1. Executive Summary

Cyclistic is a bike-sharing company seeking to increase the conversion of casual riders into annual members. While members already represent a stable and predictable user base, casual riders account for a significant portion of total trips and show patterns that suggest a strong potential for conversion.

This analysis examines user behavior differences between casual riders and members by analyzing trip volume, duration, temporal patterns, and station-level activity. Using trip data from 2019 and 2020, the study identifies when, how, and where casual riders use the service most intensively.

The results indicate that casual riders primarily use the service for recreational purposes, with higher activity during weekends, longer trip durations, and strong concentration in specific high-traffic stations located in leisure and tourist areas. These findings highlight clear opportunities for targeted, location-based, and time-specific marketing strategies aimed at increasing annual memberships.

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2. Business Task

The primary business objective of this analysis is to support Cyclistic's marketing strategy by identifying behavioral patterns that differentiate casual riders from annual members.

Specifically, the analysis seeks to answer the following question:

How do casual riders and annual members differ in their usage patterns, and how can these differences be leveraged to convert casual riders into annual members?

The focus is placed on usage frequency, trip duration, weekly patterns, and station-level activity in order to generate actionable insights for marketing decision-making.

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3. Data Sources

The analysis uses publicly available bike-sharing trip data provided by Cyclistic (Divvy datasets), covering trips from **Q1 2019 and Q1 2020**.

Each dataset contains detailed trip-level information, including:

- Trip start and end timestamps
- Start and end station names
- User type (member or casual)
- Trip duration and related attributes

The analysis was conducted using:

- **Google Sheets** for initial data inspection and standardization
- **Google BigQuery** for data cleaning, transformation, and SQL-based analysis
- **Tableau Public** for data visualization and dashboard creation

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4. Data Cleaning and Preparation

Before conducting the analysis, several data cleaning and preparation steps were required to ensure consistency and comparability between the two datasets.

User type standardization

The datasets used different labels to describe user categories:

- 2019: `Subscriber` and `Customer`
- 2020: `member` and `casual`

These values were standardized into two unified categories: **`member`** and **`casual`**, allowing for consistent comparison across years.

Structural alignment

To align the datasets structurally:

- Geographic coordinate columns present only in the 2020 dataset were removed, as they were not available in 2019.

- Trip start and end timestamp columns were renamed to use consistent field names across both datasets.

- The column `rideable_type` was removed, as it contained only a single value (`docked_bike`) and did not provide analytical value.

Data integration

After standardization, both datasets were loaded into **BigQuery** and combined into a single table using `UNION ALL`, creating a consolidated dataset for analysis.

Data quality filtering

During exploratory analysis, inconsistencies were identified in trip duration values, including negative durations and extremely large values. These were interpreted as data recording errors or anomalous cases.

To prevent distortion of analytical results:

- Trips shorter than **1 minute** were removed

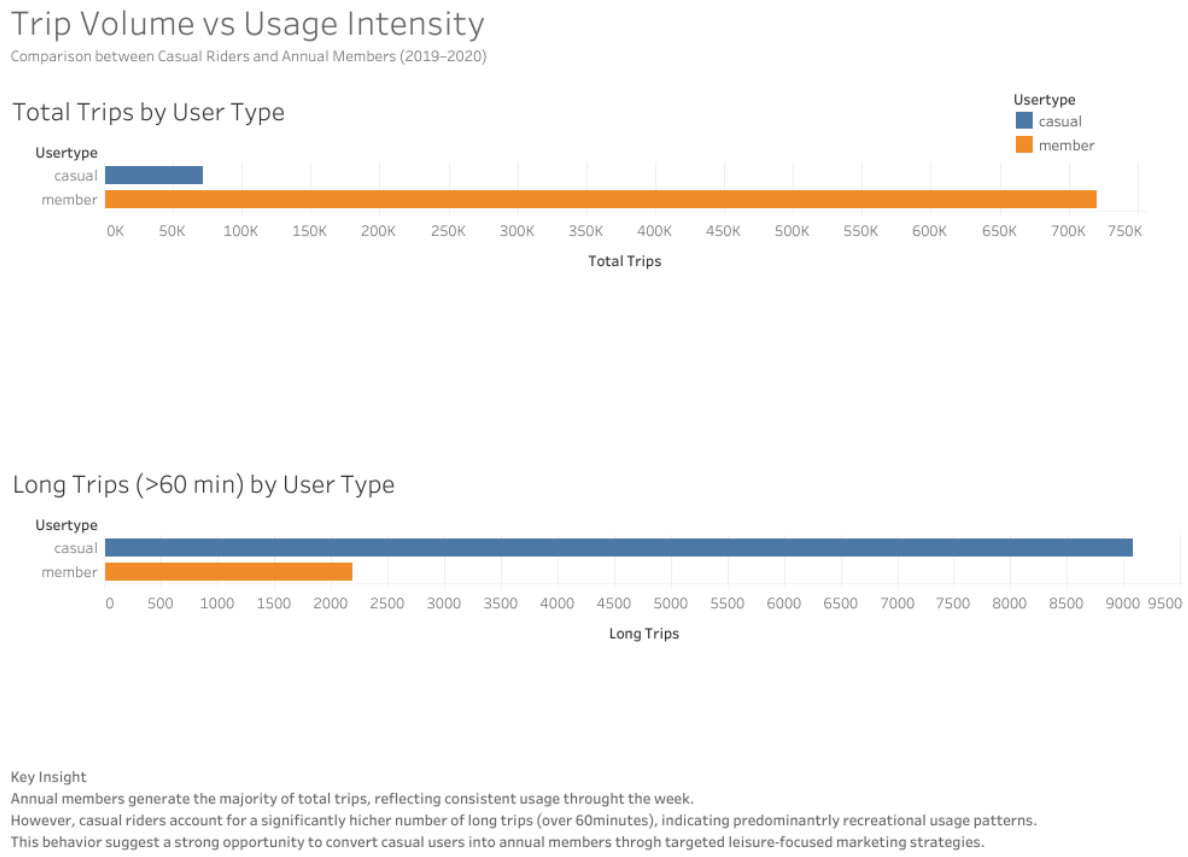
- Trips longer than **24 hours (1440 minutes)** were excluded

These filters ensured that the analysis focused on realistic and representative usage patterns.

5. Analysis and Key Findings

This section presents the main analytical findings derived from SQL queries and visualized through interactive dashboards. Each finding directly addresses the business task of identifying opportunities to convert casual riders into annual members.

5.1 Trip Volume by User Type

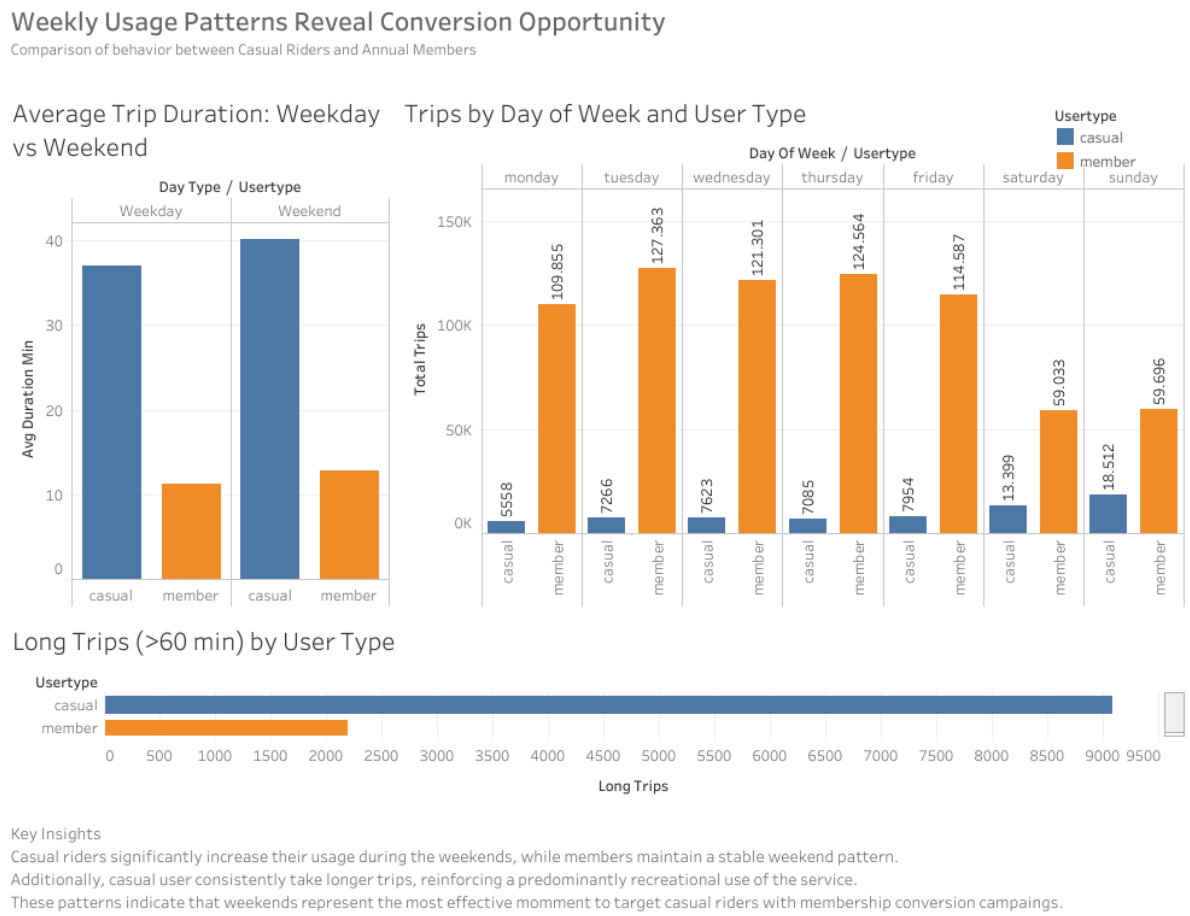


The analysis of total trip volume shows that annual members generate the majority of trips, reflecting a stable and consistent usage pattern. This behavior aligns with functional and routine-based usage, such as commuting.

However, casual riders still represent a substantial portion of total trips, indicating a meaningful opportunity for conversion if their usage behavior aligns with recurring or high-engagement patterns.

Key insight:
While members dominate total usage, casual riders constitute a large and valuable segment that should not be treated as sporadic or insignificant.

5.2 Weekly Usage Patterns by User Type



When analyzing trips by day of the week, a clear behavioral divergence emerges between the two user types.

- **Members** display a relatively stable distribution of trips throughout the week, with higher activity during weekdays.

- **Casual riders** show a strong concentration of usage during weekends, often doubling or exceeding their weekday trip volume.

This pattern indicates that casual riders primarily use the service during leisure time rather than for daily transportation needs.

Key insight:
Weekends represent the most critical time window to target casual riders with conversion-focused marketing campaigns.

5.3 Trip Duration: Weekday vs Weekend

Trip duration analysis reveals additional differences between user types.

Casual riders consistently take longer trips than members on both weekdays and weekends. While members maintain relatively uniform trip durations, casual riders exhibit longer average durations, particularly during weekends.

This reinforces the hypothesis that casual riders use the bike-sharing service mainly for recreational purposes, such as sightseeing, leisure rides, or tourism.

Key insight:
Longer trip durations among casual riders suggest higher engagement per ride, increasing the likelihood of conversion when paired with appropriate incentives.

5.4 Long Trip Analysis (Trips ≥ 60 Minutes)

To further isolate recreational usage, trips lasting 60 minutes or longer were analyzed.

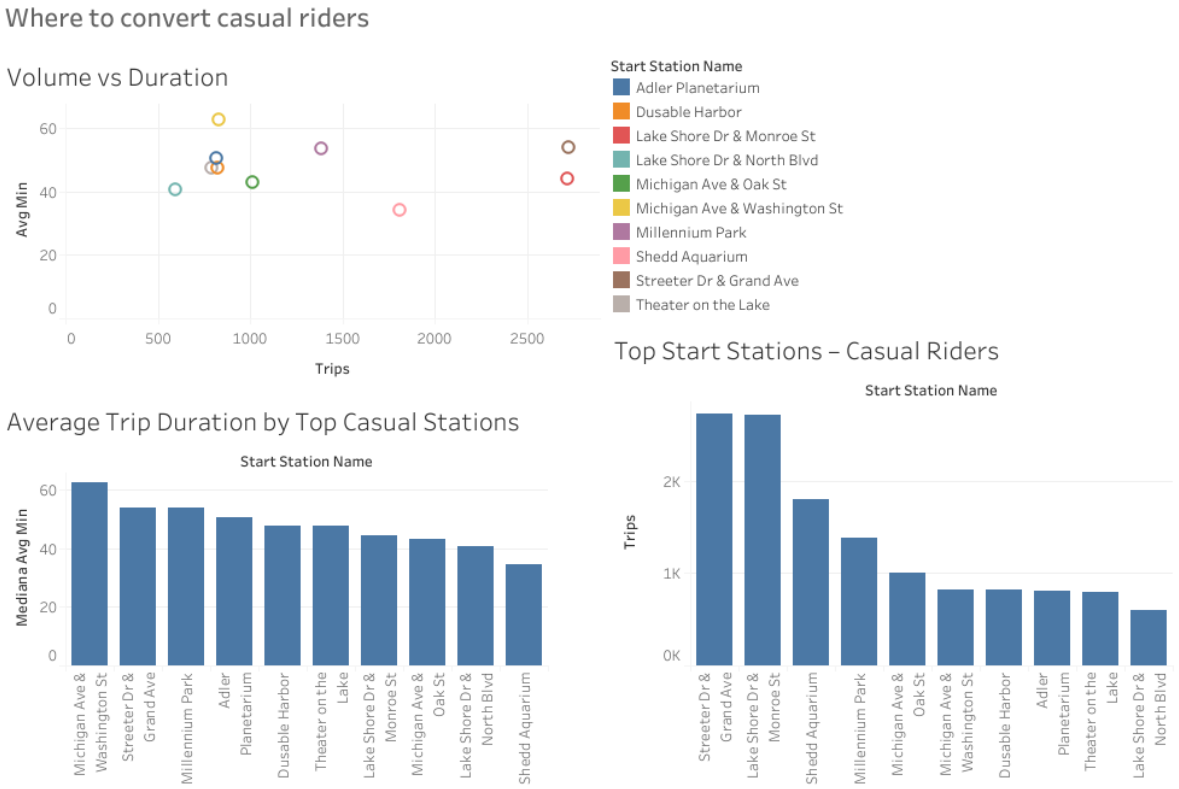
The results show that:

- Casual riders account for the majority of long-duration trips.
- Members contribute relatively few trips in this category.

This finding strengthens the distinction between functional and recreational usage patterns.

Key insight:
Casual riders are already engaging in extended usage sessions, indicating recurring value extraction from the service without membership commitment.

5.5 Station-Level Analysis: Where Casual Riders Start Their Trips



Casual riders are highly concentred in recreactional and tourist-heavy stations such as lakefront areas, parks, and attractions . These locations show both high trip volumeand long average ride duration(40-60minutes) suggesting repeated leisure use rather than one-time trials. This pattern indicates a strong opportunity to target casual ridersat these station with memberships conversion campaigns, especially during weekends and peak leisure hours.

To identify high-impact locations for marketing efforts, the analysis focused on **start stations** as proxies for user concentration and points of interaction.

The results reveal that casual riders are heavily concentrated in a limited number of stations, many of which are located in:

- Tourist areas
- Waterfronts
- Parks and recreational zones

These stations combine:

- High trip volume
- Longer average trip durations

Destinations were intentionally excluded from the analysis, as they do not represent direct interaction points for user acquisition or marketing interventions.

Key insight:
A small subset of high-traffic recreational stations represents the strongest opportunity for location-based membership conversion strategies.

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6. Marketing Implications and Recommendations

Based on the analytical findings, the following data-driven recommendations are proposed:

1. **Focus conversion campaigns on weekends**, when casual rider activity peaks.
2. **Prioritize high-volume recreational stations** for localized promotions, signage, and digital activations.
3. **Emphasize leisure-oriented messaging**, such as scenic routes, curated rides, or weekend experiences.
4. **Introduce membership incentives tied to usage**, such as discounts or rewards for long or frequent rides.
5. **Deploy on-site or app-based prompts** at start stations with high casual rider concentration.

These strategies align marketing efforts with actual user behavior, increasing the likelihood of successful conversion.

Interactive Dashboards

> The full interactive dashboards used in this analysis are available on Tableau Public:
>
> Link Dashboard Tableau
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> SQL queries used for the analysis are available in the project repository.

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7. Limitations

This analysis is subject to several limitations:

- The dataset does not include user-level identifiers, preventing analysis of individual rider recurrence or loyalty.
- No demographic or contact information is available, limiting direct targeting strategies.
- The analysis covers only a partial yearly period, which may not capture seasonal variations.
- External factors such as weather, events, or pricing changes were not included.

These limitations should be considered when interpreting the results and planning future analyses.

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8. Next Steps

Future analyses could enhance decision-making by incorporating:

- Full-year or multi-year datasets
- Weather and seasonal data
- Event and tourism calendars
- User-level anonymized identifiers to measure repeat casual usage

Such data would allow more precise modeling of conversion probability and long-term customer value.

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9. Conclusion

The analysis demonstrates that casual riders exhibit consistent and predictable behavioral patterns that differ significantly from annual members. Their preference for weekend usage, longer trip durations, and concentration in recreational stations suggests strong untapped potential for conversion.

By aligning marketing strategies with these behavioral insights, Cyclistic can implement targeted, data-driven campaigns to effectively convert casual riders into long-term members.