Overview ⓘ

Citibike provides public bicycle sharing system serving the New York city.

This project analyses the riders' demographics, the monthly and hourly ridership pattern, and the correlation with weather. Descriptive analysis of the data shows that summer, weekdays and peak commuting periods have the highest ridership with riders concentrating in 25-35 age group. The number of trips have strong correlation with temperature, precipitation and wind speed.

Citibike can use this analysis to manage the bike demand, adjust pricing and promotions to increase the ridership and mitigate the adverse impact from inclement weather.

Trips by Month

Bike rides show strong seasonality with summer the busiest season.

Average

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
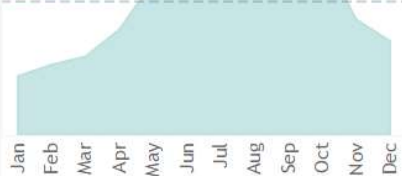
Total Number of Trips	Trips Per Hour	Trips Duration(min)	Stations
332,236	**40**	**8.1**	**59**

Gender Percentage

Female 22.7%

332,236 Trips

Male 77.3%
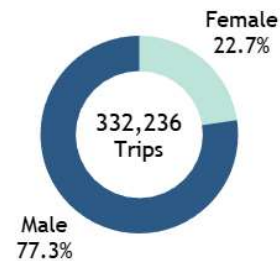
Age Percentage (Hover over to see a breakdown by weather conditions.)

Nearly half of the riders are aged 25-35.

<25 25-35 35-45 45-55 55-65 >65

User Type Percentage

Customer 2.9%

332,236 Trips

Subscriber 97.1%
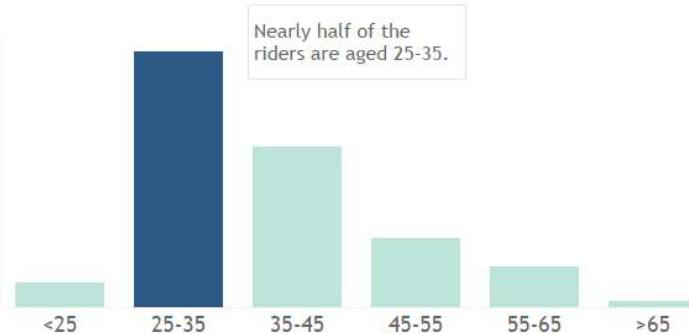
Trips by Day of Week and By Hour

12A.. 1AM 2AM 3AM 4AM 5AM 6AM 7AM 8AM 9AM 10A.. 11A.. 12P.. 1PM 2PM 3PM 4PM 5PM 6PM 7PM 8PM 9PM 10P.. 11P..

Saturday
Friday
Thursday
Wednesday
Tuesday
Monday
Sunday
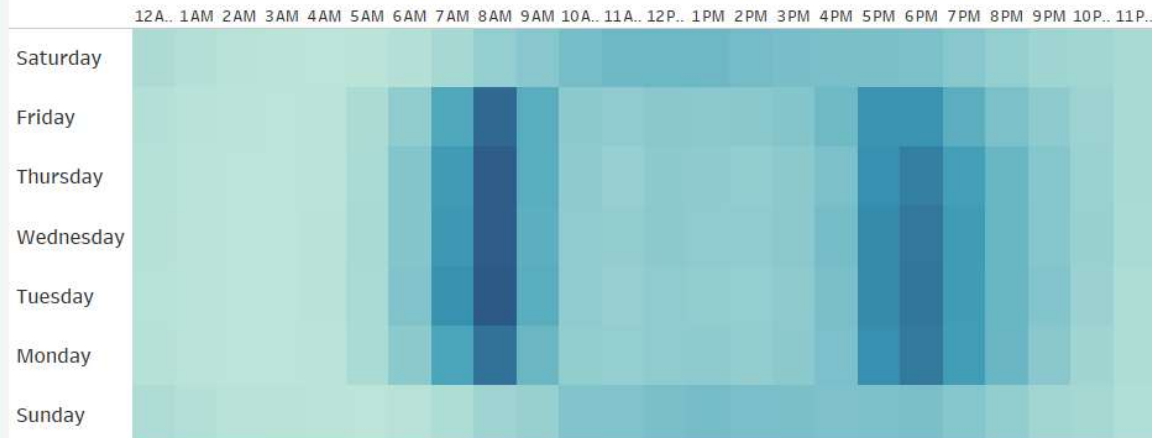
Peak-hour rides nearly quadruple the off-peak-hour rides.

Peak — 91
Off-Peak — 24

Weekend rides drop 40% from weekdays.

Weekday — 45
Weekend — 27

Weather Impact

Part I

We examined the trips correlation with the following weather features - Precipitation, Temperature, Wind Speed, Humidity and Clouds.

Key Findings:

- No direct impact from cloudy weather (cloud, mist, fog, smoke etc.) whereas precipitation significantly impacts the bike rides. On average, rides per hour dropped 22% when precipitating (rain, snow, drizzle, thunderstorm).

- The number of trips have higher correlation with temperature and wind speed than humidity and clouds.

- Peak-off drop in ridership in inclement weather is more significant than the drop in off-peak-hours rides.

Trip vs Overall Weather Condition

Snow, rain and drizzle have the lowest amount of ridership.
On Average, precipitation hours see 22% drop in bike rides.

Trips per Hour by Weather condition

Weather condition	Trips per Hour
Smoke	58.7
Fog	55.1
Haze	50.5
Mist	43.9
Thunder..	43.7
Clouds	43.0
Clear	39.0
Drizzle	35.3
Rain	34.4
Snow	16.1

Trips in Precipitation Hours
(Hover over to see peak and off-peak hours split.)

33
▼ -9.2 (-22.0%)

Trips vs Temperature

The number of trips shows positive correlation with temperature. Warm weather (May to Oct) sees more trips.
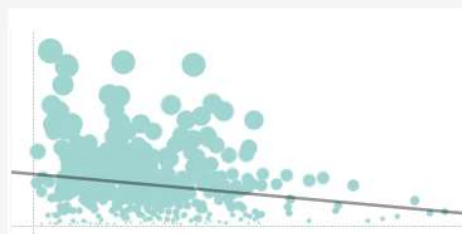
0.67

correlation(-1 to 1)
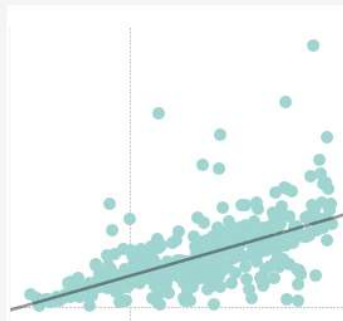
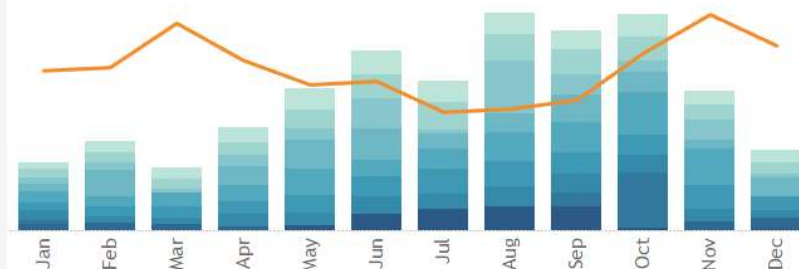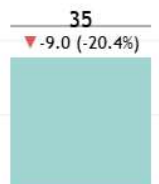### Average Rides per Hour by Month vs Temperature

Trips vs Wind Speed

Ridership shows inverse relationship with wind speed. Strong wind (wind level >3.0) caused the rides declined by 20%.

Average Rides per Hour by Month vs Wind Speed

Trips per Hour with strong wind
(Hover over to see peak and off-peak hours split.)

35
▼ -9.0 (-20.4%)
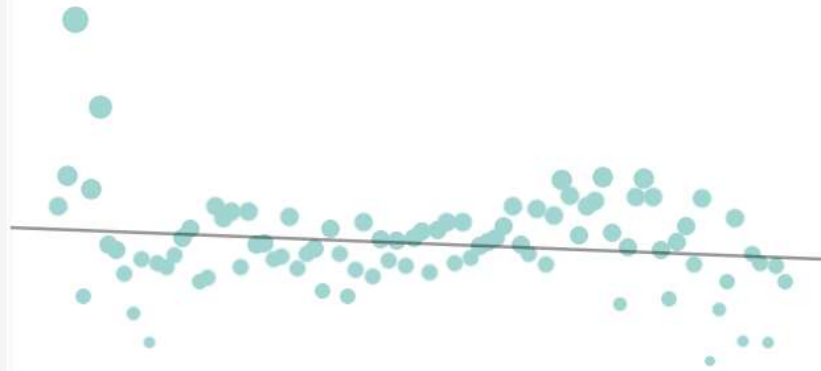
Weather Impact

Part II

Trips vs Humidity and Clouds

Trips have very weak correlation with humidity and clouds.

Actions and Recommendations:

- Manage the bike supply according the seasonality and the daily and hourly pattern to ensure enough bikes in the busy season and peak hours.

- Launch marketing campaigns that highlight health benefits, cost savings, and a sense of community to motivate more young professionals (daily commuters aged 25-35) to join our bike ride.

- Implement seasoned promotion, differentiated pricing strategy or extend members' benefits to promote the annual membership.

Next Steps:

- Build a bike rides forecast model to more accurately predict the demand. This will help citibike better manage the increasing demand and seasonality.

- Further analysis on the ridership at customer level to yield additional insights on customer riding behaviours. This will help with the pricing strategy.
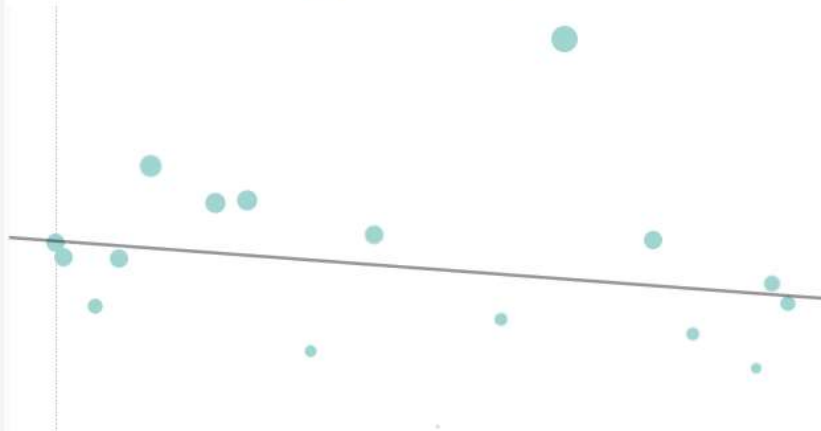
Trips per Hour vs Humidity

Average Rides per Hour by Month vs Humidity
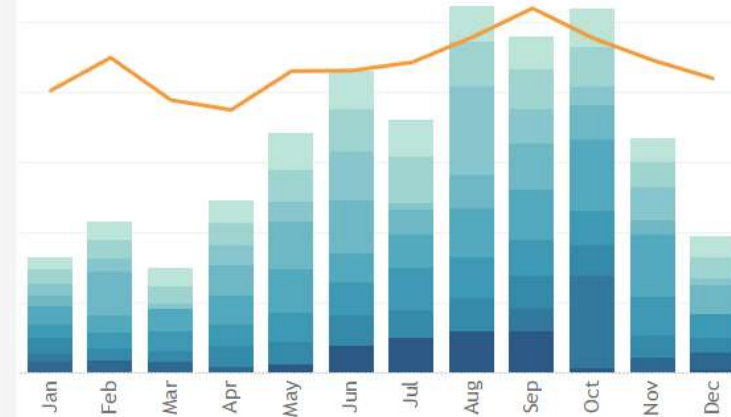
Trips per Hour vs Clouds

Average Rides per Hour by Month vs Clouds