CitiBike Demand Forcast Strategy

2025

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Forecast Strategy

Components:

- Historical Data
- Seasonal Considerations - Monthly & Weekly

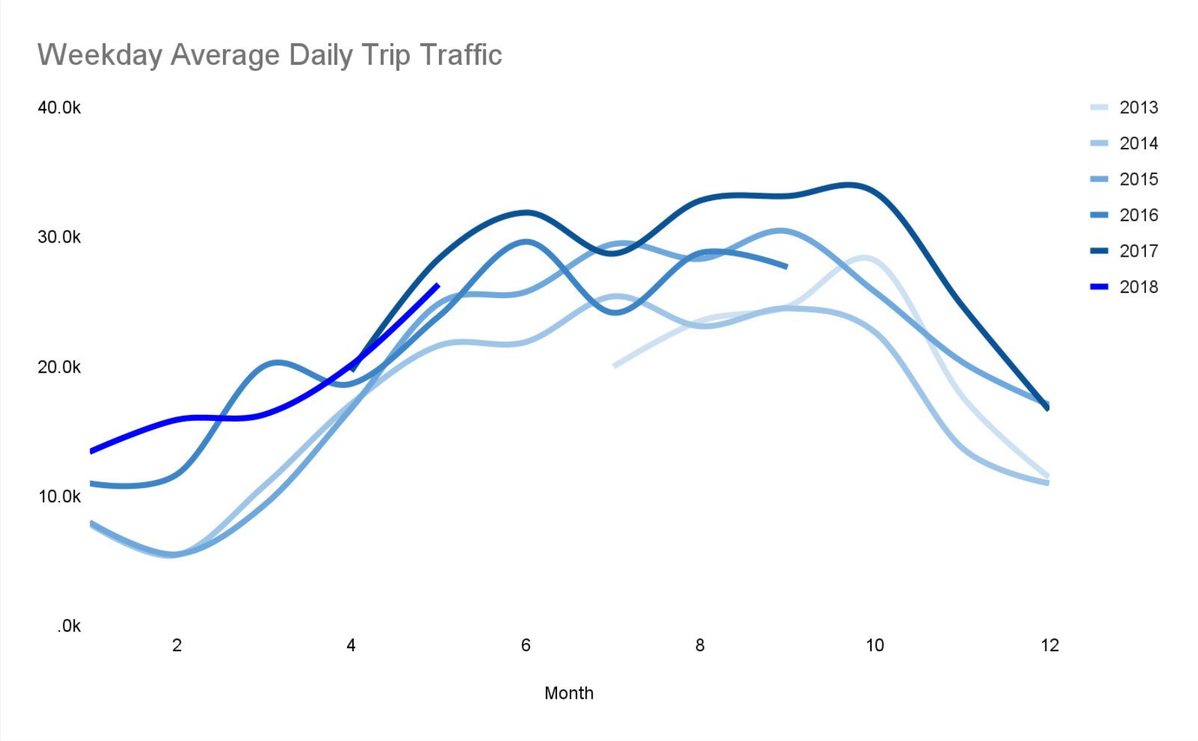
Goals:

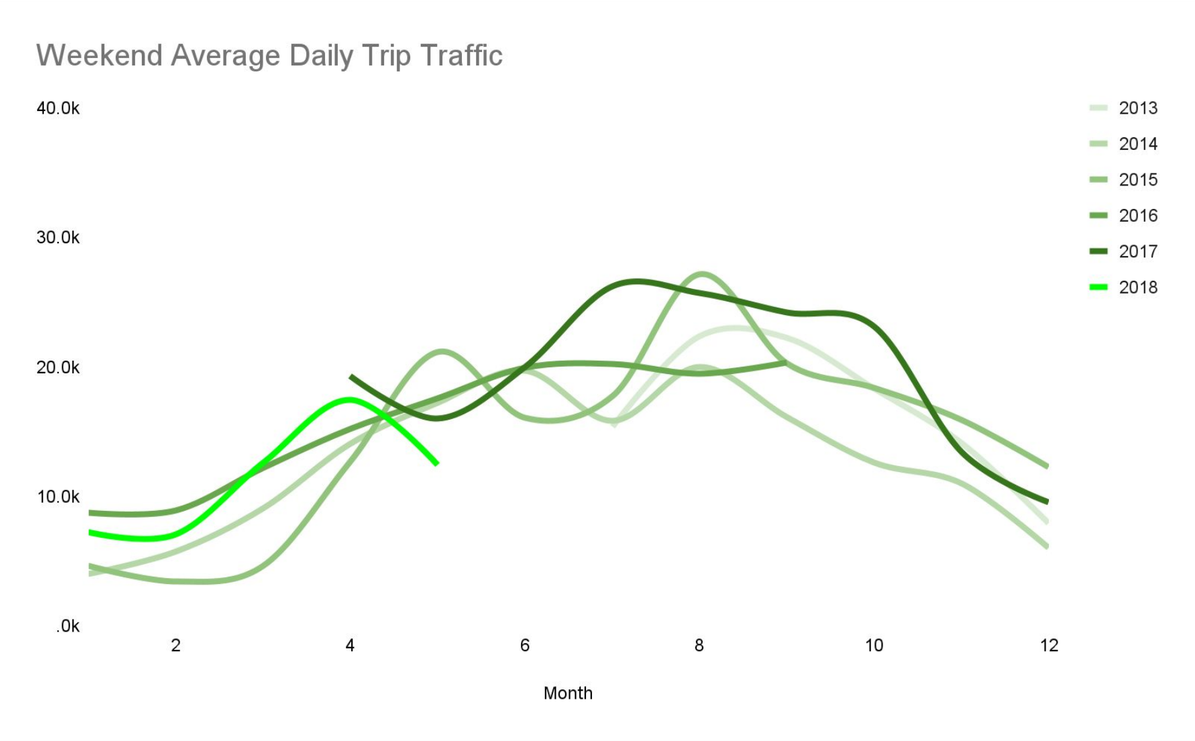
- Predict YoY Growth using previous values
- Test model between multiple years to assess accuracy
- Iterate with more precision

Assumptions and Considerations:

- Bike trips are counted toward both starting and ending stations
- Only Top 10 Stations (By Traffic Volume) are included
- Forcast uses averages which can be subject to outliers
- Data for 2013, 2016, and 2017 was incomplete

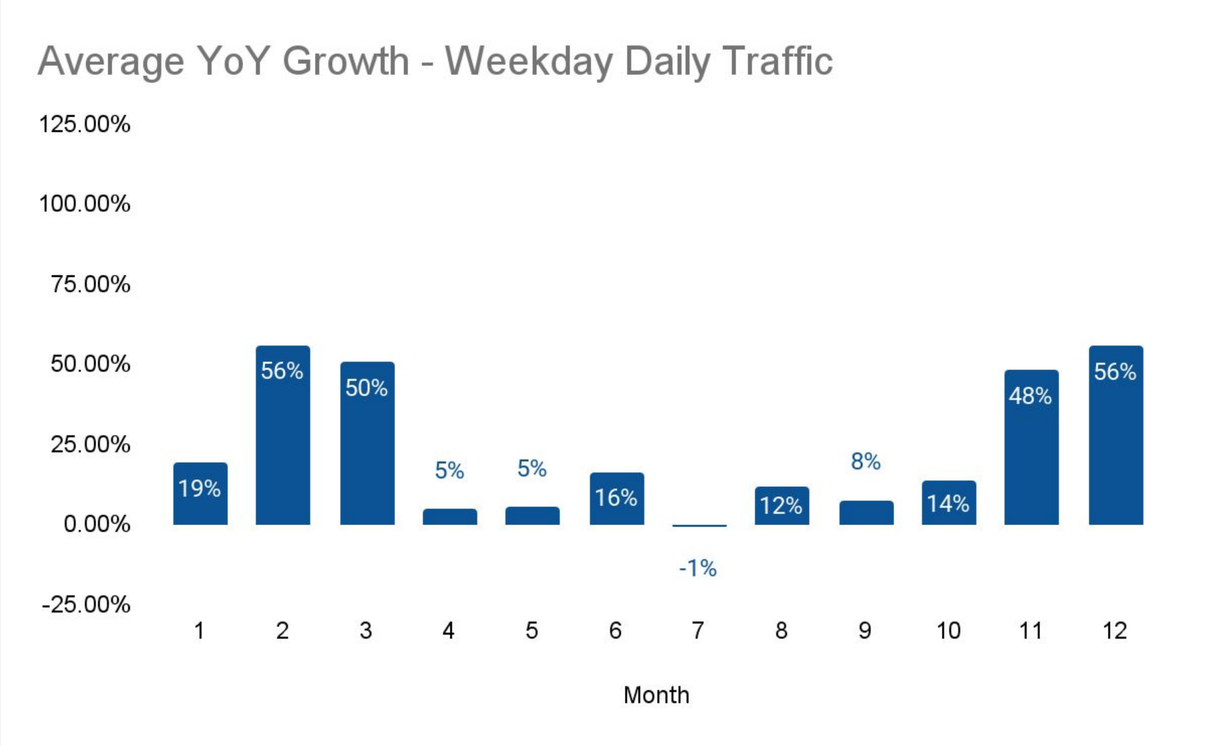
Seasonality has stayed consistent since 2013, but weekend traffic needs to be considered differently to fit a strong model

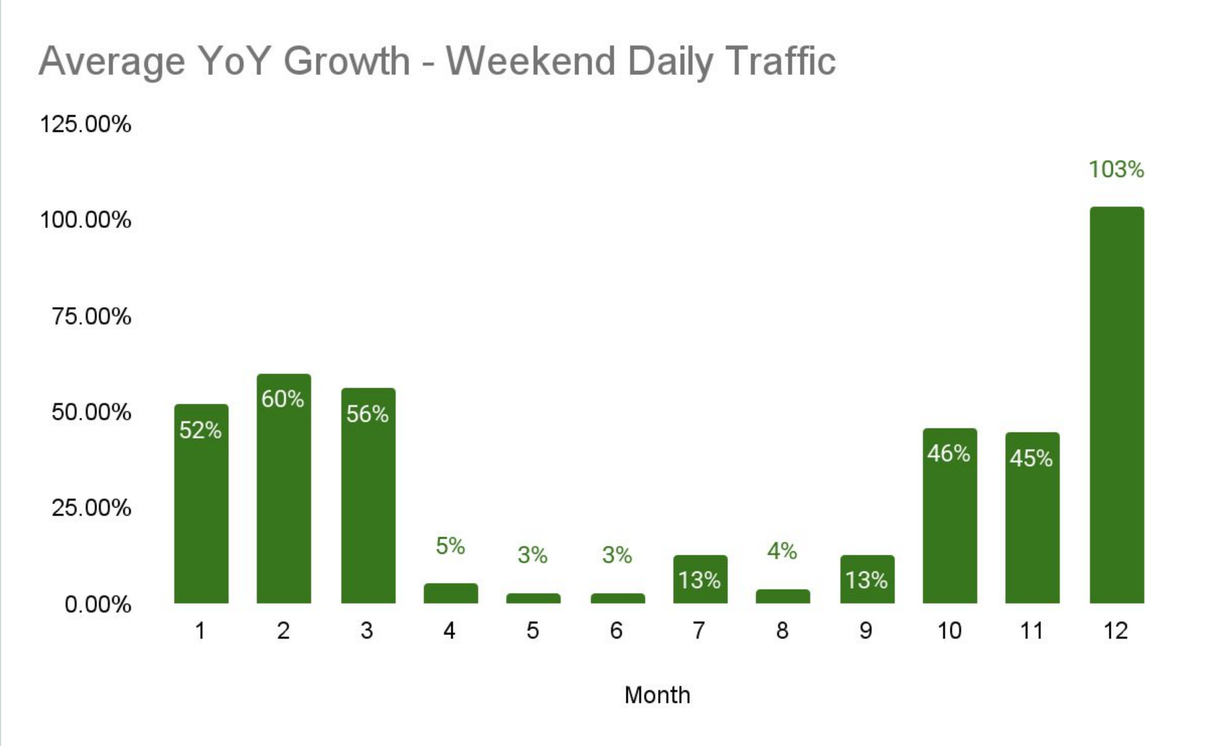




- V1 of the Demand Model splits out weekday vs. weekend traffic to account for activity gaps between commuters and weekend riders
- Less weekend data is available making modeling *potentially less accurate* than with weekday traffic
- Weekends present a ***large upside potential*** via promotions, flexible pricing and marketing.
  - Current bike supply can support larger weekday crowds, setting a goal for weekend traffic to reach

Year over year growth per month has vastly different averages – helping the model account for seasonal trends on different scales



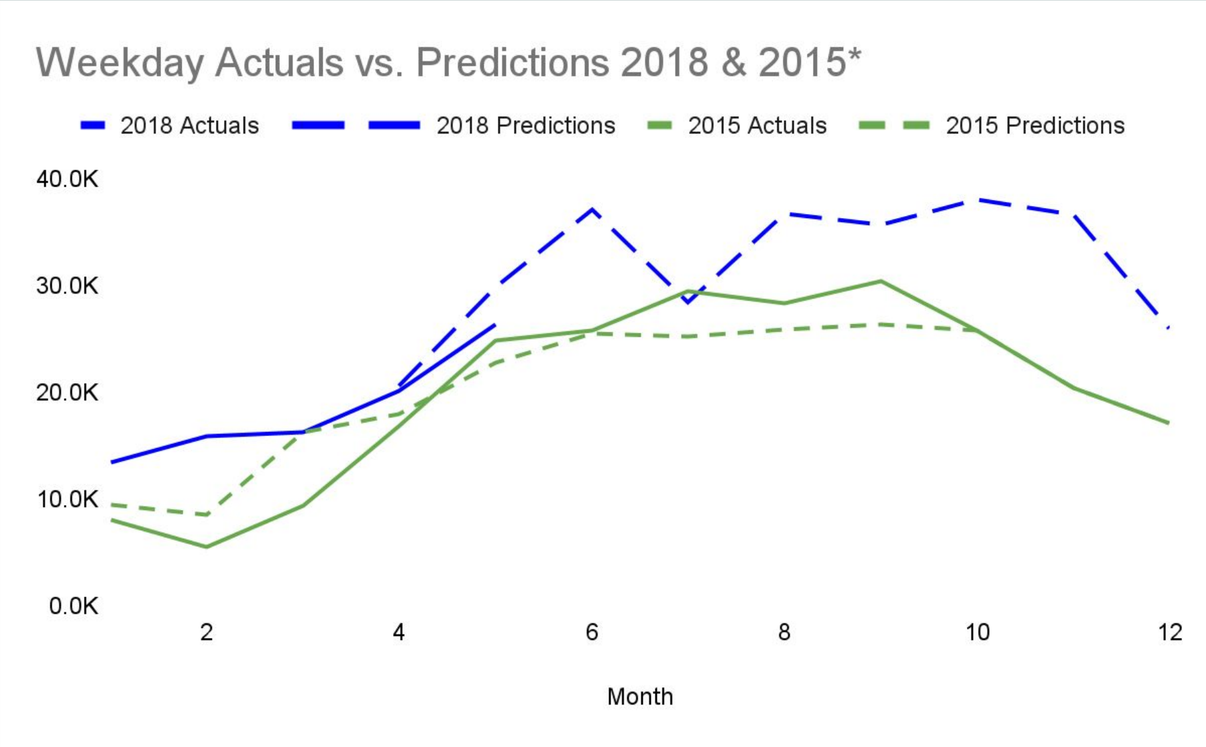


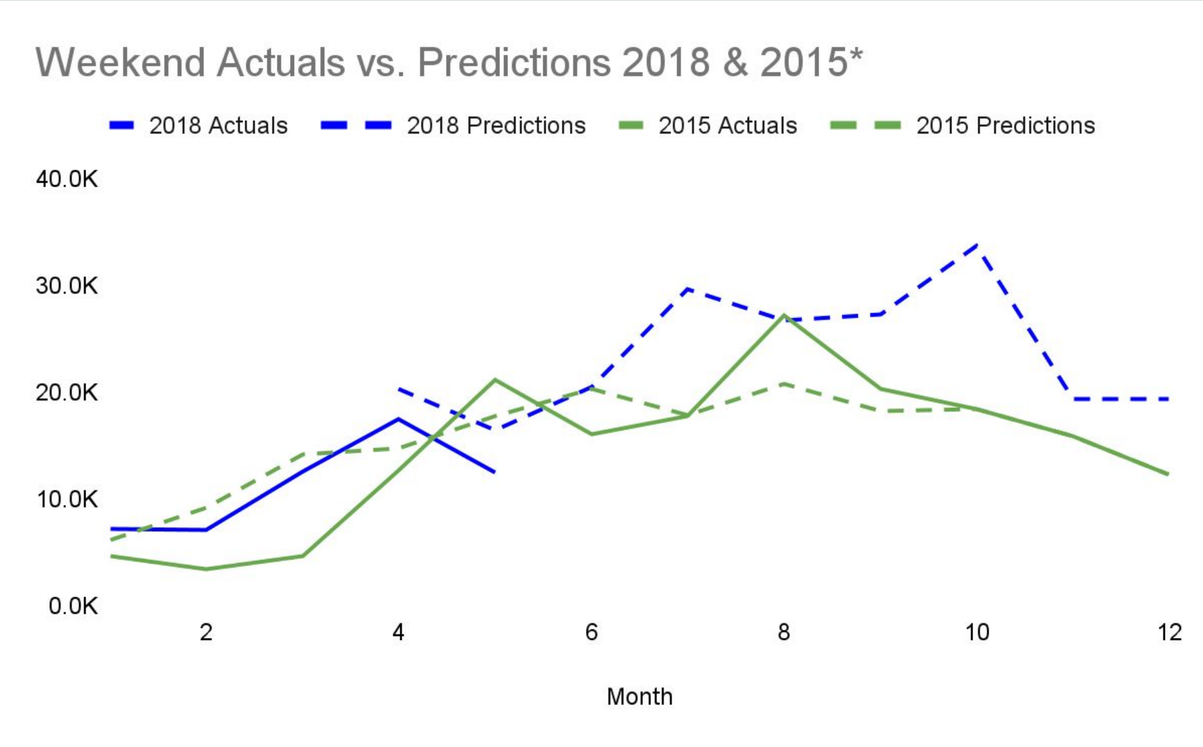
Basic Model: Forecasted Traffic in Top 10 Stations = (Estimated YoY Growth) + Actuals from Prior Year

Initial Limitations:

- Not all years have complete data
- Macro environment varies year to year
- CitiBike market may have seen strong growth in initial years due to new markets being unlocked

Model fit provides a suitable initial forecast, but can be improved with additional data and contributing factors





*2015 data used as a comparison due to it being the most recent year where the year prior (2014) and that year have complete data.

Estimated Accuracy: +8% vs. Actual on Average

Improvements to Add:

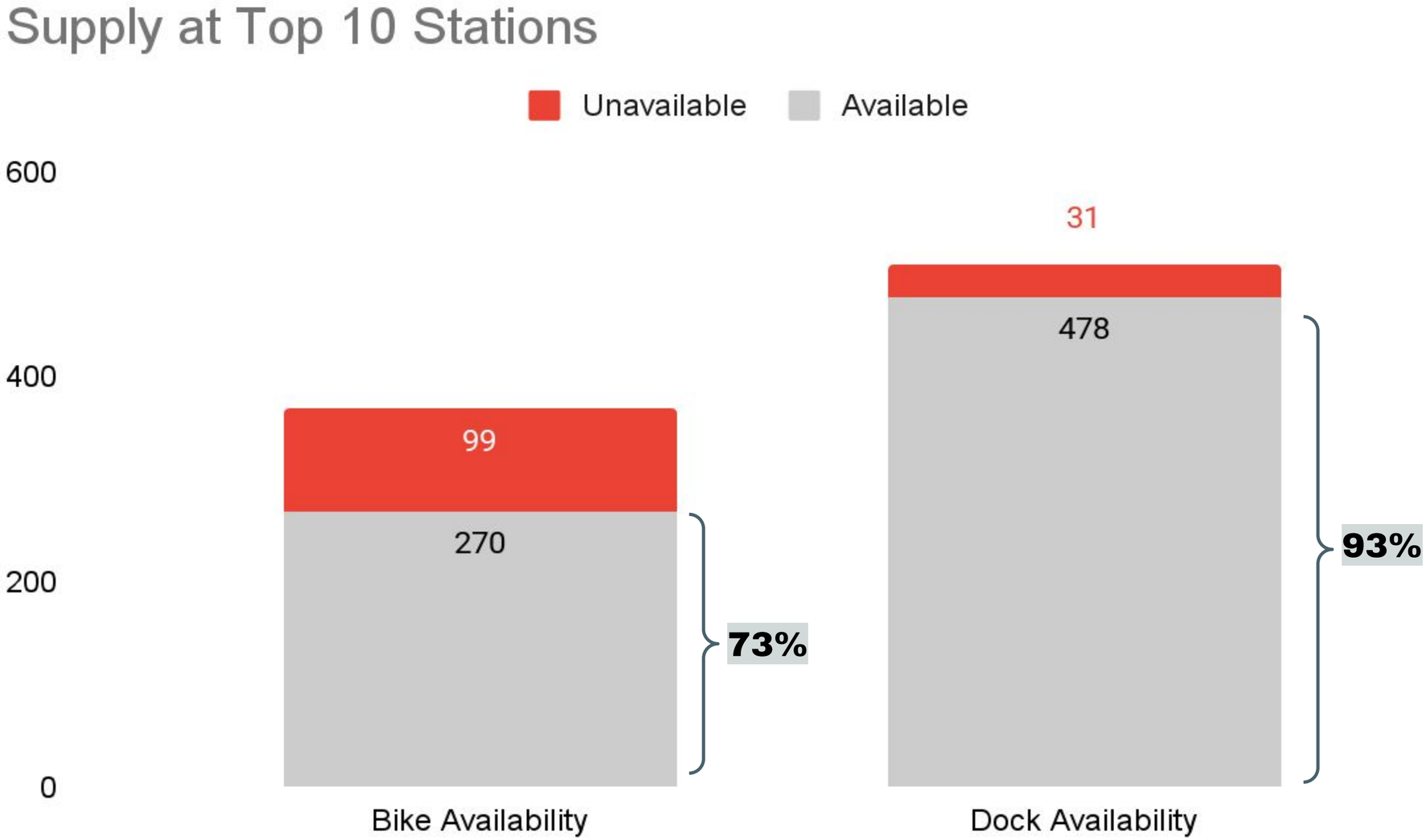
- Additional years of data
- Split of New Subscribers, Long-Term Subscribers, and Customers who have different growth trajectories

Estimated Accuracy: +33% vs. Actual on Average

Improvements to Add:

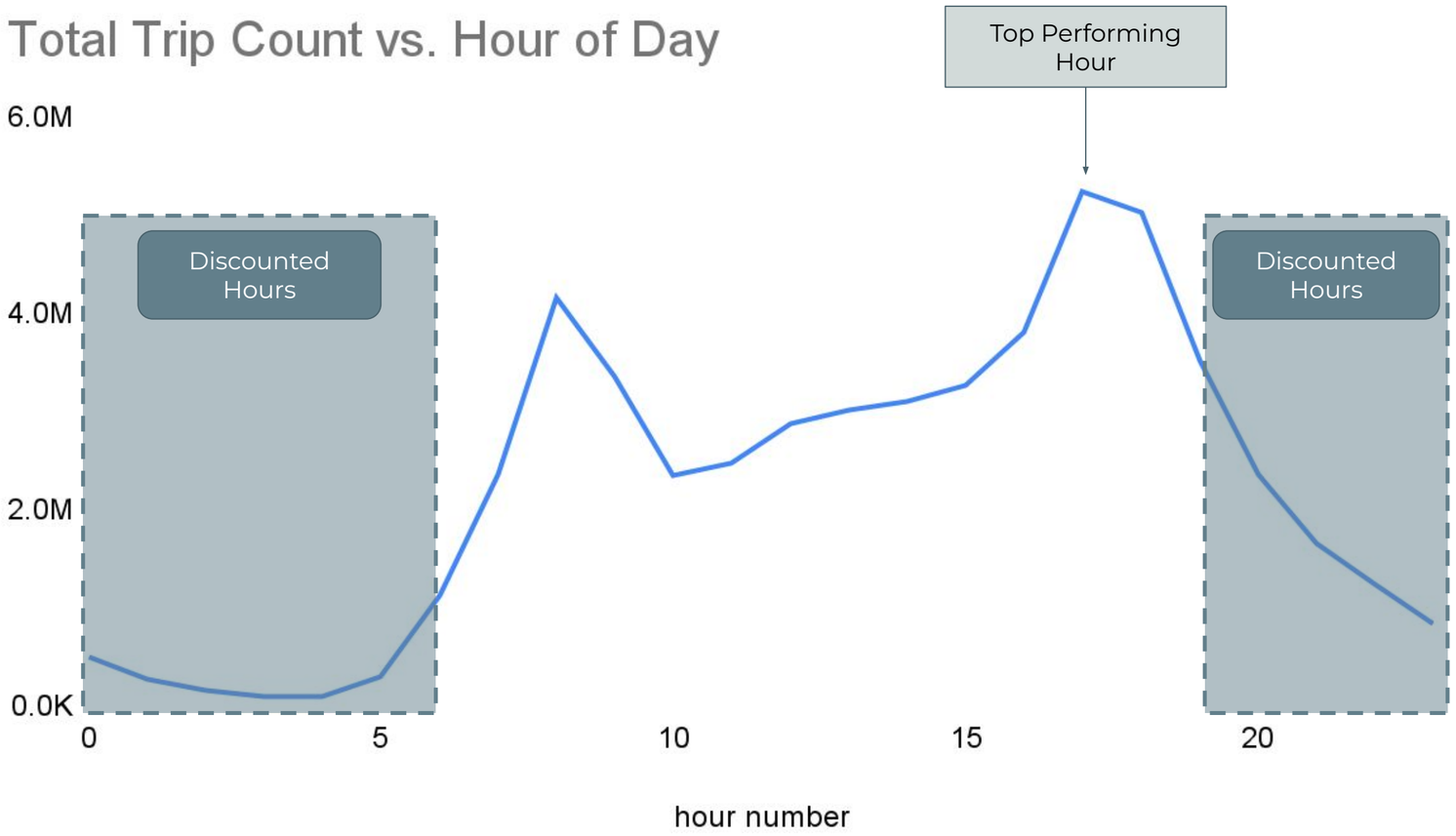
- Normalize monthly view for months with more/less weekends
- Additional years of data
- Additional stations and routes to supplement

Only 73% of bikes are available at the stations in the model - presenting potential issues for sustaining the forecasted growth



Would *adding or repairing bikes* help us reach our forecast and beyond?

To help meet or surpass the demand forecast, dynamic pricing utilizing proportional discounts can be piloted



Basic Discount: Determine discount each group by its relative proportion to the top performing group.

Initial Rollout Plan:

- Test dynamic pricing with hour of day
- Test dynamic pricing with other factors:
  - Days of the week
  - Top Stations vs. Low Performers
  - User Attributes

Example Discount

- 6 AM Traffic is ~20% of the traffic during the 5 PM peak hour.
- 6 AM Rides will be discounted by 20% vs. the price at 5 PM