

## **Part 2 : Experiment and metrics design**

There are two neighbouring cities. One city remains active in the day and the other one at night. They are connected by a toll bridge with a two way toll. To save the toll fee the driver partners are found to drive within one of the cities only. Manager of city operation has proposed an experiment to encourage the driver partners to be available in both the cities by reimbursing the toll fee. So, now the question is asked: what would be the key metrics?

Ans 1.

First of all, I will make sure that the toll fee is the only reason the driver partners are not willing to cross the bridge. It could be possible that due to less activity in the other city, drivers avoid going there since the number of passengers will also be relatively less.

However, the key metrics of the experiment would be:

(a) The number of driver partners in each city at the same time after the experiment has been implemented.

(b) If there is an improvement in the number of drivers crossing the bridge. Similarly, if there is an increase in the number of passenger's request acceptance if the passenger wants to go to the other city.

© Monitor driver partner's activity for a period of time. That means if they stick to the same city before and after the experiment or they are found more or less in both the cities.

Ans 2:

I would design an A/B testing to check the effectiveness of the experiment.

a. I would randomly select some driver partners from both the cities and split them into a control group and a treatment group. The treatment group would be asked to be available in both the cities and reimburse the toll fee at the end of the day. The control group would be kept as it is. The sample size would be decided based on 0.05 significance level, 0.80 power and 5 % effect size

(practical significance). The span of the experiment depends on the number of data points.

(b) The hypothesis of our experiment would be:

I. Null Hypothesis  $H_0$ : The number of driver partners will not be the same in both the cities. They are exclusively in one of the cities at a time.

II. Alternative Hypothesis  $H_a$ : The number of driver partners will be distributed in both the cities.

The significance level is 0.05. A t-test will be performed to check the significance of our observation.

© The difference between the mean of the control group and treatment group will be calculated. Then the p-value is calculated and it measures the probability of observing the mean difference as extreme or more extreme assuming the null hypothesis is true.

If the p-value is less than 0.05, we can reject the null hypothesis.

If the p-value is greater than 0.05, we fail to reject the null hypothesis.

Recommendations: