Ultimate Take Home Challenge part 2

1) If the only goal is to get drivers to work out of both cities, the obvious measurement would be number of tolls reimbursed. However, I would suggest this is a business decision, thus perhaps a better measurement would be increase in mean profit. It would be better to measure profit rather than revenue, because profit would take into account the money lost in reimbursed tolls, instead of just increased revenue. The underlying assumption is if drivers have more perceived freedom to pick up riders, the company's profit would increase.

2) Based on the suggested profit experiment, assuming drivers have a "home base" In one of the two cities, I would divide the drivers from both cities into two batches and offer toll reimbursements to one of the halves from each city. Thus, there are four batches of drivers, one from each city who don't get tolls reimbursed and one from each city who do get tolls reimbursed. Then, the experiment is run for however many days the company wants, 30, 60, 90, whichever, and the mean profit is measured each day for all drivers.

Once the experiment is concluded, a 2-tailed t-test can be run on the data to determine whether the mean profit is higher or lower with the tolls reimbursed than without. Specifically, run the t-test on the difference between mean profit with tolls reimbursed and without. The hypothesis test would be the difference between mean profits is 0, with the outcome of the test showing the evidence one way or the other.

Based on the p-value calculated, the company can decide if it is more profitable to continue reimbursing tolls or revert to the original operating procedure. Perhaps, the data can be further studied and tolls reimbursed only during specific times of day and/or in specific directions, since during the week, Metropolis is busier during the day and Gotham is busier at night.