

Uber Supply-Demand Gap

Sham Kumar

2nd Dec 2018

UBER Supply – Demand Gap Analysis

- **Problem Statement:**

- UBER is facing a potential revenue loss due to a lot of “Cancellations” made by Driver’s and “Non availability of Cars” at the time when request’s flows in.

- **Business Objective:**

- Identify the root cause of these 2 problems (Driver Cancellation’s and Non availability of Cars)
- Formulate a possible hypothesis of the problem
- Recommend ways to improve the situation

- **Data Source:**

- Masked data set from IIIT-B, which contains 6,745 rows and 6 columns

Exploratory Data Analysis

- **Data Cleaning/Manipulation:**

- Checked for any duplicates in “Request ID” column, as this column should be unique for each record.
- Checked for any NA values in the data set. We have “NA” in the Driver ID as these are the requests with “No Cars Available”
- Changed the “Request” and “Drop” timestamp format to Date time format

- **Univariate Analysis:**

- Identified the % share of “Pickup Point” column – Airport to City – 48% and City to Airport – 52%
- Identified the % share of “Status” variable – Completed – 42%, Cancelled – 19% and No Cars – 39%

- **Segmented Univariate Analysis:**

- Created segments based on the “Request Hour” to represent the part of day (Morning, Evening, Late Night, etc.)
- Assumptions – 12AM to 5 AM – Early Morning; 5AM to 10 AM – Morning Peak; 10AM to 5PM – Day Time; 5PM to 10PM – Evening Peak; 10PM to 12AM – Late Night

- **Bivariate Analysis:**

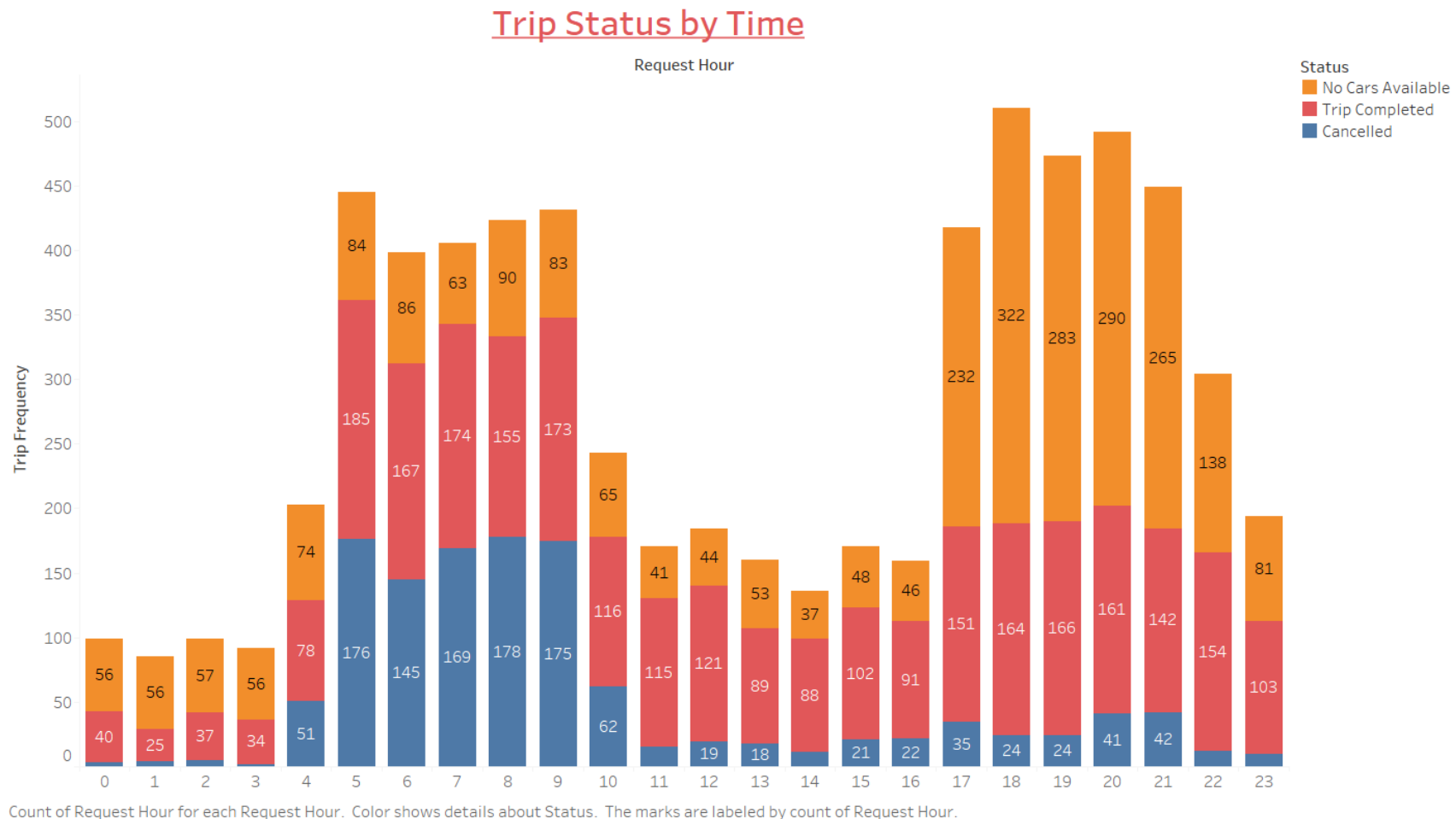
- Grouped the “Day Type” and “Status” variables to understand the trend in detail
- Grouped the “Day Type”, “Pickup Point” and “Status” variables to analyse the trend

- **Derived Variables:**

- Derived additional metrics from “Request Timestamp” variables for better analysis:
 - Months, Day, Year, Time, Hour, Minute and Day Type

Identifying the Business Problem

- Most of the “Cancellations” occur between 5AM to 9AM and “Non availability of Cars” occur between 5 PM to 10 PM
 - Of the overall trips, only 42% of the trips were completed, 39% of them were not fulfilled due to non availability of cars and 19% were cancelled by the driver



Identifying the Business Problem

- The same trend occurs for all the 5 days. Hence we can drill down to these 2 time slots to understand the problem more in detail
 - Morning Peak – 5AM to 9AM and Evening Peak - 5PM to 10PM

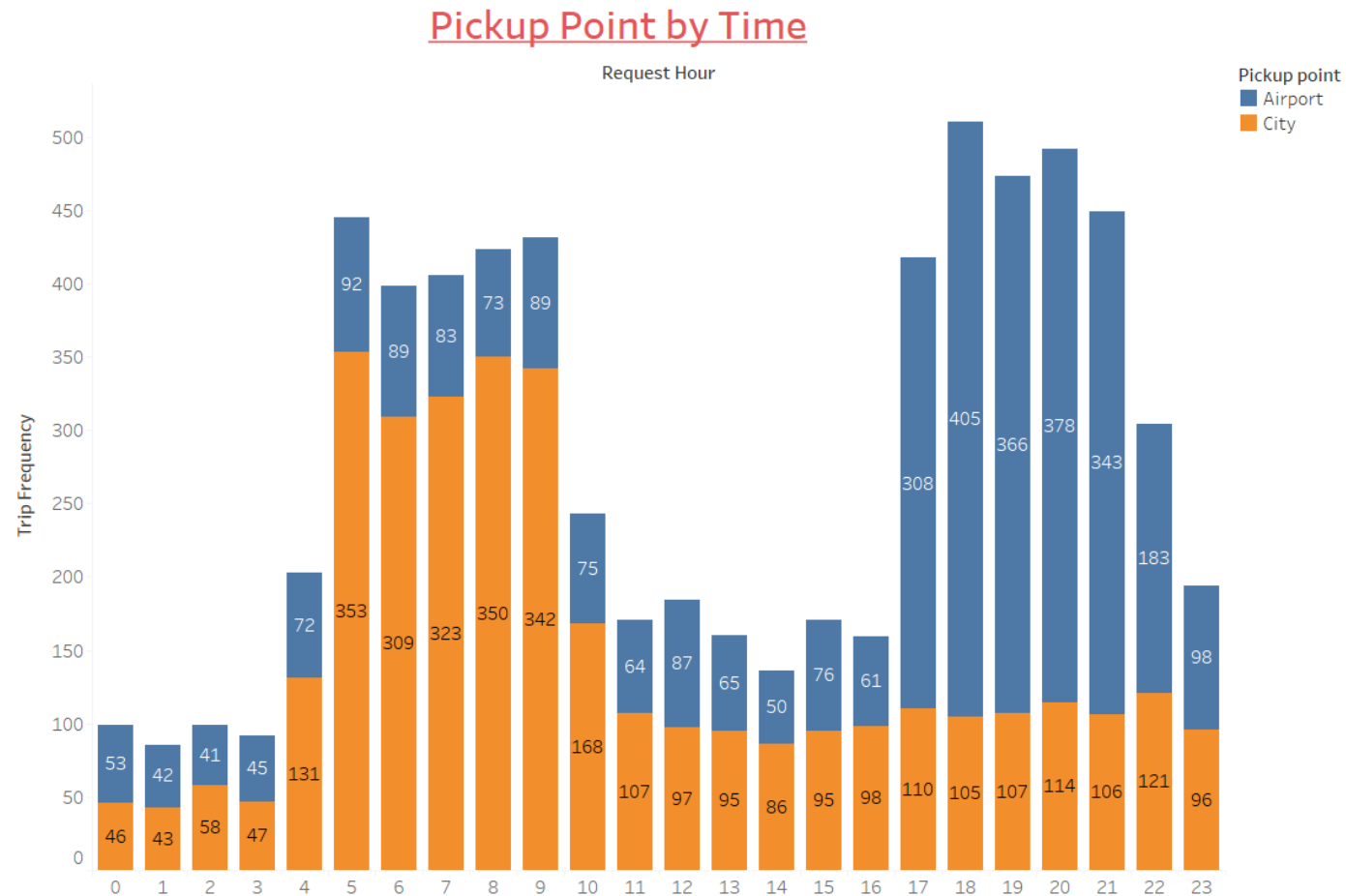
Trip Status by Time for each Day



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

Identifying the Problematic Request Type

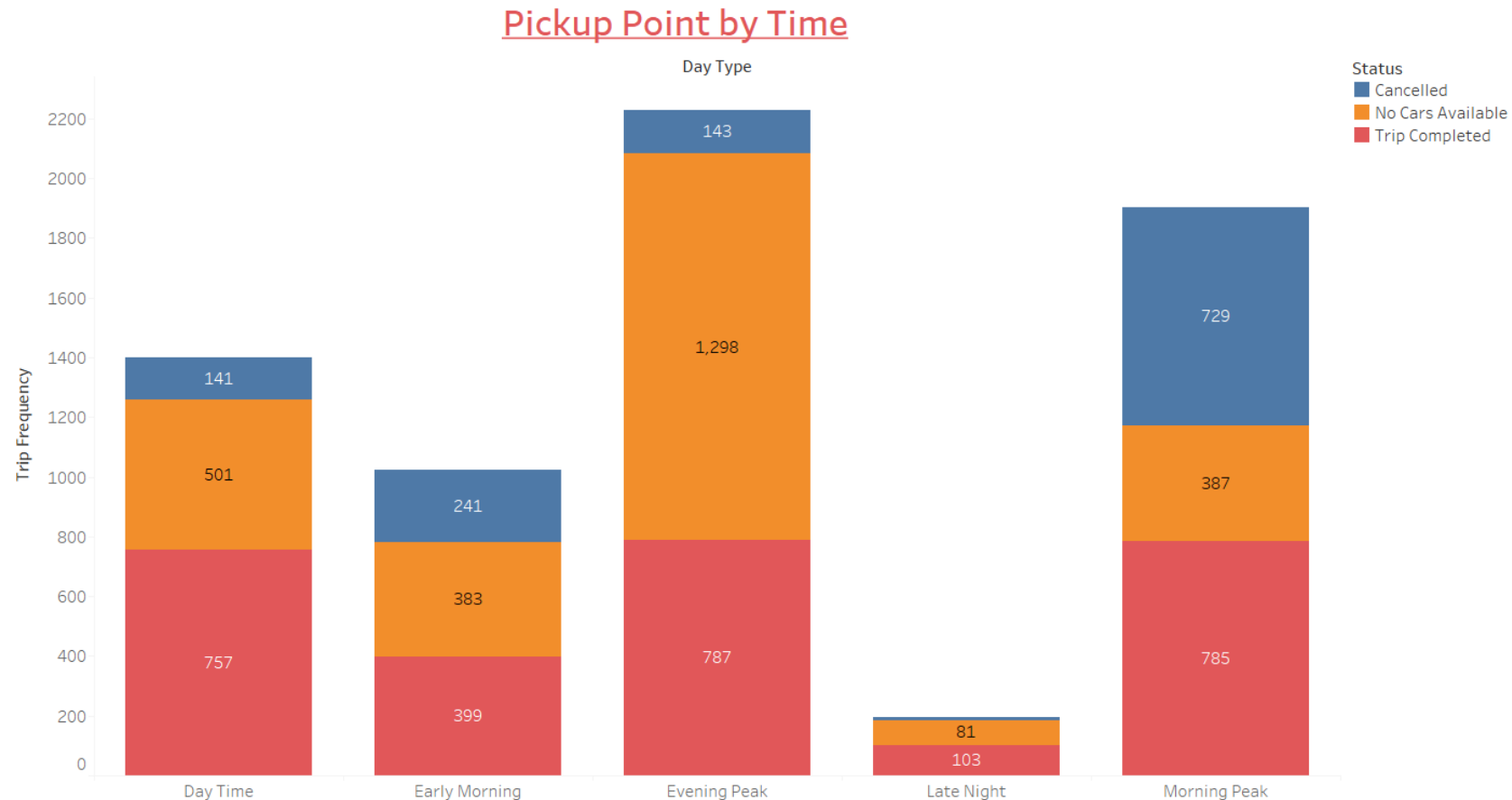
- Majority of the trips in the “Evening Peak” hours is from Airport to City, and in the “Morning Peak” hours, it is from City to Airport
 - 75% of the trip are from Airport to City in the “Evening Peak” hours
 - 78% of the trips are from City to Airport in the “Morning Peak” hours



Count of Request Hour for each Request Hour. Color shows details about Pickup point. The marks are labeled by count of Request Hour.

Identifying the Problematic Request Type

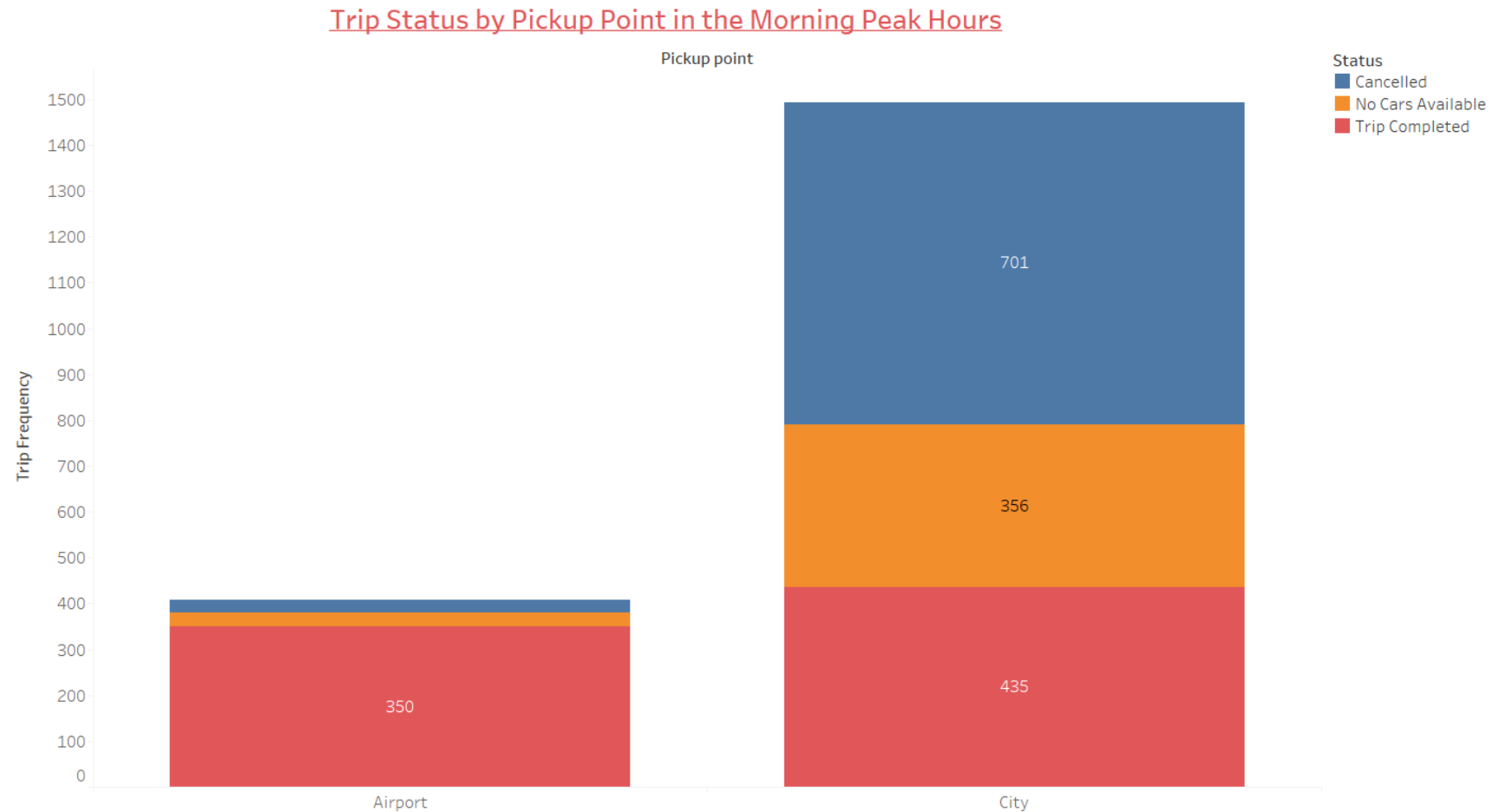
- Below chart also shows that most “Cancellations” occur during the “Morning Peak” hrs and “Unavailability of cars” occur during “Evening Peak” hrs
 - Morning Peak Hours - 729 - "Cancelled", 387 - Unavailability and 785 - Completed
 - Evening Peak Hours - 143 - "Cancelled", 1,298 - Unavailability and 787 - Completed



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

Identifying the Supply Demand Gap – Morning Peak

- “Morning Peak Hours” - 78% of the trip requests were from City to Airport, and 22% are from Airport to City.
- Of the total Demand of 1,492 requests made from City, Supply was only for 435 requests. i.e. Only 29.2% of the Demand was fulfilled, 47% of requests was "Cancelled" and 23.9% was not fulfilled due to unavailability of Cars



Count of Status for each Pickup point. Color shows details about Status. The marks are labeled by count of Status. The data is filtered on Day Type, which keeps Morning Peak.

Identifying the Problem Hypothesis – Morning Peak

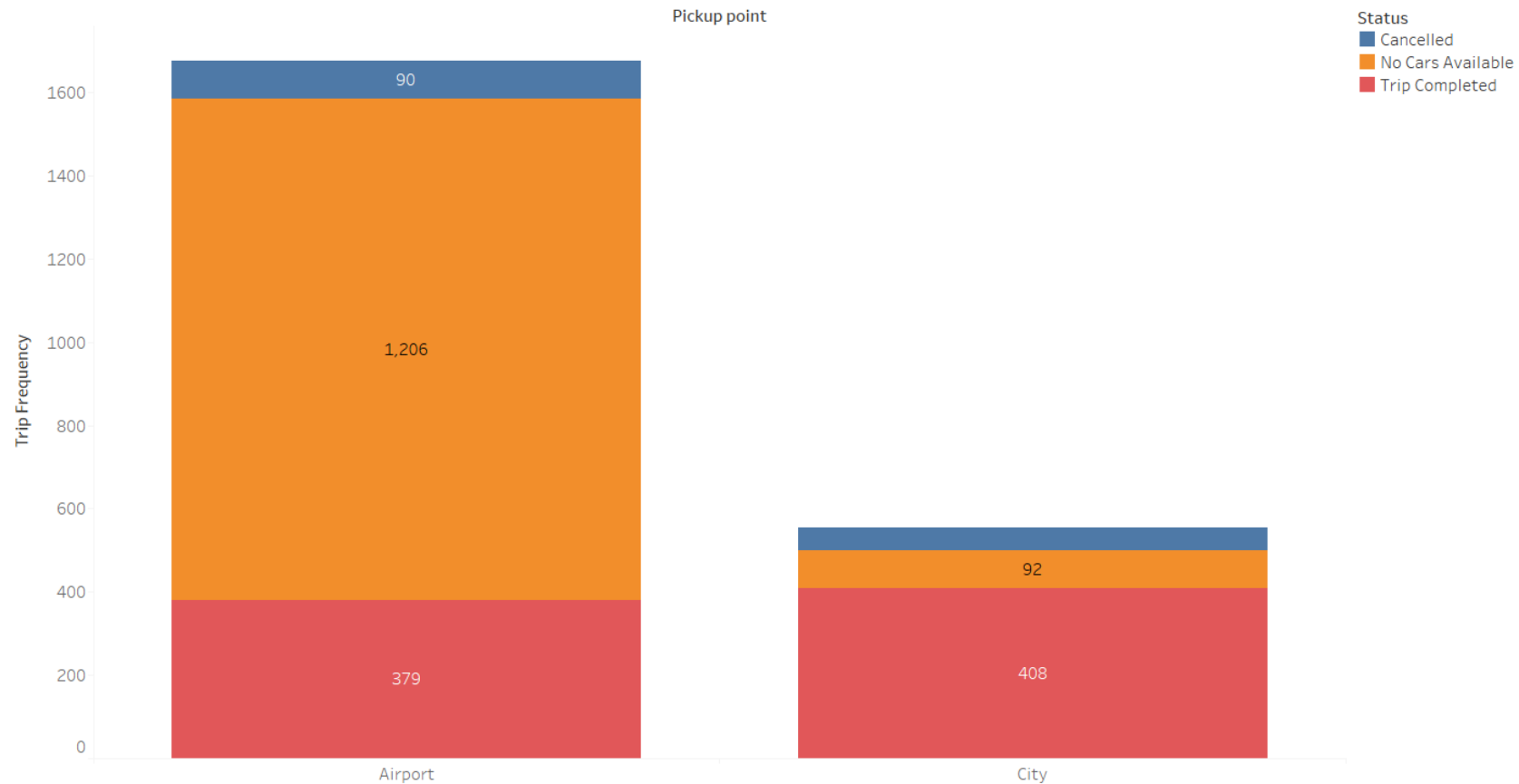
“Cancellation” of trips during the “Morning Peak” hours

- As we noticed above, only 29.2% of the demand is fulfilled in the Morning and almost 70% of the demand is not met. This is primarily due to the "Cancellation" of requests.
- Almost 47% of the demand is not fulfilled due to "Cancellation". The issue is mainly related to the huge gap between the timing of incoming and outgoing flights at the airport.
- During the Morning peak hours between 5 AM to 9 AM, there were not many incoming flights at the airport. Most of the flights are outgoing.
- Hence, if the driver fulfills the demand in the Morning, he/she will have to wait for a long time at the Airport to get a customer. During this wait time, the driver could have handled few requests, had he/she was in the city.
- This is why we see a lot of "Cancellations" happen in the Morning peak hours.

Identifying the Supply Demand Gap – Evening Peak

- “Evening Peak Hours” - 75% of the trip requests are from Airport to City, and 25% are from City to Airport
- Of the total Demand of 1,675 requests made from Airport to City, Supply was only for 379 requests. i.e Only 22.6% of the Demand was fulfilled, 5.4% of requests was "Cancelled" and 72% was not fulfilled due to unavailability of Cars

Trip Status by Pickup Point in the Evening Peak Hours



Count of Status for each Pickup point. Color shows details about Status. The marks are labeled by count of Status. The data is filtered on Day Type, which keeps Evening Peak.

Identifying the Problem Hypothesis – Evening Peak

“Non availability of Cars” during the “Evening Peak” hours

- As we noticed above, only 22.6% of the demand is fulfilled in the Evening and almost 77% of the demand is not met. This is primarily due to the "Unavailability of Cars" during that time.
- Almost 72% of the demand is not fulfilled due to "Non availability of Cars". The issue is mainly related to the huge gap between the timing of incoming and outgoing flights at the airport..
- During the Evening peak hours between 5 PM to 10 PM, there were not many outgoing flights at the airport. Most of the flights are incoming.
- Since there were not much of requests from City to Airport during the evening peak time, there were less cabs available in the airport to meet the huge demand.
- Hence, we see a huge number of requests that are not fulfilled, due to non availability of Cars.

- Reward the Drivers who fulfill the trips To & From Airports during the “Morning Peak” and “Evening Peak” hours through "Reward/Bonus Points".
- UBER can reduce their Commission/Charges for the trips made to & from the Airports during the Morning & Evening peak hours. This can motivate the drivers to fulfill the requests and UBER can also generate some revenues.
- UBER can increase the fare for the trips to & from airports during the Evening peak hours. This will also helps the Driver to take such trips rather than cancelling it.
- UBER can try and increase the demand near the Airports by offering discounts (Cashbacks, Coupons, Lucky draw) for the customers, so that they avail the Cabs more often. By this, there will be more Cabs near the airport location, and they can fulfil the demands in the airports.