Route Optimization & Redeployment Strategy

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Project Overview

- **Objective**: Identify inefficiencies in Avelo's current network and highlight strategic redeployment opportunities, especially amid West Coast shutdown.
- **Data Sources**: T-100 Segment, DB1B Market, Master Coordinate
- **Tools Used**: Python, SQL (SQLite), Power BI.
- **Key Metrics**: Load Factor, Total Departures, Distance, Average Fare Per Pax, Total Passengers.

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Why this project matters?

Business Context: In 2024–25, Avelo announced a shutdown of its West Coast base due to route unprofitability and competitive pressure.

The Challenge: With dozens of aircraft needing reassignment, where should Avelo redeploy its capacity to improve profitability?

The Goal: Build a data-driven tool to surface underperforming routes, rank redeployment opportunities, and support future route planning.

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My Approach

STEP 1 DATA PREP (PYTHON)

Filtered and cleaned 10M+ records from T-100 & DB1B; excluded April 2025 and low-activity routes.

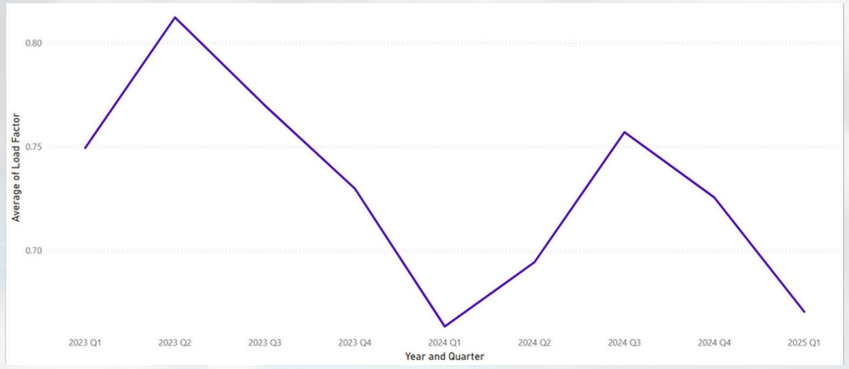
STEP 2 INTEGRATION (SQL)

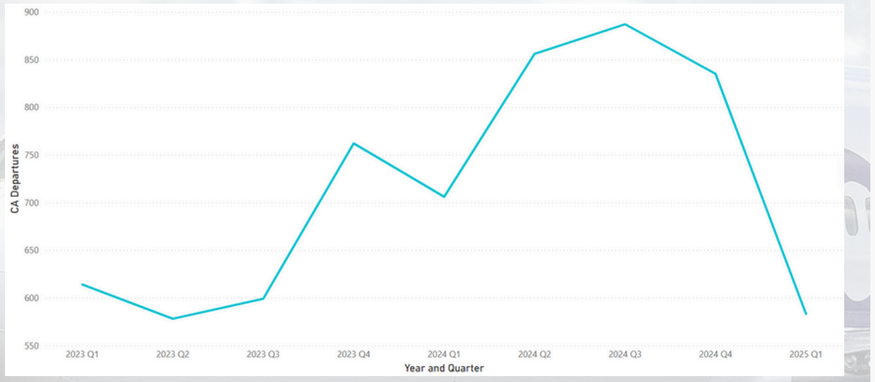
Merged datasets at route–quarter level; engineered metrics like load factor, departures, and fare per pax.

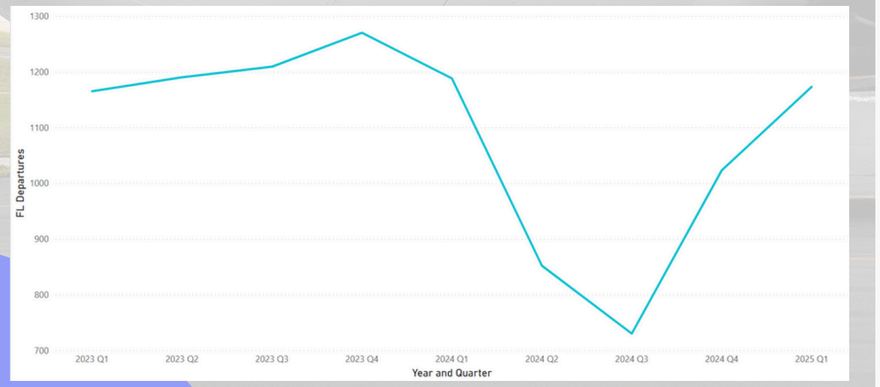
STEP 3 VISUALIZATION (POWER BI)

Built dashboards with filters, KPIs, scatter plots, and redeployment scoring logic.

Quarterly Trends & West Coast Exit Signals







LOAD FACTOR DROPPED IN EARLY 2024

After peaking at 81% in Q2 2023, system load factor fell to 66% in Q1 2024 and stayed weak in 2025 Q1 (67%).

CALIFORNIA DEPARTURES SHOW THE REAL STORY

- Q1 2023: 614 departures from CA
- Q4 2024: 835 departures
- Q1 2025: Just 583, the West Coast base shutdown clearly in effect.

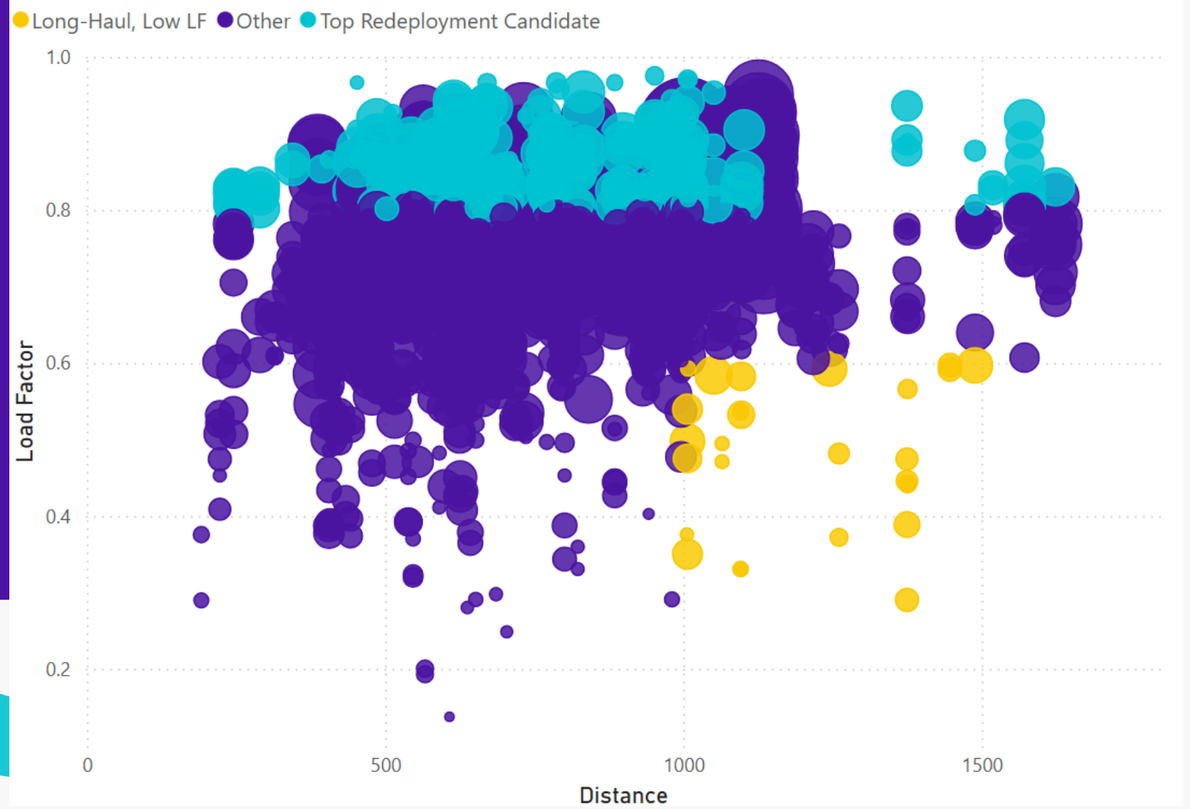
NEW HAVEN (HVN) REMAINS THE CORE ANCHOR

Across all quarters and years, HVN–MCO, HVN–FLL, and HVN–RDU dominate route activity, cementing CT as Avelo's strongest market.

FLORIDA VOLUME STABLE BUT NOT EXPANDING

Despite consistent departures (1100–1270/quarter), limited growth indicating maturity and limited upside without network changes..

Identifying Underperformers & Redeployment Opportunities



TOP 3 REDEPLOYMENT PICKS: TYS–HVN, ILG–MYR, AND LAS–DBQ

UNDERPERFORMING LONG-HAUL ROUTES

- Dozens of routes over 1,000 miles have load factors below 60%.
- Examples: DFW–HVN, HVN–DFW, and ATL–ILG, all flying long distances with weak demand.
- These routes represent capacity drains and should be deprioritized.

HIGH-SCORING REDEPLOYMENT CANDIDATES (NON-WEST COAST)

- Routes like TYS–HVN, ILG–MYR, and LAS–DBQ are performing well but receive limited service.
- These show strong load factors, high fares, and low departure volumes → clear upside for expansion.

LOAD FACTOR DISTRIBUTION SIGNALS RISK

- Nearly 140 routes operate with <60% load factor (shown in histogram).
- Majority of routes cluster in the 0.6–0.8 range, indicating room for optimization.

Strategic Recommendations

DEPRIORITIZE LONG-HAUL UNDERPERFORMERS

Routes like DFW–HVN, ATL–ILG, and HVN–DFW should be reduced or sunset.

REDEPLOY CAPACITY TO HIGH-PERFORMING SHORT/MID-HAUL ROUTES

Prioritize growth on TYS–HVN, ILG–MYR, LAS–DBQ — high load factors + high fares + low frequency.

DOUBLE DOWN ON CT-BASED STRATEGY

With HVN as the anchor, focus on profitable East Coast spokes (FLL, MCO, RDU, etc.)

Next Steps

- Incorporate profitability metrics like CASM and yield to refine ranking
- Track performance of redeployed routes over next 2 quarters
- Expand dashboard to support ongoing network optimization

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Thank you!

Feel free to explore the live dashboard or reach out for a deeper dive into route-level performance and redeployment options.

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