UBER SUPPLY-DEMAND GAP CASE STUDY

ANALYSIS & RECOMMENDATIONS

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Business Objective

- Analyse and identify the root cause of problem (i.e. cancellation and non-availability of cars) from the provided dataset, as if the drivers cancel the request or cars are unavailable, Uber losses out its revenue.
- To suggest ways to improve the situation.

Data understanding

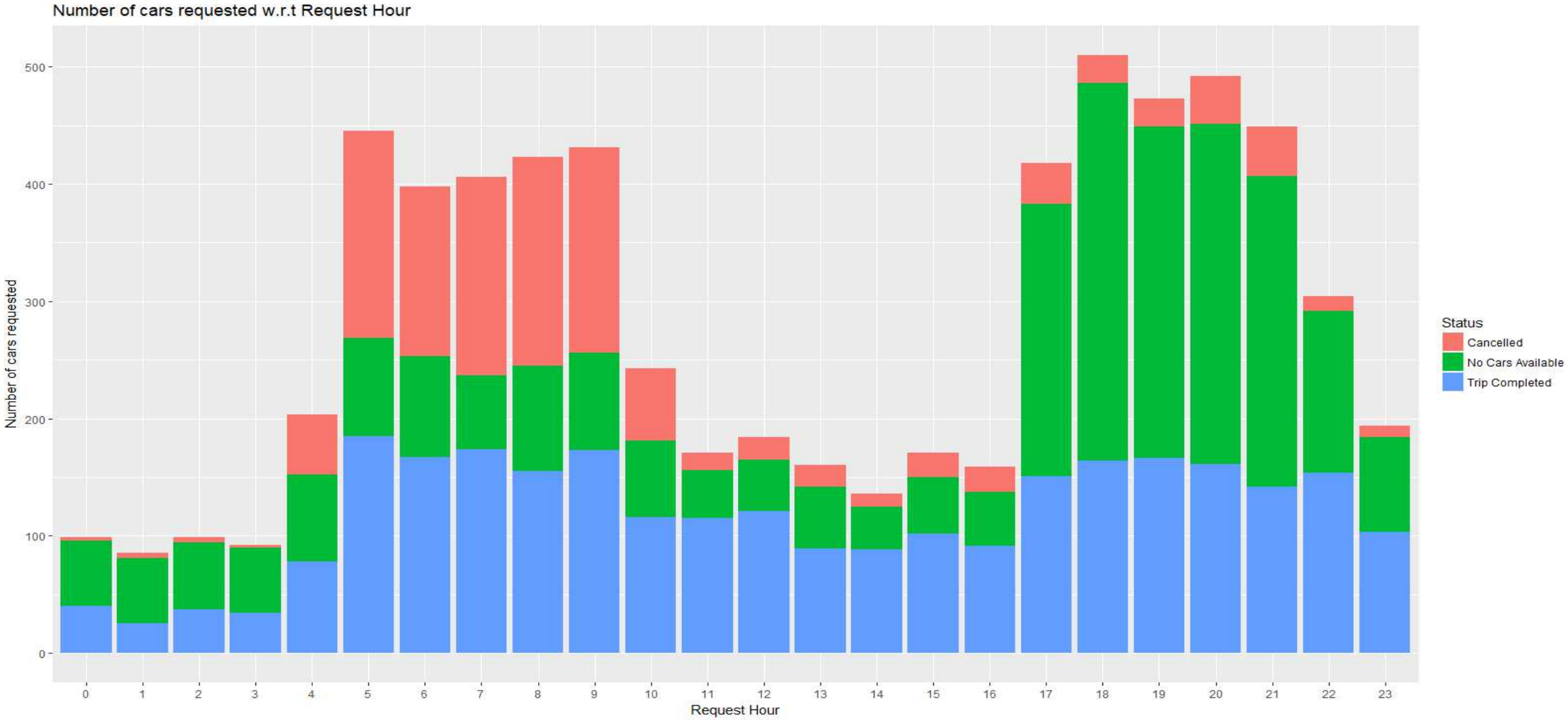
- Masked data set is provided which contains the information related to cab requests made from Airport & City.
- Total requests – 6745 (3238 from Airport & 3507 from City)
- Six attributes associated with each requests made by a customer :
  1. Request id: A unique identifier of the request
  2. Time 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

Data preparation & cleaning

- Looked upon duplicate rows.
- Checked blank & NA values.
- Standardise the format of Request Time & Drop Time using parse_date_time function under the package of Lubridate.
- Splited the Request time into Request Day & Time using strsplit function.
- Created additional columns i.e. Request_Hour and Time_Slot.
- Request time is divided into four slots i.e.
  1. Night – 23 to 04 Hours
  2. Morning Rush – 05 to 09 Hours
  3. Normal Hours - 10 to 16 Hours
  4. Evening Hours – 17 to 22 Hours

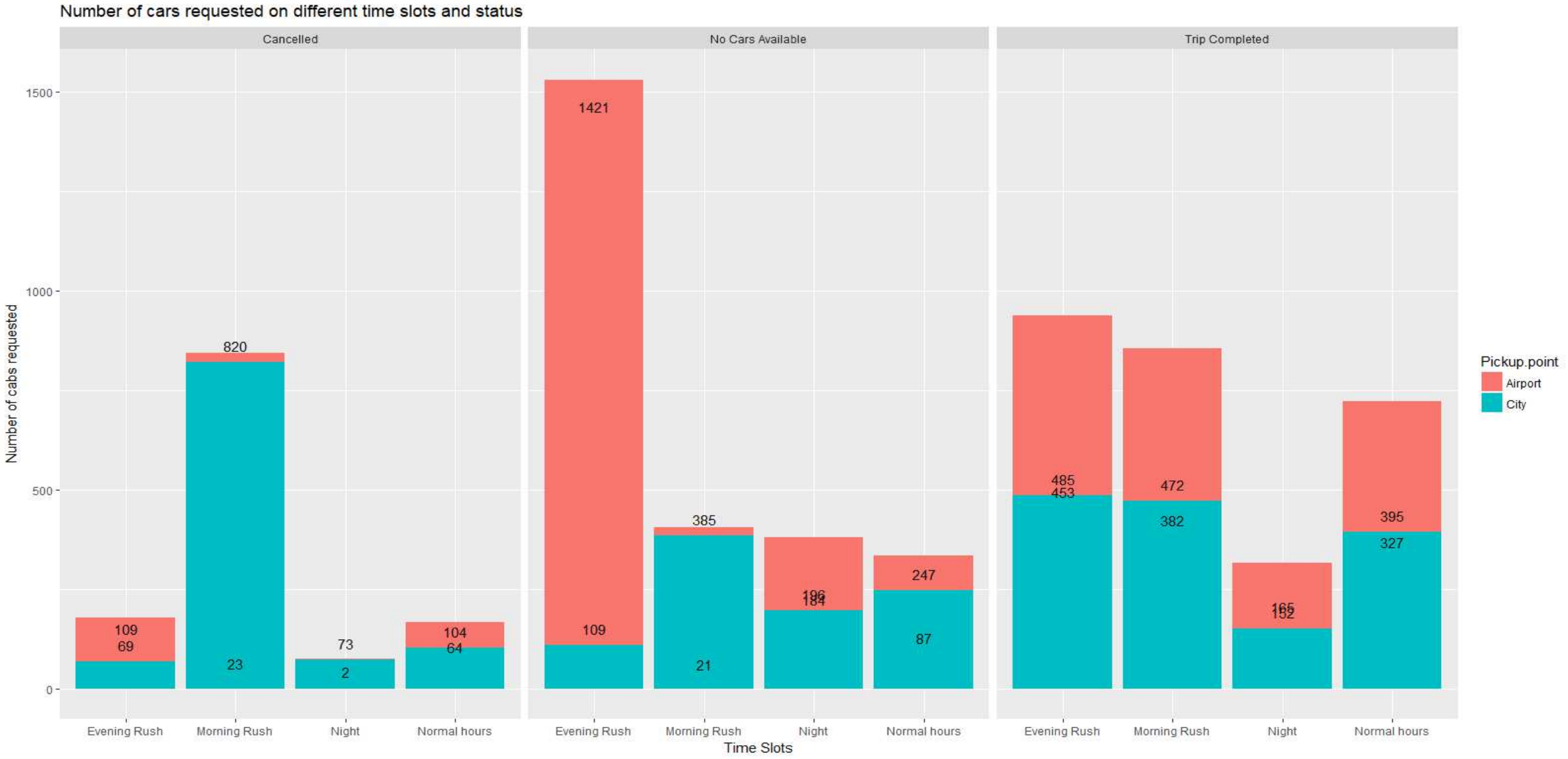
Problem identification & Analysis

Plot_01- Plotted an hourly request plot to identify the most suitable time slot buckets. Chart clearly shows that the request time can be divided into four slots i.e. Night, Morning Rush, Normal Hours and Evening Rush.



Problem identification & Analysis

Plot_02 – Plotted a bar chart where timeslots is on x axis and number of requests is on y axis for different status to identify the time slots in which large number of requests are getting cancelled or there is unavailability of cars



Problem identification & Analysis

As clearly identified in last plot that the Morning and Evening Rush hours are two critical time slots where large number of cabs are either getting cancelled or not available.

Problem 01 – In Morning Rush hours, large number of cab are getting cancelled.

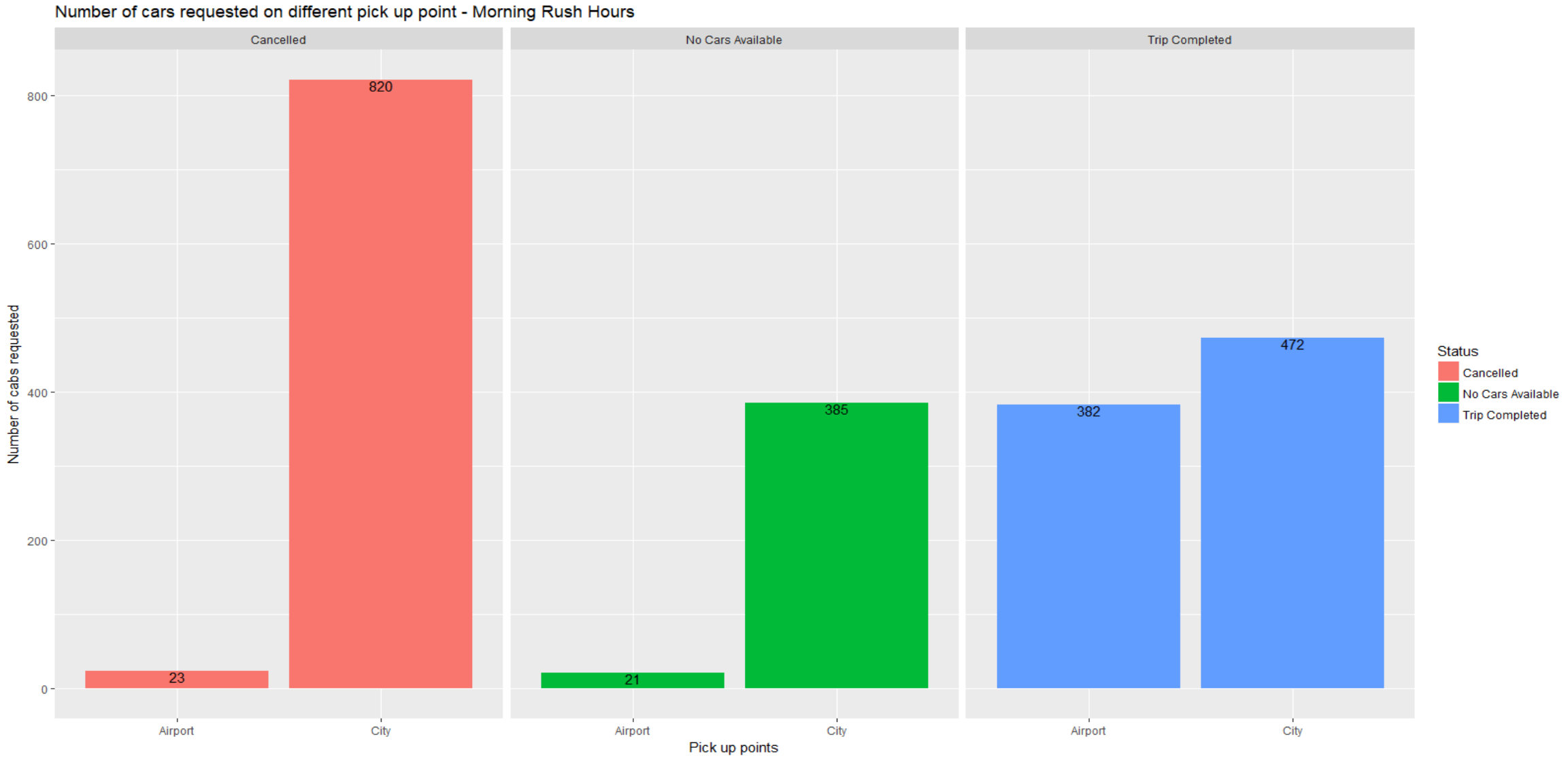
Problem 02 – In Evening Rush hours, large number of cabs are unavailable.

Let’s find out the pick up points from where above problems persists significantly.

For this, individual bar charts are plotted for morning and evening rush hours respectively.

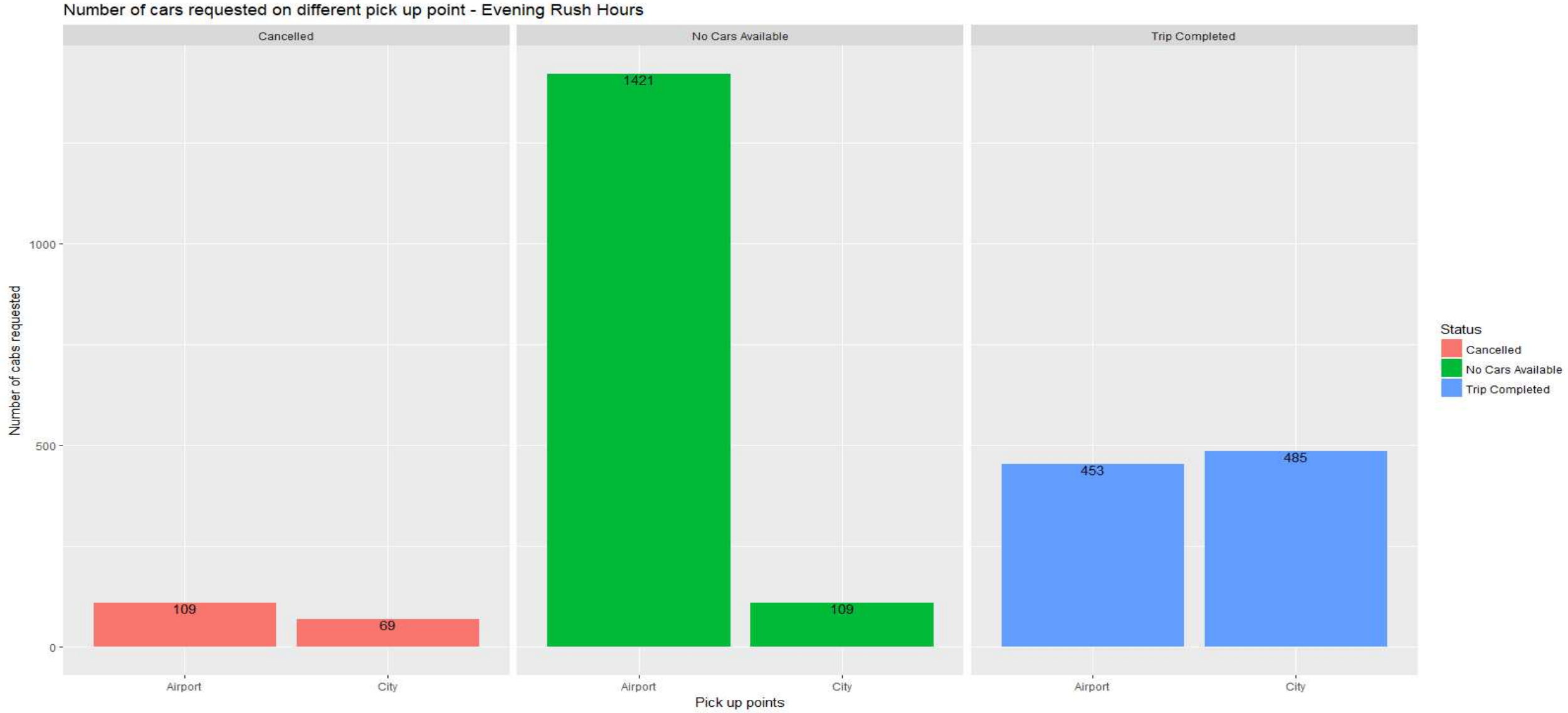
Problem identification & Analysis

Plot_03 – For Morning rush hours, plotted a bar chart to identify the pick up point from where large number of cabs are getting cancelled or unavailable. Chart clearly shows that the large number of cars are getting cancelled and also many cars are unavailable from city in Morning Rush hours.



Problem identification & Analysis

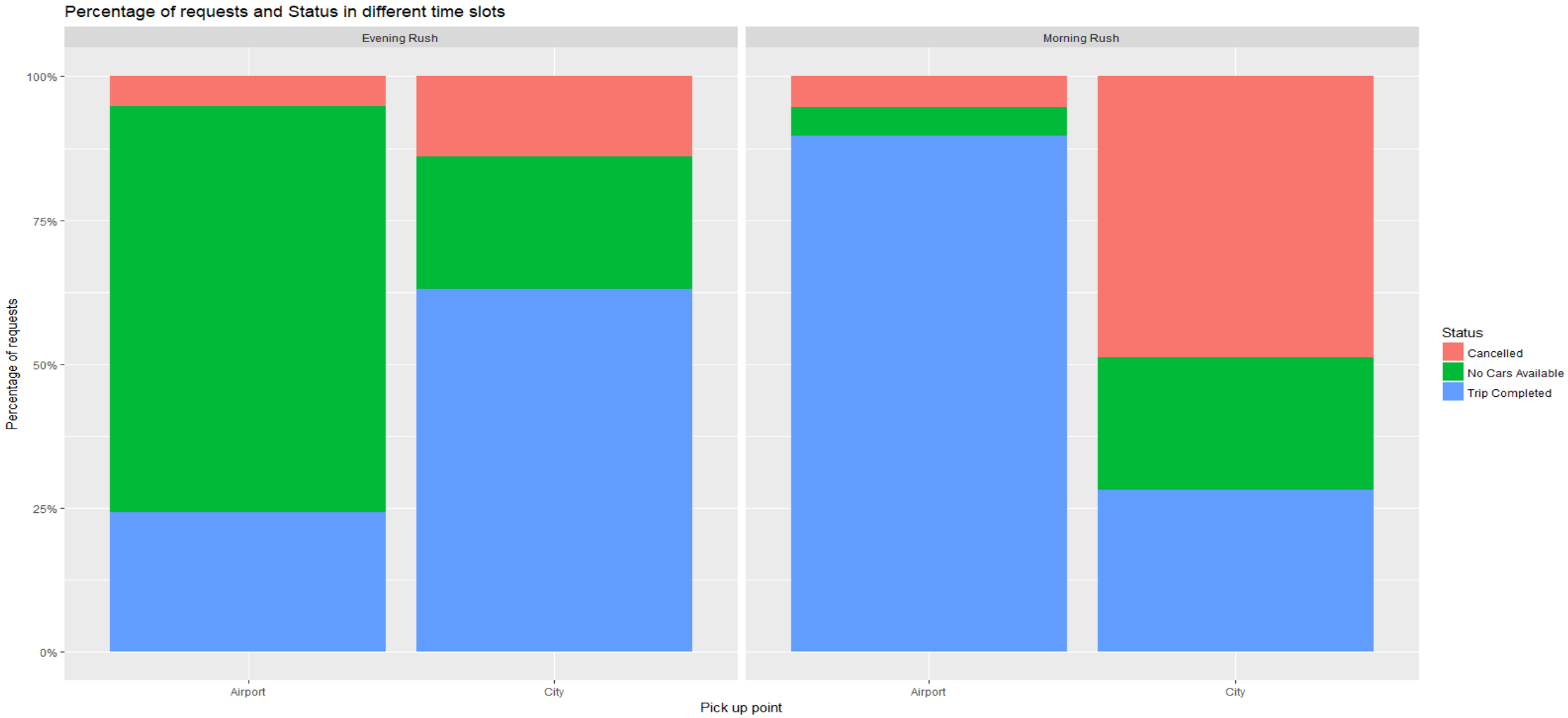
Plot_04 - For Evening rush hours, plotted a bar chart to identify the pick up point from where large number of cabs are getting cancelled or unavailable. Chart clearly shows that the large number of cars are unavailable from Airport in Evening Rush hours.



Problem identification & Analysis

Plot_05 – For evening & morning rush time, plotted the bar charts to identify the percentage of requests with status cancelled or No cars available to find out the demand and supply gap.

Clearly the chart shows that about 70% of the cabs are getting cancelled or not available from Airport in Evening Rush hours and about 70% of the cabs are either getting cancelled or not available in Morning Rush hours.



Problems

- Problem 1 – About 59% of the requests in Morning Rush & about 64% of the requests in Evening Rush respectively are either getting cancelled or cabs not available.
- Problem 2 – In morning rush hours, about 50% of the requests are getting cancelled from city and about 25% of the requests are there from city in which no cabs are available.
- Problem 3 – In evening rush hours, about 70% of the requests are there from airport in which No cabs are available.

Possible Root causes

- Root cause 1(Large number of cars are getting cancelled in Morning rush hours from city): The frequency of outgoing flights is high but frequency of incoming flights in morning is very less, so the drivers don’t want to go airport from city as they have to wait idle for some hours which is actually a waste of money for them. As they can utilize this time in city itself for other trips.
- Root cause 2(Many cars are not available in Morning rush hours from city): In some areas of city, cars might not be available as that areas are remote.
- Root cause 3(Large number of cars are not available in evening rush hours from airport): The frequency of incoming flights in evening is large so the number of people coming in airport is also large but outgoing flights are less so the cabs going to the airport is also very less. That’s why there is a huge gap.

Recommendations to resolve supply-demand gap

- Suggestion 1(Large number of cabs are getting cancelled in Morning rush hours) : To develop a mechanism by which cabs can be allowed to share till airport, so that cumulative amount from customers is sufficient to compensate the idle time of drivers. Also, if the customers are going separately in cabs then customer should be charged more and amount paid to driver for ride can be increased by not affecting the business much.
- Suggestion 2 (Many cabs are not available from city in Morning rush hours) : To solve this problem, areas need to be identified where cabs are unavailable and need to develop the mechanism to ask existing drivers to go in such areas. And, if required new drivers can also be hired.
- Suggestion 3 (Large number of cabs are unavailable from airport in evening rush hours) : To insists drivers who are living near to airport to start their shift in the evening and if required, engage more number of cars who are living near to airport and ask them to start their shift in evening rush hours from airport. Share real time data with drivers about cabs and flights, so that they can reach the airport before the arrival of flights and increase the cost to customers.