Uber Supply Demand Gap

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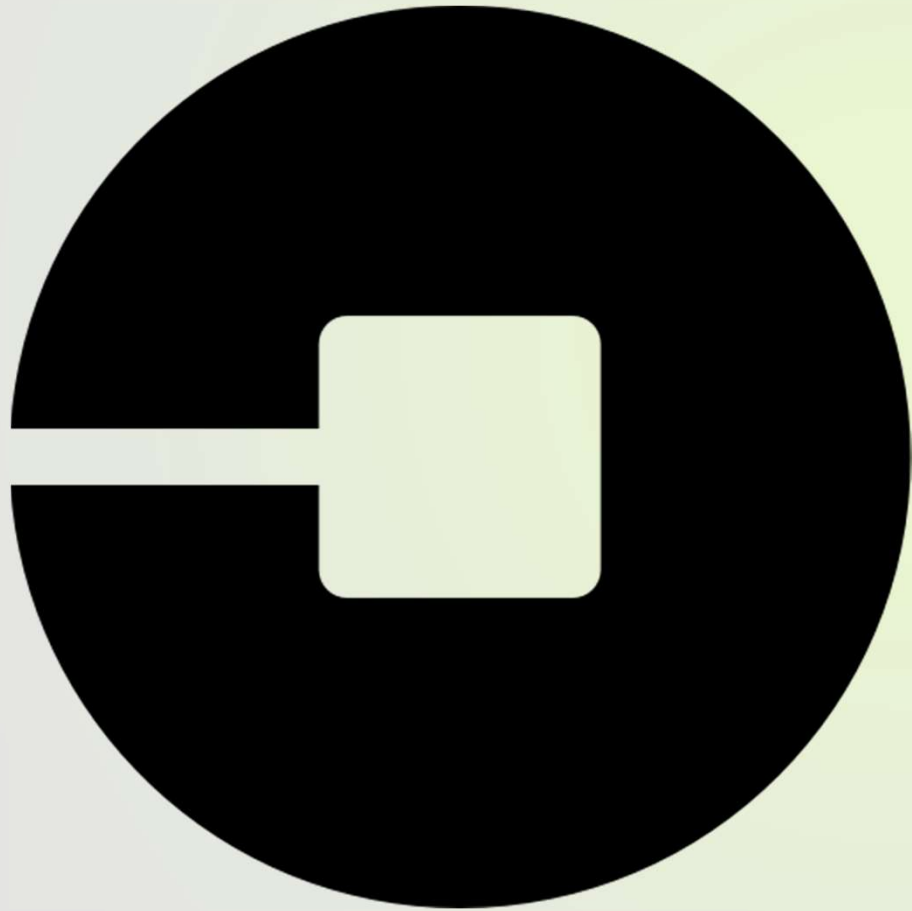
Created by:-

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Objective

- To address the problem Uber is facing - driver cancellation and non-availability of cars leading to loss of potential revenue

- To identify the root cause of the problem

- Recommendation of ways to improve the situation

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Available Dataset

- Data is available from 11th July, 2016 to 15th July 2016

- Data contains 6745 unique rows and 6 attributes

- Attributes available are :-

  1. Request id: A unique identifier of the request

  2. Time of request: The date and time at which the customer made the trip request

  3. Drop-off time: The drop-off date and time, in case the trip was completed

  4. Pick-up point: The point from which the request was made

  5. Driver id: The unique identification number of the driver

  6. Status of the request: The final status of the trip, that can be either completed, cancelled by the driver or no cars available

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Data Cleaning and Manipulation

- Possible data inconsistencies:

  1. Duplicate value of request id

  2. NA values in request id, time of request, pick-up point or status of request

- Other data issues:

  1. Request time and drop-off time are in character format need to convert them in datetime format

  2. Some of the dates are in dd/mm/yyyy format where as some are in dd-mm-yyyy format. Need to make them consistent throughout the dataset for proper extraction of date

  3. In some cases time as second and in some cases second is missing; need to make it consistent as well

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Day Wise Variation of Requests With The Status of Request

- Pattern of request is common for all the days for the status of request
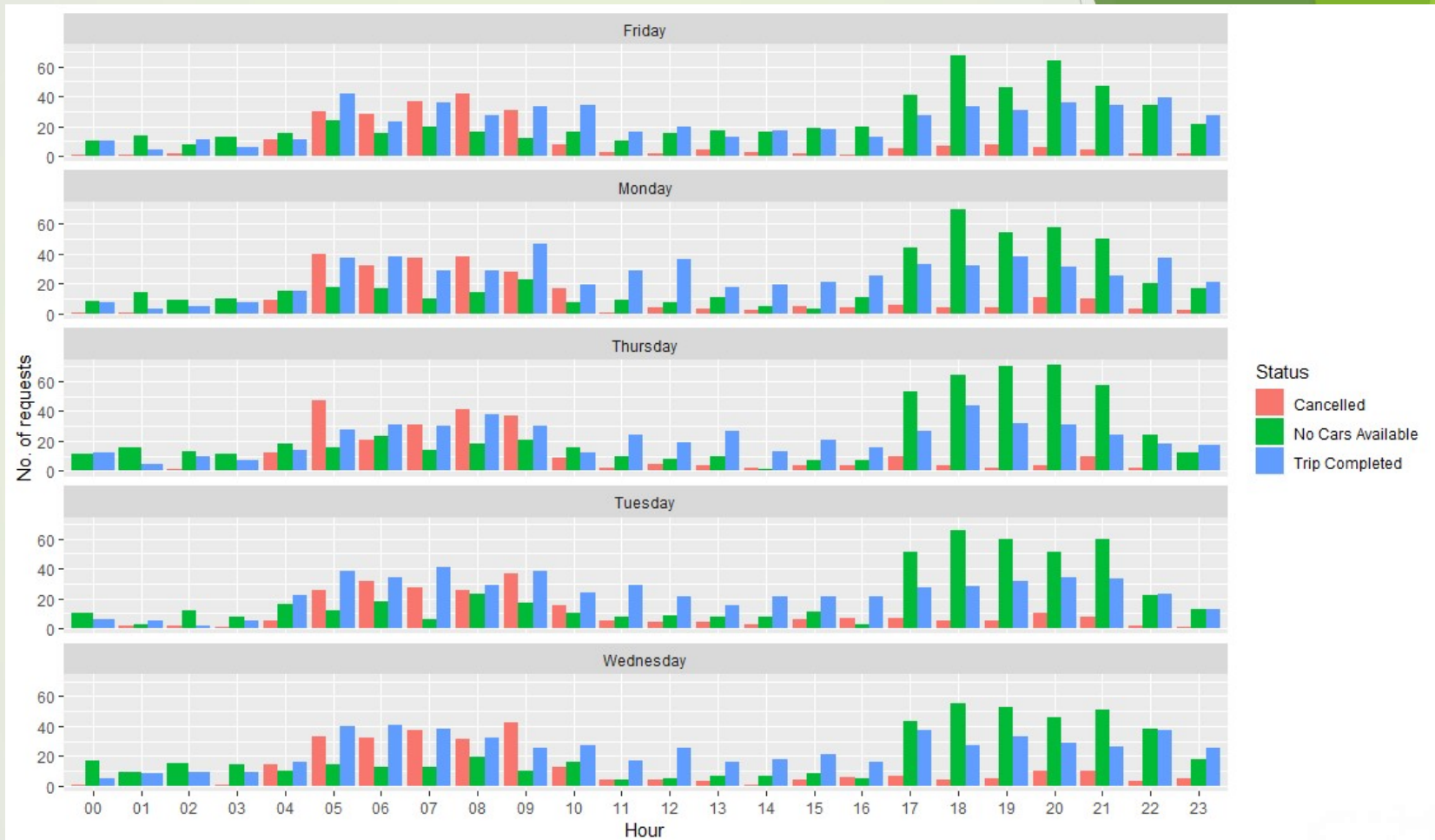
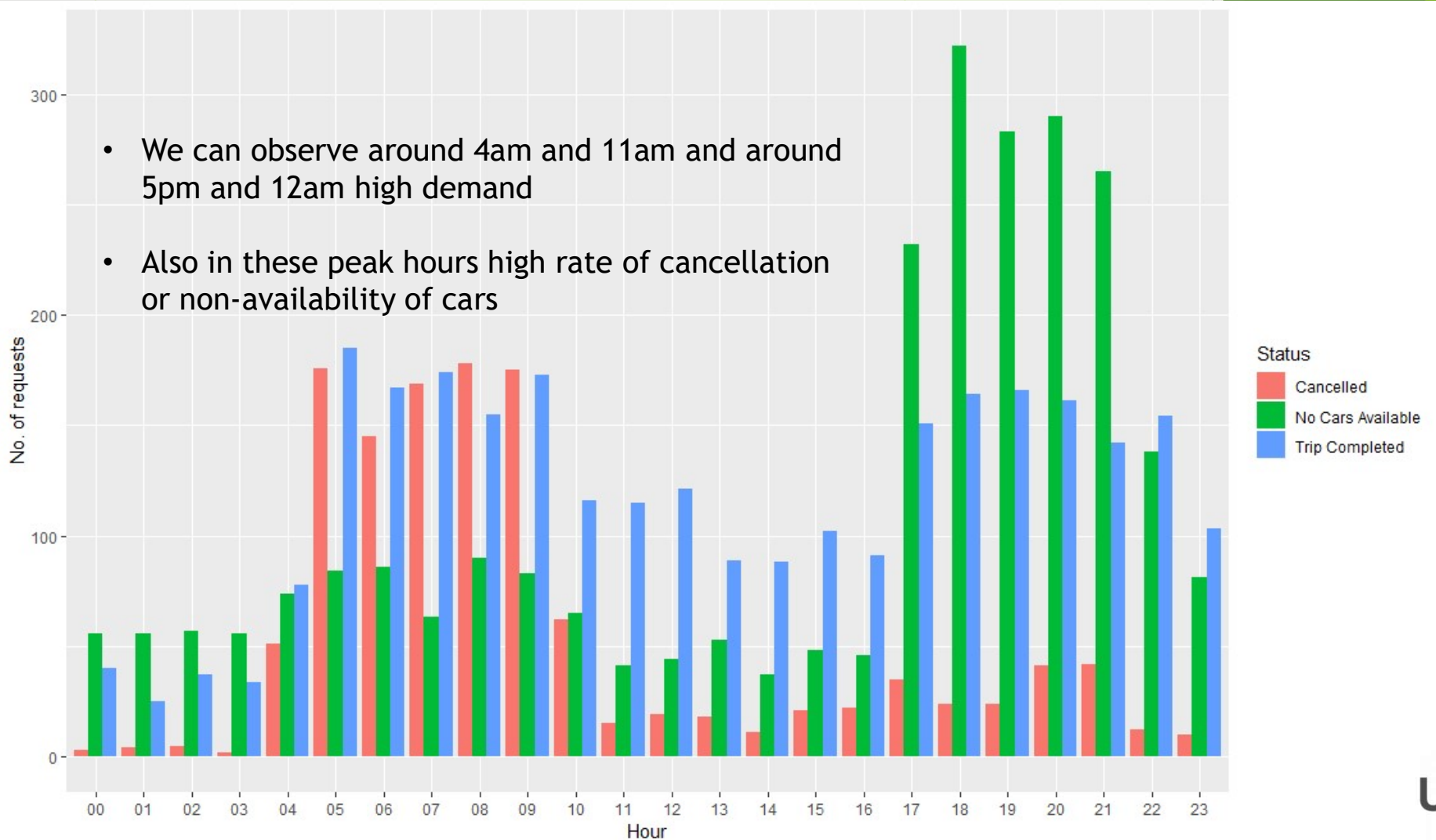# Day Wise Variation of Requests With The Pick-up Point of Request

- Pattern of request is common for all the days for the pickup point of request too

Combining Data for All Days

- Previous plots shows that all the days follows a common trend irrespective of the variation of pick-up point and trip status

- Hence we can combine all the data across days for further analysis

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Hourly Scenario of Combined Data for All Days

- We can observe around 4am and 11am and around 5pm and 12am high demand

- Also in these peak hours high rate of cancellation or non-availability of cars

Status
- Cancelled
- No Cars Available
- Trip Completed

Gaining Insights Across Hours

- It is clear from previous and this plot that number of trips from city are high in early hours and number of requests from airport are high in late hours
- city faces most of the cancellation in early hours whereas airport faces most of the non-availability in late hours
- Which is causing supply gap in the time of high demand resulting lose of revenue

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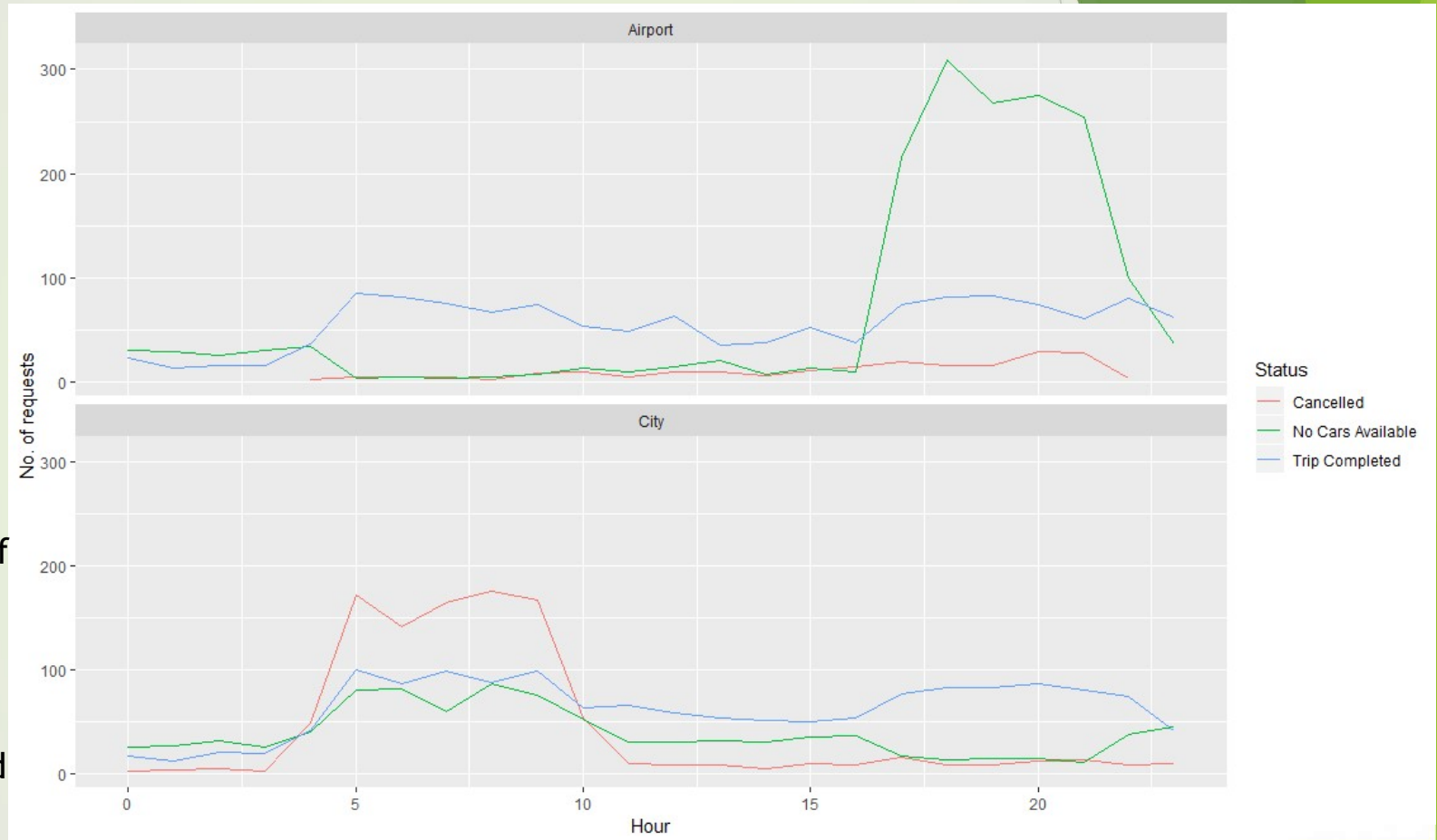
Segmenting Time into 4 Categories

Time	Category
12am to 3am	Early_hours
4am to 9am	Morning
10am to 4pm	Day_Time
5pm to midnight	Night

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Problem Identification

This graph clearly shows two major problems:
1. High rate of cancellation in Morning slot
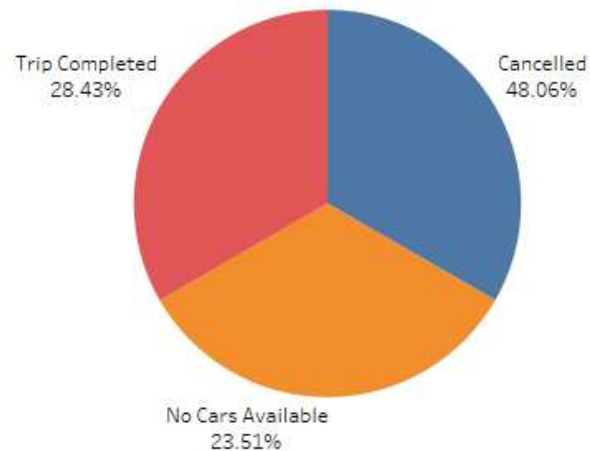2. High rate of no cars available in Night slot

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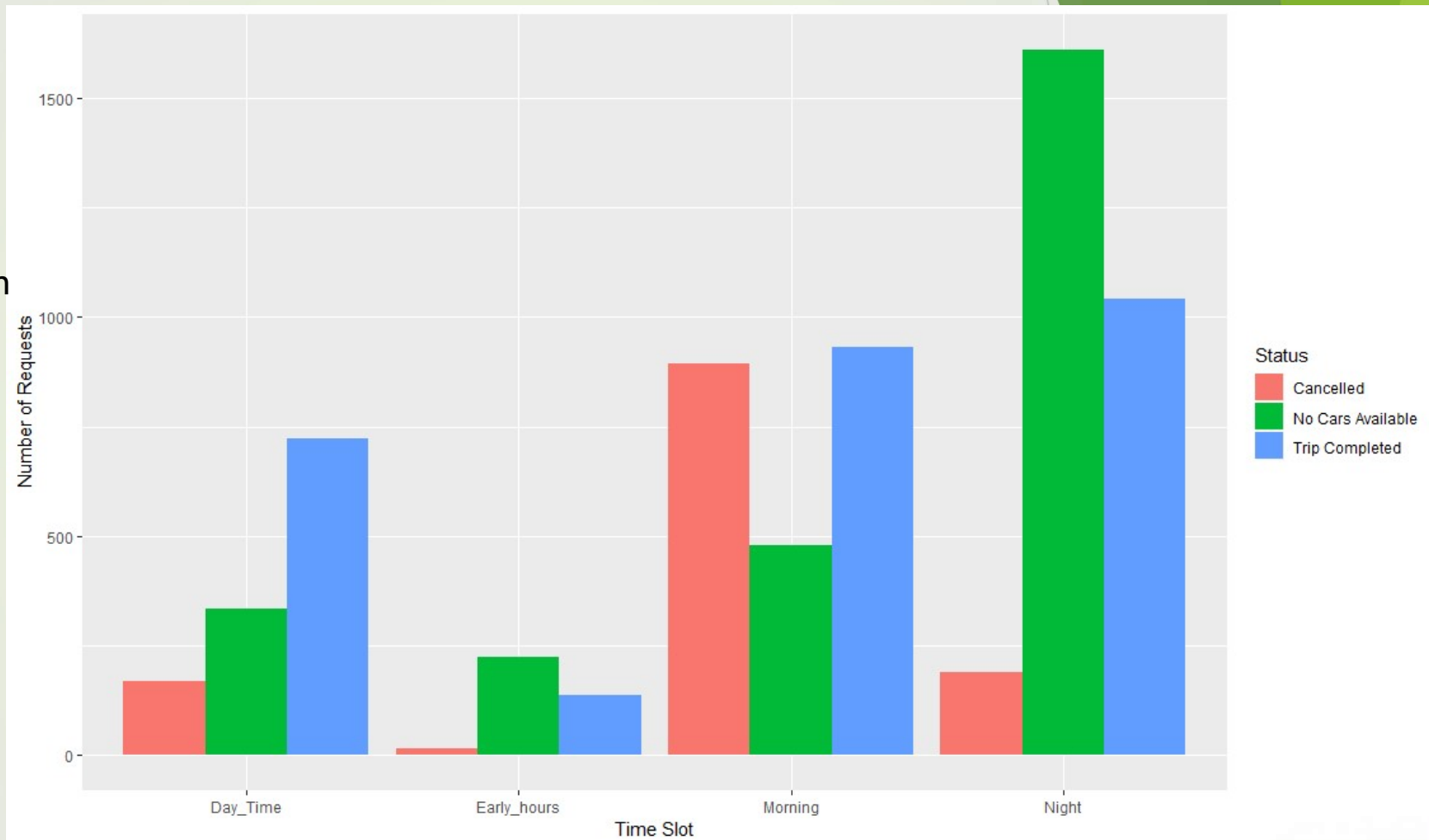
Cancelled Trips

- City has much higher number of requests
- City is highly affected by cancellation

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Cancelled Trips – City

- Almost 50% of total trip from city got cancelled

- Trip completion rate is only 29% from city in morning

Trip Completed
28.43%

Cancelled
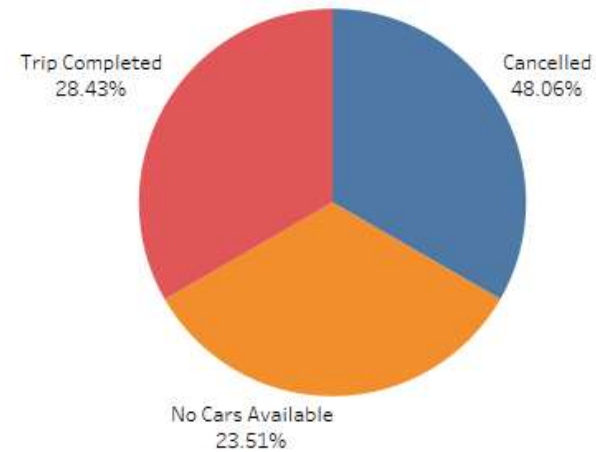48.06%

No Cars Available
23.51%

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Non-availability of Cars

- Airport has much higher number of requests
- Airport is highly affected by non-availability of cabs

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No Car Available – Airport

- Almost 70% of total trip from airport are facing no car available

- Trip completion rate is only 29% from airport in night

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Conclusions

- Uber is failing to fulfil it's demand during two specific time slots across the day:- one is from 4am to 9am, i.e., in the morning and another is from 5pm to midnight, i.e. in the night.

- During morning hours many drivers are not going to airport and cancelling the trips resulting high supply demand gap

- During night hours there is not enough cars available from airport to city which is creating a high supply demand gap as well.

Recommendations

- For the trips in the morning drivers are cancelling a lot of trips.

- We can see from analysis that there are very few requests from airport to city in those hours.

- So, we can conclude that drivers are cancelling trips to avoid high waiting time at airport.

- Some potential solutions might be-

  1. Higher fair for morning riding from city to airport

  2. Bonus to driver for each trip completion in those hours

  3. Paying the fuel price to drivers for returning back to city with empty cars

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Recommendations contd.

- There is not enough car at airport during night hours

- Drivers are completing trips within the city not needing to go to airport as there are very few requests in those hours from city to airport

- For these reasons number of car is quite low at the airport.

- Some potential solutions could be-

  1. Giving bonus to driver for night hours

  2. Introducing fresh fleet of cabs from airport in those hours which will start from airport and then continue their service throughout the whole night

  3. Increasing use of pool riding, requiring less number of cars to complete more number of successful trips

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Thank You

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