

CASE STUDY: HOW DOES A BIKE-SHARE NAVIGATE SPEEDY SUCCESS?

ABSTRACT

Analyzing the usage patterns of Casual Riders and Annual Members to support Cyclistic's marketing strategy and promote Annual Memberships

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Google Data Analytics Certificate

A data-driven strategy that leverages behavioral insights to foster deeper customer relationships and promote continued use

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Business Task

The marketing team at Cyclistic (a bike-share program that features more than 5,800 bicycles and 600 docking stations), aims to increase the number of Annual Members, as they provide higher profitability compared to Casual Riders. By identifying patterns, preferences and behaviors that distinguish these two groups, the marketing team will be able to design targeted campaigns that encourage Casual Riders to become Annual Members. In order to do that, the team needs to better understand how Annual Members and Casual Riders differ, why Casual Riders would buy membership, and how digital media could affect their marketing tactics. Therefore this dataset is suited to answer the assigned business question: *How do Annual Members and Casual Riders use Cyclistic bikes differently?* By analyzing variables such as ride length, day of the week, rideable type, and trip patterns, I will be able to identify differences in usage behaviors between Casual Riders and Annual Members. These insights will help the marketing team design targeted strategies to convert Casual Riders into Annual Members.



Data Source

The dataset used for this analysis is the Divvy Bike Trip Data, which provides historical information on bike trips taken using the Divvy bike-share system in Chicago. For this case study, I downloaded the dataset for the most recent 12 months available (202505-divvy-tripdata.csv) from the following source: <https://divvy-tripdata.s3.amazonaws.com/index.html>

The data includes fields such as:

- ride_id → unique identifier for each ride
- rideable_type → type of bike used
- started_at → start date and time of the ride
- ended_at → end date and time of the ride
- start_station_name, start_station_id → starting station details

- end_station_name, end_station_id → ending station details
- start_lat, start_lng, end_lat, end_lng → geolocation
- member_casual → user type: member or casual rider

Data Quality

I evaluated the data quality against ROCCC (Reliable, Original, Comprehensive, Current, Cited):

- **Reliable:** The data is provided by Divvy, an official operator of the bike-share program in Chicago, making it a reliable source
- **Original:** The dataset is the original source of trip data, not a secondary or third-party version
- **Comprehensive:** The dataset covers a full month of trip data with detailed ride information. However, personal identifying information is not included, according to data privacy standards
- **Current:** The dataset used is for the most recent available period (May 2025), ensuring that the insights will be aligned with current business needs
- **Cited:** The data source and license are documented at <https://www.divvybikes.com/data-license-agreement>

Privacy, Security, and Accessibility

The dataset complies with privacy requirements: it does not contain any PII (Personally Identifiable Information) about the Riders. Sensitive information such as names, payment methods, and contact details are not included. The data is open for public use under the Divvy Data License Agreement.

Process - Data Integrity and Transformation

Google Sheets has been used for data processing and analysis.

- A new column called `ride_length` was created by calculating the duration of each ride. The result was formatted as HH:MM:SS.
- A new column called `day_of_week` was created using the `WEEKDAY` function to extract the day of the week from the `started_at` timestamp.
- An additional column called `corresponding_day` was created to display the name of the day using the `TEXT` function

The dataset was checked for missing values and obvious data errors:

- Verified that all `started_at` and `ended_at` timestamps were valid (i.e. rides with `ended_at` earlier than `started_at` were excluded if any were found)
- Verified that user types were correctly labeled as either Member or Casual

No unexpected or incorrect values were detected after verification.

Data Cleaning, Filtering and Sorting

Before proceeding with the analysis, I performed additional filtering and sorting steps to ensure data quality:

- Filtered out any rows with missing values in critical columns (`started_at`, `ended_at`, `member_casual`, `ride_id`)
- Sorted the `ride_length` column to identify and review extremely short or invalid rides. I removed rides with:
 - `ride_length` = 0 seconds (likely system errors)
 - `ride_length` < 20 seconds (likely accidental unlocks)
 - `ride_length` between 20 seconds and 1 minute to focus on meaningful ride behavior

After completing these steps, the dataset was confirmed to be of good quality and ready for further analysis. These measures improve the reliability and validity of the insights derived from the data.

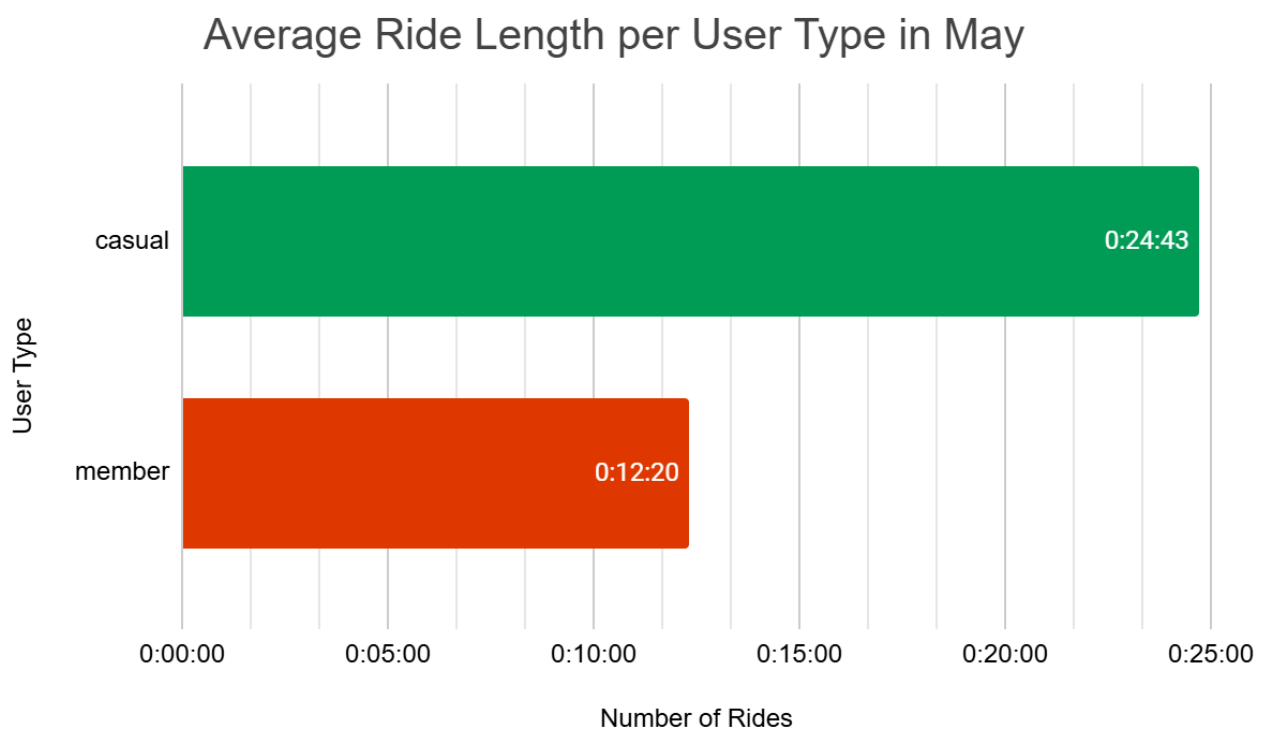
Analyze and Share

The following analyses were conducted to explore usage patterns between Casual Riders and Annual Members. These observations and analyses may be useful for developing targeted marketing strategies. By understanding when and how each user group rides, Cyclistic can design campaigns that encourage Casual users to adopt more consistent usage habits. Promoting flexibility, affordability, and health benefits could incentivize a shift toward Membership and year-round utilization.

Average ride length:

- Casual Riders: 24 minutes and 43 seconds (0:24:43)
- Annual Members: 12 minutes and 20 seconds (0:12:20)

The figure below clearly shows that the average ride length for Casual Riders is approximately twice as long as that of Annual Members. This difference suggests distinct usage behaviors: Casual Riders tend to take longer rides, which may indicate leisure-oriented use, while Members maintain shorter and more consistent ride durations, aligned with regular activities such as commuting or errands.

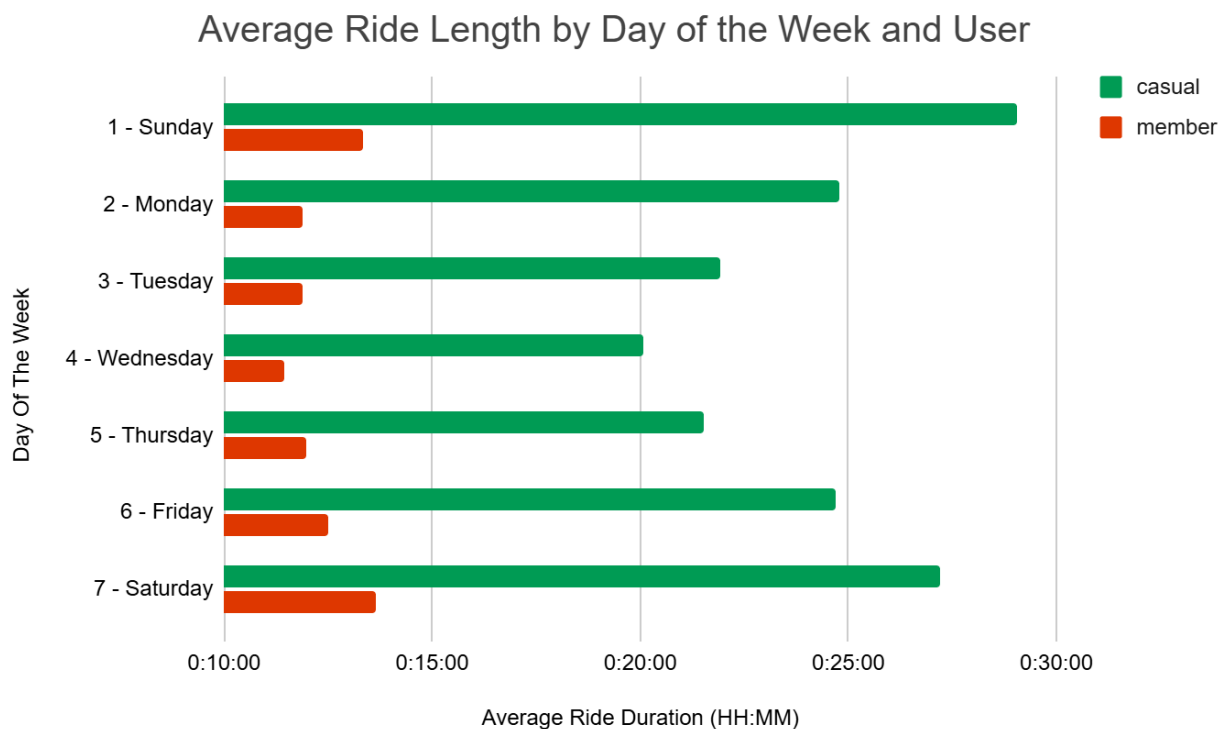


Average Ride Length by Day of the Week and User Type

A Pivot Table was used to calculate the average ride length for each day of the week, broken down by user type:

Day of Week	Casual Avg	Member Avg	Total Avg
1 - Sunday	0:29:04	0:13:21	0:20:37
2 - Monday	0:24:48	0:11:52	0:16:14
3 - Tuesday	0:21:54	0:11:52	0:14:43
4 - Wednesday	0:20:05	0:11:27	0:13:50
5 - Thursday	0:21:31	0:11:59	0:14:50
6 - Friday	0:24:41	0:12:29	0:17:01
7 - Saturday	0:27:12	0:13:38	0:20:00
Grand Total	0:24:43	0:12:20	0:16:47

Table 1 - Average Ride Length by Day of the Week and User



Insights

- Casual Riders exhibit longer average ride durations, especially on weekends (Sunday and Saturday), suggesting leisure-oriented usage

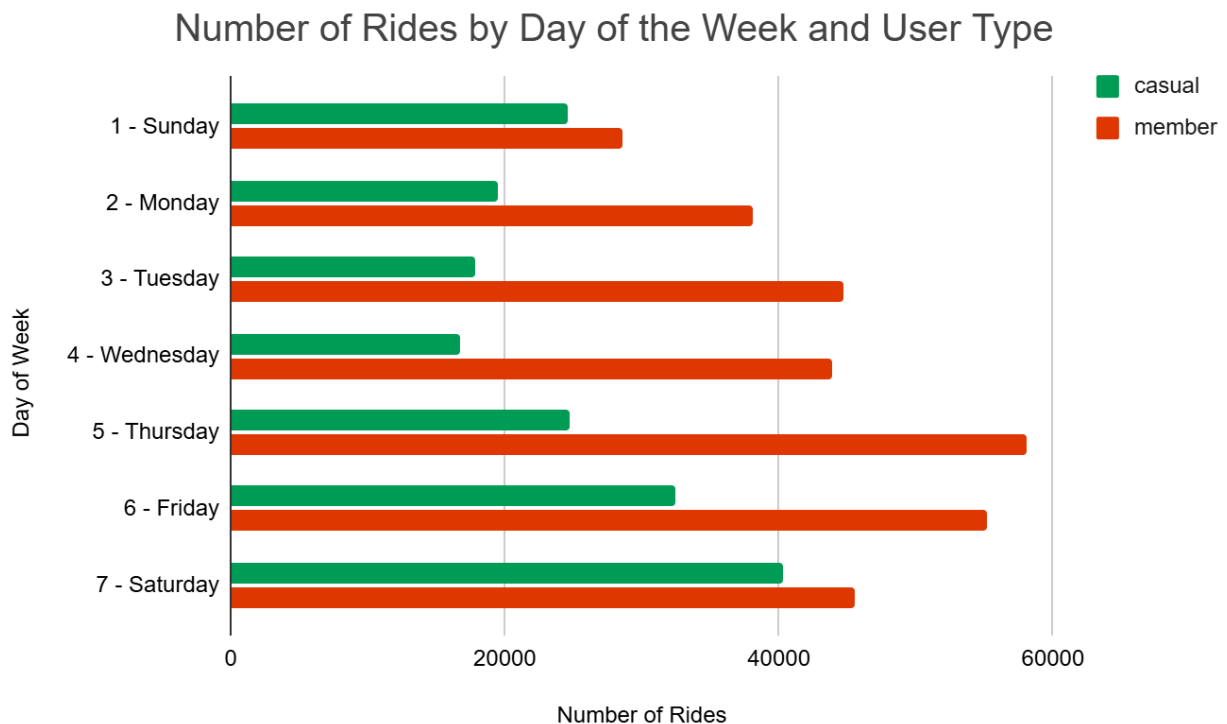
- Members maintain shorter and more consistent ride durations throughout the week, indicating possible commuting or utility-driven behavior

Number of Rides by Day of the Week and User Type

A second Pivot Table was created to analyze the count of rides per day of the week, segmented by user type:

Day of Week	Casual Rides	Member Rides	Total
1 - Sunday	24,548	28,582	53,130
2 - Monday	19,451	38,095	57,546
3 - Tuesday	17,794	44,705	62,499
4 - Wednesday	16,669	43,949	60,618
5 - Thursday	24,779	58,027	82,806
6 - Friday	32,510	55,172	87,682
7 - Saturday	40,257	45,521	85,778
Grand Total	176,008	314,051	490,059

Table 2 - Number of Rides by Day of the Week and User Type



Insights

- Casual Riders show a peak in usage during weekends (Saturday and Sunday), confirming a strong leisure-related pattern.
- Annual Members demonstrate higher usage on weekdays, with particularly high ride counts from Monday to Friday — supporting the hypothesis that Members primarily use the service for commuting or routine purposes.

Summary of Findings

The analysis highlights clear differences in usage patterns between Casual Riders and Annual Members:

- Casual Riders tend to ride longer and more frequently on weekends, indicating a focus on recreational use.
- Members show a shorter, more consistent ride length across all days, with a higher ride count during weekdays, reflecting commuting or practical use

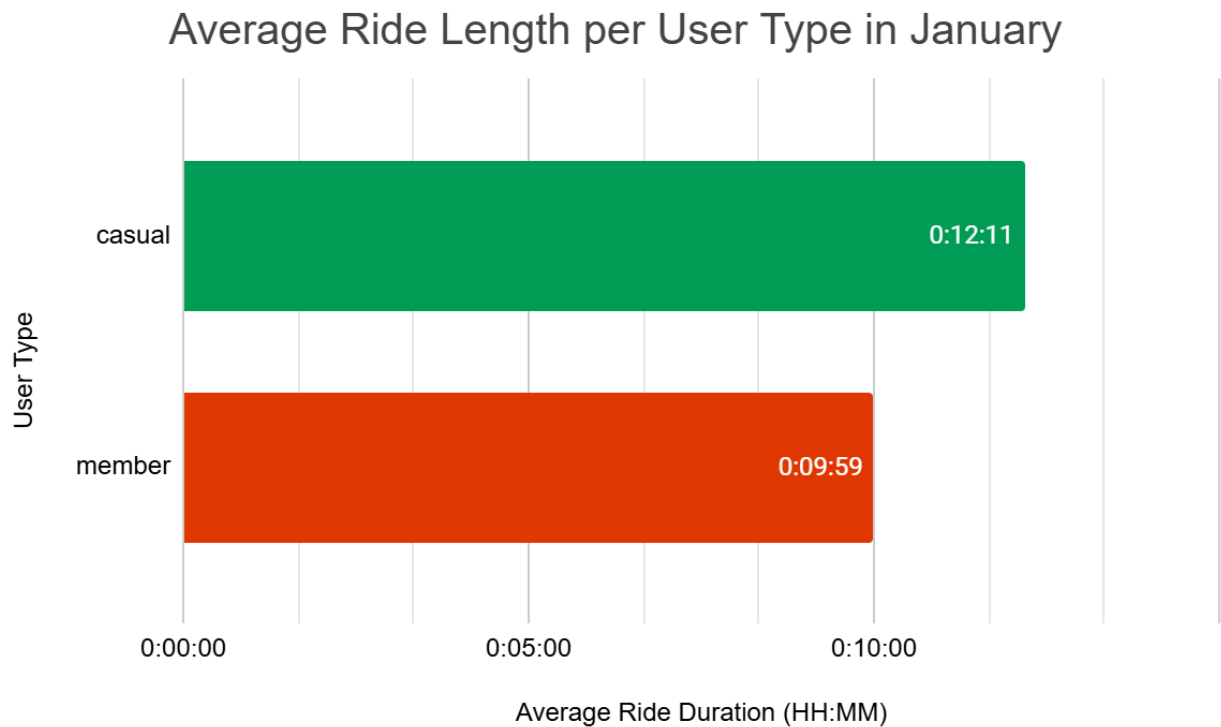
Comparison with January 2025

To gain further insight into patterns over time, I extended the analysis to a different season. In addition to May 2025, I analyzed usage data for January 2025. The same descriptive analysis was repeated, including:

- Average ride duration per user type
- Ride counts by day of the week
- Pivot tables comparing Members vs Casual Riders

Average ride length:

- Casual Riders: 12 minutes and 11 seconds (0:12:11)
- Annual Members: 9 minutes and 59 seconds (0:09:59)



In January, the average ride length of Casual Riders is only **22%** longer than that of Annual Members, while in May, it doubles (100% longer). Generally, the average ride duration is lower across both user types compared to May, likely due to colder weather or shorter daylight hours.

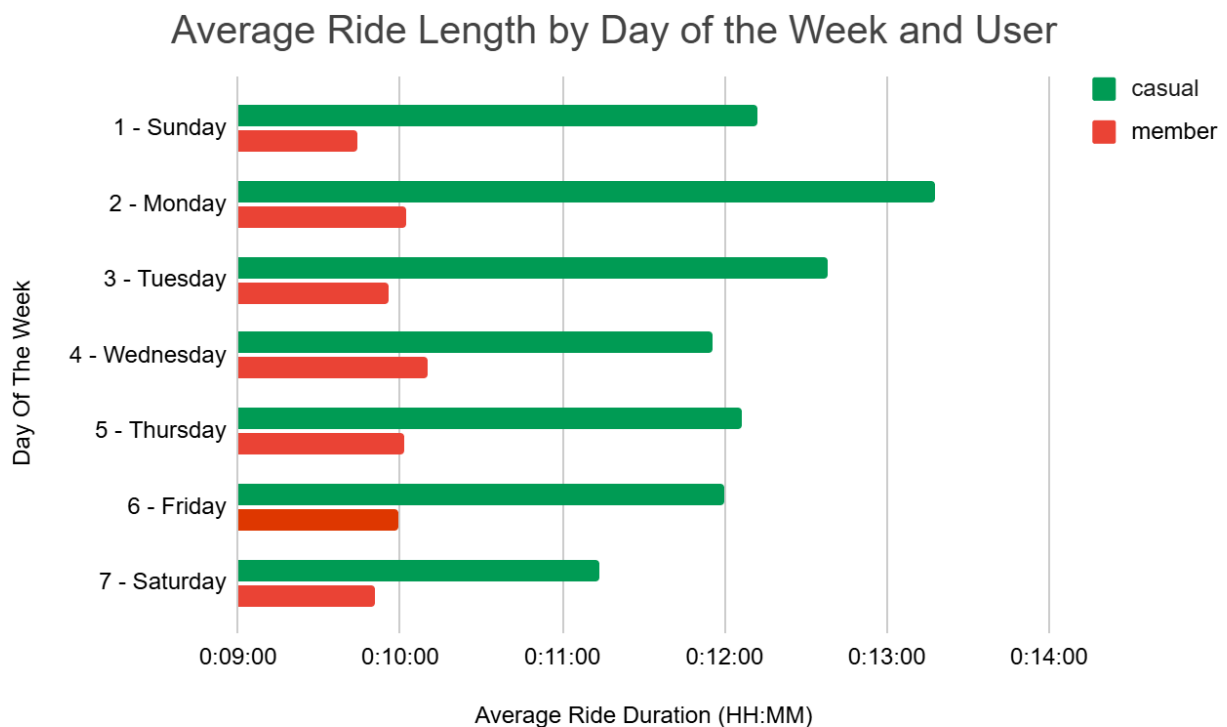
Average Ride Length by Day of Week and User Type

The average ride length of the day of the week in January is rather lower compared to May, with a reduction of **49.33%** for Casual Riders, **19.05%** for Annual Members, and **38.25%** in the overall average. This supports the observation that seasonal effects impact Casual Riders more strongly.

In contrast, Annual Members exhibit a much smaller variation in ride duration, indicating more consistent usage habits regardless of weather conditions.

Day of Week	Casual Avg	Member Avg	Grand Total Avg
Sunday	0:12:12	0:09:44	0:10:10
Monday	0:13:18	0:10:02	0:10:37
Tuesday	0:12:38	0:09:56	0:10:25
Wednesday	0:11:56	0:10:10	0:10:28
Thursday	0:12:07	0:10:02	0:10:23
Friday	0:12:00	0:09:59	0:10:19
Saturday	0:11:14	0:09:51	0:10:05
Overall Avg	0:12:11	0:09:59	0:10:22

Table 3 - Average Ride Length by Day of the Week and User



Number of Rides by Day of the Week and User Type

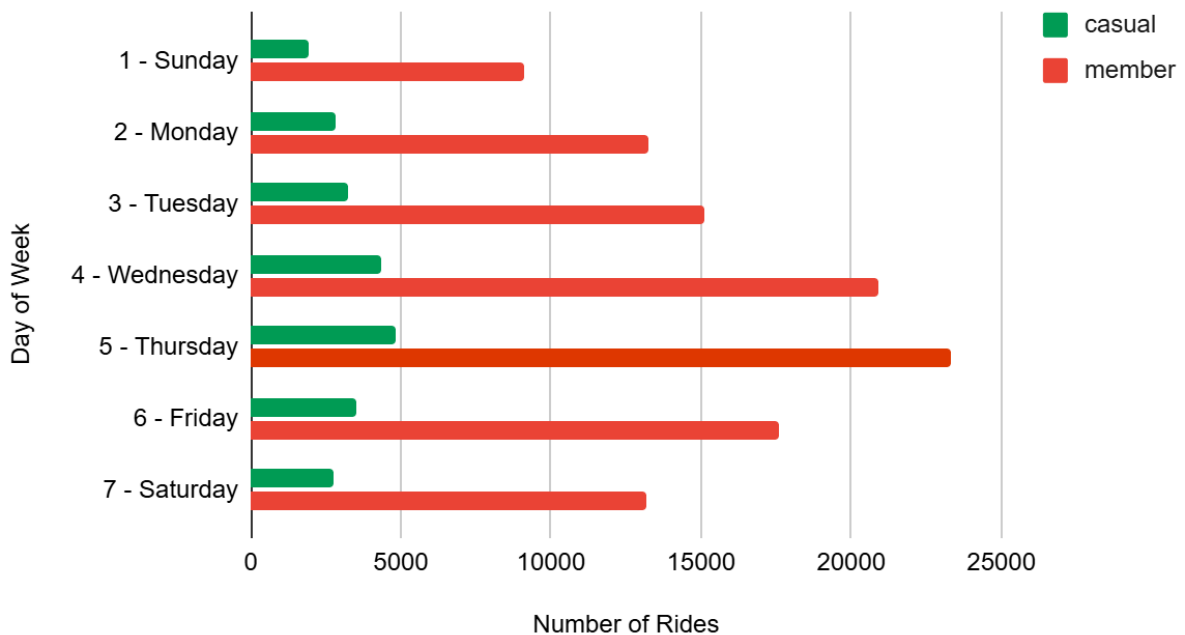
The number of rides shows a drastic shift between the winter and summer months. Specifically, the total number of rides by Casual Riders decreased by **86.63%**, while rides by Members declined by **64.20%**, leading to an overall reduction of **72.29%**. This great variation highlights how Casual usage is highly influenced by seasonal factors, likely tied to weather and leisure

behavior. In contrast Member usage, while still affected, remains more stable, reinforcing the idea of regular use throughout the year.

Day of Week	Casual Rides	Member Rides	Total
Sunday	1,895	9,090	10,985
Monday	2,811	13,242	16,053
Tuesday	3,274	15,094	18,368
Wednesday	4,351	20,887	25,238
Thursday	4,835	23,288	28,123
Friday	3,530	17,586	21,116
Saturday	2,786	13,174	15,960
Total	23,482	112,361	135,843

Table 4 - Number of Rides by Day of the Week and User

Number of Rides by Day of the Week and User Type



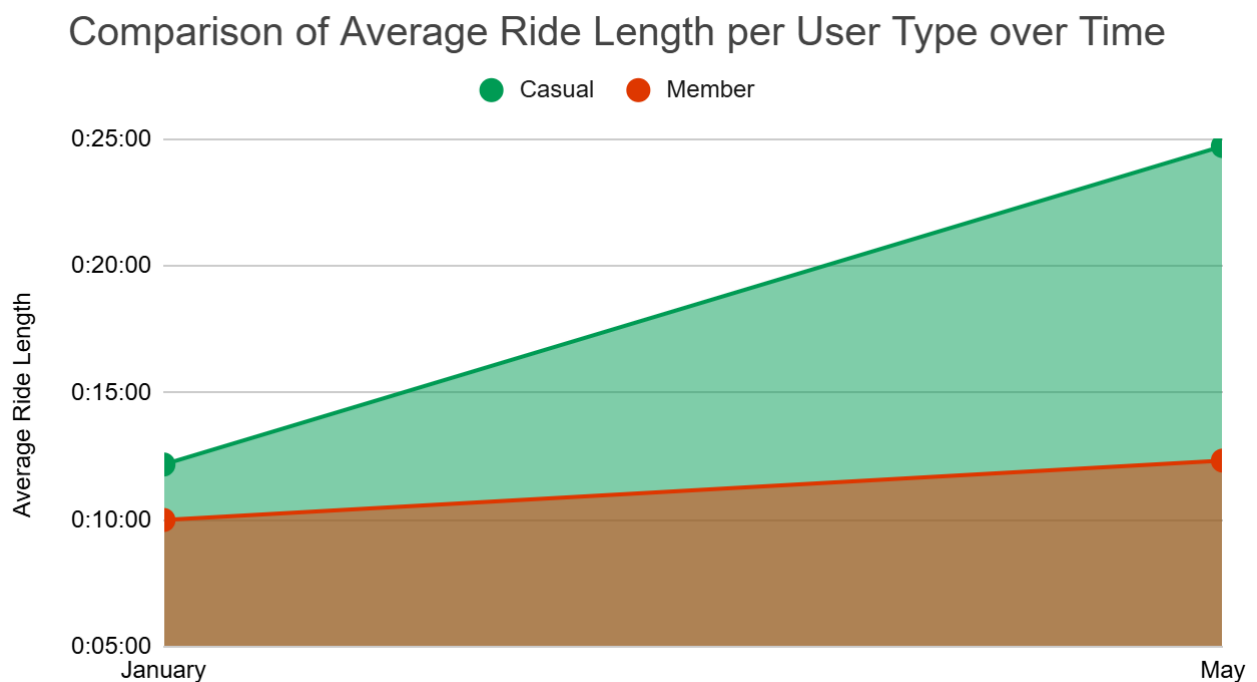
Insights from Seasonal Comparison

- Casual Riders are still more active on weekends, but their volume drops heavily, compared to Members.
- Members maintain consistent usage patterns, especially during weekdays, reinforcing their routine use (e.g., commuting).

The seasonal comparison reinforces the idea that Casual Riders are more sensitive to seasonal conditions, while Members show more stable behavior, a useful insight for targeted marketing campaigns.

Act

The chart below highlights a clear seasonal pattern in the average ride length between Casual users and Members. While both groups show a slight increase from January to May, the rise is far more strongly among Casual Riders. This suggests that Casual users are more influenced by seasonal factors and are likely to use bikes for leisure or recreational purposes, such as weekend outings or sightseeing, especially during warmer months. In contrast, Annual Members maintain a relatively stable average ride length throughout the year, reinforcing the hypothesis that they use the service for more consistent, utilitarian purposes like commuting or running errands. This reduced variance among Members indicates habitual use regardless of the season.



All these insights support a targeted marketing strategy that I suggest the Cyclistic marketing team aim to implement in order to convert occasional cyclists into Annual Members:

- Promote the practicality of using bikes for everyday needs and not just for leisure

- Highlight the convenience and economic benefits of year-round use for commuting and errands

These recommendations are directly supported by the patterns observed in the data, which show that Annual Members tend to use bikes more consistently for utilitarian purposes.

In addition, I propose several complementary strategies that, although not directly inferred from this data analysis, could support the achievement of the goal:

- Campaigns that promote eco-sustainability and physical well-being associated with cycling
- Shared subscription plans for families and friends as a way to lower the barrier to entry
- A service that allows people to leave the bike at any point and staff will collect it and bring it back to the stations
- 3-day or 1-week mini passes

When combined with eye-catching and innovative communication strategies (social media storytelling, influencer partnerships, local community engagement), these initiatives could significantly boost Cyclistic's Membership base and Annual enrollment. While the recommendations are largely supported by data, it is essential to acknowledge the complexity of user behavior change and market dynamics to strengthen the conclusion of this analysis. The main challenge these strategies aim to address is to overcome the inertia of occasional cyclists who are hesitant to sign up for an annual subscription. This group may be influenced by factors such as weather conditions, perceived costs, or the convenience of subscribing to an annual service. One possible solution could be to offer a free or low-cost trial period, where occasional users can experience the benefits of a subscription, at a discounted rate or for nothing. This would help understand the convenience and value of using an annual subscription. Furthermore, another way to improve user engagement could be to personalize pop-up notifications based on data. For example, by analyzing the habits of cyclists who use their bike primarily for daily commuting, Cyclistic could create personalized offers or send targeted communications about time and cost savings. Finally, integrating and promoting e-bikes for longer or more challenging rides could attract a wider audience that would otherwise shy away from cycling due to physical or logistical limitations. By addressing these challenges with the right data-driven strategies, Cyclistic can not only grow its membership base, but contribute to a healthier and more sustainable environment.