

Uber Supply Demand Gap Analysis

Presented by:

Shayak Roy

This presentation deck contains the details of analysis of problem Uber is facing - driver cancellation and non-availability of cars leading to loss of potential revenue.

Objective:

Use the Uber data provided in the form of ride information by various riders who took rides from airport and from city, and hence gain meaningful insights to analyze loss in revenue.

Input Data:

- Uber ride details for limited duration having details such as rider ID, driver ID, pickup points, request time for the car and the drop time of the rider to the destination location.

Deliverables:

- Analysis through R programming to find the reasons why the supply of cabs didn't meet customer demands.
- R plots to visually analyze the problem and see trends in rides all through long.
- Suggest ways to handle this demand-supply gap.

Tools used:

- R for data cleaning and analysis
- Excel for data verification.

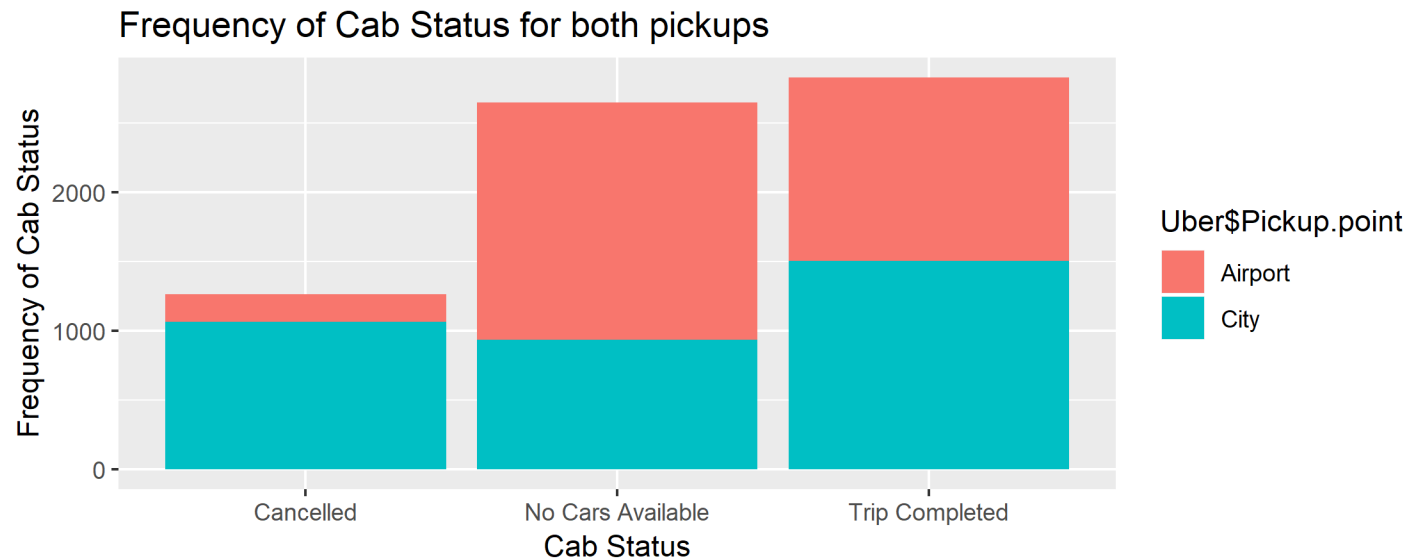
Data cleaning steps:

- Normalize the data by converting the date-timestamps to a single format and separate date, hour, minutes etc. for analysis.
- Finding out those hours in morning and evening when ride requests are high and cap them as different buckets.

(*) Didn't analyze the wait time of car drivers as, we are not sure if the car driver was idle the whole time at airport or was in other ride, as only airport ride are available in data.

Data Cleaning

Based on the data available, after importing it to R, we had to convert the Date-timestamp to a single format. Lets analyze frequency of cars available based on their status for both pick ups i.e. Airport and City.

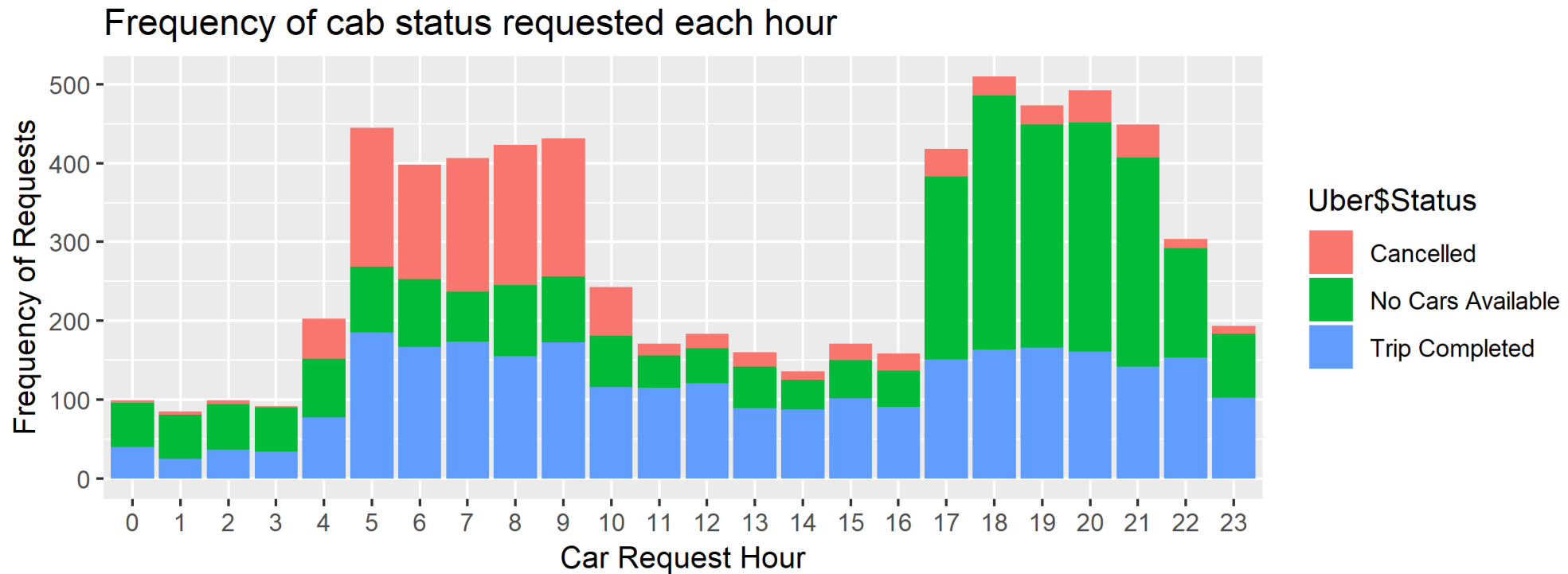


- We can visualize from above that, rate of cancellation is high from city, and unavailability from airport.
- But, is the pattern observed in above plot same for all day?

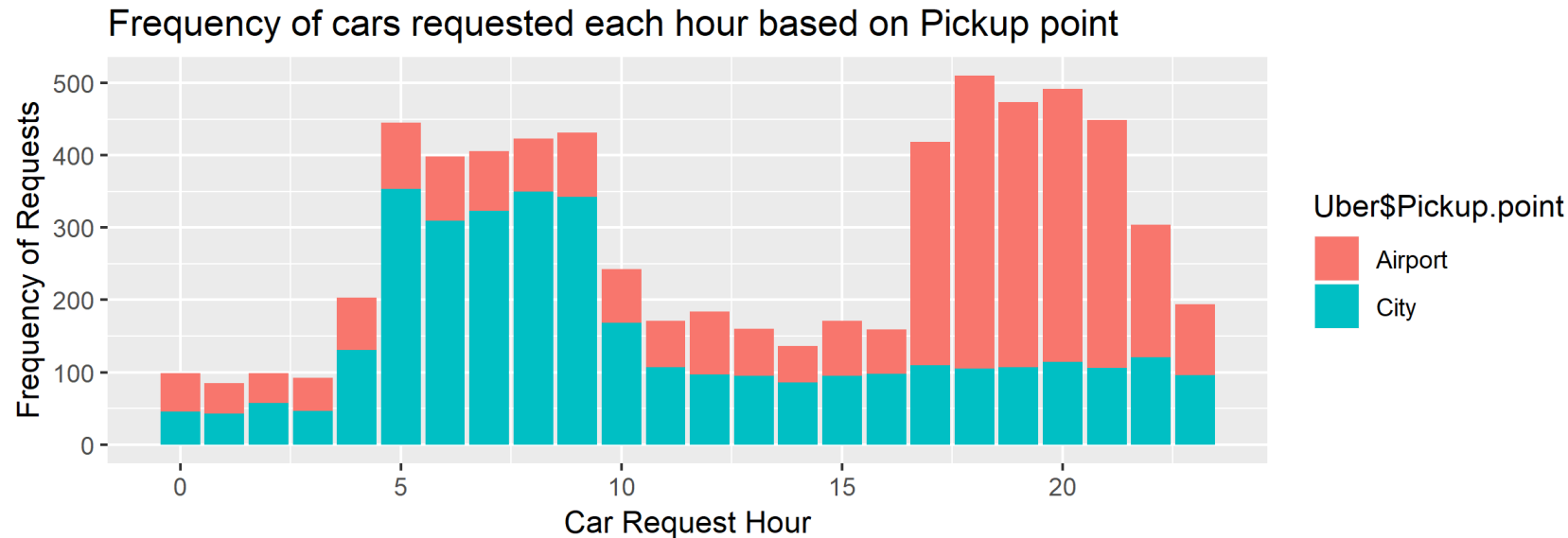
Contd..

To analyze the rides status that occurred over the day, we had to break up the distribution based on hours.
To achieve this, we broke up the request and drop date-time stamp based on year-month-date-hour and so on..

We then plot car availability status based on each hour:



Contd..

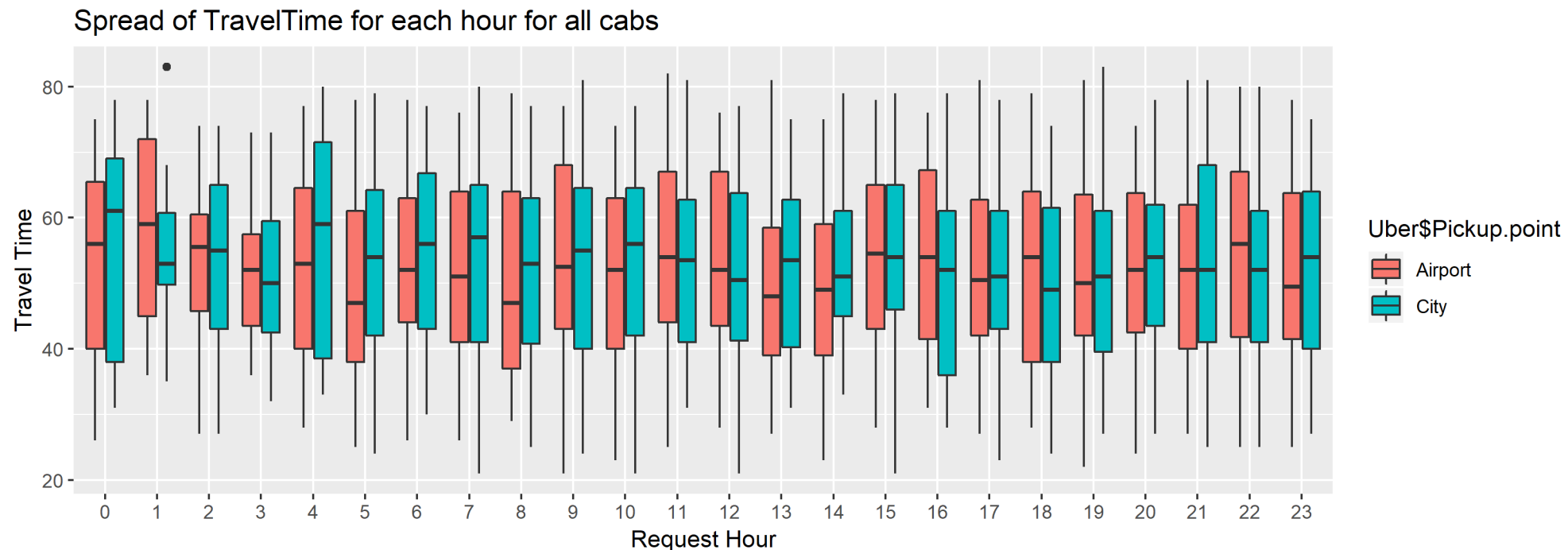


- We can observe that there are high peaks reflecting high car demands from 5am to 10am and later in evening from 5pm to 10pm.
- On analyzing along with previous plot, we could observe that requests are high for cars during morning from city to airport, which has bigger number of cars cancelling requests in the morning peak hours mostly from City as pickup.
- Also, in evening, requests for cabs are high from airport to city and a majority of cabs are marking them "Not Available" in the evening peak hours majorly from Airport as Pickup.

Analysis of Trip Cancellations

Based on previous plot, we need to understand the reason for trip cancellations.

- We take an assumption that travel time could lead to some reason behind this, so we plot a box plot of each city to airport travel time.
- We observe that in morning hours, average trip time from city is much higher as compared to rest day.



Contd....

- From the boxplot, it can be concluded that time taken to travel from city to airport in morning peak hours is high.
- So this is a primary reason for cabs cancelling in morning hours for a trip to airport. Uber needs to work on this.
- Based on calculation, 47.3% of cars cancel trips in morning peak hours for a trip to airport.
- Also, 71.6% cars are not available in evening peak hours from airport.
- As a business point of view, this can cause loss to Uber, so we have to recommend some ways to resolve this demand-supply crisis.

Problem Resolution

To address and resolve this loss in revenue caused due to shortage and cancellation of cars. Mentioned below are few ways it can be done:

1. Uber can try providing incentives and special allowances for airport trips during peak hours, and also some way to make additional cars available at airport during evening peak hours.
2. Uber can track intime of cars to airport by drop time of a rider at airport as starting time and hence calculate idle time at airport. If the car is idle for a long time, he should receive a notification that he has to take a ride soon. By this, Uber can check on driver if they halt for long hours at airport causing unavailability.
3. When rider books a car, he/she will just get an OTP and reach Uber pickup points, where each Uber car has to take turn by default and pick up riders in a queue and based on their OTP, he/she has to be dropped, hereby engaging all cars at airport, reducing them to make long halts.