How does User Group (Customer = 24-hour pass or 3-day pass user; Subscriber = Annual Member) Correlate to Station Location?

Does Gender or Age Relate to Station Location?

How does Trip Duration Relate to Station Location?

How do Numbers of Trips Depend on Office Hours (Work Day)?

Variables:

* Trip Duration (seconds)
* Start Time and Date
* Stop Time and Date
* Start Station Name
* End Station Name
* Station ID
* Station Lat/Long
* Bike ID
* User Type (Customer = 24-hour pass or 3-day pass user; Subscriber = Annual Member)
* Gender (Zero=unknown; 1=male; 2=female)
* Year of Birth

**From Article - these were his main goals:**

1. Examine the overall spatial patterns of rebalanced bicycles

2. Compare the availability of bicycles over time using the same month over three

consecutive years of operation.

3. Compare the delivery of bicycles during empty intervals in the same month over three

consecutive years of operation.

4. Simulate rebalancing trips and availability patterns over time as a time series

5. Compare the average durations of full and empty time from year to year

6. Observe the geospatial patterns in bicycle transfer over the course of one night

7. Simulate the overnight path taken of a rebalancing truck

8. Promote reproducible information by providing codes used in the analysis

Our Question:

How have the peak hours & numbers of trips between 2019 and 2020 been altered or been affected by the COVID-19 outbreak?

What are the peak hours?

Have overall numbers of trips changed?

Summary/Context:

With the recent outbreak of the coronavirus pandemic in 2020, we aim to compare data on bike sharing services in New York City from the years 2019 and 2020 to see if there are any conclusions that can be drawn relating to the pandemic’s effect on the CitiBike NYC services. Although correlation does not prove causation, we believe that examining these two years and comparing the data will allow us to make assumptions based on the data found.

The data that was collected and observed included variables relating to location, time, number of trips and user type. With our question in specific we aimed at looking at location and the timeline of the trips. On looking at the graphs concerning peak hours, it is observed that not only did the peak hours fluctuate but also the number of trips varied. Conclusions can be drawn relating to the number of trips, where there was a sharp decrease in March & April of 2020 when national lockdown began. Comparatively, in 2019 there was a sharp increase in these months. In addition, peak hours during 2019 and 2020 both show early morning and evening hours as high points, alluding to the argument that bike sharing services were used primarily for commuting to and from work.

Daily trips in 2020 showed greater variance with a minimum number of trips per day at 3 and a maximum at 2796, while 2019 showed a minimum of 196 trips per day and a max at 1925. Overall, the median trips per day is at 1142, higher than the 2020 median which sits at 883.5 trips per day. There are clear differences between the years 2019 and 2020 that show unusual trends in 2020, confirming our belief that bike share trips were affected by the corona virus outbreak. Nonetheless, the bike sharing service data shows that it is a resilient transportation service.

https://www.nytimes.com/2020/03/14/nyregion/coronavirus-nyc-bike-commute.html

Citi Bike, the city’s bike share program, has seen demand surge 67 percent this month: Between March 1 and March 11, there were a total of 517,768 trips compared with 310,132 trips during the same period the year before.

At the same time, ridership on the subway as well as on the commuter rails that carry workers into New York from the suburbs has seen a precipitous drop as people try to avoid crowded spaces and more and more businesses are asking their employees to work from home.

The average number of trips per day shows that in 2019, there were two peaks - in the morning and afternoon. This alludes to the conclusion that shared bike systems were used for commuting to and from work. Comparatively, the data from 2020 shows the absence of a morning peak in trips, possibly due to change in working patterns and transition to working-from-home. However, there is still a peak in the afternoon, showing that people continued to use shared bike systems in the evening for pleasure purposes. As seen in the graphs, the demand and the patterns show the usage reducing by half in the first peak (about 8am) and reduced in a lesser intensity at the second peak (between 7pm - 8pm).

COVID-19 shutdowns began in March of 2020 in the state of New York. Number of COVID-19 cases in NYC today amount to over 676,000 with over 28,000 deaths.Due to the amount of cases in NYC, we found it important to determine the effects of the pandemic on the city's shared bike system.

Citations:

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