Experiment and Metrics Design

1. Measure of success

The measure of success that could be used in this experiment is to get the fraction of trips a driver partner has in their city; for example, if a driver partner does 10 trips during the time of the experiment and six of the trips are in their city then the driver partner gets a score of 0.6. Therefore, the closer a driver partner is to a score of 0.5, the less they prefer one city over the other.

2. Experiment Design

In order to conduct the experiment, we would give half of the driver partners the special reimbursement of tolls deal but not to the other half. It is important that we choose the control group and special group carefully, so we need to split each city's local partners randomly in half; after splitting the two groups, we should have half of both Gotham and Metropolis drivers in the control group.

After splitting the driver partners into the two groups, the experiment can begin. Once the experiment has been carried out for a reasonable amount of time, the statistical tests to determine whether or not the reimbursement of tolls encouraged driver partners to serve the other city can be done; due to its simplicity, we can use bootstrapping tests to conclude whether a significant difference in behavior was observed. We start the statistical inferential tests by scoring all the driver partners and getting the average score of the driver partners in the control and experimental groups. Whatever the difference between their scores, permuted bootstrapping simulation can be carried out in which the two groups are simulated to have equal average scores; this will tell us what the probability would be that the difference

observed between the two groups could happen to chance. In effect, if the bootstrap tests conclude with more than 95% confidence that the observed difference between groups could not have happened due to chance, then we can reject the null hypothesis that there is no difference observed between the group offered the promotional reimbursement and the control group. This would mean that we could conclude with 95% confidence that offering the toll reimbursement to driver partners does indeed encourage them to accept rides from the opposing city. Further experiments can be carried out to determine by how much offering toll reimbursements improves driver partners' willingness to offer their service to the other city.