Uber Supply-Demand Gap

ASSIGNMENT SUBMISSION

Name:

Vipul Shrivastava

Abstract

Problem Statement:

- Uber is a peer-to-peer ride sharing, taxi cab company which provides cab services all over the world.
- They are facing problems of trip cancellation and no cars available to and from the Airport.
- Objective of analysis is to find root cause of the problem and to find supply-demand gap.

Approach:

- We worked on data which is similar to dataset used by Uber and prepared it into suitable form so that analysis done should be clear and accurate.
- We performed analysis to identify most problematic type of requests(city->airport/ airport->city) and time slots.
- We also find the supply-demand gap that exists during different time and pickup location.

Conclusion

- After applying standard data analysis as per the business objective, we identified most pressing problems for Uber and also supply-demand gap occurs during different time and location.
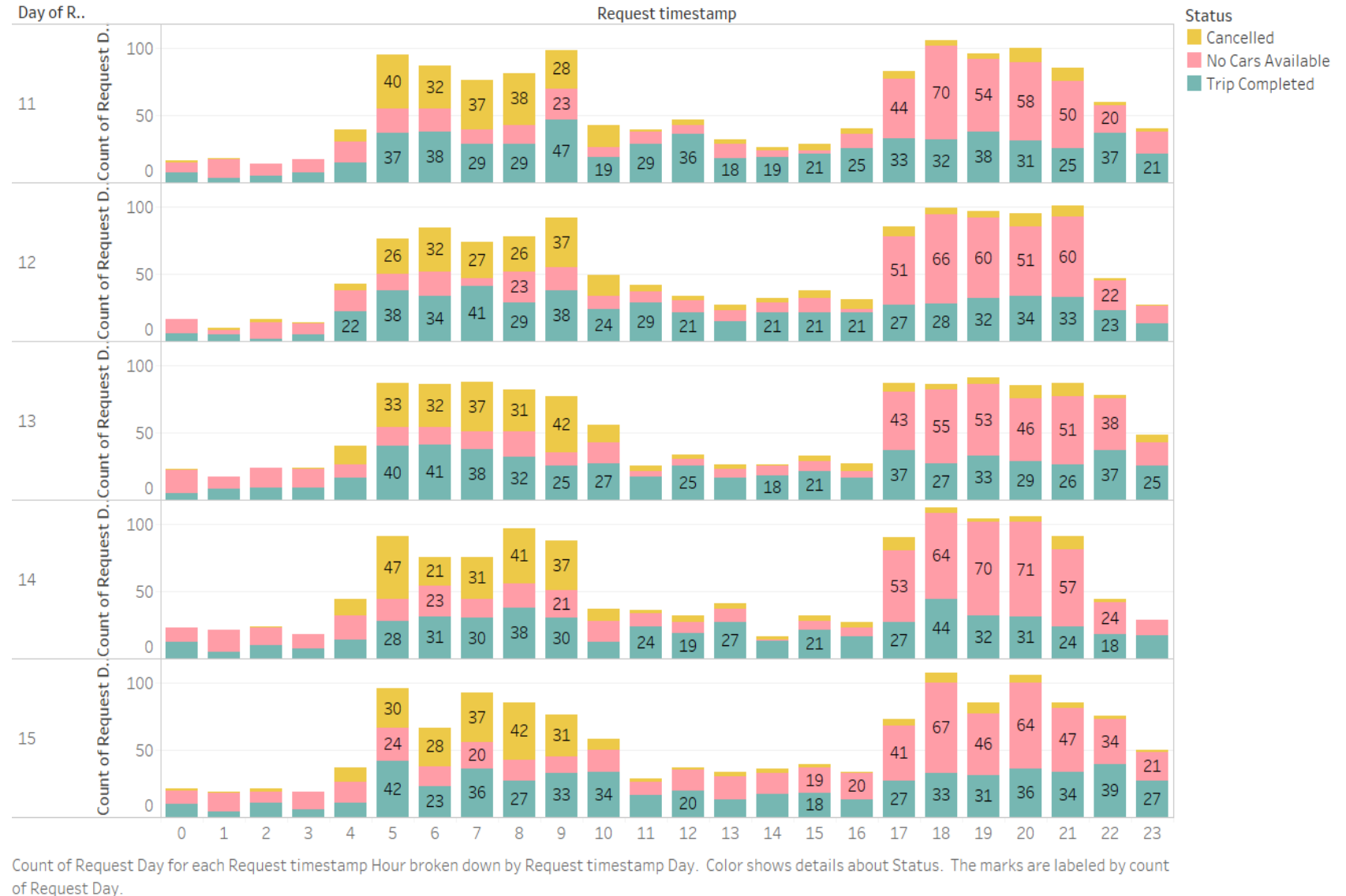- We recommended ways to solve supply-demand gap.

Data Understanding

There are six attributes associated with each request made by a customer

| Column	Description
Request id	A unique identifier of the request
Pick-up point	The point from which the request was made (i.e. Airport or City)
Driver id	The unique identification number of the driver
Status	The final status of the trip, 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

Frequency of requests for different status

- Graph shows the frequency i.e. number of requests that get cancelled or show 'no cars available' or trip get completed.

- We can see from this graph that the pattern of request is almost the same for each day

Count of Request Day for each Request timestamp Hour broken down by Request timestamp Day. Color shows details about Status. The marks are labeled by count of Request Day.

Frequency of requests for different pickup points

- Graph shows the frequency i.e. number of requests received for pickup point Airport or City.

- We can see from this graph that the pattern of request is almost the same for each day
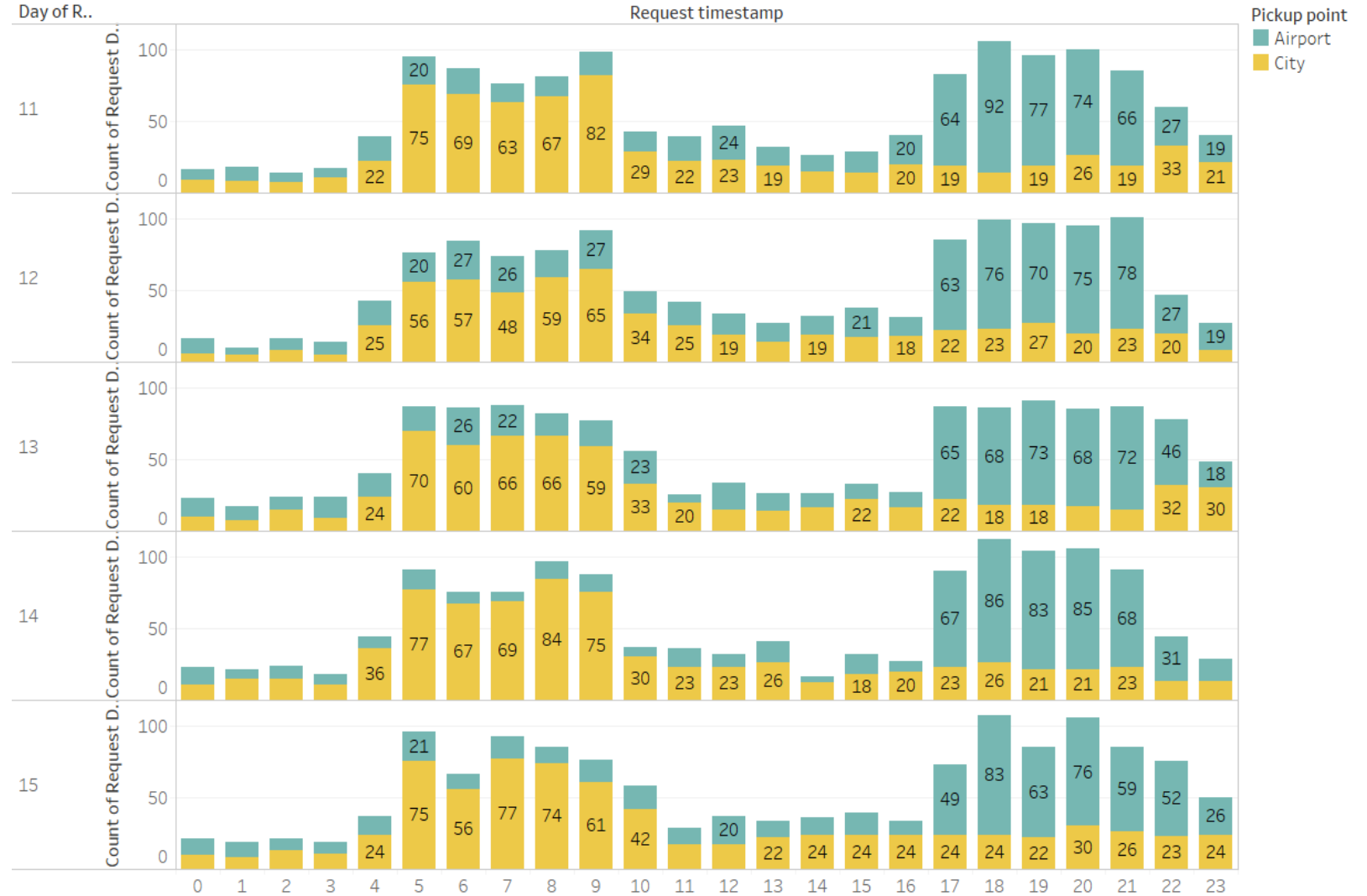
Count of Request Day for each Request timestamp Hour broken down by Request timestamp Day. Color shows details about Pickup point. The marks are labeled by count of Request Day.

Dividing each hour into different time slots

To identify at what time the number of request are high and at what time number of request is less we divide each hour of a day in different time slot as follows:

Hour of a day	Time Slot
3 AM – 5 AM	Early_morning
6 AM – 10 AM	Morning
11 AM – 4 PM	Day
5 PM – 9 PM	Evening
10 PM – 2 AM	Late_night

Frequency of requests for different time slots

- Graph shows the number of requests that are completed or no cars available or trip cancelled for different time slots.
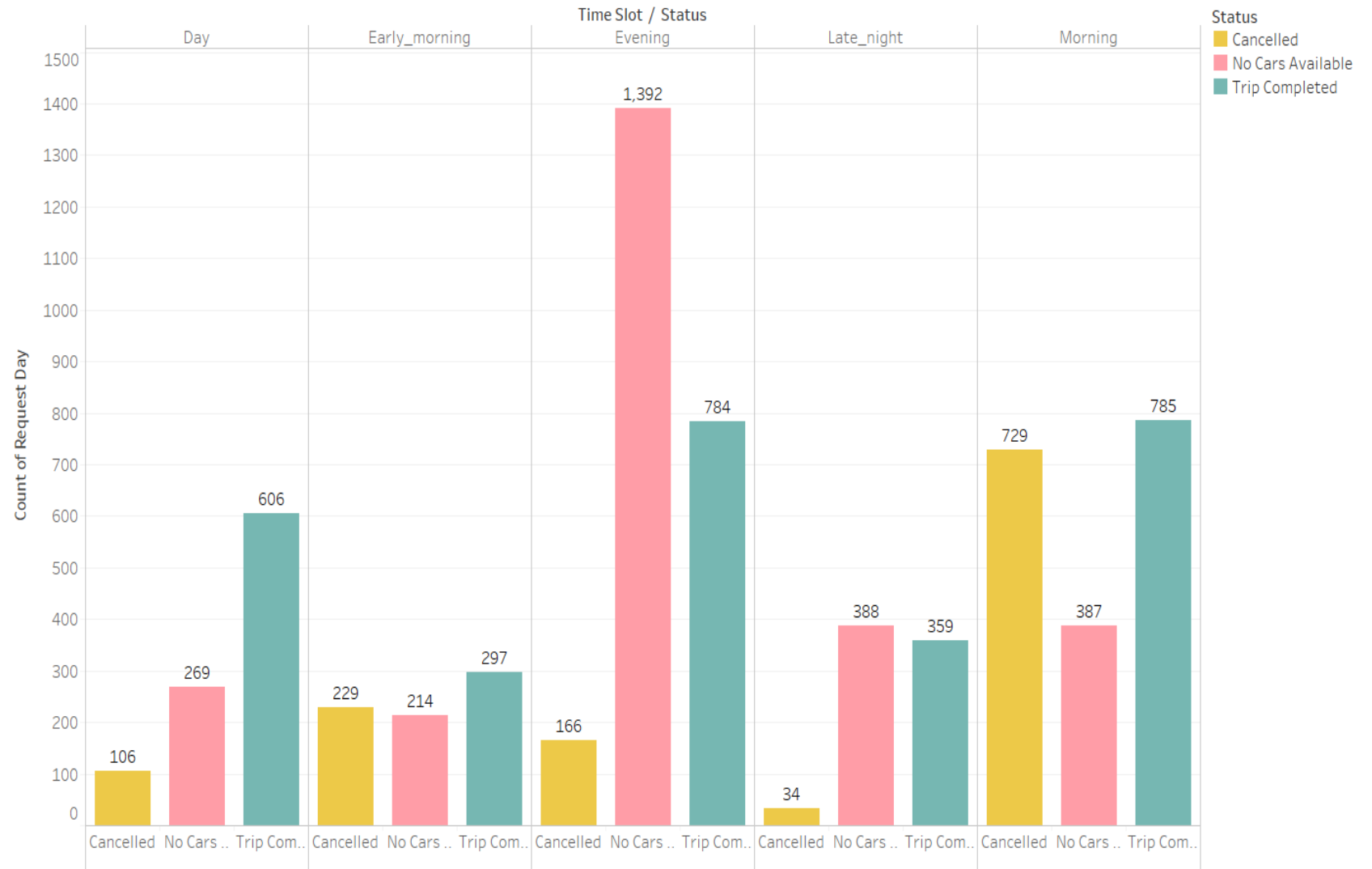
Count of Request Day for each Status broken down by Time Slot. Color shows details about Status. The marks are labeled by count of Request Day.

Most pressing problem for Uber

- **From the graph we can infer:**

1. Number of request Cancelled when pickup point is City is high for time slot Morning(6am-10am).

2. Number of request when No Cars Available is high when pickup point is Airport and time slot is Evening(5pm-9pm)

- **Two problems found are:**

1. Cancelled trip are more in Morning time (6am-10am) from City

2. No cars available problem is more in Evening time (5pm -9pm) from Airport.
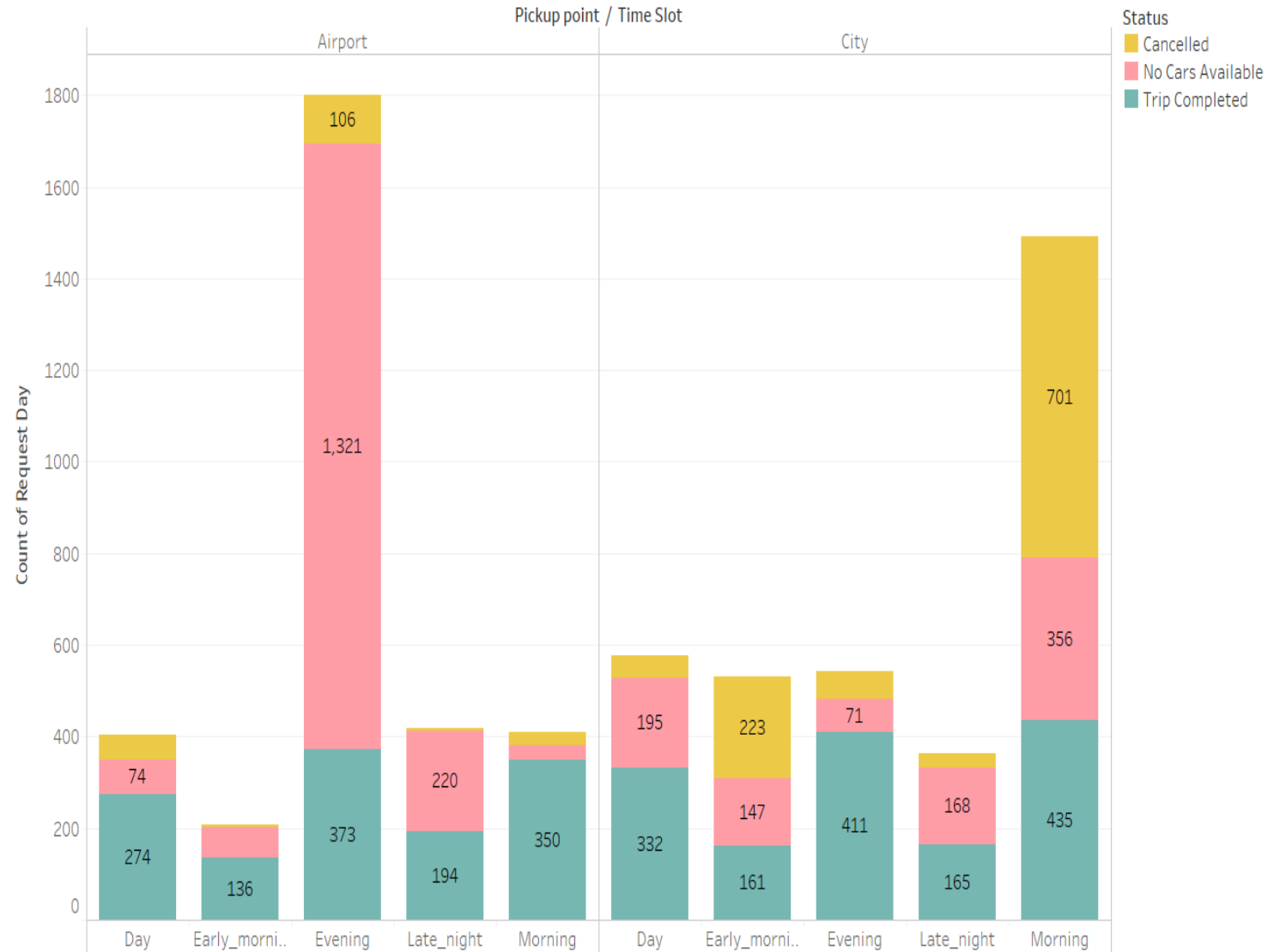
Count of Request Day for each Time Slot broken down by Pickup point. Color shows details about Status. The marks are labeled by count of Request Day.
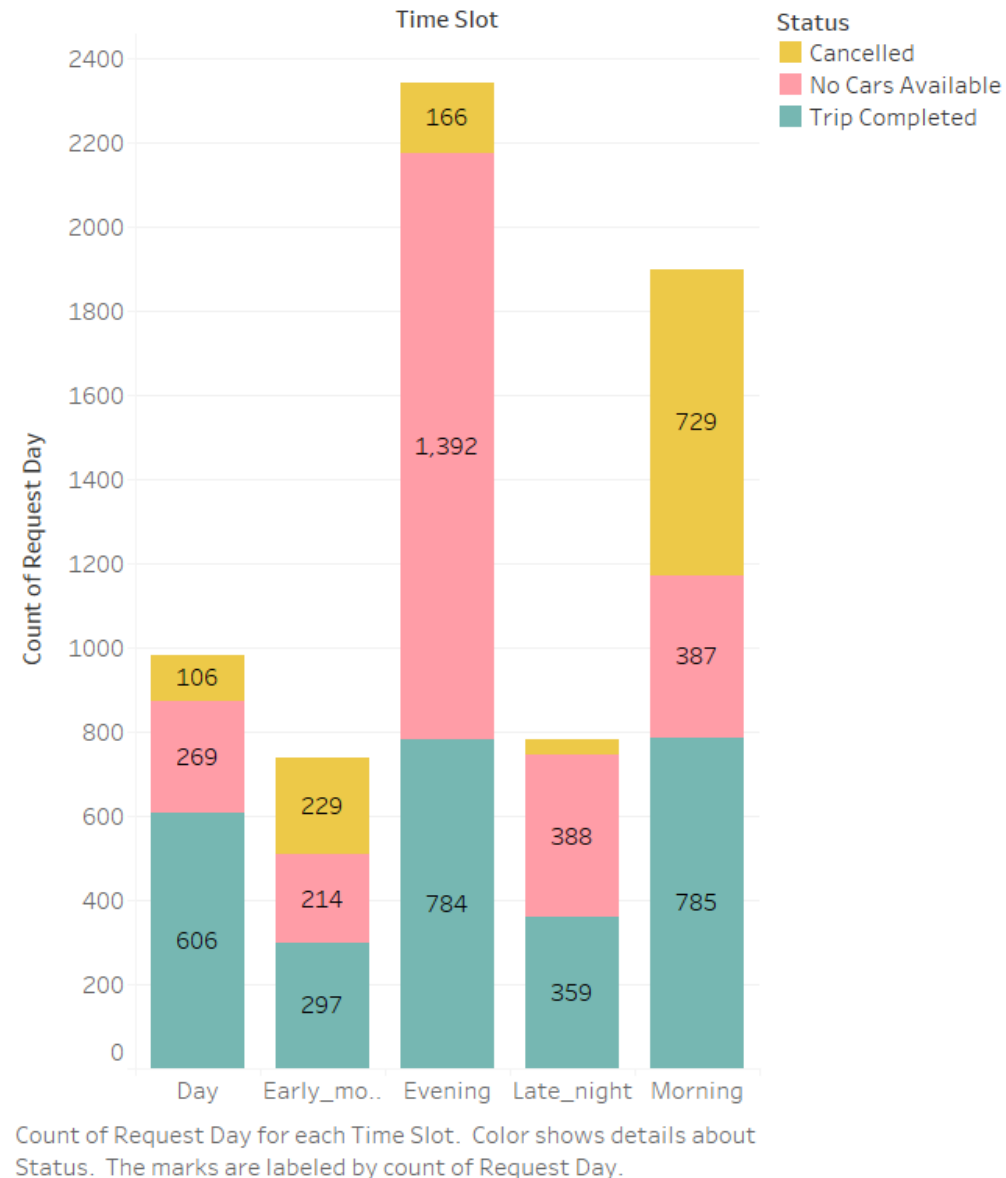
Supply-Demand Gap for problematic time slots

From the graph we can find supply-demand as follows:

Demand = Trip completed + No cars Available + Cancelled

Supply = Trip completed

Time Slot	Demand	Supply	Supply-Demand gap
Early_morning	297 + 214 + 229 = 740	297	443
Morning	785 + 387 + 729 = 1901	785	1116
Day	606 + 269 + 106 = 981	606	375
Evening	784 + 1392 + 166 = 2342	784	1558
Late_night	359 + 388 + 34 = 781	359	422

From the above table and graph we found that **Morning(6am-10am)** time slot and **Evening(5pm-9pm)** time slot has very high supply-demand gap

Count of Request Day for each Time Slot. Color shows details about Status. The marks are labeled by count of Request Day.

Supply-Demand Gap for problematic requests for identified time-slots

From the graph we can find supply-demand as follows:

Demand = Trip completed + No cars Available + Cancelled

Supply = Trip completed

| Time slot	Status Pickup point	Demand	Supply	Supply-Demand gap
Morning	**Airport**	350 + 31 + 28 = 409	350	59
	City	435 + 356 + 701 = 1492	435	1057
Evening	**Airport**	373 + 1321 + 106 = 1800	373	1427
	City	411 + 71 + 60 = 542	411	131

From the above table we found that

1. **Trip Cancelled** is high in **Morning(6am-10am)** time slot when pickup point is **City**

2. **No cars available** problem is high in **Evening (5pm- 9pm)** time slot when pickup point is **Airport**
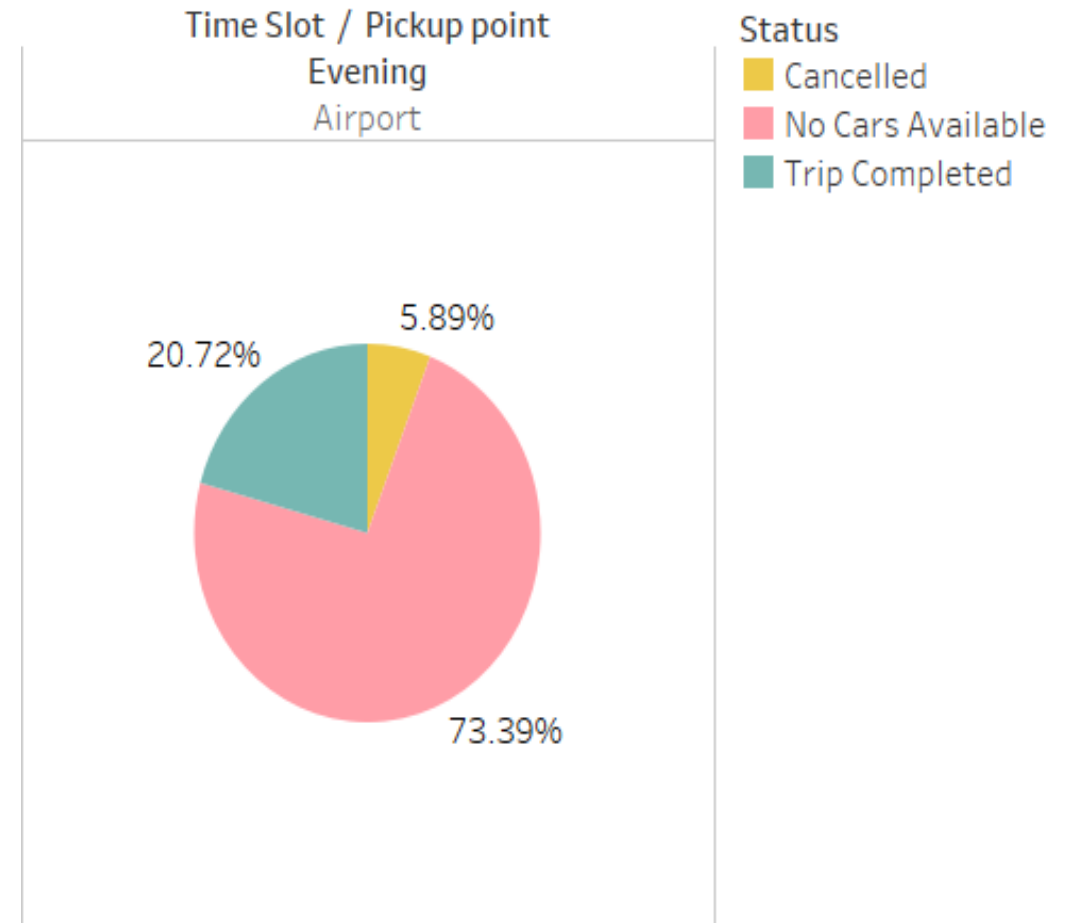
Severity of Problem faced by Uber

- 47% of request are getting cancelled during morning and city as pickup point
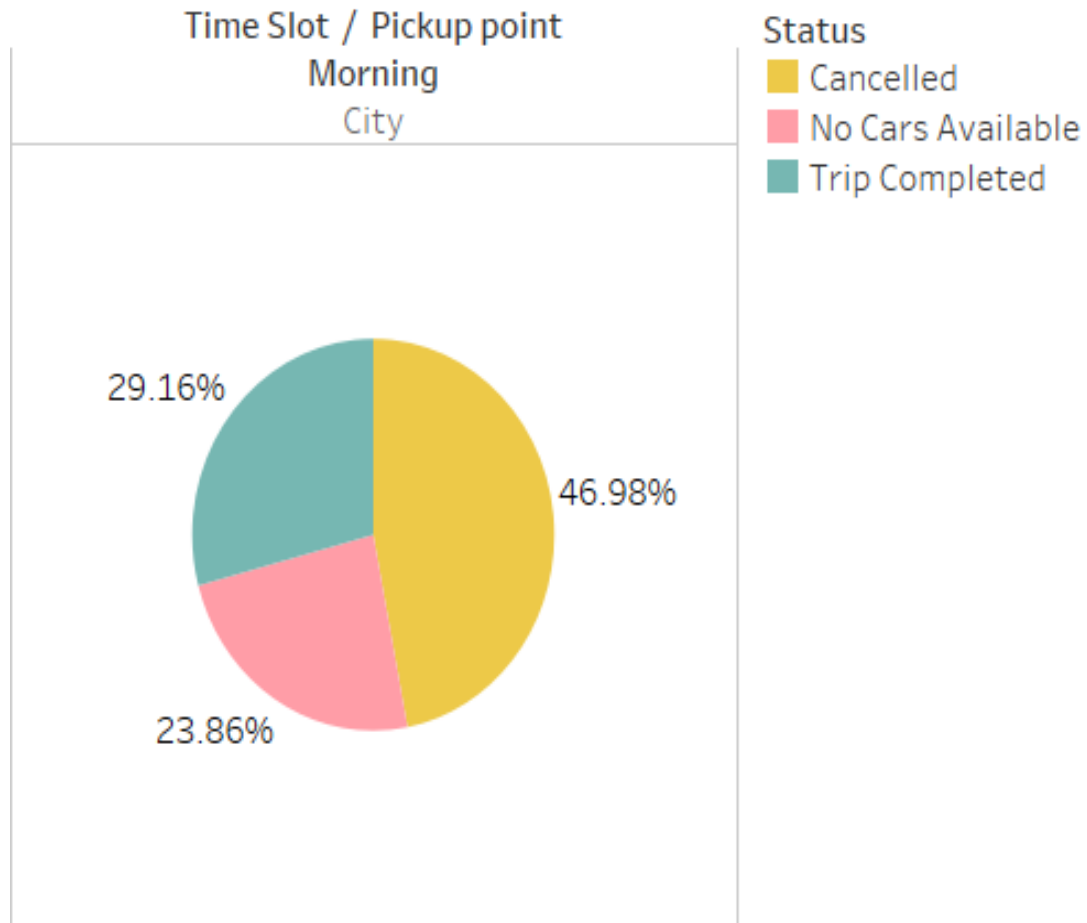
- 74% of time no cars available during evening and airport as pickup point

Reason for supply-demand gap

1. Driver doesn't want to go airport so early in the day knowing that the idle time could be more at airport.

2. The distance from city to airport is too much fearing driver of empty return trip.

3. The time taken to reach airport in the morning is higher as compared to rest of the day reducing earning opportunity of driver.

4. Less number of incoming flights during late night means less number of passengers available to travel from airport to city.

5. Waiting time at airport is high that force driver's not to take trip to the airport.

Recommended ways to resolve the supply-demand gap

For Trip Cancellation problem in Morning from City

1. Uber can provide offers to the passengers at the airport that encourages them to book cab and leads to increase in demand at airport.

2. Increase commission of driver or pay incentives to those driver who are willing to take trip from city to airport in the morning rush hour.

For No cars available problem in Evening from Airport

1. Uber has to increase the number of cabs at airport during evening time to overcome cabs unavailability problem.

2. Can implement cab sharing from airport to city thereby reducing the cars unavailability to certain extent.

3. Encourage driver's to take trip from city to airport during evening time by paying incentives. This will increase the car availability at airport.