Uber Supply Demand Gap Analysis

Exploratory Data Analysis

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Data Exploration and Problem Statement

The Given dataset consist of 6 columns.
Those are,

- Request.id
- Pickup.point
- Driver.id
- Status
- Request.timestamp
- Drop.timestamp

- The Data is present only for 5 continuous days, i.e.., from 11th July 2016 to 15th July 2016.
- The request id present for rides request from,
  - ✓ City to Airport
  - ✓ Airport to City
- Each row corresponds to a request with, an id to uniquely identify the request, the driver information if present, the DateTime when the request is placed and the End DateTime if the request corresponds to trip and is completed.

Objective:

- Identify the most pressing problem of Uber
- Problematic pickup point
- Problematic time frame
- Demand Supply analysis for the identified pickup point at the identified time frame
- Find the reason and recommend a solution close in the Demand-Supply gap

Data Cleaning and Attributes derivation

Data Checks performed:

- ✓ Check for any duplicated rows/requests in the given data
- ✓ Check if NA values are present in columns- Request.id, Pickup.point, Status, Request.timestamp,
- ✓ Check if NA values are present in columns- Driver.id, when the status of the request is “Trip Completed” or “Cancelled”
- ✓ Check if NA values are present in columns- Drop.timestamp, when the status of the request is “Trip Completed”

Data cleaning performed:

- ✓ The columns- Drop.timestamp and Request.timestamp have conflicting datetime formats. Those are converted into the proper formats.
- ✓ The formatted datetime formats has been converted to datetime objects.

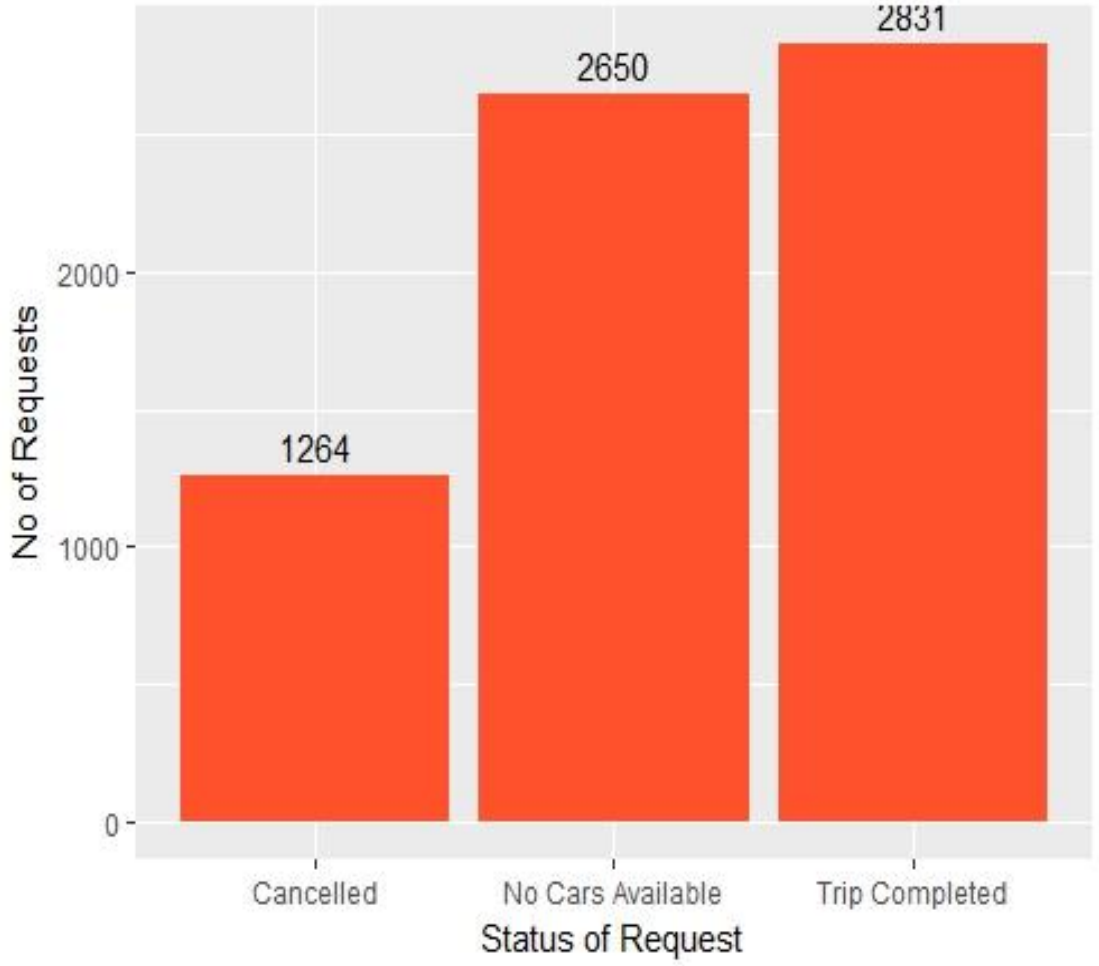
Data Derivation:

- ✓ The following columns are derived from the given data.
  - ➢ Date
  - ➢ Day
  - ➢ Req_Hour
  - ➢ Drop_Hour
  - ➢ Time_Period

Time Interval	Time Period
3 am to 7 am	Early Morning
7 am to 11 am	Morning
11 noon to 4 pm	Afternoon
4 pm to 7 pm	Evening
7 pm to 11 pm	Night
11 pm to 3 am	Mid Night

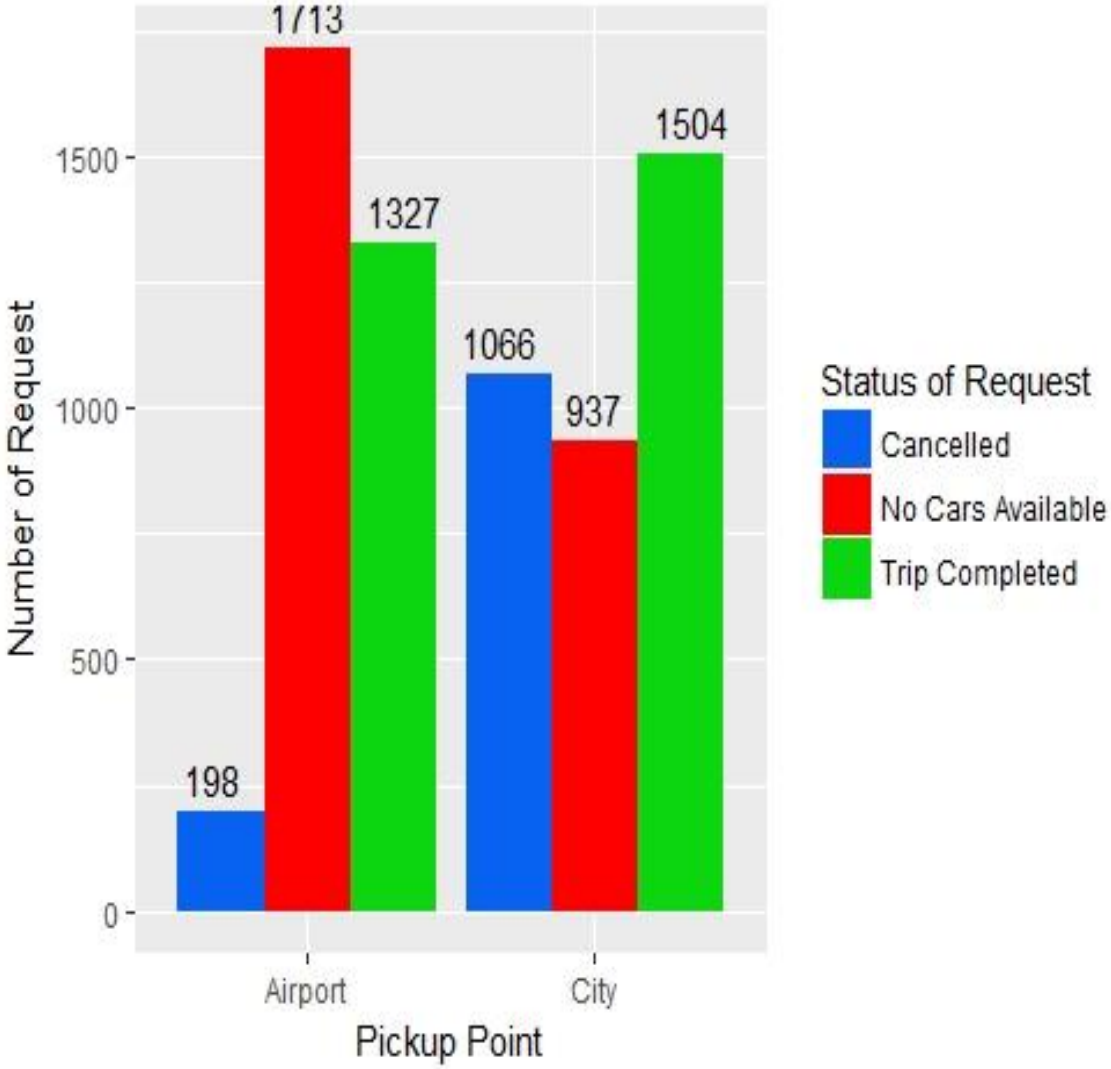
Status of Request Vs Number of Request

- ✓ Cancelled Request: 1264
- ✓ No Cars Available: 2650
- ✓ A total of 3914 requests are lost due to Trip Cancellation or Non-availability of cars.
- ✓ This results in financial loss.



Pickup Point Vs Number of Request_Status-wise

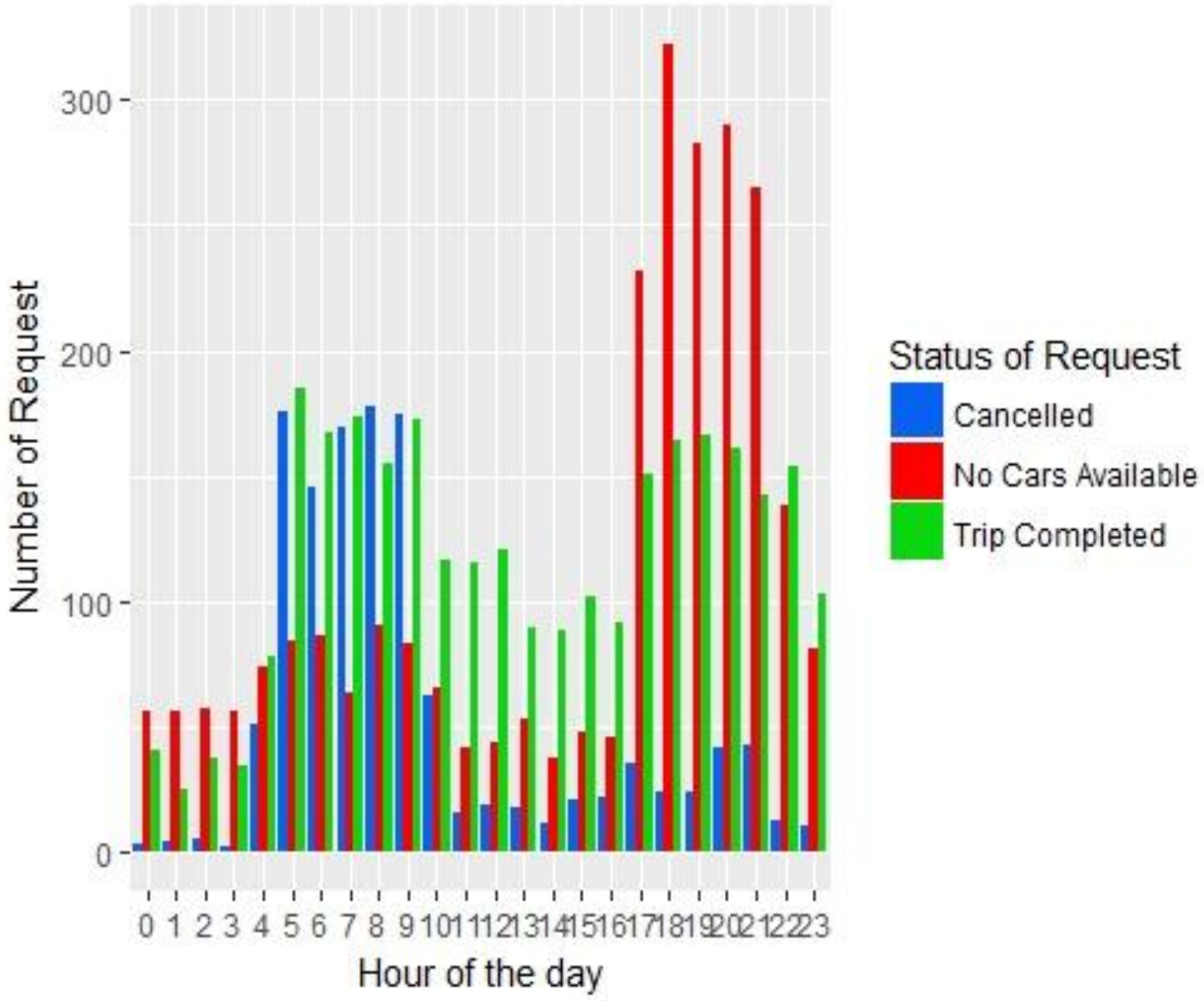
- ✓ From the graph, we can definitely say that the most request that originate in the CITY are either cancelled or there are no cars are available to complete the request.
- ✓ Hence the problematic place of request is in CITY.
- ✓ No of Request, that were CANCELLED from CITY: 1066
- ✓ No of Request, where there were NO CARS from CITY: 937



Request Hour Vs Number of Request_Status-wise

It can be concurred from the above graphs that,

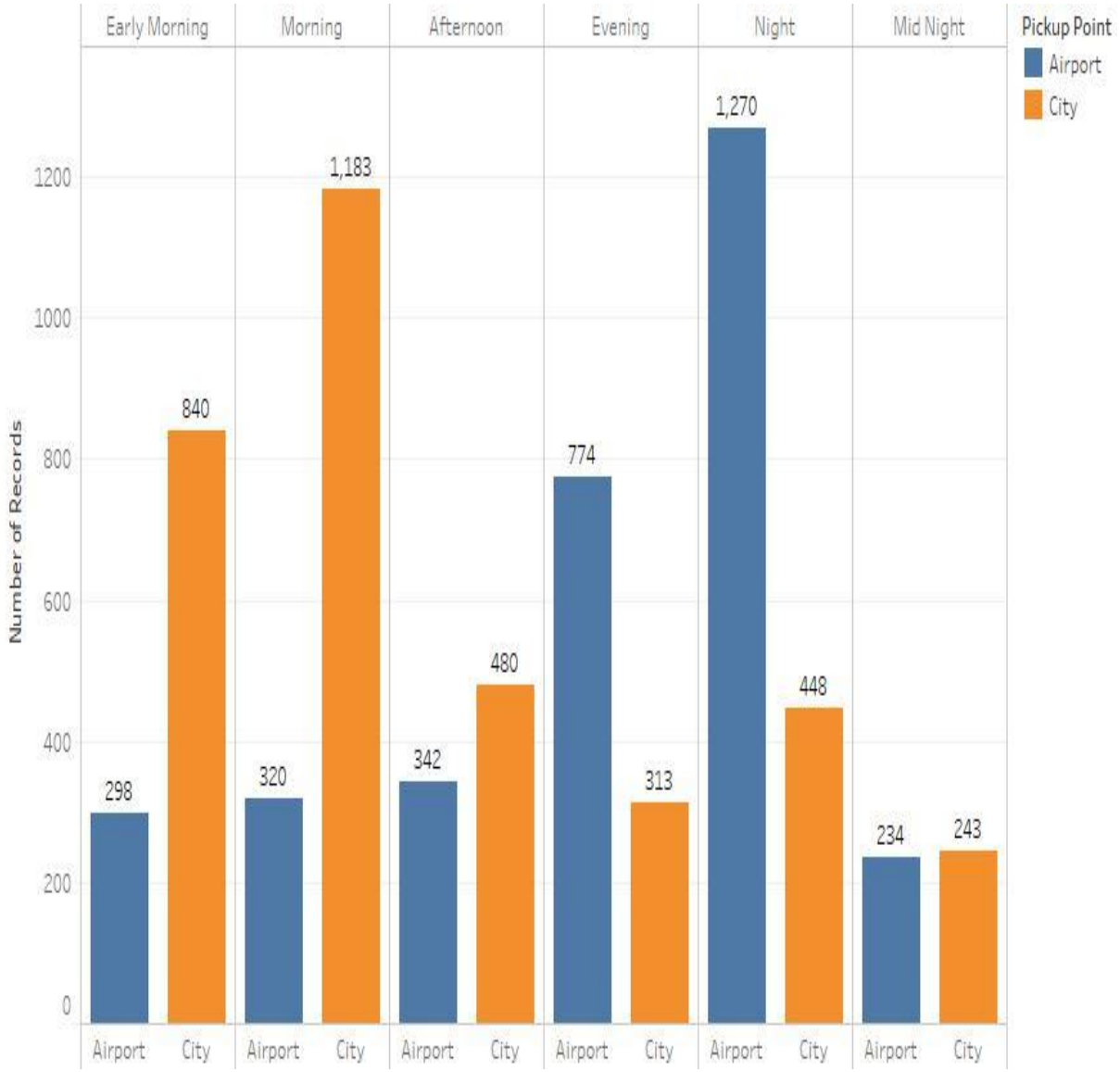
- ✓ At Morning, there is highest number of trip cancellation.
- ✓ At Evening & Night, there are more number of trip request, but very less cars to full fill the request.



Time Period Vs Number of Request_PickupPoint-wise

It can be concurred from the above graphs that,

- ✓ The number of cab request from City to Airport is the highest in the Morning.
- ✓ The number of cab request from Airport to City is the highest in the Evening and night.



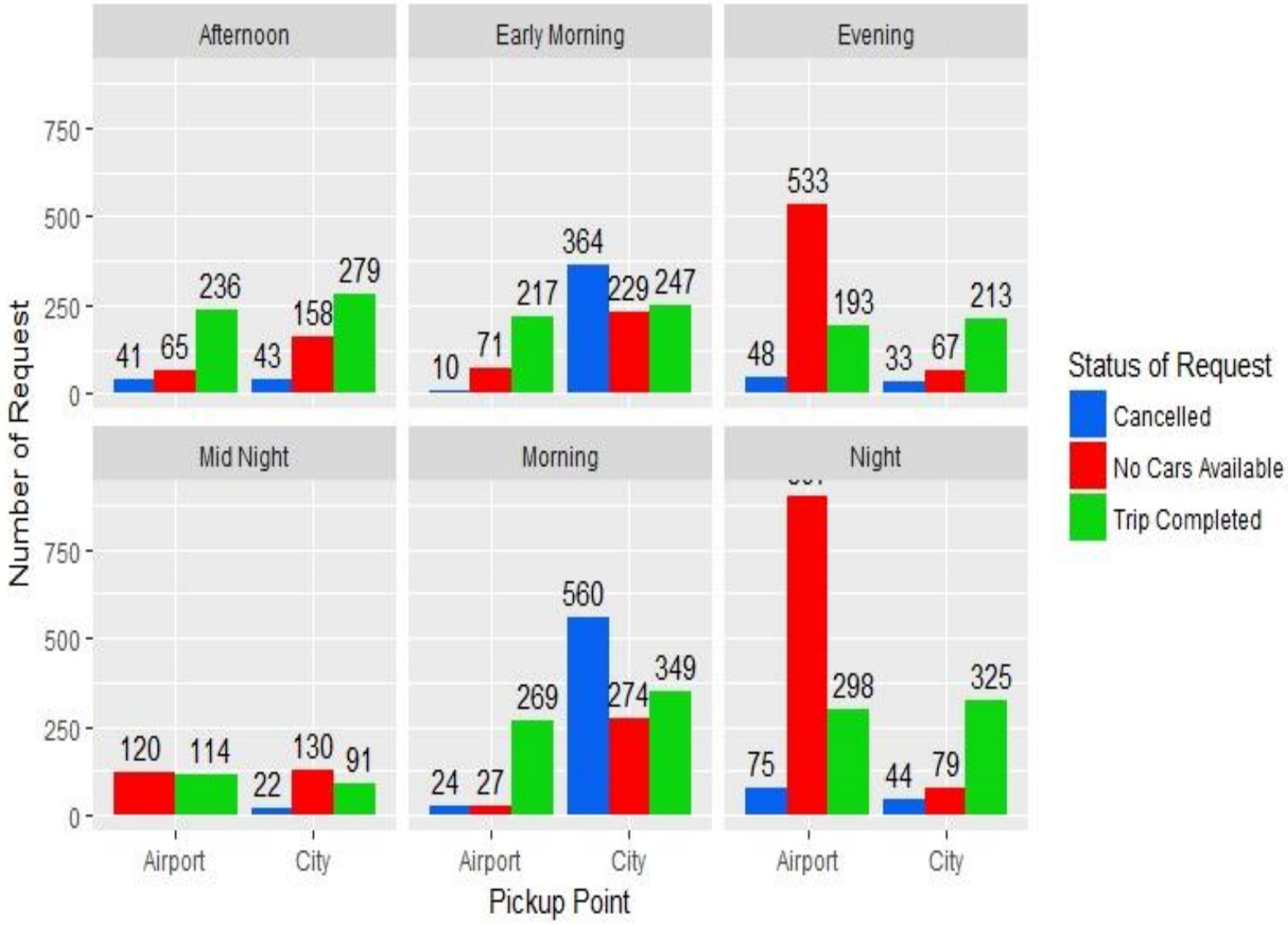
Problem Statement Identified

Problem 1:

Rides from CITY, booked at the time frame of approximately 3am to 12 noon are cancelled more.

Problem 2:

Rides from Airport to City in the evening-night time frame is not getting cars (No cars Available) for the request.



Problem - 1

Statement:

Rides from CITY, booked at the time frame of approximately 3am to 12 noon are cancelled more.

Reason:

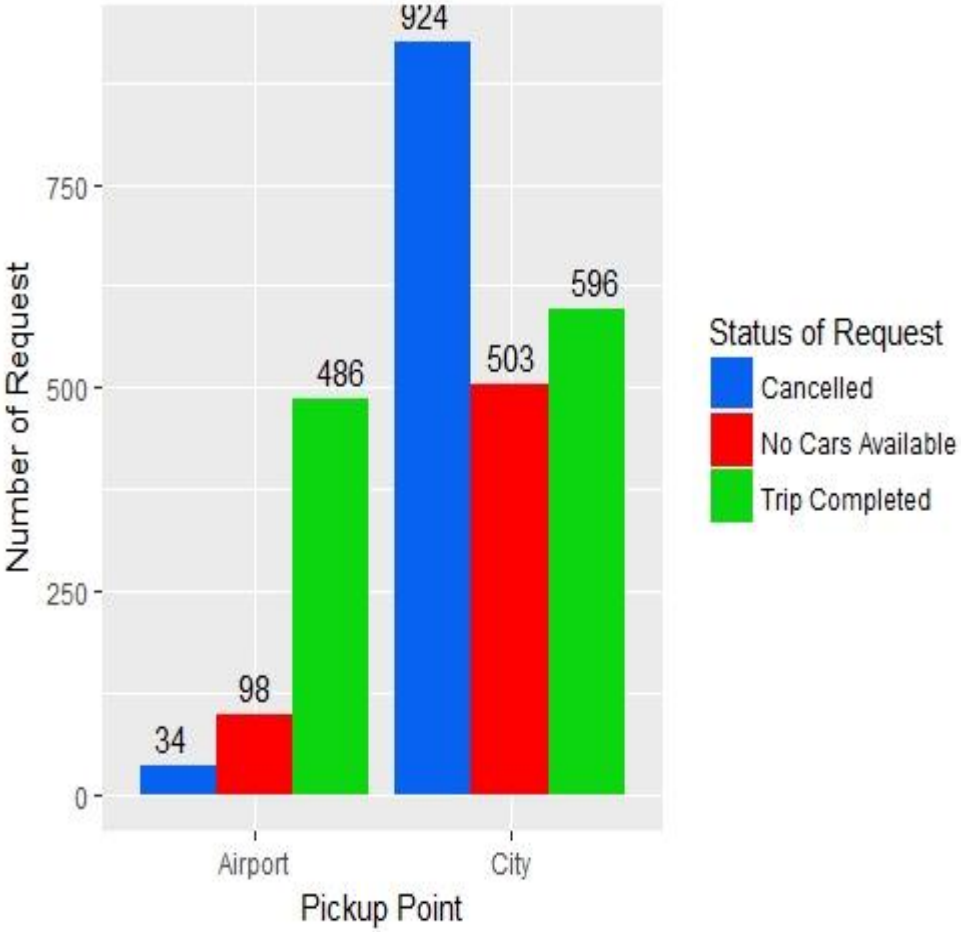
Of the Supply Demand Gap, Cancellation of Trip results for approximately 65%. i.e.., drivers are reluctant in accepting the trip request to airport. This is because, as Airports are usually situated in the outskirts of the city & there is very less demand for cabs from Airport to city in this time frame, the drivers fear they may not get the ride back to city from airport, and they may end up waiting for long time in airport for the ride or comeback to city at their own expense, both incurring financial loss to Driver.

Moreover, drivers usually get many rides within city at this time frame and therefore, they don't mind cancelling the rides to airport.

Recommendation:

A fine of some kind for cancelling the trip request or an incentive for drivers, who don't cancel their rides can be announced to discourage the drivers from cancelling the rides.

At the same time, if a driver takes up a ride to Airport, and does not get a ride back to city and he faces time loss (due to waiting in airport for ride) then the drivers can be compensated on common grounds without any harm to company or driver.



Demand: 2023
Supply: 596
Demand-Supply Gap: 1427
Demand-Supply Gap: 70.53%

Problem - 2

Statement:

Rides from Airport to City in the evening-night time frame is not getting cars (No cars Available) for the request.

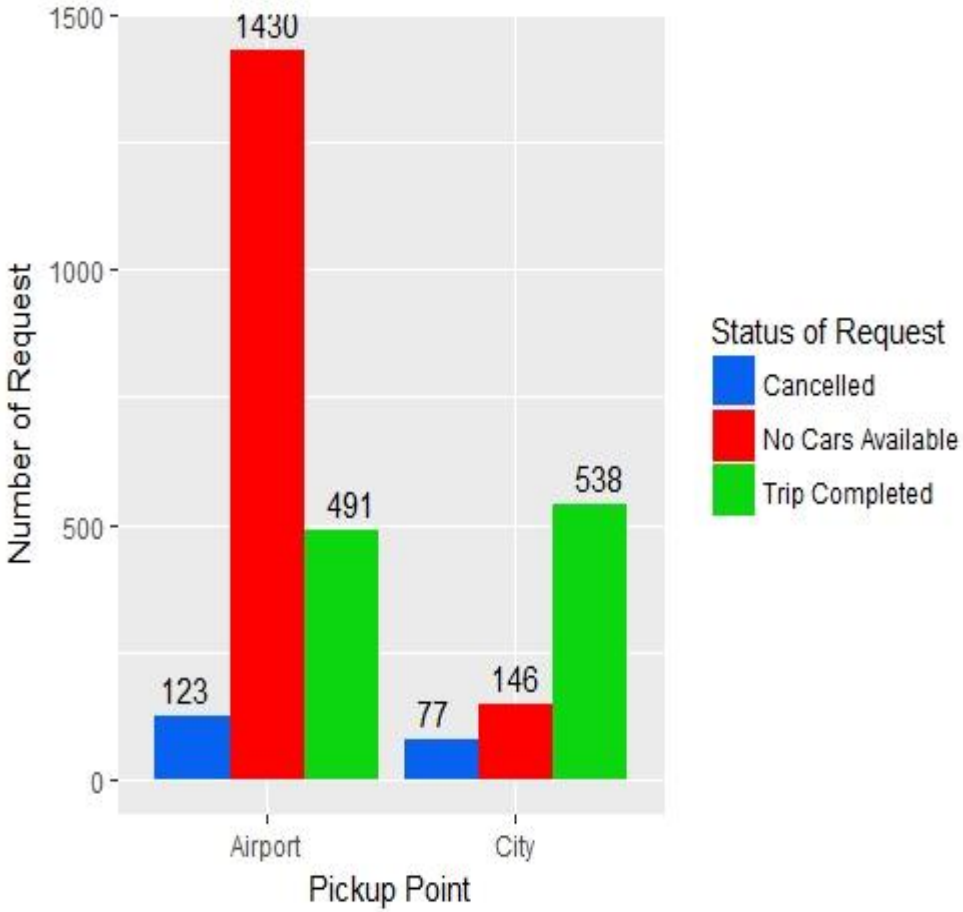
Reason:

The main reason for the shortage of cars from airport, when there is high demand is that, there is very less demand for cabs from city to airport. There is very less Supply (City to Airport, total no of request is ~ 761). As the airport is situated at the outskirts of the city, no driver will come to airport to just pick up the passenger. It is not feasible for the drivers. Even if the full demand of City to Airport is met, that is will in no match to the demand from Airport. The Demand-Supply % is at whopping 76%. Hence obviously, the total number of cars is very less.

Recommendation:

The most obvious solution is to increase the number of cars operating under Uber. Yet, Just for closing in the demand supply gap, we can't get new cars. It will be financially feasible, only if the demand in other area in other time are also high. Or else, the supply will become more and the demand will less, resulting in loss.

Other Feasible solution is that, making the drivers get the request with long distance route, so that the drivers are will be compensated for the loss incurred for driving to airport from city without customer. Cabs that reached airport for dropping the customer can be given, short route request.



Demand: 2044
Supply: 491
Demand-Supply Gap: 1553
Demand-Supply Gap: 75.97%

Thank You