

Executive Summary Team Nullvalue

Lifetime Value

A driver's lifetime value would be calculated using a linear combination of projected lifetime revenue, average prime time bonus per ride, and proportion of rides driven during rush hour or late nights. After normalizing each component, we multiply them together to get a lifetime value.

Revenue is often an important indicator of an employee's worth to a company. At the end of the day, an employee's contribution to their company's bottom line determines how important they are to the company, at least financially. To determine a driver's financial value, we found their average daily revenue by totaling the revenue of their rides during their lifetime and dividing by their lifetime before multiplying by the average driver lifetime. This revenue calculation accounts for prime-time bonuses as well.

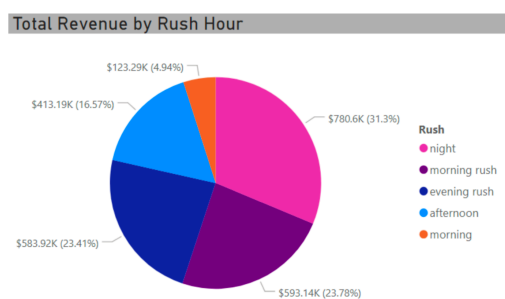


Figure 1: The pie chart suggests that drivers working during night and rush hours generate the most revenue.

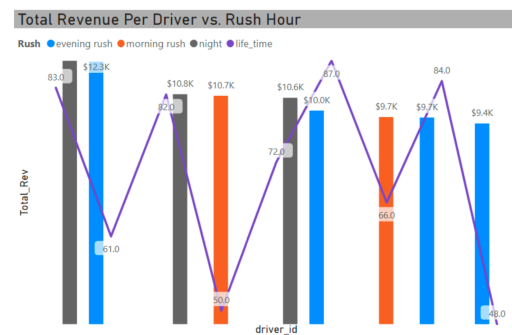


Figure 2: The column and line chart reveals that lifetime (total work days) isn't the only important factor in determining a driver's revenue. The time of the day a driver works at also plays a key role in evaluating a driver's lifetime value to Lyft.

However, while revenue is important, it is not all a driver has to offer to Lyft. We believe that a driver who works for Lyft during times of high demand, such as holidays or rush hours, would be of much value to the company. Not only would they bring in more revenue from the prime-time bonuses that have taken effect, but they also bolster Lyft's consistency and dependency during times when people rely on them the most. Moreover, they increase Lyft's ability to contend against competitors when there are more potential riders unfamiliar with the service or are not loyal to a specific one. By allowing Lyft to provide its services to more riders during especially busy, critical times, these drivers have increased worth towards Lyft that cannot be described by revenue alone (Figure 2).

In order to represent this, we summed up all the prime-time bonuses for each driver as an approximate measure of how often they drive during high demands. Larger total prime time

bonuses indicate a tendency to work during busy times and lower totals indicate otherwise. We once again normalize this factor.

Another factor we wish to consider is how often a driver works during rush hours or at night (Figure 1). This is somewhat similar to the previously mentioned total prime time, but the number of rides during rush hour or late nights represents a more consistent work schedule. Because customers who hail rides at such times often view ridesharing a necessity due to various inconveniences, we believe Lyft drivers who work within these hours are not only fulfilling demand but also building customer loyalty. Because many regularly hail rides during these times, they tend to stick with a ridesharing company, and drivers who help saturate this market with Lyft options not only capitalize on revenue but also aid in developing long-term customers for Lyft. As a result of their contributions towards brand marketing and loyalty, these drivers are very valuable assets to Lyft.

To get this information we labelled each ride with a time of day depending on when the ride was requested. We then summed up the number of rides that occurred during rush hours (5-10am and 3-7pm) and once again normalized it.

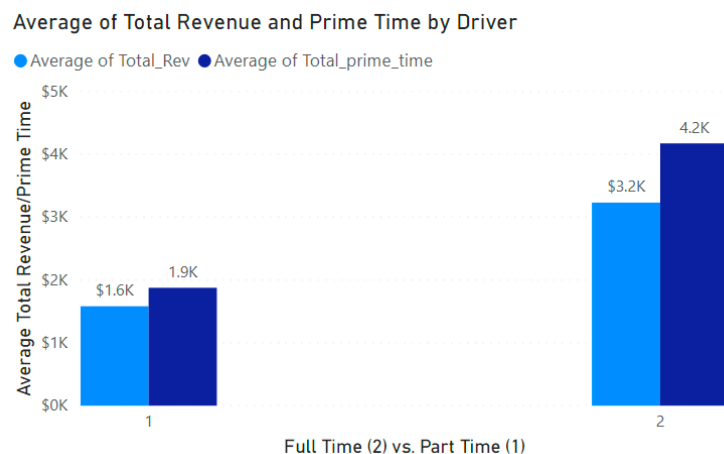


Figure 2.5: Average Total Revenue and Prime Time for Full Time & Part Time Drivers

Something worth mentioning is our inference that drivers who work full time (or similar hours as a full-time employee) are more valuable than a part time driver (Figure 2.5). A full-time driver could be a more reliable, consistent source of revenue for Lyft, making them more favorable than drivers who adhere to an erratic schedule. To classify a driver as full or part time, we first grouped the timestamp data by driver id and took the difference between each consecutive time a ride was requested. Using a K-Means algorithm, we classified the drivers into full or part time clusters based on their total time differences. However, we ended up with over 700 full time drivers, which we suspect could not be quite representative. Although, we did not include this factor in our final model, we understood its importance as it played a solid role in determining a driver's value.

Driver Projected Lifetime

The average projected lifetime of a driver is approximately 56 days, or a little under 2 months based on the data given. Furthermore, the minimum lifetime is 1.7 days, the first quartile is 43 days, the median is 58 days, the third quartile is 73 days, and the maximum is 91 days. The distribution of lifetimes is only slightly left skewed. We calculated the lifetime of a driver by subtracting their onboard date from their last recorded ride date. However, because the data was only representative of a 3-month period the projected lifetime in this dataset is likely shorter than the true projected lifetime of a Lyft driver.

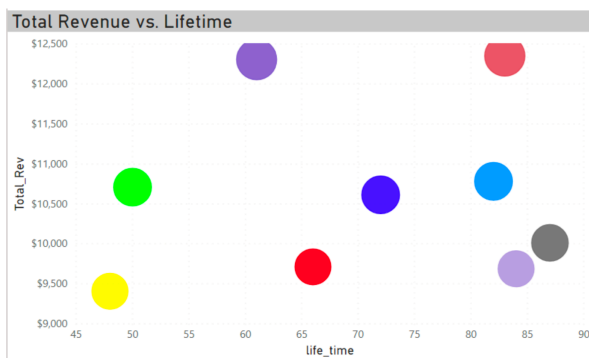


Figure 3: The bubble chart suggests little correlation between the total revenue and lifetime of a driver, refuting the claims of a multiple regression model.

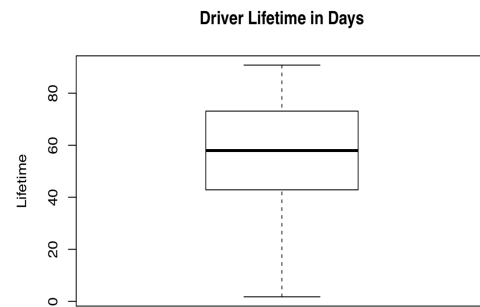


Figure 4: Boxplot of lifetimes for all drivers

As expected, the lifetime of a driver has no relation to the total revenue of a driver (Figure 3 & 4). The correlation between the two is 0.52, which can be seen by plotting the lifetime vs the total revenue. This makes sense, as a part-time driver working the same amount of time as a full-time driver will make much less. Thus, we can rule out lifetime as a key factor in a driver's lifetime value.

Outlier Drivers

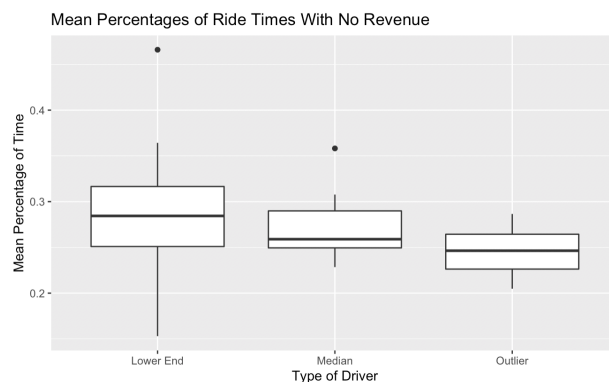


Figure 5: Ride times earning low revenue

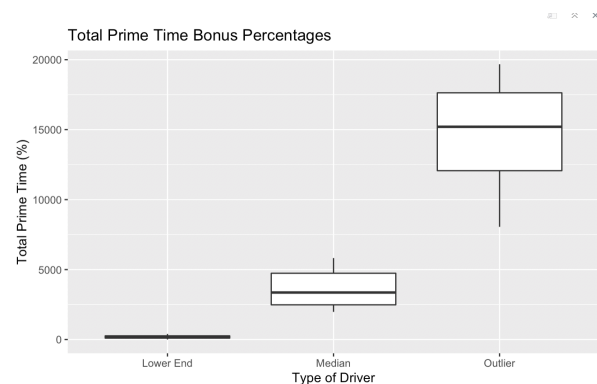


Figure 6: Total Prime Time %

There are eight drivers whose total revenue is about three to four times greater than the median total revenue, making \$10,000-\$12,000 while the median is about \$3,000. These drivers are considered outliers, and we will be analyzing them alongside median and lower end drivers to observe how they set themselves so far apart from others. To pick drivers for each group, we calculated the outlier threshold for revenue, and selected all drivers that earned equal to or more than that amount. For median drivers, we ranked the drivers by revenue and picked an equal number of drivers from the middle, in this case eight. For the lower end drivers, we picked the bottom eight.

We were first interested in the percent of rides that did not earn revenue for each group of drivers, namely the time between the request and passenger pick up. We first calculated for each ride the total ride time between request and drop off and subtracted the ride duration. We divided this by the total ride time to get the proportion of the ride that did not earn revenue. Surprisingly, the distribution of percentages of times with no revenue were not significantly different between the three groups, which is evident from the large p-values of 0.155, 0.21, and 0.615 based on a critical value of 0.05 (Figure 5).

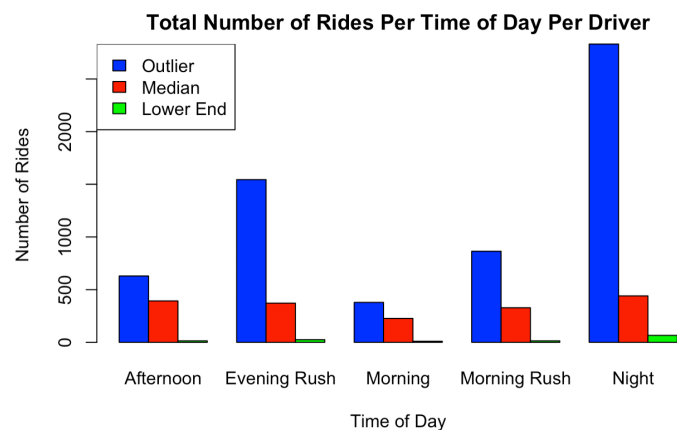


Figure 7: Number of rides per time of day

Looking at the total prime time bonuses, which we previously discussed, it is evident that the drivers that bring in the most revenue tend to drive during prime times more often than average drivers (Figure 6). Thus, prime time might be a key factor in enhancing their ability to earn more than their peers.

We were also interested in how many rides drivers in each group drove, and at what times during the day. As shown by the bar plot, outlier drivers had more rides in every category than both median and lower end drivers (Figure 7). It seems another important factor in more overall revenue is the number of rides driven overall, which is obvious. However, it is also notable that outlier drivers had the majority of their rides driven at night (past 7pm).

Actionable Recommendations

Based on our analysis of drivers with outlier revenue, there are several ideas that Lyft could consider in order to boost driver revenue, and therefore profit. Because outlier drivers primarily worked during rush hour and at night, it would be a good idea to focus on these areas. Lyft could emphasize rush hour rides or rides at night in their advertisements and marketing to better take advantage of the high demand for rides during these times. As for the drivers, Lyft could incentivize more drivers to work during rush hours at which prime rates generate higher income, so customers could easily locate reliable transportation despite increased demands. At night, drivers could drive without too much traffic and complete more rides in equal amount of time. By helping drivers, who represent the company image, make more efficient use of driving time, customers could enjoy greater convenience in commuting from crowded cities and consider Lyft as a dependable partner for their next ride.