

Comparing, Contrasting, and Predicting Commercial Flight Characteristics, Pre-, Mid-, and Post-COVID-19 Pandemic

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Introduction

Before the COVID-19 pandemic, the commercial aviation industry had reached new heights. 2016-2019 marked robust expansion in air travel (Mutzabaugh, 2019 & Morris, 2018). Airlines expanded fleets and added routes to meet growing demand. Post-COVID, the industry evolved to meet new realities. Strategic realignments by airlines aimed to optimize operations and adapt to changed market.

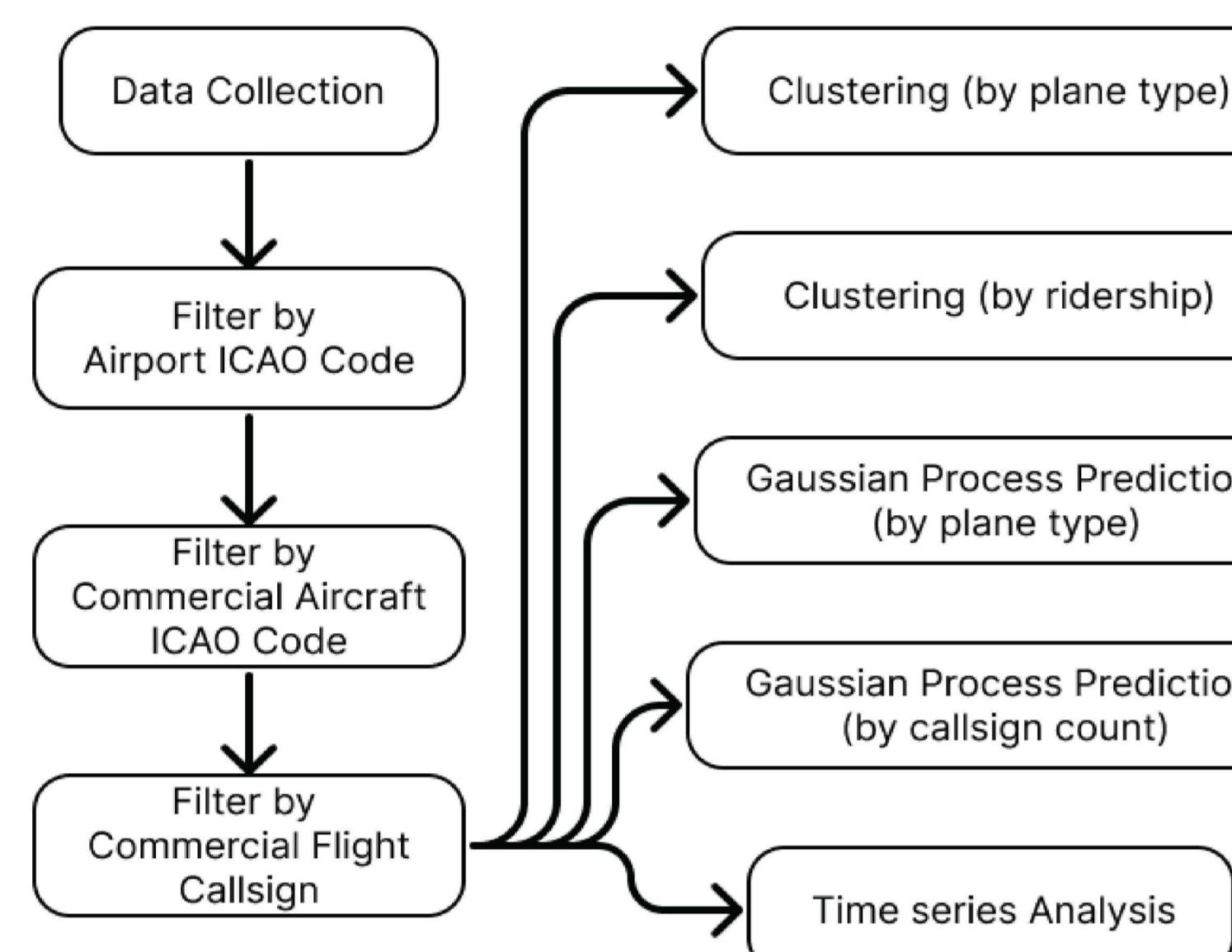
Research Question

- How did ridership trends shift pre-, during, and post-pandemic?
- What changes occurred in aircraft types used, and how do these reflect airline strategies and passenger preferences?
- What are the projections for post-pandemic ridership recovery, and how do they compare to pre-pandemic growth projections?

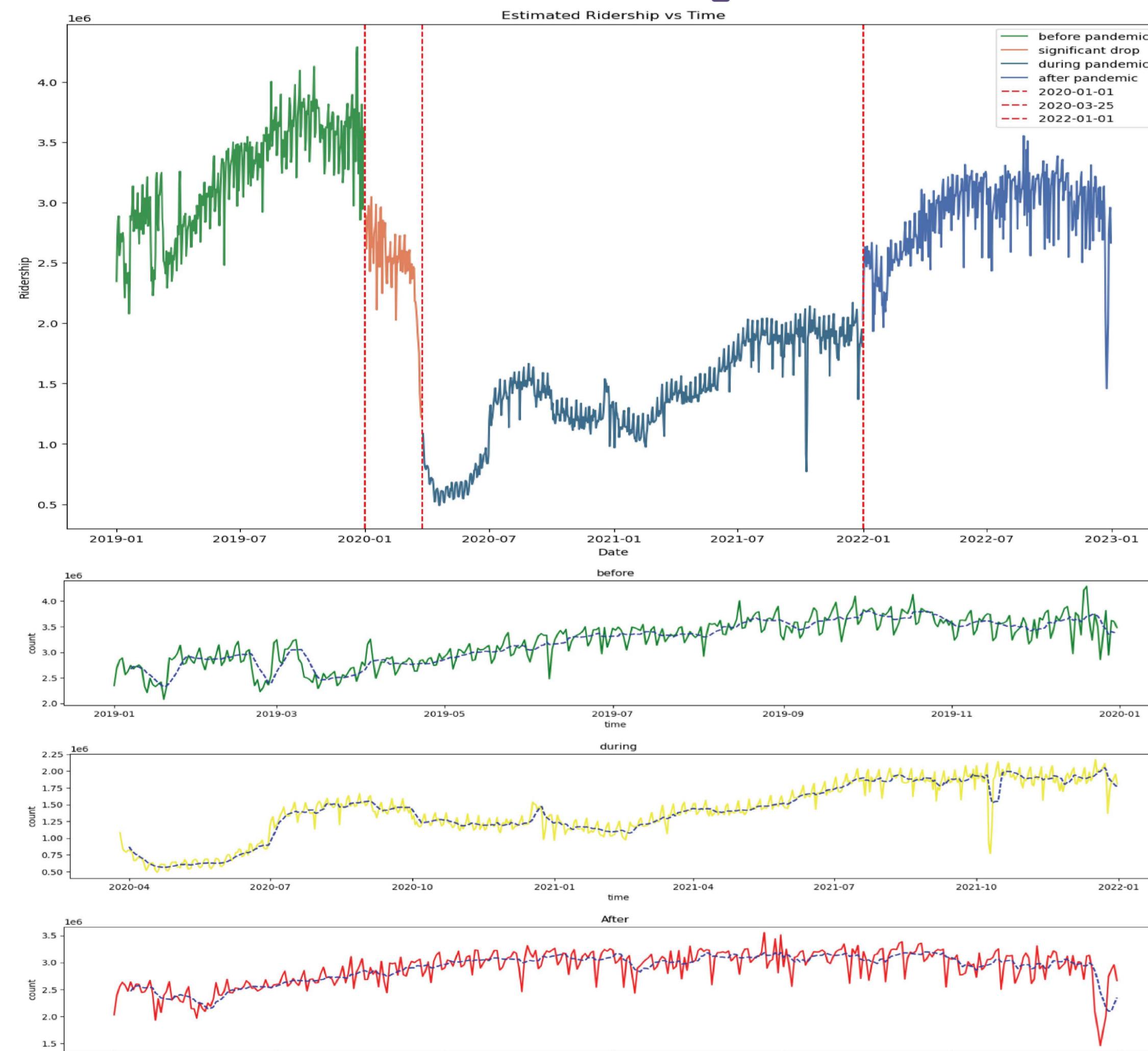
Hypothesis

- Post-pandemic, narrowbody aircraft have become more prevalent in flight clusters than widebody/mid-sized aircraft.
- Based on Gaussian Prediction (GP) Post-Pandemic ridership recovery can be predicted to continue to rise, but would most likely struggle to reach a pre-pandemic growth levels had the pandemic never happened.

Methodology



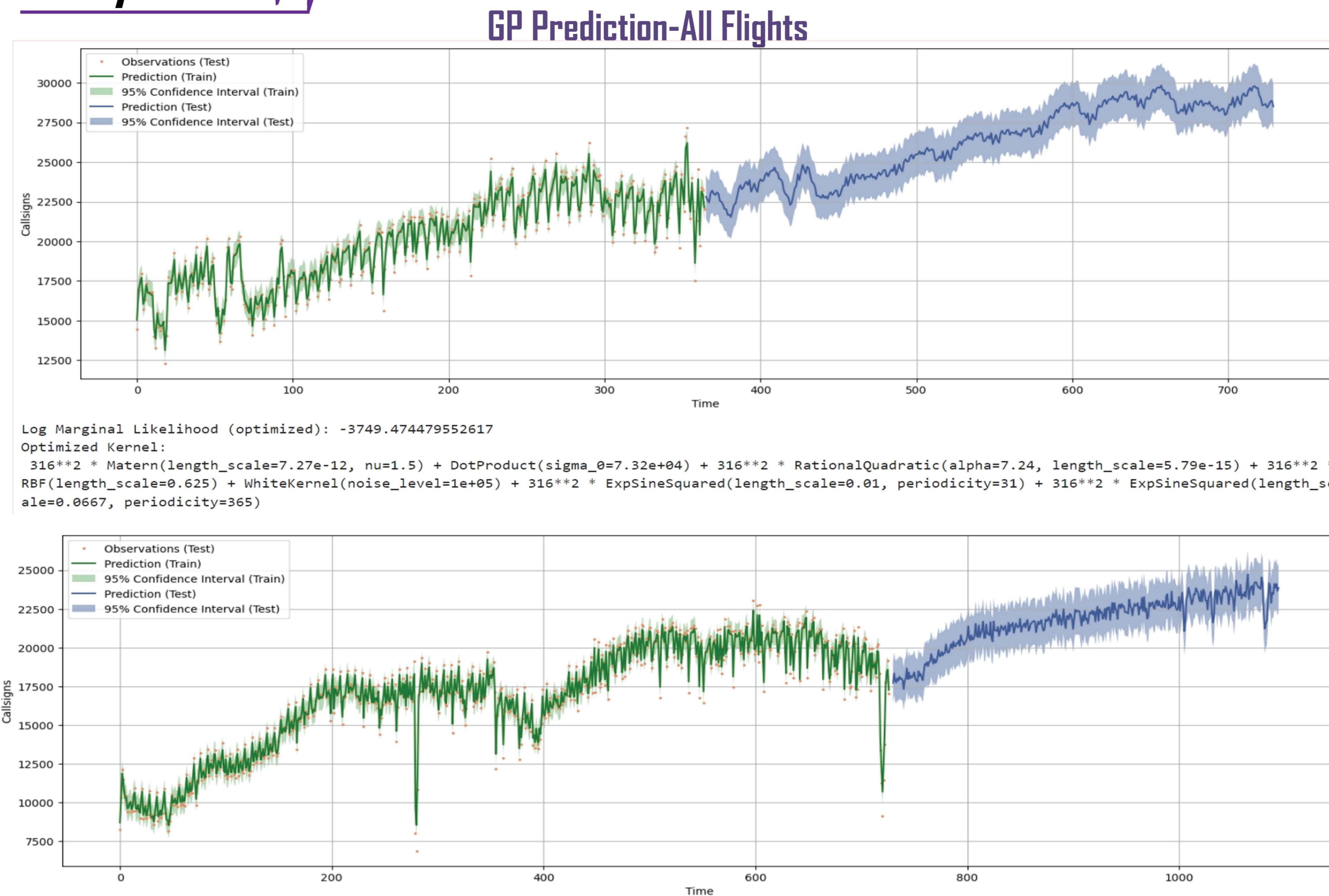
Time Series -Passenger Amount



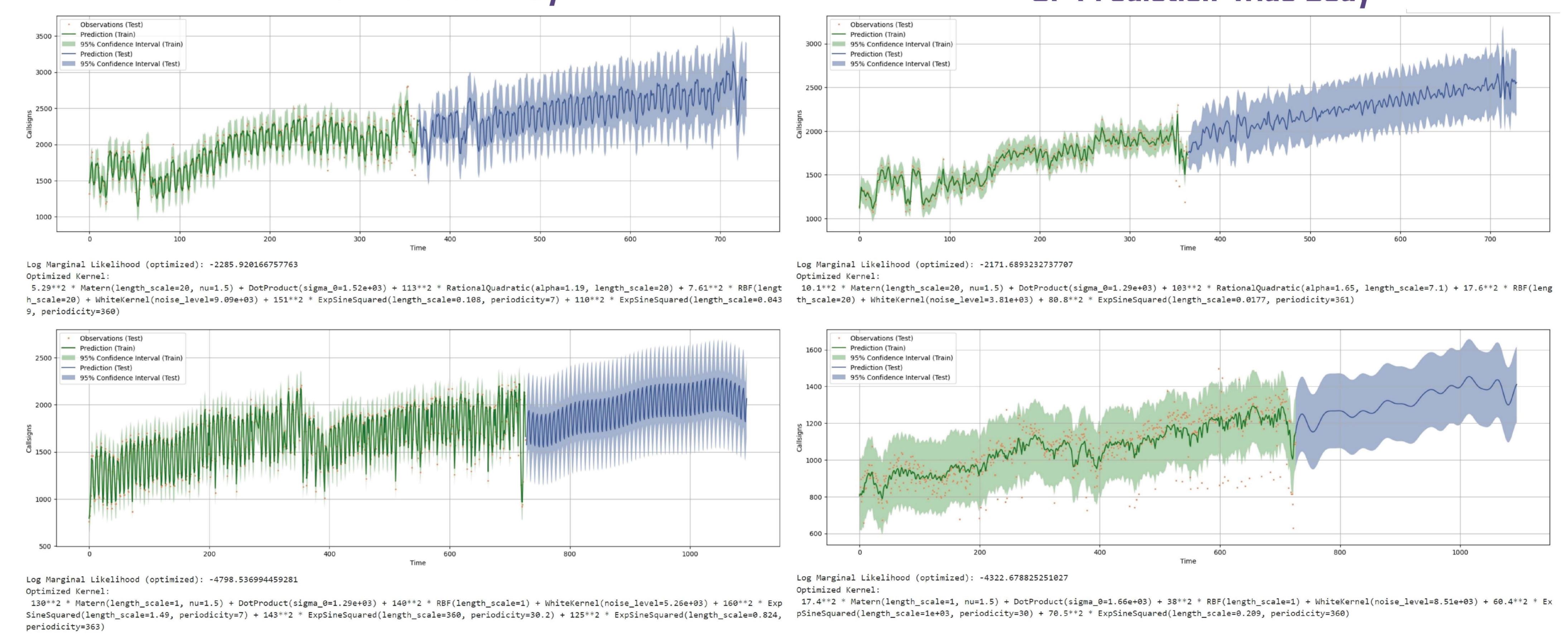
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Analysis



GP Prediction-Mid Body



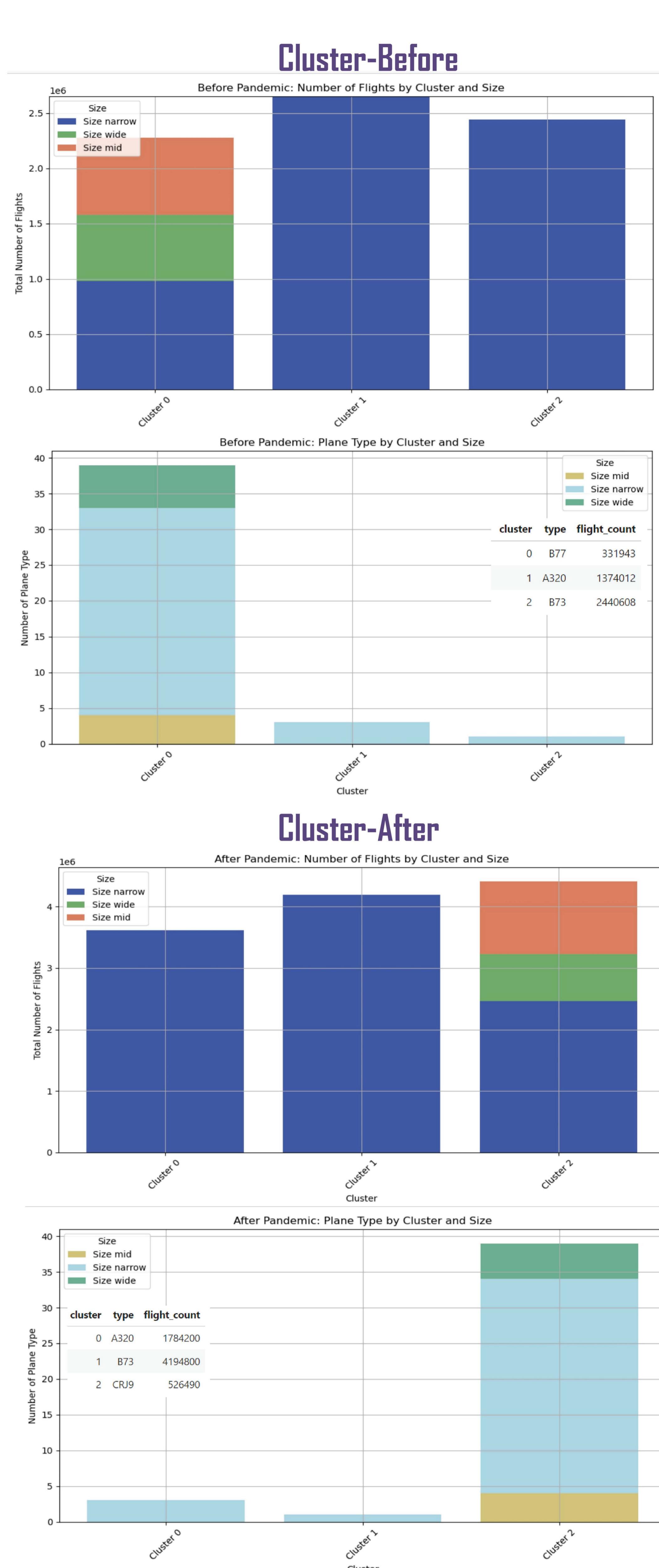
Future Research

Extending the Scope of Data

- ICAO conforming Flight data from 2016-2018 will help in developing a more precise model and will enable more accurate predictions
- Using 2024 data to further extrapolate recovery trends moving forward

Extending the Granularity of Data

- segmenting by region according to the OD pairs to analyze the specific impact of the pandemic on airline load factors
- integrate a severity index to visualize differentiated impacts



Conclusions

- Ridership recovery prediction based on 2021-2022 data shows a slow pace to 75% of projected 2018-2019 data growth
- Projected Wide body ridership (B777s, A340s, A380s) are recovering at a slightly faster rate than Mid-body ridership (A330s, B767s, B787s)
- Narrowbody jets comprised of highest flight count amongst all three post-Pandemic, compared to pre-pandemic widebody prevalence

Data Sources

