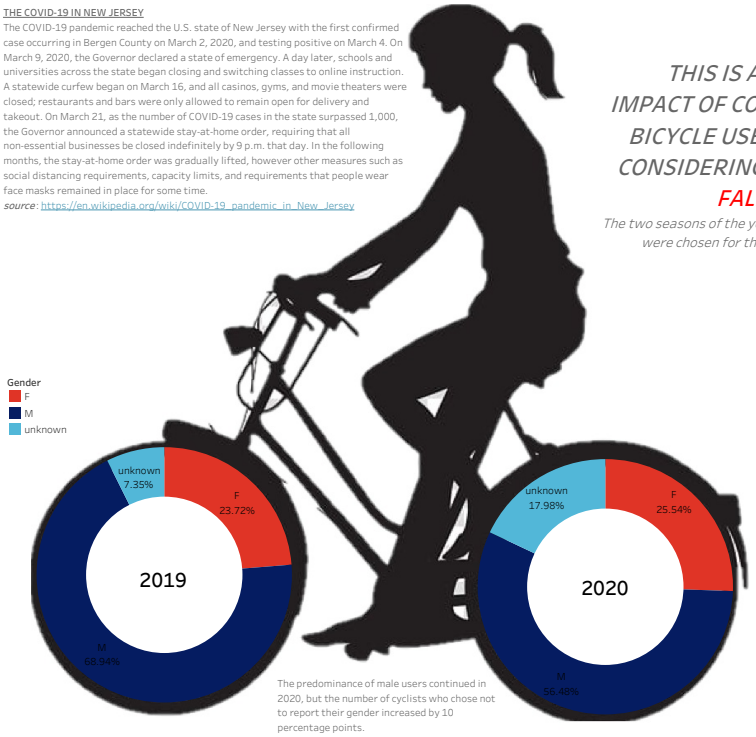
CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

THE COVID-19 IN NEW JERSEY

The COVID-19 pandemic reached the U.S. state of New Jersey with the first confirmed case occurring in Bergen County on March 2, 2020, and testing positive on March 4. On March 9, 2020, the Governor declared a state of emergency. A day later, schools and universities across the state began closing and switching classes to online instruction. A statewide curfew began on March 16, and all casinos, gyms, and movie theaters were closed; restaurants and bars were only allowed to remain open for delivery and takeout. On March 21, as the number of COVID-19 cases in the state surpassed 1,000, the Governor announced a statewide stay-at-home order, requiring that all non-essential businesses be closed indefinitely by 9 p.m. that day. In the following months, the stay-at-home order was gradually lifted, however other measures such as social distancing requirements, capacity limits, and requirements that people wear face masks remained in place for some time.

source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_New_Jersey



THIS IS AN ANALYSIS OF THE IMPACT OF COVID -19 ON CITIBIKE BICYCLE USE IN JERSEY CITY, NJ, CONSIDERING THE SUMMER AND FALL OF 2019 AND 2020

The two seasons of the year with the mildest temperatures were chosen for this analysis, given that cycling is an outdoor activity.

Summary

	2019	2020
Total number of trips	254,181	224,062
Total distance traveled (mi)	157,667	154,119
Average number of trips per day	1,389	1,224
Average number of trips per bike	441	187
Average trip duration (min)	12.9	28.4
Average distance per trip (mi)	0.62	0.69
Total number of casual users	33,247	82,660
Total number of members	220,934	141,402
Total number of stations used for starting the trip	52	52
Total number of stations used for ending the trip	105	118

The predominance of male users continued in 2020, but the number of cyclists who chose not to report their gender increased by 10 percentage points.

Percent Difference on number of trips compared to previous months

Started At	2019					2020				
	June	July	August	Septem..	October	Novem..	June	July	August	Septem..	October	Novem..
		10.95%	11.35%	1.09%	-14.20%	-27.11%	19.89%	4.76%	11.86%	-6.67%	7.81%	-51.13%

Total number of trips, user types and peak hours

Gender and daily distribution

Age distribution

Stations names and use

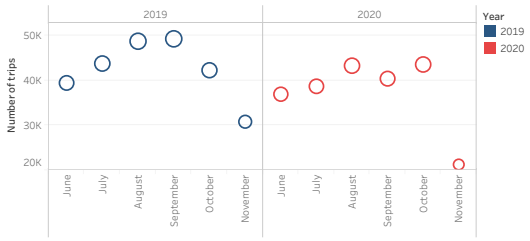
Bicycle use and condition

Static Maps

CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

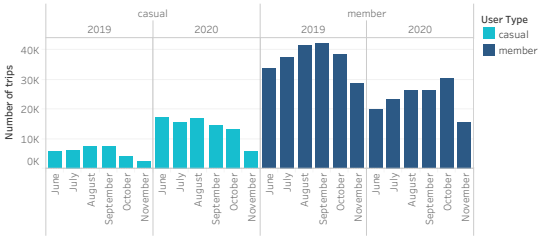
Home | Next: Gender and daily distribution

Number of trips



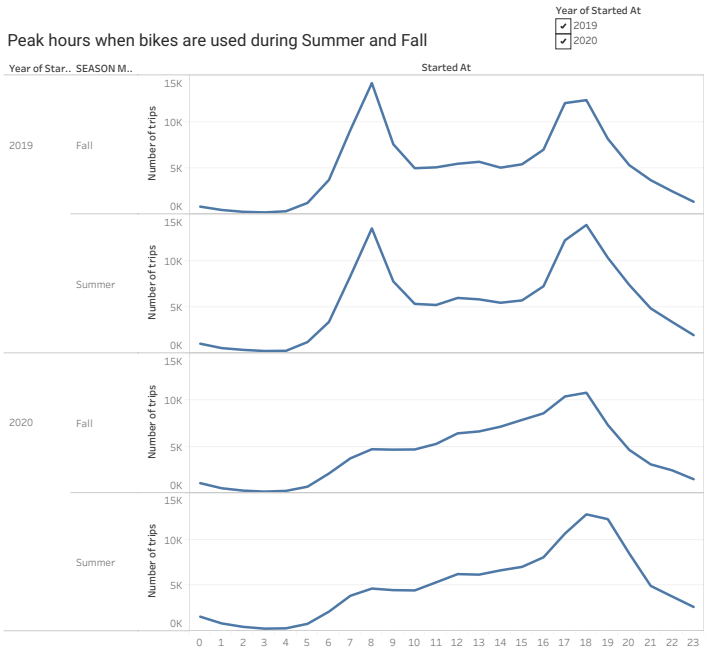
The above chart shows that the number of bike rides significantly decreased in 2020, when the lockdown was determined. In October 2020, Newark imposed city level restrictions requiring nonessential businesses to close by 8pm. (source: Wikipedia)

Proportions of members and casual users



The users changed their behavior regarding committing in annual memberships or not. With the pandemic and the lockdown, when many people stopped going to the office, the number of members significantly decreased, while the number of casual users increased.

Peak hours when bikes are used during Summer and Fall



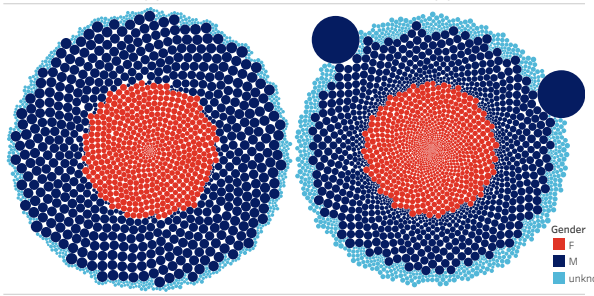
Here it is observed that the morning peak hours (6 to 10 am) of bike use almost disappeared in 2020. This is probably due to the lockdown, as people were not riding the bikes to go to their offices anymore.

CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

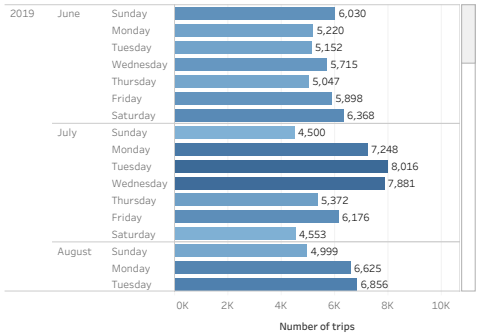
Home | **Next: Age distribution**

Mileage per gender

The mileage has visibly decreased among the different genders, meaning shorter trips in 2020. On the other hand, the users with gender not specified have increased the number of rides.



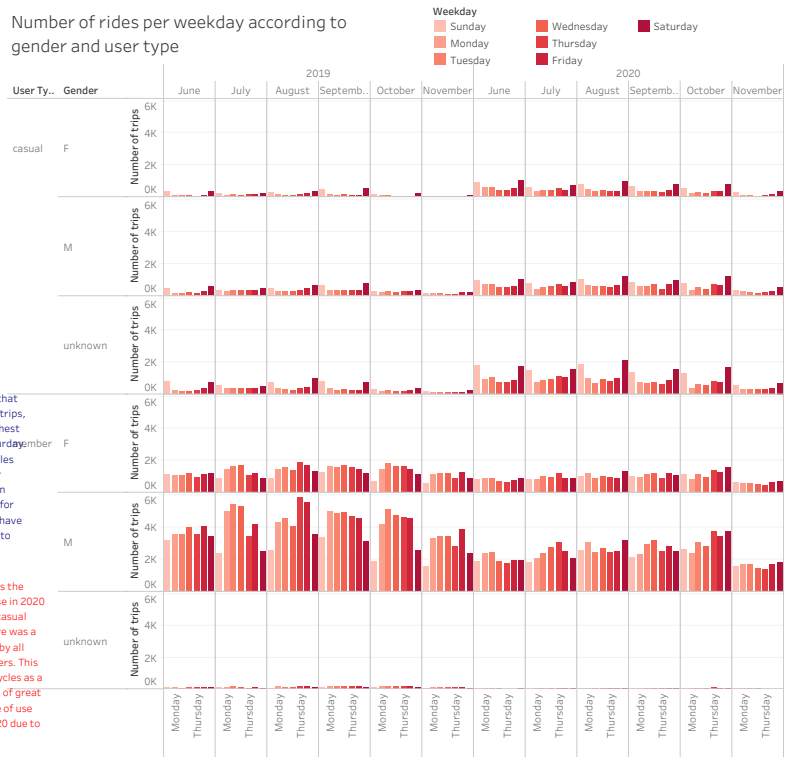
Total number of rides per weekday



The bar chart on the left shows that in 2019 weekdays had the most trips, but in 2020 the day with the highest amount of trips was mainly Saturday. This indicates that in 2019 bicycles were likely to be mainly used for transport to workplaces, while in 2020 bicycles were mainly used for leisure, given that many people have started working from home due to the lockdown.

The bar graph on the right shows the significant increase in bicycle use in 2020 by all genders reported among casual users, but at the same time there was a decrease in the number of trips by all genders reported among members. This may indicate that the use of bicycles as a means of transport to work was of great importance in 2019, as this type of use was significantly reduced in 2020 due to the pandemic.

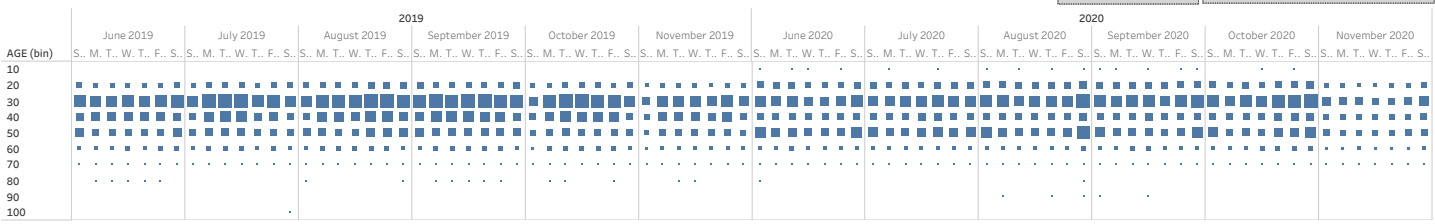
Number of rides per weekday according to gender and user type



CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

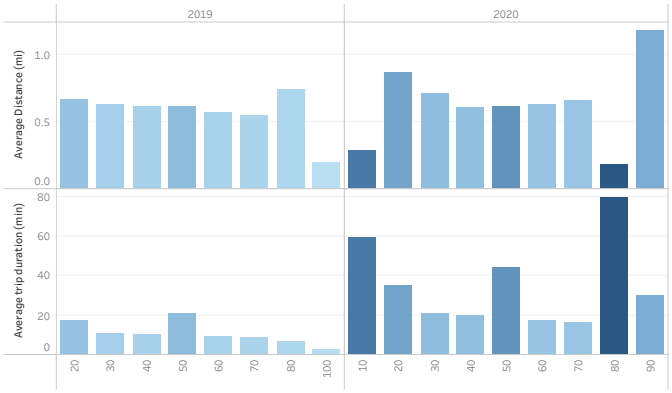
Weekday total by age group

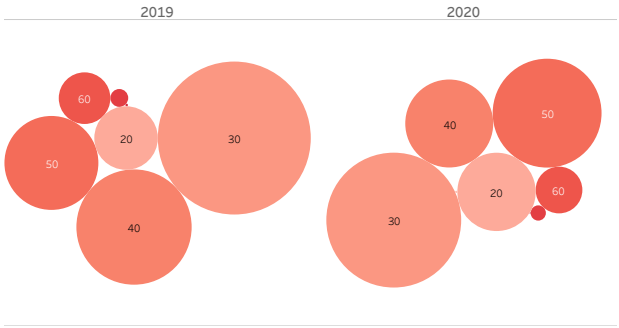
Home | Next: Stations names and use



The charts on this page represent measures by age groups (for example, an age group of 30 contains all ages between 21 and 30 years old). Ages over 100 years old on the dataset were excluded from the charts. The graph above shows that the largest number of customers is in the 21 to 30 age group, followed by the 31 to 40 age group. There was a significant increase in cyclists in the 41-50 age group in 2020, while the 21-40 age group had fewer users this same year. Due to the fact that the older part of the population is at greater risk of complications from COVID-19, this increase may have reflected the substitution of public transport for bicycles in this age group. The bar graph in the lower left corner shows that average distance and average trip duration increased for all ages in 2020. The bubble graph in the lower right corner shows the visual distribution of ages for each year.

Trip duration and distance by group of age





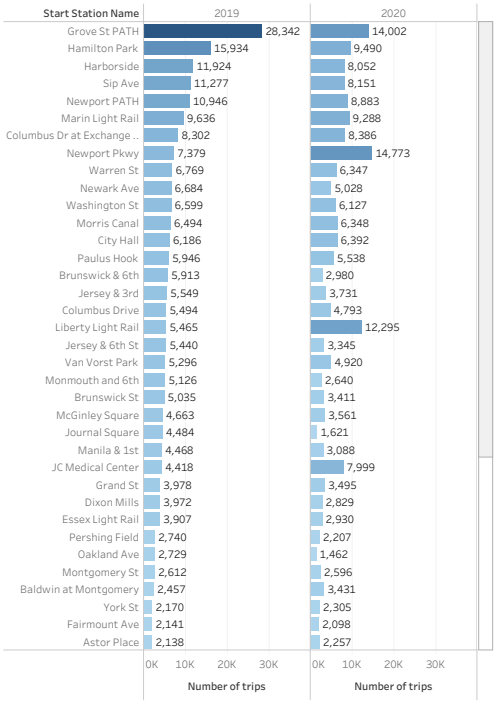
AGE (bin) broken down by YEARS. Color shows details about AGE (bin). Size shows count of Bike Id. The marks are labeled by AGE (bin). The data is filtered on Action (AGE (bin),YEAR(Started At)) and Action (AGE (bin),YEAR(Started At),WEEKDAY(Started At),MONTH(Started At)). The Action (AGE (bin),YEAR(Started At)) filter keeps 21 members. The Action (AGE (bin),YEAR(Started At),WEEKDAY(Started At),MONTH(Started At)) filter keeps 600 members. The view is filtered on AGE (bin), which excludes 110, 120 and 130.

CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

This dashboard shows the list of the top and bottom stations to start and end the journey with the bicycle. The charts show all the stations and the number of trips that took place in each one per year and the tables show the bottom 10 stations for each case considering both years together. None of the bottom stations coincide at the start or end of the trip, which may indicate that they are more spread out through areas distant from each other and are used by specific customers.

Home | Next: Bicycle use and condition

Top and bottom 10 stations to start the journey



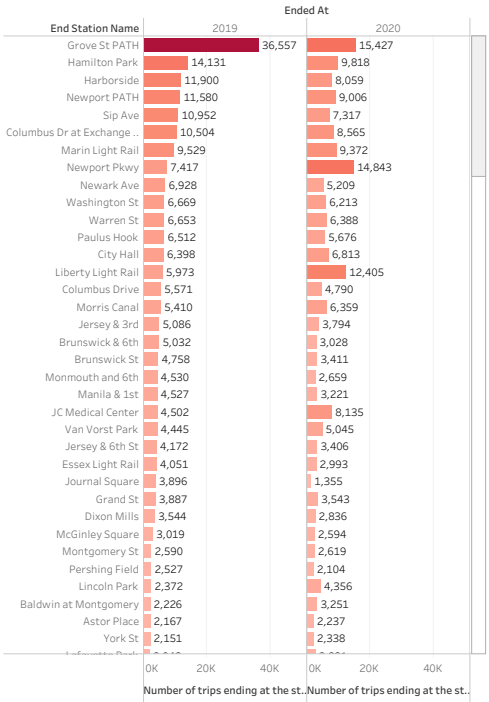
Bottom 10 stations for starting a journey

Communipaw & Berry Lane	3,030
5 Corners Library	2,835
Riverview Park	2,783
Glenwood Ave	2,691
Christ Hospital	2,384
Leonard Gordon Park	2,102
Union St	1,897
Dey St	1,883
Jackson Square	

Bottom 10 stations for ending a journey

1 Ave & E 5 St	1
10 Ave & W 28 St	1
6 Ave & Canal St	1
8 Ave & W 52 St	1
Adam Clayton Powell Blvd & ..	1
Amsterdam Ave & W 125 St	1
Barclay St & Church St	1
Barrow St & Hudson St	1
Bayard St & Baxter St	1
Broadway & E 14 St	1

Top and bottom 10 stations to end the journey

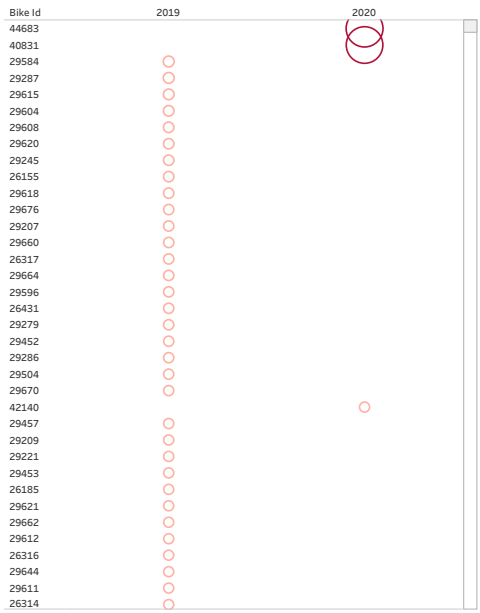


CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

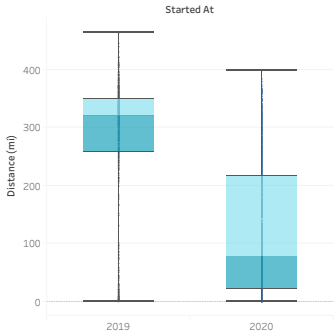
Home | Next: Static Maps

Average distance per trip per bike

Total distance traveled per bike



Distance variability per bike



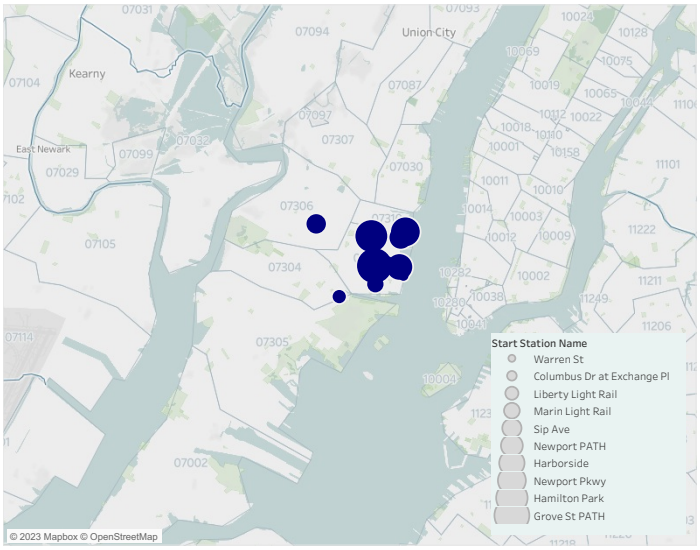
The first graph on the left shows the average distance traveled per bicycle over the two years. In 2020 there was a considerably higher amount of trips with an average mileage greater than 1.0 mile, while in 2019 only 5 of the averages reached this figure, which may show that in 2020 customers were using bicycles as a means of transport to go places farther to where they would previously have chosen public transport, but COVID-19 restrictions may have changed customers' minds on this.
Due to some trips with greater total distances in 2020, the middle graph shows that the bikes with the highest mileage are ID 44683 and 40831, which makes them immediately worth repairing.
The graph on the right shows the variability of distance traveled per bicycle. It is interesting to see that in 2020 the variability is much greater, while in 2019 the distance traveled was much greater overall. This could mean that new customers may have started using the bicycle transport option and old customers may have changed their usual route by more or less miles to adapt to the lockdown restrictions.

CITIBIKE DATA ANALYSIS AND COVID-19 IMPACT IN JERSEY CITY, NJ - USA (2019 and 2020)

Home

These maps show the geographic location of the top 10 stations for starting and ending a trip. 9 out of 10 of these stations are the same and are relatively close to each other, which probably means that they are located in a major city center where bicycle use is more intense due to the large population frequenting this area.

Map static (TOP start stations)



Map static (TOP end stations)

Top 10 stations for starting a journey

Grove St PATH	Hamilton Park	Newport Pkwy	Harborside	Newport PATH	Sip Ave	Marin Light Rail	Liberty Light Rail	Columbus Dr at Exchange..	Warre
42,344	25,424	22,152	19,976	19,829	19,428	18,924	17,760	16,688	

Top 10 stations for ending a journey

Grove St PATH	Hamilton Park	Newport Pkwy	Newport PATH	Harborside	Columbus Dr at Exchang..	Marin Light Rail	Liberty Light Rail	Sip Ave	City Hall
51,984	23,949	22,260	20,586	19,959	19,069	18,901	18,378	18,269	13,211