Uber Supply-Demand Gap Analysis

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Business Objectives & Strategy

Objectives

- Identify root causes of the problems - Cancellation and Non-availability of cars for City and Airport Pickups
- Recommend ways to improve the Supply-Demand gap situation.

Strategy

- Use the available trips requests data of 5 business days for *Exploratory Data Analysis*
- Identify Time Slots with highest cancellation and non-availability of cars per each Pickup Point
- Hypothesis for Problem statement and Reasons
- Propose Recommendations for improvement

Problem Solving Methodology – Analysis Flow

Business and Data Understanding

Step 1 – Business Analysis Decision is to analyze date time level requests data at aggregated level of 1 hour window.

Step 2 – Clean data, for unified Date Time format and extract hours

Univariate & Bi-Variate Analysis

Step 3 - Univariate Analysis on **Trip Status**, **Pickup Point** and **Time Slots**

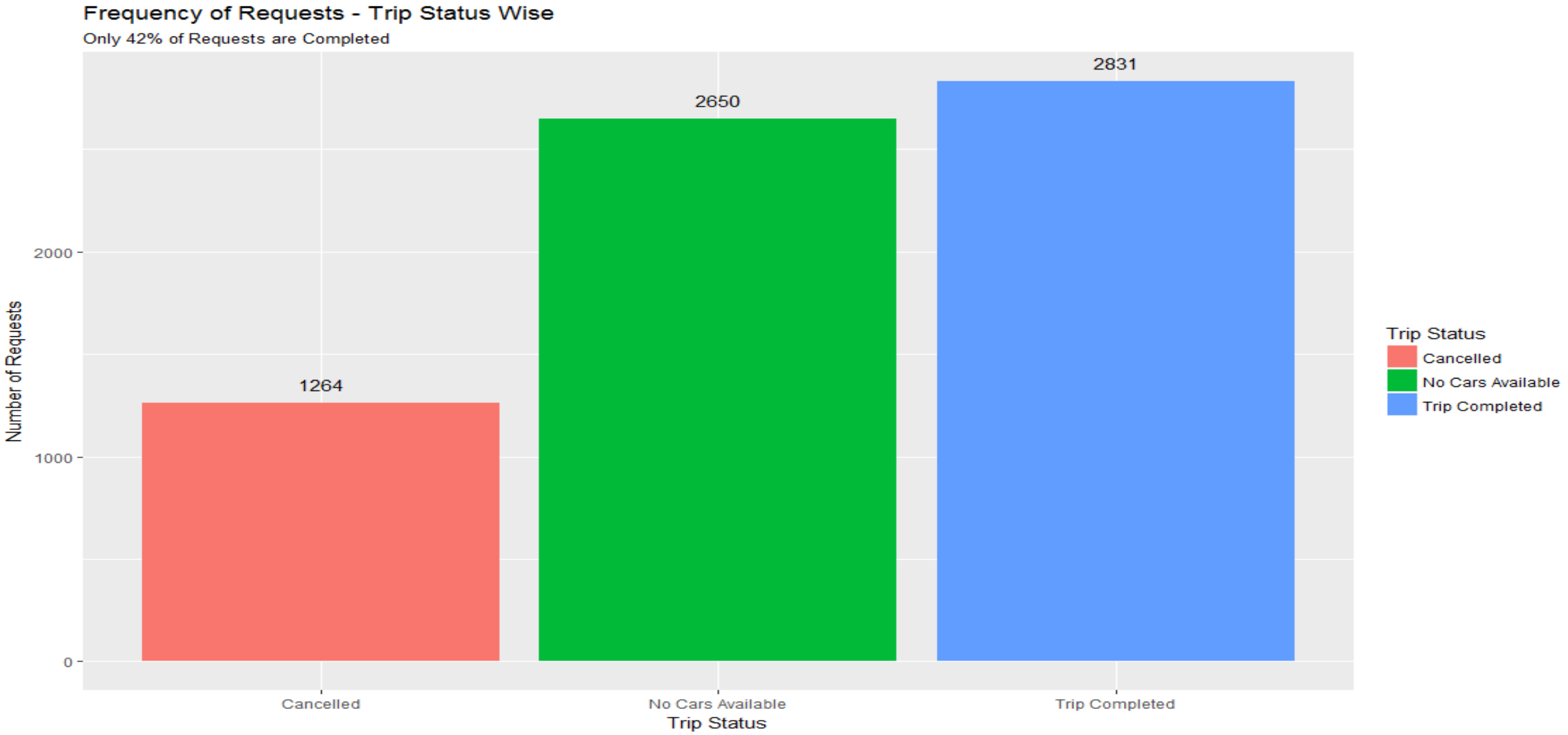
Step 4 – Bi-variate Analysis of **Trip Status**, **Pickup Points** and **Time Slots**

Supply-Demand Gap Analysis

Step 5 – Analyze Supply-Demand Gap across Time Slots

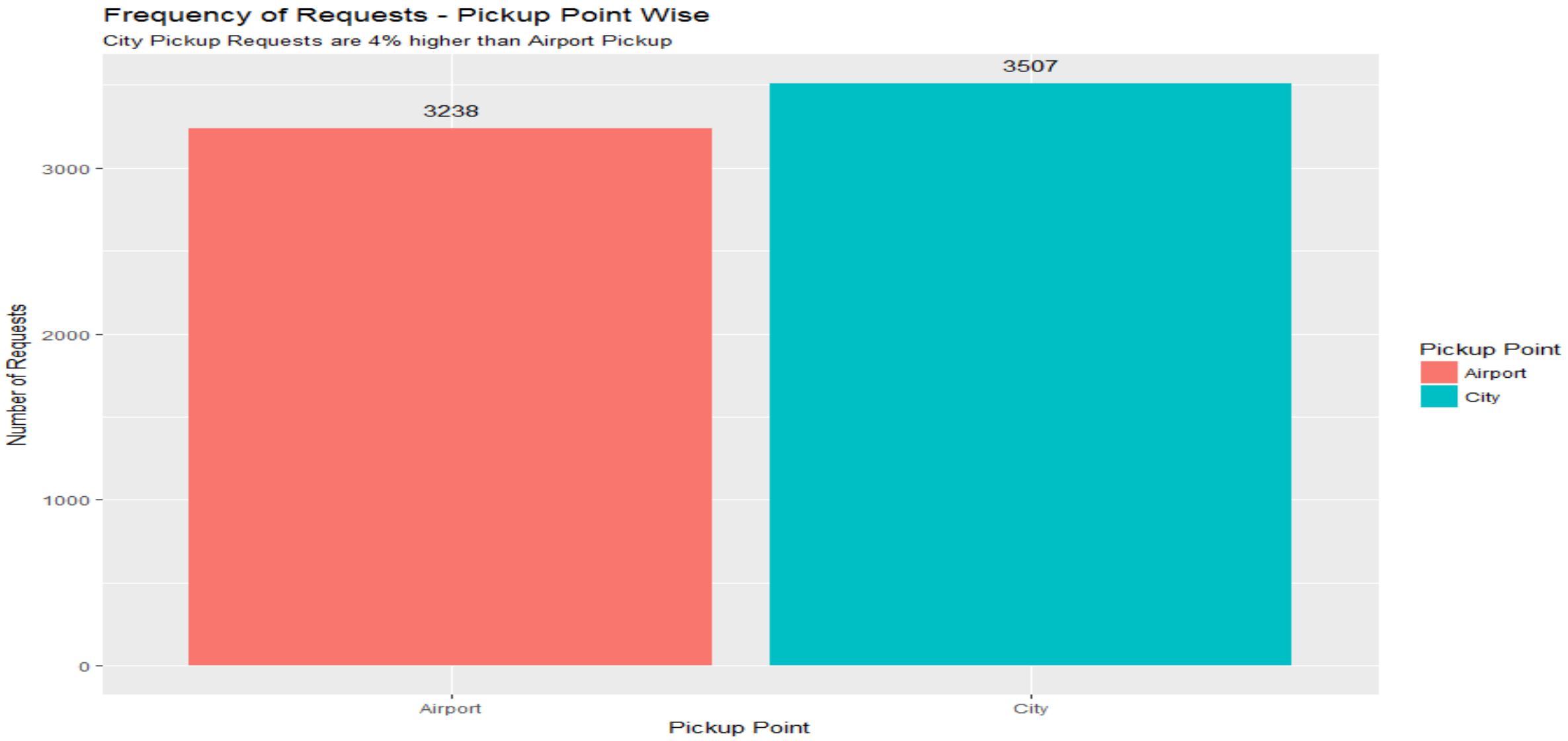
Step 6 – Identify Root causes of Cancellations and Non-availability for Time slots & Pickup points

Frequency of Trip Status



***Plot**: Showing Histogram for Trip Status – **42%** of requests completed and **58%** are requested resulted in loss of Business*

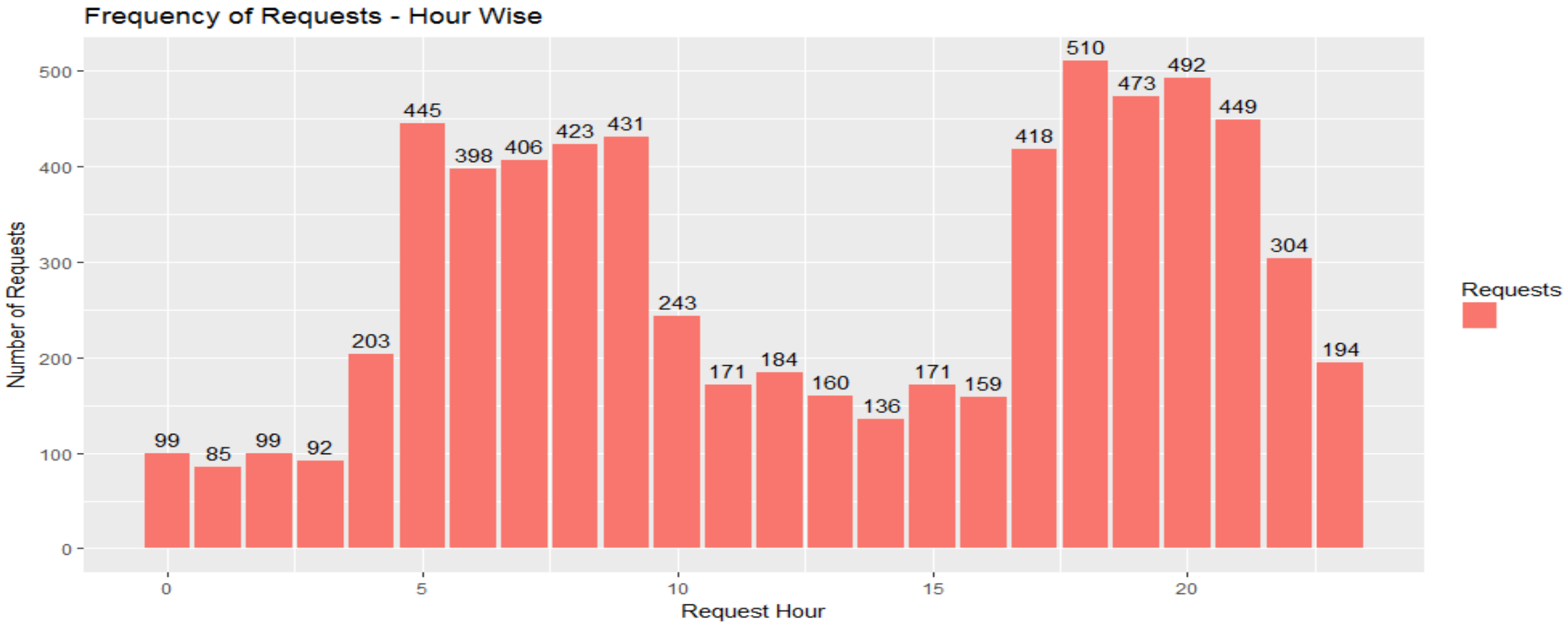
Frequency of Pickup Points



Plot**: Showing Histogram for Pickup Point. City Pickup requests are **52%** and Airport pickup are **48%

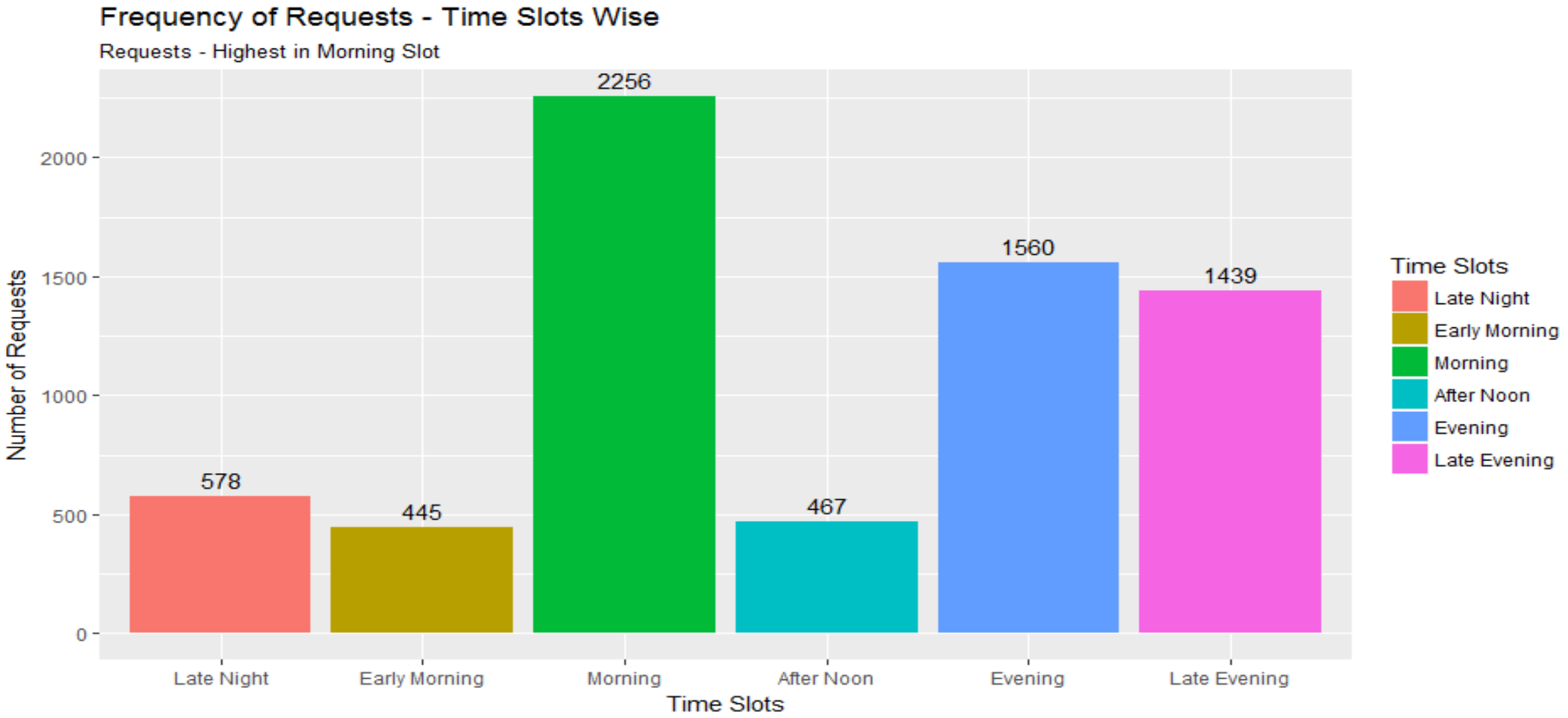
Frequency of Trip Request Time

24 Hours Spread



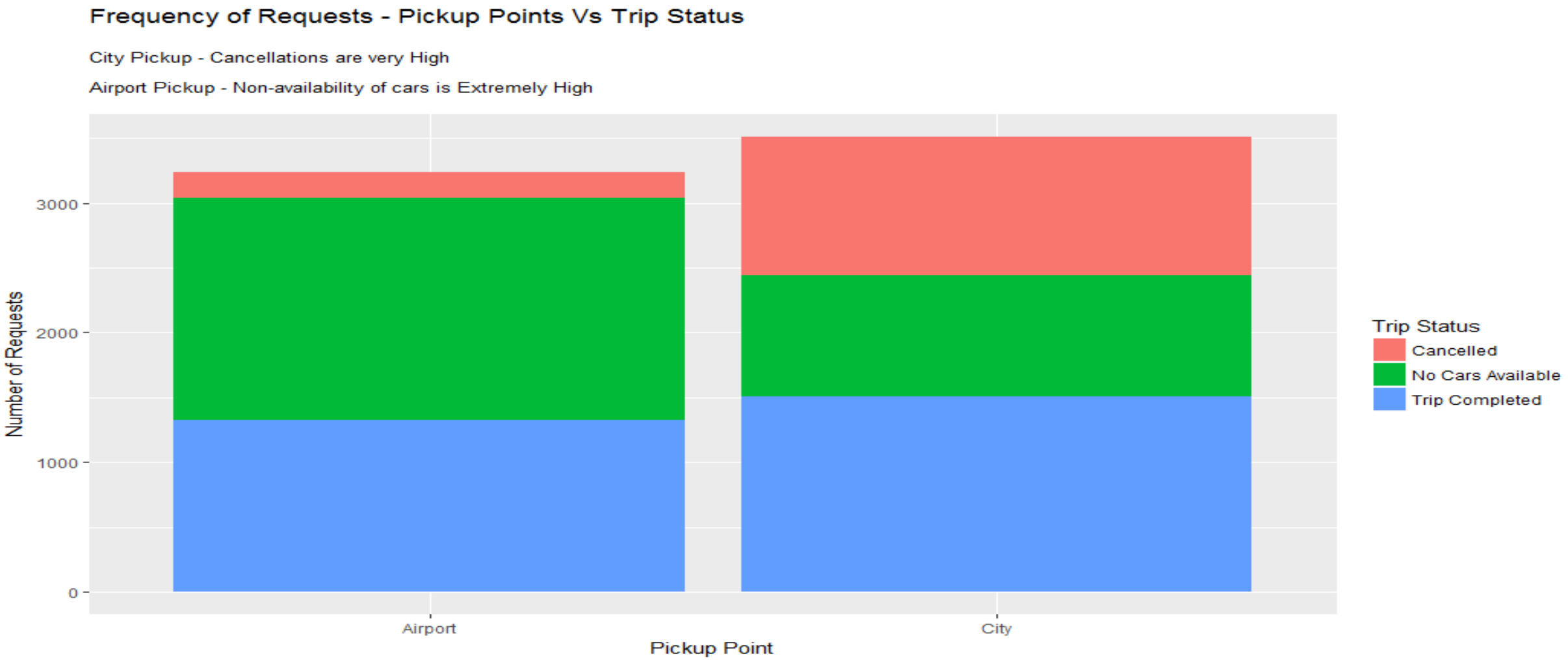
Plot**: Showing Histogram for* Trip Request Hour. *Peak hours are Morning **6 AM – 10 PM** and Evening **6PM – 10 PM

Frequency of Trip Request Time Slots



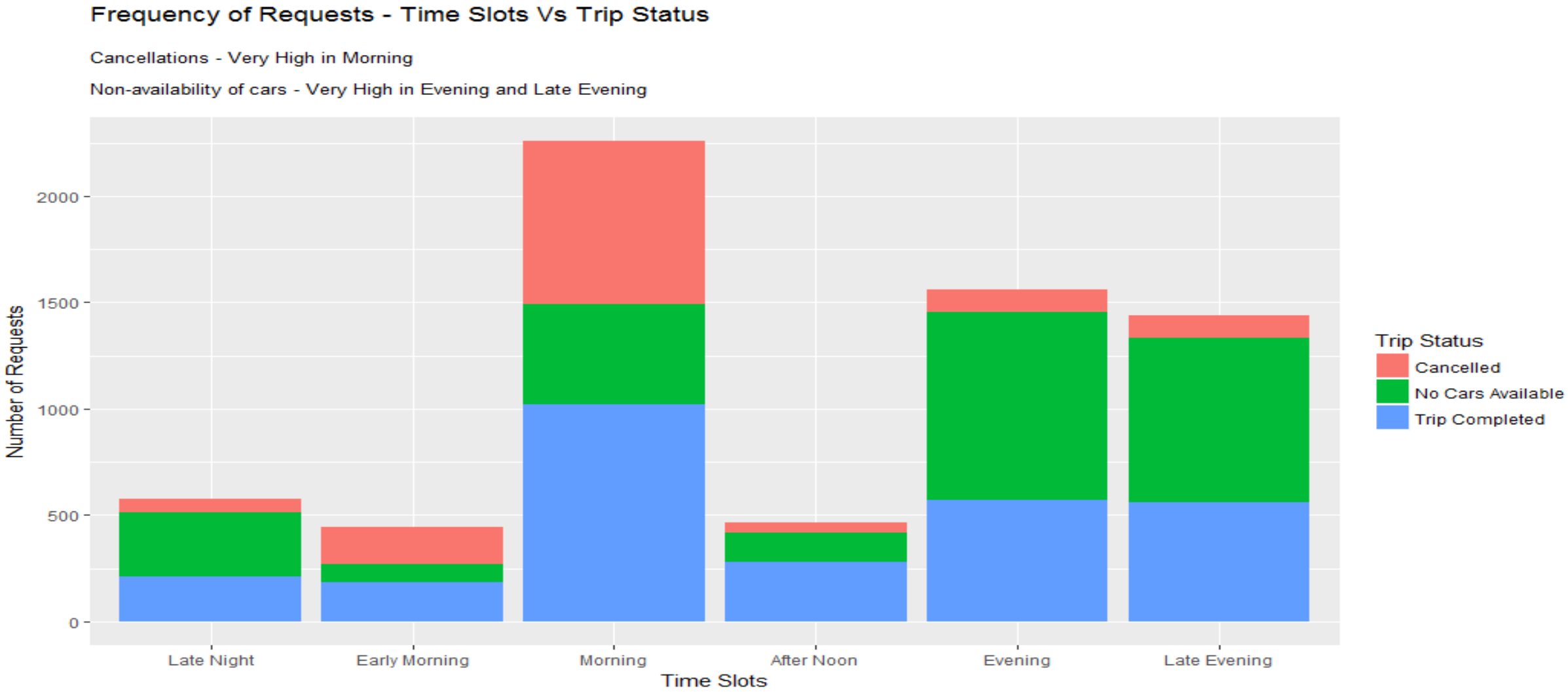
***Plot**: Showing Histogram for Trip Time Slots – **Morning, Evening and Late Evening** where high demand for Business*

Frequency of Pickup Points with Trip Status



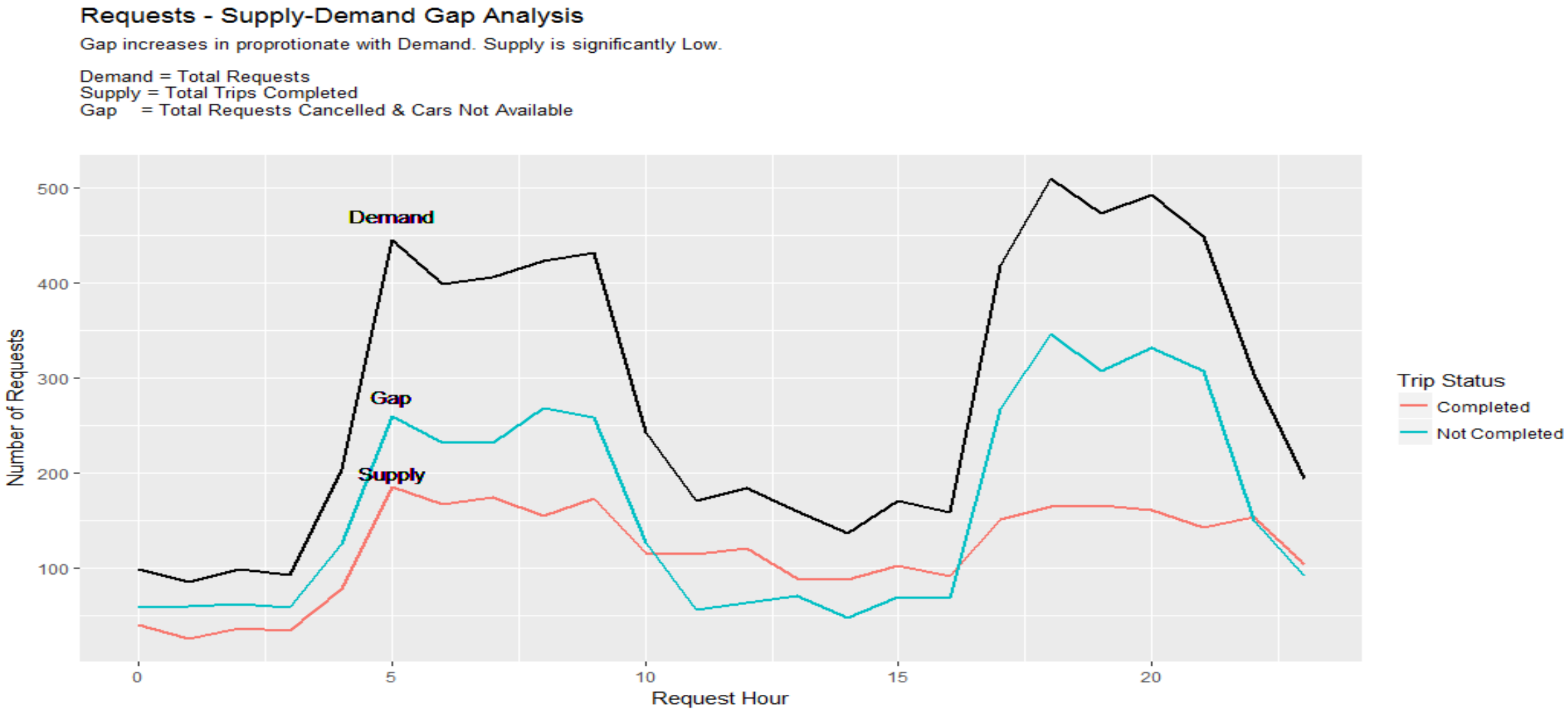
***Plot**: Showing Histogram for Pickup Point - Trip Status wise*

Frequency of Time Slot with Trip Status



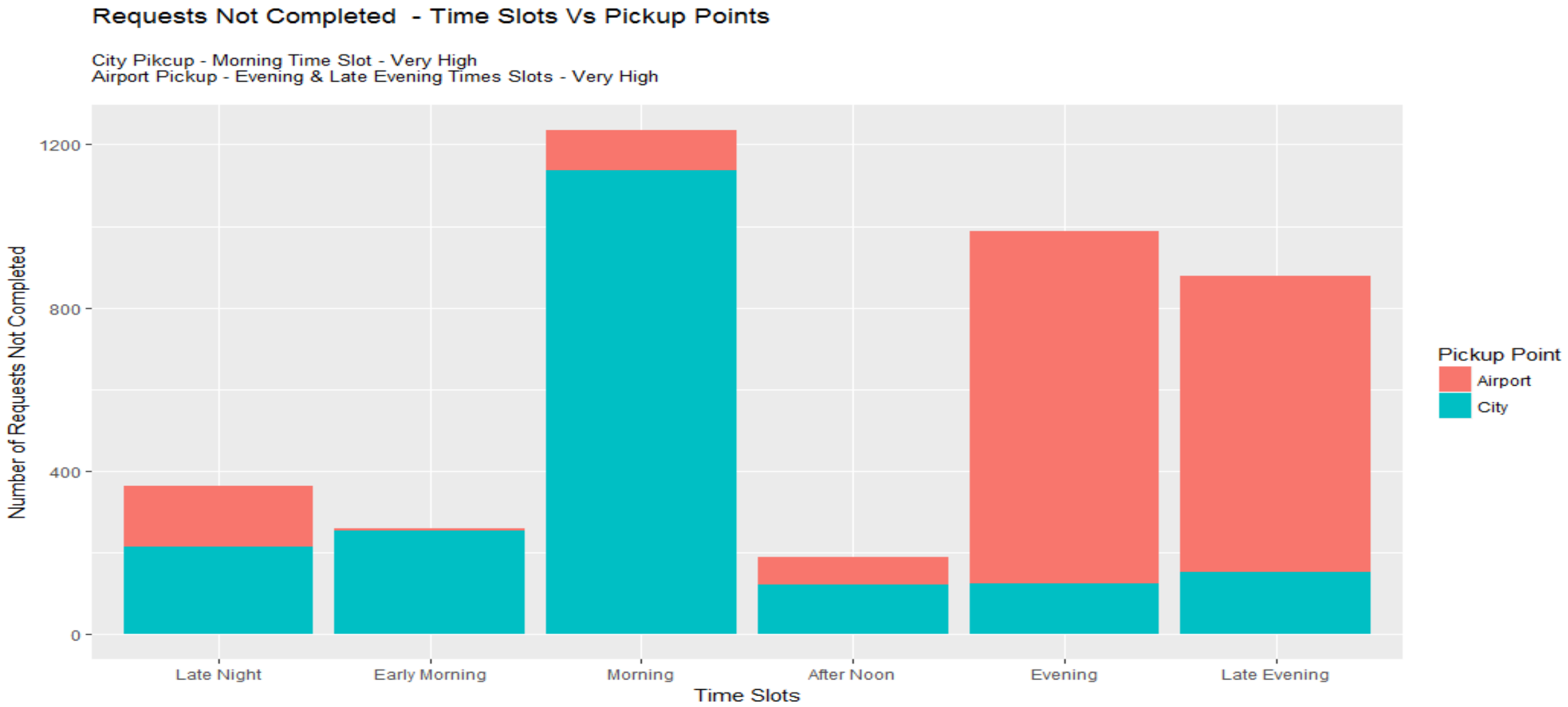
***Plot**: Showing Histogram for Time Slots - Trip Status wise*

Supply - Demand & Gap – Trend Analysis



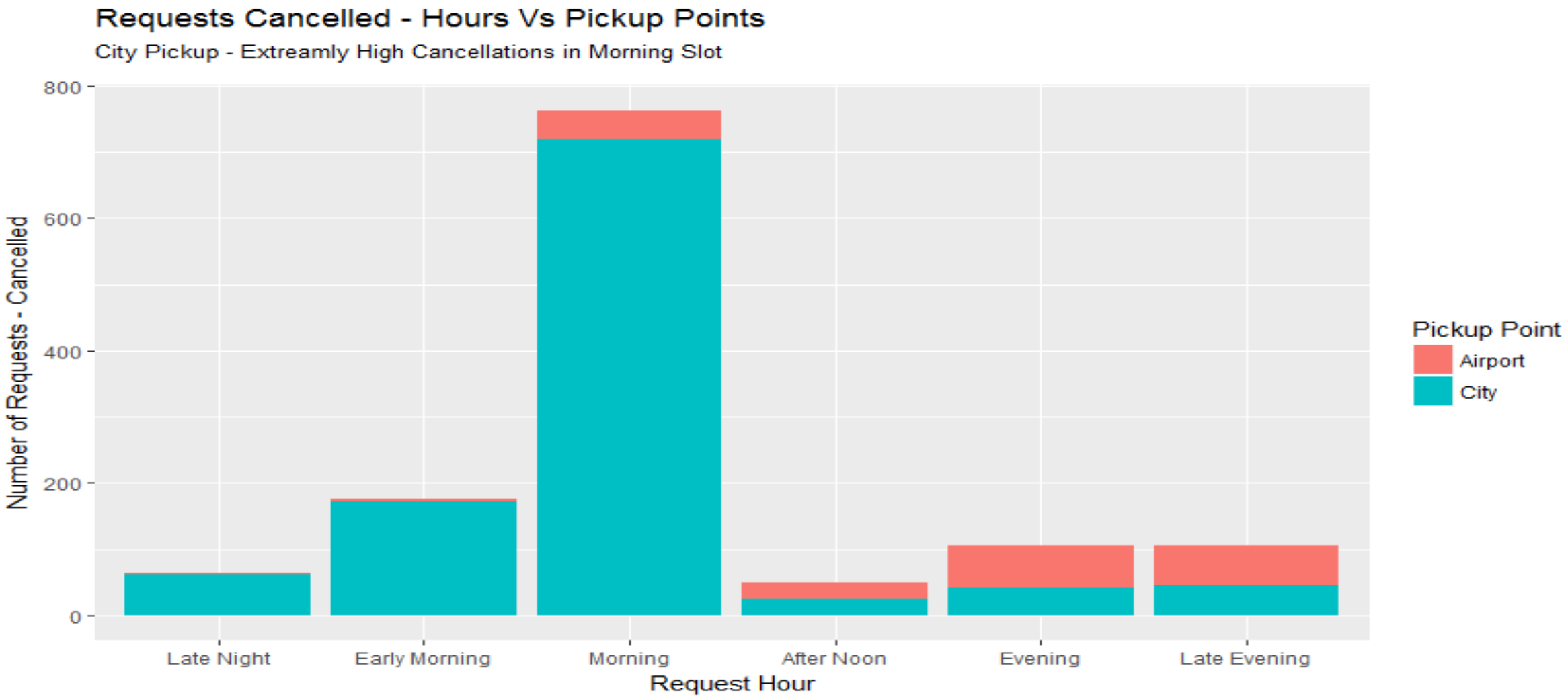
Plot**: Showing trend of Demand, Supply and Gap for requests hour wise. The current **Supply is Very Low against Very High Demand

Supply Gap - Incomplete Requests Analysis



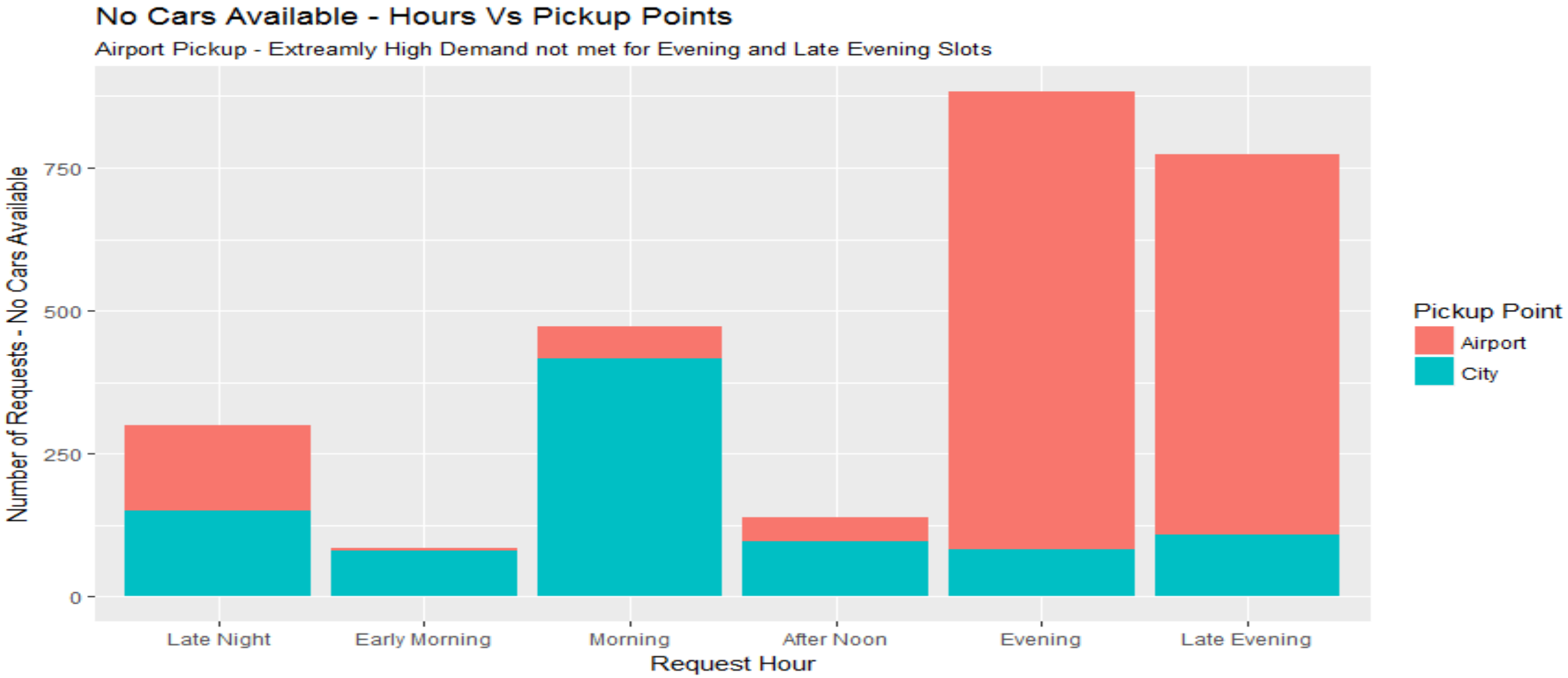
Plot**: Showing frequency of **Requests Cancelled & Non-available cars combined** are **Very High** in peak hours **Morning, Evening & Late Evening

Root Cause Analysis – Cancelled Requests



***Plot**: Showing Extremely High Cancellations in **Morning Slot** for **City Pickup** are clear **Root Cause** for over all High Cancellations & Loss of Business*

Root Cause Analysis – Cars Not Available



***Plot**: Showing Extremely High Demand in **Evening & Late Evening Slots** for **Airport Pickup** is clear **Root Cause** for over all Less Supply .*

This is an Opportunity for More Business

Hypothesis - Business Loss and Supply-Demand-Gap

Business Loss

- **58%** of Overall Demand not met due to less Supply
- **79%** of Gap occurs in Time Slots - ***Morning, Evening & Late Evening***

Top 3 Pressing problems need immediate rectification

- Airport Pickup - Non-Availability of Cars for in *Evening & Late Evening (6PM - 10PM)*
- City Pickup - Cancellations in *Morning Time Slot (6AM - 10 AM)*
- City Pickup - Non-Availability of Cars - *Morning Time Slot (6AM - 10 AM)*

Possible Reasons

- City Pickup Cancellations (6AM - 10AM) and City Pickup - Non-Availability of Cars - *Morning Time Slot (6AM - 10 AM)*
    1. Extremely Low Demand during *After Noon (Noon - 4PM)* hours for Airport Pickup to get a return City Pickup

- Airport Pickup Non-Availability of Cars (6PM - 10PM)
    1. Extremely High Demand in *Evening and Late Evening* which is twice to that City Pickup Cancellations problem
    2. Cars do not reach Airport due to City Pickup Cancellations (6AM - 10AM), has cascading effect to this problem

Recommendations

City Pickup Cancellations in *Morning* (6AM - 10AM)

- Add premium charge for customers who book cab at these hours, which helps to compensate drivers for low demand during *After Noon (Noon - 4PM)* hours at Airport

Airport Pickup - Non-Availability of Cars for in *Evening & Late Evening (6PM - 10PM)*

- Deploy more cabs at premium charge for customers who book cab at these hours
- Solution to City Pickup Cancellations in *Morning* (6AM - 10AM) also has possible positive cascading effect in resolving this partially if drivers wait more time for Airport Pickup to City for premium charge
- When demand doesn't meet, explore possibilities of adding cars in nearest City areas, for e.g. <5KM and approx. 30 Mins ride to drive to Airport pickup, at a premium charge.

Non-Availability of Cars - City Pickup in *Morning (6AM - 10 AM)*

- Deploy few more cabs at this slot for premium charge
- Car Pool for specific main routes for customers with very minimal luggage