Cyclistic Bike-Share Analysis

A Google Data Analytics Capstone Project exploring how to convert casual riders into annual members for long-term profitability.

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Business Task and Problem Statement

Objective

Identify key factors influencing bike-share usage trends.

User Demographics

Analyze who uses the bikes and their travel behaviors.

Ride Patterns

Explore trends by time, day, and month for targeted action.

Recommendations

Propose growth strategies tailored to rider behavior.

Data and Analytical Tools

Data Source

12 months of combined trip data from 2019-2020, 5M+ rides.

Tools Used

- Python and Pandas for data processing
- Matplotlib and Seaborn for visualization
- Jupyter Notebook for interactive analysis

Data Cleaning

Standardize

Standardized column names across quarterly files.

Missing Value Removal

Ensured data completeness and accuracy.

Create

Added useful fields: ride_length_minutes, day_of_week, month_name, hour, and age.

Age Filtering

Retained realistic ages (18-60 years).

Feature Engineering

Duration

Calculated ride length in minutes

Classification

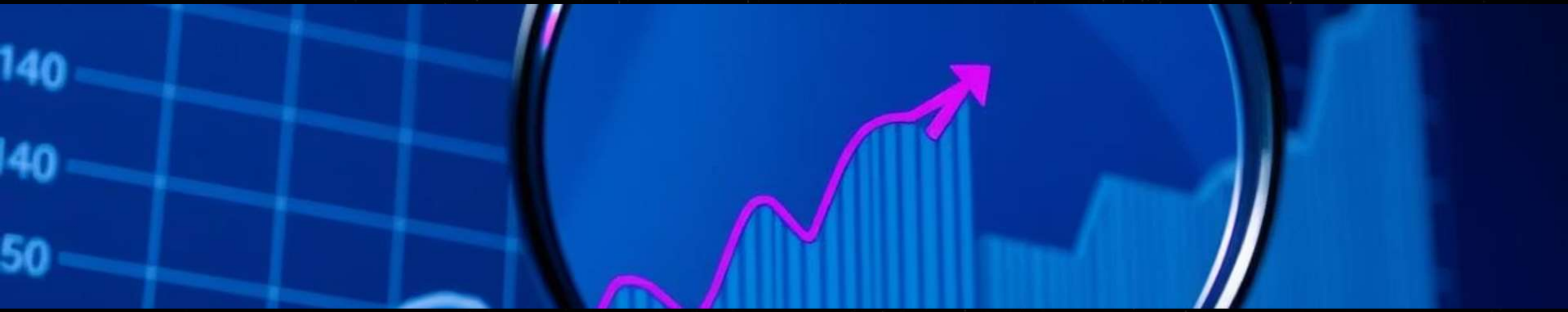
Separated rides by user type: Casual vs. Member

Timing

Extracted ride start hour and day

Demographics

Determined rider age from birth year



Outlier Detection and Removal

IQR Method Applied

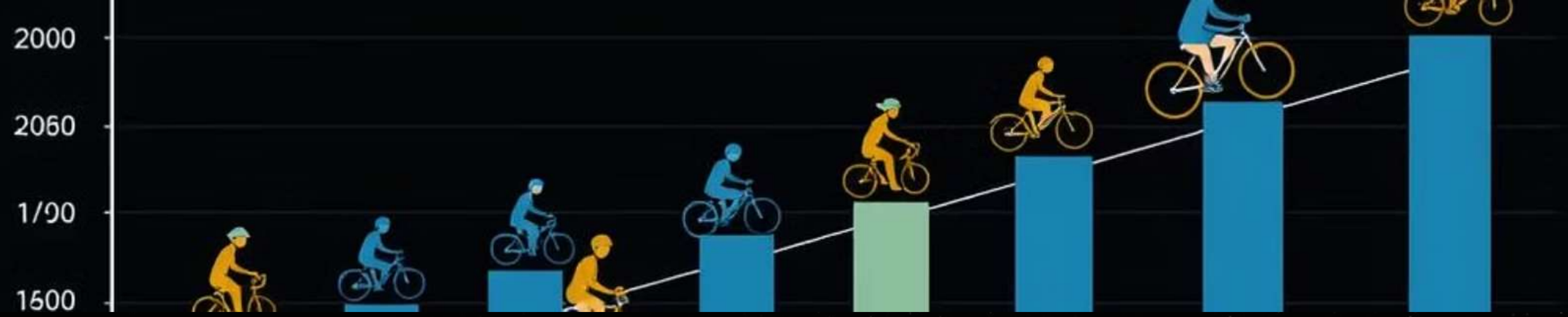
Interquartile Range used on ride length data.

Extreme Duration Removal

Eliminated unrealistic ride times.

Improved Accuracy

Resulted in clearer plots and averages.



Exploratory Data Analysis

1

Ride Duration

Members take shorter, more consistent rides, Casual riders Longer, Varied rides

2

Weekly Patterns

Casual riders show heavy weekend usage.

3

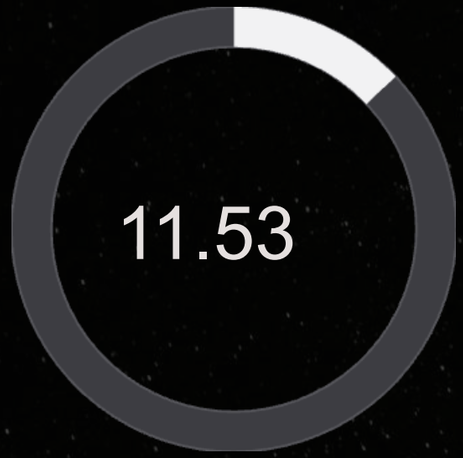
Seasonal Trends

Ride volume peaks during summer months.

Ride Duration Comparison

Casual Riders

Average ride length in minutes



Annual Members

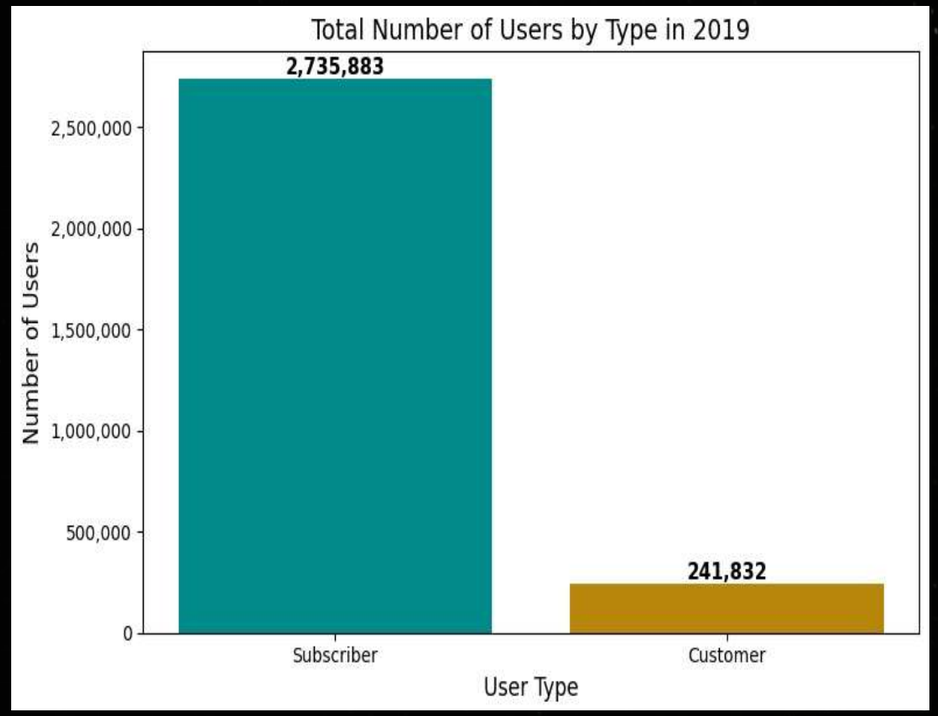
Average ride length in minutes

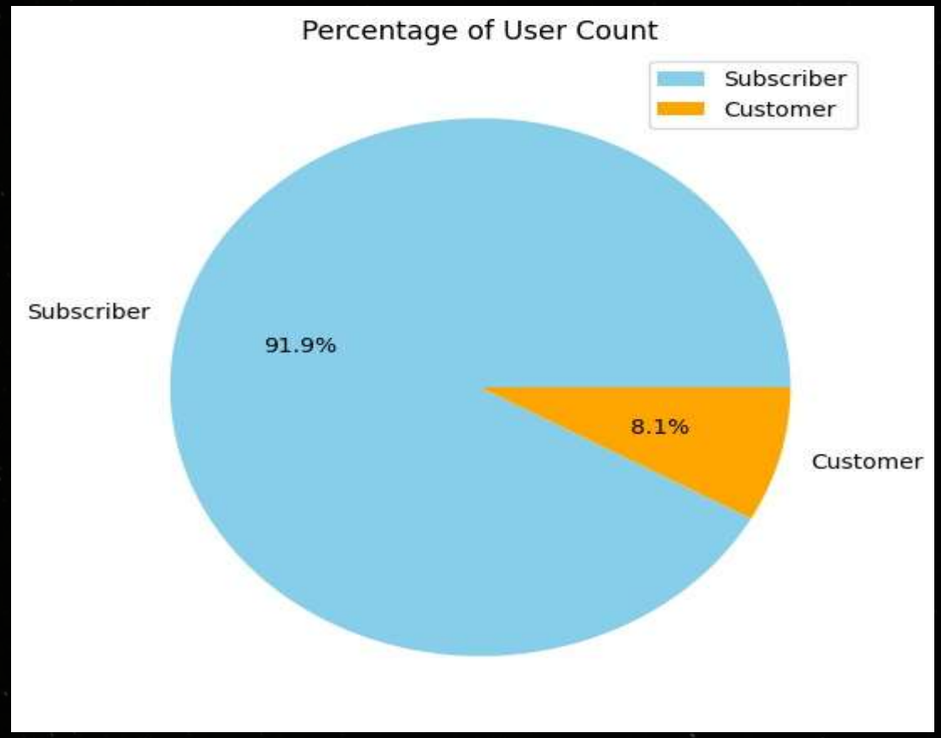
Difference

Casual rides ride 173.77% longer on average than members.

Our Rider Community

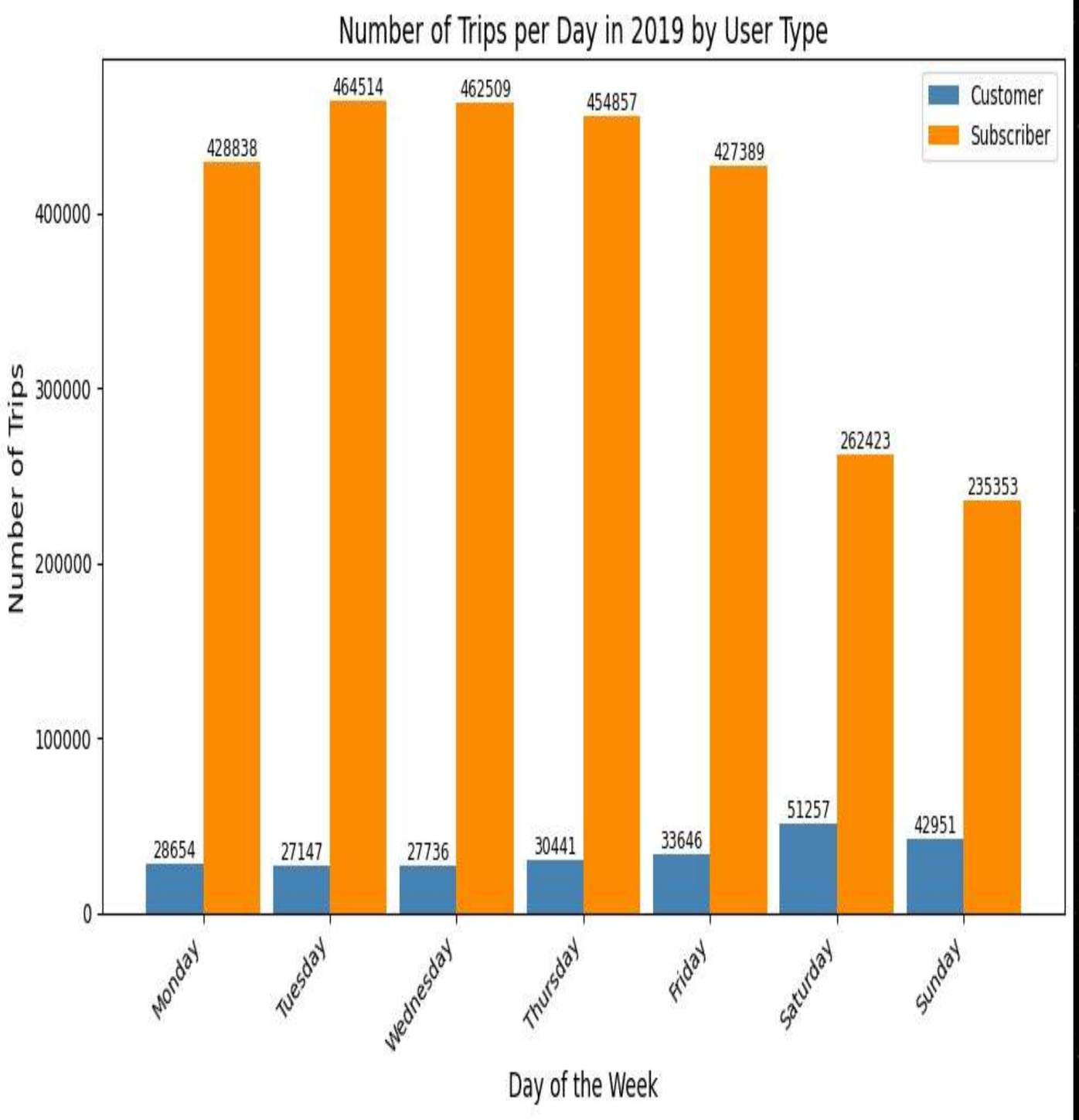
Annual members dominate ridership
casual riders offer growth potential.





Majority are annual subscribers, providing stable revenue.

Casual users represent the largest opportunity for growth.



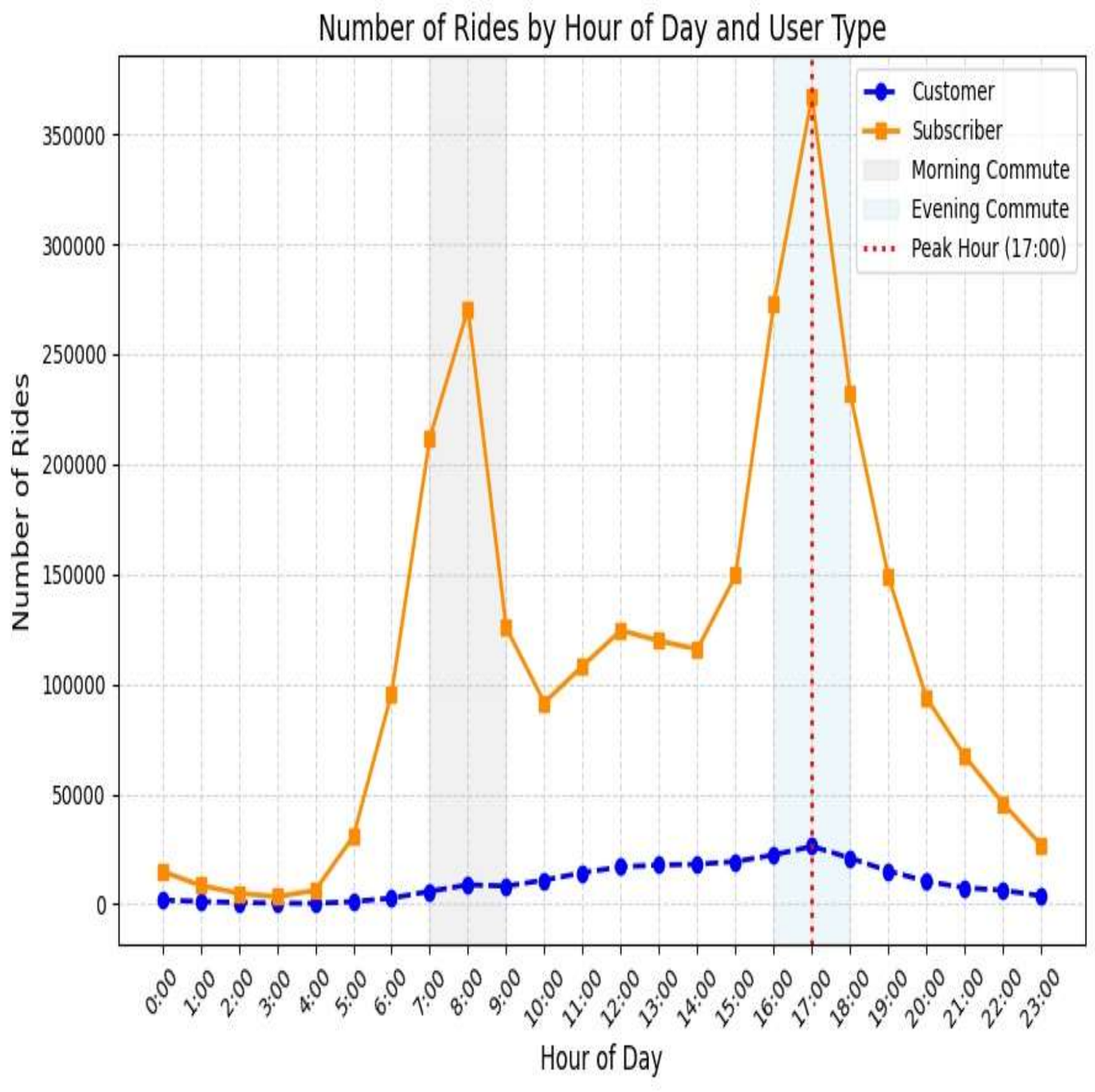
Weekly Usage Trends

Annual Members

Ride frequency decreases on weekends compared to weekdays

Casual Riders

Usage spikes on Saturdays and Sundays.



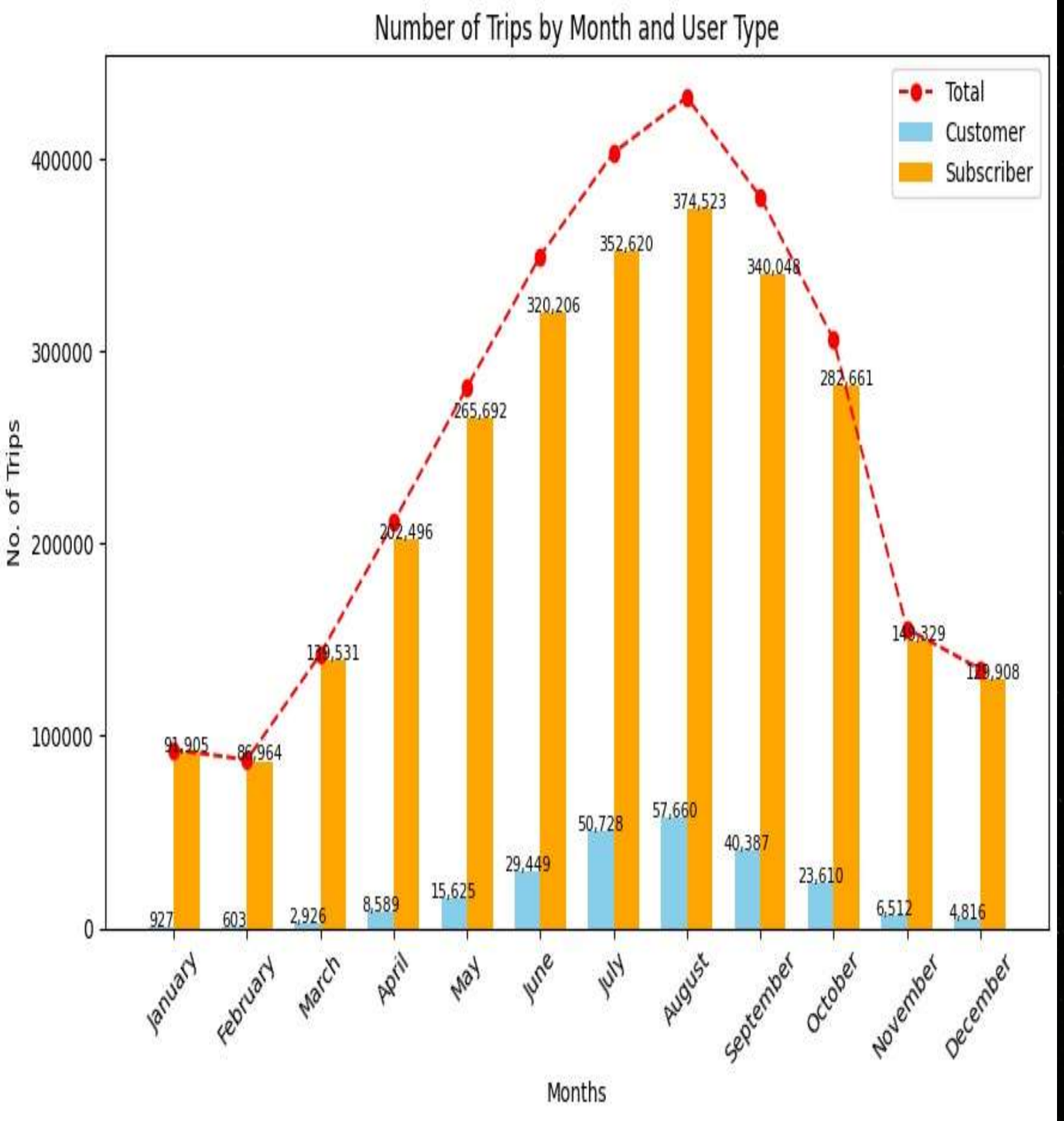
Daily Usage Patterns

Annual Members

Sharp morning and evening peaks during commute hours.

Casual Riders

Use bikes at varied times with flat distribution across day.



Seasonal Ridership Trends

Peak in Summer

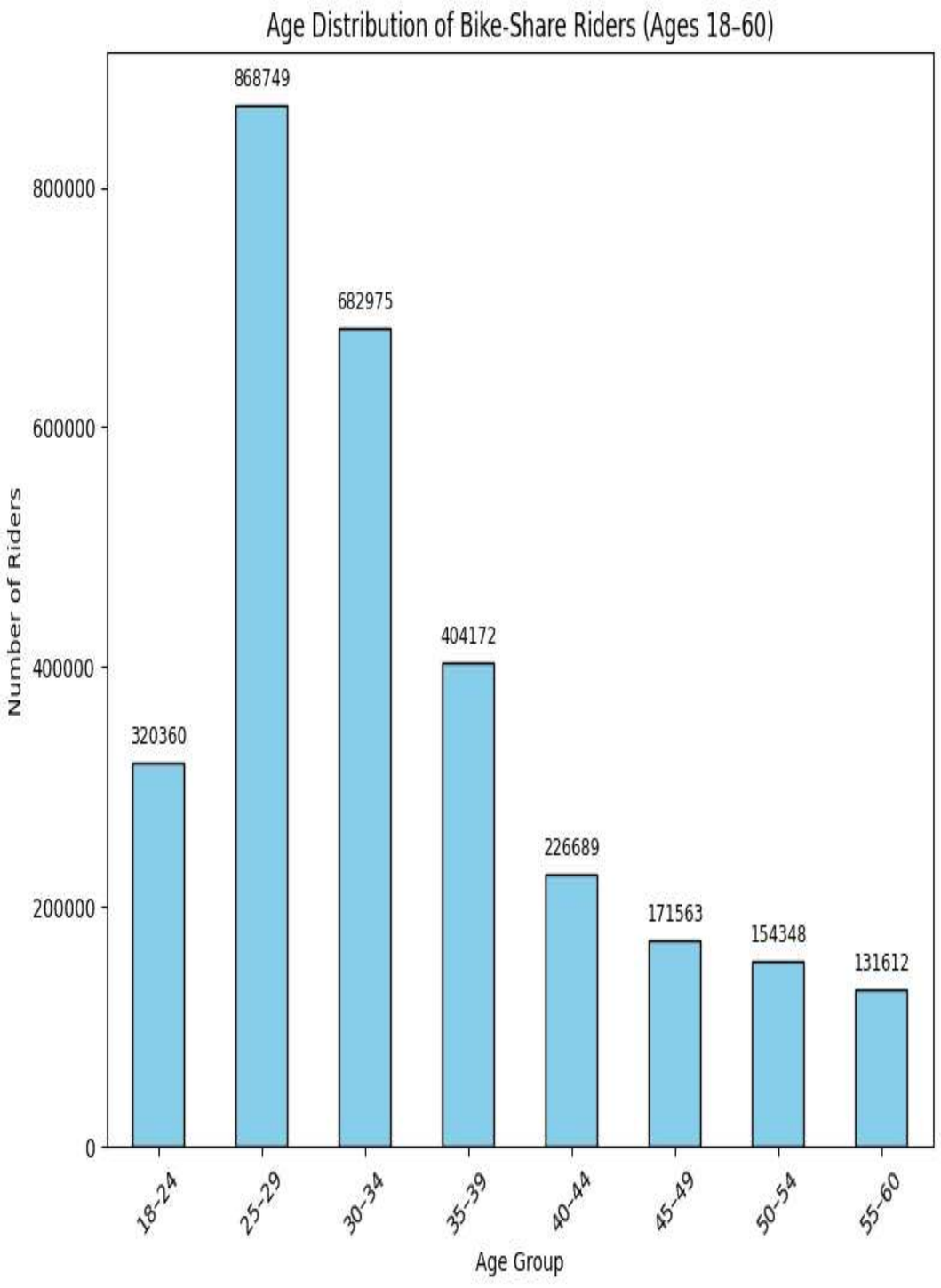
Both members and casual riders increase activity.

Consistent Members

Annual members sustain ridership across all seasons.

Casual Variability

Usage fluctuates more by season.



Rider Age Demographics

Main Age Group

Most riders fall between 25 to 34 years old.

Additional Insights

Understanding the core demographic helps refine marketing.

Strategies to Grow Membership

1

Weekday Incentives

Encourage casual riders to commute with membership perks.

2

Summer Promotions

Leverage peak casual usage to boost sign-ups.

3

Targeted Marketing

Focus campaigns on riders aged 25-34 for maximum impact.

Conclusion and Next Steps

Convert Casual Riders

Focus on their unique usage habits for effective strategies.

Implement Promotions

Use data-driven actions to increase annual memberships.

Monitor Results

Track impact and iterate strategies for continued success.