Cyclistic Data Analysis Report

Insights into Member and Casual Rider Behavior

Prepared for:

• Lily Moreno, Director of Marketing

• Cyclistic Executive Team

Prepared by:

Dave R. Lashley, Data Analyst

Date:

2.18.2025

Table of Contents

---

1. Executive Summary

This report examines how Cyclistic's annual members and casual riders use their services. Key findings indicate that although members make 1.7× more rides, casual riders enjoy significantly longer ride durations. Usage patterns reveal that both groups peak around 5 PM and show distinct behaviors regarding station usage and day-of-week preferences. Based on these insights, three targeted recommendations are provided to convert casual users into members, optimize rewards during rush hours, and launch seasonal promotions.

---

2. Introduction

2.1 Business Problem & Objectives

- **Problem Statement:**
    • How do annual members and casual riders use Cyclistic bikes differently?
    • Why would casual riders consider an annual membership?
    • How can digital media be used to influence casual riders to convert to members?
- **Business Task:**
  Study and compare the behaviors of casual and annual riders to develop a marketing plan that effectively converts casual users into long-term annual members.

2.2 Stakeholders

- **Lily Moreno:** Director of Marketing and Manager

- **Cyclistic Executive Team:** Decision makers for the recommended marketing program

---

3. Data Sources & Methodology

3.1 Data Sources

- Primary data was sourced from public trip data available at: https://divvy-tripdata.s3.amazonaws.com/index.html
- Data provided under the license from Motivate International Inc.

3.2 Data Cleaning & Preparation

- Blank rows and cells were removed.
- Duplicates, particularly for rides under one minute, were identified and excluded.
- Inconsistent time entries (e.g., negative ride lengths) were corrected or removed.
- Data was backed up and processed in Excel (_V02 and _V03 versions) to ensure integrity.
- New columns were created (ride_length, day_of_week) and functions such as TRIM and WEEKDAY were applied for accurate formatting.

3.3 Tools & Techniques

- **Excel:** Used for initial data cleaning, pivot tables, and preliminary analysis.
- **SQL Queries:** Deployed for detailed data segmentation (e.g., ride counts, average ride durations, station popularity, temporal trends).

---

4. Analysis & Findings

4.1 General Usage Overview

- **Ride Counts:**
  - Members completed 2,688,161 rides versus 1,514,400 by casual riders.
  - Members take roughly 1.7× more rides than casual users.

- **Ride Duration:**
  - Average ride for members: 00:12:34
  - Average ride for casual riders: 00:24:11
  - Casuals ride almost twice as long on average.

4.2 Station Usage Patterns

- **Popular Stations:**
  - Casual riders tend to use stations for round trips (e.g., Streeter Dr & Grand Ave, DuSable Lake Shore Dr & Monroe St).
  - Members display non-round trip patterns with distinct start and end stations.

4.3 Temporal Analysis

- **Busiest Days:**
  - Members: Peak on Wednesdays
  - Casuals: Peak on Saturdays
- **Peak Hours:**
  - Both groups show peak usage at 5 PM, with 4 PM as a close second.
- **Seasonal Trends:**
  - Usage peaks in mid-Summer through early Fall and drops during winter.

4.4 Bike Type & Ride Characteristics

- **Bike Preference:**
  - Classic bikes are most popular among both members and casual riders.
- **Long-Distance Riders:**
  - Over 869,000 casual riders have rides longer than 12 minutes, suggesting they are prime candidates for conversion.

4.5 Day Type Analysis

- **Weekday vs. Weekend:**
  - Both members and casual riders primarily use the bikes on weekdays.

---

5. Recommendations & Action Plan

5.1 Immediate Plan for Membership Conversion

- **Seamless Membership Funnel at High-Traffic Stations:**
  - "Ride 3x, Get a Discount" incentive: Casual riders earning three trips in a week unlock a one-week trial membership, with clear cost-savings shown at checkout.
  - Gamification elements (progress bars, notifications) to motivate continuous usage.
  - QR Code sign-ups at popular stations for instant activation.
  - Discounted first-time membership offers following the trial period.

5.2 Ongoing Perks & Rewards Strategy

- **Rush Hour Incentives:**
  - Introduce "Member-Only Lanes" or priority reservations during peak hours.
  - "Commute & Save" program: Casual riders earn ride credits during rush hours, with additional benefits for members.
  - Bonus challenges on Wednesday (members) and Saturday (casuals) to accumulate extra rewards.
  - Group memberships and referral discounts to leverage social influence.

5.3 Seasonal Promotion Initiatives

- **Targeted Summer Promotions:**
  - Personalized in-app messages for casual riders taking long rides, offering membership discounts.
  - Partnerships with local events to distribute discounted or free trial memberships.
  - "Summer Ride Pass": A low-risk seasonal membership to encourage trial usage, which can lead to long-term membership conversion.

---

6. Conclusion & Next Steps

Final Conclusions:

- Members ride more frequently but for shorter durations, while casual riders have longer rides and exhibit round-trip patterns.
- Peak usage times and days are consistent across both groups, with significant seasonal variations.

Application & Next Steps:

- Implement the immediate conversion funnel at popular stations.
- Launch targeted digital and in-app campaigns based on peak usage insights.
- Explore additional data (e.g., rider feedback, geo-demographic information) to further refine marketing strategies and tailor membership offerings.

---

7. Appendices

SQL Queries

1. General Usage Overview by User Type

```
SELECT member_casual, COUNT(*) AS total_rides
FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`
GROUP BY member_casual;
```

2024 Results:

Member Total Rides= 2,688,161

Casual Total Rides= 1,514,400

Total riders= 4,202,561

Observation:

- Members take approximately 1.7x more rides than casual riders.

2. Average Ride Duration by User Type

```
SELECT member_casual,
    FORMAT_TIMESTAMP('%H:%M:%S',
    TIMESTAMP_SECONDS(CAST(AVG(TIMESTAMP_DIFF(ended_at, started_at,
    SECOND)) AS INT64))) AS avg_ride_duration
FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`
```

```
GROUP BY member_casual;
```

2024 Results:

Member Avg Ride= 00:12:34

Casual Avg Ride= 00:24:11

Observation:

- Casuals take longer rides than members by almost 2x the time.

3. Most Popular Start & End Stations for Each User Type

```
SELECT member_casual, start_station_name, end_station_name, COUNT(*) AS ride_count
FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`
GROUP BY member_casual, start_station_name, end_station_name
ORDER BY ride_count DESC
LIMIT 10;
```

2024 Results:

member_casual	start_station_name	end_station_name	ride_count
casual	Streeter Dr & Grand Ave	Streeter Dr & Grand Ave	8,396
casual	DuSable Lake Shore Dr & Monroe St	DuSable Lake Shore Dr & Monroe St	6,868
member	State St & 33rd St	Calumet Ave & 33rd St	5,476
member	Calumet Ave & 33rd St	State St & 33rd St	5,441
casual	DuSable Lake Shore Dr & Monroe St	Streeter Dr & Grand Ave	5,234
casual	Michigan Ave & Oak St	Michigan Ave & Oak St	4,445

member	Ellis Ave & 60th St	University Ave & 57th St	3,928
member	Ellis Ave & 60th St	Ellis Ave & 55th St	3,739
member	University Ave & 57th St	Ellis Ave & 60th St	3,614
member	Ellis Ave & 55th St	Ellis Ave & 60th St	3,565

Observations:

- Casual riders popular stations appear to be round trips.
  1. Streeter Dr & Grand Ave
  2. DuSable Lake Shore Dr & Monroe St
  3. Michigan Ave & Oak St

- Members popular stations appear "not" to be round trips but frequented start and end stations.

4. Busiest Days of the Week for Each User Type

```
SELECT member_casual, EXTRACT(DAYOFWEEK FROM started_at) AS day_of_week,
COUNT(*) AS ride_count

FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`

GROUP BY member_casual, day_of_week

ORDER BY ride_count DESC;
```

2024 Results:

member_casual	day_of_week	ride_count
member	4	448,886
member	5	418,892
member	3	416,372
member	2	391,446
member	6	382,756
member	7	335,467
casual	7	316,674
member	1	294,342
casual	1	263,992
casual	6	223,889
casual	4	187,385

casual	5	183,521
casual	2	178,039
casual	3	160,900

Observations:

- Members busiest day is Wednesday (4)
- Casuals busiest day is Saturday (7)

5. Peak Ride Hours by User Type (ideal for time-based membership discounts)

```
SELECT member_casual, EXTRACT(HOUR FROM started_at) AS hour_of_day, COUNT(*) AS ride_count

FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`

GROUP BY member_casual, hour_of_day

ORDER BY  ride_count DESC

LIMIT 20;
```

2024 Results:

member_casual	hour_of_day	ride_count
member	17	293,408
member	16	253,967
member	18	218,808
member	8	193,042
member	15	182,932
member	7	156,619
member	19	151,431
member	14	148,703
member	12	148,550
member	13	147,846
casual	17	145,864
casual	16	138,207
member	11	130,228
member	9	127,141
casual	15	122,154
casual	18	120,368

casual	14	111,871
member	10	111,713
casual	13	108,130
member	20	104,680

Observation:

- 5pm (17) is the peak ride time for both members and casuals, followed by 4pm (16) for both groups.

6. Seasonal Trends – Rides Per Month (ideal for targeted membership promotions)

```
SELECT member_casual, EXTRACT(MONTH FROM started_at) AS month, COUNT(*) AS ride_count

FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`

GROUP BY member_casual, month

ORDER BY member_casual, month;
```

2024 Results:

member_casual	month	ride_count
casual	1	17,373
member	1	93,550
casual	2	37,613
member	2	144,465
casual	3	61,799
member	3	164,708
casual	4	92,234
member	4	200,336
casual	5	164,420
member	5	270,099
casual	6	206,705
member	6	284,522
casual	7	230,169
member	7	307,498
casual	8	226,811
member	8	311,127

casual	9	214,287
member	9	319,102
casual	10	158,441
member	10	288,467
casual	11	68,393
member	11	176,414
casual	12	36,155
member	12	127,873

Observation:

- Members & casuals record peak rides from mid-Summer to the start of Fall.
- Members & casuals record lowest rides for Winter season.
- Members are the highest demographic in either case.

7. Most Used Bike Type by User Type

```
SELECT member_casual, rideable_type, COUNT(*) AS ride_count

FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`

GROUP BY member_casual, rideable_type

ORDER BY member_casual, ride_count DESC;
```

2024 Results:

member_casual	rideable_type	ride_count
casual	classic_bike	972,078
casual	electric_bike	517,044
casual	electric_scooter	25,278
member	classic_bike	1,775,014
member	electric_bike	891,471
member	electric_scooter	21,676

Observation:

- Classic bikes are most popular amongst members and casual riders.

8. Identifying Long-Distance Casual Riders (Potential Members)

```
SELECT ride_id, member_casual,
        FORMAT_TIMESTAMP('%H:%M:%S',
        TIMESTAMP_SECONDS(TIMESTAMP_DIFF(ended_at, started_at, SECOND)))
        AS ride_duration
FROM ` hardy-magpie-433820-n2.cyclistic_2024_data.2024`
WHERE member_casual = 'casual'
        AND TIMESTAMP_DIFF(ended_at, started_at, SECOND) >= 720 -- 12 minutes
        in seconds
ORDER BY ride_duration DESC
```

2024 Results:

The query returned 869,951K results for casual users who ride longer than 12 mins. With the longest ride being 23 hours and 59 minutes.

Observation:

- Being that the average casual ride length is 2x longer than that of members (12 mins). There are 869K+ casual riders who ride longer than 12 mins and are prime candidates to convert to membership status.

9. Analyzing Weekend vs. Weekday Usage

```
SELECT member_casual,
    CASE
      WHEN EXTRACT(DAYOFWEEK FROM started_at) IN (1, 7) THEN 'Weekend'
      ELSE 'Weekday'
    END AS day_type,
    COUNT(*) AS ride_count
FROM ` hardy-magpie-433820-n2.cyclistic_2024_data.2024`
GROUP BY member_casual, day_type
ORDER BY member_casual, ride_count DESC;
```

2024 Results:

member_casual	day_type	ride_count
casual	Weekday	933,734
casual	Weekend	580,666
member	Weekday	2,058,352
member	Weekend	629,809

Observations:

- Casual riders use bikes mostly during the week just like members do.

10. Identify Popular Start Stations Among Casual Riders (Ideal Membership promotions)

```
SELECT start_station_name, COUNT(*) AS total_rides
FROM `hardy-magpie-433820-n2.cyclistic_2024_data.2024`
WHERE member_casual = 'casual'
GROUP BY start_station_name
ORDER BY total_rides DESC
LIMIT 10;
```

2024 Results:

start_station_name	total_rides
Streeter Dr & Grand Ave	47,828
DuSable Lake Shore Dr & Monroe St	31,776
Wells St & Elm St	23,375
Michigan Ave & Oak St	23,145
DuSable Lake Shore Dr & North Blvd	21,178
Millennium Park	20,626
Shedd Aquarium	19,867
Dusable Harbor	17,127
Theater on the Lake	15,302
Michigan Ave & 8th St	12,445

Observations:

- The top 6 stations have over 20K - 40K+ casual riders each. This totals approximately 165k+ potential new members.

Excel & Pivot Table Example

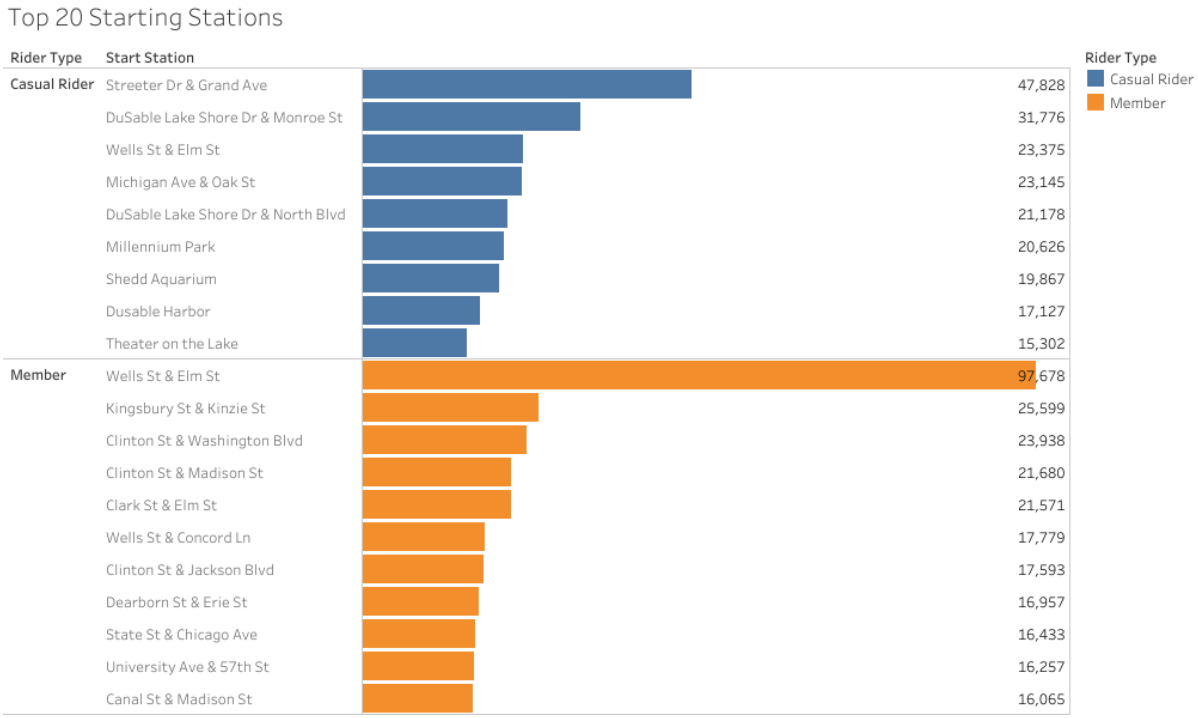
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	ride_id	rideable_type	started_at	ended_at	ride_length	day_of_week	start_station_nam	start_station_id	end_station_name	end_station_id	start_lat	start_lng	end_lat	end_lng	member_casual
2	88BCE90D0B04B22(	classic_bike	5/30/2024 14:16	5/30/2024 14:17	0:01:00	5	California Ave & M	15622	California Ave & M	15622	41.961068	-87.695439	41.961068	-87.695439	member
3	132131456CD4A3D(	classic_bike	5/22/2024 10:40	5/22/2024 10:41	0:01:00	4	Mies van der Rohe	13338	Michigan Ave & Pe	13034	41.89694463	-87.62175769	41.89766	-87.62351	member
4	DE915E536084CB5(	electric_bike	5/1/2024 17:25	5/1/2024 17:26	0:01:00	4	Halsted St & Fulton	23003	Halsted St & Fulton	23003	41.88665962	-87.64810336	41.886871	-87.648089	member
5	1E9E61718FBF1BD(	classic_bike	5/30/2024 15:00	5/30/2024 15:01	0:01:00	5	Streeter Dr & Grand	13022	Streeter Dr & Grand	13022	41.892278	-87.612043	41.892278	-87.612043	casual
6	77C1D5AF4B0D07B	electric_bike	5/9/2024 10:22	5/9/2024 10:23	0:01:00	5	Kedzie Ave & Chica	KA1504000114	Kedzie Ave & Chica	KA1504000114	41.89545739	-87.70609689	41.8954653	-87.70612788	member
7	55BDBEC34F24040(	classic_bike	5/6/2024 6:48	5/6/2024 6:49	0:01:00	2	Mies van der Rohe	13338	Mies van der Rohe	15529	41.89694463	-87.62175769	41.89858665	-87.62191523	member
8	E5DB97F3B80DADF(	classic_bike	5/26/2024 8:37	5/26/2024 8:38	0:01:00	1	Dearborn Pkwy & D	TA1307000128	Dearborn Pkwy & D	TA1307000128	41.898969	-87.629912	41.898969	-87.629912	casual
9	818FC5980CC48D2(	classic_bike	5/27/2024 18:16	5/27/2024 18:17	0:01:00	2	Benson Ave & Chur	596	Benson Ave & Chur	596	42.048214	-87.683485	42.048214	-87.683485	casual
10	06D7AFC8A7C8B58	electric_bike	5/4/2024 16:05	5/4/2024 16:06	0:01:00	7	Clark St & North Av	13128	Clark St & North Av	13128	41.91200912	-87.63202429	41.911974	-87.631942	casual
11	55C26D924BE3DFD	classic_bike	5/27/2024 19:01	5/27/2024 19:02	0:01:00	2	Streeter Dr & Grand	13022	Streeter Dr & Grand	13022	41.892278	-87.612043	41.892278	-87.612043	casual
12	3DB1F5997AE2468(	classic_bike	5/11/2024 14:46	5/11/2024 14:47	0:01:00	7	Streeter Dr & Grand	13022	Streeter Dr & Grand	13022	41.892278	-87.612043	41.892278	-87.612043	member

Spreadsheet snapshot displaying the newly created columns, ***"ride_length"*** *and* ***"day_of_week,"*** *calculated from* ***"started_at"*** *and* ***"ended_at"*** *using the formulas* ***=D3-C3*** *and* ***=WEEKDAY(C3, 1),*** *respectively.*

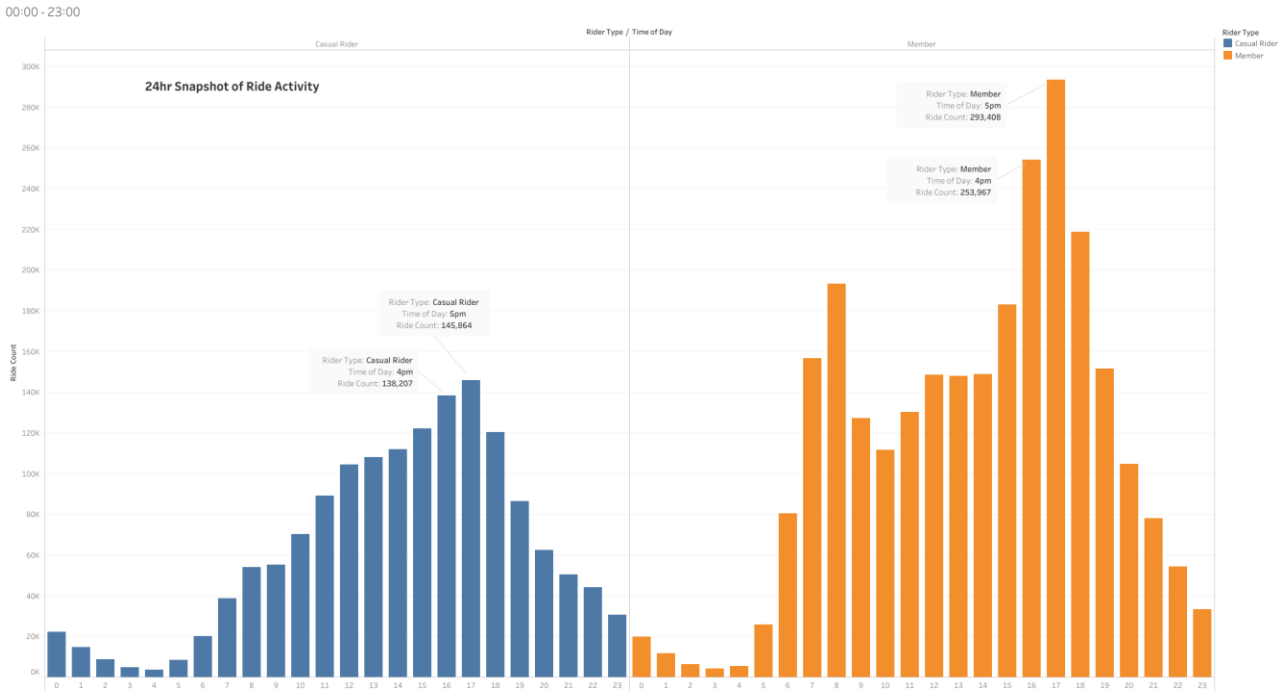
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**Avg ride length**			**Max ride length**									
2	**Row Labels**	**Average of ride_length**		**Row Labe**	**Max of ride_length**								
3	casual	0:27:22		casual	24:56:25								
4	member	0:13:31		member	24:35:37								
5	**Grand Total**	**0:18:45**		**Grand Total**	**24:56:25**								
6													
7	**Avg ride length by day**												
8	**Average of ride**	**Column Lal**										**Legend**	
9	**Row Labels**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Grand Total**			1= Sunday	
10	casual	0:31:07	0:27:48	0:21:28	0:24:44	0:23:36	0:26:00	0:31:28	0:27:22			2= Monday	
11	member	0:15:10	0:12:51	0:12:34	0:13:14	0:12:37	0:13:01	0:15:59	0:13:31			3= Tuesday	
12	**Grand Total**	**0:22:54**	**0:18:12**	**0:15:06**	**0:16:46**	**0:16:00**	**0:17:57**	**0:23:56**	**0:18:45**			4= Wednesday	
13												5= Thursday	
14	**Number of rides by day of week**											6= Friday	
15	**Count of mem**	**Column Lal**										7= Saturday	
16	**Row Labels**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Grand Total**	**Most Popular Day**			
17	casual	25515	17688	13751	23271	19654	27693	36790	164362	4			
18	member	27050	31765	34583	52595	44047	45213	34798	270051				
19	**Grand Total**	**52565**	**49453**	**48334**	**75866**	**63701**	**72906**	**71588**	**434413**				
20													
21	**Bike type rental**												
22	**Count of mem**	**Column Lal**											
23	**Row Labels**	**classic_bike**		**electric**	**Grand Total**								
24	casual	114072		50290	164362								
25	member	186960		83091	270051								
26	**Grand Total**	**301032**		**133381**	**434413**								
27													

Pivot table snapshot displaying ride calculations comparing members and casual riders.

Visualizations

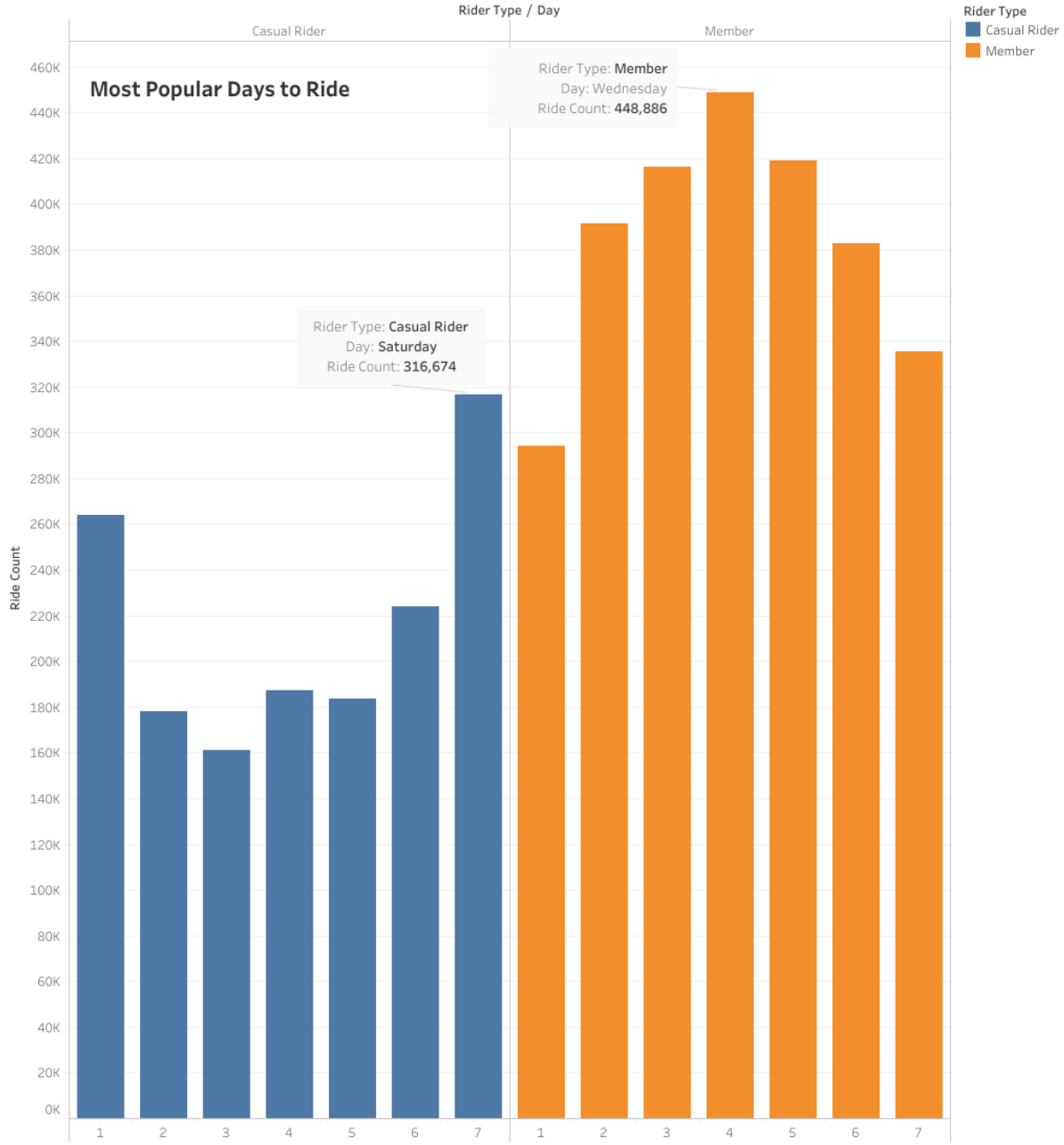


Popular Stations

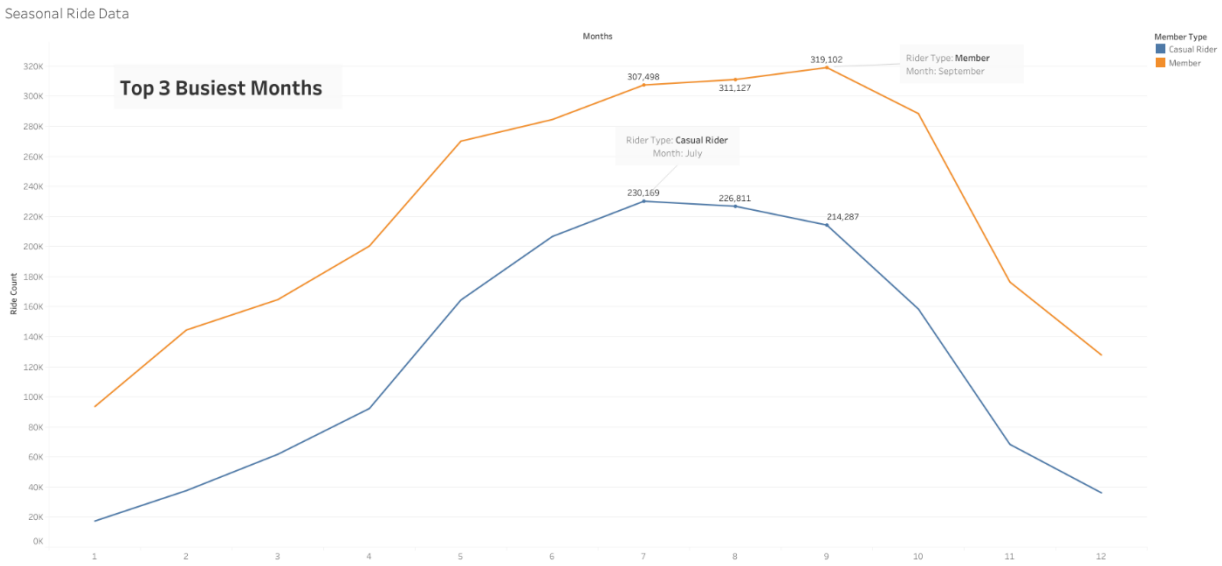


Peak Ride Hours

Sunday - Saturday



Peak Ride Days



Peak Seasonal Rides