“UBER SUPPLY DEMAND GAP”
CASE STUDY

JITHIN JOSE THOMAS
DDA1710300

Objective

- Visually identify the **most pressing problems for Uber** ??
- Find out the **gap between supply and demand** ??
- What do you think is the **reason for this issue for the supply-demand gap**??
- **Recommend some ways to resolve the supply-demand gap** !!!

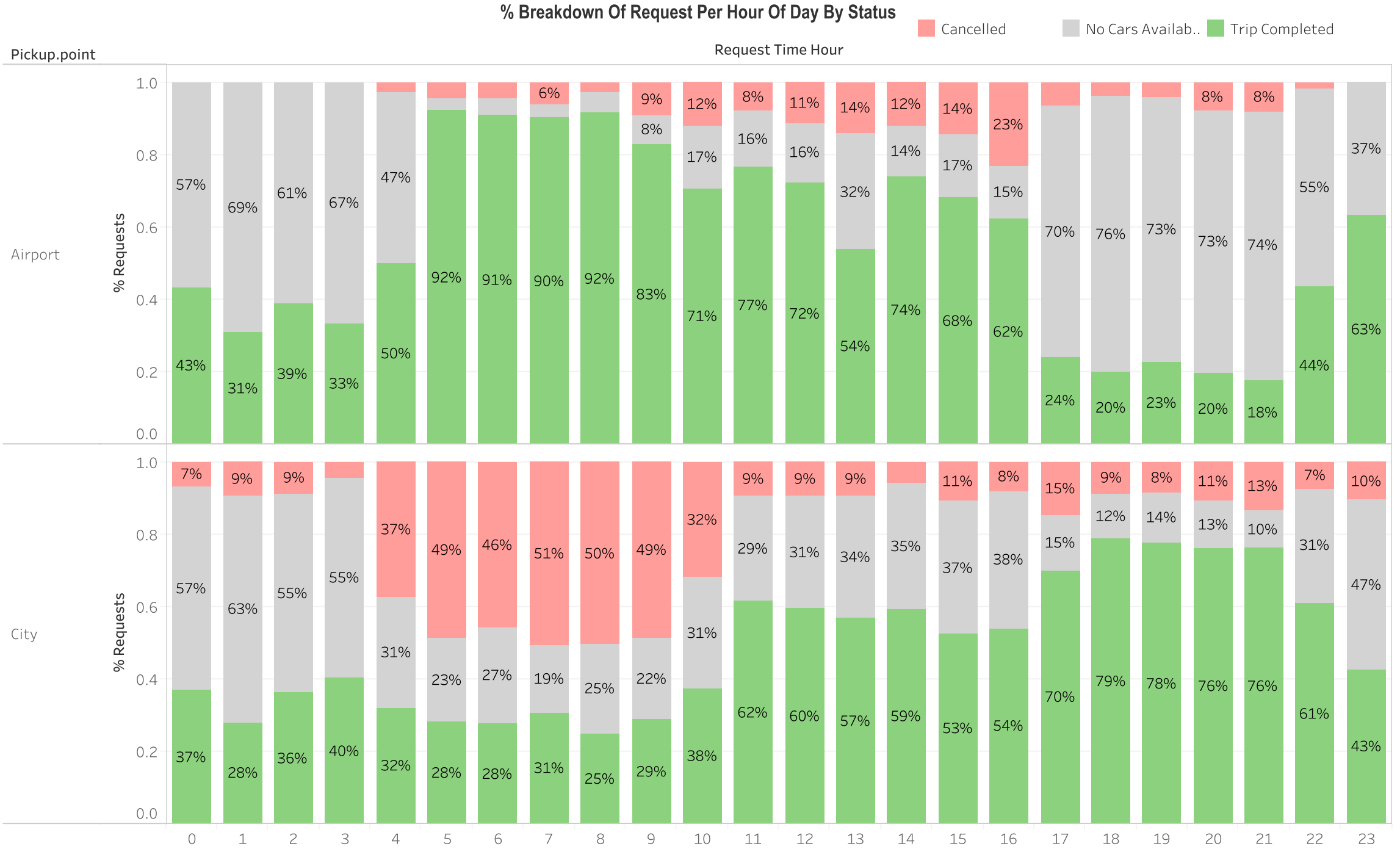
Data Set

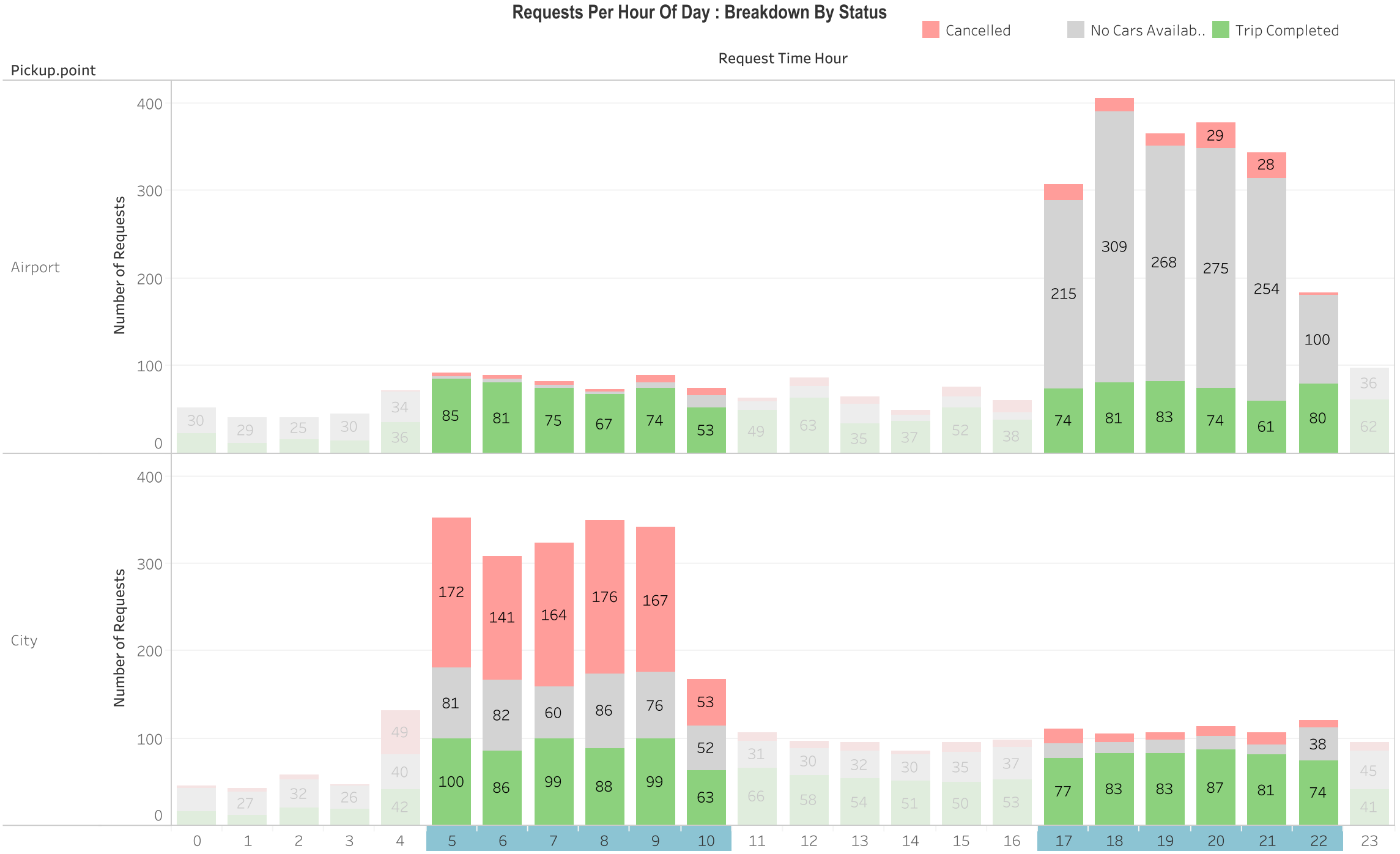
- Data is collected from **11 July 2016** to **15 July 2016.**
- Total of **6745** records.
- There are six attributes associated with each request made by a customer:
  - **Request id**: A unique identifier of the request.
  - **Time of request**: The date and time at which the customer made the trip request.
  - **Drop-off time**: The drop-off date and time, in case the trip was completed.
  - **Pick-up point**: The point from which the request was made.
  - **Driver id**: The unique identification number of the driver.
  - **Status of the request**: The final status of the trip, that can be either completed, cancelled by the driver or no cars available.

The most pressing problems for Uber ??

The most pressing problems for Uber are

- **High cancellation of "City to Airport"** Cab Requests made by the drivers in between **5 A.M to 10 A.M.**
- **High Non Availability of Cabs from "Airport to City"** for the customers from **5 P.M to 10 P.M.**


% Breakdown Of Request Per Hour Of Day By Status
Cancelled
No Cars Availab..
Trip Completed
Pickup.point
Request Time Hour
Airport
City
% Requests
1.0
0.8
0.6
0.4
0.2
0.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Airport: 57% 69% 61% 67% 47% 92% 91% 90% 92% 83% 71% 77% 72% 54% 74% 68% 62% 24% 20% 23% 20% 18% 44% 63%
Airport: 43% 31% 39% 33% 50% 8% 9% 10% 8% 9% 17% 16% 16% 32% 14% 17% 15% 70% 76% 73% 73% 74% 55% 37%
Airport: 6% 9% 12% 8% 11% 14% 12% 14% 23% 8% 8%
City: 37% 28% 36% 40% 32% 28% 28% 31% 25% 29% 38% 62% 60% 57% 59% 53% 54% 70% 79% 78% 76% 76% 61% 43%
City: 57% 63% 55% 55% 31% 23% 27% 19% 25% 22% 31% 29% 31% 34% 35% 37% 38% 15% 12% 14% 13% 10% 31% 47%
City: 7% 9% 9% 37% 49% 46% 51% 50% 49% 32% 9% 9% 9% 11% 8% 15% 9% 8% 11% 13% 7% 10%


Requests Per Hour Of Day : Breakdown By Status
Cancelled
No Cars Availab..
Trip Completed
Request Time Hour
Pickup.point
Airport
City
Number of Requests
0
100
200
300
400
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
30 29 25 30 34 36 85 81 75 67 74 53 49 63 35 37 52 38 215 74 309 81 268 83 275 74 254 61 100 80 36 62
27 32 26 49 40 42 172 81 100 141 82 86 164 60 99 176 86 88 167 76 99 53 52 63 31 66 30 58 32 54 30 51 35 50 37 53 77 83 83 87 81 38 74 45 41

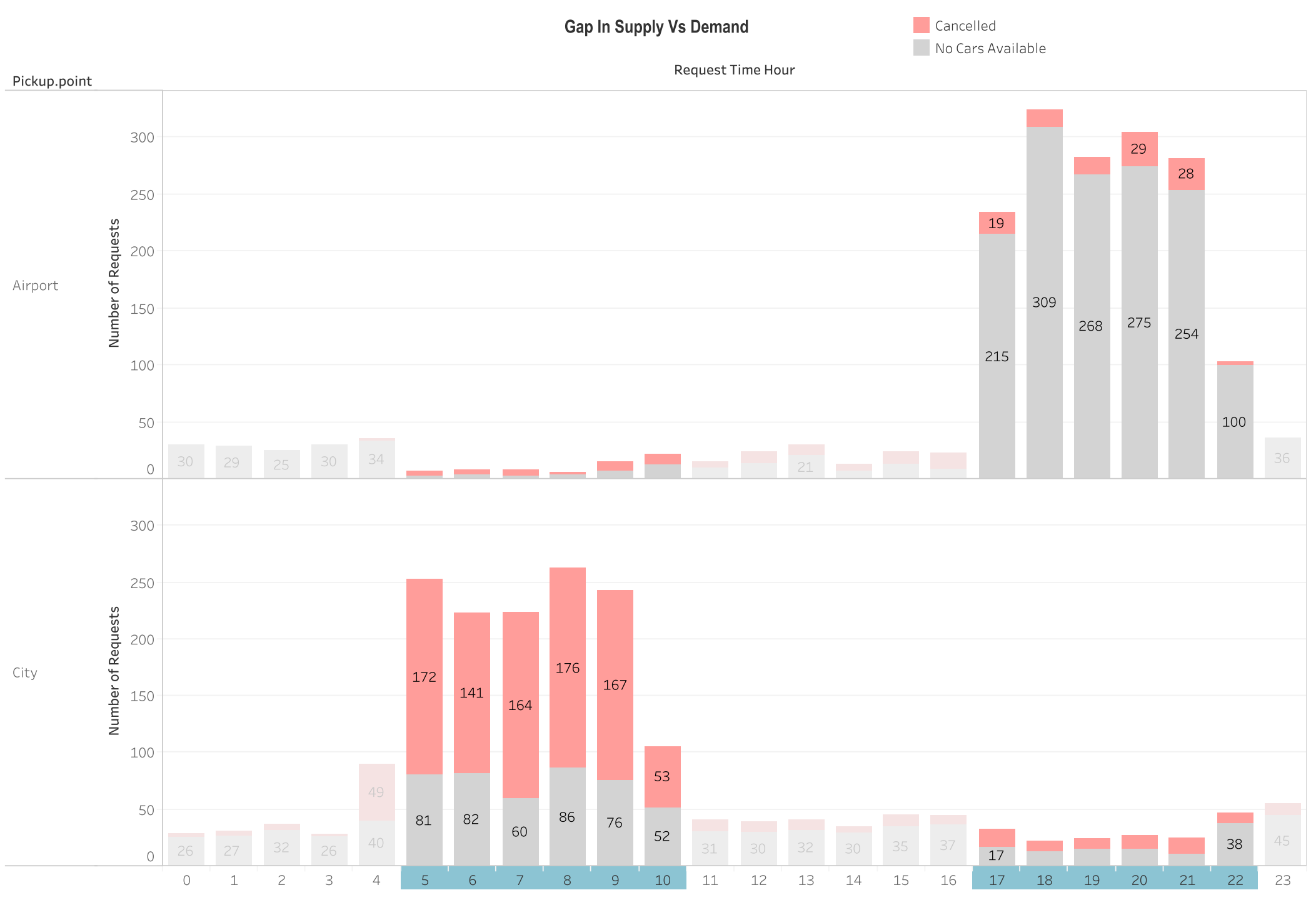
Gap Between Supply And Demand ??

Demand and supply gap at the City:

- For this case, the **demand is the number of trip requests made at the city**, whereas the **supply is the number of trips completed from city to the airport**.

Demand and supply gap at the Airport:

- For this case, the **demand is the number of trip requests made at the airport**, whereas the **supply is the number of trips completed from airport to the city.**


Gap In Supply Vs Demand
Cancelled
No Cars Available
Request Time Hour
Pickup.point
Airport
City
Number of Requests
0
50
100
150
200
250
300
30 29 25 30 34 21 215 309 268 275 254 100 36
19 29 28
26 27 32 26 40 81 82 60 86 76 52 31 30 32 30 35 37 17 38 45
172 141 164 176 167 53 49
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Cont …

- Time slots when the **highest gap** exists ??
  - Morning **5.00 A.M** to **10.00 A.M**
  - Evening **5.00 P.M** to **10.00 P.M**

- The types of requests for which the **gap is the most severe**??
  - Morning **5.00 A.M to 10.00 A.M. “city to airport”**
  - Evening **5.00 P.M to 10.00 P.M. “airport to city”**

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

The supply-demand gap happens due to two reasons mainly :

- **High cancellation of "City to Airport"** cabs from **5 A.M to 10 A.M**
    - From driver's perspective **it doesn't make sense for him to travel from "city to airport" and then wait at the airport for the next cab request from "airport to city"** as the **cab request from "airport to city" during 5 A.M to 4 P.M is comparatively low**.
    - There is high chance that he might have to **wait for very long hours for next cab request at the airport or return back to the city empty handed**. In both cases **the driver suffers a loss**.
    - Whereas **if the driver had stayed in the city**, cancelling the cab requests, **he might have got cab requests for within city runs and thus complete his daily target**. (assumption, as data for city to city cab requests are not available)

Cont…

- **High Non Availability of Cabs from "Airport to City"** from **5 P.M to 10 P.M**

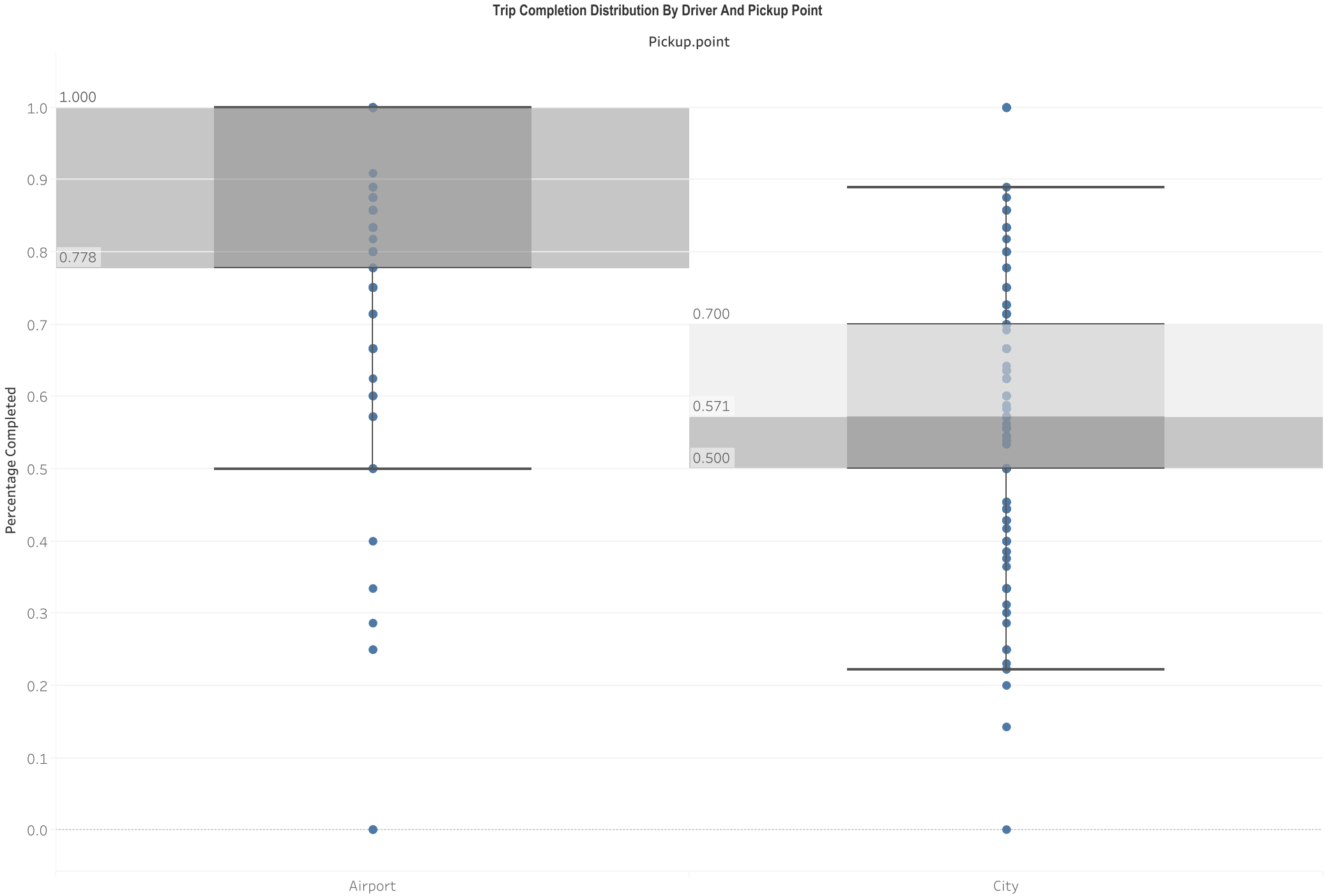
  - Since there is **very less inflow of Uber cabs to the airport** as **cab requests from city to airport is low** in the time frame **5 P.M to 10 P.M**, there will be **shortage of supply of cabs at the airport** and the **surplus demand for cab requests cannot be met**.

Some ways to resolve the supply-demand gap ??

- To reduce **High cancellation of "City to Airport"** cab requests from **5 A.M to 10 A.M.**
  - It is evident from the box-plot provided in the coming slides that, there are **many drivers who has less than 50% trip completion rate**, **these drivers should be penalized/fined.**
  - The threshold can be set for Trip completion, **those drivers who doesn't meet the threshold should be monitored**. See whether their **reason for cancellation is genuine or not.**
  - One more thing that Uber can do is provide **surge pricing/ incentives for airport trips made during this time frame.**

Cont…

- To reduce **High Non Availability of Cabs from “Airport to City”** for the customers from **5 P.M to 10 P.M.**
  - Provide **surge pricing/incentives for “airport to city” trips**, once the driver gets this notification, **if he’s in the airport's vicinity (within 30 mins from airport, or 5-15 km radius), he will have more tendency to move towards the airport**.


Trip Completion Distribution By Driver And Pickup Point
Pickup.point
Percentage Completed
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1.000
0.778
0.700
0.571
0.500
Airport
City