# **Cyclistic Bike-Share: Understanding User Behavior & Driving Membership Growth**

## **Executive Summary**

This report presents an analysis of Cyclistic's bike-share trip data, focusing on understanding the distinct usage patterns of annual members versus casual riders. Our objective is to leverage these insights to develop targeted marketing strategies aimed at converting casual riders into more profitable annual members.

Our analysis reveals that members primarily utilize Cyclistic for **efficient, routine weekday commuting**, characterized by frequent, shorter trips to specific urban hubs. In contrast, casual riders predominantly engage in **leisurely, longer-duration weekend rides**, often originating from and returning to popular tourist and recreational areas.

Based on these clear behavioral differences, we propose three key recommendations:

1. **Targeted Weekday/Commuter Conversion:** Engage casual riders who already use the service for utilitarian purposes with cost-saving membership benefits.
2. **Weekend/Leisure-Oriented Membership Packages:** Introduce flexible membership options and promotions tailored to casual riders' recreational use cases.
3. **Strategic Bike & Station Optimization:** Ensure optimal bike availability and rebalancing efforts align with the distinct peak demands of both user segments.

These strategies aim to enhance casual rider value perception and drive sustainable growth in annual memberships.

## **Introduction**

Cyclistic, a leading bike-share company in Chicago, offers flexible pricing plans including single-ride passes, full-day passes, and annual memberships. While the flexible pricing has successfully attracted a broad customer base, financial analysis indicates that **annual members are significantly more profitable** than casual riders. To maximize future growth, the Director of Marketing, Lily Moreno, has identified a strategic opportunity to convert existing casual riders into annual members, as they are already familiar with and engaged with the Cyclistic service.

This report addresses the core question: **How do annual members and casual riders use Cyclistic bikes differently?** By answering this, we aim to provide data-backed insights that will inform a new marketing strategy to achieve the company's growth objectives.

## **Data Overview & Methodology**

This analysis utilized Cyclistic's historical trip data from **January 2025 to June 2025**, provided by Motivate International Inc. in individual .csv files. The data was assessed for credibility using the ROCCC framework (Reliable, Original, Comprehensive, Current, Cited) and deemed highly suitable for this project.

The data processing involved a rigorous cleaning and transformation pipeline:

* **Python (Pandas & geopy):** Used for initial data consolidation from multiple .csv files, comprehensive null value handling (e.g., filling missing station names with 'UNKNOWN', dropping sparse null coordinates), robust data type conversions (e.g., datetime, category), removal of duplicate ride IDs, and the calculation of trip\_duration\_mins and distance\_traveled\_km (using the Haversine formula). Outliers, such as rides with zero or excessively long durations (over 24 hours) or out-of-bounds geographical coordinates, were systematically removed to ensure data accuracy.
* **SQL Server:** The cleaned and transformed dataset was then ingested into a Microsoft SQL Server database, serving as a robust and accessible central repository for the final analytical dataset.
* **Microsoft Power BI Desktop:** The primary tool for the analysis and visualization phase. Data was imported directly from SQL Server, and Power BI's DAX (Data Analysis Expressions) was used to create additional time-based attributes (e.g., Day of Week Name, Hour of Day, Is Weekend) and custom bins for Trip Duration and Distance to facilitate in-depth comparative analysis and interactive reporting.

The analytical approach focused on descriptive and comparative analysis, leveraging interactive visualizations to highlight key differences in usage patterns between annual members and casual riders across various dimensions.

## **Key Findings**

Our analysis reveals distinct behavioral patterns between Cyclistic's annual members and casual riders, providing critical insights for membership conversion strategies.

### **1. Overall Usage & Rider Distribution**

* **Members constitute the majority of rides:** Annual members account for approximately **66.8%** of all trips, totaling around **1.39 million rides**, while casual riders make up **33.2%**, with roughly **692,000 rides**.
* **Bike Type Preference:** Both members and casuals show a similar preference for electric bikes, which comprise approximately 62% of rides for both user types.

### **2. Ride Duration Analysis**

* **Casuals take significantly longer rides:** Casual riders have an average trip duration of **19.9 minutes**, nearly double that of annual members, who average **11.6 minutes**.
* **Distribution by Duration:** Members overwhelmingly dominate shorter ride durations, accounting for **71.95%** of all trips lasting between 0-15 minutes. Conversely, casual riders are disproportionately represented in longer duration bins, making up **68.7%** of rides lasting between 45-60 minutes. This suggests members prioritize quick, efficient trips, while casuals engage in more extended rides.

### **3. Time-Based Usage Analysis (Temporal Patterns)**

* **Day of Week:**
  + **Members:** Exhibit consistent, high usage during **weekdays**, with peak ridership around **228K on Thursday**. Usage drops significantly on weekends (e.g., to 147K on Sunday), indicating a strong **commute or routine-based usage pattern**.
  + **Casuals:** Show a clear preference for **weekend usage**, with a notable jump on Fridays (**113K**) and Saturdays (**145K**), suggesting **leisure and recreational activities**. Weekday usage for casuals hovers around 75K.
* **Hour of Day:**
  + **Members:** Display pronounced **rush-hour peaks** at **8 AM (101K rides)** and **5 PM (151K rides)**, strongly confirming their use for commuting.
  + **Casuals:** While their overall volume is lower, casual usage also sees increases during these busy hours (25K at 8 AM, 68K at 5 PM), indicating that some casual riders *do* leverage the service for more utilitarian, time-sensitive trips.
* **Monthly/Seasonal:**
  + Both user groups show a strong **seasonal trend**, with ridership increasing significantly from winter to summer. Member usage rises from **112K (January) to 379K (June)**, and casual usage jumps even more dramatically from **23K (January) to 279K (June)**.
  + **Casuals are more weather-dependent:** The much larger proportional increase for casuals highlights their greater sensitivity to favorable weather conditions, reinforcing their recreational usage.

### **4. Location-Based Analysis**

* **Distinct Station Preferences:** A critical finding is the **complete lack of overlap in the top 5 most frequently used start and end stations** between members and casual riders.
  + **Members:** Their most preferred station (Kingsbury St & Kinzie St, with 14.1K starts and 14.2K ends) and other top stations are typically located in **dense residential areas, business districts, or key public transit hubs**. This reinforces their utility-driven, point-to-point travel patterns.
  + **Casuals:** Their most preferred station (Streeter Dr & Grand Ave, with 16.3K starts and 17.1K ends) is notably located near **Navy Pier, a major tourist attraction**. Other top casual stations are also concentrated around recreational areas, indicating usage for sightseeing and leisure.

### **5. Distance Analysis**

* **Similar Average Distances, Different Pacing:** The average trip distance for members is **2.21 KM**, remarkably similar to casuals at **2.20 KM**.
* **Duration-Distance Paradox:** When combined with the duration findings, this suggests that casual riders cover similar distances but take significantly longer to do so. This implies a more **leisurely pace, frequent stops, or riding in more congested recreational areas**, contrasting with members' more efficient and direct travel.
* **Distribution by Distance:** While members have higher absolute ride counts across all distance bins (e.g., 456K vs 230K for 1-2 KM), casuals show a relatively higher proportion of their total rides in the longer distance categories (e.g., 10-15 KM and 15+ KM), indicating a segment that enjoys extended journeys.

## **Recommendations**

Based on these distinct behavioral insights, we propose the following data-driven marketing strategies to convert casual riders into annual members:

### **1. Targeted Weekday/Commuter Conversion for Casuals**

* **Strategy:** Engage casual riders who already use Cyclistic bikes during weekdays or traditional rush hours by highlighting the **cost savings, efficiency, and convenience** of an annual membership for their routine trips.
* **Rationale:** A segment of casual riders is already experiencing the utilitarian benefits of bike-share during peak demand. They are prime candidates for conversion if the value proposition for frequent, short trips is clearly communicated.
* **Implementation:**
  + Launch digital advertising campaigns (e.g., social media, in-app notifications, targeted email marketing) geo-fenced around business districts and residential areas, specifically active during weekday morning and evening commute hours.
  + Messaging should emphasize "Beat the traffic, save money: Your daily commute, simplified with Cyclistic membership."
  + Offer limited-time "Weekday Warrior" trial memberships (e.g., 1-week free unlimited rides) to demonstrate the value proposition.

### **2. Weekend/Leisure-Oriented Membership Packages & Promotions**

* **Strategy:** Introduce flexible membership options and promotions specifically designed to appeal to the **recreational and leisure-focused usage** of casual riders, particularly on weekends and during peak seasons.
* **Rationale:** The majority of casual usage is driven by leisure, tourism, and exploration. Current membership models might not fully resonate with this use case. Tailoring offers to their actual behavior will increase perceived value.
* **Implementation:**
  + Develop a "Summer Explorer Pass" or "Weekend Unlimited Membership" offering unlimited weekend rides for a set seasonal fee.
  + Partner with major tourist attractions (e.g., Navy Pier, Millennium Park), parks, and entertainment venues to offer exclusive member discounts or bundled experiences.
  + Run social media campaigns showcasing the joy of extended weekend rides, scenic routes, and group outings, emphasizing that membership "unlocks" more exploration for less cost.
  + Consider family or group membership discounts to encourage collective recreational use.

### **3. Strategic Bike & Station Optimization**

* **Strategy:** Proactively optimize bike distribution and station rebalancing efforts to align with the distinct peak demands and geographical preferences of both member and casual riders.
* **Rationale:** Ensuring bike availability at the right place and time is crucial for user experience and reduces frustration, which can be a barrier to conversion.
* **Implementation:**
  + Utilize predictive analytics to anticipate demand at top member stations during weekday rush hours and top casual stations (e.g., Streeter Dr & Grand Ave) during weekend leisure times.
  + Prioritize stocking electric bikes at popular stations, given their preference by both user types.
  + Enhance the Cyclistic mobile app with real-time bike availability and station capacity information to empower users to easily find bikes, especially during busy periods.

## **Conclusion**

This analysis has provided a comprehensive understanding of the distinct behavioral patterns of Cyclistic's annual members and casual riders. Members are characterized by their efficient, routine, weekday commuting, while casuals are driven by leisurely, longer-duration weekend and seasonal recreational activities.

By recognizing these fundamental differences, Cyclistic can move beyond a one-size-fits-all marketing approach. The proposed recommendations offer targeted strategies to convert casual riders into more profitable annual members by addressing their specific motivations and demonstrating the enhanced value of membership for both utilitarian and recreational use cases. Implementing these data-driven initiatives will be key to maximizing annual memberships and driving Cyclistic's future growth.

**Note to Stakeholders:**

* **Visualizations:** Supporting charts and dashboards are available in the accompanying Power BI report for interactive exploration.
* **Detailed Process Documentation:** For a comprehensive overview of the data collection, cleaning, and transformation processes, please refer to the metadata report and source files available in our Git repository.