' data was removed, since it would artificially increase the flow.

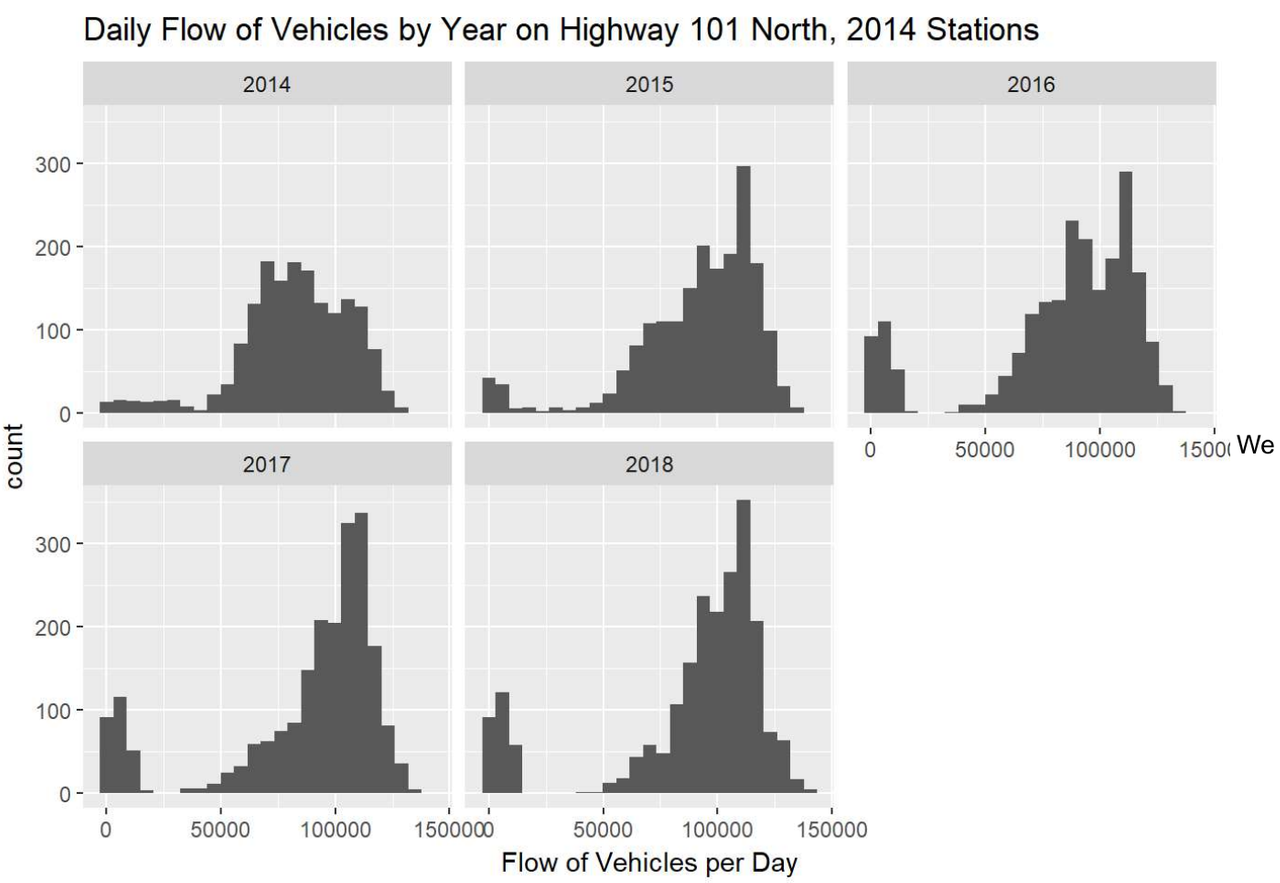
```
## Warning: package 'ggmap' was built under R version 3.4.4
```

```
## Warning: package 'purrr' was built under R version 3.4.4
```

```
##
## Attaching package: 'plyr'
```

```
## The following object is masked from 'package:purrr':
##
##     compact
```

```
## Warning: package 'gridExtra' was built under R version 3.4.4
```



noticed from the plot above that there is a cluster forming around 0 flow starting from 2015 and becomes very prominent by 2018. This could mean intense backups along the highway due to increased demand of getting into the city. Next, we see overall that there are more cars on the road from year to year as the main curve (discluding the cluster around 0) gradually becomes right skewed.

Next, we see if there are any different patterns between weekdays vs. Fridays vs. weekends from year to year.

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## Warning: Removed 4 rows containing missing values (geom_bar).

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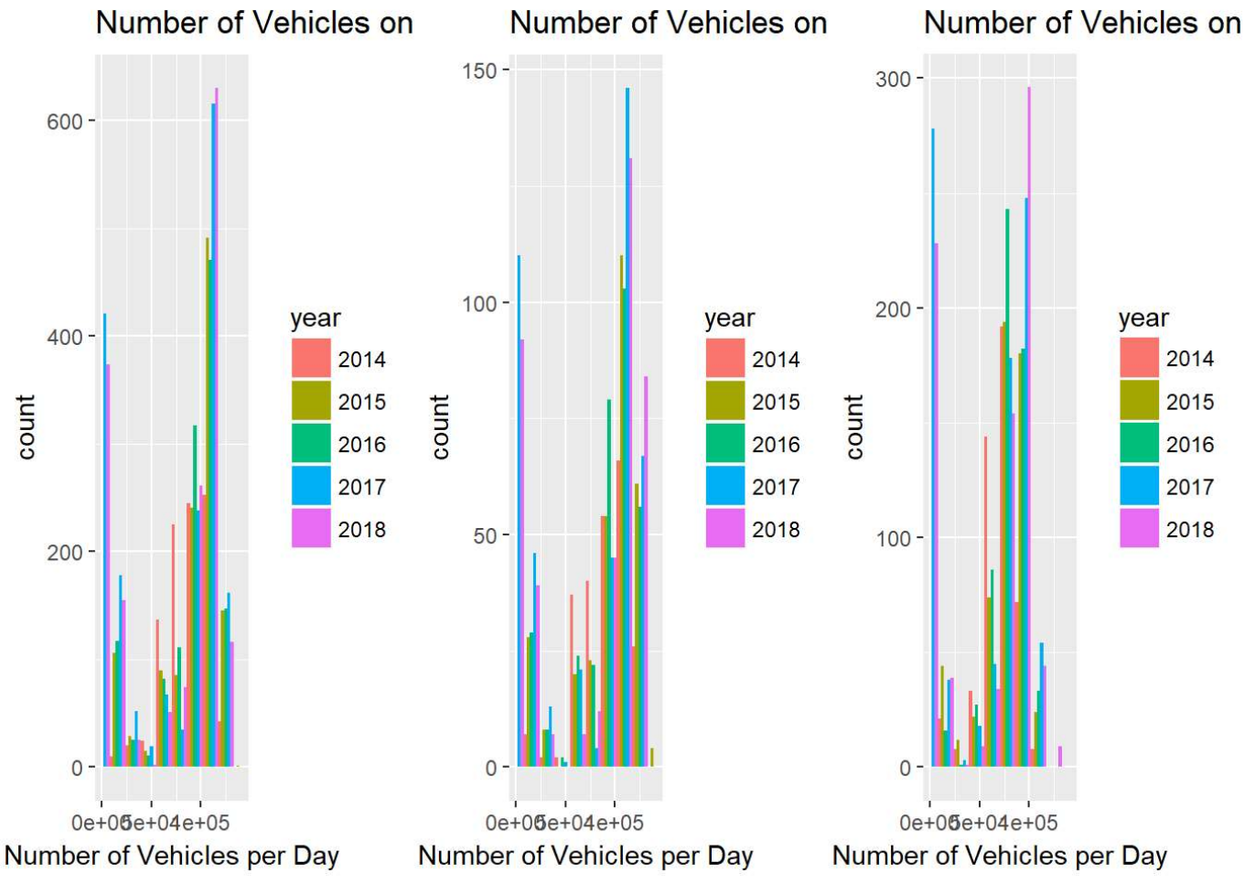
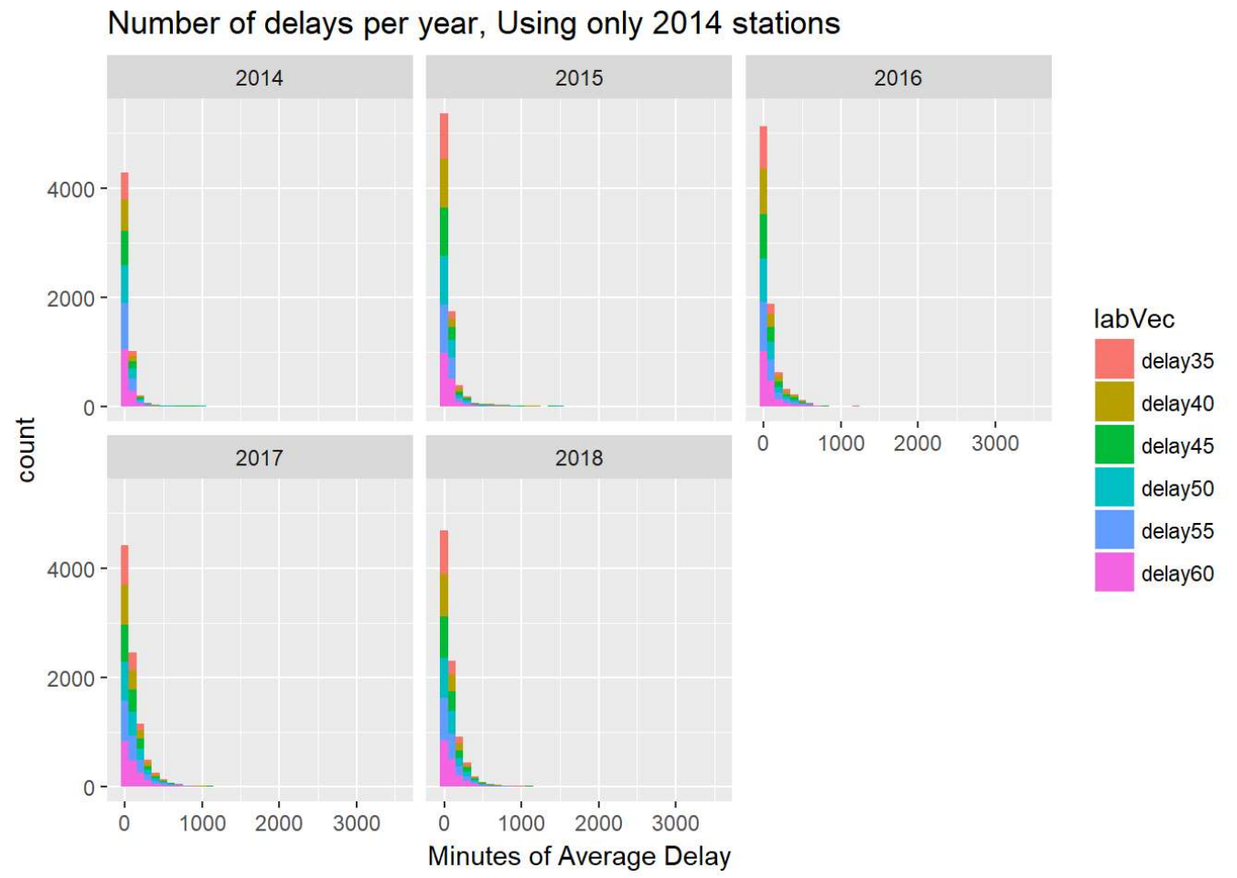


First, we can see that in 2016-2018, there are more vehicles on Highway 101 on weekdays, which can be tied to worker commutes going to San Francisco. The contrast between weekdays and Fridays is most prominently seen near the high end. However, there are not many differences in distribution between weekdays and specifically Fridays. We do see less cars on the road on weekends, since those are not working days. More vehicles are generally on the road on Fridays. Next thing we see are the outliers on the Weekends plot. There are some occurrences of high vehicle flow in 2018 on weekends, meaning it is increasingly popular to drive to the city on weekends.



This counts the number of delay types and is color coded by delay The values on the x-axis are the average duration over the day of the specific delay. For delay 35, a considerable number of delays occurred in 2016-2018. There is also a continuous increase in overall number of delays as delay threshold increases, which is to be expected.