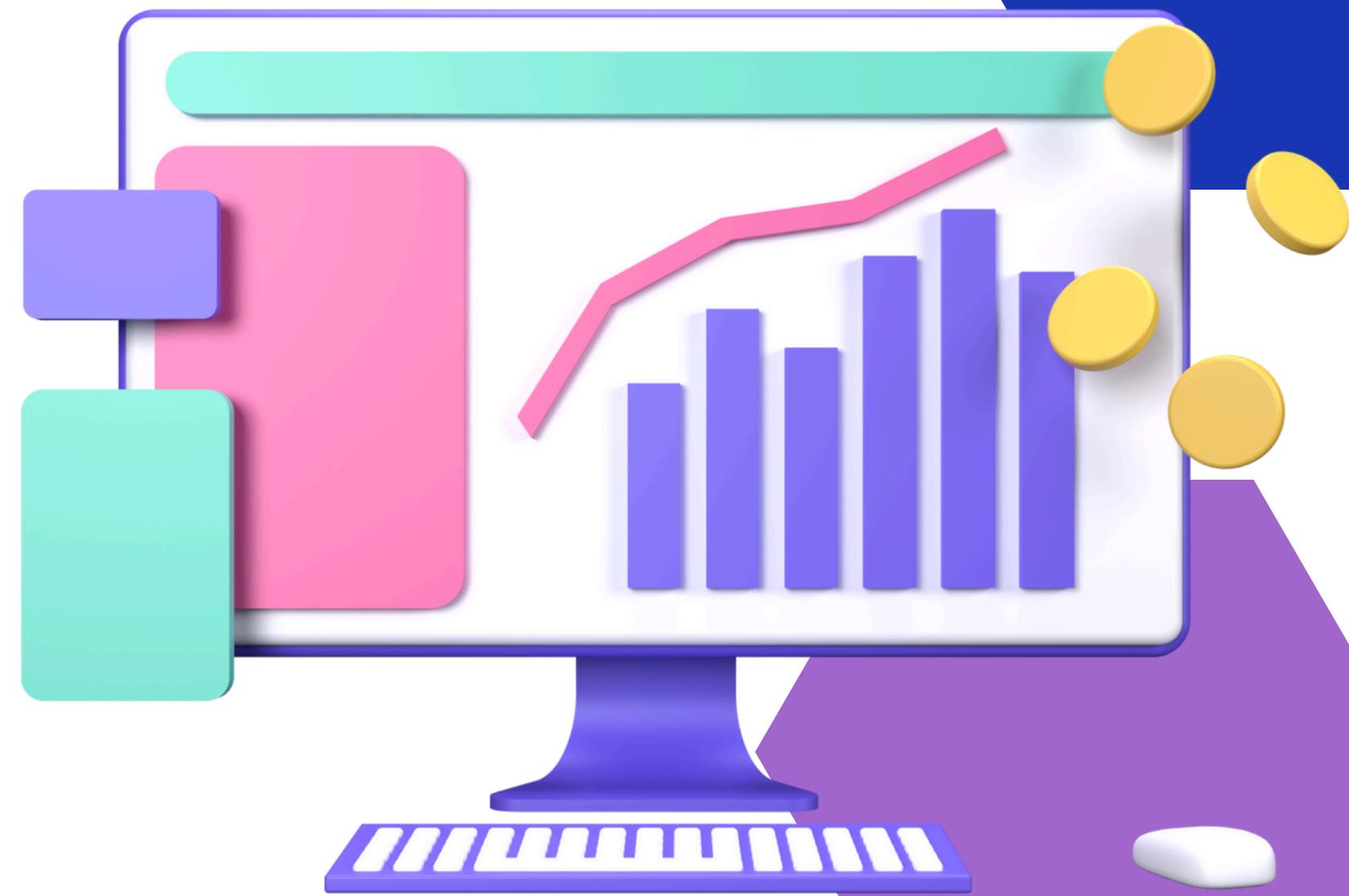
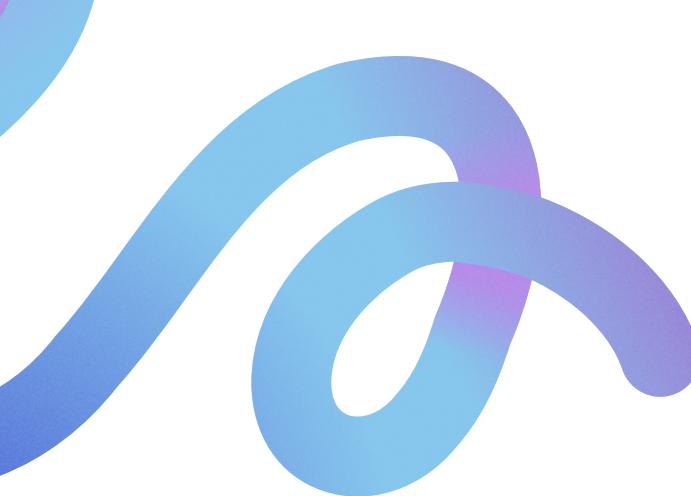


BUS TRANSPORTATION ANALYSIS

Presented by: Komal Sukheja





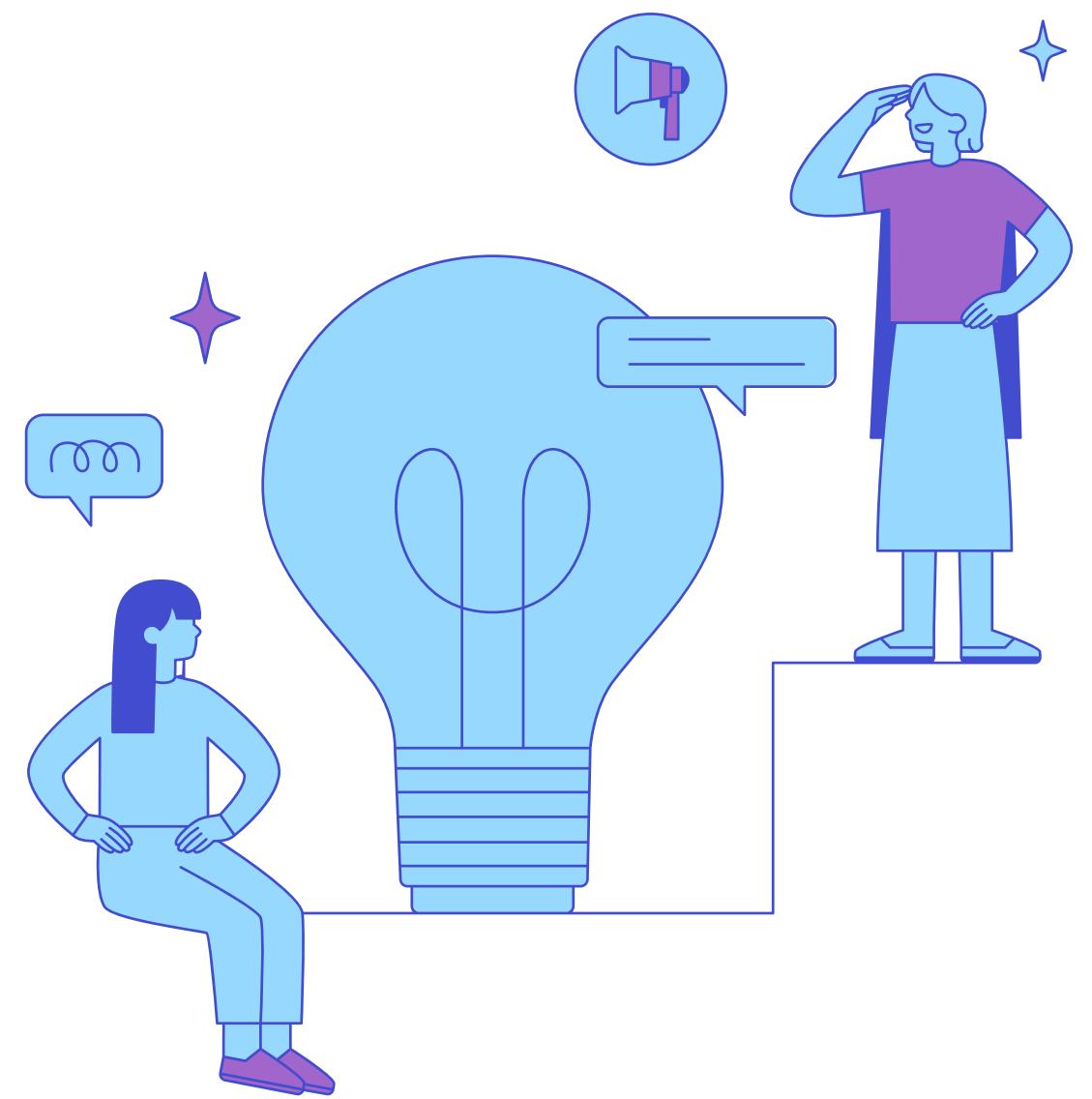
OVERVIEW OF DATASET

- The dataset is comprehensive, encompassing ridership, route, bus, demographic, and date information, providing a detailed view of bus transportation operations
- It covers a limited time frame, specifically December 2023 and January 2024, which may affect the ability to identify longer-term trends.
- The data also includes detailed demographic information and temporal analysis, shedding light on passenger characteristics and ridership patterns across different times and days.



PROBLEM STATEMENT

The bus transportation system struggles with optimizing service efficiency and resource allocation due to a lack of detailed insights into ridership patterns and demographics. Limited to December 2023 and January 2024, the data analysis aims to uncover meaningful trends and insights to guide strategic decisions and improve overall service.



Key Objectives

01 Identify peak and off-peak hours to optimize bus schedules.

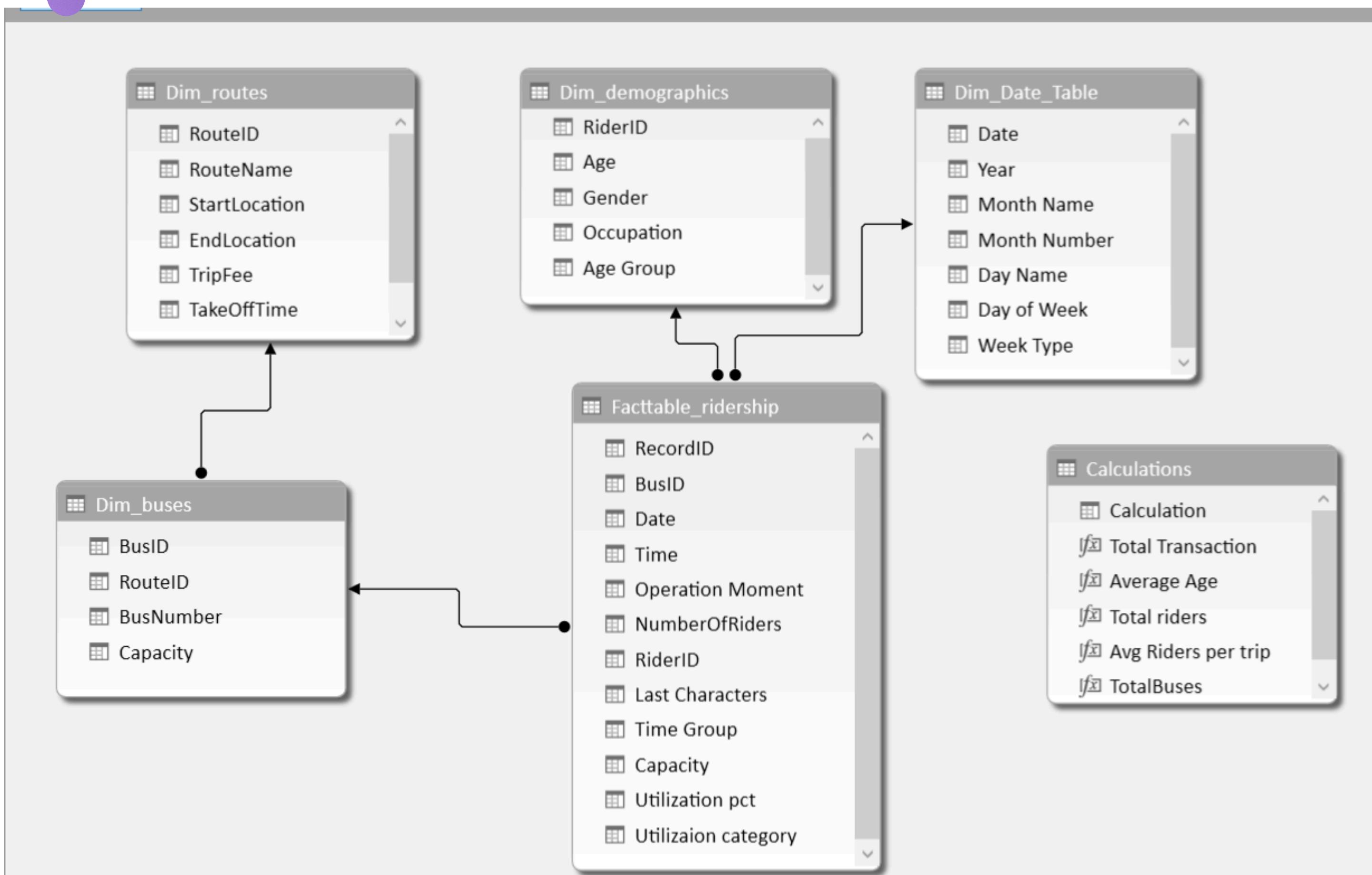
02 Determine busiest and least busy routes for better resource allocation.

03 Understand passenger demographics for targeted marketing.

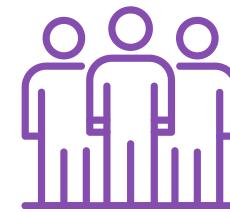
04 Assess bus utilization rates for efficient fleet use.

05 Examine temporal ridership trends for strategic decisions.

DATAMODEL



Key Performance Indicators



Total Riders - 6,587



Avg Riders per Trip - 33



Avg Trip fee - \$26.80



**Busiest Route - East West
Express**

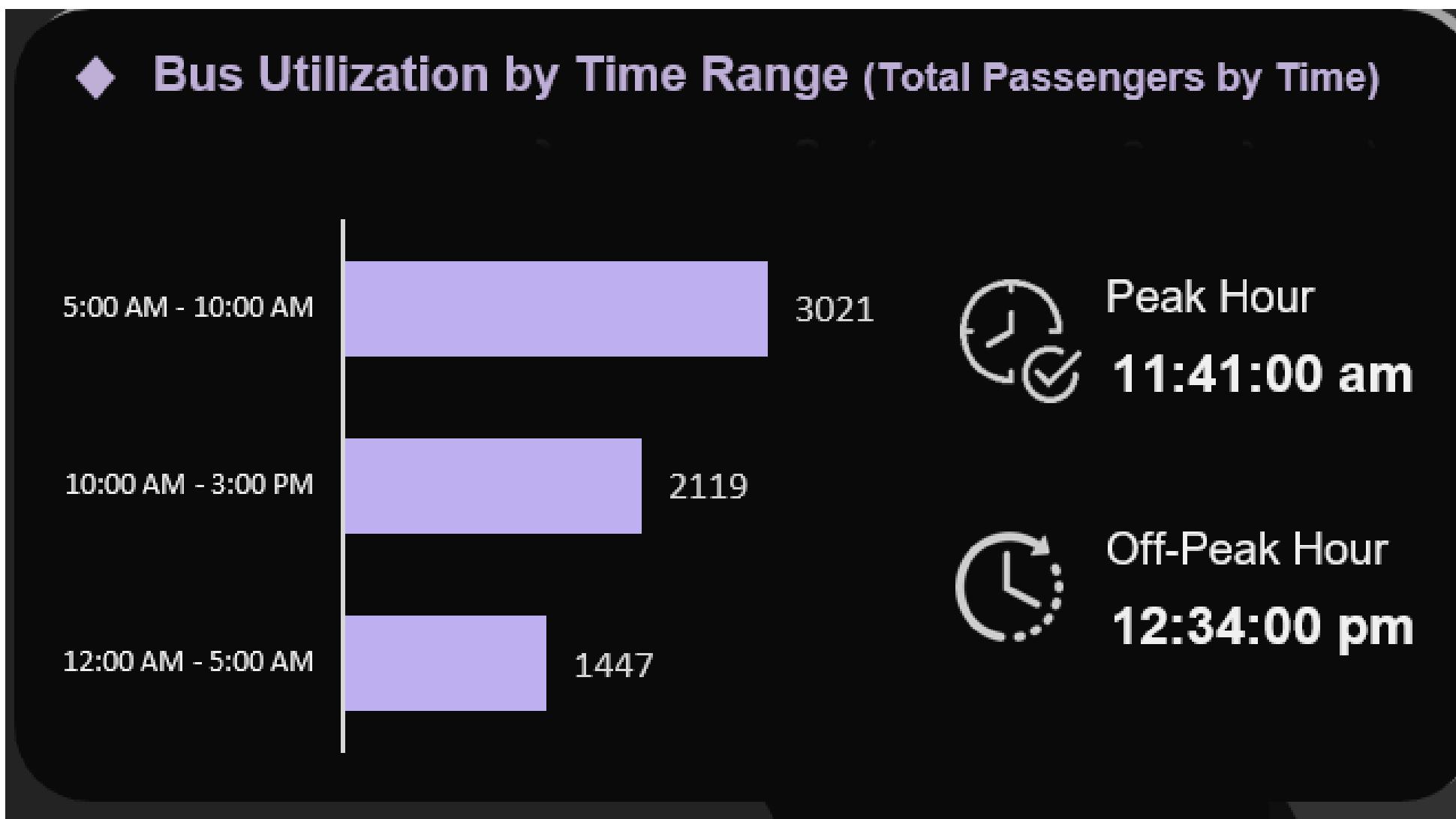


**Least Busy Route - South
Line**

INSIGHTS AND RECOMMENDATIONS

Time Range Analysis

Question: How is bus utilization distributed across different times of the day?



Insight

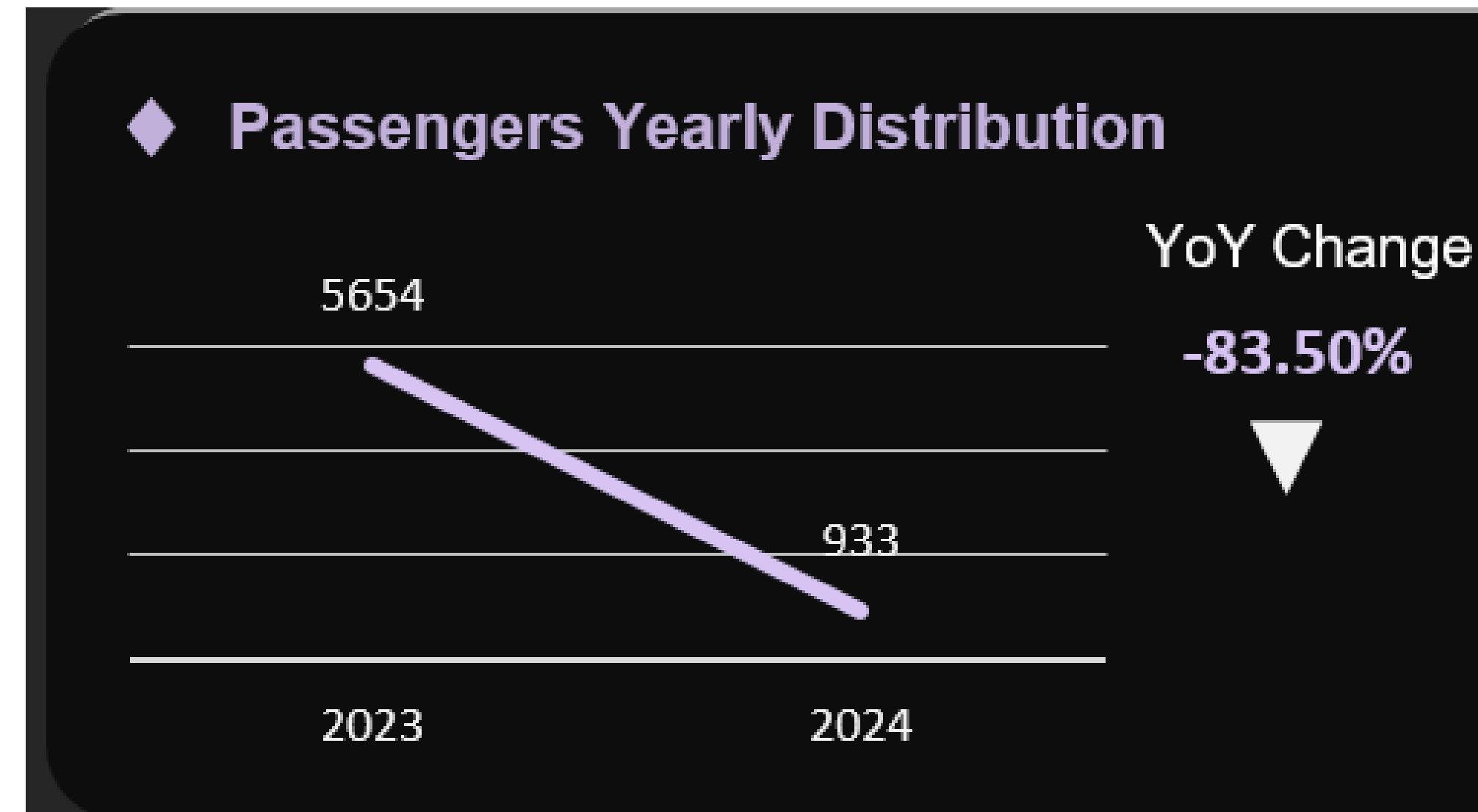
Highest utilization is between 5:00 AM and 10:00 AM with 3,021 passengers. Lowest is from 12:00 AM to 5:00 AM with 1,447 passengers. Peak hour is at 11:41 AM, and off-peak hour is at 12:34 PM.

Passengers Yearly Distribution

Question: How does annual ridership compare?

Insight

There is a sharp decline in yearly passengers from 2023 (5,654) to 2024 (933), representing an 83.50% decrease. This indicates a significant drop in ridership year-over-year, suggesting a need for improvement.

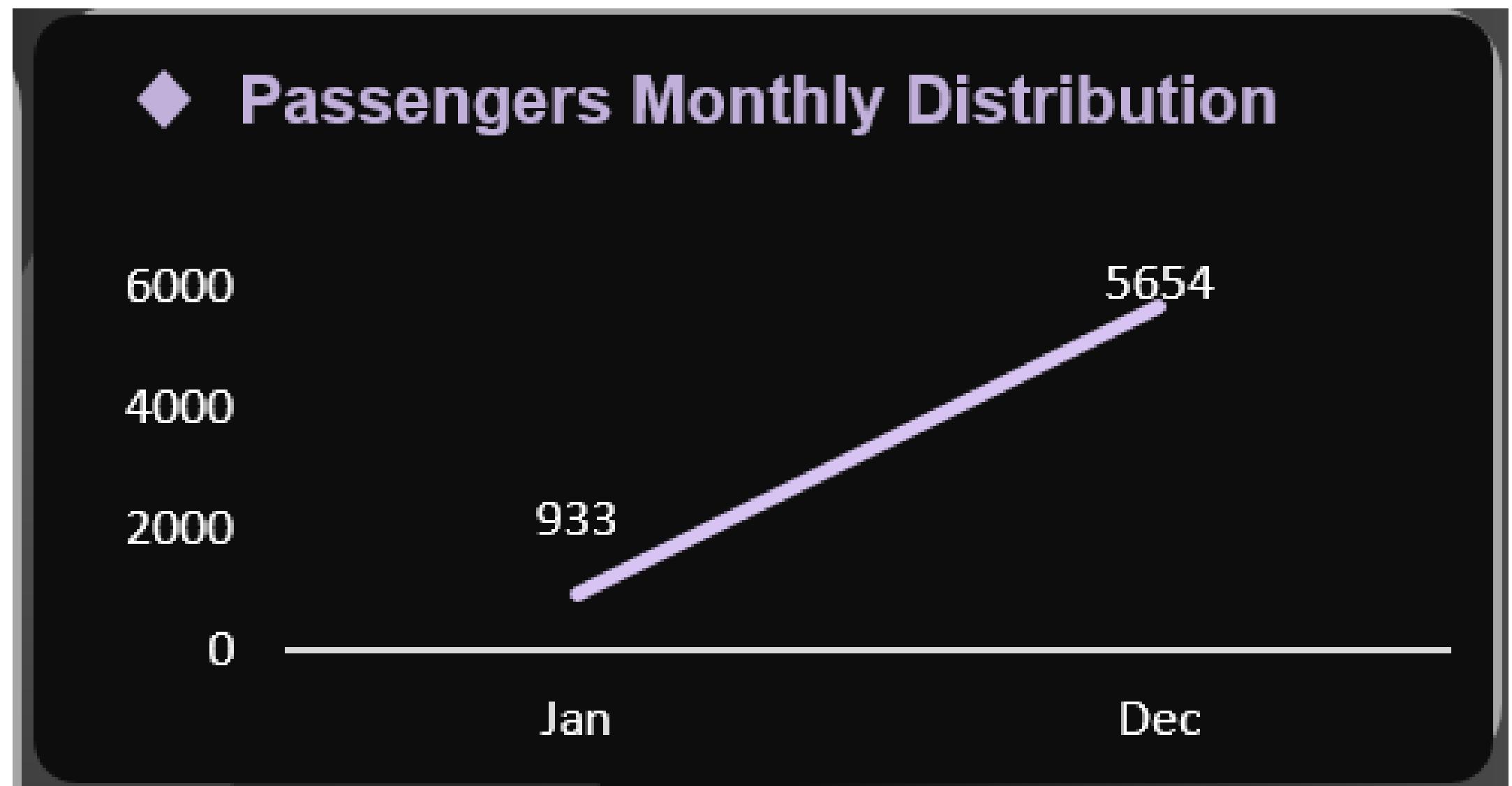


Monthly Analysis

Question: How does bus ridership vary across different months?

Insight

Ridership reduces significantly from December 2023 (5,654 passengers) to January 20 (933 passengers). This shows a substantial rise in bus usage towards the end of the previous year compared to the start of the current year.

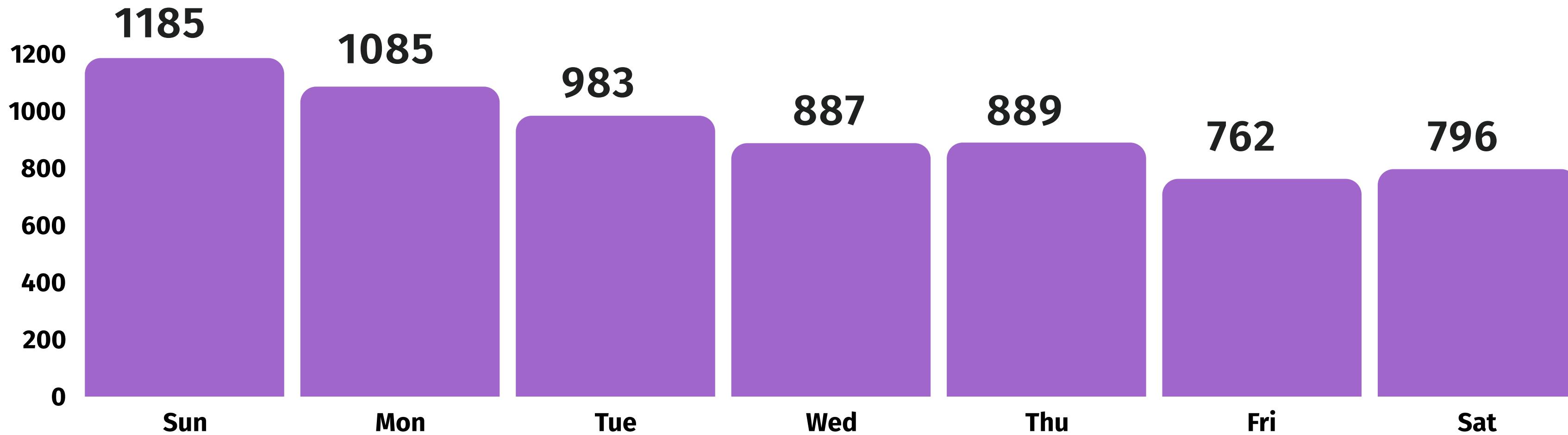


Weekly Analysis

Question: What are the patterns of bus ridership on different days of the week?

Insight

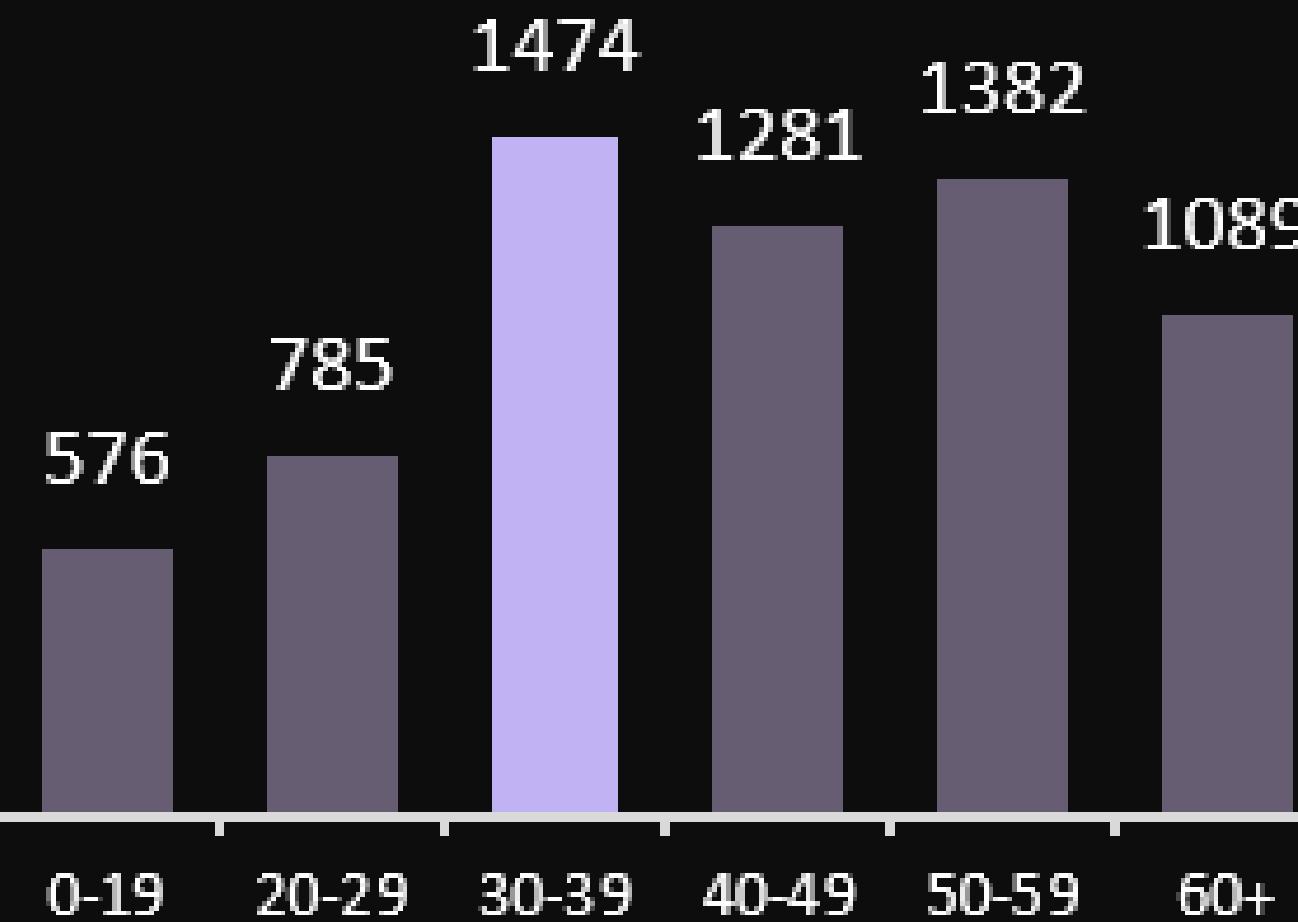
Sunday, Monday, and Tuesday have the highest ridership, together accounting for 49.4% of total passengers. Ridership is lowest on Friday and Saturday.



Age-Group Analysis

Question: What is the age-group distribution of bus passengers?

◆ Age-Group Distribution



Insight

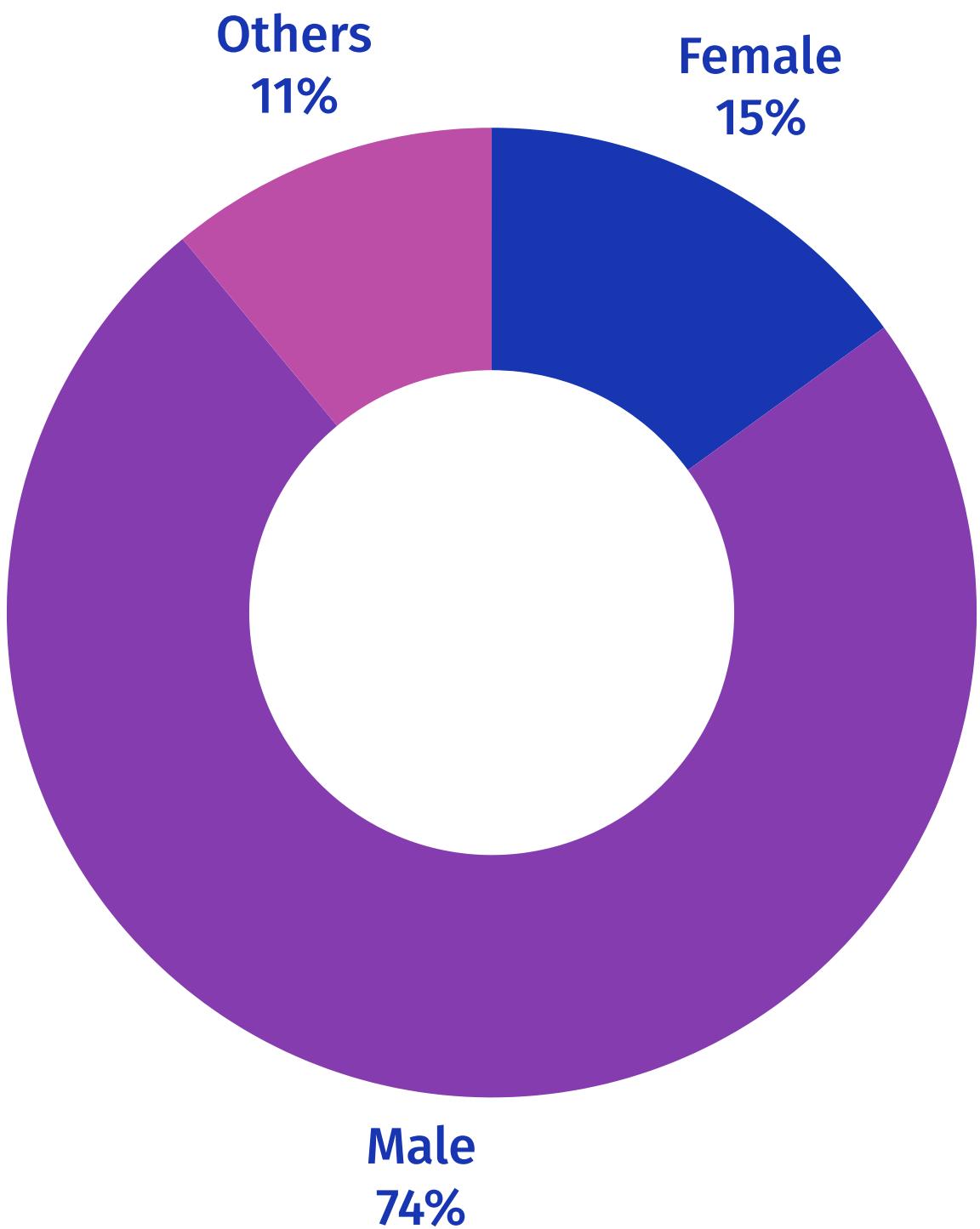
The 30-39 age group has the highest ridership with 1,474 passengers, followed by 40-49 (1,382 passengers) and 50-59 (1,281 passengers). The youngest age group (0-19) has the least ridership with 576 passengers.

Demographics by Gender

Question: What is the age-group distribution of bus passengers?

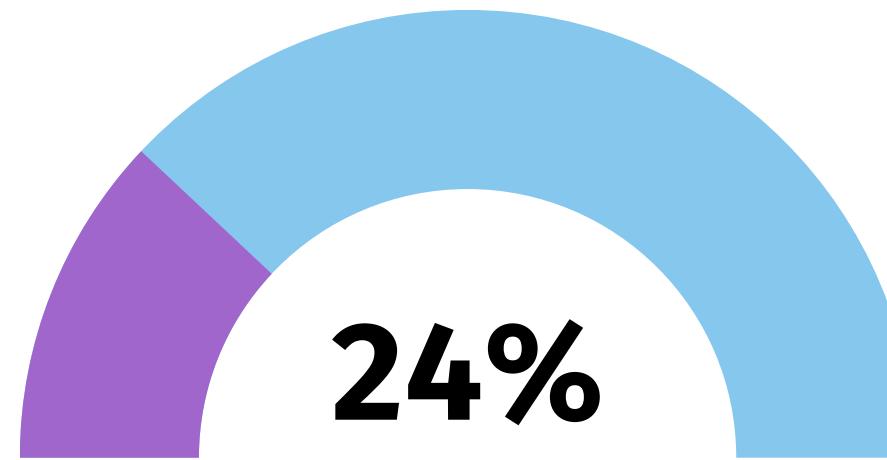
Insight

The majority of passengers are male (74%), followed by female (15%), and other genders (11%). This indicates a significant male dominance in bus ridership.

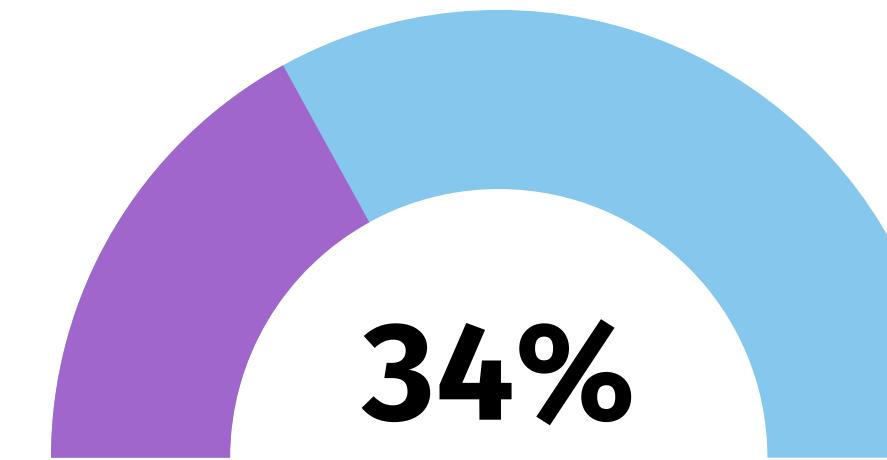




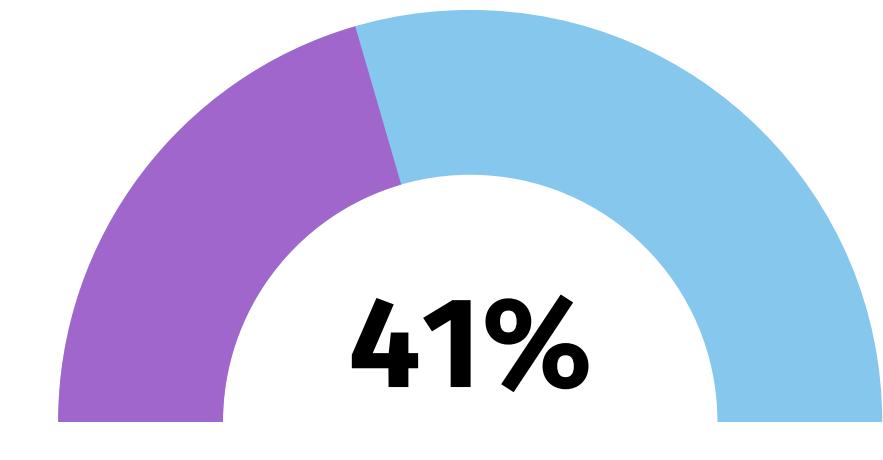
BUS UTILIZATION RATE



Over Utilized



Well Utilized



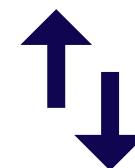
Under Utilized

Insight

24% of buses are over-utilized (20 total buses), 34% are well-utilized (28 total buses), and 41% are under-utilized (34 total buses). This indicates that a significant portion of the bus fleet is not being used to its full potential.



Recommendations



Address Under-Utilized Buses

Reallocate or reduce buses on under-utilized routes. Analyze reasons for low utilization and adjust schedules or routes accordingly.



Investigate Yearly Ridership Decline

Identify causes of the yearly passenger decline. Develop strategies to regain ridership, like service improvements or community engagement.



Improve Weekday Ridership

Implement marketing campaigns and incentives for weekdays. Introduce discounted fares or promotions on low ridership days.



Enhance Peak Hour Services

Increase bus frequency during peak hours. Ensure schedules align with commuter needs for reliable and comfortable service.

Recommendations



Expand Services for High-Demand Age Groups

Cater services to the 30-39 age group. Consider adding express routes or more frequent services during their peak times.



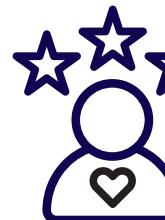
Gender-Specific Marketing

Create campaigns to increase female ridership. Address safety or convenience concerns and promote improvements to attract more female passengers.



Seasonal Adjustments

Adjust schedules and increase capacity during peak months. Consider seasonal promotions to boost ridership.



Customer Feedback and Satisfaction

Implement a feedback system to gather passenger opinions. Use data to make continuous service quality improvements.

DASHBOARD

Bus Transportation Dashboard

Operation Moment

AM

PM

Total Riders
6,587

Avg Riders per Trip
33

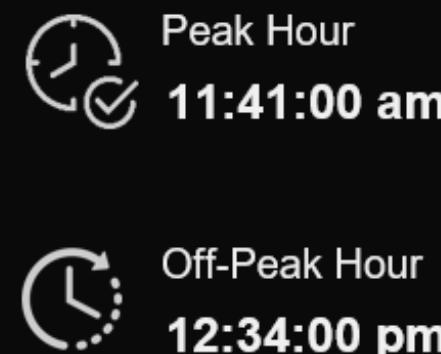
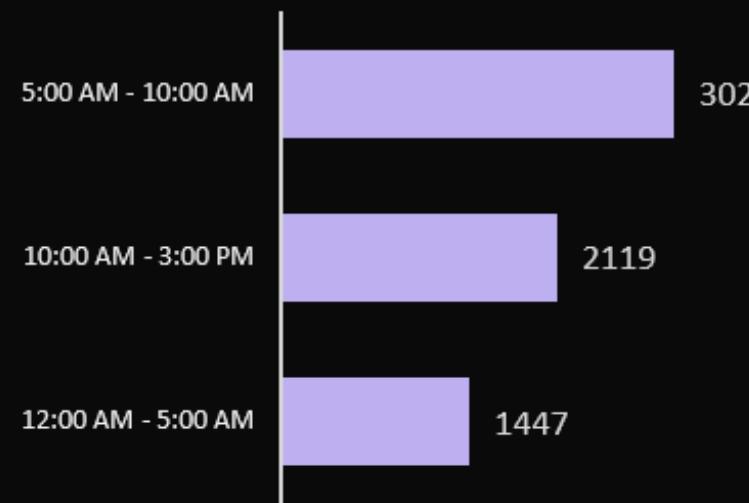
Avg Trip fee
\$26.80

Busiest Route
East-West Express

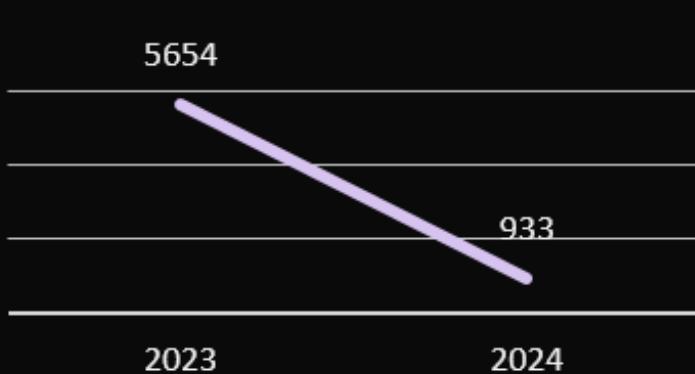
Least Busy Route
South Line

Year	2023	2024
Passenger Count	6,587	933

Bus Utilization by Time Range (Total Passengers by Time)



Passengers Yearly Distribution

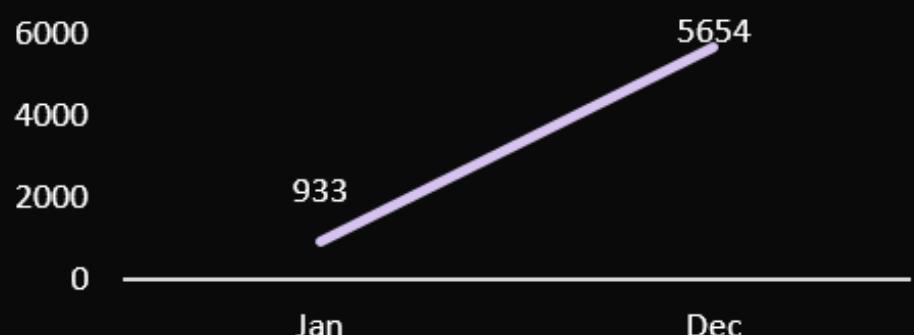


YoY Change
-83.50%



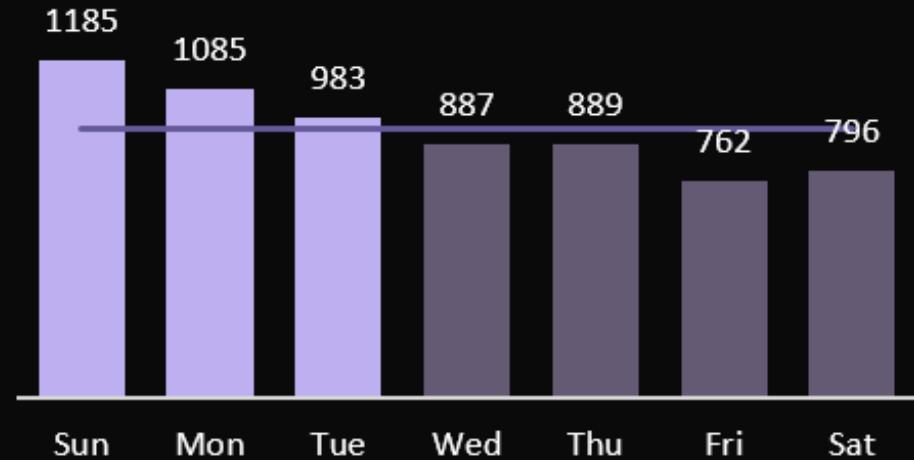
YoY change suggests room for improvement

Passengers Monthly Distribution



Passengers Weekday Distribution

Focus on Highlighted Weekdays: they exceeded the 941 passengers average and account for 49.4% of Total passengers

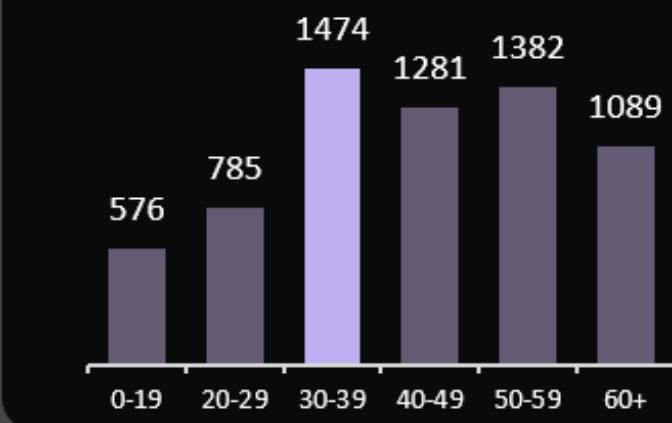


Passengers Demographics

By Gender

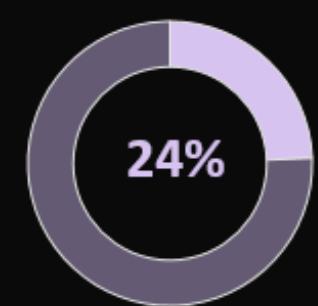


Age-Group Distribution

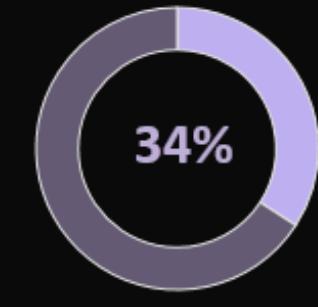


Average Age 43

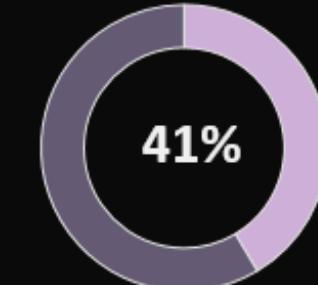
Bus Utilization Rate



Over-Utilized
20 Total Buses



Well-Utilized
28 Total Buses



Under-Utilized
34 Total Buses

Thank you!

Feel free to reach if you have any questions.