

UBER SUPPLY-DEMAND GAP CASE STUDY

Business Objective

The aim of analysis is to identify the root cause of the problem (i.e. cancellation and non-availability of cars) and recommend ways to improve the situation. As a result of your analysis, you should be able to present to the client the root cause(s) and possible hypotheses of the problem(s) and recommend ways to improve them.

Data Understanding

There are six attributes associated with each request made by a customer:

1. **Request id:** A unique identifier of the request
2. **Time of request:** The date and time at which the customer made the trip request
3. **Drop-off time:** The drop-off date and time, in case the trip was completed
4. **Pick-up point:** The point from which the request was made
5. **Driver id:** The unique identification number of the driver
6. **Status of the request:** The final status of the trip, that can be either completed, cancelled by the driver or no cars available

Note: For this case study, only the trips **to and from the airport** are being considered.

Data Cleaning and Derived Columns

● Data Cleaning

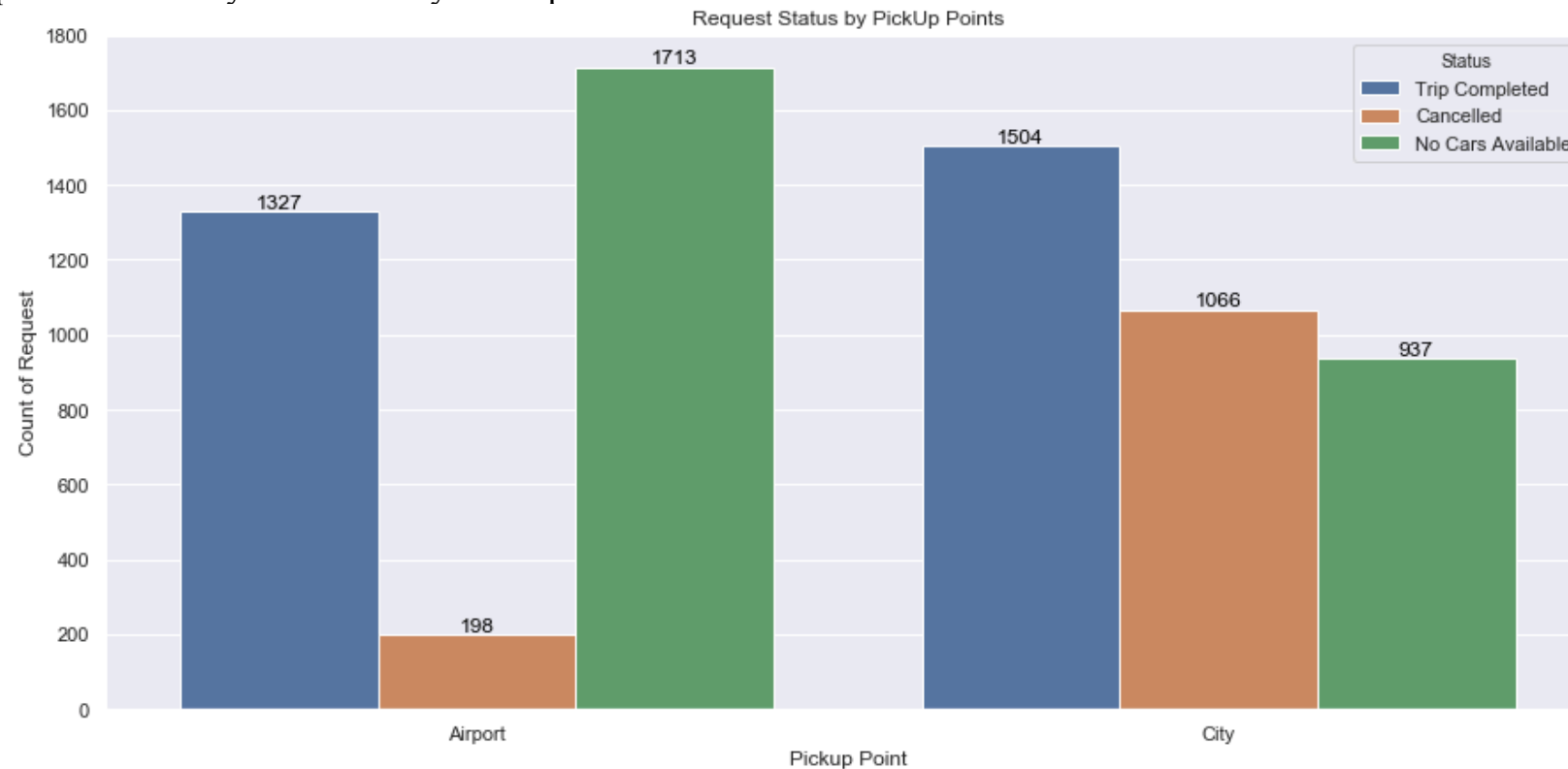
1. **Time of request:** The timestamp format is mixed of / and - ,hence it is been standardised for the ease of analysis
2. **Drop-off time:** The timestamp format is mixed of / and - ,hence it is been standardised for the ease of analysis
3. For few of the Timestamp in both the Time of Request and the Drop off time ,seconds were not present ,hence it is been stripped off from all the column , as it will not have any major significance in the analysis.

● Derived Columns

1. Columns are derived from **Time of request & Drop-off time**
 - A. **rt_hour** - Hour component of the Time of Request
 - B. **rt_date** - Date component of the Time of Request
 - C. **rt_time** - Time component of the Time of Request
 - D. **rt_weekday** - Day of Week component of the Time of Request
 - E. **dt_hour** - Hour component of the Drop off time
 - F. **dt_date** - Date component of the Drop off time
 - G. **time_slot** - Derived from Hour component of the Time of Request
 - 04:00 - 08:00 - EARLY MORNING
 - 08:00 - 12:00 - MORNING
 - 12:00 - 16:00 - DAY TIME
 - 16:00 - 20:00 - EVENING
 - 20:00 - 00:00 - NIGHT
 - 00:00 - 04:00 - LATE NIGHT

Problem - Frequency of Requests by PickupPoint /Status

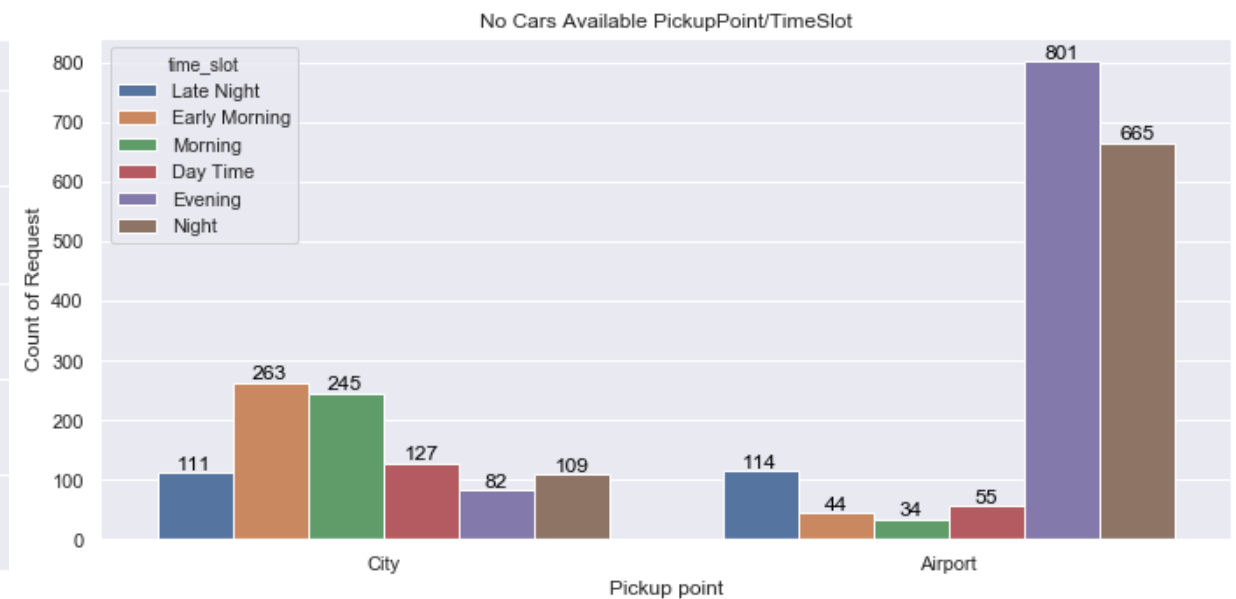
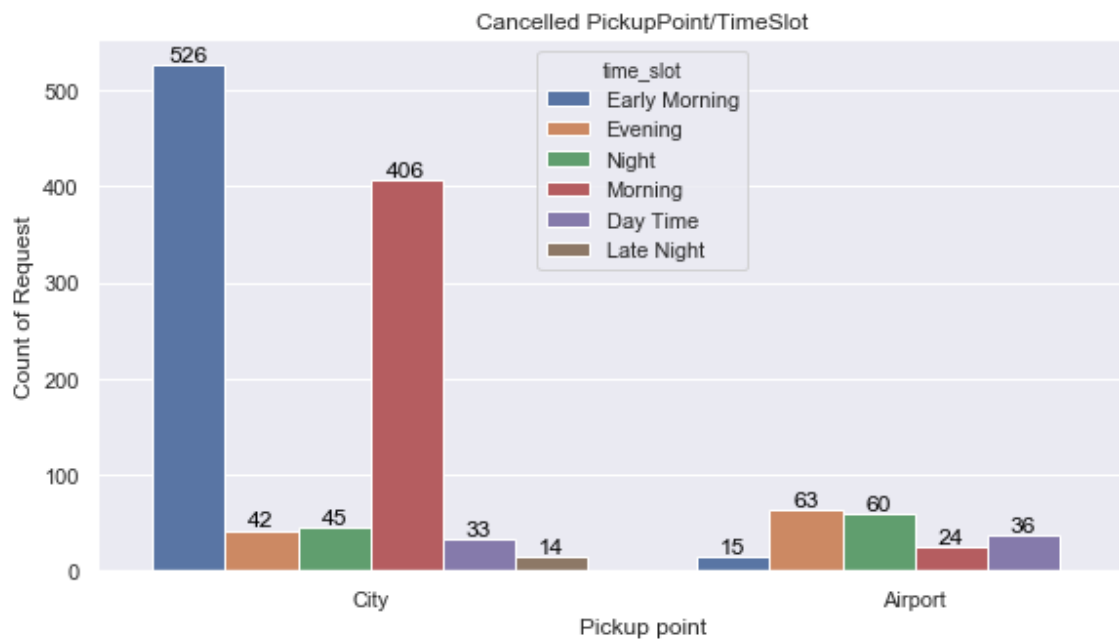
1. “**No Cars Available**” is an issue where most of the Request were made from the Airport.
2. “**Cancelled**” is an issue where most of the Request were made from the City.
3. “**Trip Completed**” is mostly from the City Pickup.



Problem - Frequency Of Request by PickUpPoint/Time Slot

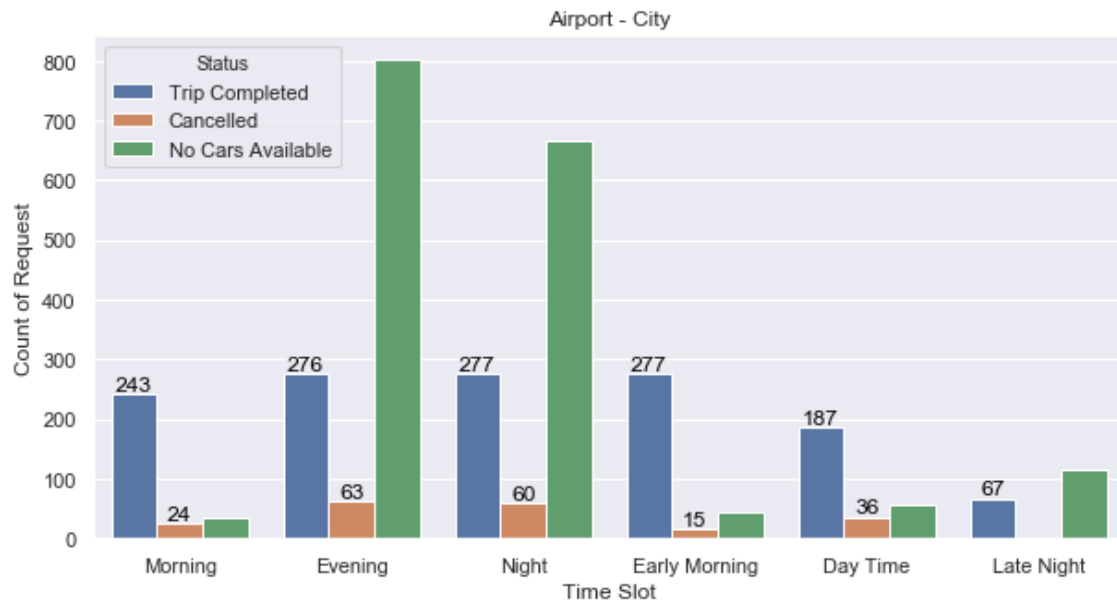
Since the issues lies with the Cancellation and the No Cars Availability

1. **Cancelled PickupPoint/TimeSlot** shows that ,most of the Cabs were cancelled during the Early Morning & Morning Time from **City**
2. **No Cars Available PickPoint/TimeSlot** shows that, most of the Cabs were not available at Evening & Night time from **Airport**.



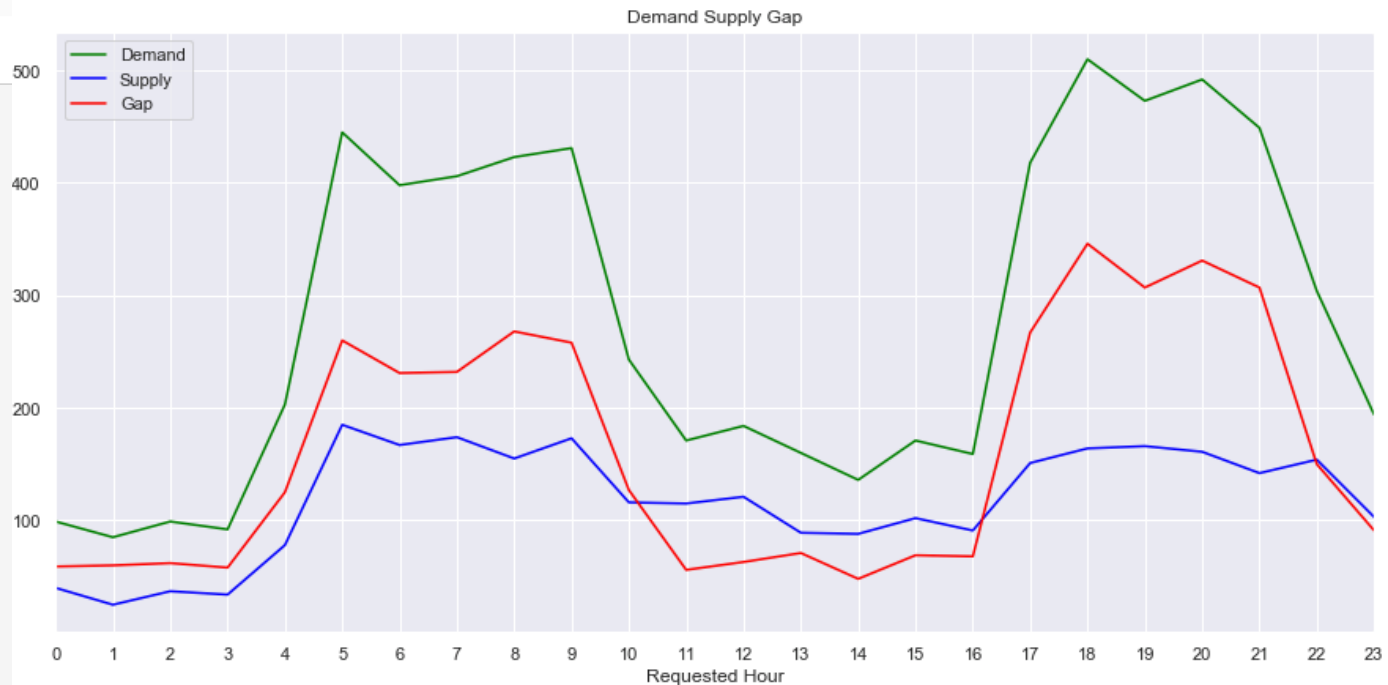
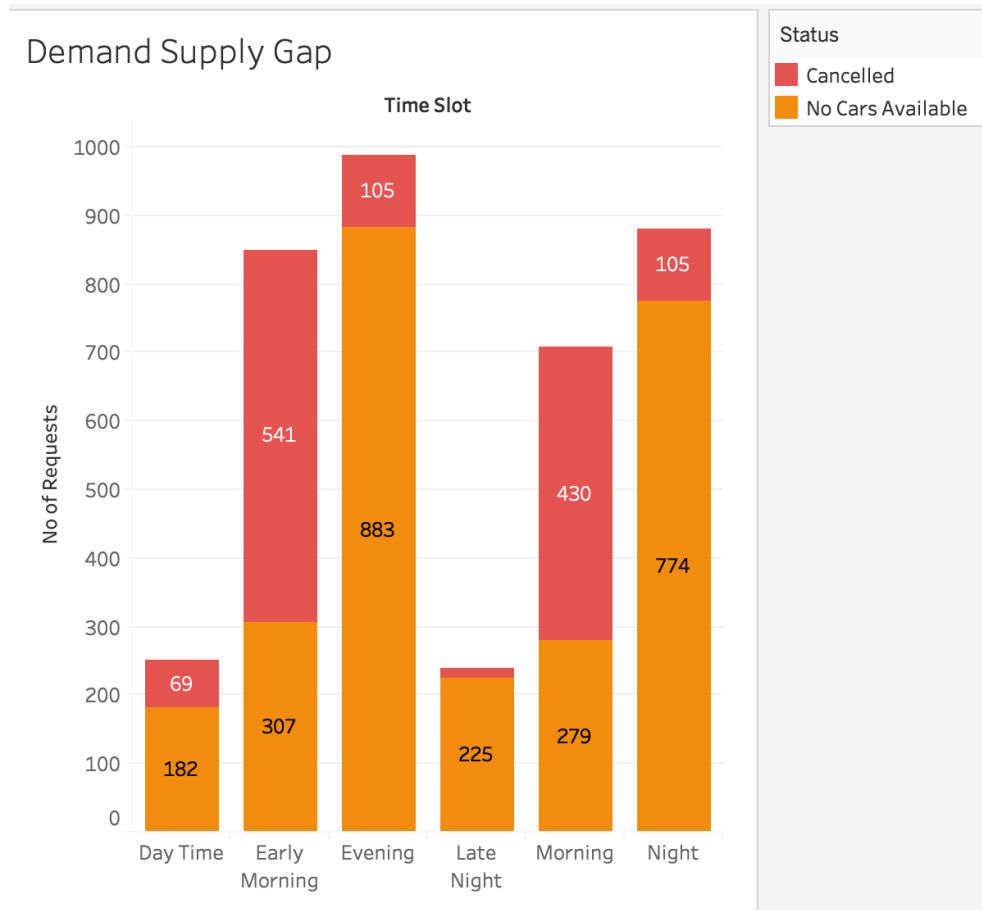
Problem - Frequency Of Request by Time Slot/Status

1. **Airport** Demand is more during the Evening & the Night time , whereas the supply is less ,hence the reason of No Cars Available
2. **City** Demands is more during Early Morning & Morning time slot ,but the ride is Cancelled by driver



Supply - Demand Gap (Overall)

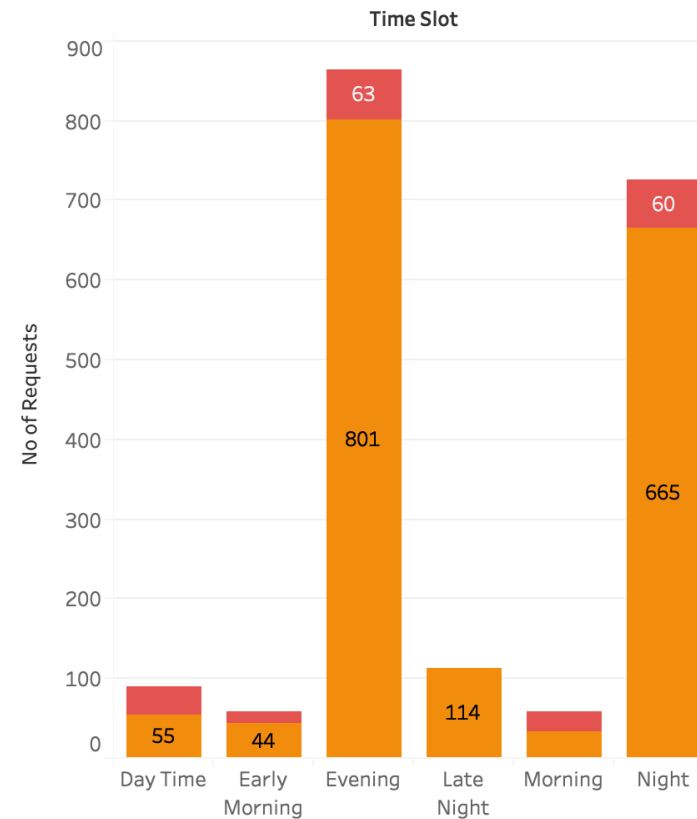
1. Supply - Demand Gap exists majorly in Early Morning, Morning , Evening & Night
2. **Highest Supply Demand Gap** - Evening with 988 requests not entertained.



Supply - Demand Gap (Airport)

- Supply - Demand Gaps were seen in the Evening & the Night slots, the reason being the Cabs are not available.
- Clearly Demands are high compared to supply

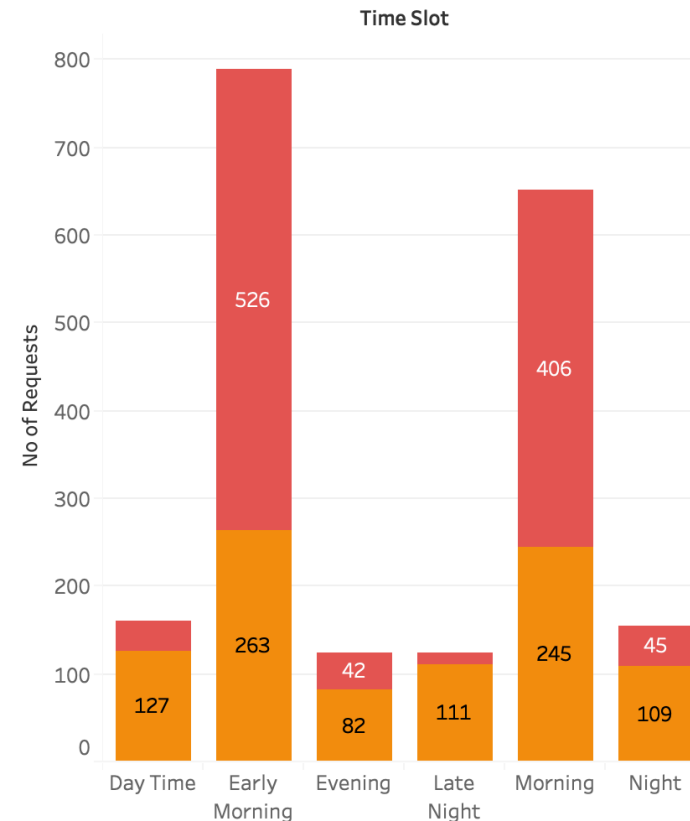
Demand Supply Gap - Airport



Supply - Demand Gap (City)

- Supply - Demand Gaps were seen in the Early morning & Morning time slots ,the reason being the driver cancelled the Request.

Demand Supply Gap - Airport



Status

- Cancelled
- No Cars Available

Bottleneck for Supply -Demand Gap Issue

- **Pickup from Airport Supply Demand Gap**

- A. Cabs inflow to the airport is less during the Day Time which results in less cabs available from the airport during the Evening.
- B. Less Frequency of the Flight landing during day time ,hence less request were made to the City ,hence Cabs are not available during evening.
- C. If we look to the plot in slide 7 ,the inflow of Cabs in Airport is more during Early morning & Morning ,hence **Driver idle time** increases till evening as more flight landed in the evening and eventually demands increases.
- D. Usually the Evening & Late Evening is the end of Day for most of the driver ,hence less number of driver prefer to work late ,hence supply is limited or less in the evening hours.

- **Pickup from City Supply Demand Gap**

- A. Less chances of getting a trip back from the Airport ,hence the trip is mostly cancelled by the Driver
- B. Eventually Driver would have thought of doing entertaining multiple request within City ,rather than going to Airport ,where his waiting time is more
- C. Flights during the Day Time is less ,hence less probability of driver getting a return trip.
- D. Parking in airport is on Hourly basis.

Suggestions to Solve Supply Demand Gaps

- Additional incentives to the driver during the Peak Hours like Evening & Night
- Parking Pool for Uber should be introduced so that Driver need not to pay parking charges during idle time.
- Bonus to the Driver ,when it completes 10 to n fro trips to Airport in month.
- Creating a pool of Cabs near airport during peak hours ,so that problem of “No Cars Available” will not happen.
- Base Price of Driver can be increased when travelling to Airport during the Morning Peak hours and while coming back from the airport.

THANK YOU