Uber Supply-Demand Gap

From

Name: Aditya Vikram Singh

Email: adisingh75@gmail.com

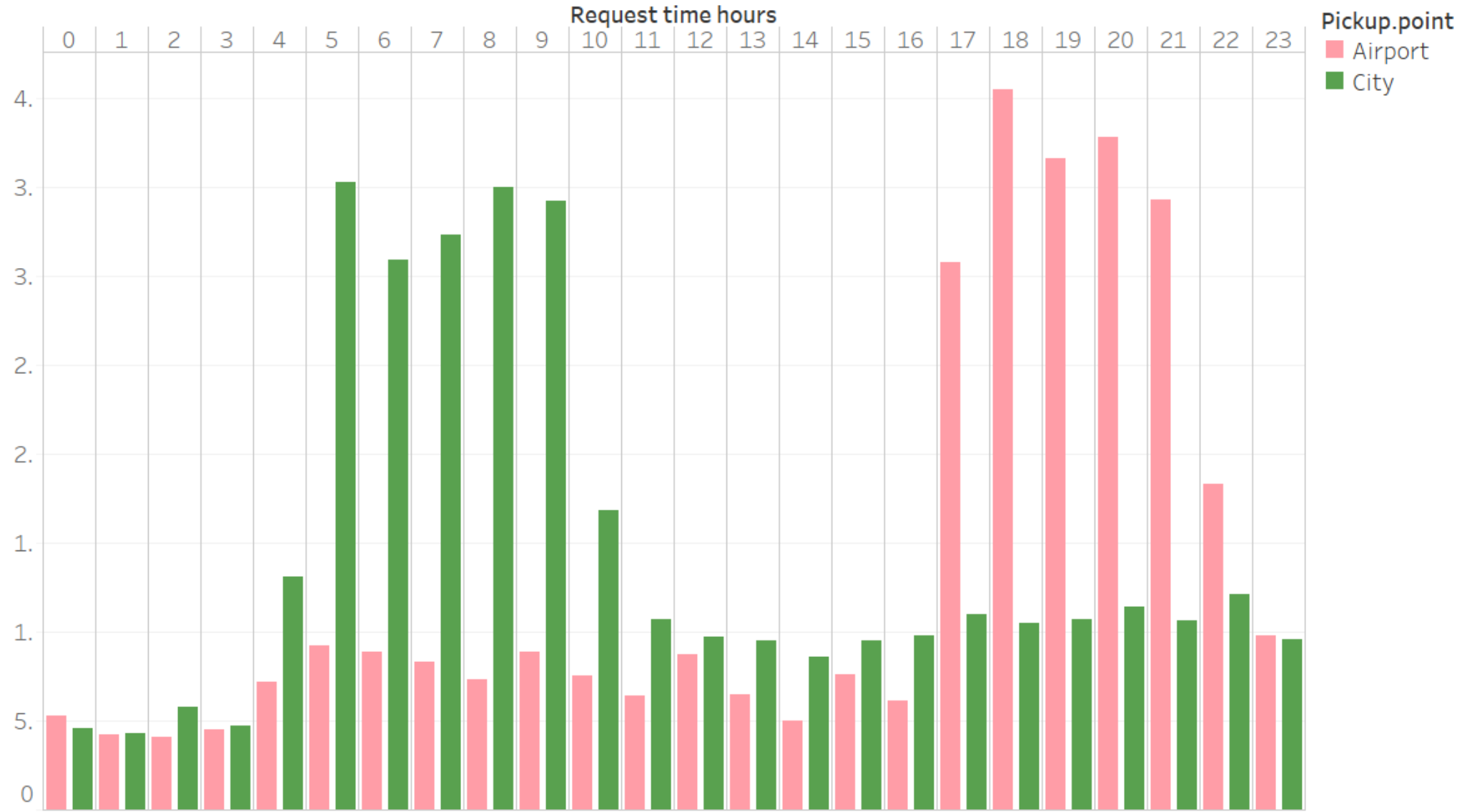
Objective

In this case study we will be analyzing what is the root cause for the gap in demand and supply of cabs. If drivers cancel the request of riders or if cars are unavailable, Uber loses out on its revenue. The aim of analysis is to identify the root cause of the problem (i.e. cancellation and non-availability of cars) and we will be recommending ways to improve the situation. Additionally, with the help of visualization we will dive deep to find out how the demand supply gap varies with each hour of the day as well as each day of the week.

CONTENTS

- Plots:
  - *Ride Request date (hourly) from Airport and City*
  - Frequency/Ride Status of cabs in different time slots
  - Frequency/Ride Status of rides requested from Airport and City
  - Demand-Supply Gap for cabs in different time slots
- Quick statistics for reference

Ride Request hourwise from Airport and City

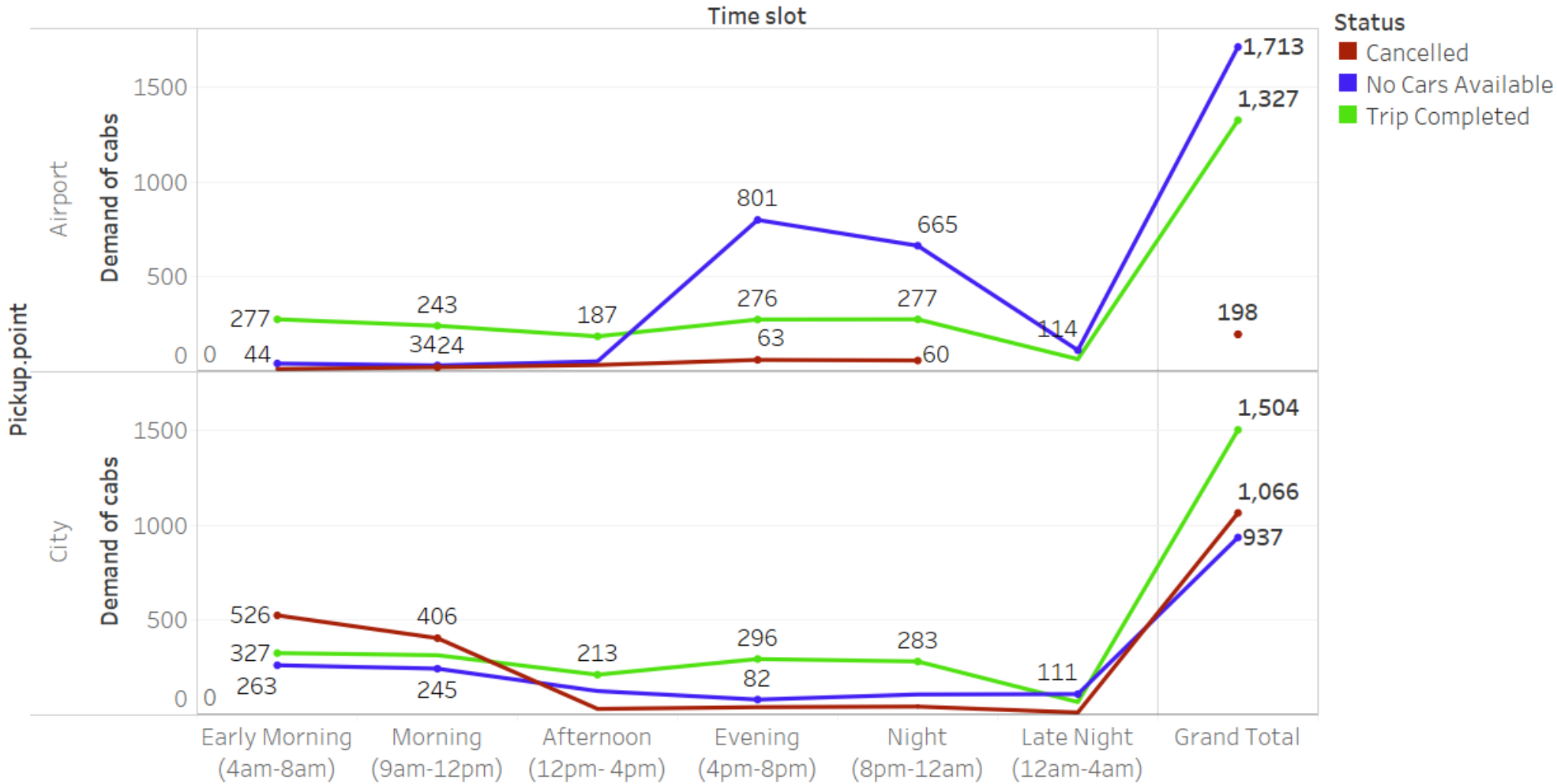


Count of Status for each Pickup.point broken down by Request time hours. Color shows details about Pickup.point.

Analysis: Hourly ride request

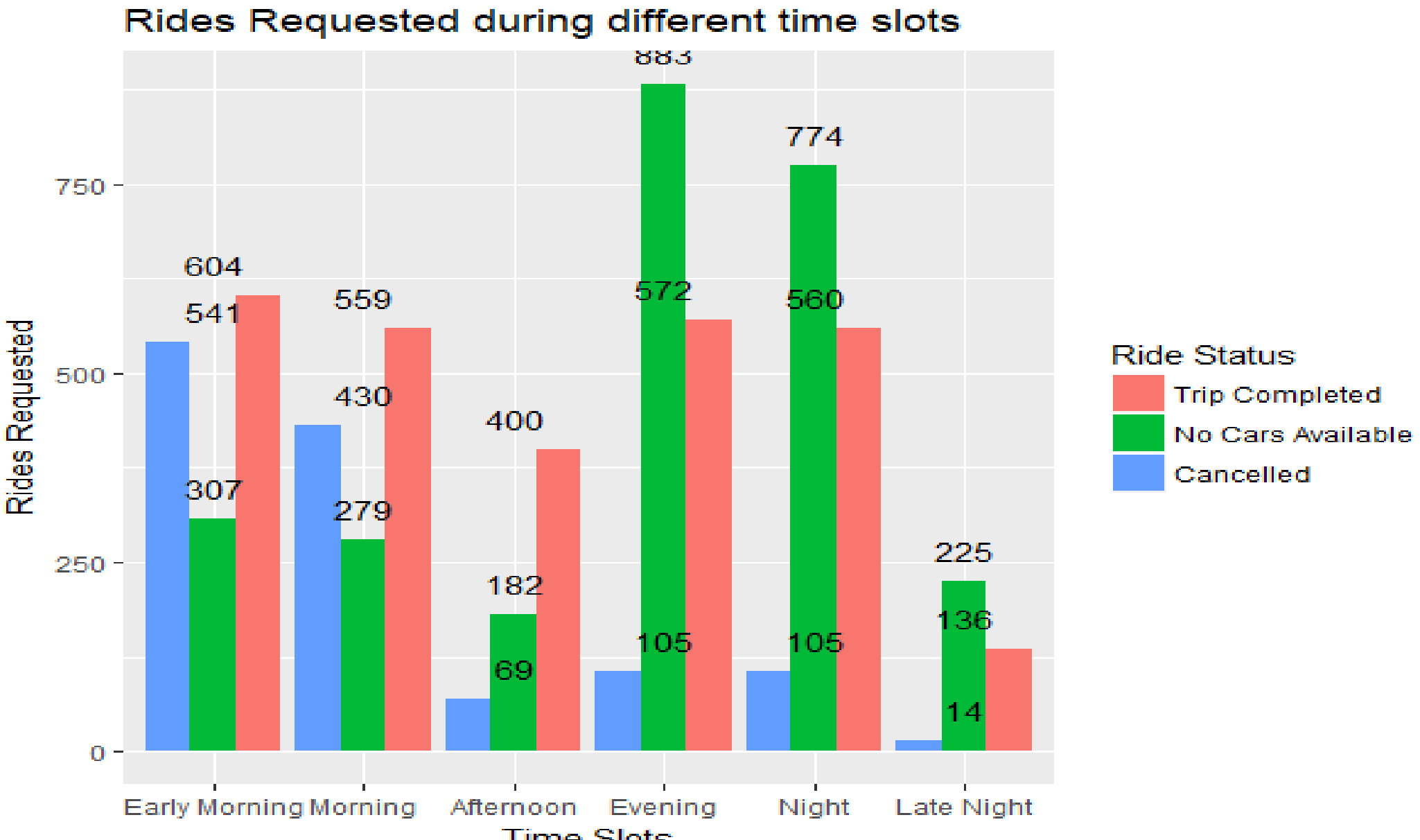
- We see from the plot that maximum number of cabs are booked from city to airport during 5am - 9am in the morning since this is the time for maximum departure of flight so the maximum number of cabs during this time.
- Additionally, this is the time when public transport is less available compared to other slots of day due to which we can see a surge in the ride request in morning when flight departures are maximum.
- Similarly there is a high surge in the ride request for cabs from airport to city during 5pm – 9pm in the evening which is the time for maximum arrival of flights.
- We will do some deep analysis in the slide where we will see trip status for different time slots.

Ride Status In Different Time Slots

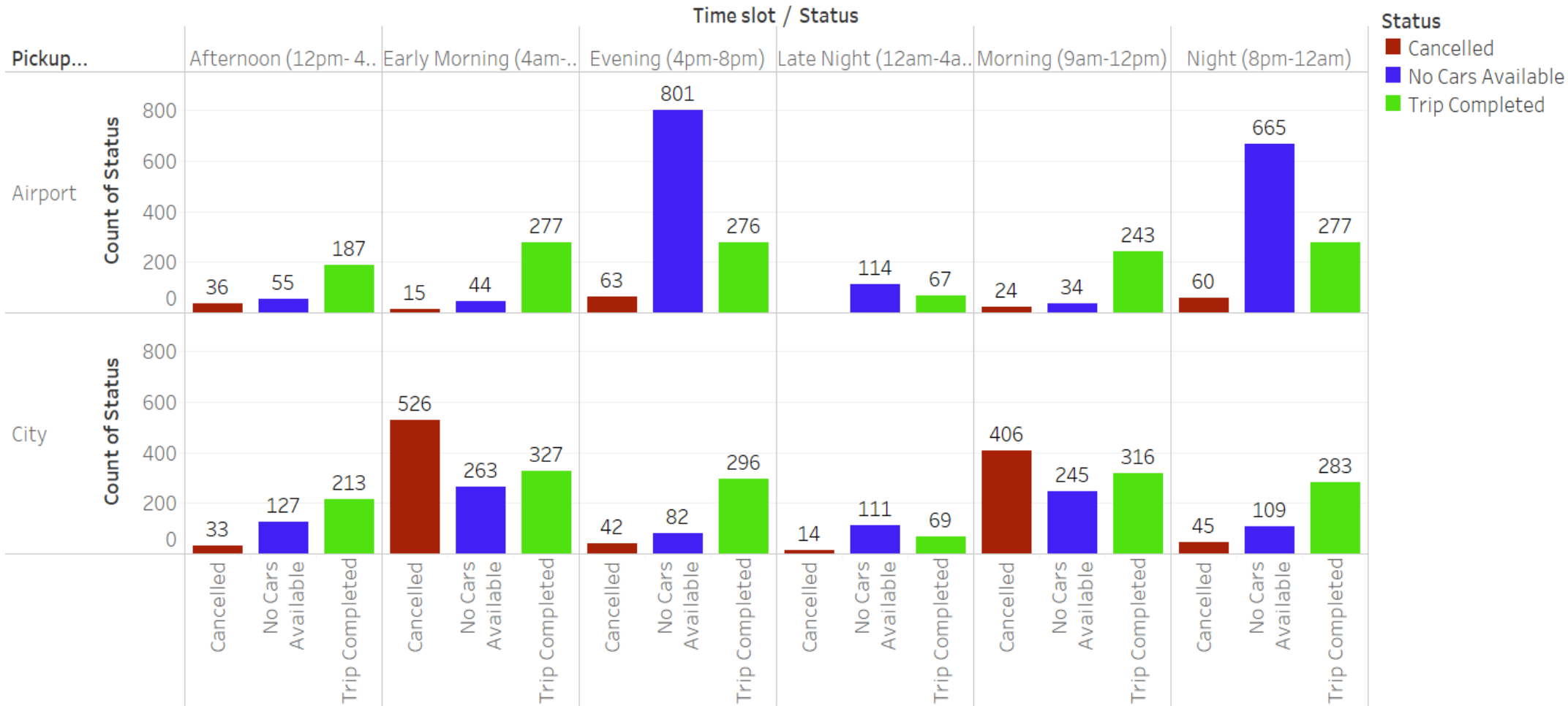


The trend of count of Status for Time slot broken down by Pickup.point. Color shows details about Status.

All Rides During Different Time Slots



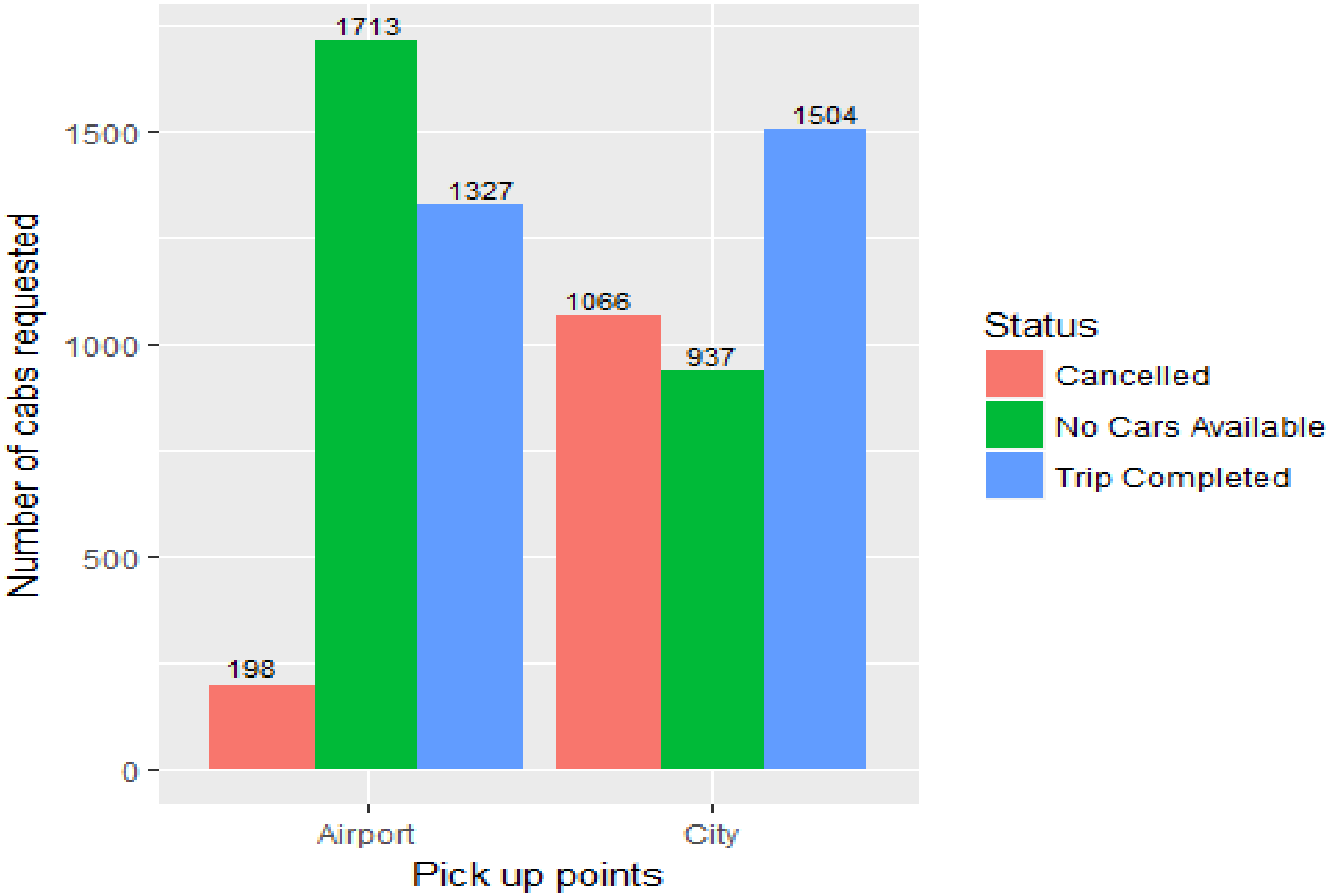
Trip status on different time slots of the week



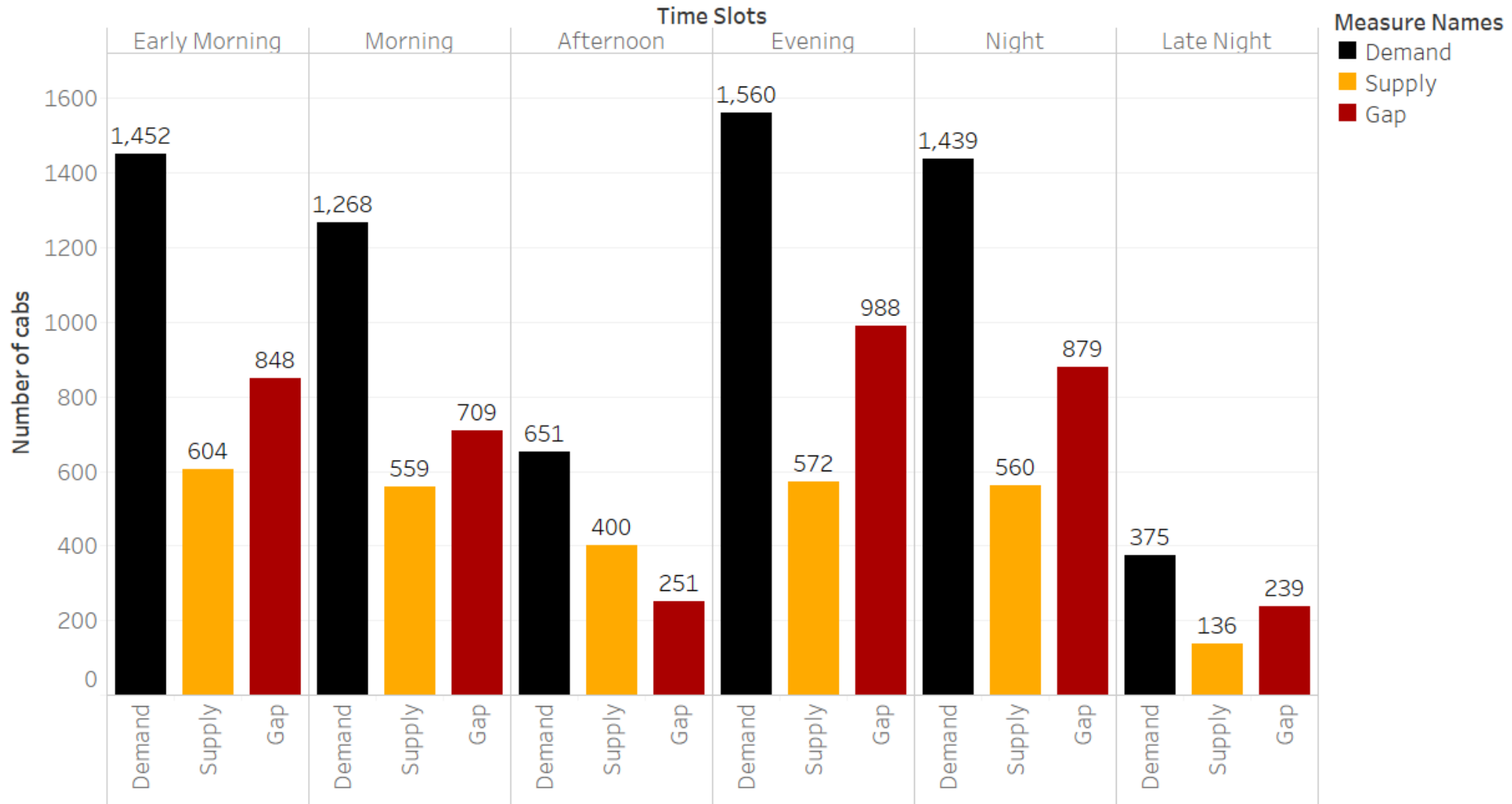
Count of Status for each Status broken down by Time slot vs. Pickup.point. Color shows details about Status.

Analysis: Ride Frequency/Status in different Time Slots

- In this graph we divided our analysis into different time slots to check which time slot of the day is affecting the most.
- We see from the plot that evening and night are the time slots when maximum cabs are booked from airport however, for most of the request, cars are not available.
- One more alarming thing we see is the number of cancelled rides in the pre morning and morning time slot when maximum number of cabs are booked for airport


1713
1504
1327
1066
937
198
1500
1000
500
0
Number of cabs requested
Airport
City
Pick up points
Status
Cancelled
No Cars Available
Trip Completed

Demand-Supply Gap



Demand, Supply and Gap for each Time Slots. Color shows details about Demand, Supply and Gap.

Analysis: Demand-Supply Gap

- We have break down our analysis into the following for this plot
  i. **Demand**: Total rides booked (completed + cancelled + no car available)
  ii. **Supply**: Total number of rides that were completed
  iii. **Gap**: Difference between total demand and supply
- From the graph we see that **Evening** and **Night** is the slot when the gap between demand is supply is the **maximum** and we lost the most opportunity in these slots.
- It clearly shows that the acceptance ratio is one third of the total rides requested during that time period
- Additionally, we also see that the **Early Morning** slot is also affected wherein we were only able to cater to 604 request from the total of 1452.

Statistics

Total Rides: 6745
Total Trip Completed: 2831

Pickup point	Ride Status			
Row Labels	Cancelled	No Cars Available	Trip Completed	Grand Total
Airport	198	1713	1327	3238
City	1066	937	1504	3507
Grand Total	**1264**	**2650**	**2831**	**6745**

Total Ride Requested From Airport: 3238
Total Ride Requested From City : 3507
Total lost opportunity : **58%**

Pickup point	Total Demand	Total Supply	Deficit/Gap	% Opportunity Lost
Airport	3238	1327	1911	59.02%
City	3507	1504	2003	57.11%
Grand Total	**6745**	**2831**	**3914**	**58.07%**

We lost major business opportunity totaling to 58% due to multiple cancellations and unavailability of the cabs.

Refer to the next slide to understand which time slot we missed the most on.

As seen in the tableau graphs provided in the above slides, we lost the most opportunity in the evening and night time slot of around 73% when the pickup point was the 'Airport' and lost close to 70% of business opportunity in th Early morning time slot.

Pickup point	Total Demand	Total Supply	Deficit/Gap	% opportunity Lost
Airport	**3238**	**1327**	**1911**	**59.02%**
Afternoon	278	187	91	32.73%
Early Morning	336	277	59	17.56%
Evening	1140	276	864	75.79%
Late Night	181	67	114	62.98%
Morning	301	243	58	19.27%
Night	1002	277	725	72.36%
City	**3507**	**1504**	**2003**	**57.11%**
Afternoon	373	213	160	42.90%
Early Morning	1116	327	789	70.70%
Evening	420	296	124	29.52%
Late Night	194	69	125	64.43%
Morning	967	316	651	67.32%
Night	437	283	154	35.24%
Grand Total	**6745**	**2831**	**3914**	**58.03%**

What do you think is the reason for this issue for the supply-demand gap?

- After the analysis, I have come to a conclusion that the reason why missed on the business opportunity in the morning time slot for the rides requested from 'City' to the 'Airport' is that the drivers have to spend some idle time when they drop the customers to the airport before accepting the ride to the city back since there are lot of flights departing from the airport during the early morning time slot, however, as the number of arrivals are less in the morning, the drivers have to wait for a customer before they can come back to the city as without a customer, it will be difficult for them to manage due to increase in there expense of the gas cost from the airport to the city.

This is the reason why the drivers do not want to miss on the rides that they can get while in the city itself in the early morning time instead of going to the airport and wait there for another customer due to which they miss on the opportunity of high rides.

- For the ride request between 'Airport' to the 'City', the incoming flights are more and outgoing flights are less during Evening time slot. As the outgoing flights are less, the cabs coming to the airport are also very less during that time. This is drastically reducing the availability of cabs at airport in the evening rush time slot. As the incoming flights are more, the passengers are also more in the evening. These passengers are not getting sufficient cabs to leave the airport in the evening. This is leading to a huge supply demand gap at the airport in evening time slot.

Recommendations for Uber for the ride requests between the Airport and City:-

- Fee charged on every ride between the airport and the city can be reduced so that it enables the drivers to not cancel the rides.
- Launching recognition and rewards programs for the drivers who have taken most rides between airport and city. It will surely help increase the morale of the drivers.
- Collaborating with the airline companies to understand there schedules so that proper forecasting can be done to analyze the demand for the quarter basis which a strategy can be developed to determine the supply. Through this, extra rewards in the form of money can be provided to the drivers on a daily basis for taking extra rides between the airport and the city.