Data Analysis Interview Challenge

**Part 1 – Exploratory Data Analysis**

**Part 2 – Experiment & Metrics Design**

***Key Measure of Success:***

I would choose to measure driver partner bridge crossings. Within the realm of what is measurable as a city manager, I think this makes the most sense because our goal is more dual-city availability. But availability isn’t a data point that is easy to access or aggregate. We could also have the balancing measure of total bridge crossings, and track driver partner crossing as a % of total crossings to not mistake overall traffic increase with a successful experiment.

***Practical Experiment:***

My idea for this experiment would be to include 3 different groups of driver partners: one control with no reimbursement, one with a after-the-fact process for manually adding how much you paid for tolls, and one a sort of “fasttrak” that allows for automatic free crossing without having to worry about paying and being reimbursed (assuming we could work with the bridge authority to set this up). Then compare the 90 days pre- and post-intervention with an Analysis of Variance (ANOVA) test on the results to see if the variation is statistically significant.

To interpret these results we would check the results against the null hypothesis that there is no difference between the means of the individual group changes, rejecting if we get a p-value below the standard 0.05 (with one test). If we can reject that null hypothesis we could then take the groups and compare individually against another using something like a Tukey Multiple Comparison of Means to see what is driving the difference of means. And recommend the intervention that is most statistically likely to incentivize more driver partners to operate in both cities.

**Part 3 – Predictive Modeling**