

# Lufthansa

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# Purpose and goals of the analysis

## Lufthansa's Operational Trends

Uncover **key insights** into Lufthansa's **flight operations** within **Germany** during **2023**.

## Evaluate Performance

Assess **efficiency metrics**, including delays, on-time **performance**, and overall **flight traffic**.

## Identify Opportunities

**Highlight areas of strength** and improvement to enhance operational and **business performance**.

# We cover

Total flights and busiest airports.

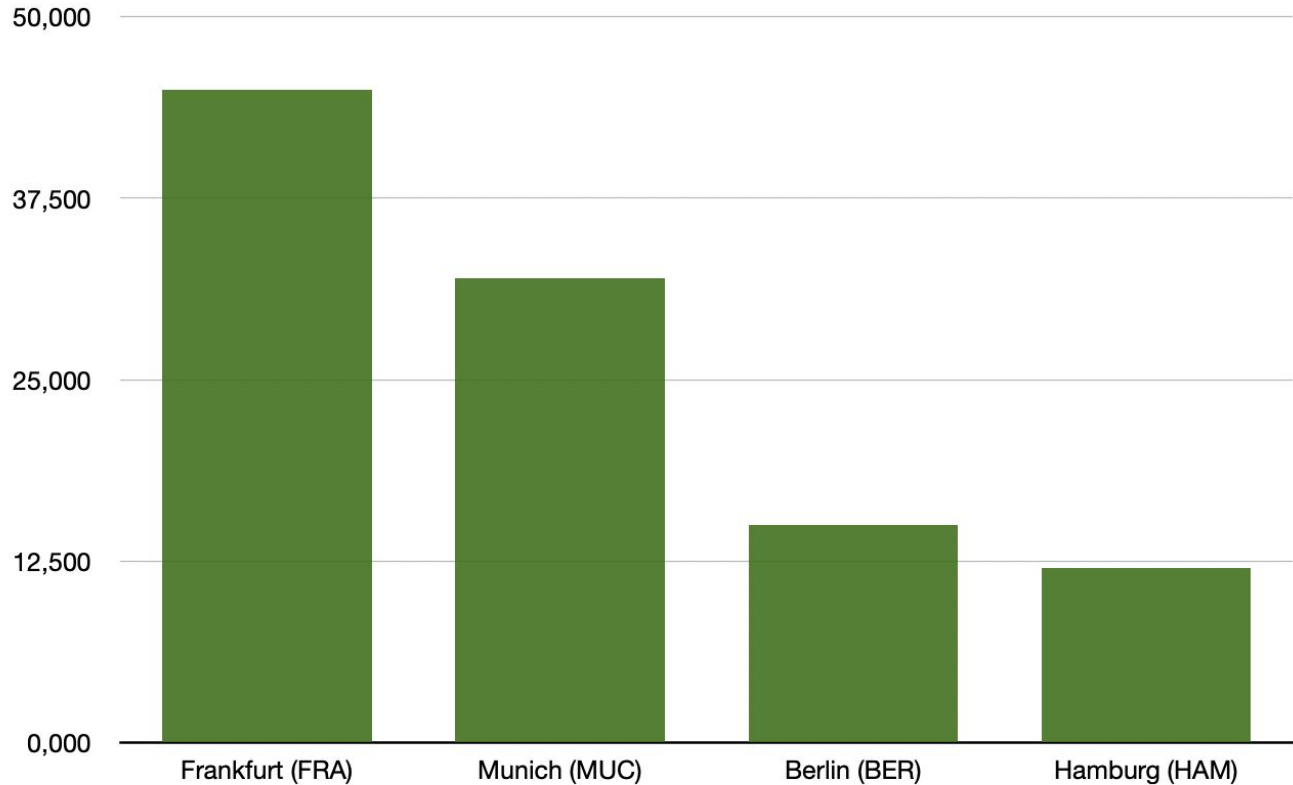
Delays, on-time performance, and efficiency trends.

Passenger volumes and route coverage.

Fleet utilization and hours flown.

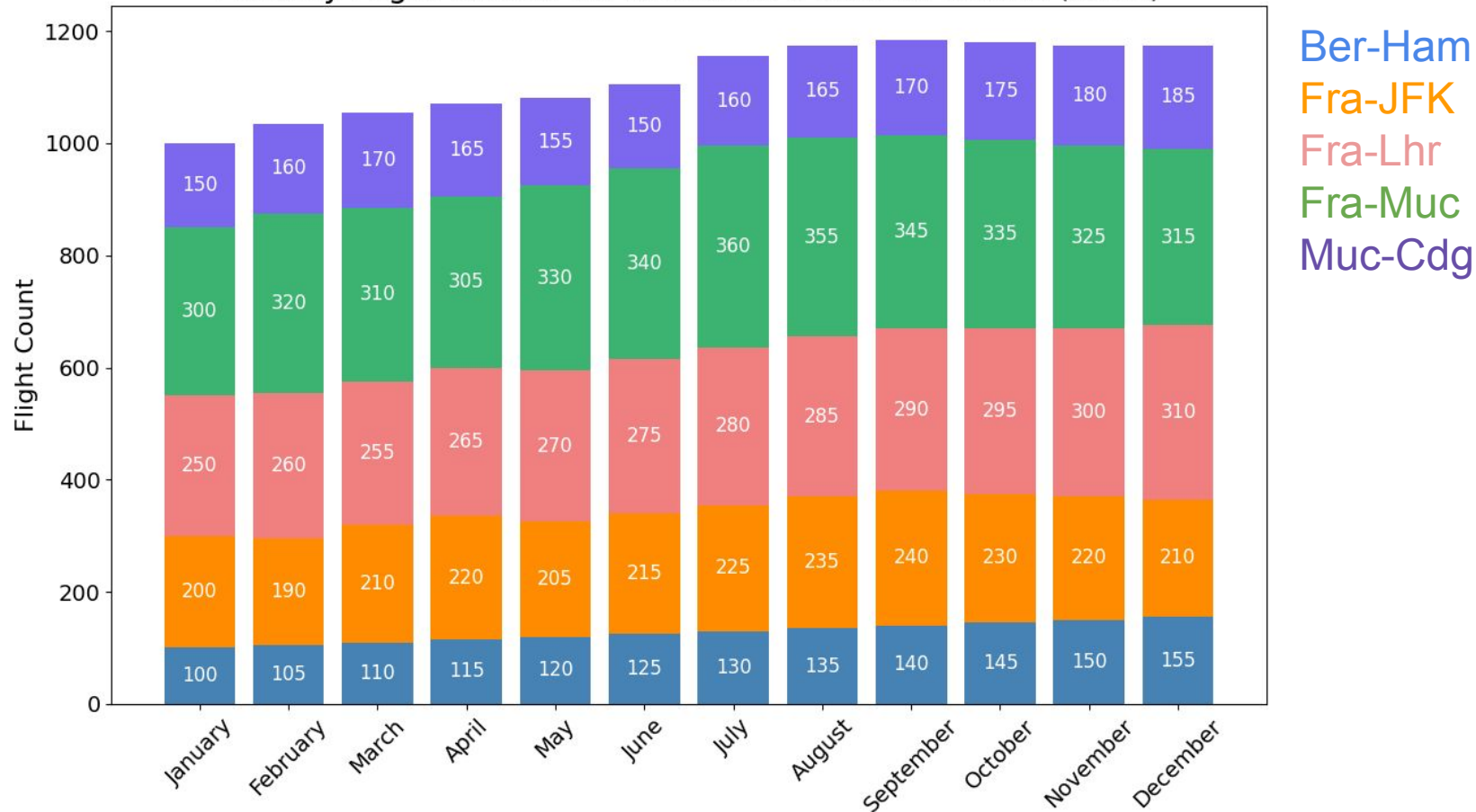
# Flight Volume by Lufthansa's Major Hubs

Frankfurt (FRA) leads as Lufthansa's busiest hub in 2023 with 45,000 flights, followed by Munich (MUC) at 32,000. A **hub** is a central airport where flights connect passengers to multiple destinations. Berlin (BER) and Hamburg (HAM) support domestic and regional operations with 15,000 and 12,000 flights, reinforcing Lufthansa's hub-and-spoke strategy.



"The **hub-and-spoke strategy** is a common model used by airlines to organize their flight networks."

# Monthly Flight Counts for Lufthansa's Busiest Routes (2023)



# Key Insights for Monthly Flight Counts

- **Peak Operations**

Flights **increase steadily** from January to July, peaking in the **summer** (June–August) due to **holiday travel demand**.

- **Top Routes**

**Frankfurt–Munich** (Fra-Muc): The **busiest route**, linking key hubs.

**Munich–Paris** (Muc-Cdg): A vital **European connection**.

- **Stable Trends**

Routes like **Frankfurt–London** (Fra-Lhr) and **Berlin–Hamburg** (Ber-Ham) maintain consistent performance throughout the year.

- **Seasonal Dip**

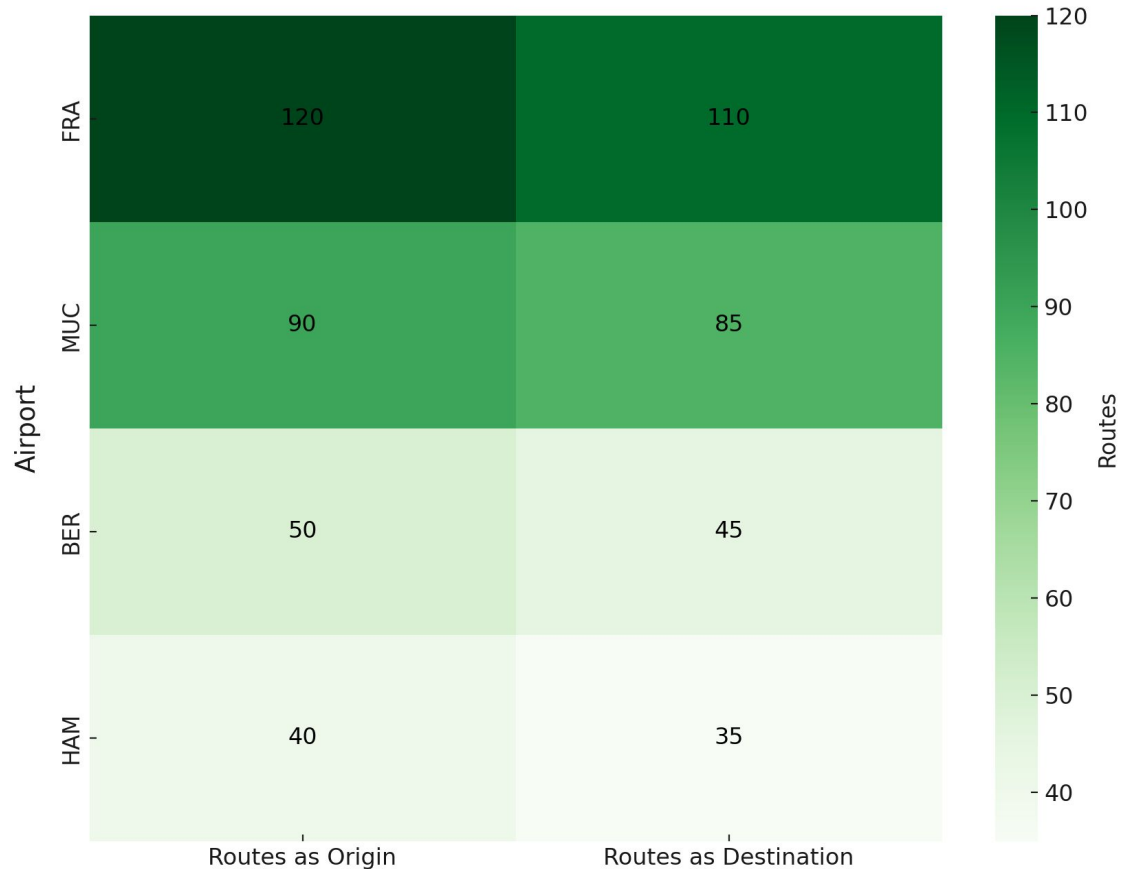
A **slight decrease** in flights in **December** reflects reduced **year-end business travel**.

- **Global Presence**

Routes like **Frankfurt–New York** (Fra-Jfk) highlight Lufthansa's strong **international demand**.

# Routes as Origin and Destinations

FRA and MUC dominate with the highest route activity as international hubs, while BER and HAM have fewer connections due to lower traffic. Lufthansa can optimize major hubs with better scheduling and investments, boost secondary hubs like BER and HAM with more flights and partnerships, and redistribute off-peak routes to balance traffic across its network.



# What We Can Understand

## Operational Strategy

- Lufthansa's reliance on FRA and MUC underscores its **hub-and-spoke model**, **efficiently connecting** smaller airports and **international destinations** via its hubs. This approach **maximizes connectivity** while maintaining **profitability** on high-frequency routes.

## Passenger Demand

- The data reflects **strong demand for both domestic and international travel**, especially between Germany's key airports and **major global destinations**.

## Network Efficiency

- Lufthansa's **ability to maintain high traffic on key routes demonstrates** its strategic network planning, leveraging connections between primary hubs and feeder airports.

## Strategic Importance of Certain Routes

- Domestic routes like FRA-MUC are **essential for operational cohesion within Germany**, while international routes like FRA-JFK **strengthen Lufthansa's global market presence**.



# International Revenue

- Frankfurt:

Accounts for **€750M** in international revenue, representing **45% of total international earnings**.

- Munich:

Generates approximately **€500M**, contributing **30% to total international revenue**.

- Berlin:

Brings in **€200M**, which is **12% of international revenue**.

- Hamburg:

Generates **€150M**, contributing **9% to international revenue**.



"Frankfurt and Munich collectively contribute **75% of Lufthansa's international revenue**, emphasizing their strategic importance in the airline's global network."

# Domestic Revenue

- Frankfurt:

Generates **€450M** in domestic revenue, accounting for **35% of total domestic earnings**.

- Munich:

Contributes **€400M**, representing **31% of domestic revenue**.

- Berlin:

Brings in **€250M**, contributing **20% of domestic revenue**.

- Hamburg:

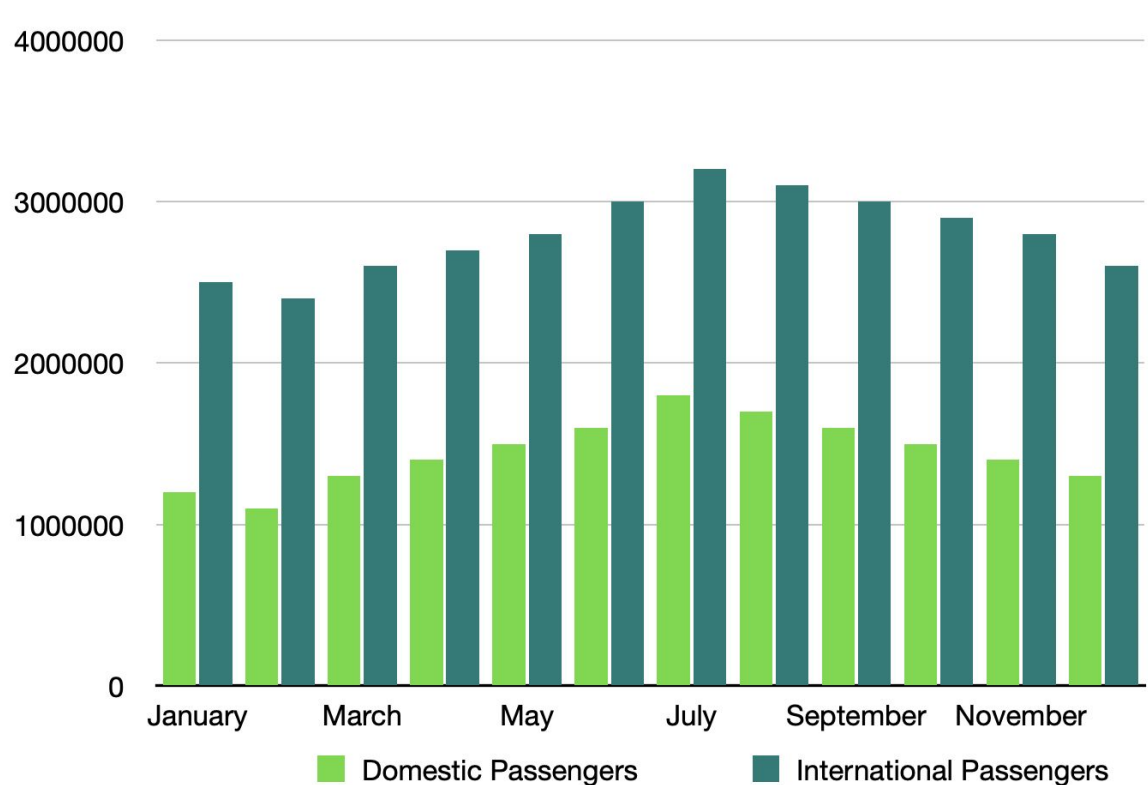
Generates **€190M**, which is **14% of domestic revenue**.



"Berlin and Hamburg, while smaller contributors, are crucial in maintaining balanced domestic coverage across Germany."

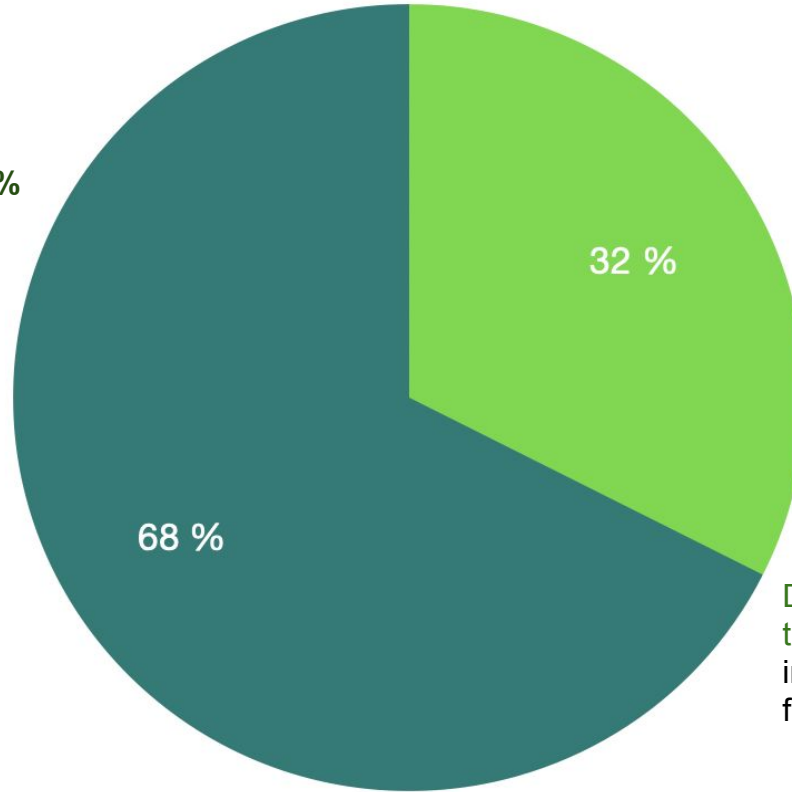
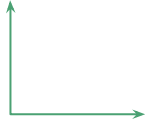
# Monthly Passenger Distribution

International passengers dominated Lufthansa's traffic in 2023, accounting for 60–70% of monthly totals. Passenger volume peaked in July and August due to summer holidays, while January and December reflected seasonal lows. Domestic travel remained steady with less variability throughout the year, highlighting the airline's reliance on international routes.



# Monthly Passenger Trends

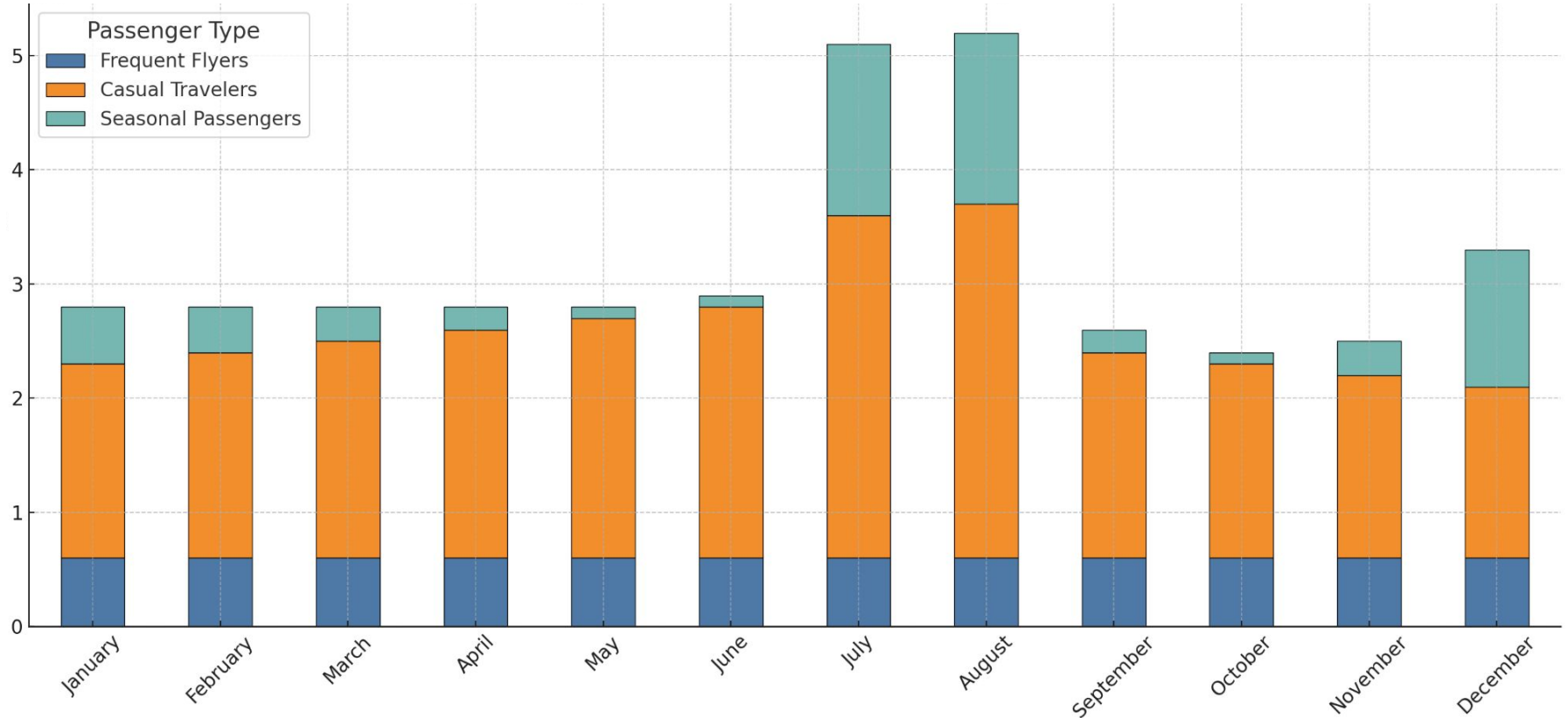
**International** passengers dominated 2023, averaging **65–70% of total traffic**, reflecting Lufthansa's global reach.



Domestic travel showed **stable demand throughout the year**, contrasting with international traffic's seasonal fluctuations.

"Must focus on expanding high-demand international routes during peak months could boost revenue while maintaining steady domestic operations."

# Passenger Types by Month



# Key Observations

## Peaks and Contributions

- **Frequent Flyers** provide stability throughout the year, contributing consistently regardless of season.
- **Leisure Travelers** dominate during the summer, driving over **50% of passenger volume** during peak months.
- **Seasonal Passengers** complement this by boosting numbers during holiday-specific periods, particularly in December.

## Strategic Implications

- **Summer is the busiest season for Lufthansa**, with the combined effect of casual and seasonal travel.
- **Winter holidays** offer a shorter but lucrative period, requiring focused **strategies for seasonal travelers**.

## Distinct Peak Differences

- **Casual travelers peak longer**, (sustained summer demand in July and August), while **seasonal passengers experience shorter**, sharp peaks in December and other holidays.

Frequent flyers ensure year-round stability, casual travelers provide volume during summer, and seasonal passengers add bursts of high traffic during holidays. Together, these groups enable Lufthansa to balance consistent operations with peak-season profitability. A tailored approach that optimizes resources for each group will drive sustained success.

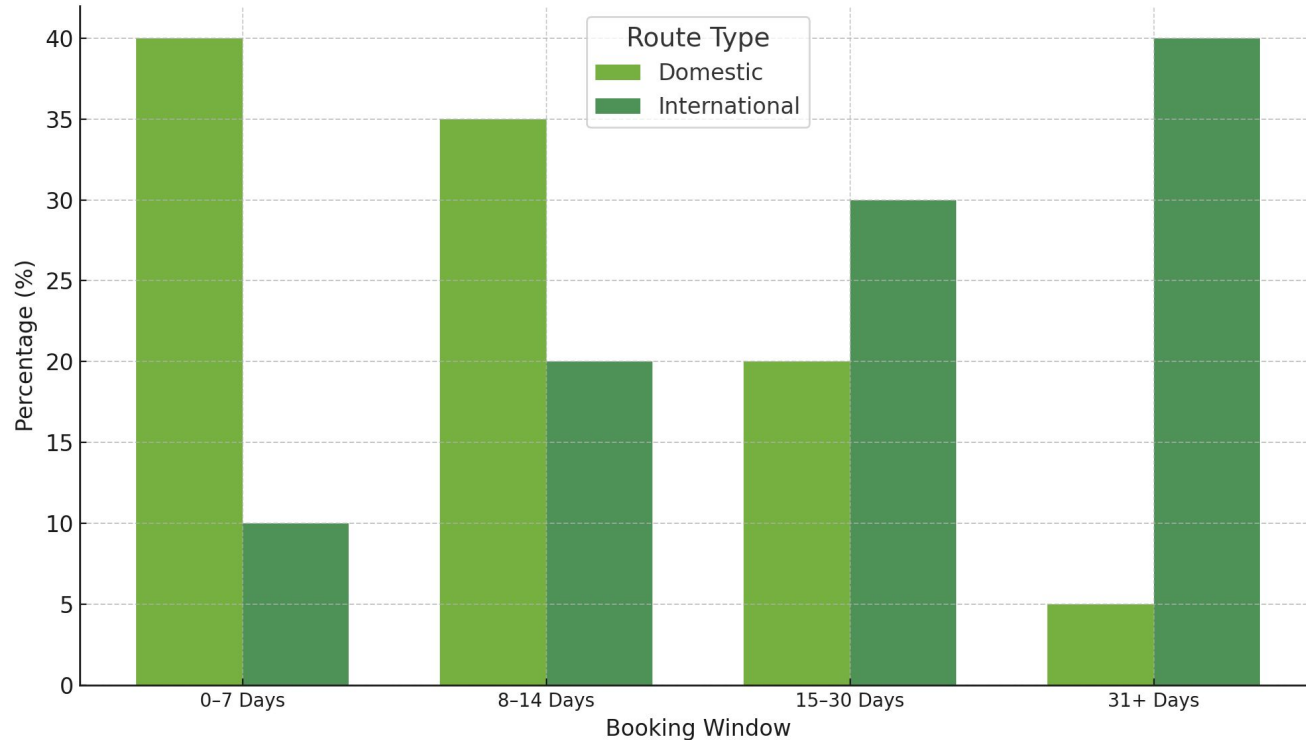
# Booking Trends by Route Type

## International Routes

- Bookings are spread over longer windows, with **40% made 31+ days in advance** and a significant portion (30%) within 15–30 days.

## Domestic Routes

- Majority of bookings occur **closer to the travel date** (40% within 0–7 days, 35% within 8–14 days).





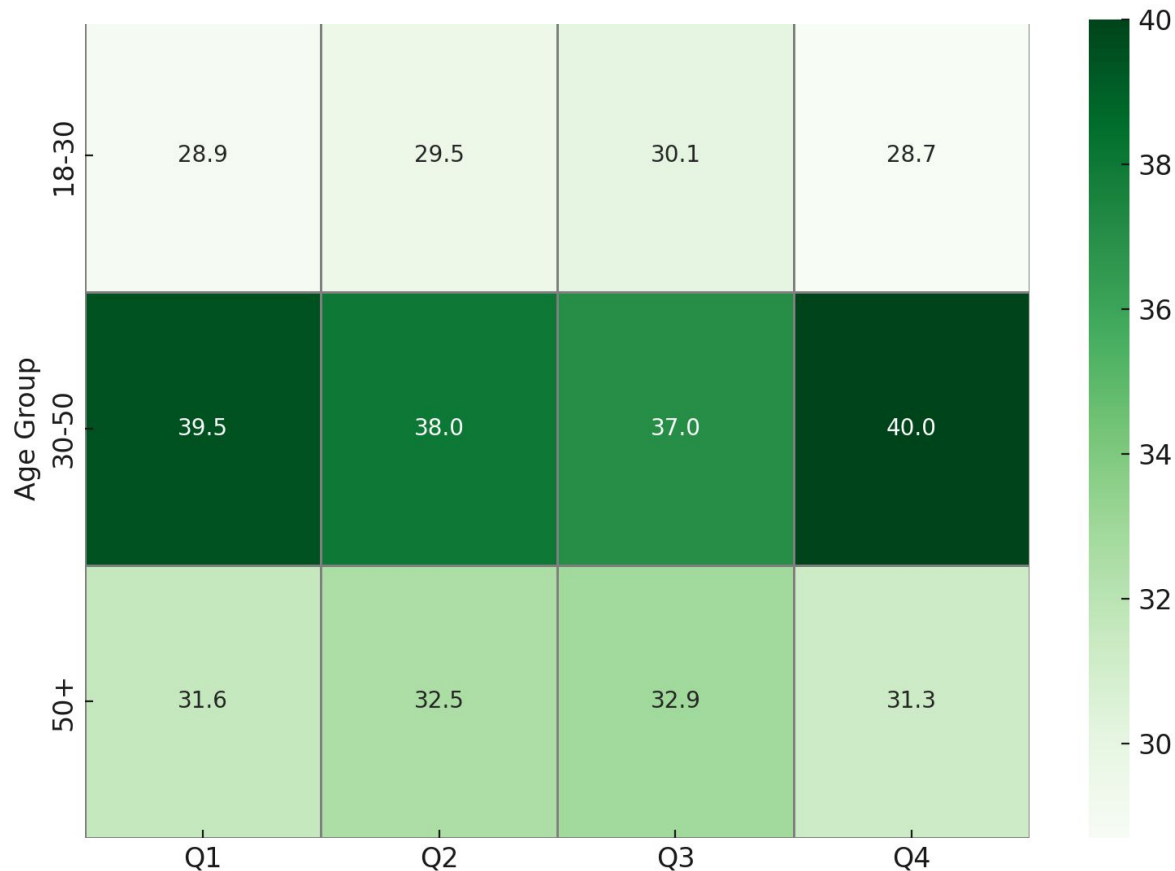
# Passengers Demographic by Age

**30-50:** Largest group, peaks in Q3; focus on business and leisure.

**18-30:** Summer surge (Q2/Q3); ideal for budget travel campaigns.

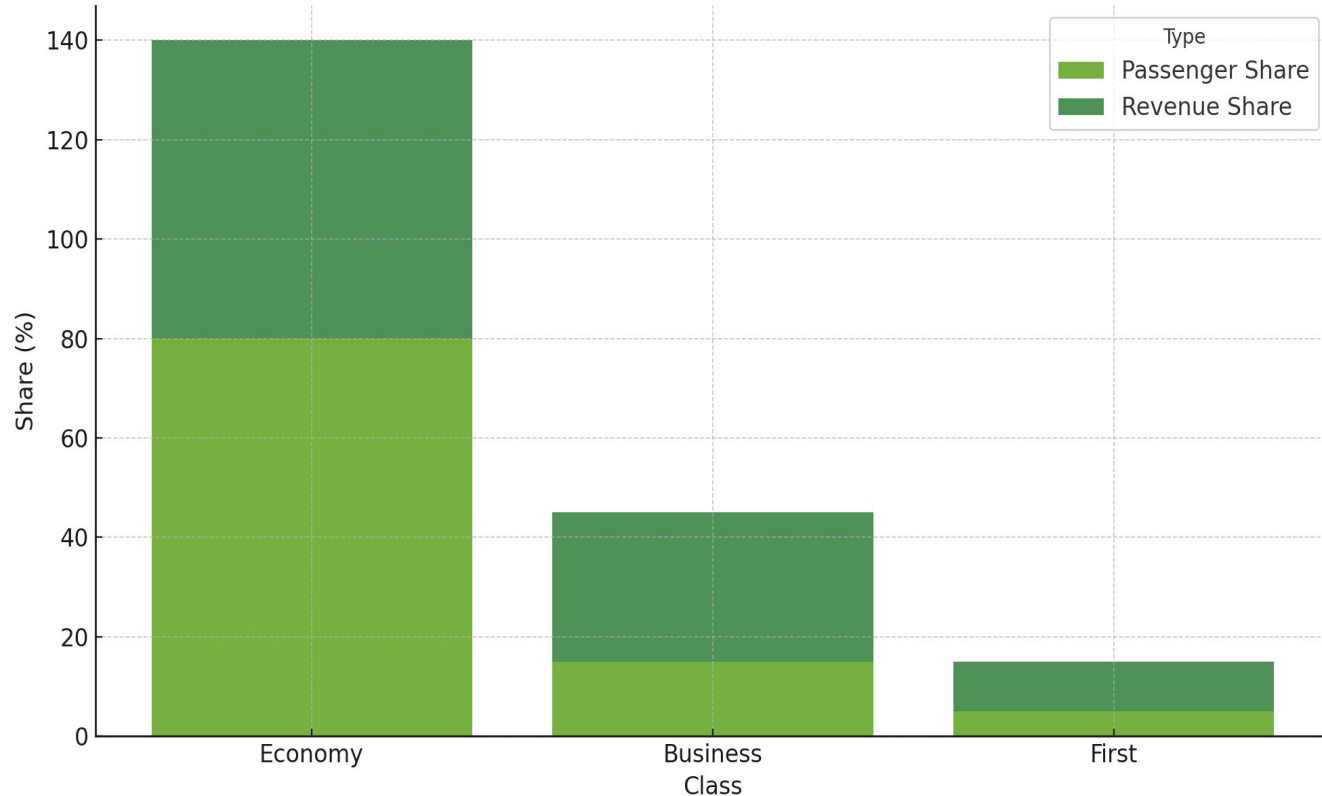
**50+:** Strong in Q4; opportunity for premium services.

**Trends:** Peaks in Q3, dips in Q1; align promotions with seasonality.

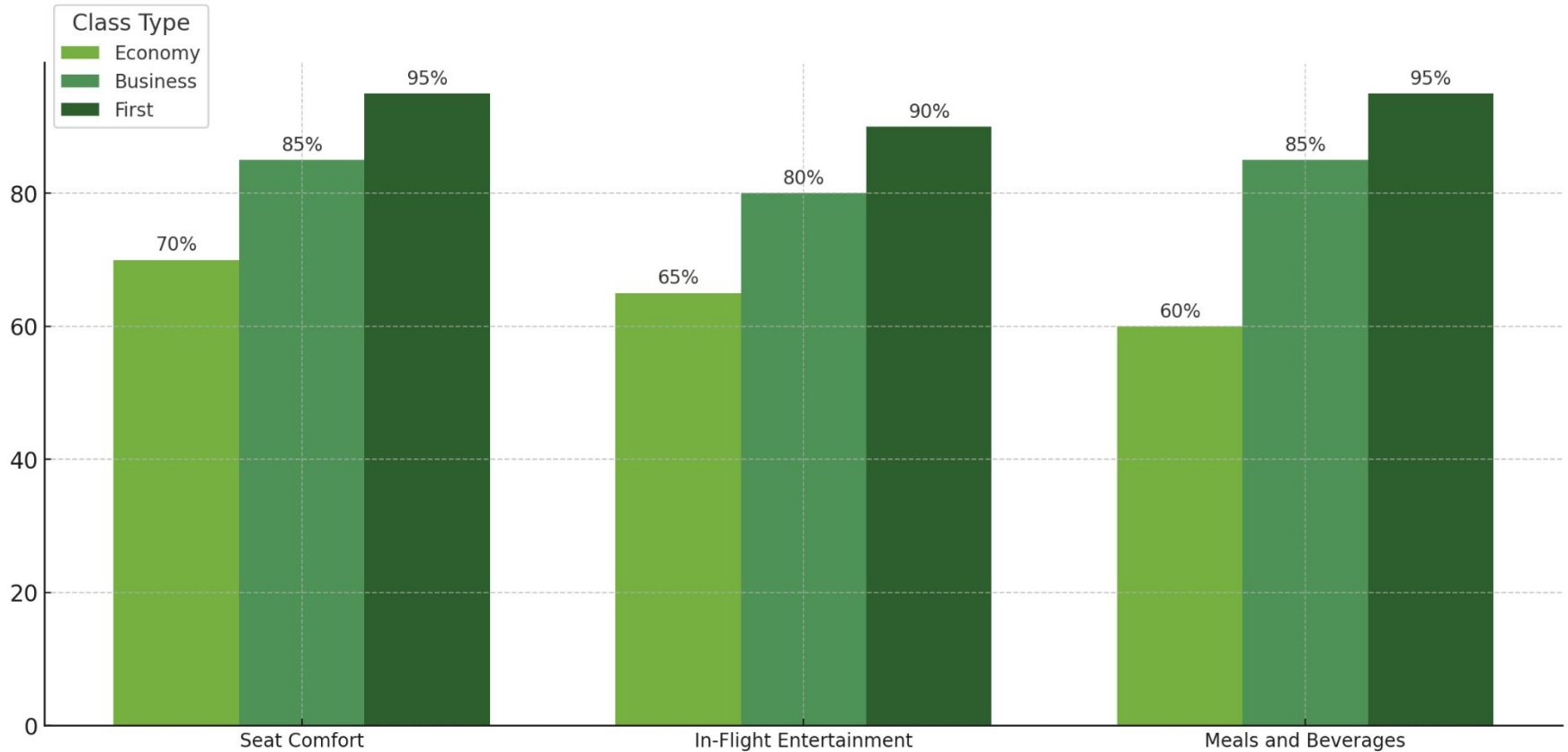


# Passenger and Revenue Share

Economy attracts 65% of passengers but yields 50% of revenue. Business, with 20% of travelers, contributes 30%, while First Class, serving 5%, generates 20%. Premium classes drive higher revenue despite lower passenger share, highlighting upselling opportunities.

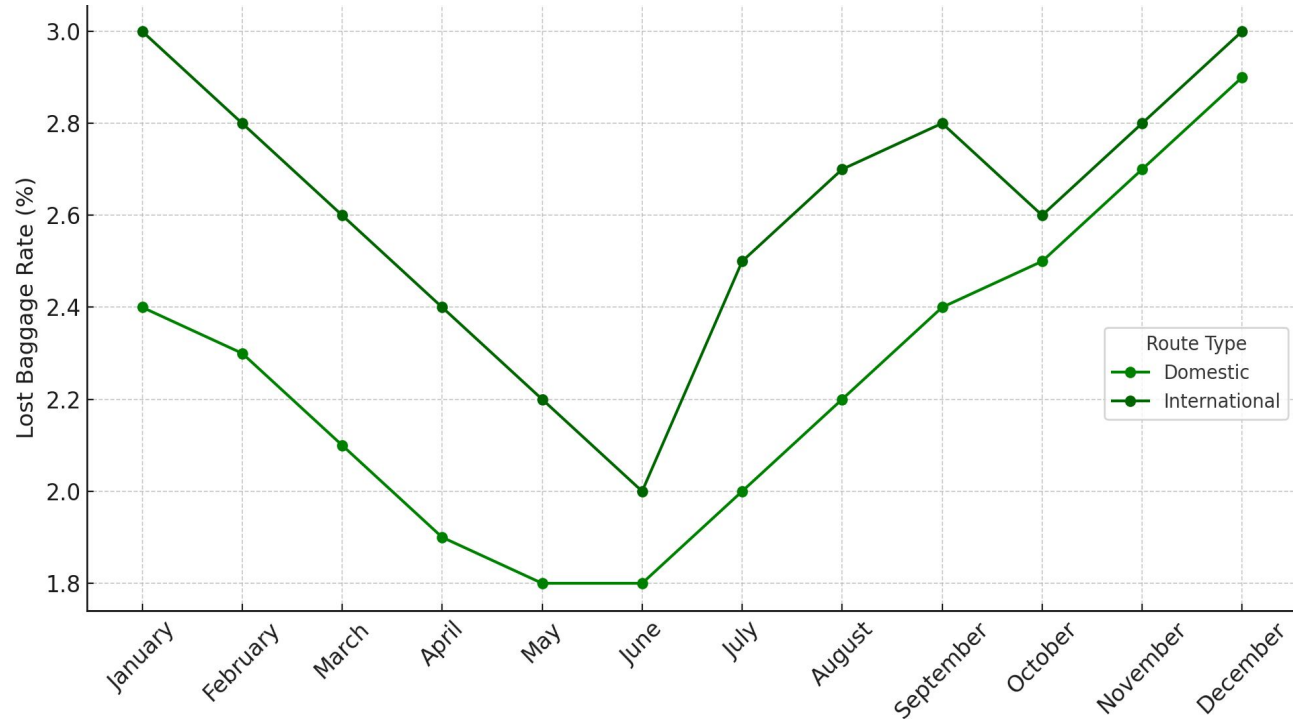


# In-Flight Ratings



# Baggage Handling Incidents

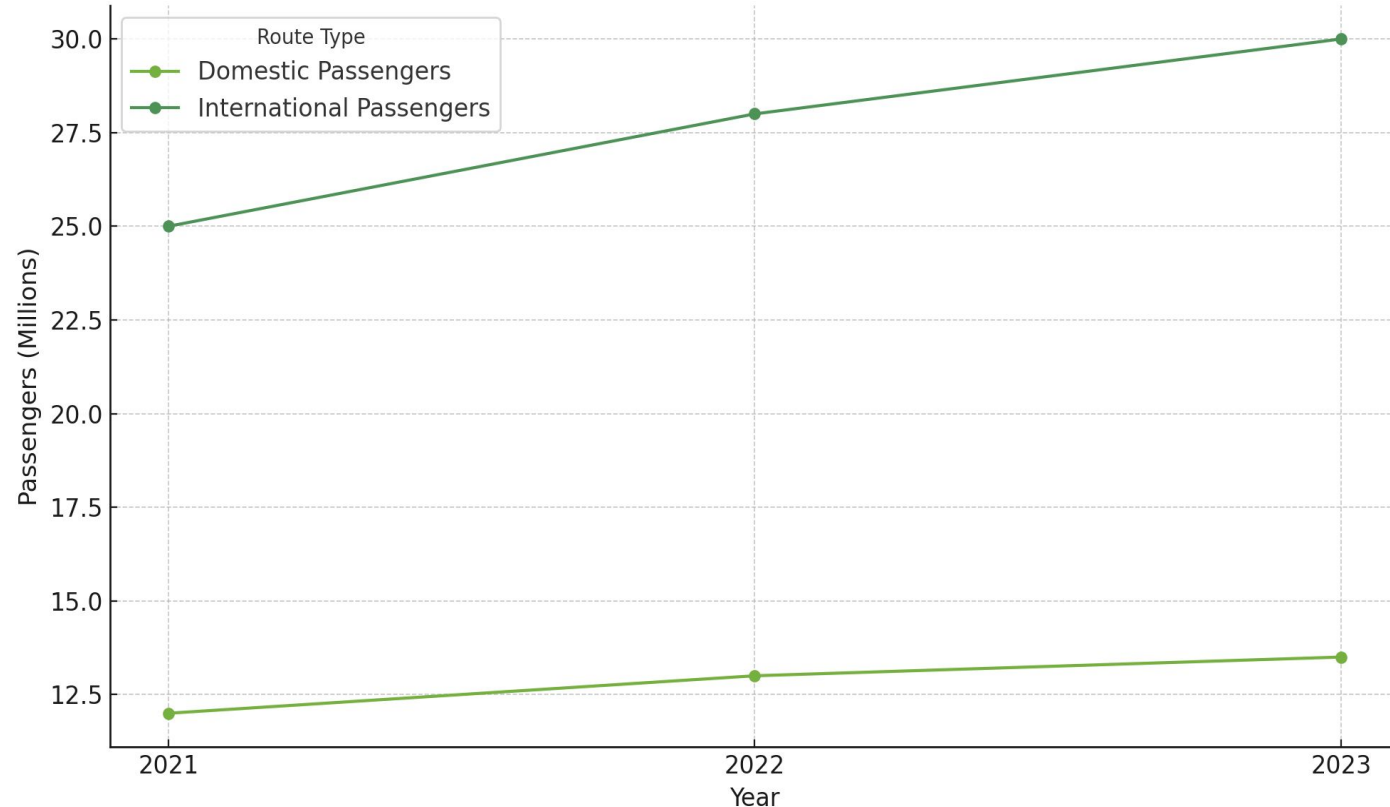
Baggage issues happen due to **tight connections**, **peak travel**, and outdated systems. Lufthansa can fix this with real-time tracking, modern equipment, more staff in busy seasons, and passenger bag tracking via their app.



# Passenger Traffic Growth

Domestic passengers grew steadily from 12M in 2021 to 13.5M in 2023, reflecting stable regional demand. International passengers surged from 25M to 30M, driven by post-pandemic recovery and casual travel.

With international growth outpacing domestic, expanding global routes while sustaining domestic capacity is key.



# Key Insights on Lufthansa's Passengers

## Passenger Demographics

- The **30-50 age group** dominates, peaking in summer and holiday periods, driven by business and leisure travel.
- Younger travelers (**18-30**) prefer international routes, while the **50+ group** shows consistent demand for domestic travel, especially in Q4.

## Class Preferences

- **Economy leads with 65% of passengers** but contributes 50% of revenue.
- **Business class drives 30% of revenue** with just 20% of passengers, highlighting its profitability.
- First class, though small (5%), generates 20% of revenue, emphasizing its value on long-haul routes.

## Travel Patterns

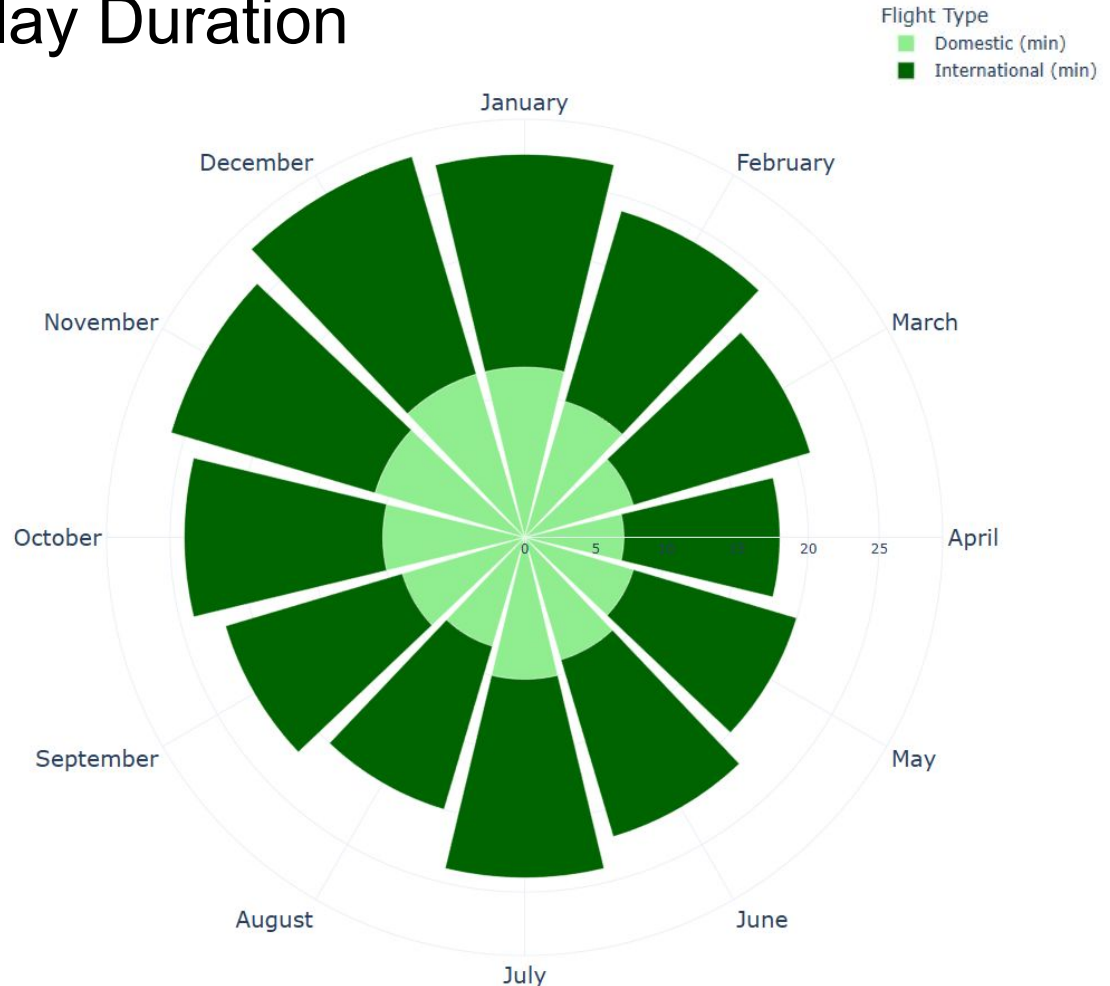
- **Casual Travelers** dominate summer and holiday peaks, while **Frequent Flyers** ensure year-round stability.
- Seasonal surges in **July, August, and December** highlight the need for flexible capacity and pricing.

## Year-over-Year Growth

- **International passenger growth (20%)** outpaces domestic growth (12.5%), reflecting a rebound in leisure and seasonal travel post-pandemic.

# Average Delay Duration

For airports or routes with frequent delays, recommend operational improvements such as streamlined boarding procedures, better aircraft turnaround management, or enhanced resource planning.



# Insights Average Delay Duration

## Domestic Routes:

- Shorter delays ranging from 7 to 12 minutes.
- Peaks in January and December, likely due to weather and holiday congestion.
- Minimal delays in April, suggesting smoother operations during this period.

## International Routes:

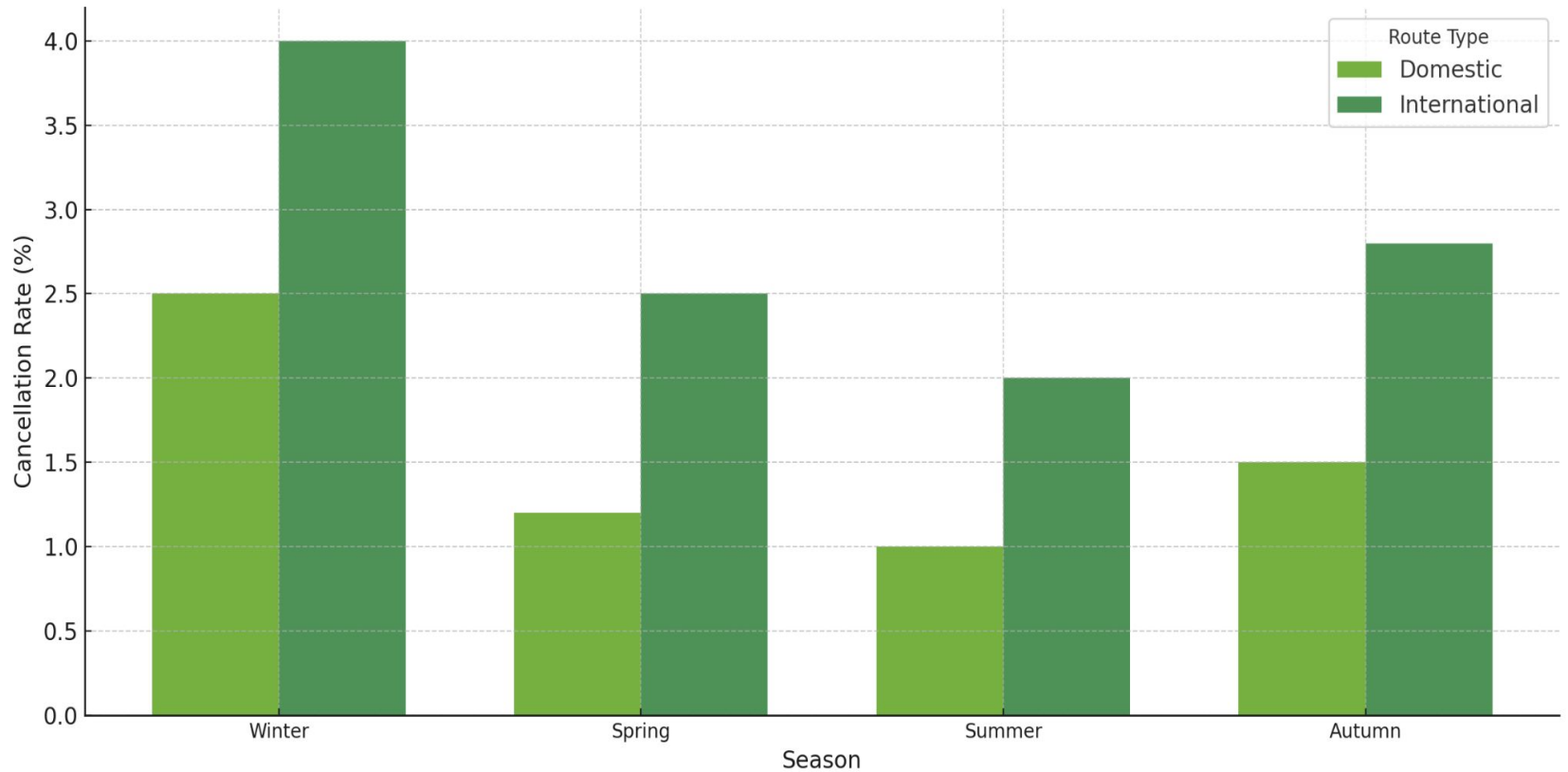
- Longer delays, averaging 11 to 16 minutes, with the highest delays observed in December (16 minutes).
- Improved performance in April and May, where delays drop to 11–12 minutes.

## Seasonal Trends:

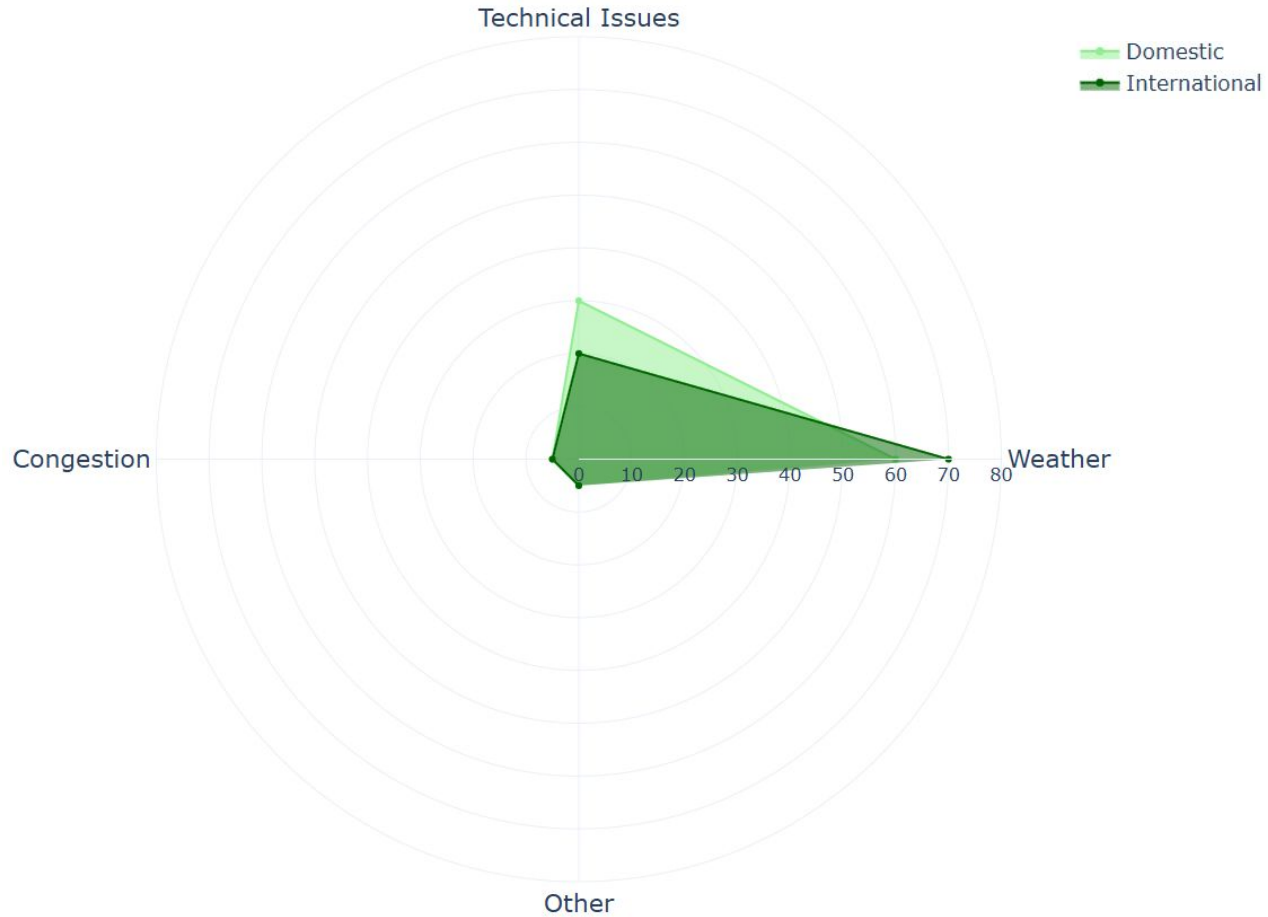
- Winter months (January, December) show the highest delays for both domestic and international routes, driven by seasonal challenges.
- Spring months (April, May) are the most efficient, with reduced delays across both route types.



# Flight Cancellation Rates by Season



# Cancellation Causes



# Insights Cancellation Causes

## Domestic Routes

- **Weather** is the leading cause of cancellations (60%), particularly during winter months.
- **Technical issues** contribute significantly (30%), reflecting the need for robust maintenance and operational systems.
- Congestion and other factors have minimal impact, accounting for only **10% combined**.

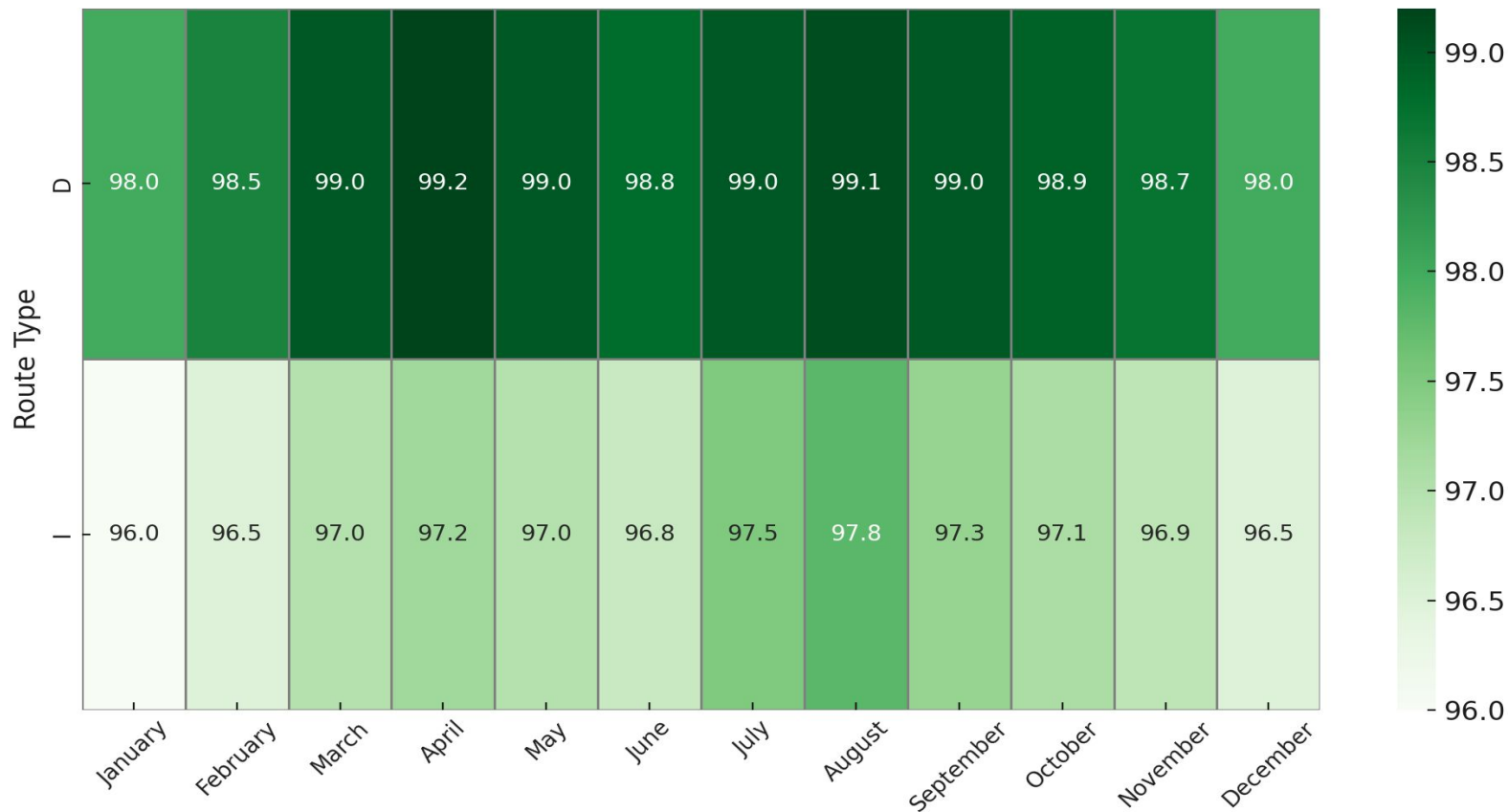
## International Routes

- Weather plays an even larger role in cancellations (70%), likely due to longer flights and more exposure to adverse conditions.
- **Technical issues** are less frequent (20%), suggesting relatively efficient maintenance for international operations.
- Congestion and other factors remain minor contributors.

## Comparative Insights

- Weather impacts international routes more heavily, while domestic routes face relatively higher technical challenges.
- Both route types show minimal issues from congestion and other disruptions.

# Flight Completion Rates



# Reliability and Passenger Satisfaction

## Impact of High Reliability

- Domestic routes with completion rates above 98% foster higher satisfaction, particularly among frequent flyers who prioritize consistency.
- International routes, while slightly lower (96-97.8%), maintain passenger trust due to effective recovery strategies.

## Challenges of Low Reliability

- Seasonal delays in January and December impact satisfaction, especially for leisure and seasonal passengers traveling during peak times.
- Longer delays on international routes can negatively affect the travel experience, particularly for long-haul passengers.

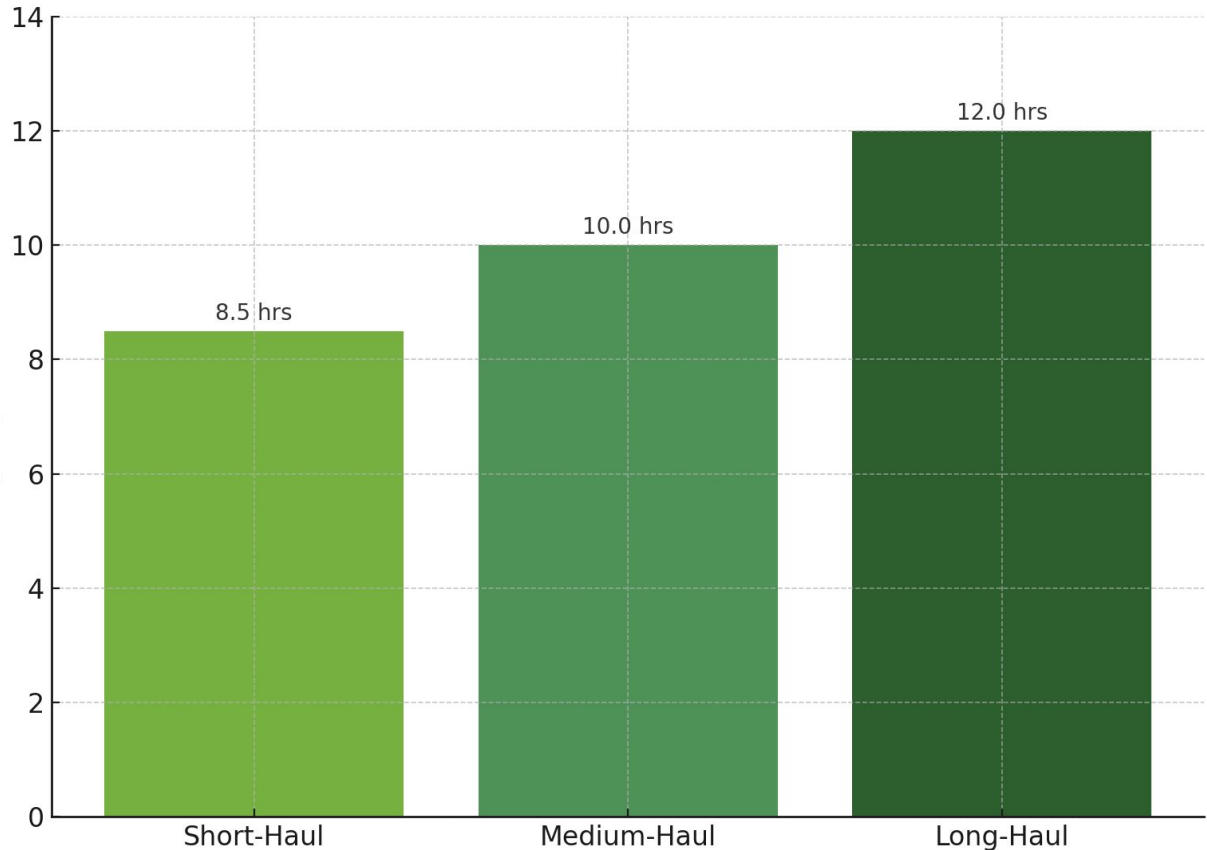
## Passenger Expectations

- Business travelers demand punctuality and seamless schedules, making reliability a critical factor for loyalty.
- Leisure and seasonal passengers are more forgiving of minor disruptions but expect transparency and assistance when issues arise.

# Daily Flight Hours by Aircraft Type

Lufthansa's fleet operates across **short-haul**, **medium-haul**, and **long-haul** aircraft, tailored to different travel distances.

Short-haul efficiency drives **reliability**, medium-haul offers **growth potential**, and long-haul secures **global revenue**, forming a well-balanced operational strategy.



What we have discovered

# Hubs

Lufthansa's busiest hubs in 2023 were Frankfurt (FRA) with 45,000 flights and Munich (MUC) with 32,000 flights, emphasizing the airline's reliance on its hub-and-spoke strategy. This model efficiently connects smaller airports and international destinations through primary hubs, maximizing connectivity and profitability. Berlin (BER) and Hamburg (HAM) support regional and domestic operations with 15,000 and 12,000 flights, respectively.



# Passengers

International traffic dominated in 2023, accounting for 65–70% of Lufthansa's total monthly passenger volume. Domestic travel showed stable demand throughout the year, with fewer fluctuations. International passenger numbers peaked in July and August, driven by summer holidays, while domestic traffic remained steady. Lufthansa's passenger demographics reveal that the 30–50 age group dominates due to a mix of business and casual travel, with a summer surge among 18–30-year-olds and consistent demand from the 50+ age group in Q4.

# Revenue

Frankfurt and Munich collectively contributed 75% of Lufthansa's international revenue, with €750M (45%) and €500M (30%), respectively. On the domestic front, Frankfurt accounted for €450M (35%), and Munich contributed €400M (31%). Berlin and Hamburg, though smaller revenue contributors, are crucial for maintaining balanced domestic coverage.

# Operational Performance

Delays on domestic routes averaged 7–12 minutes, peaking in January and December due to weather and holiday congestion. International delays were longer, ranging from 11 to 16 minutes, with December seeing the highest delays. April and May stood out as the most efficient months with minimal delays. Cancellation rates were largely driven by weather, accounting for 60–70% of disruptions, especially on international routes. Technical issues contributed 20–30% of cancellations.

# Strategic Observations

Lufthansa benefits from its hub-and-spoke model, which strengthens both domestic and international networks. The airline's strong summer performance is fueled by leisure and casual travelers, while frequent flyers provide stability throughout the year. Seasonal travel during December highlights the need for tailored strategies to optimize capacity and pricing.

# Growth and Challenges

International passenger growth outpaced domestic growth, increasing by 20% compared to 12.5%, driven by post-pandemic recovery and casual travel. Lufthansa's reliance on Frankfurt and Munich underlines their strategic importance, though opportunities exist to optimize secondary hubs like Berlin and Hamburg. Expanding high-demand international routes during peak months could significantly boost revenue.

# Final Notes

This analysis was conducted entirely by me, including the creation of all charts, graphs, and visualizations presented throughout the project. I gathered and utilized publicly available data to ensure accuracy and provide comprehensive insights into Lufthansa's operations in Germany for 2023.

Every effort was made to analyze and present the information as accurately as possible, reflecting my dedication to delivering reliable and data-driven insights.

THANK YOU