

Cyclistic Bike-Share Analysis: Understanding User Behavior to Drive Membership Growth

Summary

This case study analyzes how Cyclistic, a fictional bike-share company in Chicago, can maximize annual memberships by understanding the differences in bike usage between casual riders and annual members. The primary objective is to identify key trends that will support a marketing strategy aimed at converting casual riders into members. The study follows the "Ask, Prepare, Process, Analyze, Share, and Act" framework for data analysis.

Ask Phase

Business Task

The business task is to determine **how annual members and casual riders use Cyclistic bikes differently**. This insight will guide a marketing strategy aimed at converting casual riders into annual members.

Stakeholder

The key stakeholders are:

- **Cyclistic Marketing Team:** Responsible for analyzing data to guide marketing strategies.
- **Lily Moreno:** Director of Marketing at Cyclistic, tasked with promoting the bike-share program and maximizing memberships.
- **Cyclistic Executive Team:** The decision-making body that will review the recommendations and data insights.

Prepare Phase

Dataset used

The dataset used for this analysis consists of **Cyclistic's historical bike trip data from the past 12 months**. This data provides insights into the usage patterns of casual riders and members.

Accessibility and privacy of data

The data is public and provided by **Motivate International Inc.** under a license agreement. Privacy protocols prohibit using personally identifiable information (PII), such as credit card details, to maintain user privacy and data integrity.

Information about our dataset

The dataset includes trip details, enabling the team to explore usage patterns for different customer types (casual vs. member). It covers metrics such as trip duration, start and end times, and days of the week.

Data Organization and verification

The data is organized into files that include columns for essential ride details. Preparation steps included downloading, unzipping, and storing data files systematically, followed by verifying consistency in columns, data formats, and calculated metrics like ride duration and weekday.

Column Name	Type	Description	Format
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ride_id	String	Unique identifier for each ride	Microsoft Excel CSV
rideable_type	String	Type of bike used for the ride (e.g., electric, standard)	Microsoft Excel CSV
started_at	DateTime	Start date and time of the ride	Microsoft Excel CSV
ended_at	DateTime	End date and time of the ride	Microsoft Excel CSV
start_station_name	String	Name of the station where the ride began	Microsoft Excel CSV
start_station_id	String	Unique identifier for the start station	Microsoft Excel CSV
end_station_name	String	Name of the station where the ride ended	Microsoft Excel CSV
end_station_id	String	Unique identifier for the end station	Microsoft Excel CSV
start_lat	Float	Latitude of the start station	Microsoft Excel CSV
start_lng	Float	Longitude of the start station	Microsoft Excel CSV
end_lat	Float	Latitude of the end station	Microsoft Excel CSV
end_lng	Float	Longitude of the end station	Microsoft Excel CSV
member_casual	String	Indicates if the rider is a member or a casual user	Microsoft Excel CSV

Data Credibility and Integrity

The data's credibility was ensured through careful sorting, filtering, and reviewing for errors. Privacy and integrity measures ensured it was reliable and suitable for answering the business questions. Additionally, licensing

agreements and public data access increased its credibility for commercial analysis.

Process Phase

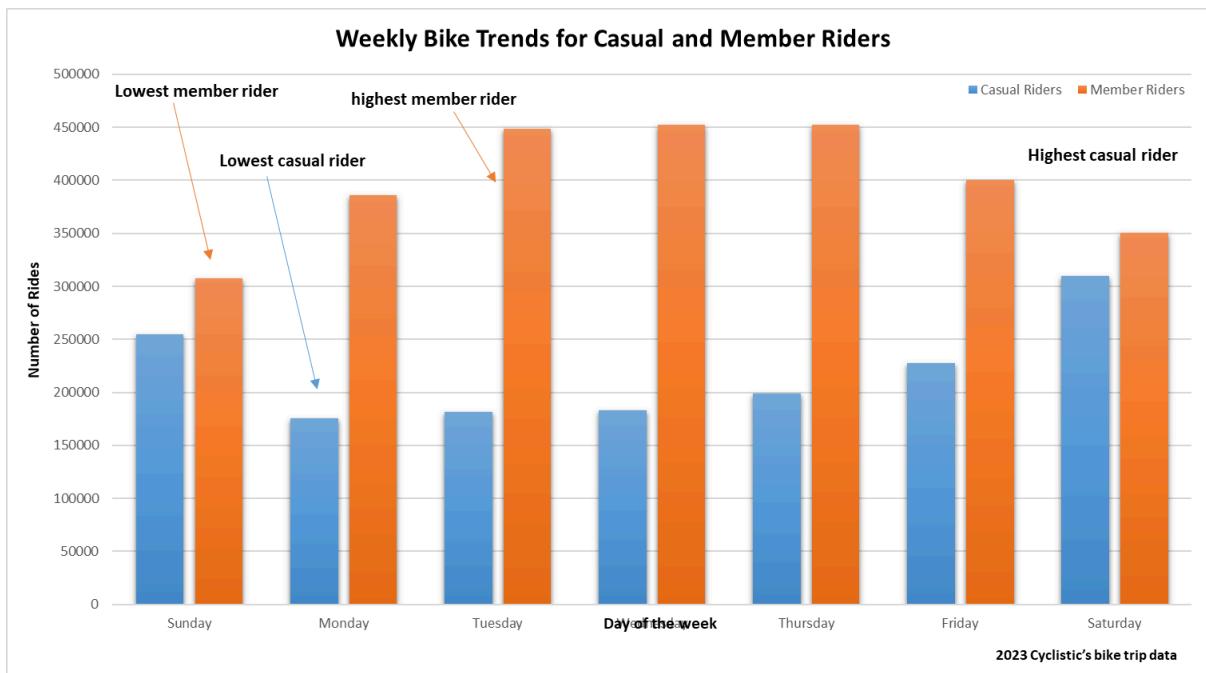
The analysis uses historical trip data from **January 2023 to December 2023**, sourced from [Cyclistic Historical Data](#). This dataset contains details on trip start and end times, station names, bike types, rider types (casual or member), and trip durations. To ensure data accuracy and reliability, the following steps were taken in data cleaning, using Power Query for analysis:

- **Null Values and Zero Durations:** Rows with null values or zero trip durations were removed to maintain data quality.
- **Data Standardization:** Date and time fields were reformatted, and additional columns (day of the week, month, hour, and trip duration in minutes) were derived to support temporal analyses.
- **Duplicates Removal:** Duplicate entries were checked and removed if present.

I will conduct my analysis in Power Query due to its advantages for data handling and transformation.

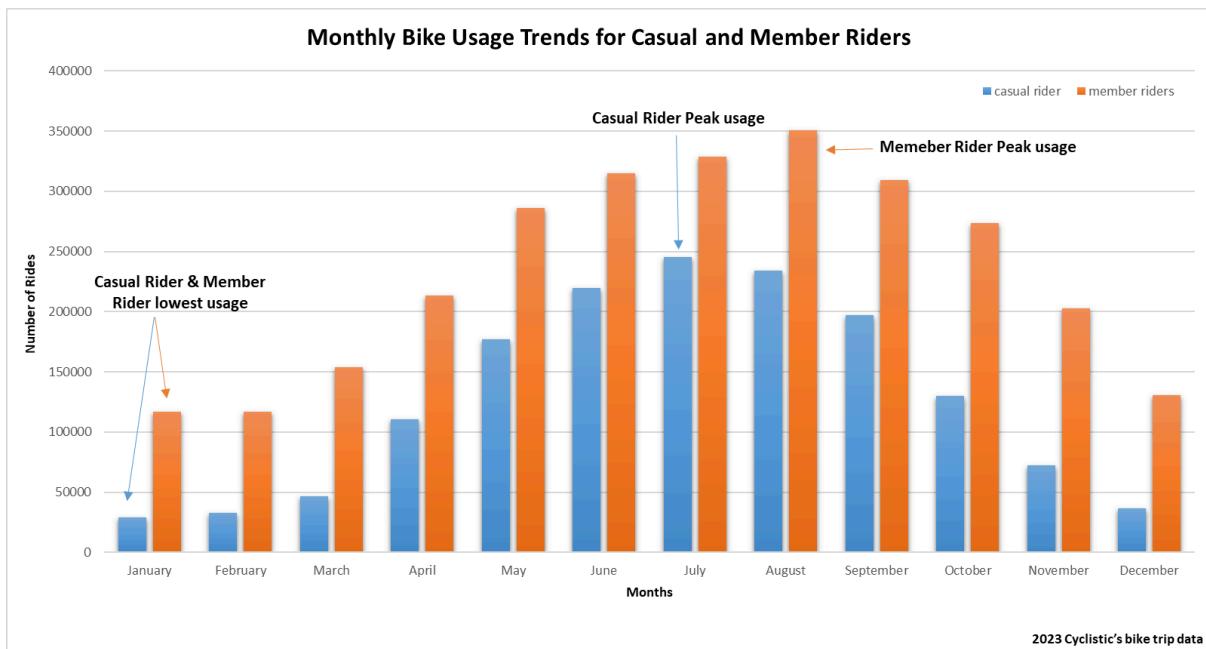
Key Insight

Weekly Bike Trends for Casual and Members Riders



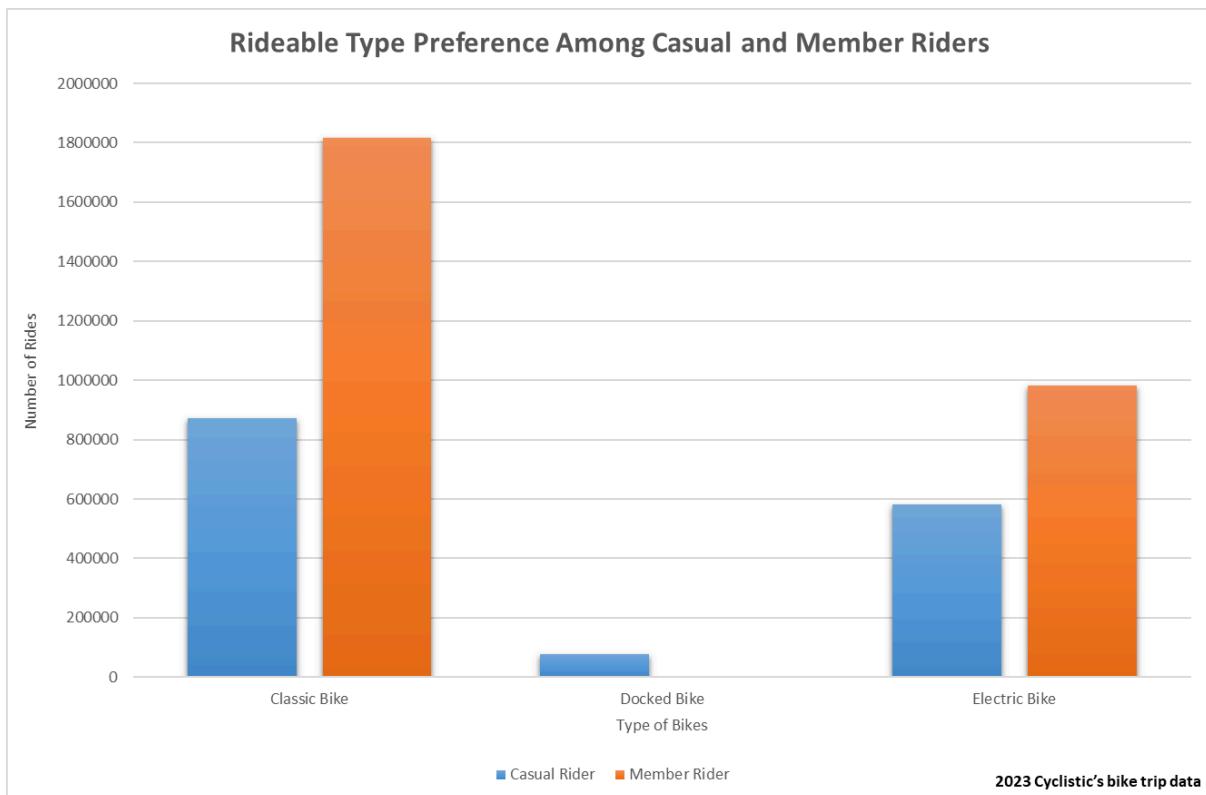
- **Casual Riders:** Peak usage on **Saturday (310,122 rides)** and lowest on **Monday (175,349 rides)**, indicating a preference for leisure biking on weekends.
- **Member Riders:** Highest on **Tuesday (448,409 rides)** and lowest on **Sunday (307,647 rides)**, suggesting regular commuting during the weekdays.
- **Comparative Insights:** Members use bike more during weekdays, while casual riders dominate on weekends. This suggests that marketing strategies could target casual riders to convert them to members by highlighting the benefits of weekday biking

Monthly Bike Usage Trends for Casual and Member Riders



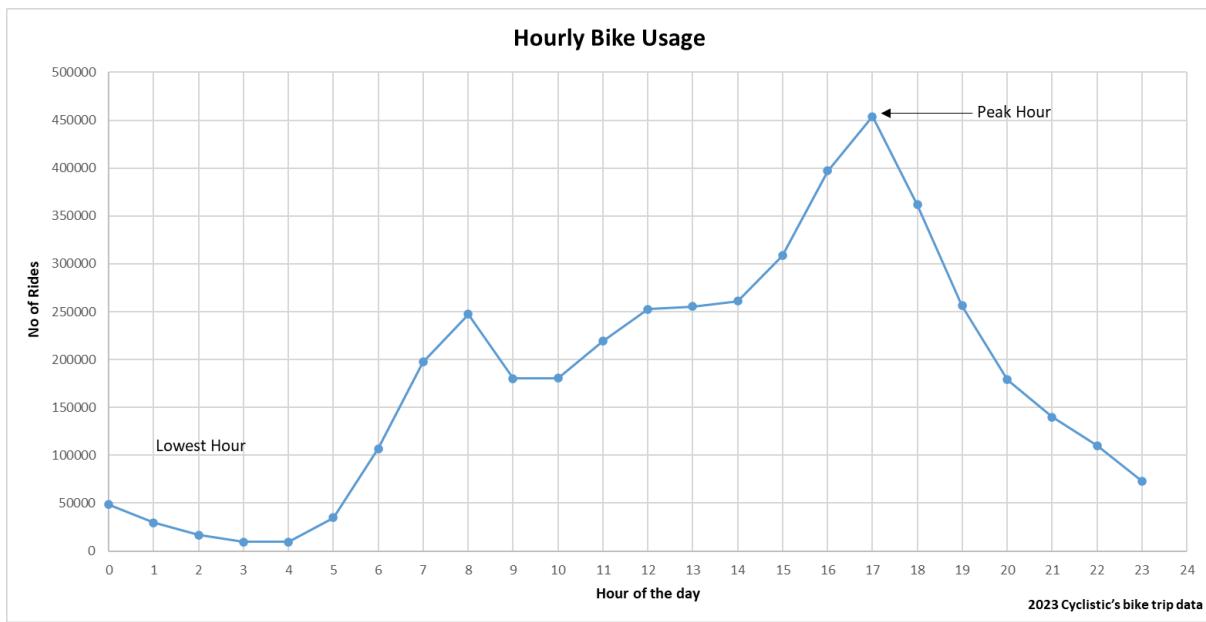
- **Casual Riders:** Peak usage in **July (245,321 rides)** and lowest in **January (29,277 rides)**, indicating a strong preference for leisure biking in warmer months.
- **Member Riders:** Highest in **August (351,004 rides)** and lowest in **January (116,723 rides)**, showing consistent year-round usage.
- **Comparative Insights:** Casual riders dominate in summer, suggesting a seasonal trend, while members maintain steady usage throughout the year. This indicates a marketing opportunity to target casual riders with promotions in spring to convert them to members.

Rideable Type Preference Among Casual and Member Riders



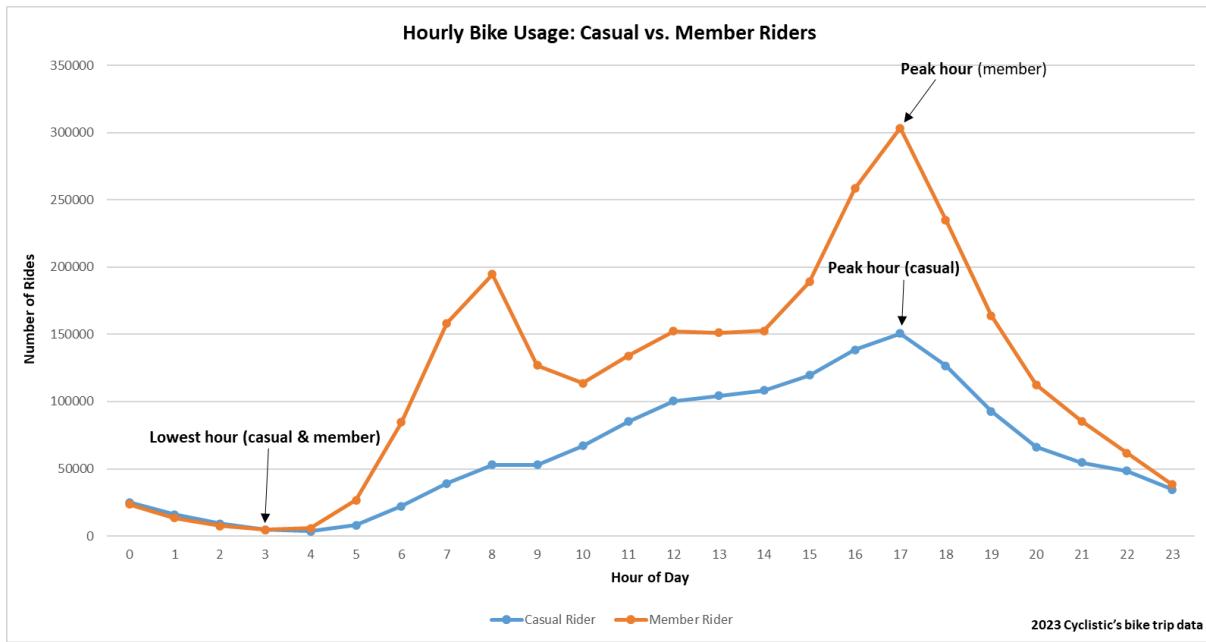
- **Casual Riders:** Highest usage of electric bikes (582,224 rides) and significant usage of classic bikes (872,884 rides), indicating a preference for convenience and leisure biking. Docked bikes are minimally used by casual riders and not at all by members, suggesting limited interest or availability.
- **Member Riders:** Predominantly use classic bikes (1,816,921 rides), with electric bikes also popular (980,778 rides), suggesting a focus on commuting and utility.
- **Comparative Insights:** Casual riders favor electric bikes for leisure, while members rely more on classic bikes for commuting. This indicates a marketing opportunity to promote electric bikes to members for casual trips, potentially increasing their usage.

Hourly Bike Usage



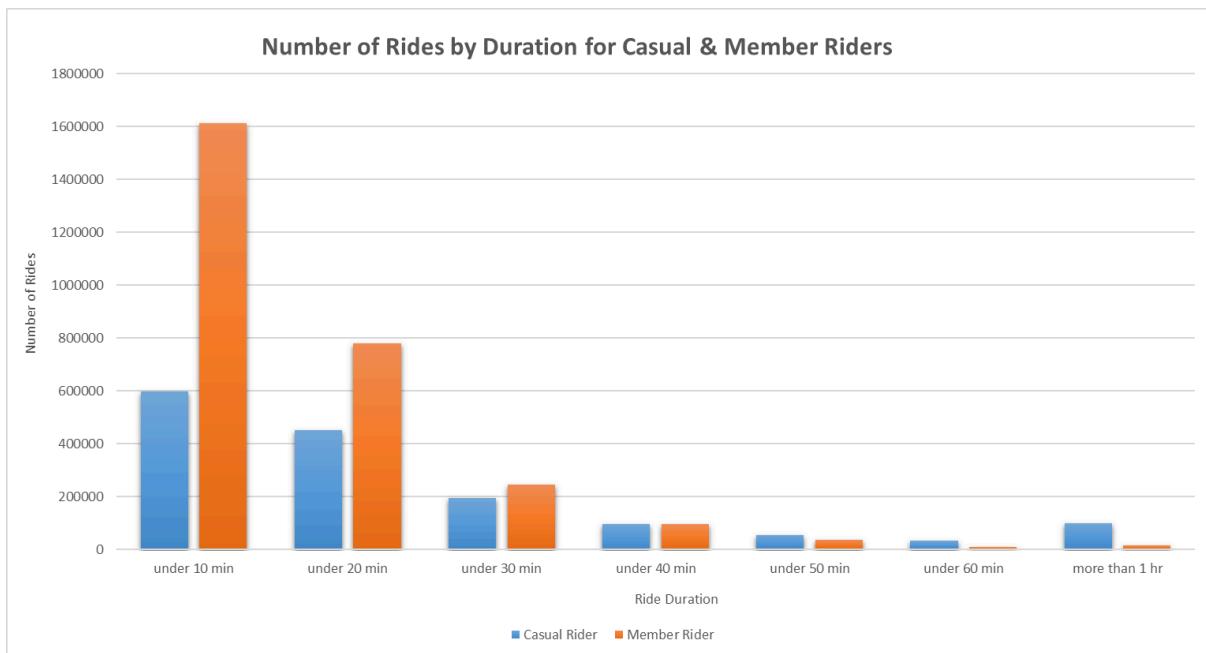
- **Peak Hours:** The highest bike usage occurs at 5 PM (453,888 rides), with significant activity also at 4 PM (397,021 rides) and 6 PM (361,522 rides). This suggests a strong trend for evening commuting
- **Morning Commute:** There's a notable increase in usage starting at 6 AM (106,864 rides), peaking at 7 AM (197,336 rides) and 8 AM (247,529 rides), indicating a morning commuting pattern.
- **Midday and Afternoon Activity:** Between 10 AM and 3 PM, usage remains steady (180,000 to 260,967 rides), which may reflect a mix of leisure and non-commuting activities, as there are no sharp peaks.
- **Lowest Usage:** The least activity occurs between 2 AM and 5 AM, with the lowest point at 3 AM (9,406 rides), consistent with expectations for this time frame

Hourly Bike Usage: Casual vs. Member Riders



- **Usage Trends:** Both groups have low usage in the early hours, with peaks in the afternoon and evening.
- **Casual Riders:** Highest rides (119,575) at 3 PM, indicating peak leisure use.
- **Member Riders:** Early morning usage begins at 5 AM, peaking (303,288) at 5 PM, suggesting consistent commuting patterns.
- **Comparative Insights:** Members utilize the bike share program more consistently, particularly for commuting, whereas casual riders favor leisure rides during peak afternoon hours.

Number of Rides by Duration for Casual & Member Riders



- **Short Trips (Under 10 Minutes):** Member riders overwhelmingly dominate with **1,611,610 trips** compared to **598,234 for casual riders**. This suggests that members frequently use the service for brief, routine trips.
- **Moderate Trips (10-30 Minutes):** Both rider groups have a steady decline in numbers as duration increases. Casual riders take **453,182 trips under 20 minutes** and **195,083 trips under 30 minutes**, which are significantly less than their under-10-minute trips but still notable.
- **Longer Trips (30-60 Minutes):** Casual rider trips start to drop sharply beyond 30 minutes, while member riders decline even more rapidly in this range, indicating that members predominantly use bikes for shorter periods.
- **Trips Over an Hour:** Casual riders maintain a higher number of **99,867 trips lasting more than an hour**, in contrast to **only 16,616 such trips by members**, indicating that casual riders are more inclined toward longer recreational rides.

Recommendations

Based on the findings, the following recommendations are suggested to encourage casual riders to transition into members:

- **Weekday Ride Incentives for Casual Riders:** Create promotions for weekday riding, emphasizing the convenience and value of membership for

regular access, especially during peak commuting hours.

- **Seasonal Membership Promotions:** Launch spring and summer campaigns offering discounts or trial memberships for frequent casual riders, appealing to their seasonal biking habits.
- **Highlight Electric Bike Access:** Promote electric bike access as a membership benefit to attract casual riders who favor these bikes, encouraging them to join for year-round accessibility.