

Case study: How does a bike-share navigate speedy success?

Business Task

The objective of this analysis is to understand how annual members and casual riders use Cyclistic bikes differently. Cyclistic's marketing team believes that increasing the number of annual memberships is key to the company's long-term growth. To support this goal, the analysis focuses on identifying behavioral differences between casual riders and members, specifically in terms of ride frequency and ride duration. These insights are intended to inform data-driven marketing strategies aimed at converting casual riders into annual members.

***Key stakeholder:** Cyclistic's marketing leadership and executive team, who will use these findings to approve and guide future marketing initiatives.*

Data Sources

This analysis uses publicly available Cyclistic trip data provided by Motivate International Inc. and made available for the purpose of this case study. The following datasets were used:

- Divvy Trips 2019 Q1
- Divvy Trips 2020 Q2

These datasets were selected in accordance with the case study document, which recommends using these two quarters when working in R due to memory constraints. Each dataset contains detailed trip-level information, including ride start and end timestamps, station information, rider type, and trip identifiers.

The data is Reliable, Original, Comprehensive, Current, and Credible.

Data Cleaning and Preparation

The analysis was conducted using R for data wrangling and Tableau for visualization. Libraries used include tidyverse and conflicted.

Step 1: Column Standardisation

Column names were standardized across both datasets to ensure consistency. 2019 Q1 dataset columns were renamed to match the 2020 dataset (trip_id -> ride_id, start_time -> started_at).

Step 2: Rider Type Standardisation

In the 2019 dataset, rider types were labeled as Subscriber and Customer. These were recoded to match the 2020 labels of member and casual, respectively.

Step 3: Dataset merging and removal of extra columns

The 2019 Q1 and 2020 Q1 datasets were combined into a single master dataset using row binding. Columns not present in the 2020 dataset (gender, latitude/longitude, etc.) were removed to maintain consistency.

Step 4: Data Manipulation to derive new columns

A new column, ride_length, was calculated as the difference between ended_at and started_at timestamps (in seconds).

An additional column specifying the day of the week was added to the master dataset as well.

Step 5: Data Integrity Checks

Trips with negative ride lengths or quality-control test rides (e.g., “HQ QR” station entries) were removed. Final v2 dataset contained only valid, positive-duration rides.

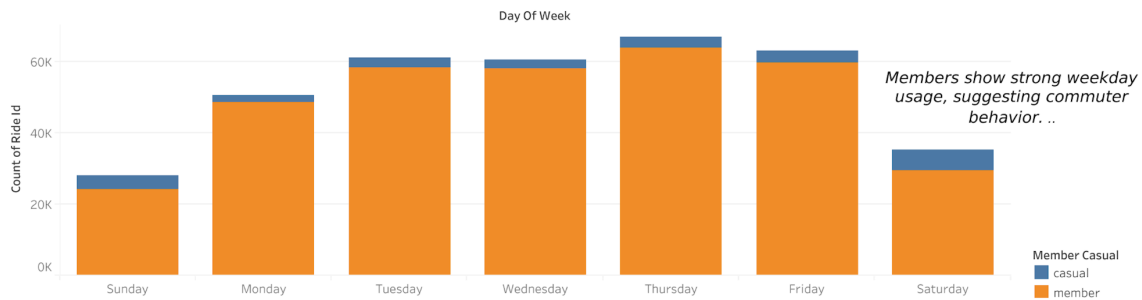
Summary of findings

The analysis revealed clear behavioral differences between annual members and casual riders.

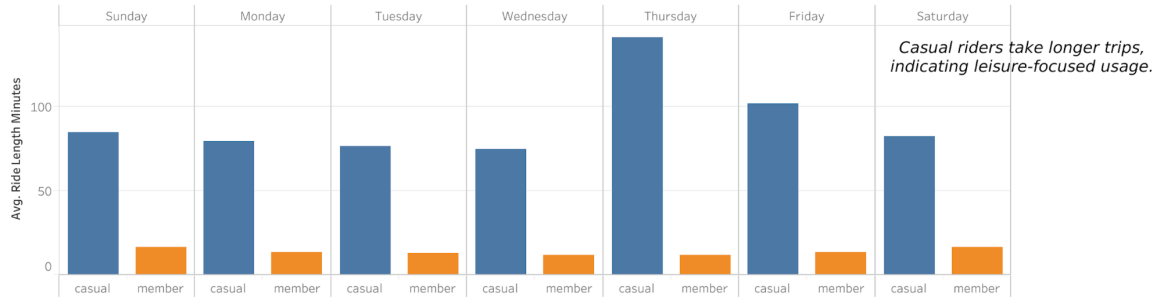
- Members take significantly more rides on weekdays, suggesting routine, commuter-oriented usage.
- Casual riders show relatively higher usage on weekends, aligning with leisure or recreational travel.
- Casual riders consistently have longer average ride durations than members across all days of the week.
- Member ride durations are shorter and more consistent, while casual rides vary more and frequently exceed one hour.

Cyclistic Rider Behavior: Members vs Casual Riders

Ride Volume by Day of Week



Average Ride Duration by Weekday & Rider Type



Visualization 1: Number of Rides by Weekday and Rider Type

Key Finding

Annual members take substantially more rides than casual riders on weekdays, suggesting commuter-oriented usage. Casual ridership increases on weekends, indicating leisure-based use.

Visualization 2: Average Ride Duration by Weekday and Rider Type

Key Finding

Casual riders have longer average ride durations across all days of the week, particularly on weekends. This suggests that casual riders are more likely to use Cyclistic bikes for longer, recreational trips.

Ride duration was calculated in seconds using start and end timestamps. For interpretation, durations were converted to minutes. Casual riders consistently exhibit longer ride durations (often exceeding one hour), while members tend to take shorter trips, averaging under 20 minutes, suggesting utilitarian versus leisure-based usage patterns.

Based on these observed behavioral differences, the following recommendations aim to increase the conversion of casual riders into annual members.

Top Three Business Recommendations

1. Weekend-Focused Membership Promotions

Cyclistic should target casual riders on weekends with membership promotions, such as discounted annual plans or free trial memberships, when casual usage is highest.

2. Convert Leisure Riders with Flexible Plans

Since casual riders take longer trips, Cyclistic could introduce flexible membership options tailored to recreational use, such as weekend-only or seasonal memberships.

3. Reinforce Commuter Value Messaging

Marketing efforts should emphasize the convenience and cost savings of annual memberships for weekday commuting, reinforcing the value proposition already demonstrated by existing members.