Aircraft Utilization and Scheduling Optimization

Introduction: This analysis simulates how Flight Schedule Pro can leverage scheduling data to surface inefficiencies in aircraft utilization and booking patterns—unlocking new opportunities to improve revenue and reduce idle time.

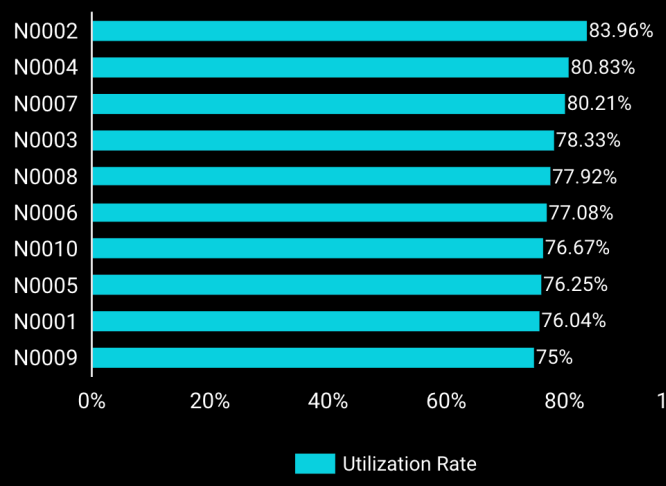
Using a mock dataset of 1,495 ***(View dataset)*** aircraft booking records across 30 days and 10 aircraft, I queried, cleaned, and modeled the data using **Google BigQuery *(View SQL Queries)***, calculating key performance indicators (KPIs) such as **utilization rate**, **booking frequency**, and **peak usage blocks**.

The results were visualized using **Looker Studio** to identify when and how aircraft are being under- or over-utilized, setting the stage for smarter scheduling strategies

Key Performance Indicators Analyzed:

- **Utilization Rate by Aircraft** = Total scheduled time ÷ Total available time
- **Bookings by Time Block & Day** = Daily patterns segmented into 4 operational time slots
- **Peak vs. Idle Time Windows** = Based on booking density across hours/days

Utilization Rate by Aircraft



Utilization varied significantly across aircraft, with some aircraft operating at **75%+** of available time and others under **55%**. This indicates scheduling imbalances, possibly tied to instructor preferences, maintenance downtime, or base location demand.

Booking Heatmap by Time Block

Day of Week	6–10 PM	2–5 PM	6–9 AM	10 AM–1 PM
Monday	12	52	46	56
Wednesday	12	47	45	62
Sunday	19	48	52	49
Tuesday	14	57	47	53
Thursday	8	51	67	49
Friday	12	63	70	60
Saturday	15	66	65	64

Bookings are highly concentrated in the **10 AM–5 PM** window, particularly mid-week and on Saturdays. Time slots between **6–9 AM** and **6–10 PM** remain consistently under-booked across all days.

Takeaways: This analysis highlights clear areas where Flight Schedule Pro can help flight schools increase operational efficiency through data-driven scheduling:

- **Redistribute load** to underutilized aircraft to increase training time without adding new resources
- **Incentivize bookings** during underused time blocks (e.g., 6–9 AM, 6–10 PM) to flatten peak demand and maximize asset usage
- **Integrate these insights** into real-time dashboards to empower schools to track utilization and make proactive adjustments

These actions can directly improve training throughput, reduce downtime, and further position FSP as a platform that drives both logistics and financial outcomes for its users.

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Student Progress Bottleneck Analysis

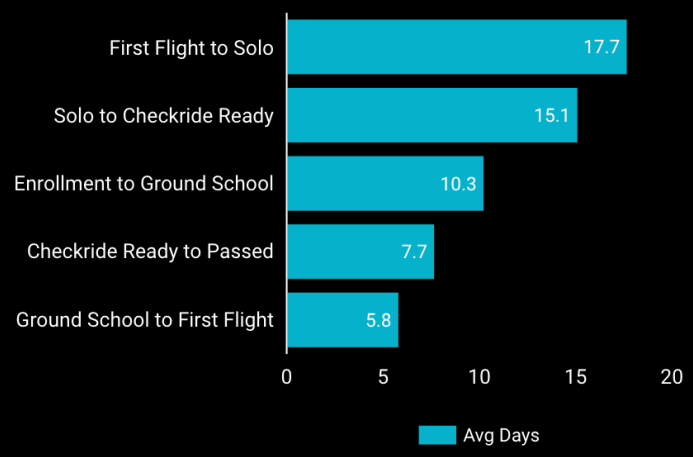
Introduction: This analysis simulates a typical student journey through a flight training program to identify key bottlenecks and drop-off points. Using a mock dataset of 200 students ***(View dataset)***, I uploaded and modeled the data in **Google BigQuery** ***(View SQL Queries)***, calculating completion rates at each stage and the average number of days between major training milestones.

The results were visualized in **Looker Studio** to uncover when and where students are most likely to stall, disengage, or drop out. These insights aim to help Flight Schedule Pro enable its school partners to improve student retention and optimize training throughput.

Training Funnel

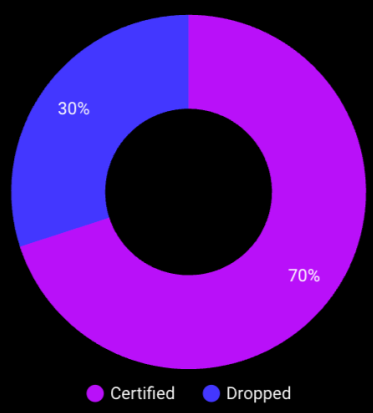
Out of 200 students, 75% completed ground school, 62% reached their first solo flight, and only 45% completed certification. The most significant drop-offs occurred between **Solo** and **Checkride Ready**, suggesting a need for additional support or scheduling optimization during this transition phase.

Average Time Between Milestones



The longest delays were observed between **First Flight and Solo (16.4 days)** and **Solo and Checkride Ready (13.1 days)**. These extended gaps are often caused by scheduling inefficiencies, weather delays, or instructor availability—each an opportunity for improvement.

Outcome Breakdown: Certified VS Dropped



Students who dropped out took **over 2x longer to reach their first flight** compared to certified peers. This early delay is a strong indicator of disengagement and presents a key opportunity to intervene sooner in the training pipeline.

Takeaways: This analysis highlights clear opportunities for Flight Schedule Pro to support better training outcomes through embedded analytics. By tracking time-to-milestone KPIs and identifying early delays—particularly before solo flights—flight schools can proactively intervene with at-risk students. Embedding this level of visibility into instructor and admin dashboards would empower FSP's partners to reduce dropout rates, shorten time to certification, and ultimately drive greater throughput and revenue, aligned with FSP's mission to shape the future of aviation training through data.

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