



Cyclistic

How do rider types differ?

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Outline

Business Task

- How do annual members and casual riders use Cyclistic bikes differently?

Team Goal

- Design marketing strategies aimed at converting casual riders into annual members.

Data Outline

In this presentation,

- casual riders = single-ride rider & full-day passes
- member = annual memberships

The data doesn't contain any information that identifies any individual, this means we can't analyze individual riders and target them for an annual membership.

Data Background

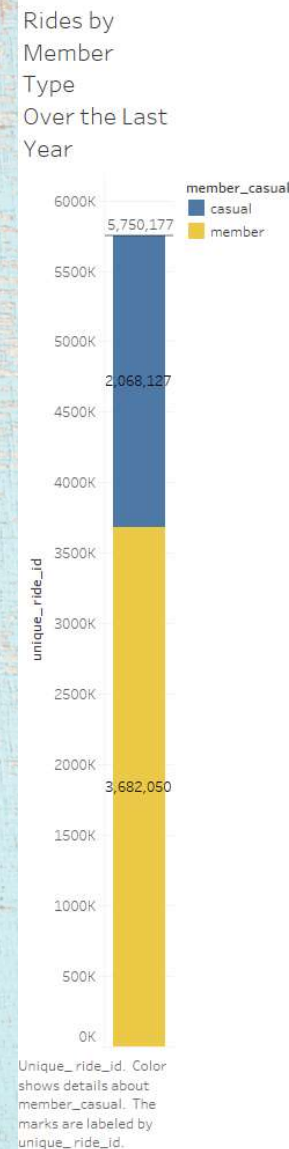
- This data is internal data from Cyclistic.
- The data is public and stored at <https://divvy-tripdata.s3.amazonaws.com/index.html>
- Note: The datasets have a different name because Cyclistic is a fictional company. For the purposes of this case study, the datasets are appropriate and will enable you to answer the business questions. The data has been made available by Motivate International Inc. under this [license](#).
- Data-privacy issues prohibit you from using riders' personally identifiable information. This means that you won't be able to connect pass purchases to credit card numbers to determine if casual riders live in the Cyclistic service area or if they have purchased multiple single passes

Data Cleaning and Processing

- This data is the most currently available during the project. The data was stored as .csv files by month and year.
- Data was reviewed and cleaned the data before combining individual datasets: located in [Excel Log for Cyclistic](#)
 - New columns for start_lag and end_lag, correcting data type error =VALUE() formula
 - Ride_length calculated =IF(ended_at<started_at,"", ended_at - started_at)
 - Data contains start_at times that finish after end_at times; therefore, the ride_length calculation was an IF-THEN statement to correct the error of negative time.
- The data was then uploaded to Tableau as a .xlsx file, which allowed me to perform a union of the document's sheets. This joined every month of data (previously individual .csv files) on top of each other.
- Next, the individual columns were checked for the correct data structure associations.
- Created a count distinct ride_id to ensure no rides were counted twice.

Summary of Rides for April 2023 – March 2024 (Last Yr.)

- Generally, this data looks at the last 12 months of rides, April 2023 – March 2024, in which rides are more frequently made by annual members than casual riders.
- We had 5,750,177 individual rides in the last year.
- To put this in perspective, approximately 35.97%, or 2.1 million, are casual riders, and approximately 64.03%, or 3.7 million, are annual members.



Rides by Member Type Over the Last Year

member_casual	
casual	35.97%
member	64.03%
Grand Total	100.00%

% of Total unique_ride_id broken down by member_casual.

Daily Summary by Casual & Member

Next, we began to look for the differences between annual members and casual riders by first looking at overall trends.

- In this chart, we are looking at average ride length, maximum and minimum ride length, and finally, the number of rides by weekday for each group.
- Here, we see higher maximum and average rides for casual riders. Casual riders also have a weekday mode of Saturday (the day of their most rides), followed by Sunday and Friday.
- Finally, member riders ride more often but enjoy shorter rides on average and comparing maximum ride length. Their weekday mode is Thursday, followed by Wednesday and Tuesday.

Daily Summary by Rider Type

member_casual	Day	Avg. ride_length	Max. ride_length	Min. ride_length	unique_ride_id
casual	Sunday	00:32:58	15:47:06	00:00:00	336,328
	Monday	00:27:55	21:42:35	00:00:00	236,302
	Tuesday	00:25:31	13:31:42	00:00:00	244,154
	Wednesday	00:24:18	09:29:04	00:00:00	247,356
	Thursday	00:24:48	06:49:55	00:00:00	272,951
	Friday	00:27:27	09:35:01	00:00:00	312,577
	Saturday	00:32:03	10:49:15	00:00:00	418,459
	Total	00:28:23	09:29:04	00:00:00	2,068,127
member	Sunday	00:14:17	01:01:00	00:00:00	407,528
	Monday	00:12:13	01:00:00	00:00:00	500,519
	Tuesday	00:12:26	01:00:00	00:00:00	571,565
	Wednesday	00:12:21	01:00:00	00:00:00	590,031
	Thursday	00:12:17	01:00:00	00:00:00	601,874
	Friday	00:12:39	01:00:00	00:00:00	530,154
	Saturday	00:14:08	02:00:00	00:00:00	480,379
	Total	00:12:49	02:00:00	00:00:00	3,682,050

Avg. ride_length, Max. ride_length, Min. ride_length and unique_ride_id broken down by member_casual and Day.
The view is filtered on Day, which keeps 7 of 7 members.

Enlarged View

Daily Summary by Rider Type

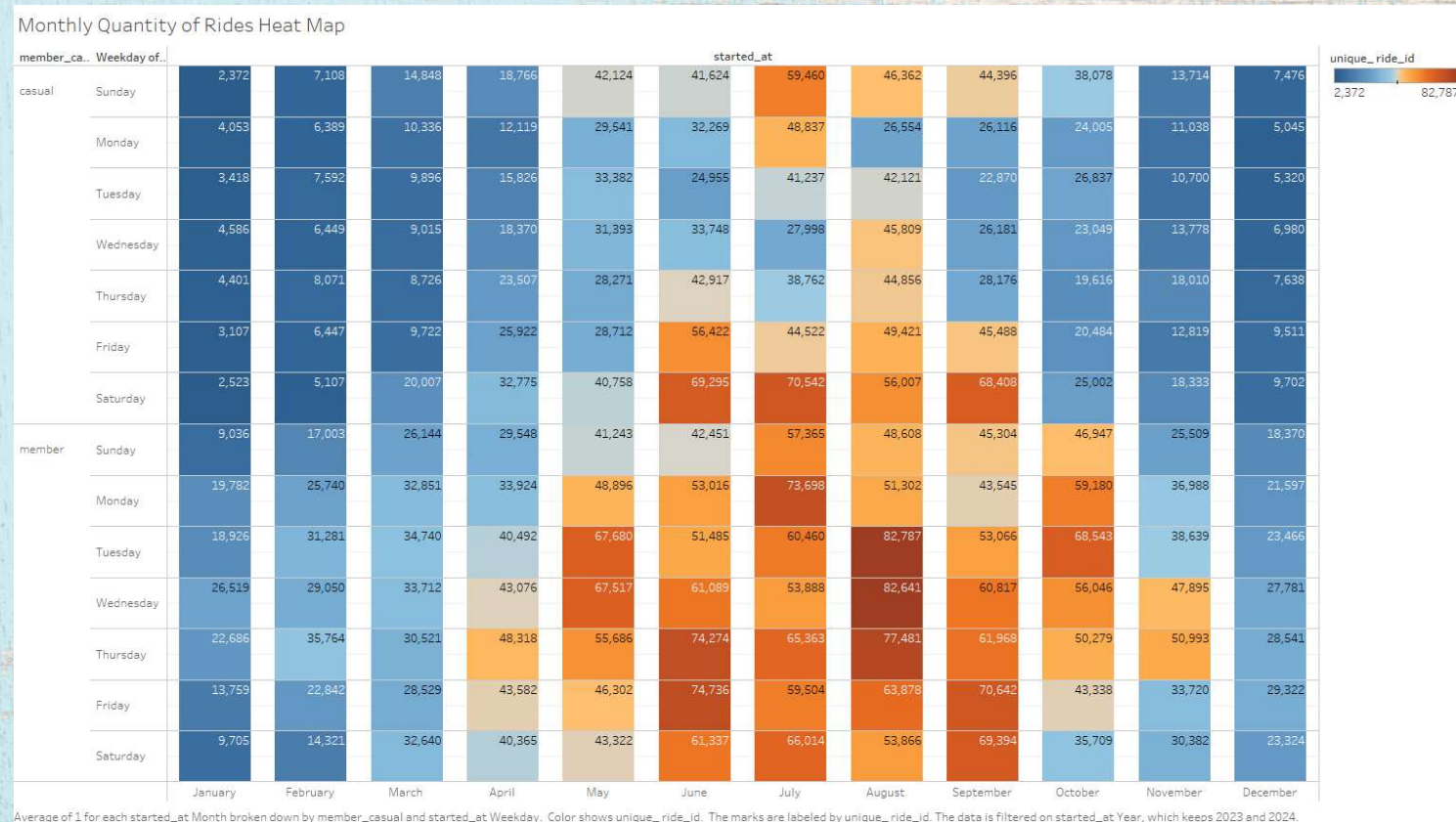
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Avg. ride_length, Max. ride_length, Min. ride_length and unique_ride_id broken down by member_casual and Day.
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Monthly Quantity of Rides Heat Map

This map looks at ride quantity by day and month.

- Casual riders have higher rider-ship in the Summer months.
- Members have higher numbers in Summer but ride more from April – November.



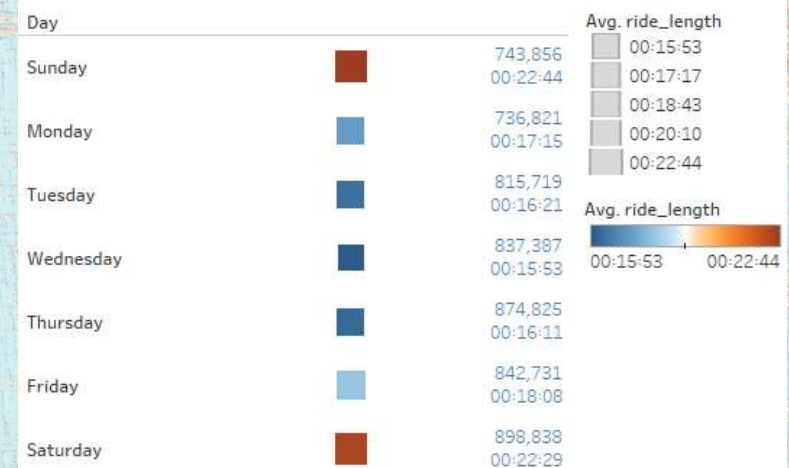
Daily Rides by All Riders

This is a continuation of the analysis of the ride summary focusing on ride length using a different graphic.

- In this visual, we have all riders represented, and you can see a clear heat map of ride lengths by weekday, with dark orange being the higher ride lengths and dark blue being the shorter ride lengths.
- Saturday and Sunday standout at appx. 22 min a ride.

Daily Rides All Riders

with Average Length and Quantity of Rides



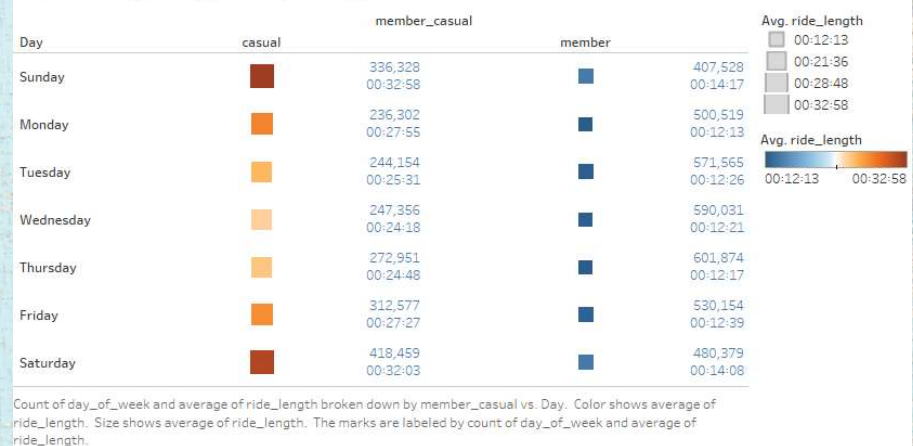
Count of day_of_week and average of ride_length broken down by Day. Color shows average of ride_length. Size shows average of ride_length. The marks are labeled by count of day_of_week and average of ride_length. The data is filtered on member_casual, which keeps casual and member.

Daily Riders by Casual & Member

Each member type is represented in this table.

- Now we can see that although Saturday, Sunday, and Friday are high-activity days, it is casual members, on average, that produce longer rides and more frequently ride on the weekends.
- Contrary to the casual riders, annual members use the bikes more frequently throughout the week on Thursday, Wednesday, and Tuesday. Annual members make longer weekend rides, but it doesn't compete with casual riders' average distances.
- We can see the mode of the weekdays for casual riders is Saturday, with 418,459 rides.
- Opposed to annual members weekday mode of Thursday, 601,874 rides.

Daily Rides by Casual and Member
with Average Length and Quantity of Rides



Daily Rides by Casual & Member and Mode

Next, we explored ride types and learned all the rides in the last year for docked bikes were made by casual riders.

- Otherwise, casual riders choose electric 52.75%, classic bikes 43.80%, and docked bikes 3.46%. Annual members, on the other hand, about evenly chose between classic and electric bikes.

Ridetype by Rider Type

	rideable_type			unique_ride_id	
	member_casual	classic_bike	docked_bike	electric_bike	
casual		905,858 43.80%	71,334 3.45%	1,090,935 52.75%	71,334 1,868,311
member		1,868,311 50.74%		1,813,739 49.26%	

Unique_ride_id and % of Total unique_ride_id broken down by rideable_type vs. member_casual. Color shows unique_ride_id. The marks are labeled by unique_ride_id and % of Total unique_ride_id.

Station by Casual & Member Focused on Casual Riders

Next, we explored location data.

- Here we learned for both member types Null Station Name was used the most followed by the following locations for casual riders.

Top 15 - Start Stations Most Commonly Visited by Casual Riders

start_station_name	member_casual	
	casual	member
Null	324,947	549,503
Streeter Dr & Grand Ave	47,166	17,400
DuSable Lake Shore Dr & ..	31,272	10,123
Michigan Ave & Oak St	23,108	14,816
Millennium Park	20,496	10,037
Theater on the Lake	16,752	14,065
DuSable Lake Shore Dr & ..	16,106	12,854
Wells St & Concord Ln	12,028	21,283
Clark St & Elm St	10,849	24,873
Wilton Ave & Belmont Ave	10,642	16,922
Wells St & Elm St	10,162	20,589
Broadway & Barry Ave	9,356	18,899
Kingsbury St & Kinzie St	8,839	26,689
Clinton St & Washington ..	6,376	27,173
Clinton St & Madison St	6,244	21,682

Unique_ride_id broken down by member_casual vs. start_station_name. The view is filtered on start_station_name, which keeps 15 of 1,609 members.

Top 15 - End Stations Most Commonly Visited by Casual Riders

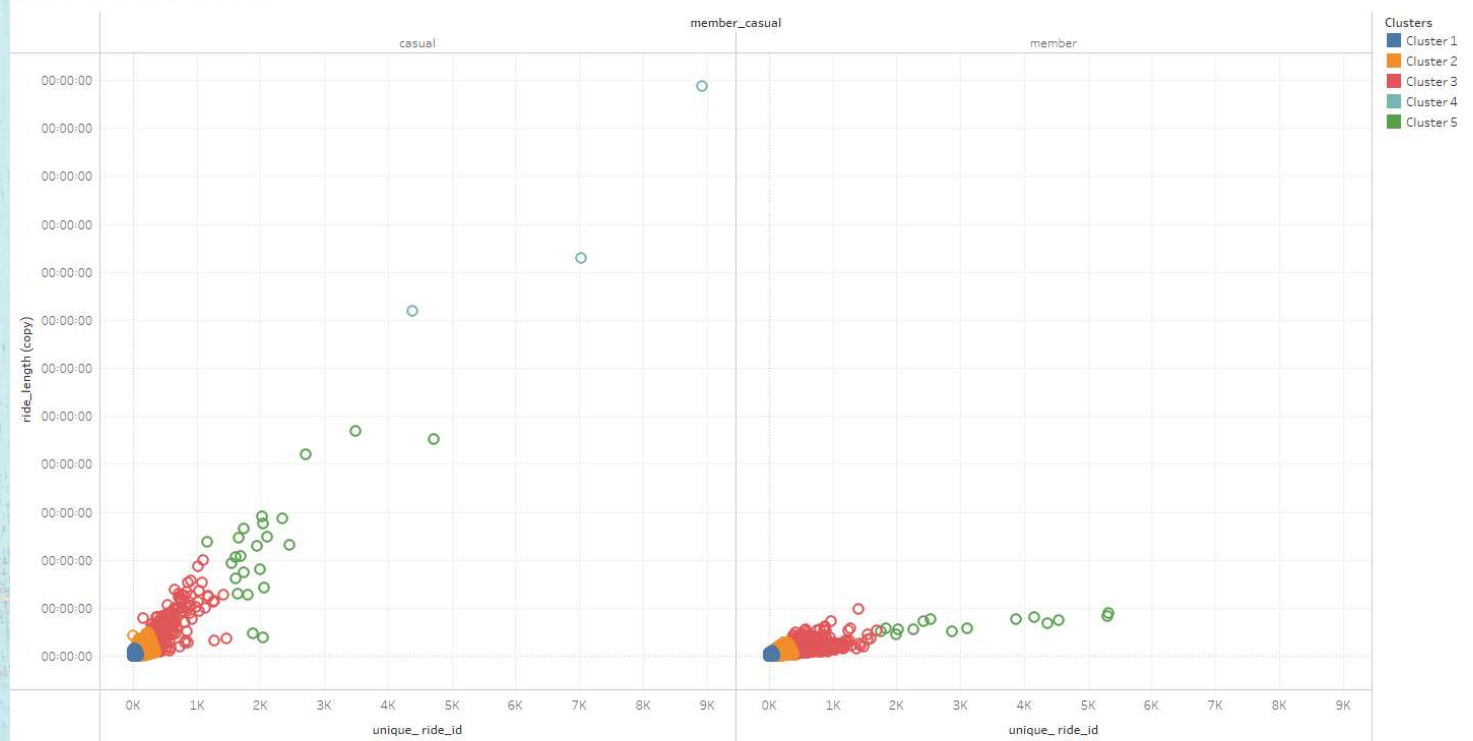
end_station_name	member_casual	
	casual	member
Null	382,130	547,096
Streeter Dr & Grand Ave	50,399	14,931
DuSable Lake Shore Dr & ..	28,488	10,759
Michigan Ave & Oak St	24,103	14,313
Millennium Park	22,449	8,886
DuSable Lake Shore Dr & ..	18,474	13,043
Theater on the Lake	18,045	13,280
Wells St & Concord Ln	11,789	22,005
Wells St & Elm St	10,256	20,399
Clark St & Elm St	10,113	24,873
Wilton Ave & Belmont Ave	9,829	17,358
Broadway & Barry Ave	9,720	19,356
Kingsbury St & Kinzie St	8,034	26,693
Clinton St & Washington ..	6,076	28,126
Clinton St & Madison St	5,884	23,125

Unique_ride_id broken down by member_casual vs. end_station_name. The view is filtered on end_station_name, which keeps 15 of 1,621 members.

Station Routes

Using a cluster analysis, we were able to isolate the non-null routes that rider most frequented, represented in Cluster 5 in darker green.

Cluster Analysis by Ride Length and Routes Most Frequented
by Casual and Member
Excludes Null Station Names



Unique_ride_id vs. sum of ride_length (copy) broken down by member_casual. Color shows details about Clusters. Details are shown for Routes. The data is filtered on end_station_name and start_station_name. The end_station_name filter excludes Null. The start_station_name filter excludes Null. The view is filtered on Routes and sum of ride_length (copy). The Routes filter excludes Null. The sum of ride_length (copy) filter keeps non-Null values only.

Routes Most Frequented by Riders

Continuing with the cluster analysis, you can see the top routes taken by casual rider then member.

- Causal riders favored DuSable Lake Shore Dr & Monroe St to Streeter Dr & Grand Ave with 4,717 rides and 12:50:57 total ride length.
- Members favored Calumet Ave & 33rd St to State St & 33rd St with 5,318 rides and 22:29:20 total ride length

Cluster Analysis by Ride Length and Routes Most Frequented for Casual Riders
Excludes Null Station Names

Routes	unique_ride_id	member_casual
DuSable Lake Shore Dr & Monroe St to Streeter Dr & Grand Ave	ride_length (copy)	4,717
Millennium Park to Millennium Park	ride_length (copy)	3,490
Montrose Harbor to Montrose Harbor	ride_length (copy)	2,713
Streeter Dr & Grand Ave to DuSable Lake Shore Dr & Monroe St	ride_length (copy)	2,462
DuSable Harbor to DuSable Harbor	ride_length (copy)	2,339
Shedd Aquarium to Streeter Dr & Grand Ave	ride_length (copy)	2,100
Shedd Aquarium to Shedd Aquarium	ride_length (copy)	2,049
Ellis Ave & 60th St to Ellis Ave & 55th St	ride_length (copy)	2,043
Adler Planetarium to Adler Planetarium	ride_length (copy)	2,033
Theater on the Lake to Theater on the Lake	ride_length (copy)	2,026
Streeter Dr & Grand Ave to Michigan Ave & Oak St	ride_length (copy)	1,987
Streeter Dr & Grand Ave to Millennium Park	ride_length (copy)	1,949
Ellis Ave & 55th St to Ellis Ave & 60th St	ride_length (copy)	1,874
Shedd Aquarium to DuSable Lake Shore Dr & Monroe St	ride_length (copy)	1,794
Michigan Ave & 8th St to Michigan Ave & 8th St	ride_length (copy)	1,745
DuSable Harbor to Streeter Dr & Grand Ave	ride_length (copy)	1,743
DuSable Lake Shore Dr & North Blvd to DuSable Lake Shore Dr & North Blvd	ride_length (copy)	1,693
Indiana Ave & Roosevelt Rd to Indiana Ave & Roosevelt Rd	ride_length (copy)	1,665
DuSable Lake Shore Dr & Monroe St to Shedd Aquarium	ride_length (copy)	1,643
Millennium Park to Streeter Dr & Grand Ave	ride_length (copy)	1,607
Streeter Dr & Grand Ave to Theater on the Lake	ride_length (copy)	1,603
Michigan Ave & Oak St to Streeter Dr & Grand Ave	ride_length (copy)	1,554
Shore Dr & 55th St to Shore Dr & 55th St	ride_length (copy)	1,157
Grand Total	ride_length (copy)	47,986
	ride_length (copy)	03:20:01

Cluster Analysis by Ride Length and Routes Most Frequented for Members
Excludes Null Station Names

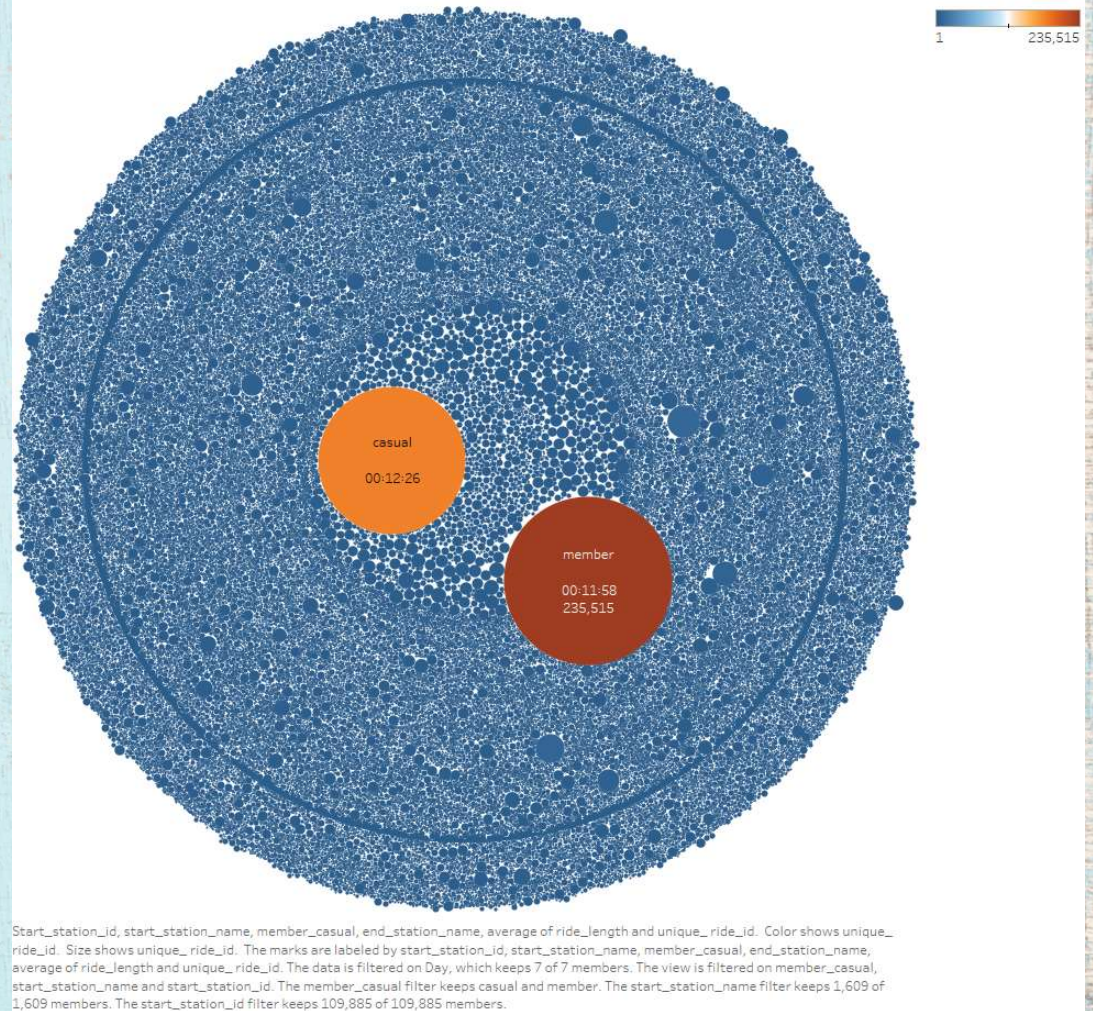
Routes	unique_ride_id	member
Calumet Ave & 33rd St to State St & 33rd St	ride_length (copy)	5,318
State St & 33rd St to Calumet Ave & 33rd St	ride_length (copy)	5,315
Ellis Ave & 60th St to University Ave & 57th St	ride_length (copy)	4,549
University Ave & 57th St to Ellis Ave & 60th St	ride_length (copy)	4,375
Ellis Ave & 60th St to Ellis Ave & 55th St	ride_length (copy)	4,161
Ellis Ave & 55th St to Ellis Ave & 60th St	ride_length (copy)	3,867
Loomis St & Lexington St to Morgan St & Polk St	ride_length (copy)	3,112
Morgan St & Polk St to Loomis St & Lexington St	ride_length (copy)	2,874
MLK Jr Dr & 29th St to State St & 33rd St	ride_length (copy)	2,533
State St & 33rd St to MLK Jr Dr & 29th St	ride_length (copy)	2,430
University Ave & 57th St to Kimbark Ave & 53rd St	ride_length (copy)	2,260
Kimbark Ave & 53rd St to University Ave & 57th St	ride_length (copy)	2,026
University Ave & 57th St to Lake Park Ave & 56th St	ride_length (copy)	1,994
Loomis St & Lexington St to Halsted St & Polk St	ride_length (copy)	1,830
Lake Park Ave & 56th St to University Ave & 57th St	ride_length (copy)	1,757
Grand Total	ride_length (copy)	48,401
	ride_length (copy)	23:38:49

Unique_ride_id and ride_length (copy) broken down by member_casual vs. Routes. The data is filtered on end_station_name, start_station_name and Clusters (3). The end_station_name filter excludes Null. The start_station_name filter excludes Null. The Clusters (3) filter keeps Cluster 5. The view is filtered on Routes, sum of ride_length (copy) and unique_ride_id. The Routes filter excludes Null. The sum of ride_length (copy) filter keeps non-Null values only. The unique_ride_id filter includes values less than or equal to 8,925.

Null Station Rides by Casual & Member

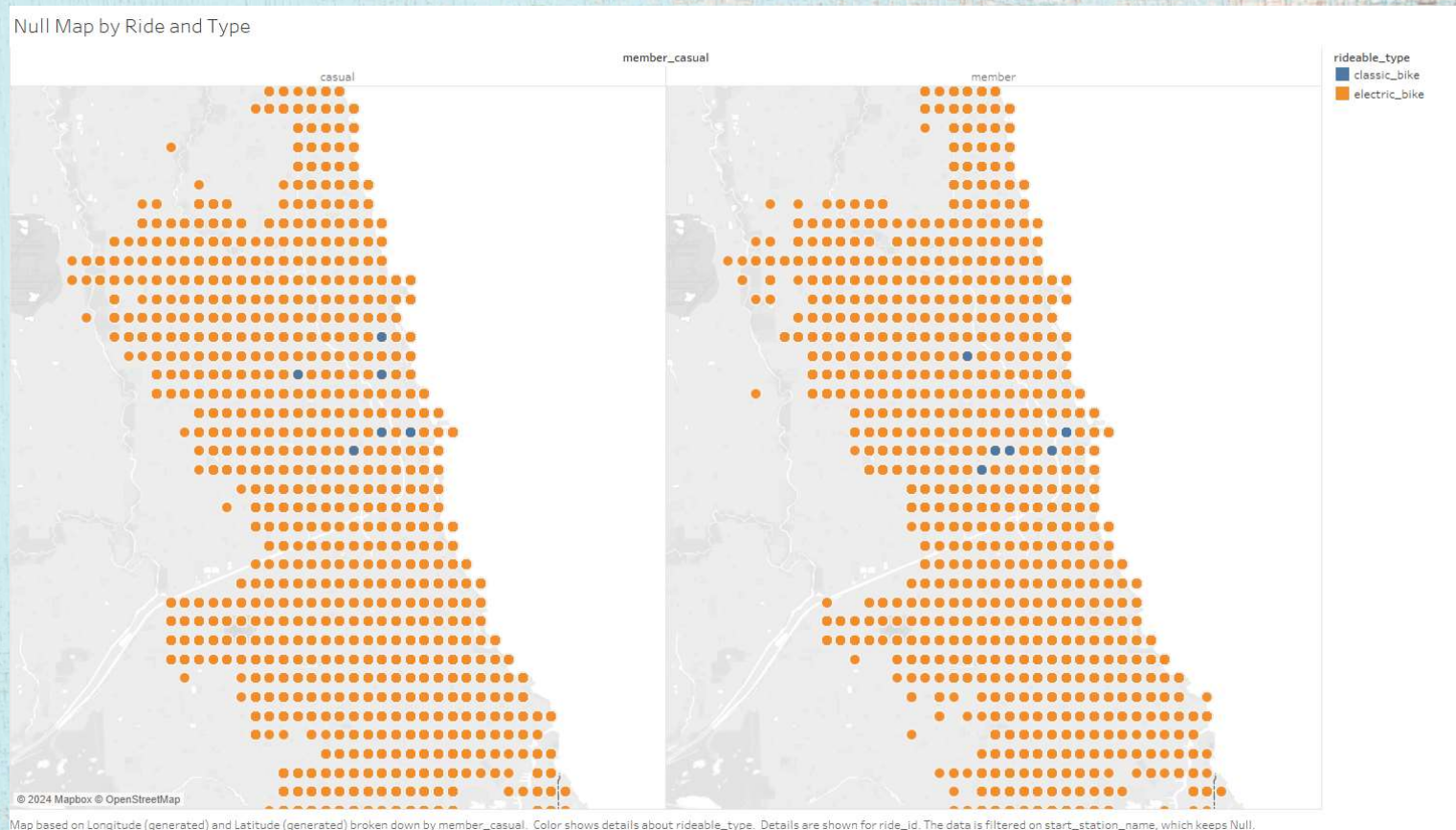
Here is a different graphically representation showing the importance of the Null Station.

Null Station to Null Station Rides Highlighted



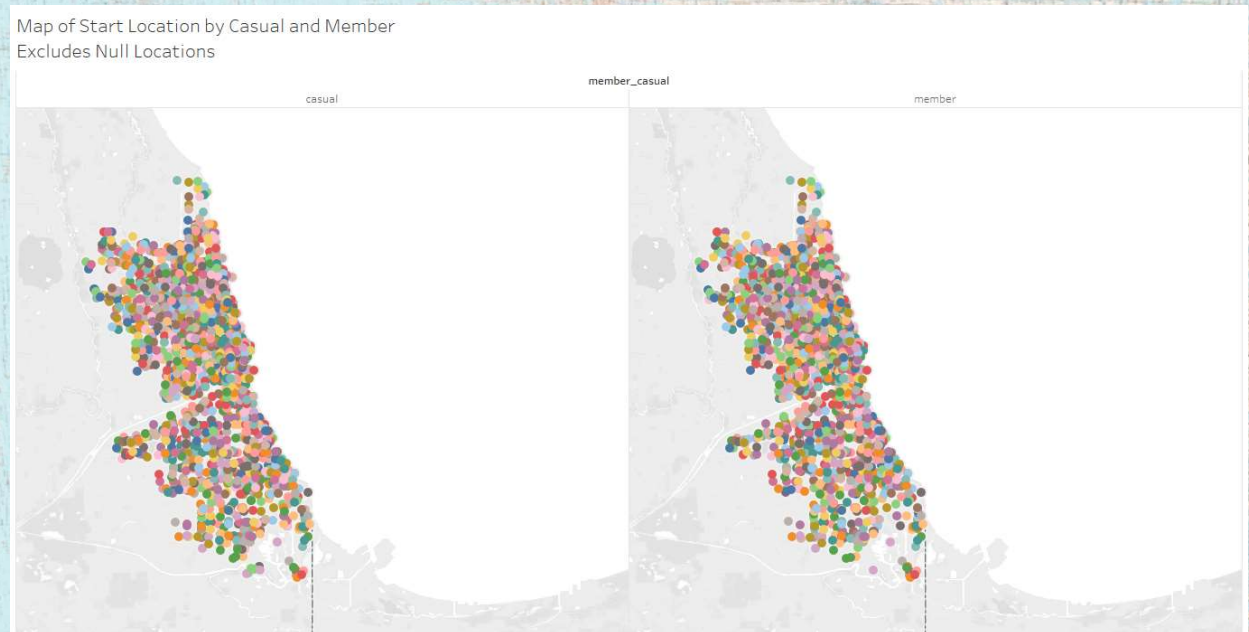
Null Locations by Casual & Member

- Continuing with null locations, we have a geographical representation of the distribution of the nulls.
- This is layered with ride type.
- Casual riders and annual members that use the null locations have a clear preference for electric bikes.



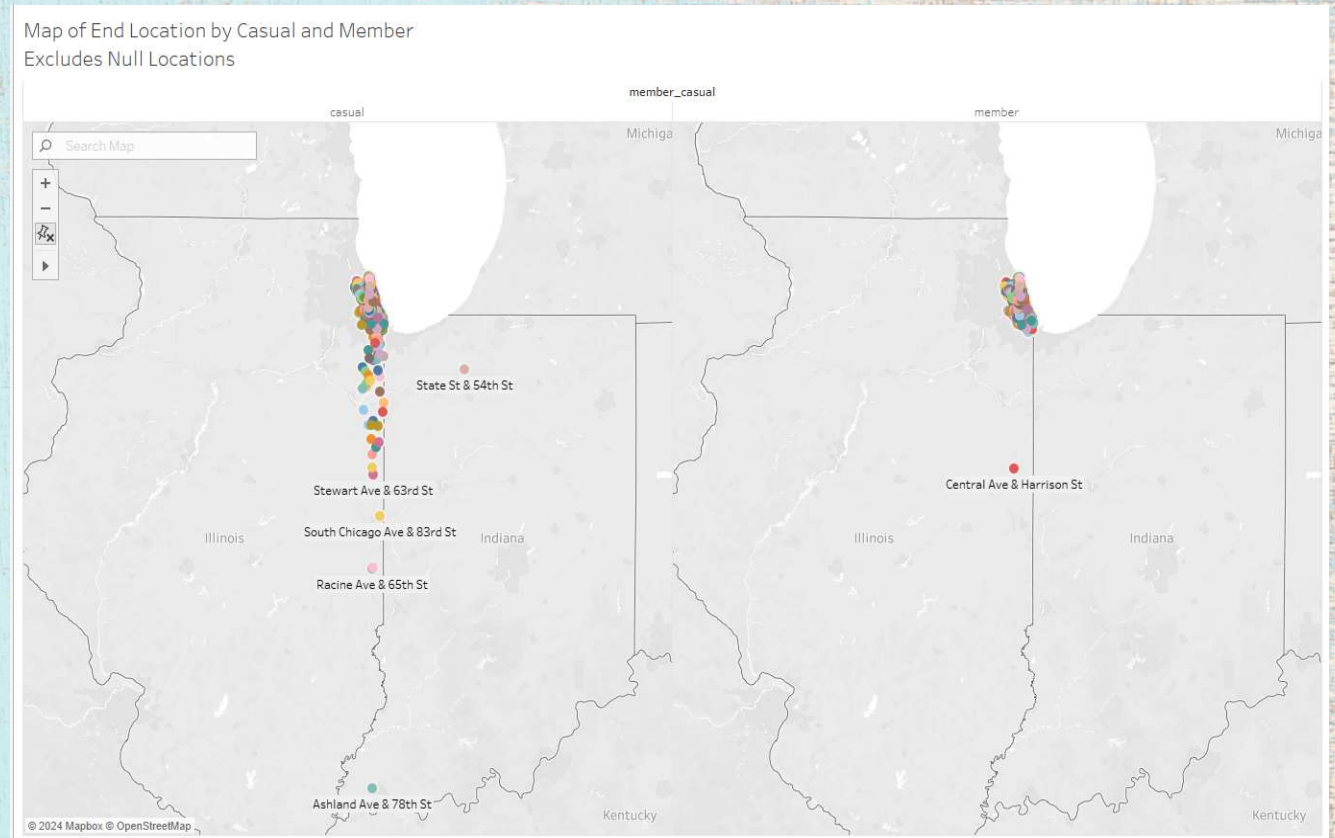
Start Location by Casual & Member

- Here we have an image of non-null locations using start locations by member type.
- The distribution appears to be even.



End Location by Casual & Member

- Here we have an image of non-null locations using start locations by member type.
- The distribution appears to be even, until you zoom out.
- Here you see the results of longer ride lengths, bikes are being returned to a wider radius of stations.



To Recap

Casual Members

- 35.97% of riders last year
- Ride more on the weekends
- Weekday Mode: Saturday
- Ride less year-round, most likely to ride in the summer
- Rides a weekday average of 00:28:23.
- Prefer null stations for start stations
- Visit a wider radius of end stations
- Includes all adaptive bike riders or docked bikes
- Frequent DuSable Lake Shore Dr & Monroe St to Streeter Dr & Grand Ave

Members

- 64.03% of riders last year
- Ride more on the weekdays
- Weekday Mode: Thursday
- Ride more year round
- Take shorter rides
- Rides a weekday average of 00:12:49.
- Prefer null stations for start stations
- Frequent Calumet Ave & 33rd St to State St & 33rd St

Top 3 Recommendations

Design marketing strategies aimed at converting casual riders into annual members

1

Focus the digital campaign delivery to the weekends to target the casual rider for annual membership status. This is the time casual riders are most likely to be using the bikes.

2

Casual members out ride members.

Find a way to incentive longer riders to hold an annual membership.

For example, you could create an awards program linking the bikes an awarding discount points for by distance ridden. It could also motivate the rider to go further like a fitness app.

Example, offer a free fitness product with a new annual membership.

3

Target specific stations using Slide 14, *Routes Most Frequented by Riders*, for marketing locations. For example, you could run digital ads at DuSable Lake Shore Dr & Monroe St and Streeter Dr & Grand Ave

In addition, consider marketing on the bikes to reach the individuals not using a station, especially the docked bikes.