

# COVID-19 DataFest

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## Topic

We will investigate bridge traffic statistics from the Niagara Falls Bridge Commission and determine whether and how the COVID-19 pandemic has affected activity at the Lewiston-Queenston, Rainbow, and Whirlpool bridges. The Niagara Falls Bridges are the second-busiest port of entry between US and Canada (behind Kennedy International); thus, these traffic statistics offer a unique opportunity to examine how port crossing has been affected by the COVID-19 pandemic.

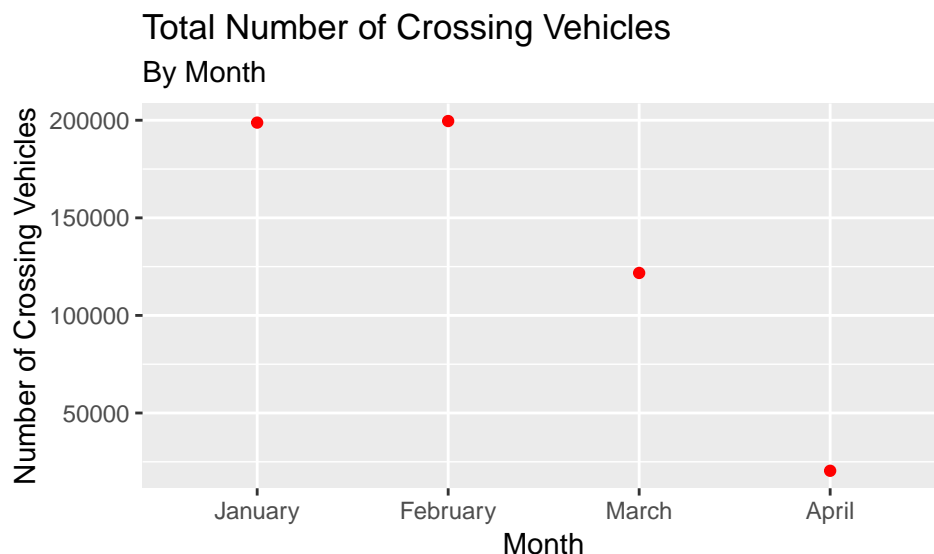
## Exploratory Data Analysis

We will begin by examining the aggregate data, which combines the traffic statistics from all three bridges – Lewiston-Queenston, Rainbow, and Whirlpool.

```
## # A tibble: 4 x 2
##   Month      total
##   <fct>      <dbl>
## 1 April      20409
## 2 March     121761
## 3 January   198787
## 4 February  199594
```

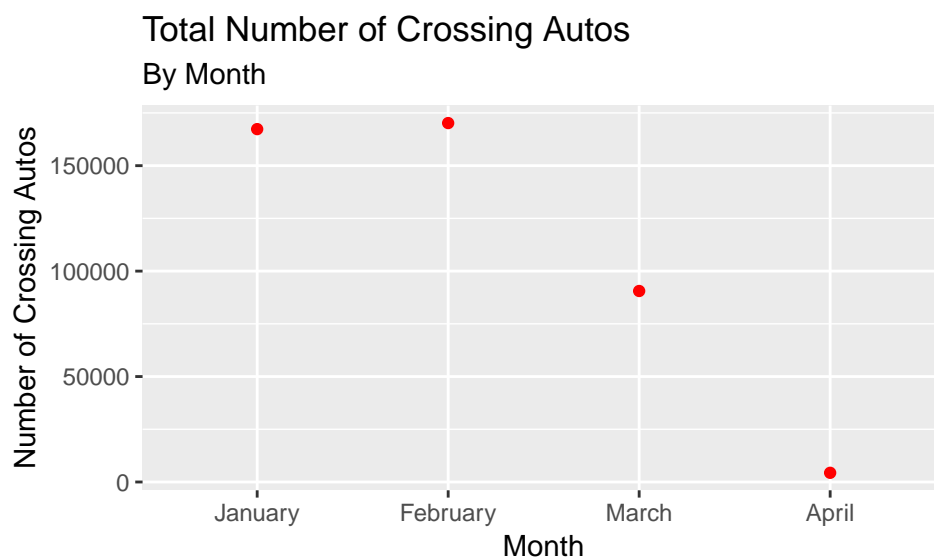
As we can see from the table above, bridge traffic was similar in January and February, with about 200,000 vehicles crossing in each month. However, when comparing February to March, we notice a large discrepancy in the number of vehicles – roughly 80,000 less vehicles! Furthermore, comparing March to April reveals an even greater discrepancy – almost 100,000 less vehicles! In sum, from January 2020 to April 2020, the number of vehicles crossing the Niagara Falls Bridges drastically decreased (approximately -180,000 vehicles).

Of course, this aligns with our expectations given the lockdown and social distancing guidelines which have been in place in March and April 2020.

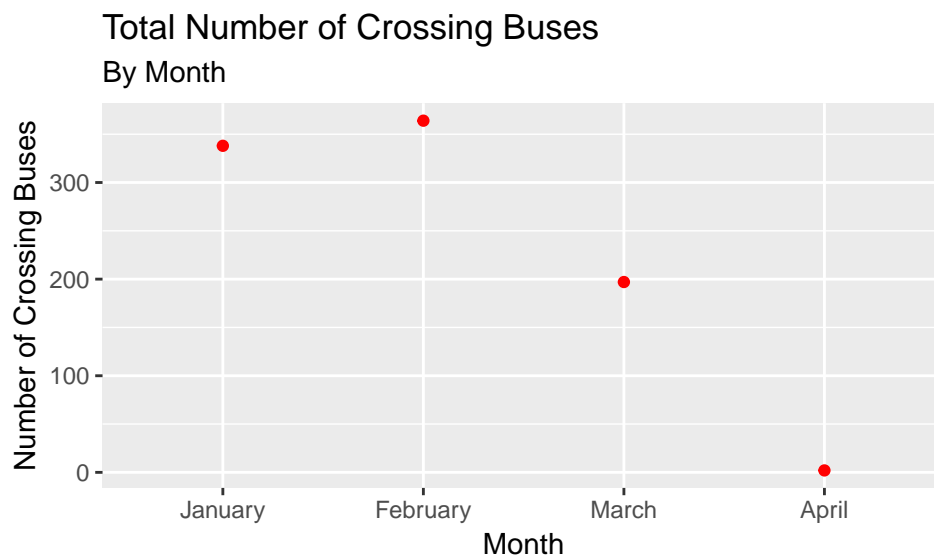


Based on the scatterplot above, there seems to be a nonlinear relationship between month of the year and the number of vehicles crossing the bridges.

```
## # A tibble: 4 x 2
##   Month    totalA
##   <fct>    <dbl>
## 1 April      4359
## 2 March    90570
## 3 January 167326
## 4 February 170191
```

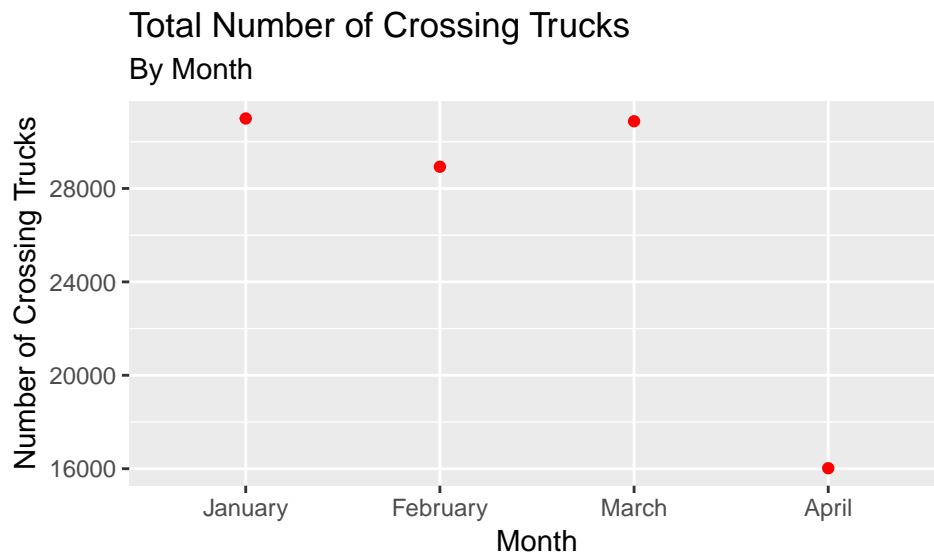


```
## # A tibble: 4 x 2
##   Month    totalB
##   <fct>    <dbl>
## 1 April         2
## 2 March       197
## 3 January     338
## 4 February    364
```

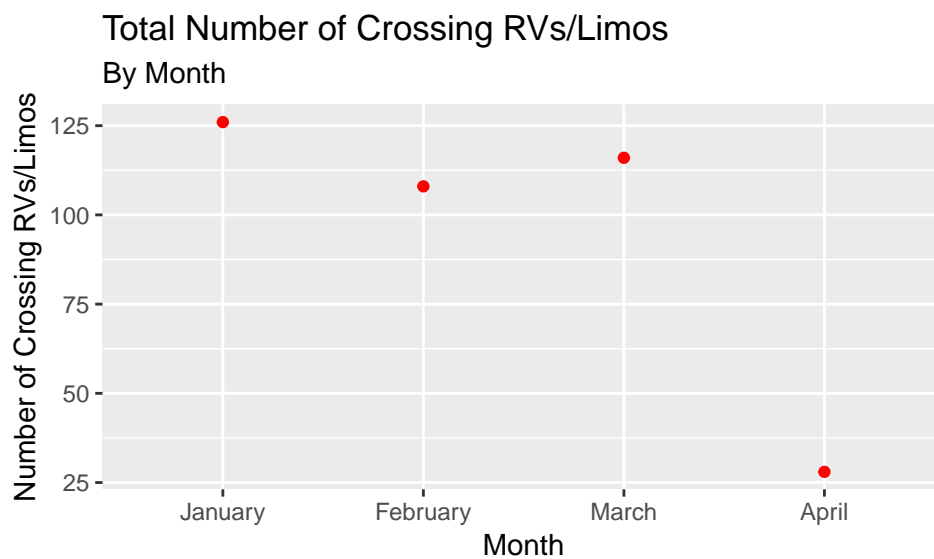


```
## # A tibble: 4 x 2
```

```
## Month totalT
## <fct> <dbl>
## 1 April 16020
## 2 February 28931
## 3 March 30878
## 4 January 30997
```



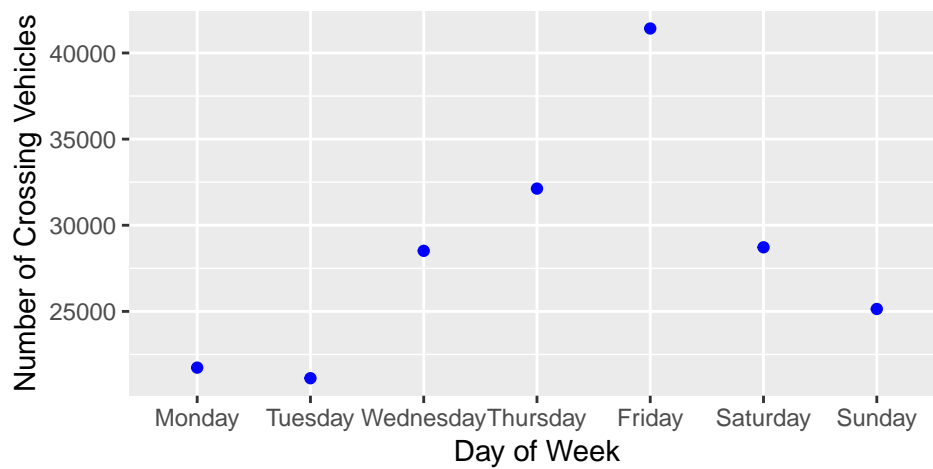
```
## # A tibble: 4 x 2
## Month totalRL
## <fct> <dbl>
## 1 April 28
## 2 February 108
## 3 March 116
## 4 January 126
```



```
## # A tibble: 7 x 2
## `Day of Week` total
## <fct> <dbl>
## 1 Friday 41421
```

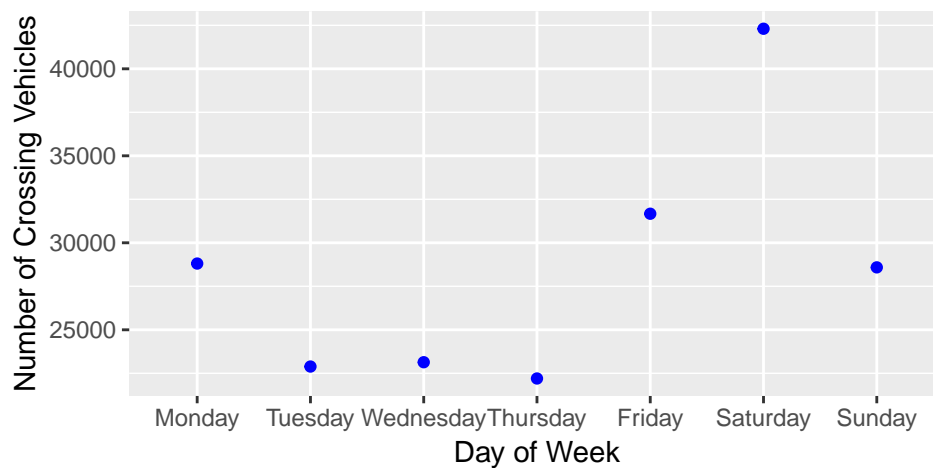
```
## 2 Thursday      32128
## 3 Saturday      28722
## 4 Wednesday     28516
## 5 Sunday        25142
## 6 Monday        21736
## 7 Tuesday       21122
```

Total Number of Crossing Vehicles in January  
By Day of Week



```
## # A tibble: 7 x 2
##   `Day of Week` total
##   <fct>         <dbl>
## 1 Saturday      42302
## 2 Friday        31670
## 3 Monday        28808
## 4 Sunday        28588
## 5 Wednesday     23136
## 6 Tuesday       22888
## 7 Thursday      22202
```

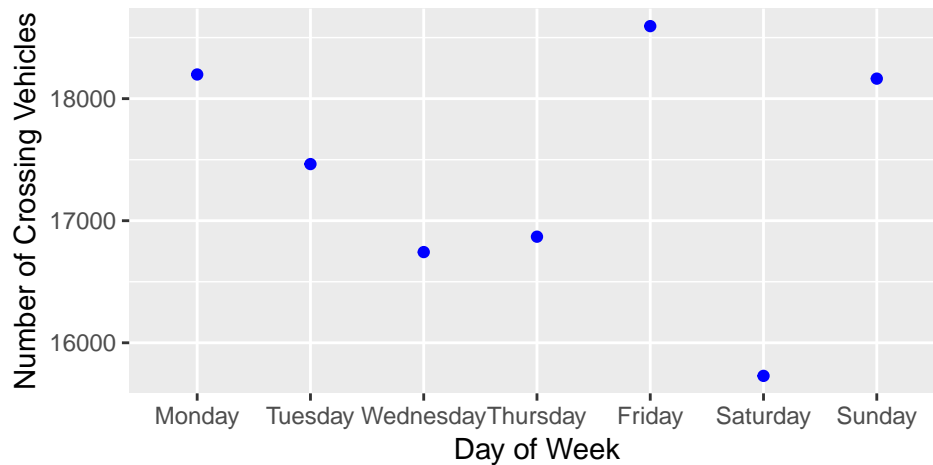
Total Number of Crossing Vehicles in February  
By Day of Week



```
## # A tibble: 7 x 2
```

```
## `Day of Week` total
## <fct> <dbl>
## 1 Friday 18594
## 2 Monday 18198
## 3 Sunday 18164
## 4 Tuesday 17464
## 5 Thursday 16869
## 6 Wednesday 16743
## 7 Saturday 15729
```

Total Number of Crossing Vehicles  
By Day of Week in March



```
## # A tibble: 7 x 2
## `Day of Week` total
## <fct> <dbl>
## 1 Wednesday 4075
## 2 Thursday 3913
## 3 Tuesday 3852
## 4 Friday 3509
## 5 Monday 3045
## 6 Saturday 1317
## 7 Sunday 698
```

