The Problem

How to help Uber partners predict demand and maximize profits based on information on geographical locations, times of the day and of the week, and weather conditions?

Problem 1

Uber drivers don't have information on how profitable rides are, only it's revenue.

Although the price of rides increases with its distance, so do fuel costs. Drivers have no information on how profitable rides are, they only know the price of rides and their count.

Problem 2

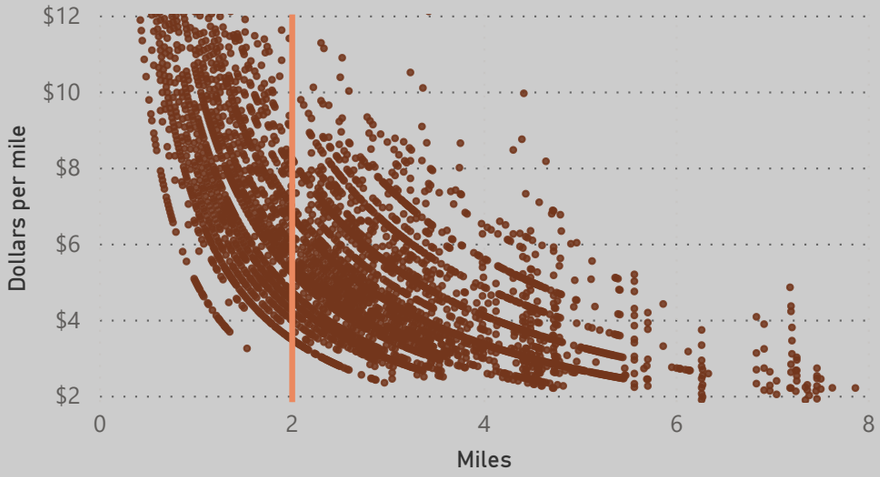
Uber drivers don't have the tools to predict demand and profitability of rides on a daily basis.

To maximize profits, Uber drivers need a strategy to predict demand and maximize profitability of rides on a daily basis, according to known variables such as location, time of the day, weekday and weather conditions.

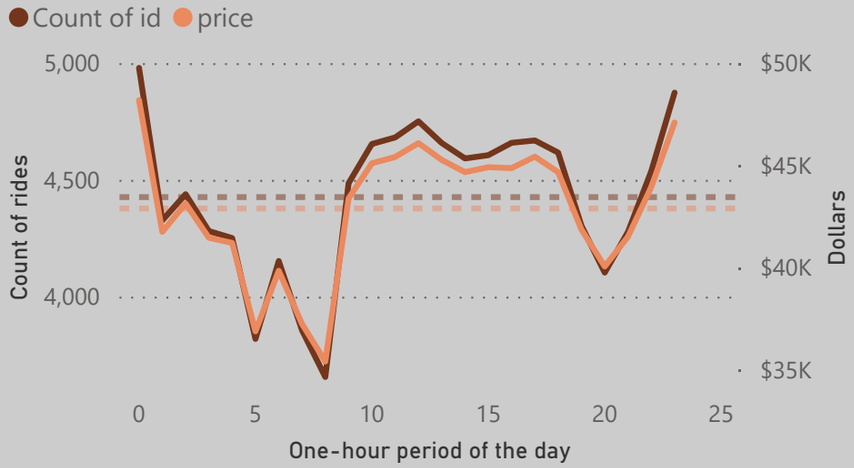
Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-

How to help Uber partners predict demand and maximize profits from rides by informing them of geographical locations, times of the day, weekdays and weather conditions where they're most likely to find clients and the most profitable rides?

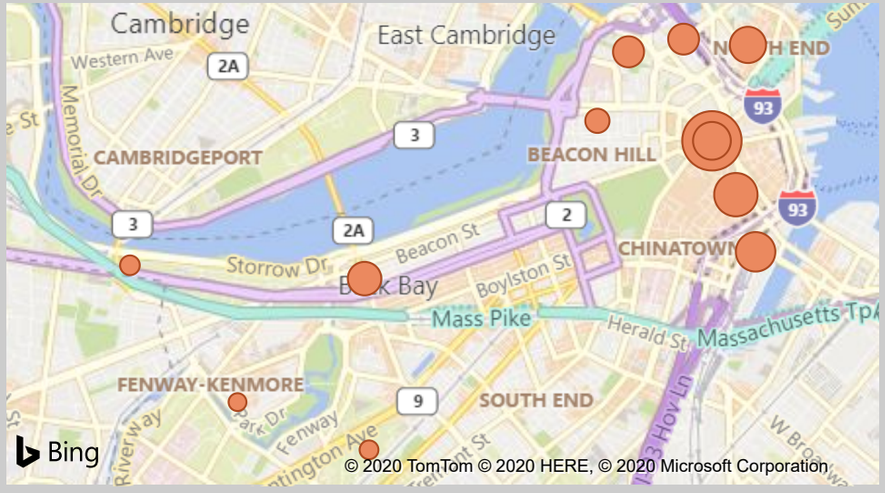
Relationship between cost/mile and distance: shorter rides are more valuable



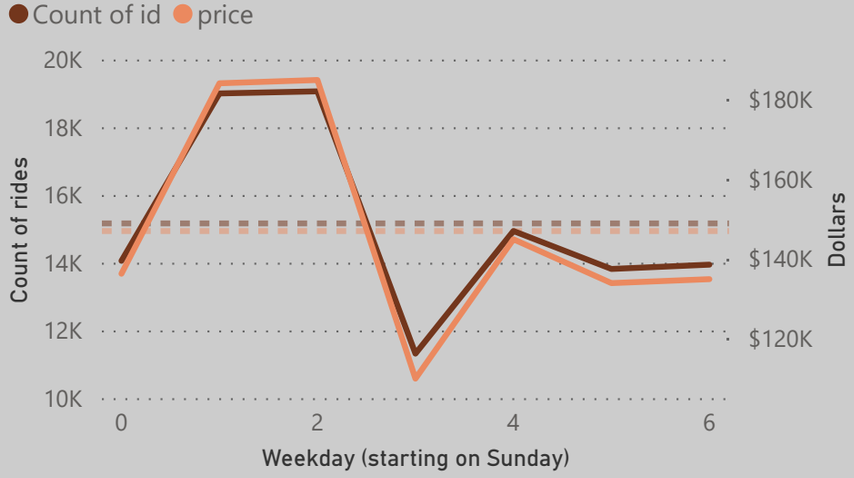
Total number of rides and total revenue generated by hour of the day



Where to find the most profitable rides?



Total number of rides and total revenue generated by weekday



Main insights

Shorter rides are more profitable than long rides. Riders should make efforts to search for rides below 2 miles long.

The demand pattern across source locations differs significantly depending on the criteria used (i.e. aggregated revenue or total rides). In both cases, the most profitable locations don't match the ones with more demand. 'Haymarket Square' is the place where rides are most profitable - that is, where every mile of the ride is worth more.

Unlike location, the times (both periods of the day and weekdays) when more people request rides are the same that generate more revenues. Regarding profitability, no insights can be drawn due to low variance.

Regarding weather conditions, demand seems to vary only according temperature and humidity levels. No differences in profitability depending on weather were found.

Lack of correlations and powerful predictive models based on linear regression shows that location, time, and weather conditions have no linear relationships with price or profitability.

Source: Uber & Lyft Cab prices: Cab and Weather

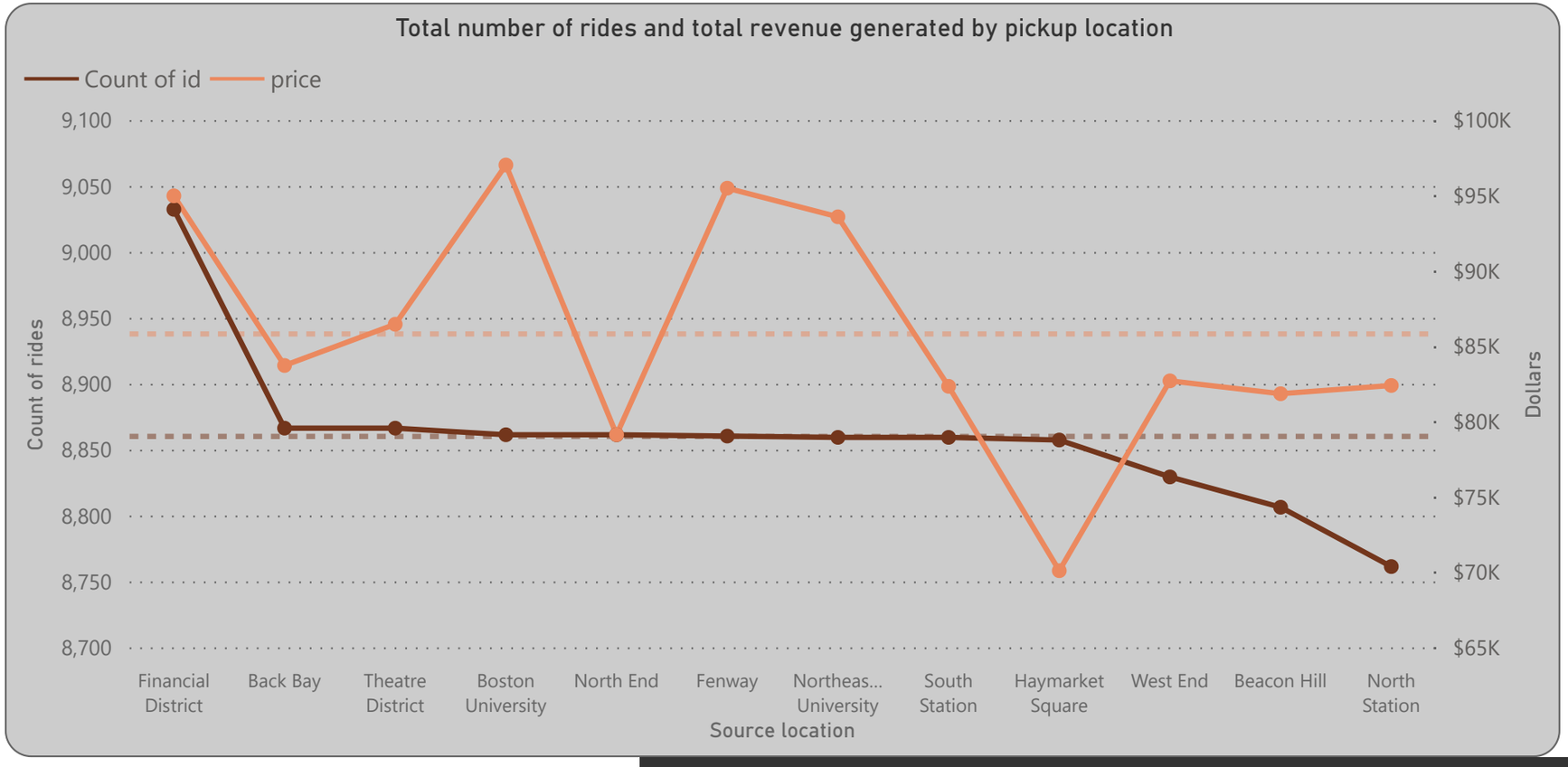
The first step was understanding where most rides start from, and where most revenue comes from. Analysis showed that the starting locations of rides from where more revenue has been generated are not the same locations where more rides are requested.

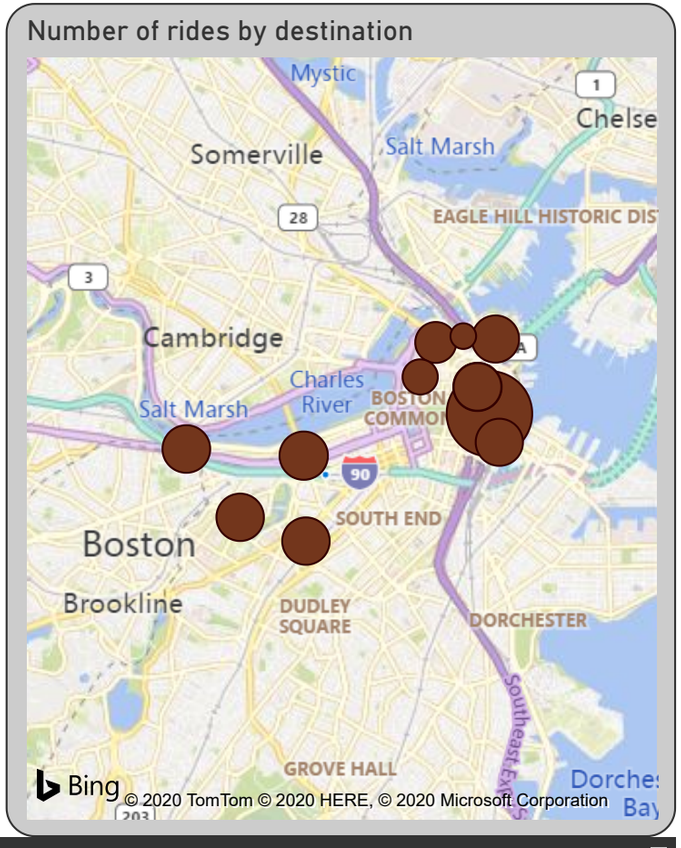
Main insights

'Financial District' is by far the location where most rides start from. However, the locations that generated more revenue are 'Boston University' and 'Fenway'. One likely explanation for this is that a significant number of expensive rides started from 'Fenway', 'Boston University' and 'Northeastern University'.

Multiplier

1	1.5	2
1.25	1.75	2.5





Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-

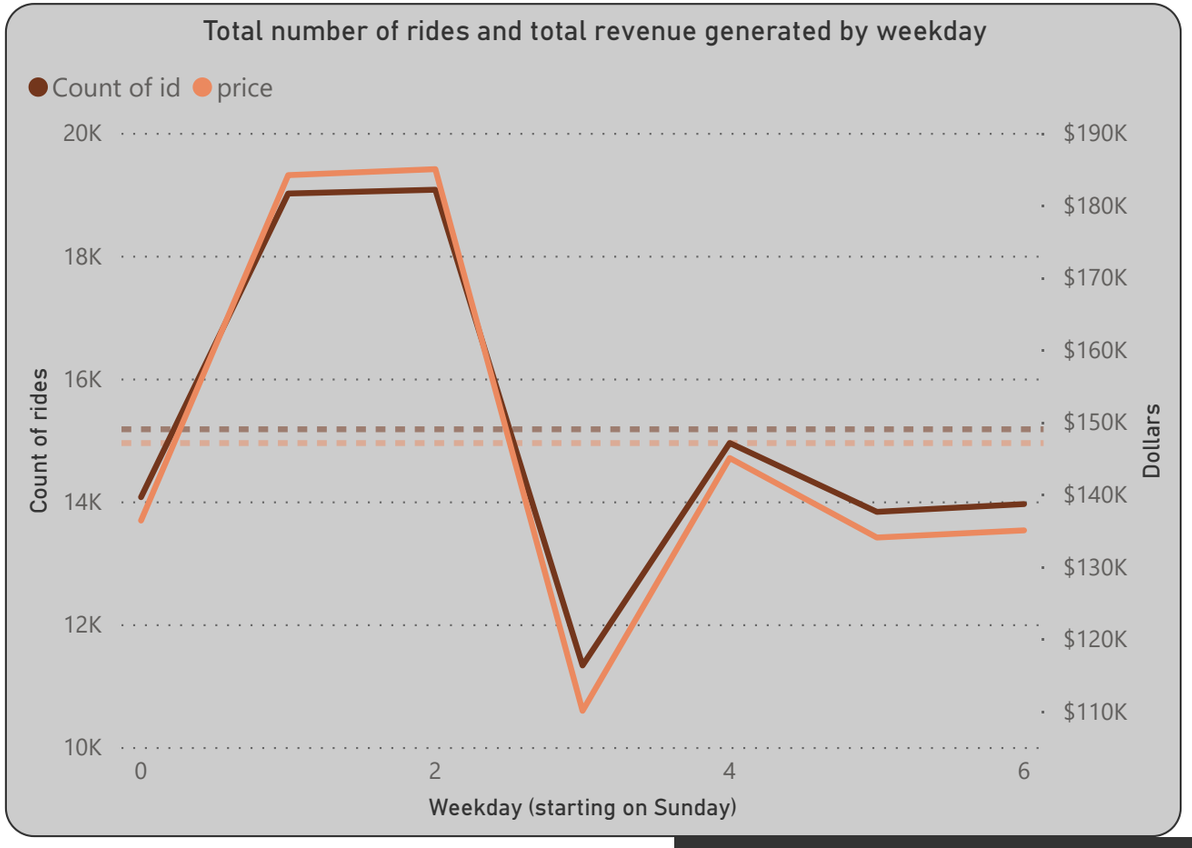
The same analysis was done for time of day and weekday, to understand when most rides start and more revenue is generated. Unlike location, the times when more people request rides are the same that generate more revenues.

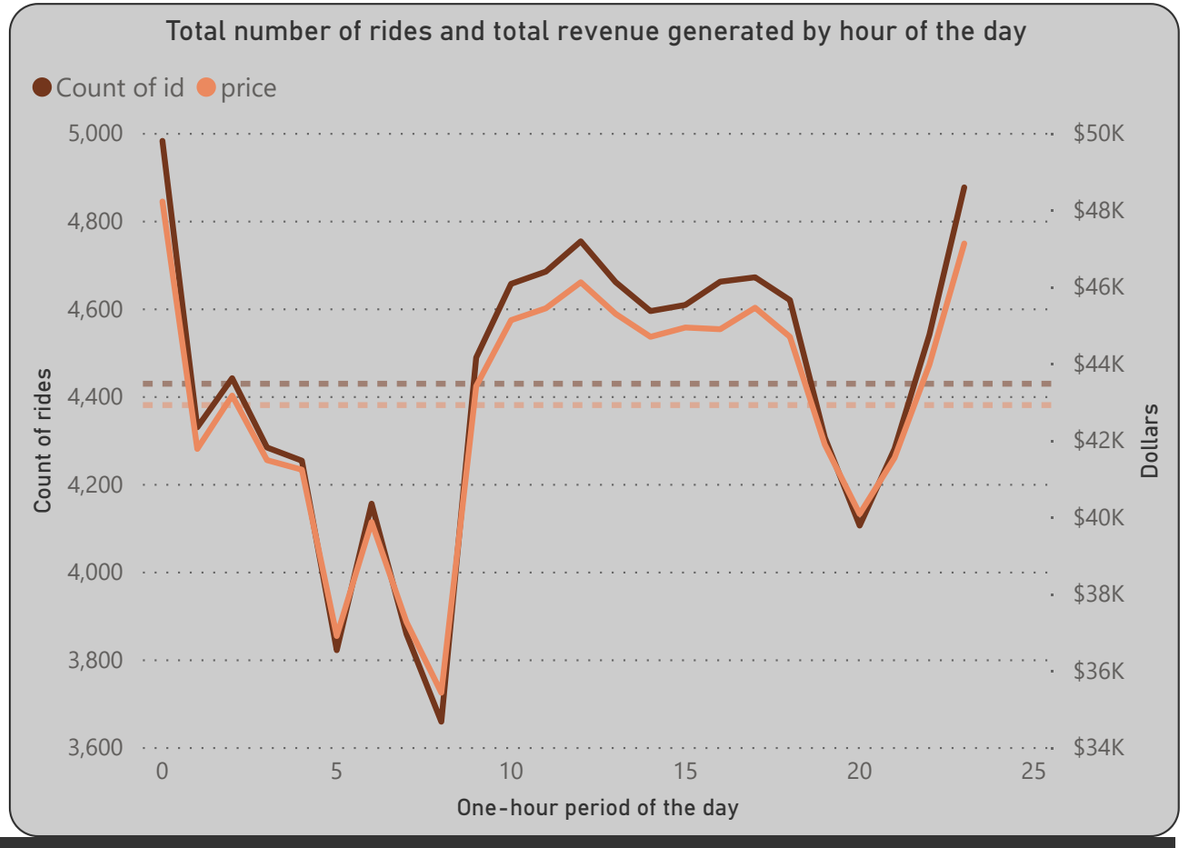
Main insights

Clients are more likely to request rides between 9am and 6pm (with peaks at midday and 5pm), and between 10pm and 1am (with a peak at midnight) - so these are the periods when drivers should be working. As for weekdays, clients request more rides on Mondays and Tuesdays - so drivers should allocate more working hours to these days - and request less rides on Wednesdays - so riders should consider using this day as a day off.

Source location

Back Bay | Beacon Hill





Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-Weather+Data)

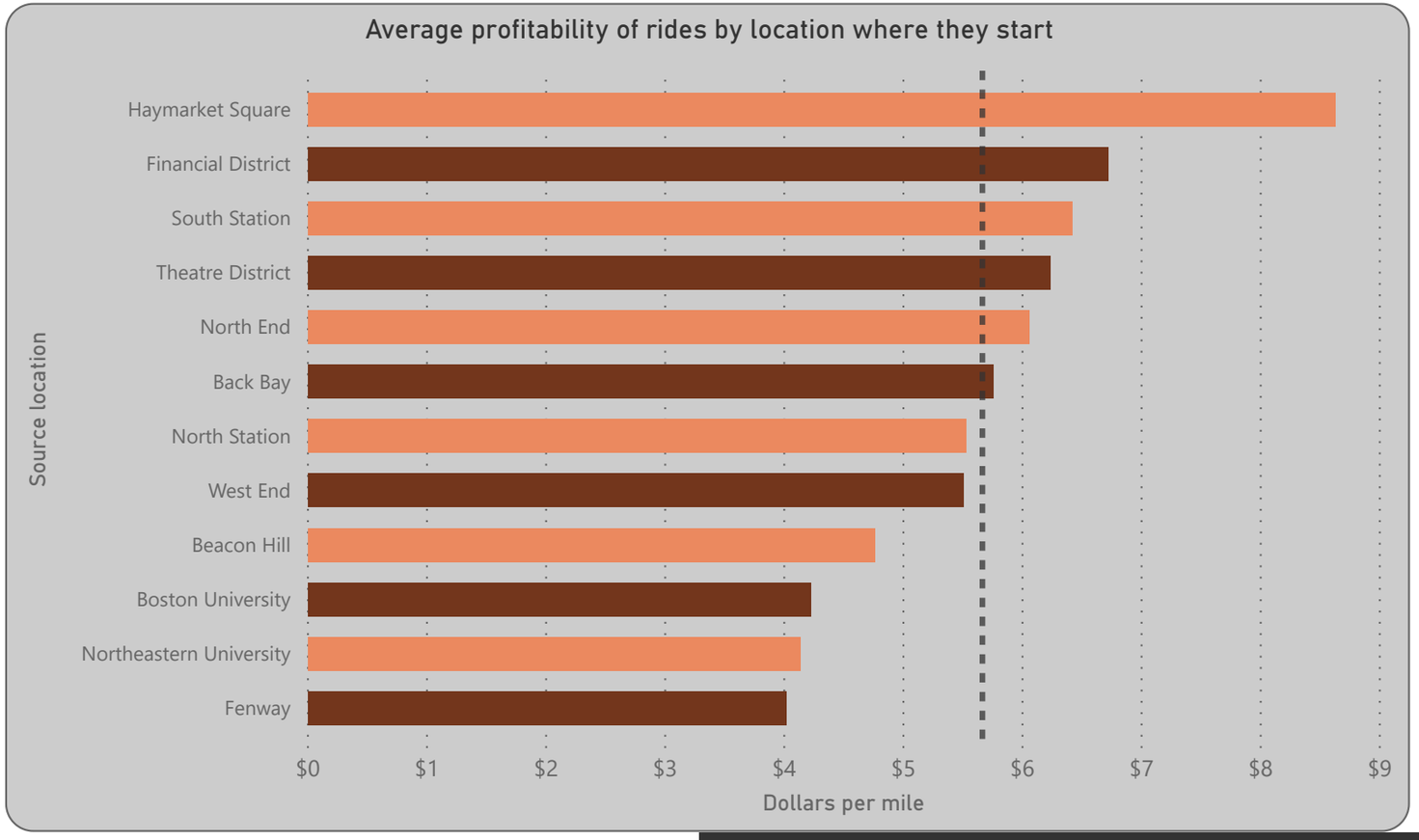
Besides demand, it's important to understand in which conditions are rides most profitable. Results show that locations where the most profitable rides start are not the same as the locations where there's more demand.

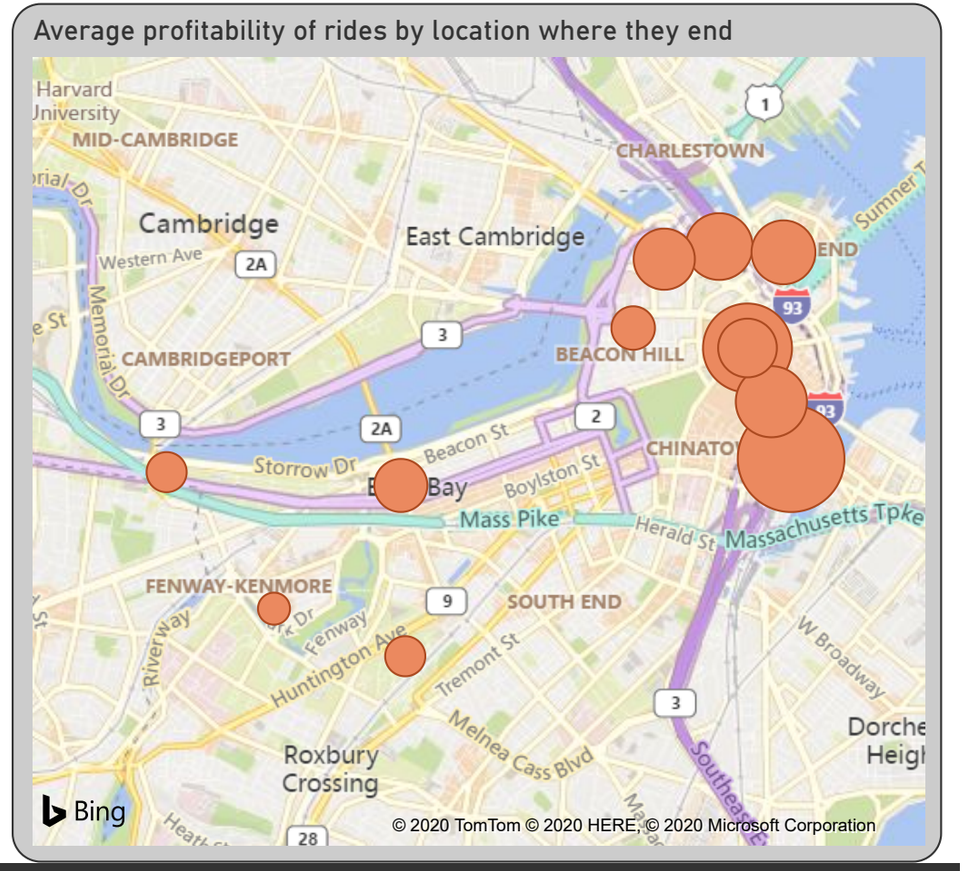
Main insights

Ride profitability is measured as the amount of revenue in dollars per mile of the ride, since longer rides necessarily mean higher fuel costs. 'Haymarket Square' stands out as the location where more highly profitable rides start. Since that is not the location where more rides start or more revenue was generated, we can conclude that making more rides or getting the more expensive ones is likely not the best strategy for drivers. In order to increase revenue and decrease costs, drivers should focus on this location.

Multiplier

1	1.5	2
1.25	1.75	2.5





Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-Weather+Data)

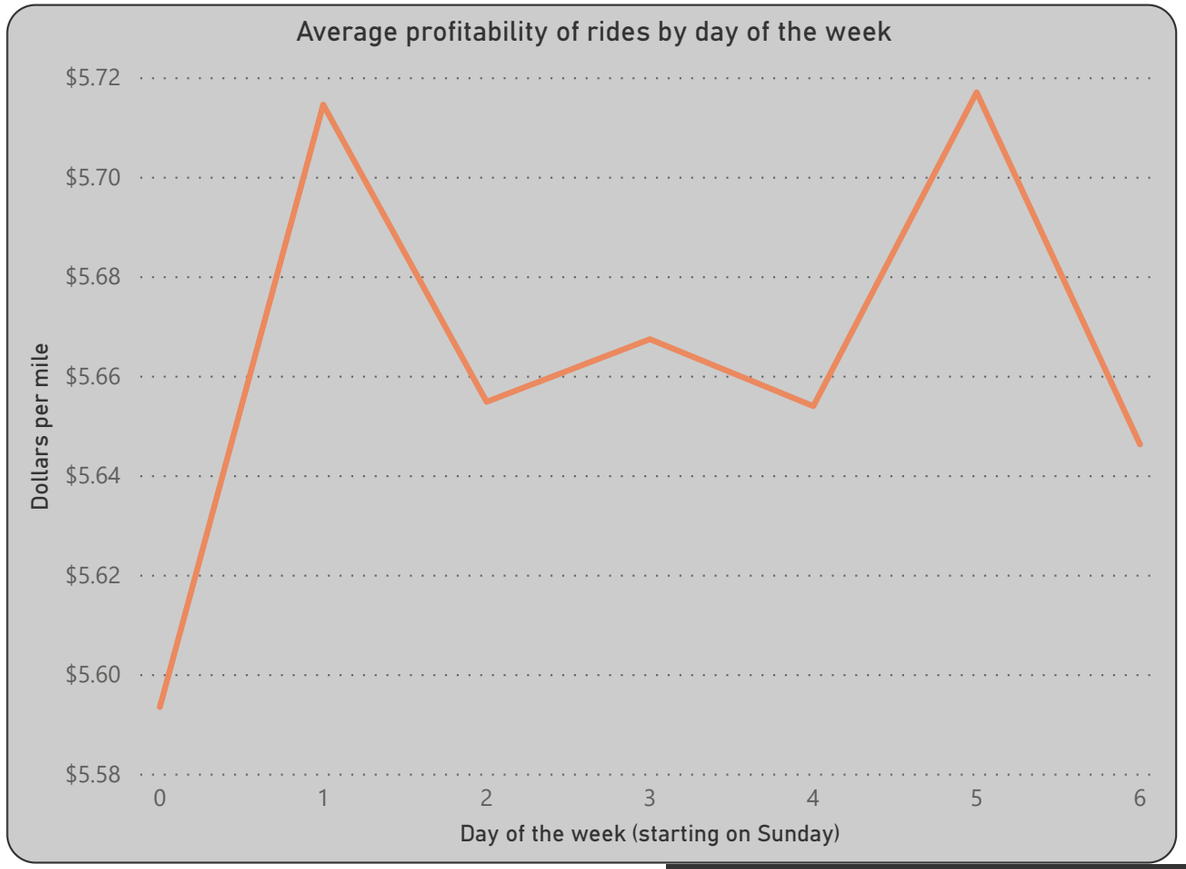
The same analysis was performed for time, but there is no relevant difference in terms of profitability across periods of the day and weekdays.

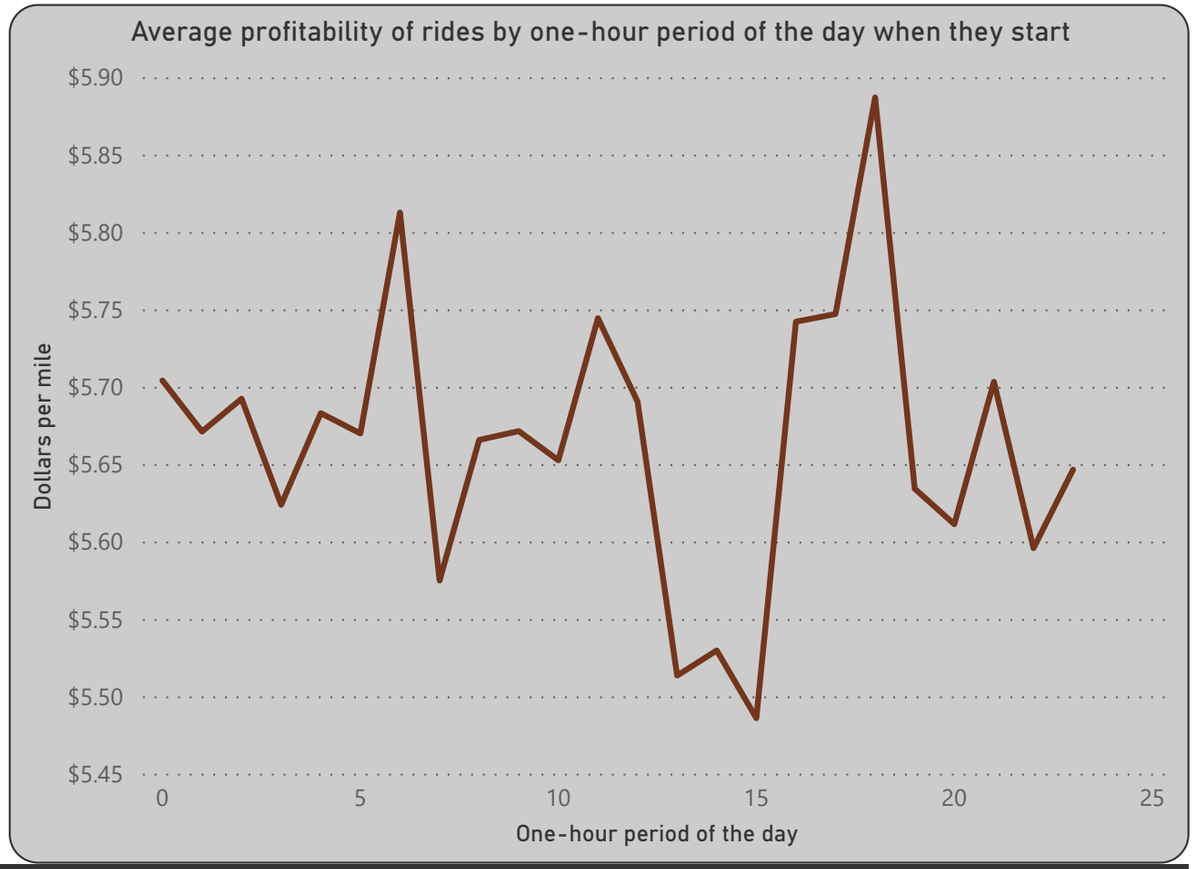
Main insights

As the plots illustrate, all time periods throughout the day and week are very similar in terms of profitability. The lack of variance suggests that no relevant insights can be drawn. Drivers should then consider the times when demand is highest to guide their strategy.

Source location

Back Bay | Beacon Hill | Boston University





Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-Weather+Data)

How to explain the differences between demand and profitability for locations? Analysis shows that drivers make more profits on shorter rides.

Main insights

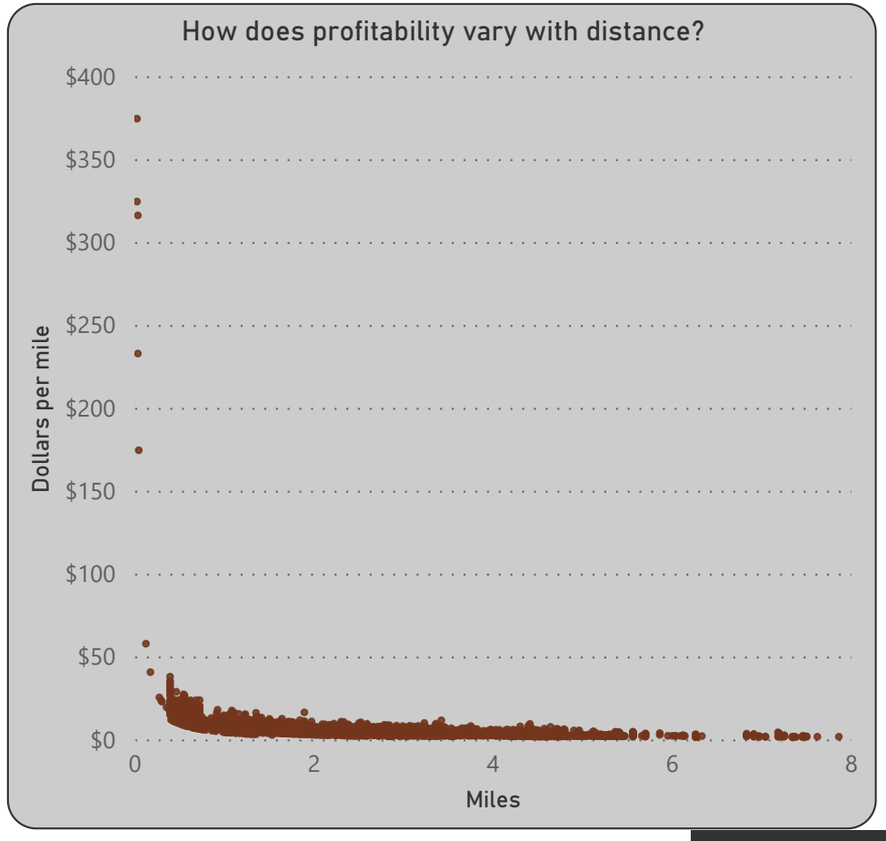
Shorter rides are more valuable to drivers, especially rides below 2 miles long. This is likely the explanation for the differences between the locations that generate more revenue, the ones that generate more rides and the most profitable ones. 'Haymarket Square' is likely the location where more rides below 2 miles start. Lack of variance of profitability across time suggests there is no time period when short rides tend to start

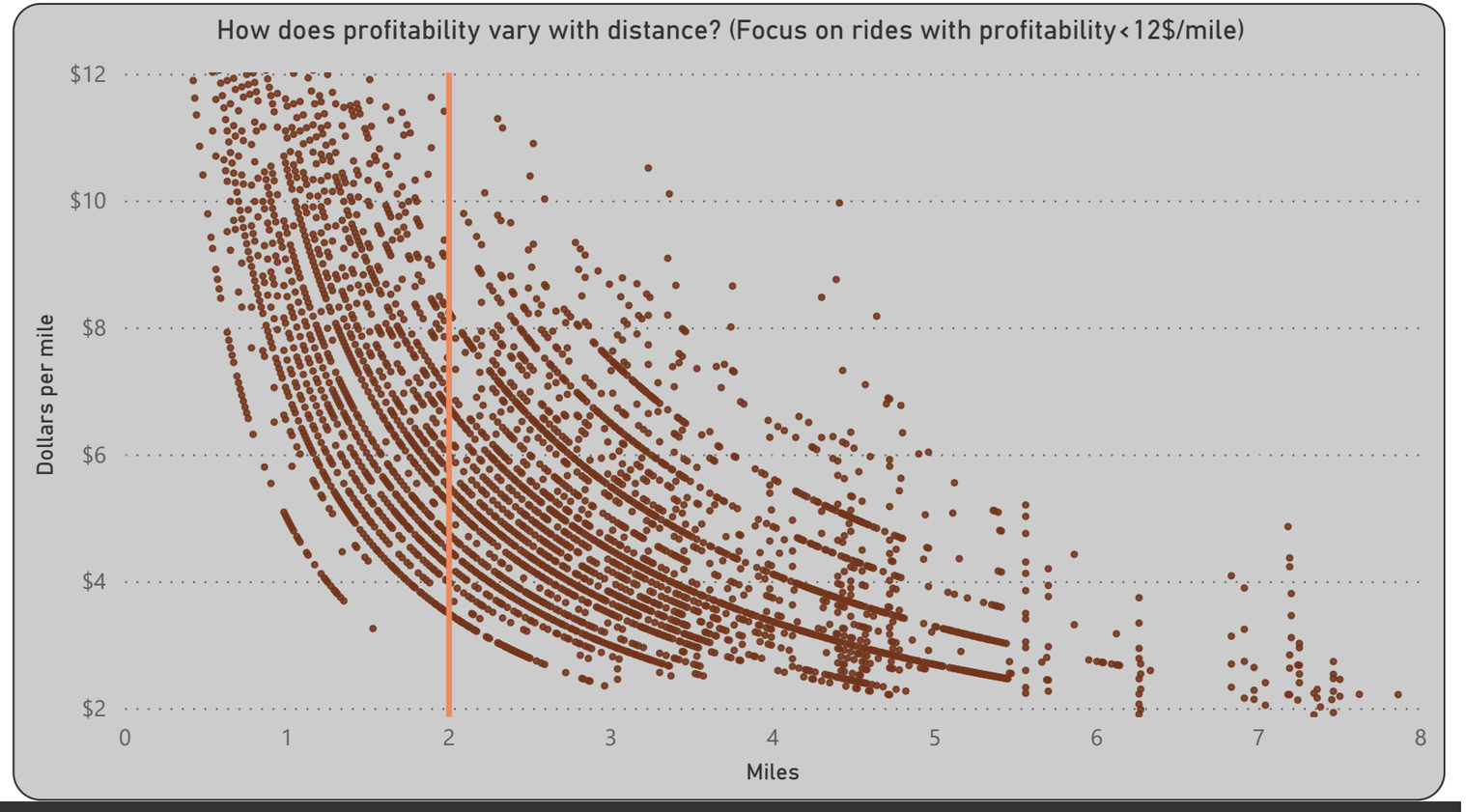
Multiplier

1 | 1.25

Source location

Back Bay | Beacon Hill



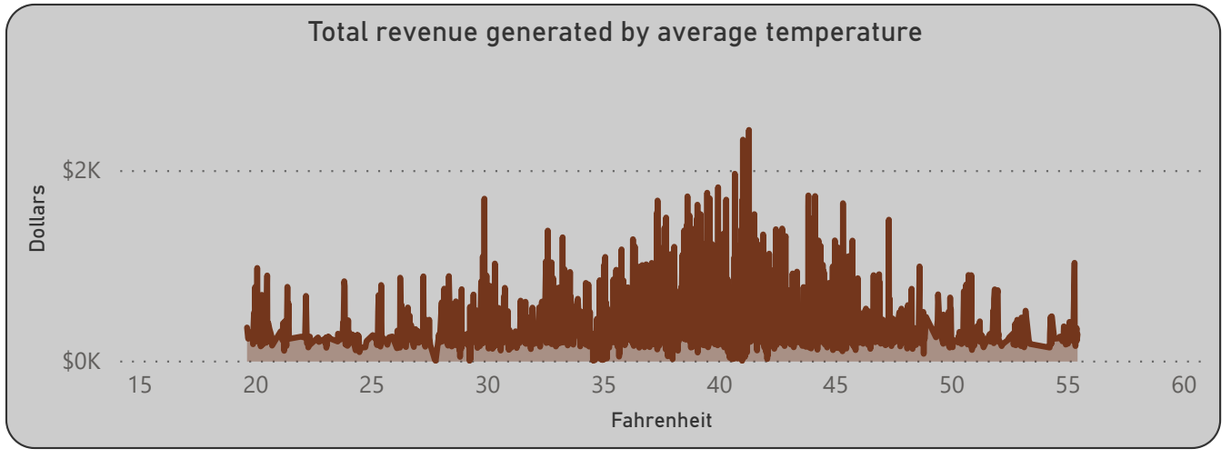


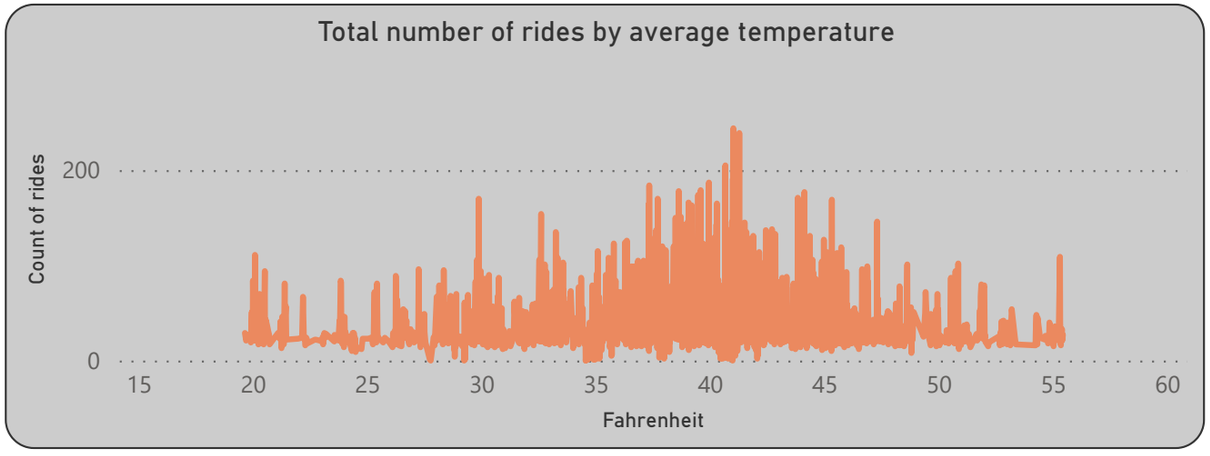
Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-Weather+Data)

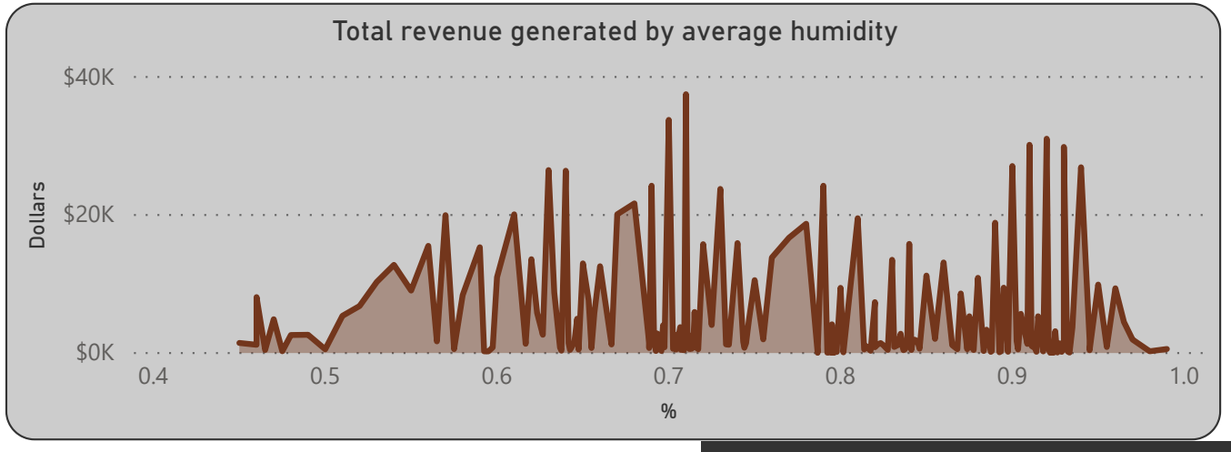
Last set of analysis concerned weather conditions, and results show that total revenue generated and total number of rides vary only according to temperature and humidity levels.

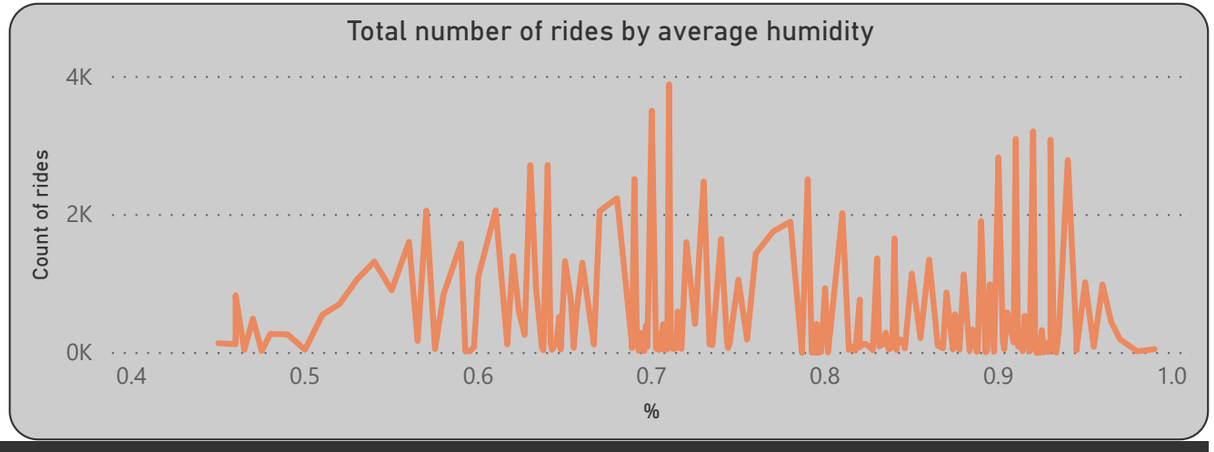
Main insights

The total revenue generated and the total number of rides taken seems to increase when temperatures are between 35 and 45 degrees Fahrenheit, and humidity levels around 0.7%. However, it's difficult to take insights from these results since these variations might be result of the day and night cycle, the impact of which was already captured with the one-hour period analysis. Further analysis is needed to clarify this issue.







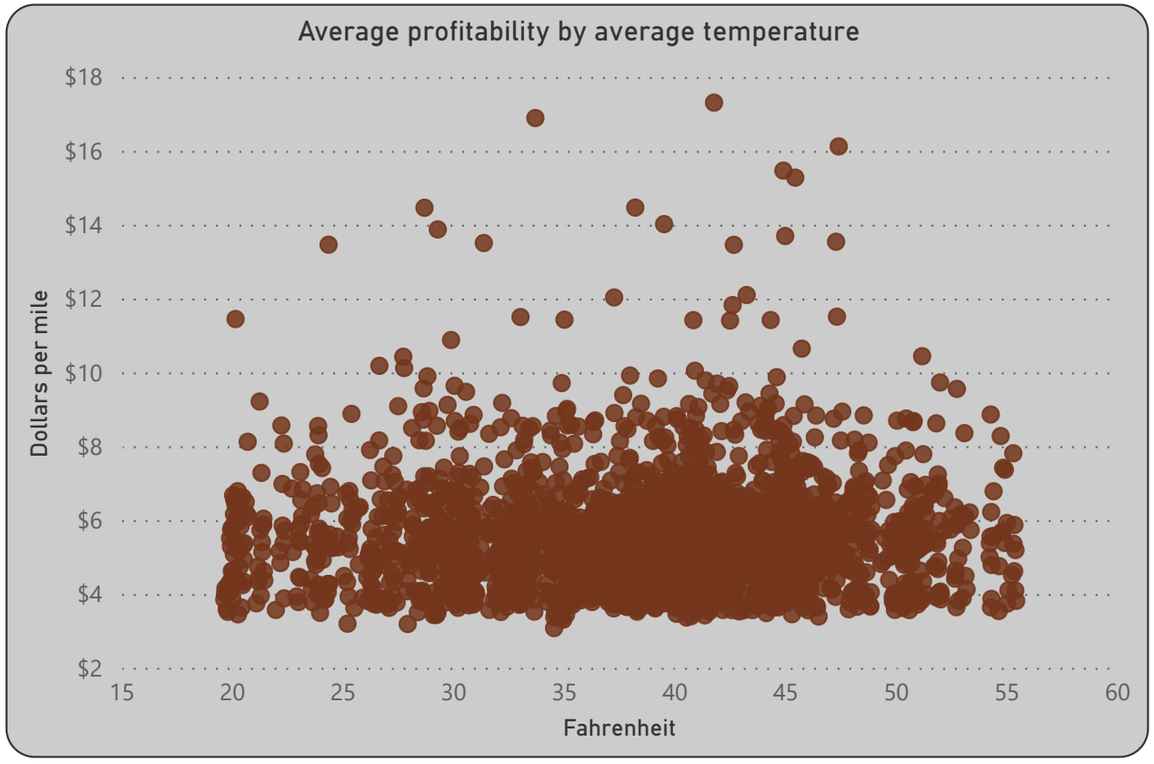


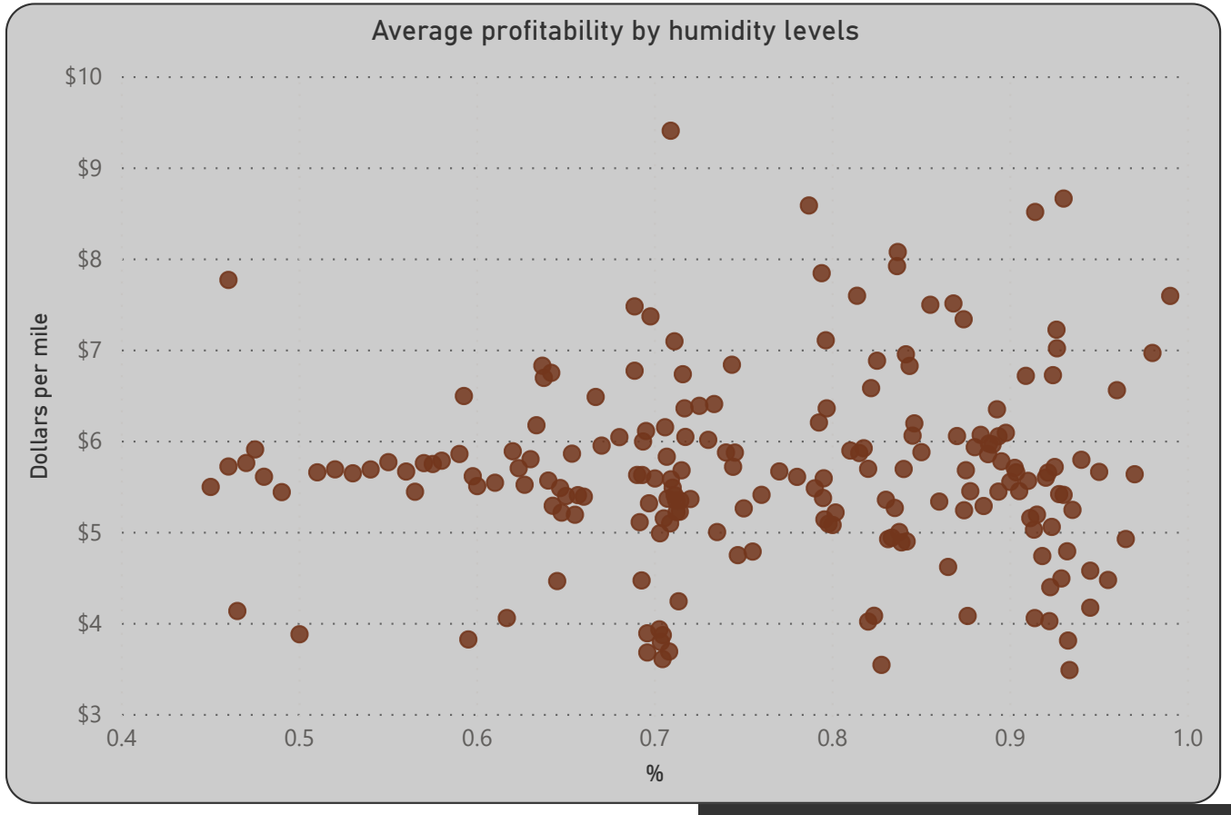
Source: Uber & Lyft Cab prices: Cab and Weather dataset to predict cab prices against weather (https://www.kaggle.com/ravi72munde/uber-lyft-cab-prices?select=Cab-Weather+Data)

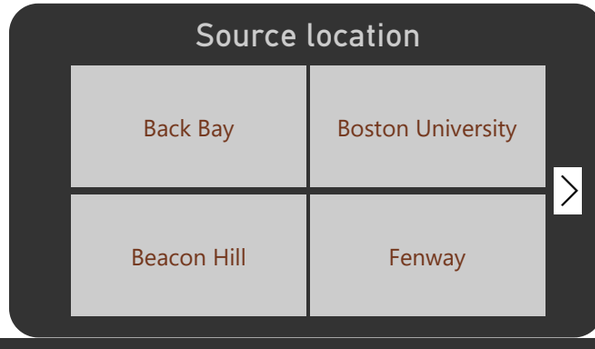
As for profitability, there are no distinct weather conditions when profitability is highest. More data needs to be collected to clarify this issue

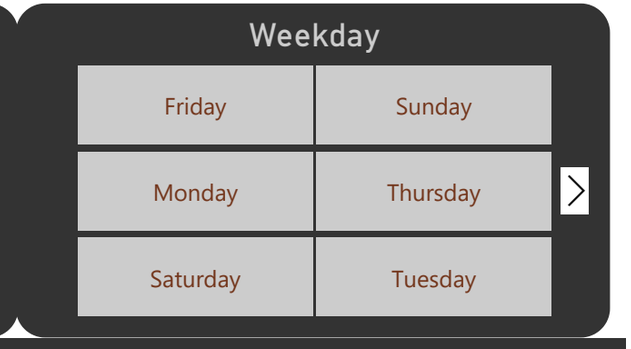
Main insights

There is no interval in any weather variable when profitability is highest, so no insights can be drawn to inform drivers' strategy to maximize profits. One reason for this lack of results may be the fact that weather data was collected in a fairly short period of time - between Nov 26th and Dec 18th - so it's likely that there wasn't enough variation in weather conditions to get clear results.









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