

UBER SUPPLY-DEMAND GAP

ASSIGNMENT SUBMISSION

Business Understanding

- If drivers cancel the request of riders or if cars are unavailable, Uber loses out on its revenue.
- Need to address the problem Uber is facing – driver cancellation and non-availability of cars leading to loss of potential revenue

Business Objective

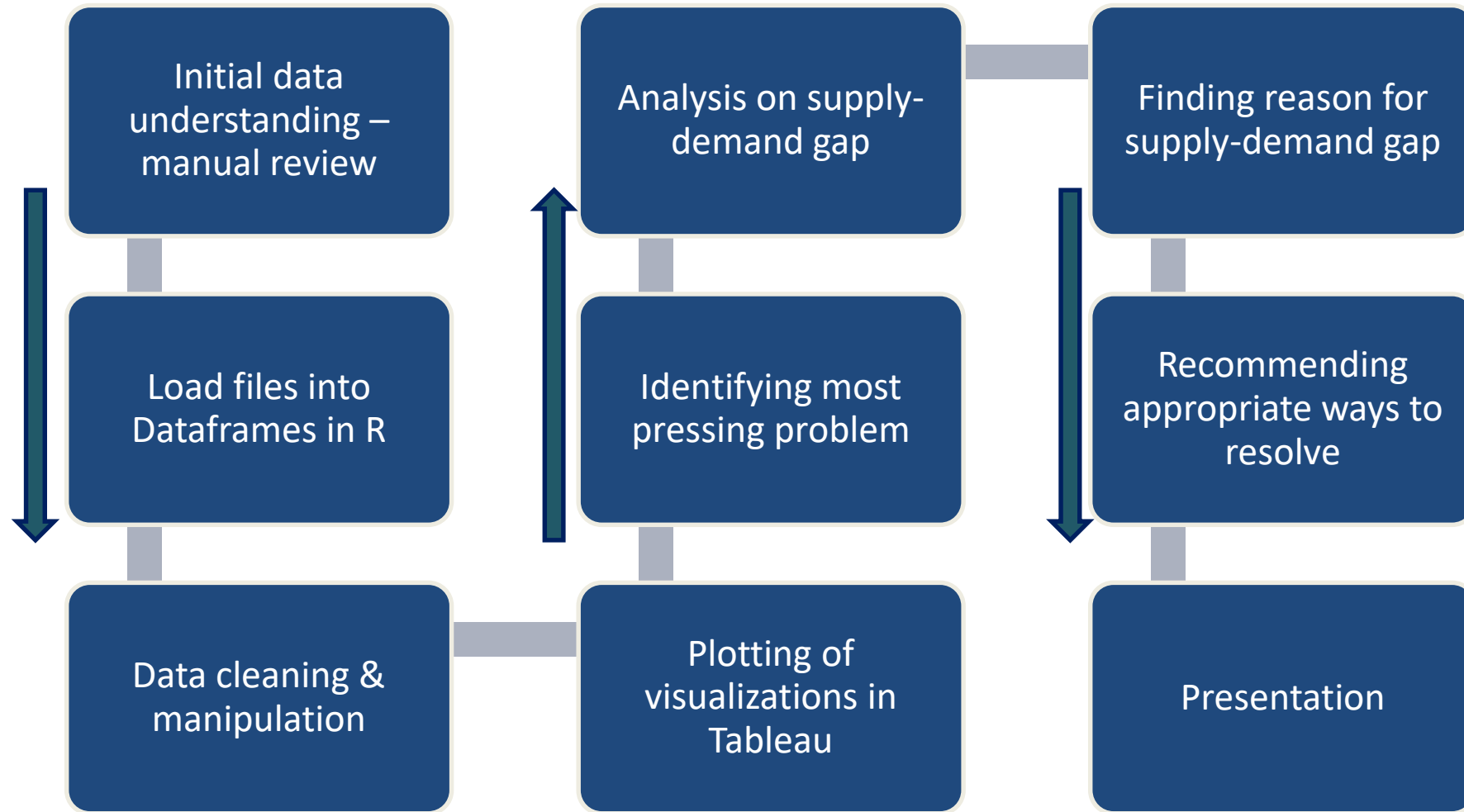
To identify the root cause of the problem (i.e. cancellation and non-availability of cars) and recommend ways to improve the situation.

Data Understanding

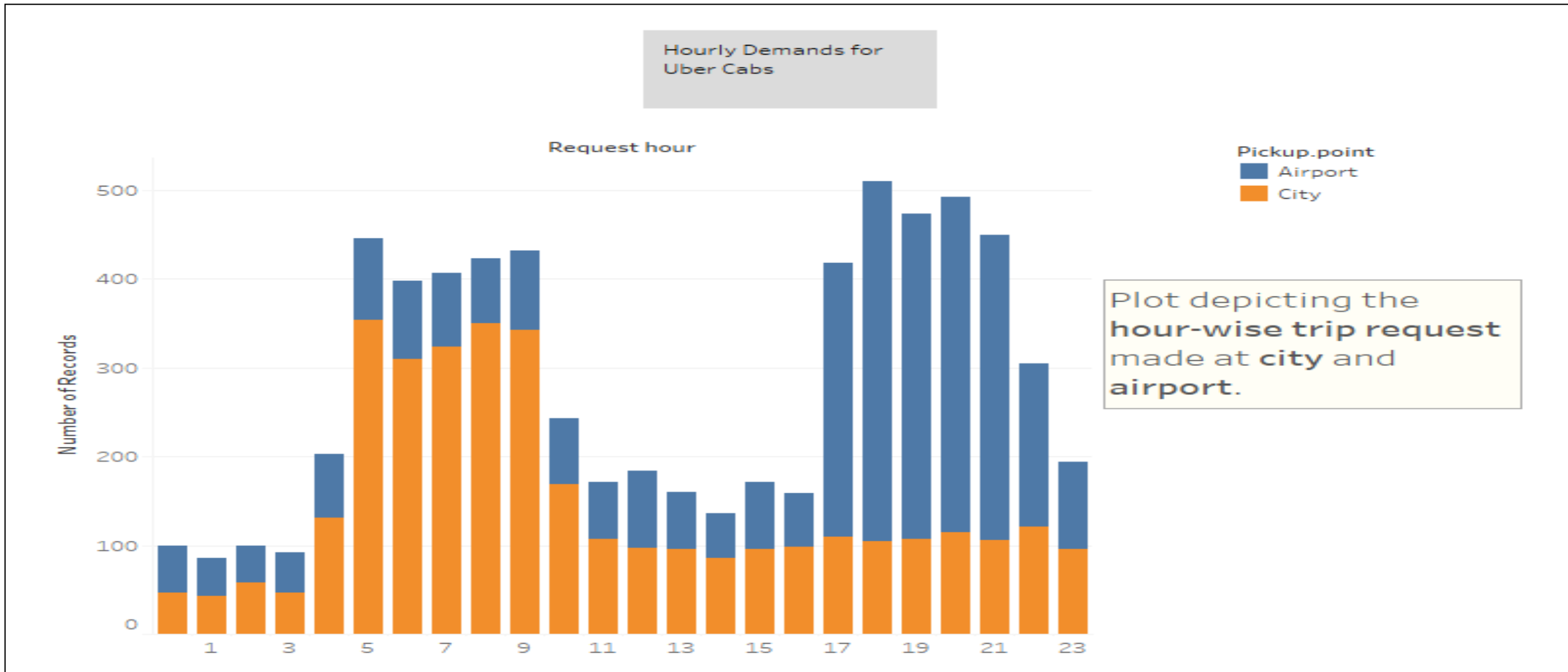
Data sources provided in 1 data set, which contained six attributes associated with each request made by a customer

Approach

- Data preparation, cleansing in R
- Data Visualizations in Tableau for data preparation, problem analysis.



Plot 1 – Identifying Time Slots



Identifying Time Slots

Approach:

1. Data Cleansing: Data quality issues were identified and cleaned by changing data types, making date and time in the proper format and deriving new variables that could be used for the analysis
2. Plot: Time slots based on the frequency of the requests made at the city and airport were identified by using data visualization.
3. Time slots were identified based on the frequency of the requests made at the city and airport

Result:

The time slot identified from the table and visualization are as follows:

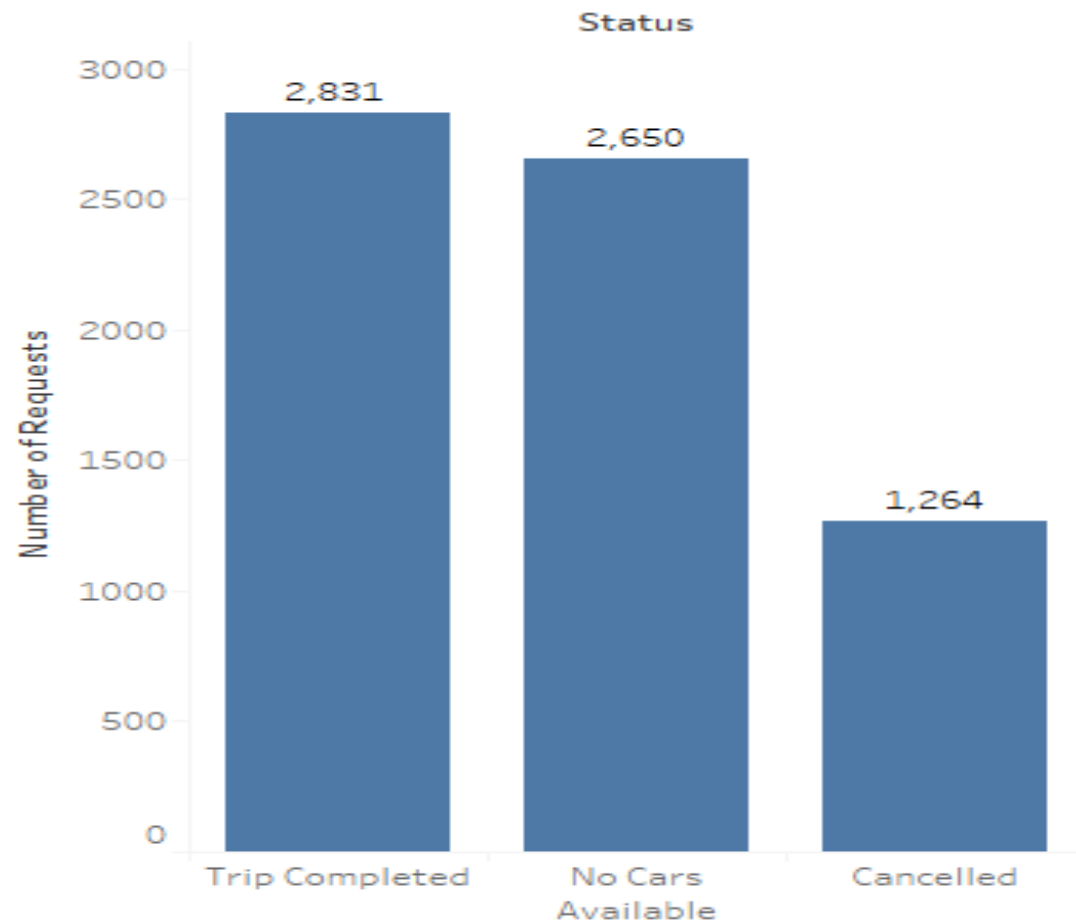
0 – 4 hour -> Early Morning Time
 5 – 10 hour -> Morning Time
 11 – 16 hour -> Day Time
 17 – 21 hour -> Evening Time
 22 – 23 hour -> Late Night

The division of time-slots may not have one right answer and would vary.

Request_hour	Number_of_requests
0	99
1	85
2	99
3	92
4	203
5	445
6	398
7	406
8	423
9	431
10	243
11	171
12	184
13	160
14	136
15	171
16	159
17	418
18	510
19	473
20	492
21	449
22	304
23	194

Plot 1 – Problem Identification

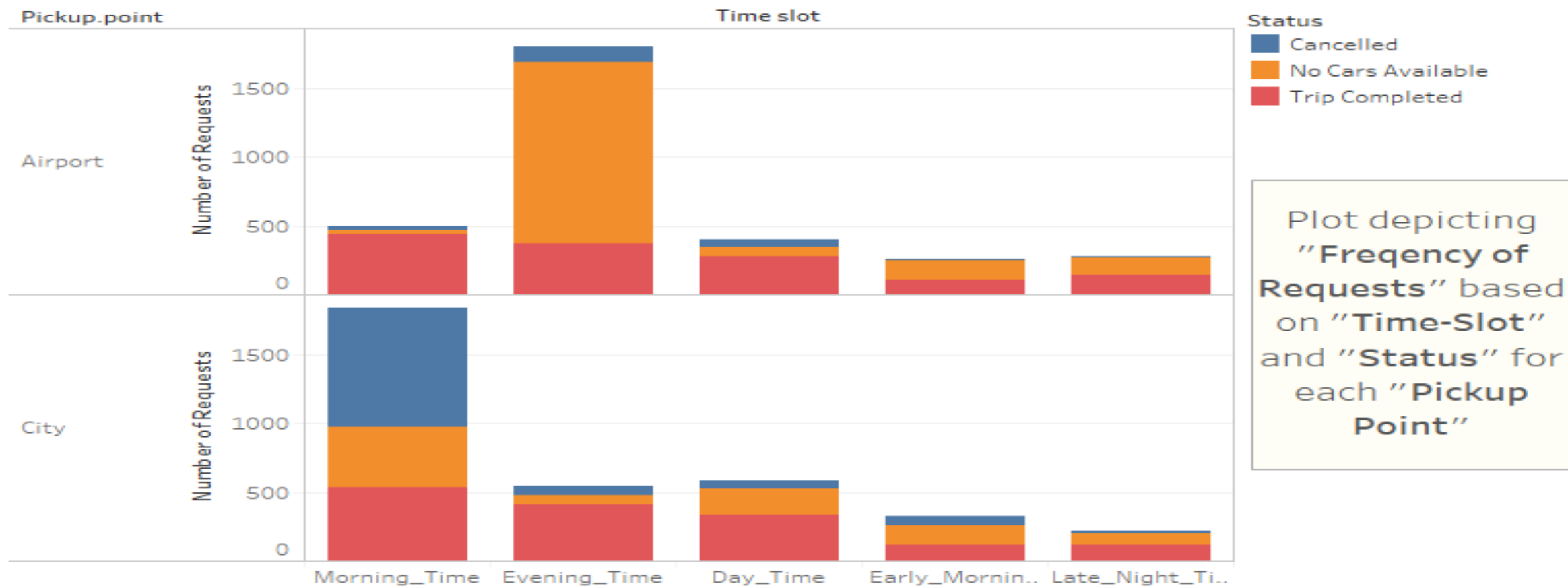
Frequency of Requests
based on Status



Plot depicting "Frequency of
Requests" based on
"Status"

Plot 2 – Problem Identification

Frequency of Requests
based on Time Slots
and Status for each
Pickup Point



Problem Identification

Approach:

1. Merge: Merged the main Uber data frame with the new variable of time slots
2. Plot: Most pressing problems for Uber were identified by using data visualization.

Result:

The most pressing problem identified for Uber from the visualizations and table are as follows:

Problem 1: Large number of requests had the status as “**No Cars Available**” during “**Evening_Time**” time slot for “**Airport to City**” pickup

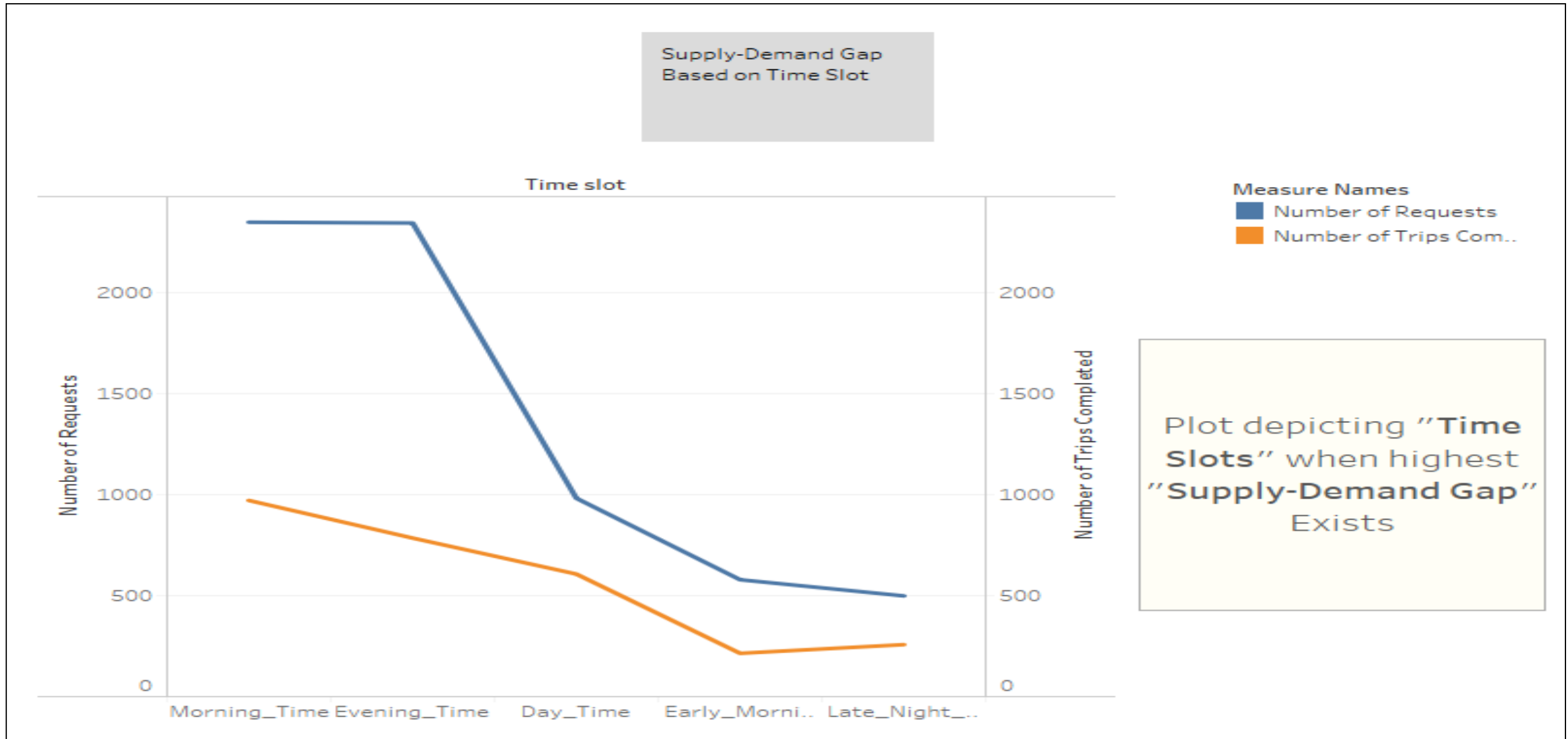
Problem 2: Large number of trips was cancelled during “**Morning_Time**” time slot for “**City to Airport**” pickup

Status	Trip Completed
Trip Completed	2831
No Cars Available	2650
Cancelled	1264

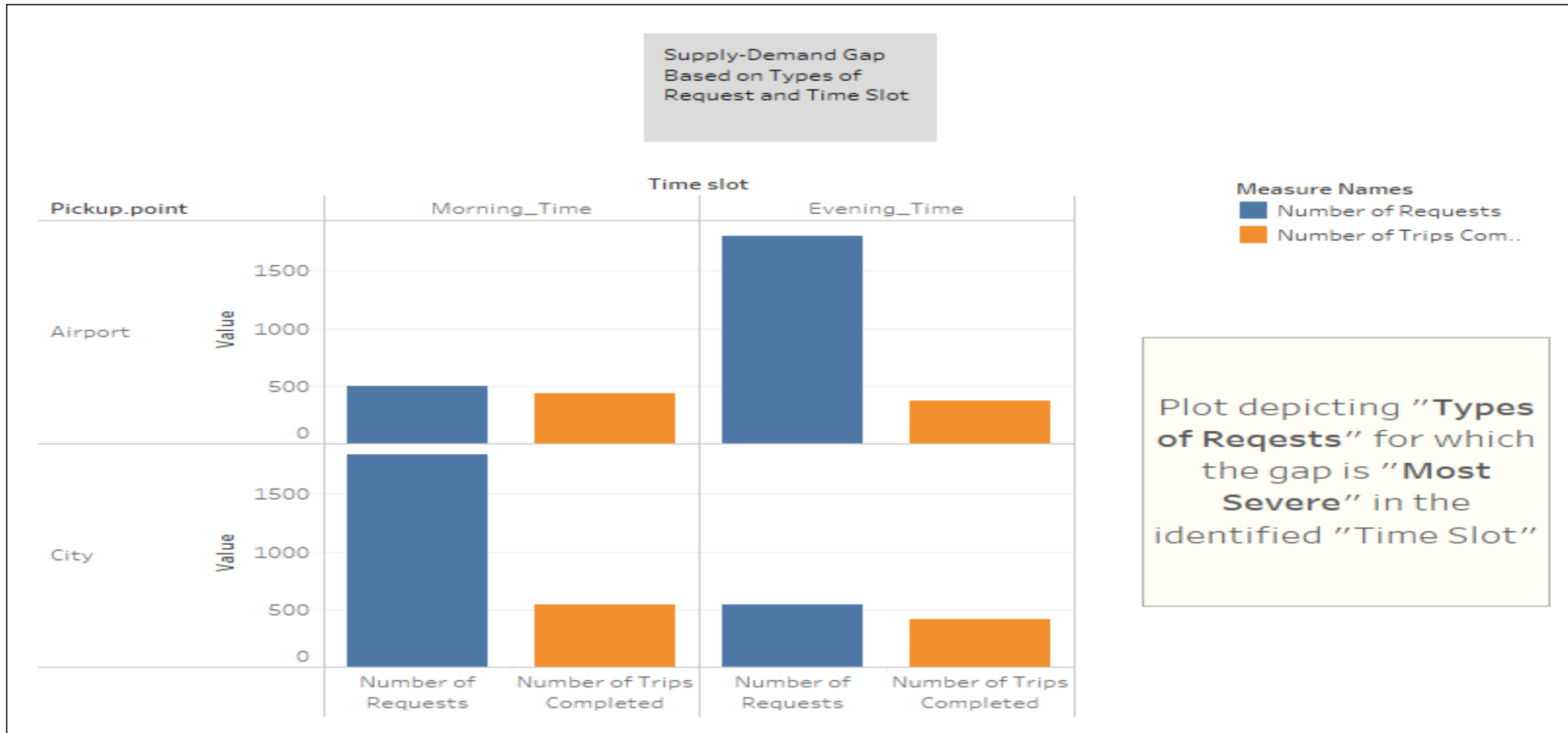
Airport to City			
Time_slot	Cancelled	No Cars Available	Trip Completed
Day_Time	55	74	274
Early_Morning_Time	2	148	103
Evening_Time	106	1321	373
Late_Night_Time	3	136	142
Morning_Time	32	34	435

City to Airport			
Time_slot	Cancelled	No Cars Available	Trip Completed
Day_Time	51	195	332
Early_Morning_Time	63	151	111
Evening_Time	60	71	411
Late_Night_Time	19	83	115
Morning_Time	873	437	535

Plot 1 – Supply-Demand Gap Analysis



Plot 2 – Supply-Demand Gap Analysis



Supply-Demand Gap Analysis

Approach:

1. Plot: Supply demand gap was identified using data visualization.

Result:

The supply demand gap identified for Uber from the visualizations and table are as follows:

1. High supply demand gap exists during “**Evening_Time**” time slot for “**Airport to City**” pickup
2. High supply demand gap exists during “**Morning_Time**” time slot for “**City to Airport**” pickup

Time_slot	Number_of_requests	Number_of_trip_completed	Difference
Day_Time	981	606	375
Early_Morning_Time	578	214	364
Evening_Time	2342	784	1558
Late_Night_Time	498	257	241
Morning_Time	2346	970	1376

Pickup.point	Time_slot	Number_of_requests	Number_of_trip_completed	Difference
Airport	Evening_Time	1800	373	1427
Airport	Morning_Time	501	435	66
City	Evening_Time	542	411	131
City	Morning_Time	1845	535	1310

Reason for Supply-Demand Gap

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

A. High supply demand gap exists during “**Evening_Time**” time slot for “**Airport to City**” pickup

Problem:

Large number of requests had the status as “**No Cars Available**”

Reason:

1. Number of “**Arrivals**” of flight are higher
2. Number of “**Departures**” of flight are minimal

Availability of cabs at the airport are less during “**Evening_Time**” since the departures of flights are minimal whereas availability of passengers at airport are higher during “**Evening_Time**” since the arrival of flights are higher. Thus, the demand for the cabs are higher than the supply of cabs for “**Airport to City**” pickup leading to high demand supply gap and status as “**No Cars Available**” during “**Evening_Time**”.

B. High supply demand gap exists during “**Morning_Time**” time slot for “**City to Airport**” pickup

Problem:

Large number of trips was cancelled

Reason:

1. Number of “**Departures**” of flight are higher
2. Number of “**Arrivals**” of flight are minimal

Cab reaching airport during “**Morning_Time**” has to spend higher waiting time to get a passenger since arrivals of flights are minimal. Instead of waiting in airport, time could be utilized for other trips if the cab do not go to the airport. Availability of passengers from “**City to Airport**” during “**Morning_Time**” are higher since departures of flights are higher. Thus, the demand for the cabs are higher than the supply of cabs for “**City to Airport**” pickup leading to high demand supply gap and “**Cancellation**” of large number of trips during “**Morning_Time**”.

Ways to Resolve Supply-Demand Gap

Recommended some ways to resolve the supply-demand gap

- A. Reducing the charge percentage from cab drivers
- B. Dynamic pricing
- C. Rewarding the cab drivers
- D. Penalty for cancellation of requests by Driver
- E. Providing limited fare to drivers for coming back to city without any passengers
- F. Reducing the waiting time for a cab driver In a airport by discussing with the airport authorities
- G. Offer on car pool to be brought in to encourage people to use car pool when there is less supply