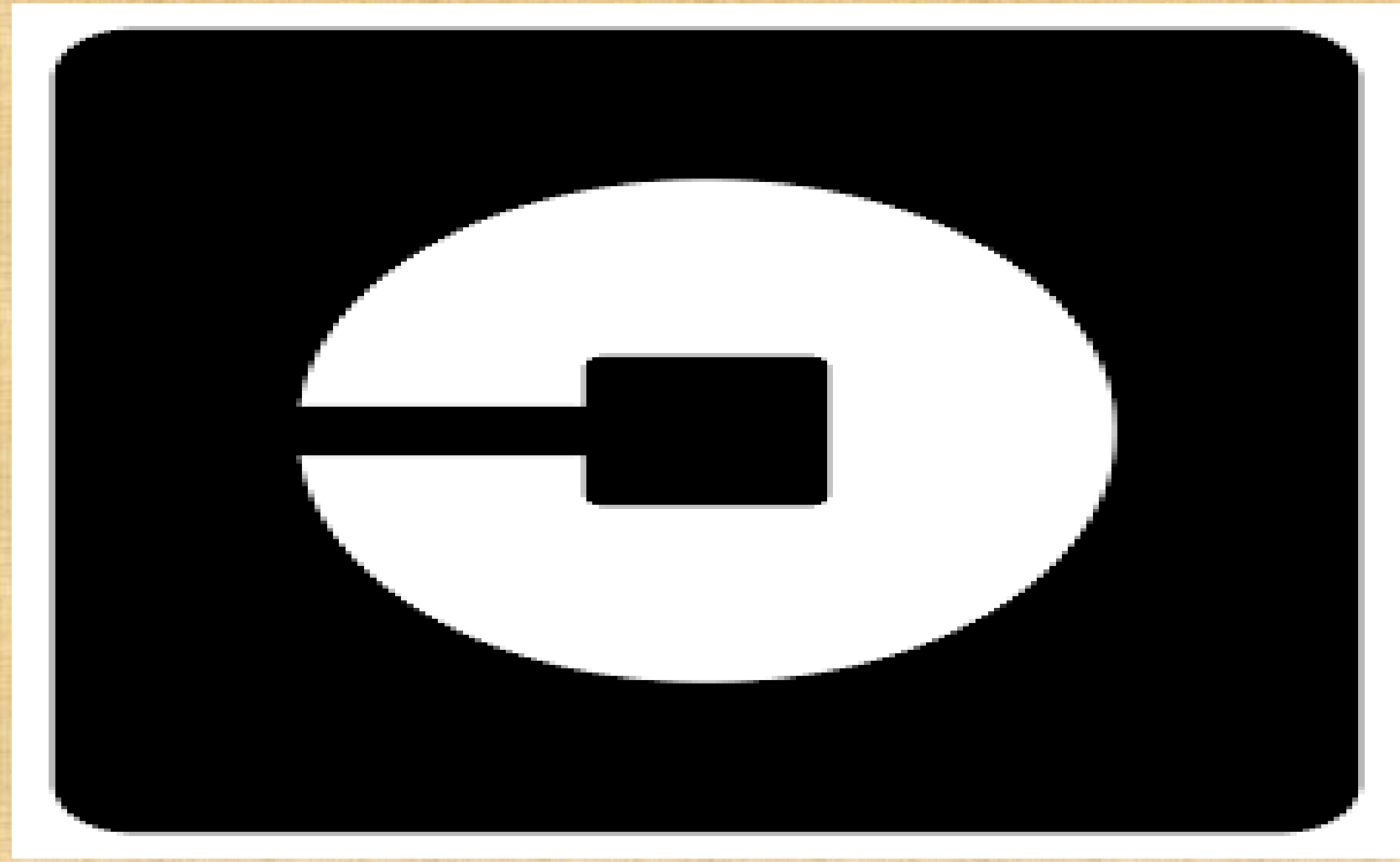
Uber Supply-Demand Gap Case Study

Kumar Abhilash
APFE18800685



Problem Statement:

- Find out the Time slots at Airport and City when there is gap in demand and supply of cabs.
- Suggest Some measures that can help reduce or resolve the problem.
- **Data Provided:**

  Request.id : A unique identifier of the request

  Pickup.point : The point from which the request was made

  Driver.id : The unique identification number of the driver

  Status : The final status of the trip, that can be either completed, cancelled by the driver or no cars available

  Request.timestamp : The date and time at which the customer made the trip request

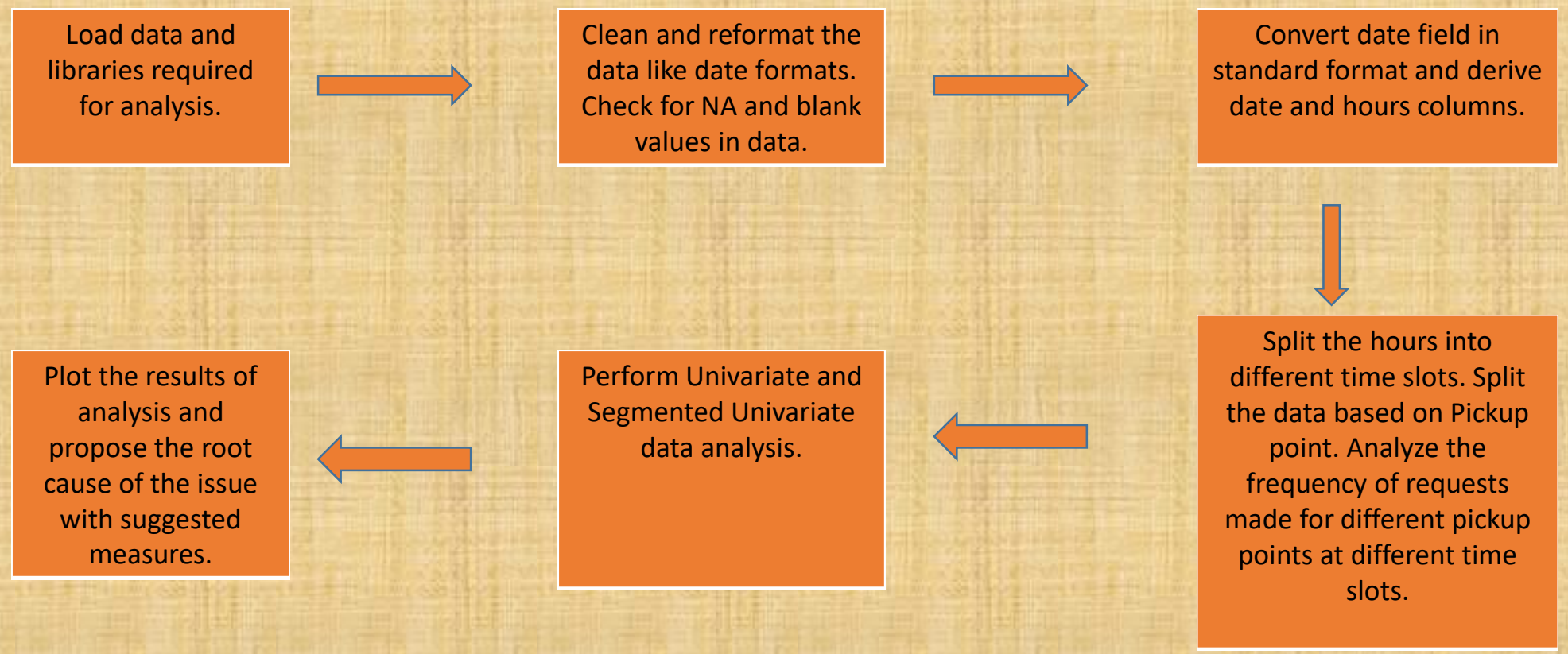
  Drop.timestamp : The drop-off date and time, in case the trip was completed

- The Uber Request data has data evenly distributed among five working days(from 2016-07-11 to 2016-07-15) and contains data for request made from Airport and City.
- The trips only **to and from the Airpor**t needs to be considered for analysis.
- **Tools Used:**

  R(for loading, analysing, cleaning and plotting the data)

  PowerPoint(to represent the issue with suggested measures)

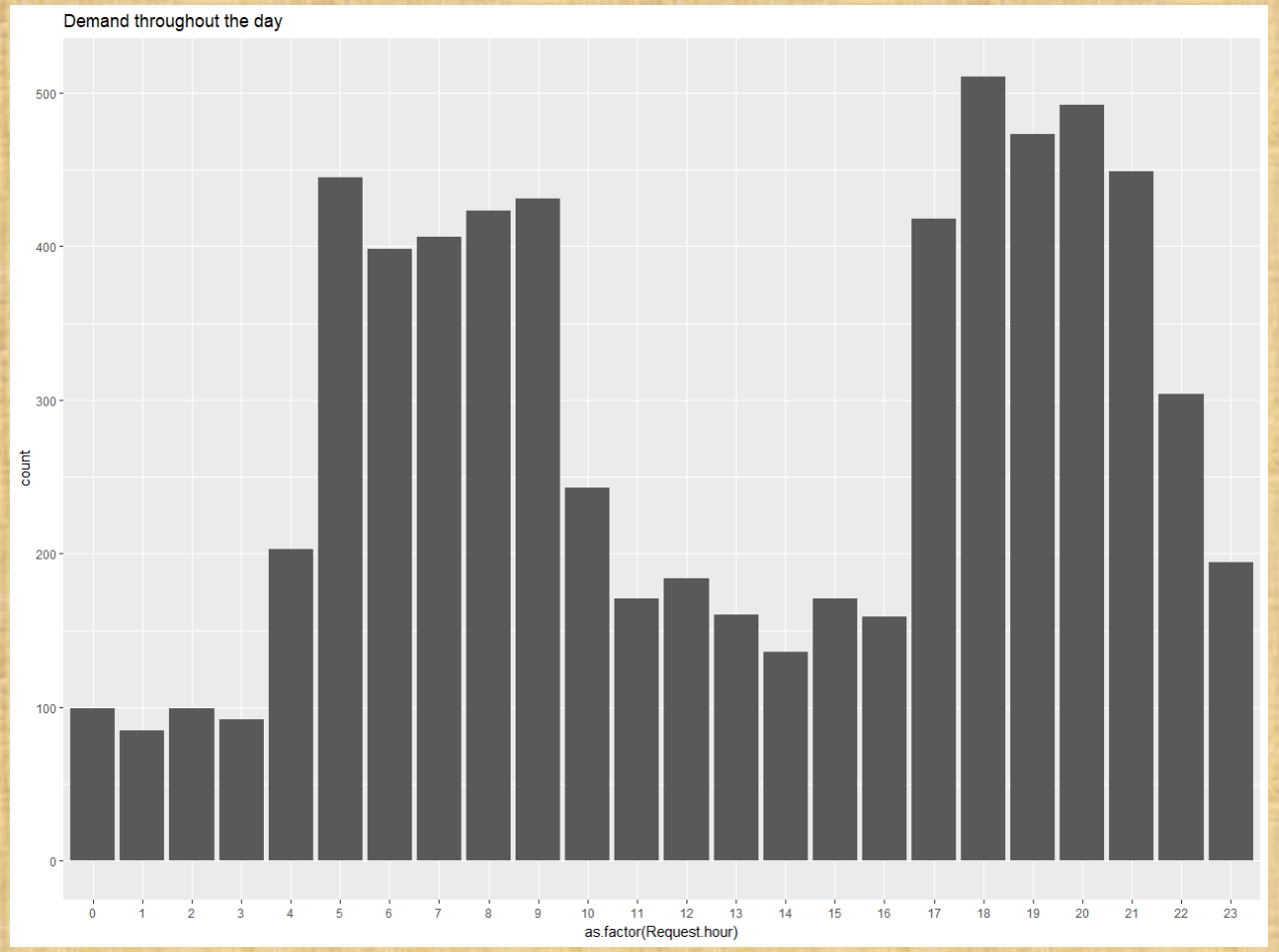
Analysis Methodology:



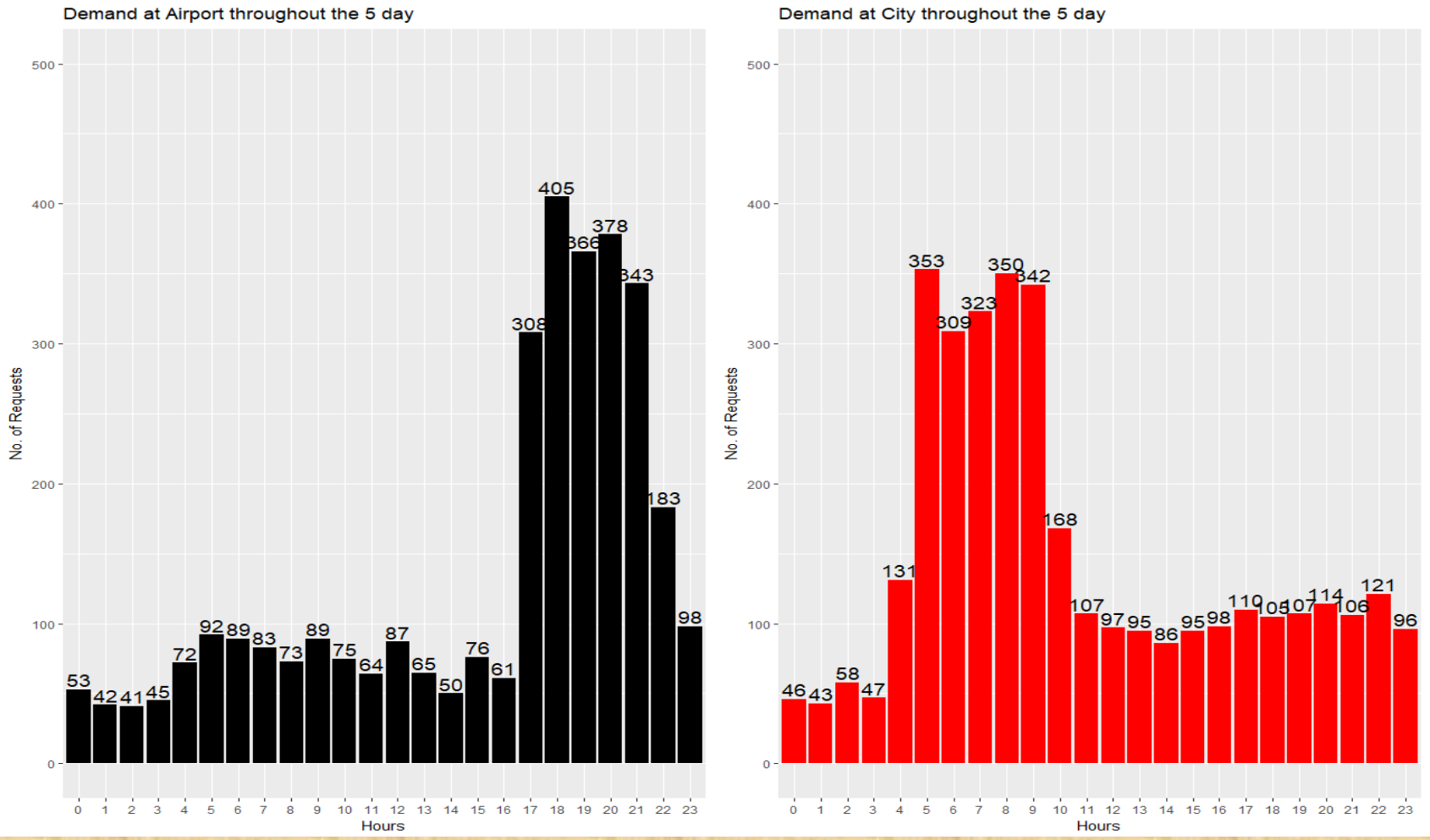
Time Slot distribution:

- The hours in a day can be distributed based on Time slots of a day. Here, 5 time slots are chosen after analyzing the distribution of demand at Airport and City.
- We can plot graphs for pickup point as "Airport" and "City" against the Request.hour see the distribution of demand and supply over the hours in a day.

0000 to 0359 <- Late_Night
0400 to 0559 <- Early_Morning
0600 to 1059 <- Morning_Rush
1100 to 1659 <- Day_Time
1700 to 2359 <- Evening_Rush

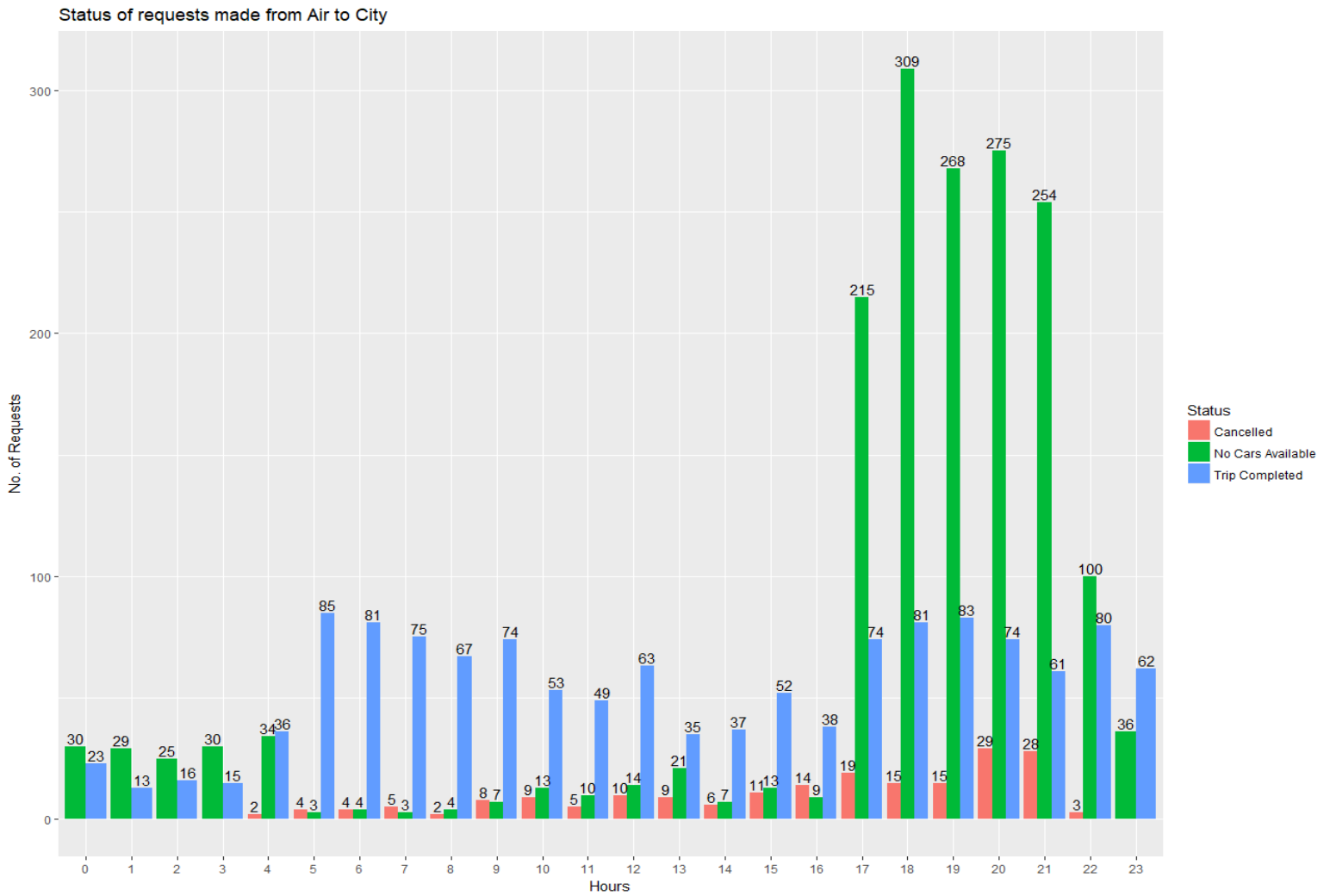


Demand at Airport/City throughout the 5 day



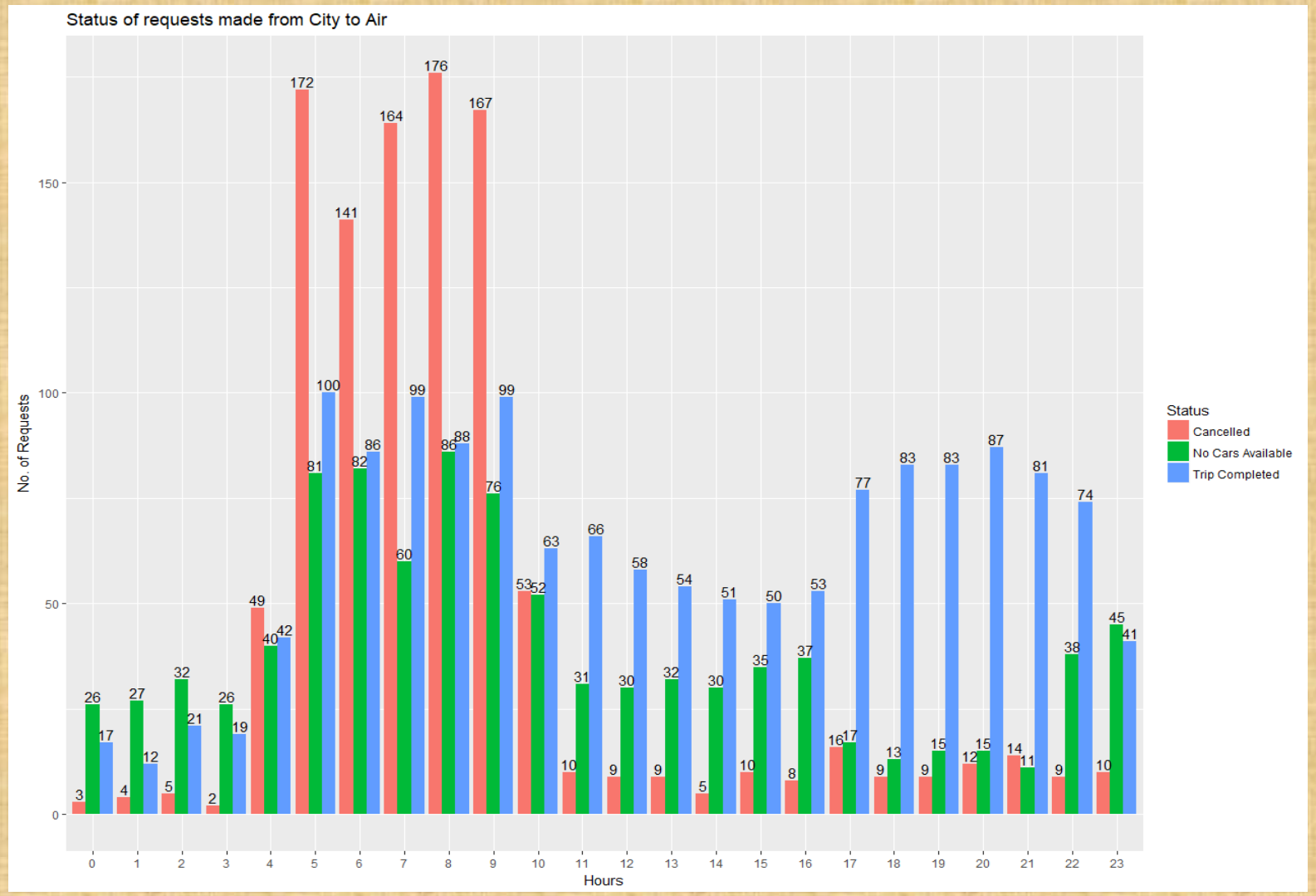
- There is high demand during Evening_Rush at Airport.
- There is high demand during Early_Morning and Morning_Rush at City.

Distribution of demand at Airport based on Status:



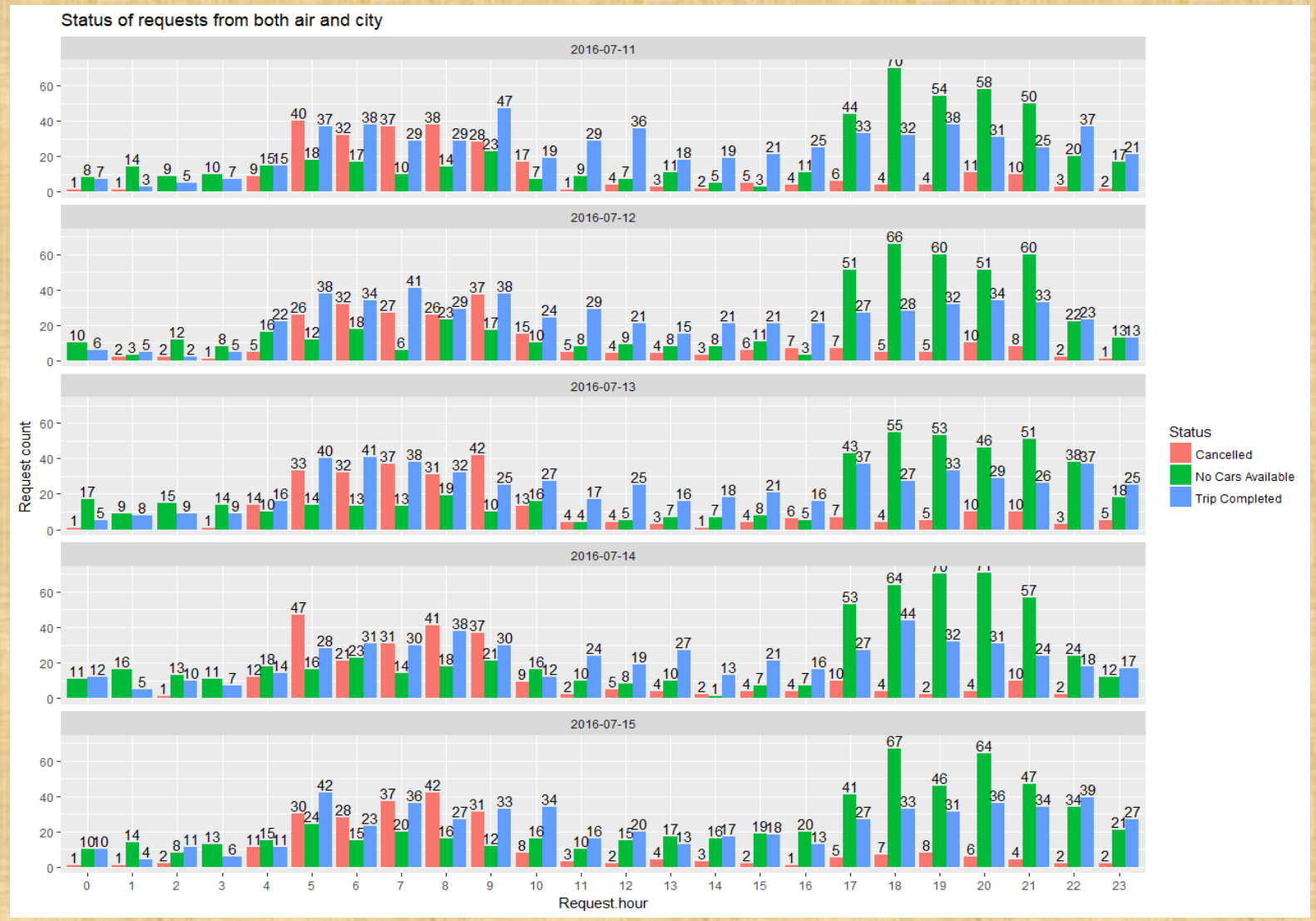
- Trip Completed : Almost equal during Evening_Rush and Morning, average during Day and least during Late_Night.
- No Cars Available : Mostly during Evening_Rush compared to other time slots.
- Cancelled: More during Evening otherwise least/none during other time slots .

Distribution of demand at City based on Status:



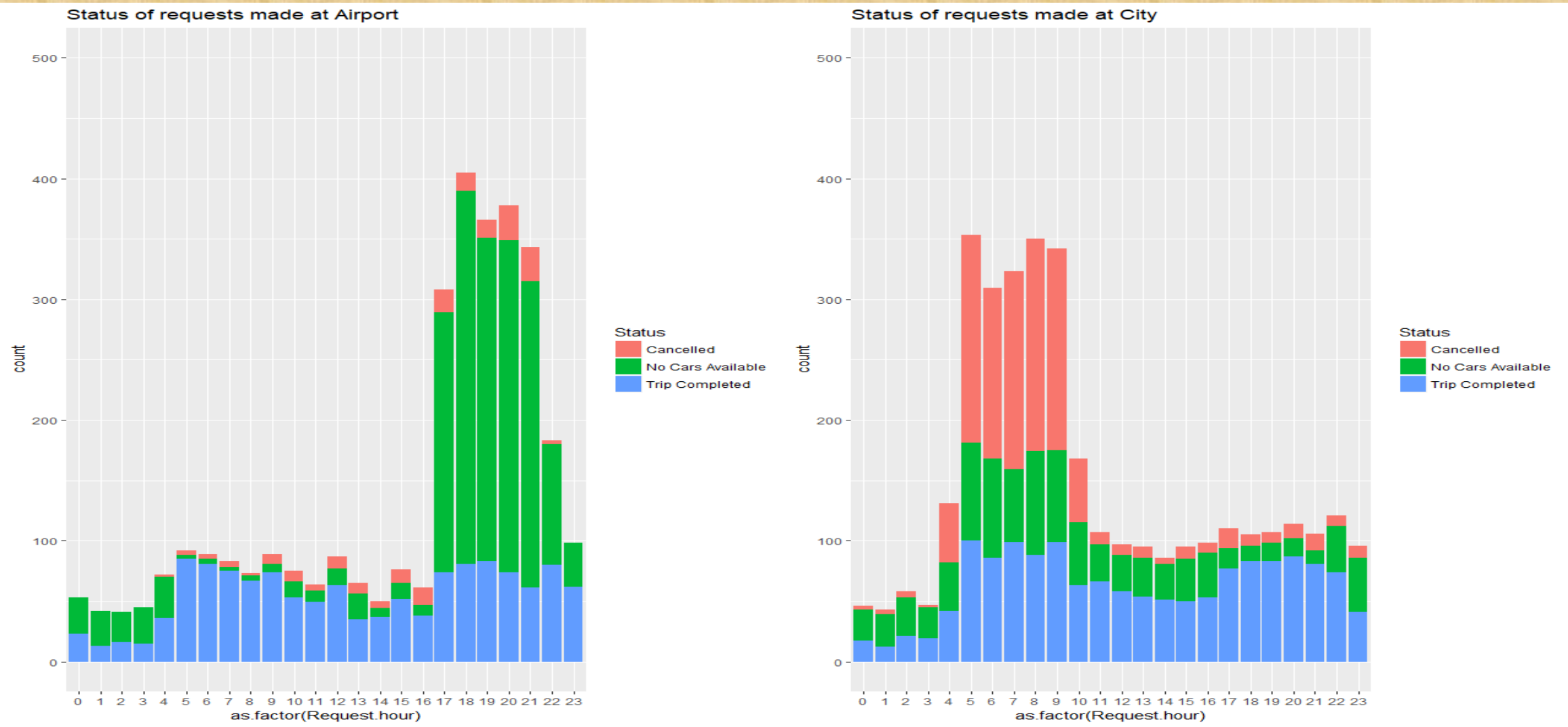
- Trip Completed : Almost equal during Evening_Rush and Morning, average during Day and least during Late_Night.
- No Cars Available : More during Morning compared to other time slots.
- Cancelled: Most during Early and Mornimg rush, otherwise evely distributed.

Distribution of demand throughout 5 days:



- There is even distribution of data among the five days.
- The status for the requests are also evenly distributed among the five days.

Distribution of demand at Airport & City for 5 days:



Demand and Supply Gap at:Airport & City

Assumption:

Demand = Trip.Completed + Cancelled + No.Cars.Available

Supply = Trip.Completed

Airport to City:

Cancelled 109

No Cars Available 1457

Trip Completed 515

Demand at airport during Evening_Rush = 515 + 109 + 1457 = 2081

Supply at airport during Evening_Rush = 515

Gap = 2081 - 515 = 1566

City to Airport:

Cancelled 922

No Cars Available 477

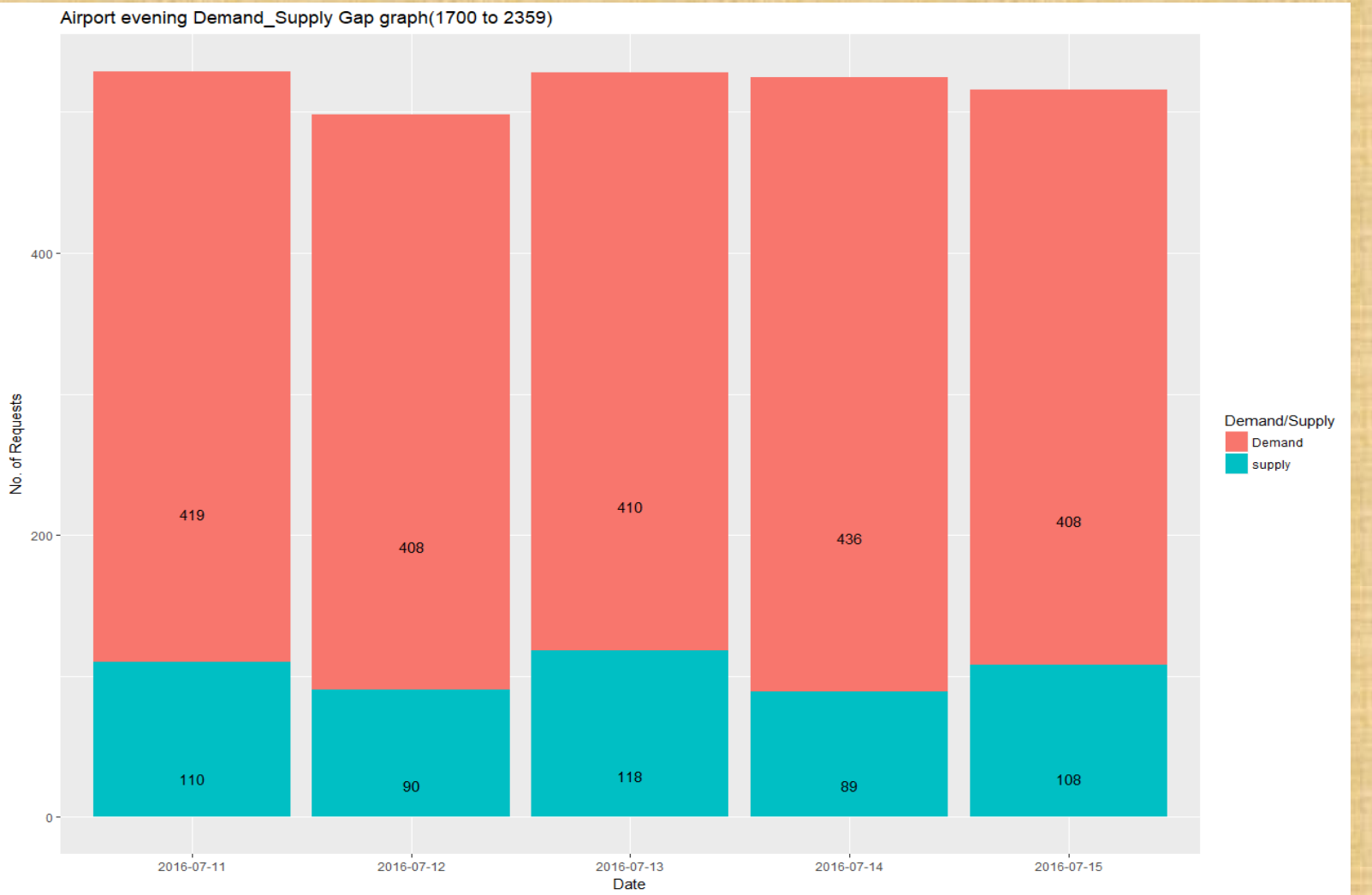
Trip Completed 577

Demand at city during Early_Morning and Morning_Rush = 922 + 477 + 577 = 1976

Demand at city during Early_Morning and Morning_Rush = 577

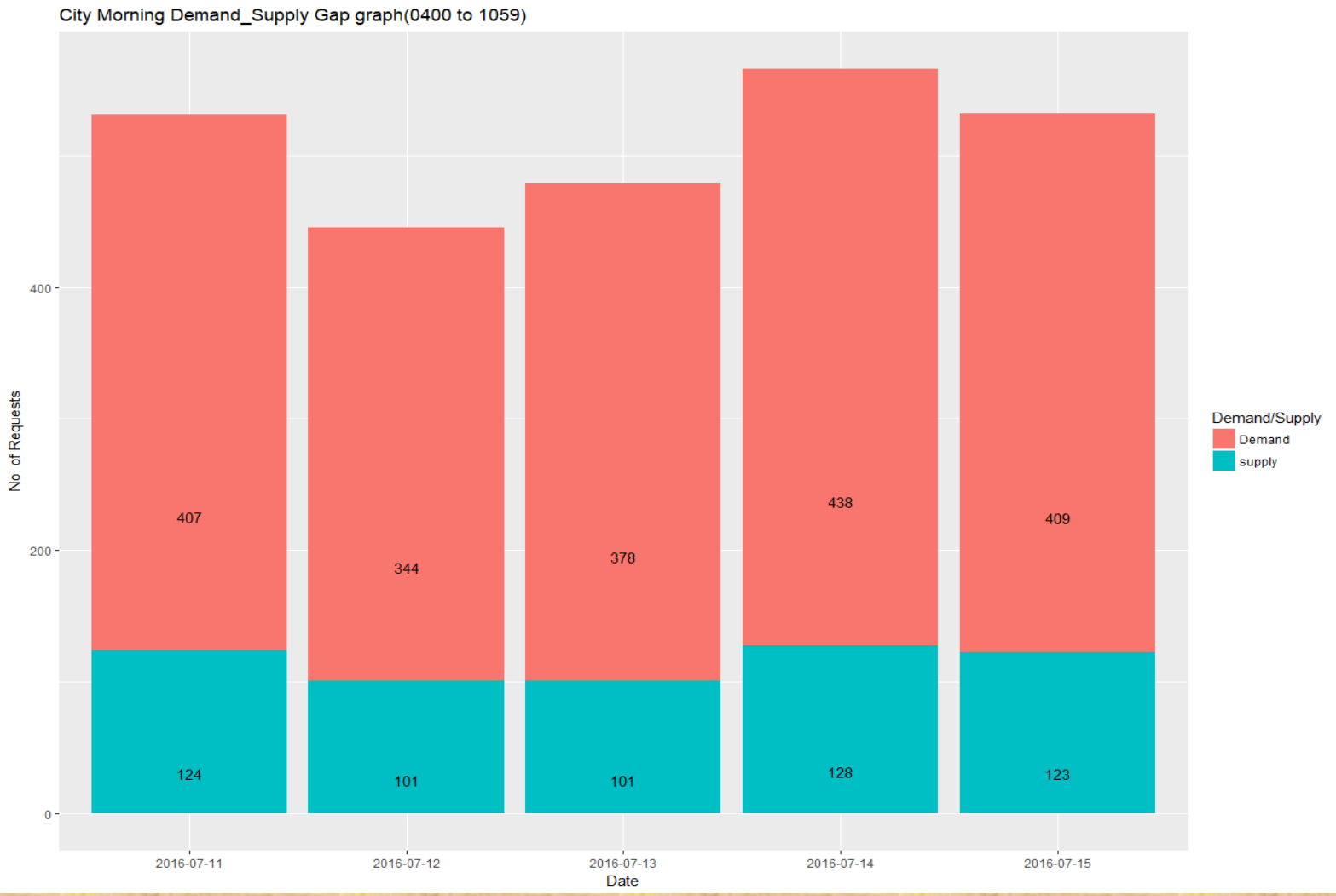
Gap = 1976 – 577 = 1399

Demand Supply gap at Airport during Evening_Rush:



- Total Demand: 2081
- Total Supply: 515
- Gap: 1566

Demand Supply gap at City during Early and Morning_Rush:



- Total Demand: 1976
- Total Supply: 577
- Gap: 1399

Conclusion:

- The Uber Request data has data evenly distributed among five working days and contais data for request made from Airport and City.
- The NA values for Driver.id and Drop.timestamp are justified as either the trip was cancelled or there were no cars available.
- The average trip time from Airport to City or vice versa is approx. 52 minutes.
- There is high number of "No cars available" cars at Airport during Evening rush(5 PM till 12 AM).
- There is high number of "Cancelled" cars at Airport during early morning and morning rush(4 AM till 11 AM).
- The major issue when pickup point is Airport is Demand/Supply gap during evening (Gap = 1566)
- The major issue when pickup point is City is Demand/Supply gap during morning (Gap = 1399)Plot the results of Analysis and Understand the root cause of the issue.

Recommendations:

- As there are more requests at Airport during evening time, the number of cabs should be increased at the airport by giving incentives to drivers to make trip during that time.
- During morning time, there are lot of cancellations made either by driver or customer at City. The reason could be high demand during that time. So, increasing the number of cabs will obviously help.
- Drivers can be paid extra for wait time at Airport during evening time to meet the demand during evening.
- Prior planning and cab scheduling can be done to meet the demand during most problematic time slots.
- Drivers can be awarded with bonus amounts for less cancellation of rides at peak hours.