

Team 04, 05 and 17 – Metro-North Hackers

## Metro Safe Ride

Mentors:

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# Teams 04, 05, 17 - Metro-North Hackers

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# MNR, Riding with Confidence

## **Adopting to new safety conditions at ultra-low cost-to-company**

- Built ONLY on existing systems
- No new hardware / device requirement

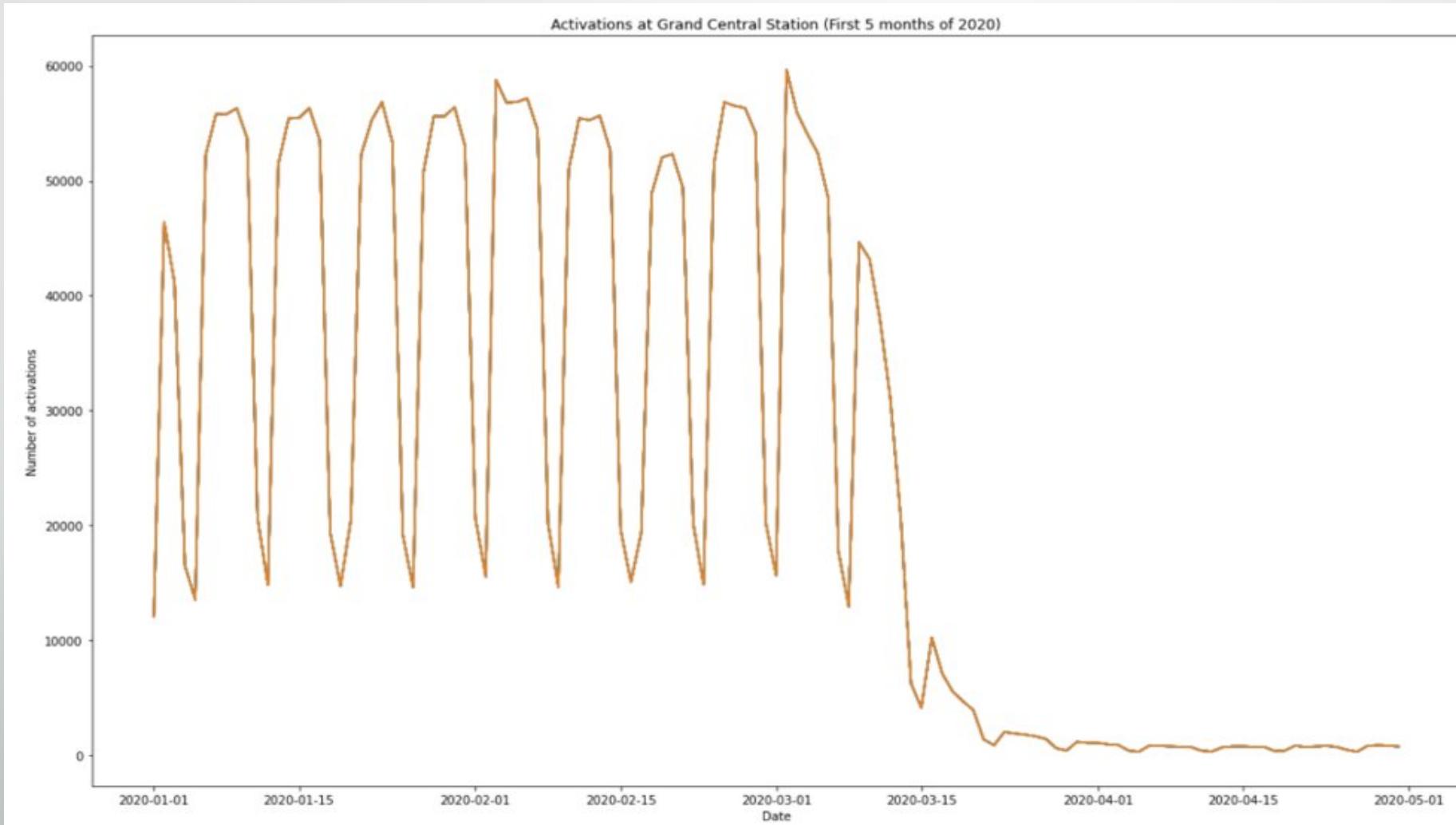
## **Points of interest where Social Distancing can fail.**

- Unable to anticipate travel patterns / spikes in ridership
- Many passengers waiting at same place on the platform
- Passenger tendency to opt to get in the car closest to the center of the platform / station entrance.

## **Proposed Solution (TWO-STAGE Approach)**

- Provide analytics to the MTA regarding expected ridership on a given day and places of frequent congestion
- Help USER come to Metro with confidence, by showing relevant safety information in all the stages of travel, from start of the travel plan, to exiting the train at the destination

# Exploratory Data Analysis



# MTA-Portal (Data Science and ML)



## Data Used

- User Activation dataset
- Ticket purchases
- Ticket scans
- COVID-19 live data
- News API

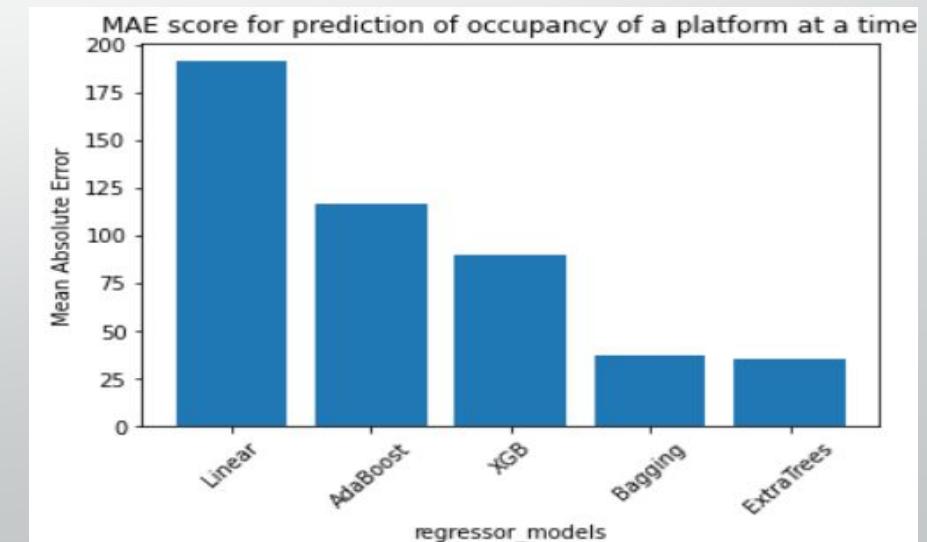
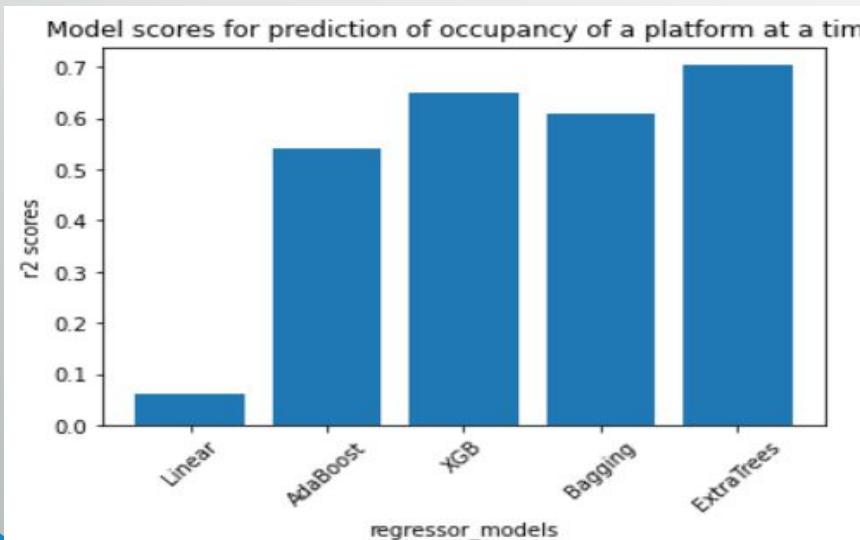
## Ridership Analysis

- Analyze number of user activations and ticket purchases and predict the expected number of passengers based on Time, day-of-the week
- Analyze the risk of each route by monitoring the infected numbers in the counties along route
- Use text analytics to find events happening near the stations to monitor surge in ridership

# Machine Learning Models Used

## Prediction for occupancy of a platform at a time:

- Dataset: Activation dataset, Routing Dataset (TTTA dataset)
- Features: year, month, day of week, origin, originName, destination, destinationName, productName(peak, off-peak,etc). Weather Data (\*), Train Routing Data (\*), Platform Sentiment (\*)
- Models: Linear Regression, AdaBoost Regressor, XGB Regressor, Bagging Regressor, ExtraTrees Regressor
- Model Results:



# User services (Metro Safe Ride)

## **1) Planning the trip**

- An estimate of train congestion for the trip is shown based on past data

Your answer goes here

## **2) Upon entering the station**

- Obtain USER\_LOCATION and show passenger clustering in the railway station

## **3) Train arrival**

- Using TIMS dataset to show train-car occupancy

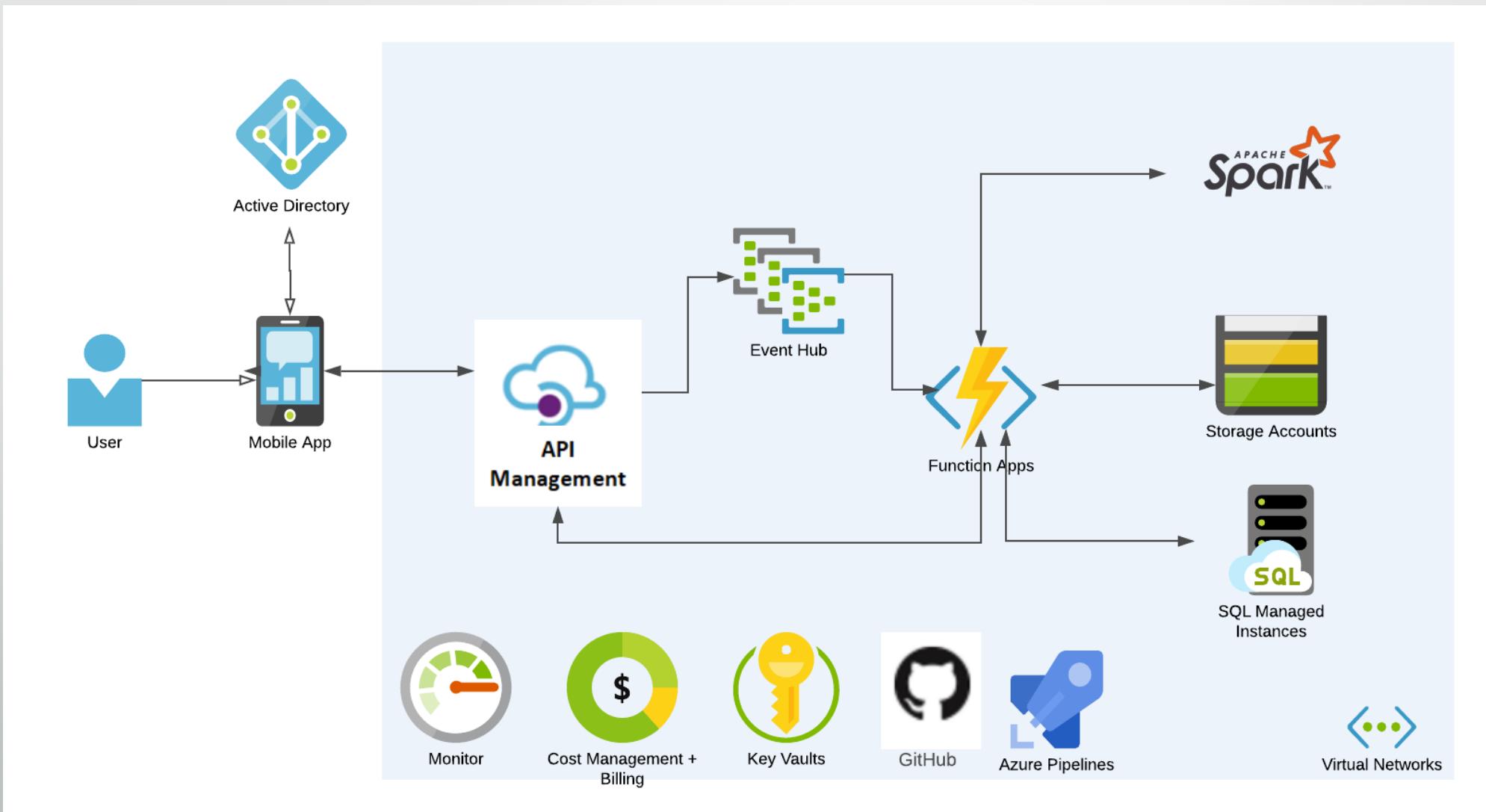
## **4) Upon Boarding**

- Request user to contribute on car-occupancy (green-yellow-red)

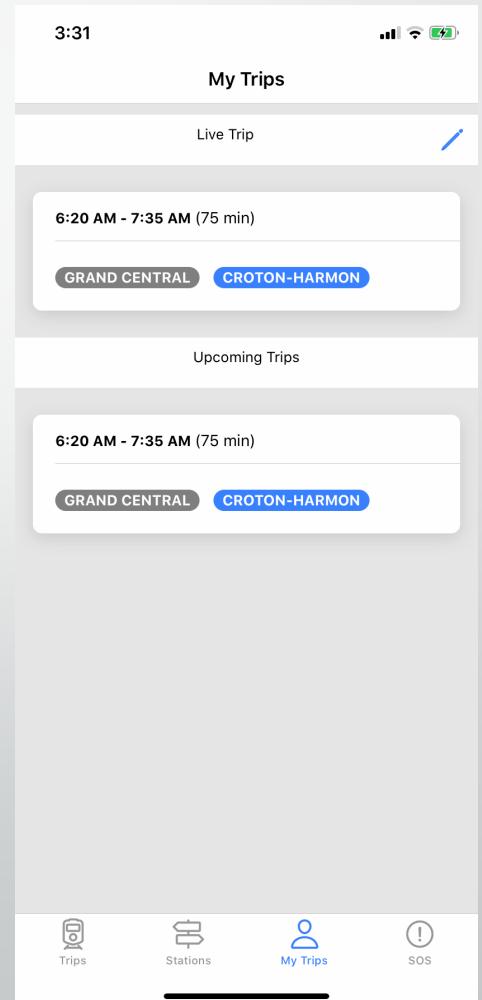
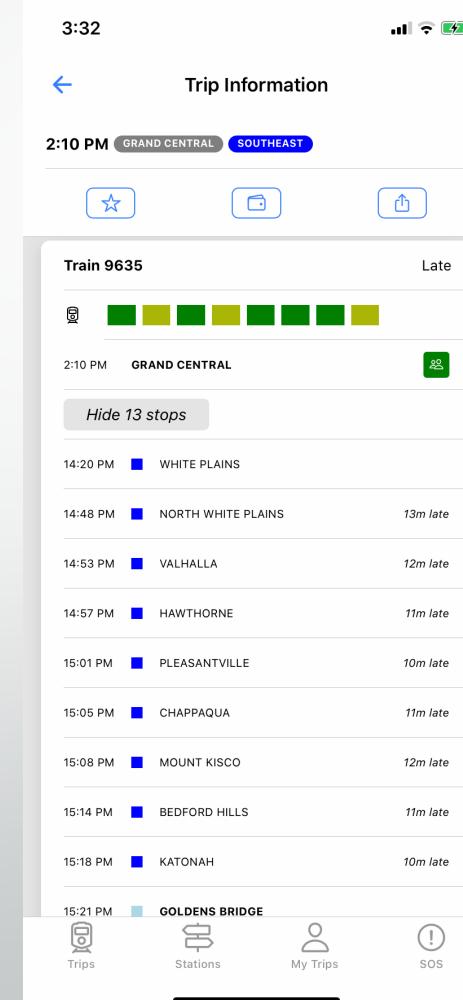
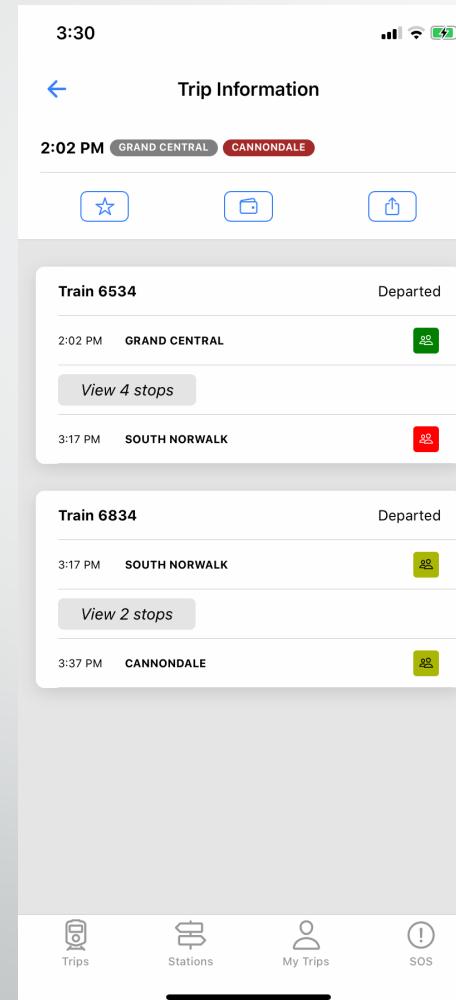
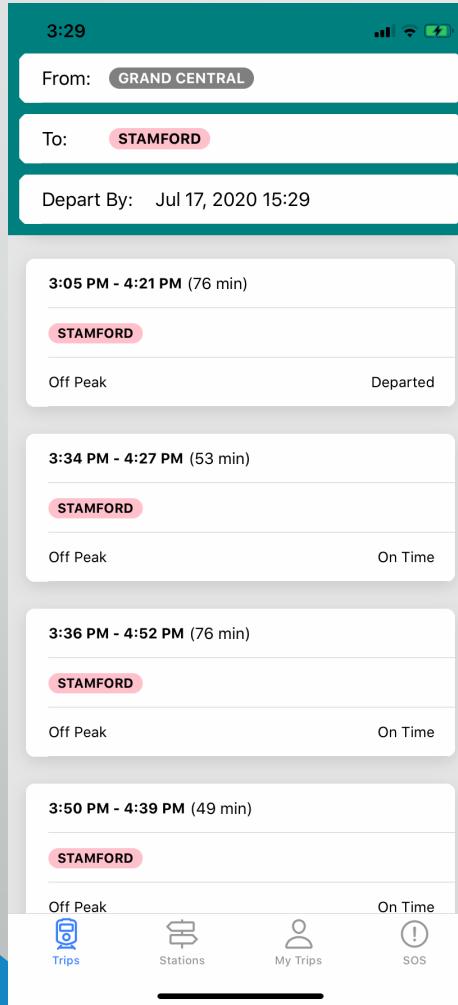
## **5) End of journey**

- User feedback to improve services

# Architecture (Metro Safe Ride)



# App wireframes



# App Code

GitHub URL:

<https://github.com/scorpionhiccup/MTAHack>

Please find the Report and Video in the Upload Here Folder.

The Android version of the app is available as well. (Would need access to the tttA APIs to function)



Thank You