# Estimating Covid-19 Impact on Citi Bike Revenue

Executive Summary

Key takeaways:

- Rental **counts are down** (Mar-May), but shows signs of steady recovery

- Avg rental **durations are up** (Mar-May) and showing consistent growth

- Total **overage minutes are up ~2x** (Jan-May, 2019 vs. 2020) for all riders

- Est. program **revenue* is up ~50%**

*Revenue calculations estimated based on available data, annual subscriber fees not included

What is a bike share program?
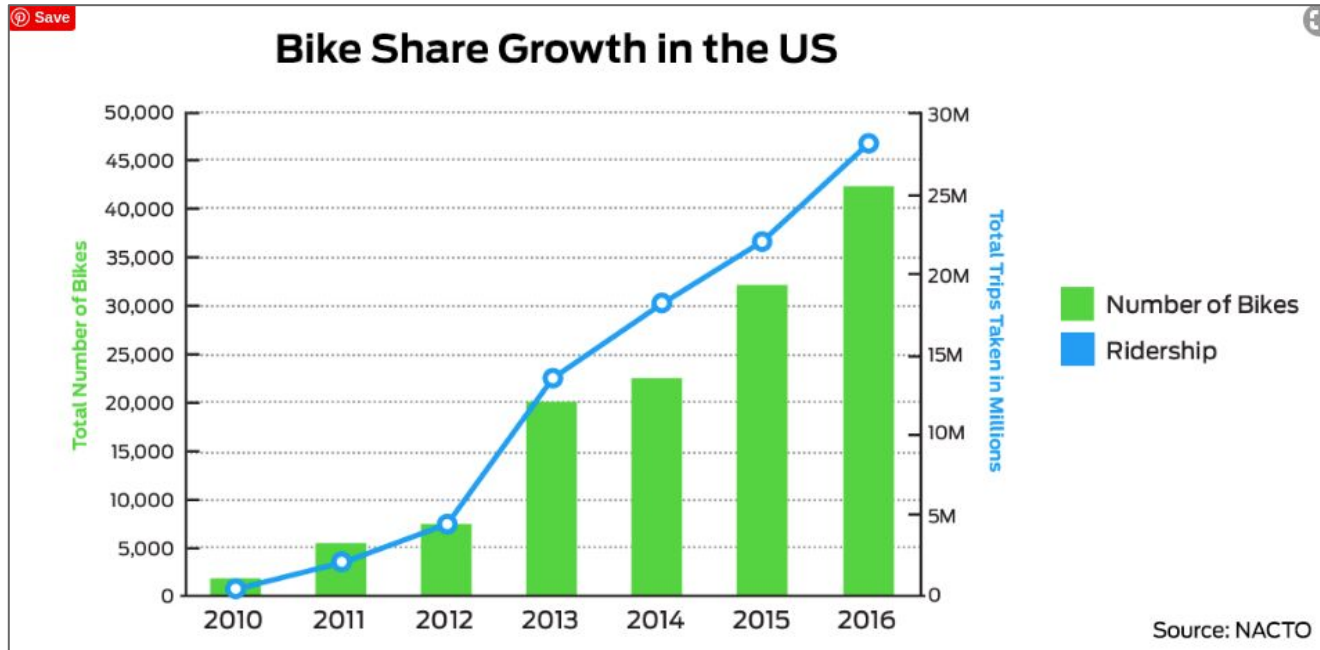
Citi Bike in NYC

- Launched in 2013

- Bike share servicing the New York City area including:
  - Manhattan
  - Brooklyn
  - Queens
  - Jersey City

- Largest bike share program in the US
  - 14,000 bikes
  - 900 stations

Source: shutterstock

What does the data look like?

Monthly data files include:

- Time & duration
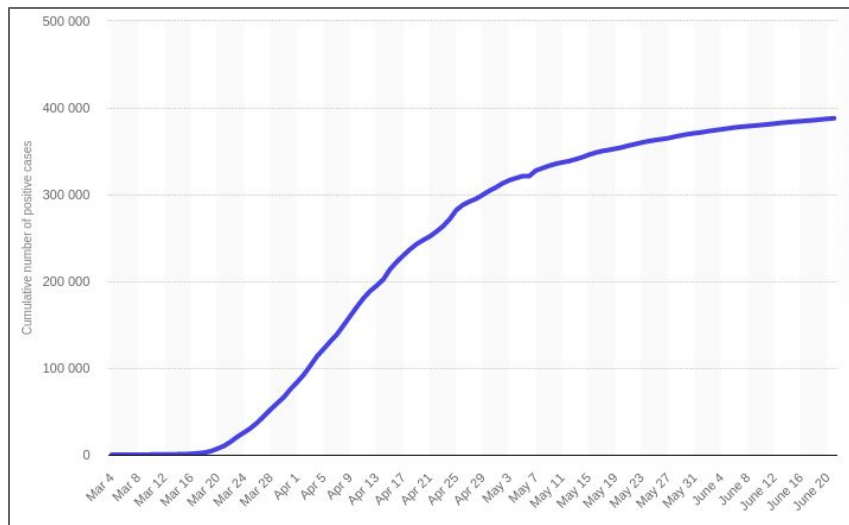- Demographics
- Station & Bike info

Gaps:

- Subscribership data
- User specific data

Why now?

Unprecedented times...

- Covid-19, global pandemic

- NYC rapid growth in confirmed
  cases (0-83k in March!)

- Unemployment surges to 18.3%

New York - Cumulative Covid-19 Cases

Source: Statista
https://www.statista.com/statistics/1109721/new-york-state-covid-cumulative-cases-us/

What key factors could affect revenue?

Negative:

⬆ Public health concerns

⬆ Remote work

⬆ Unemployment*

⬇ Daily commuting

⬇ Tourism

Positive:

⬇ Transportation options

⬇ Car traffic

⬇ Exercise options

⬆ Free time

*NYC local unemployment rate at 18.3% as of May 2020, up ~350% over the 2019 average
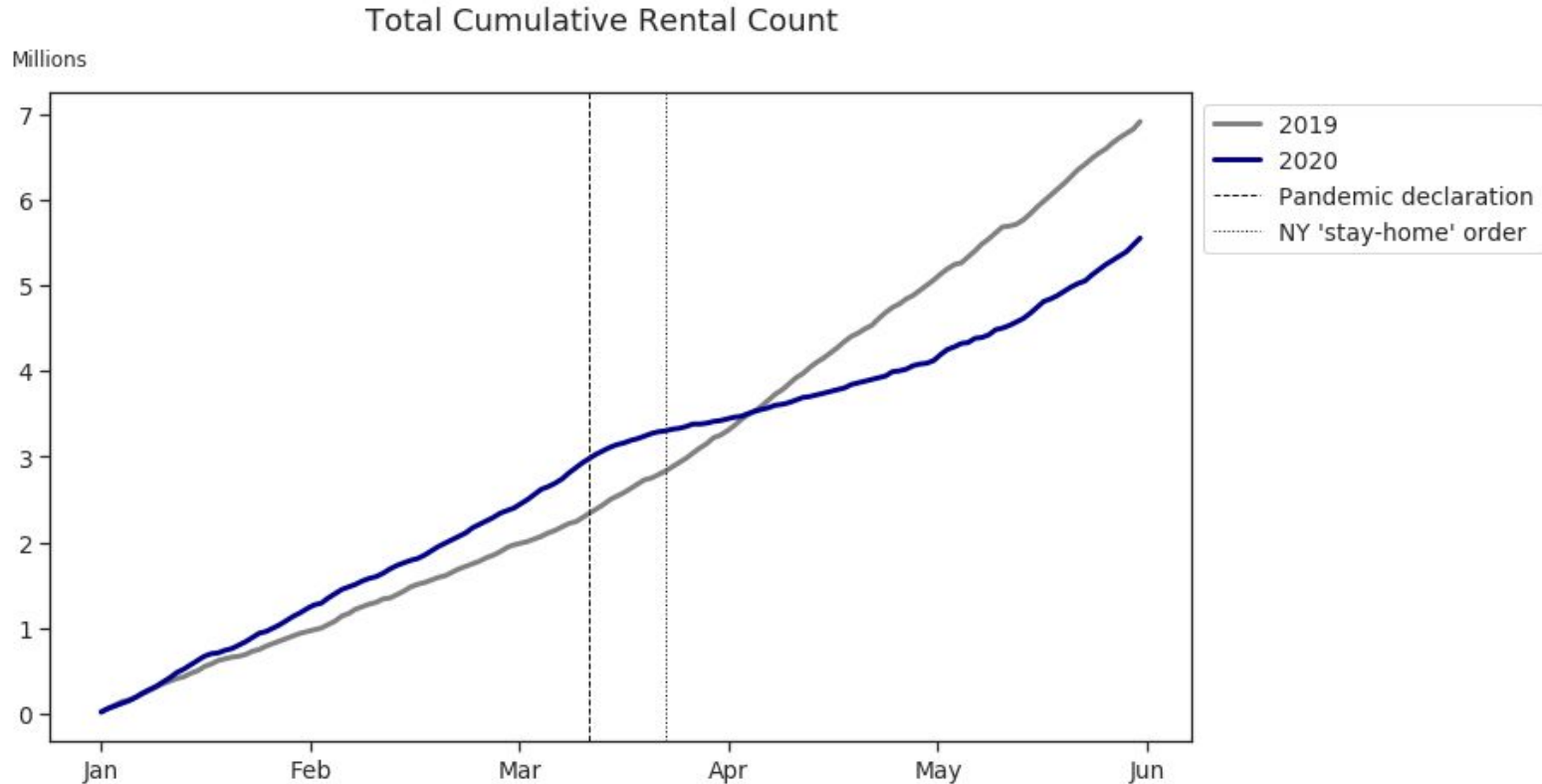(https://www.bls.gov/regions/new-york-new-jersey/data/xg-tables/ro2xglausnyc.htm)

Do people still rent bikes during a pandemic?

Rental Counts Drop in March, Bounce Back in May

Rental Counts By Month and Year
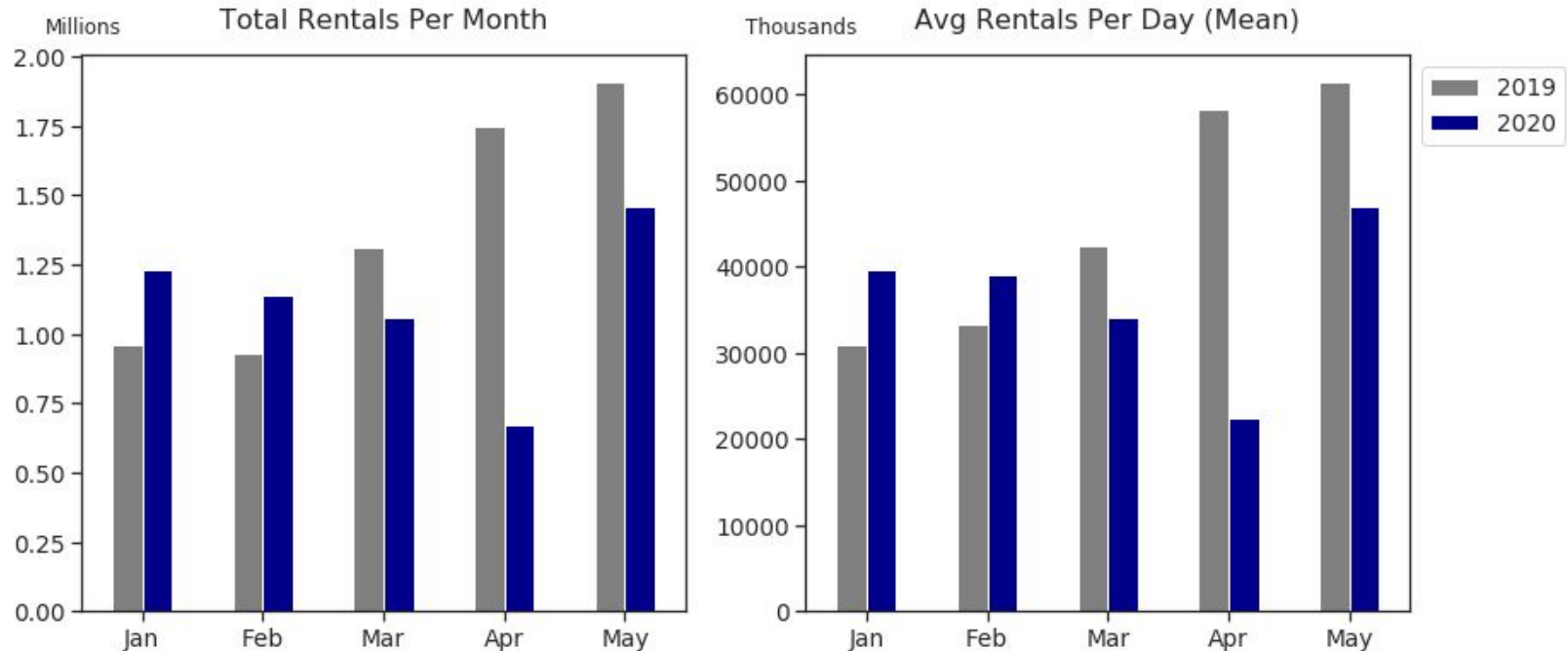
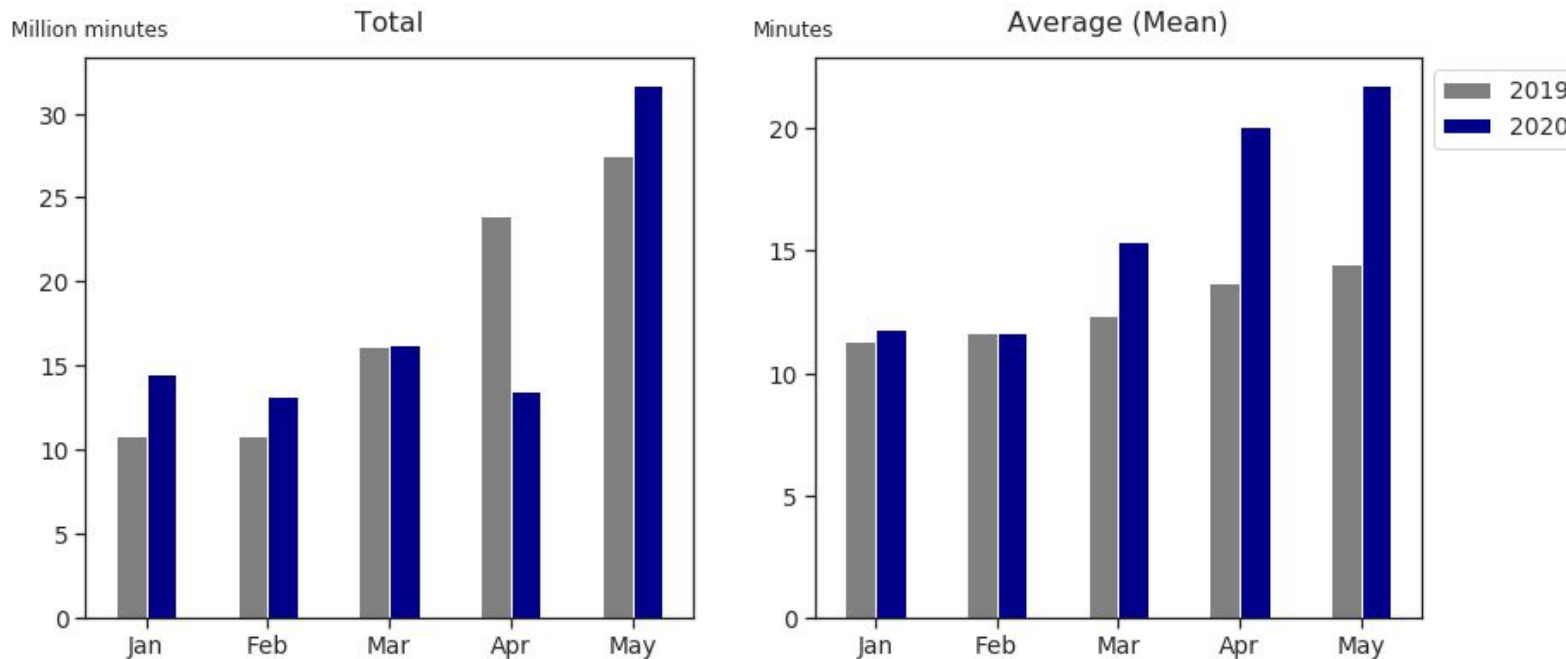# Bike Rental Counts Drop After "Stay Home" Order
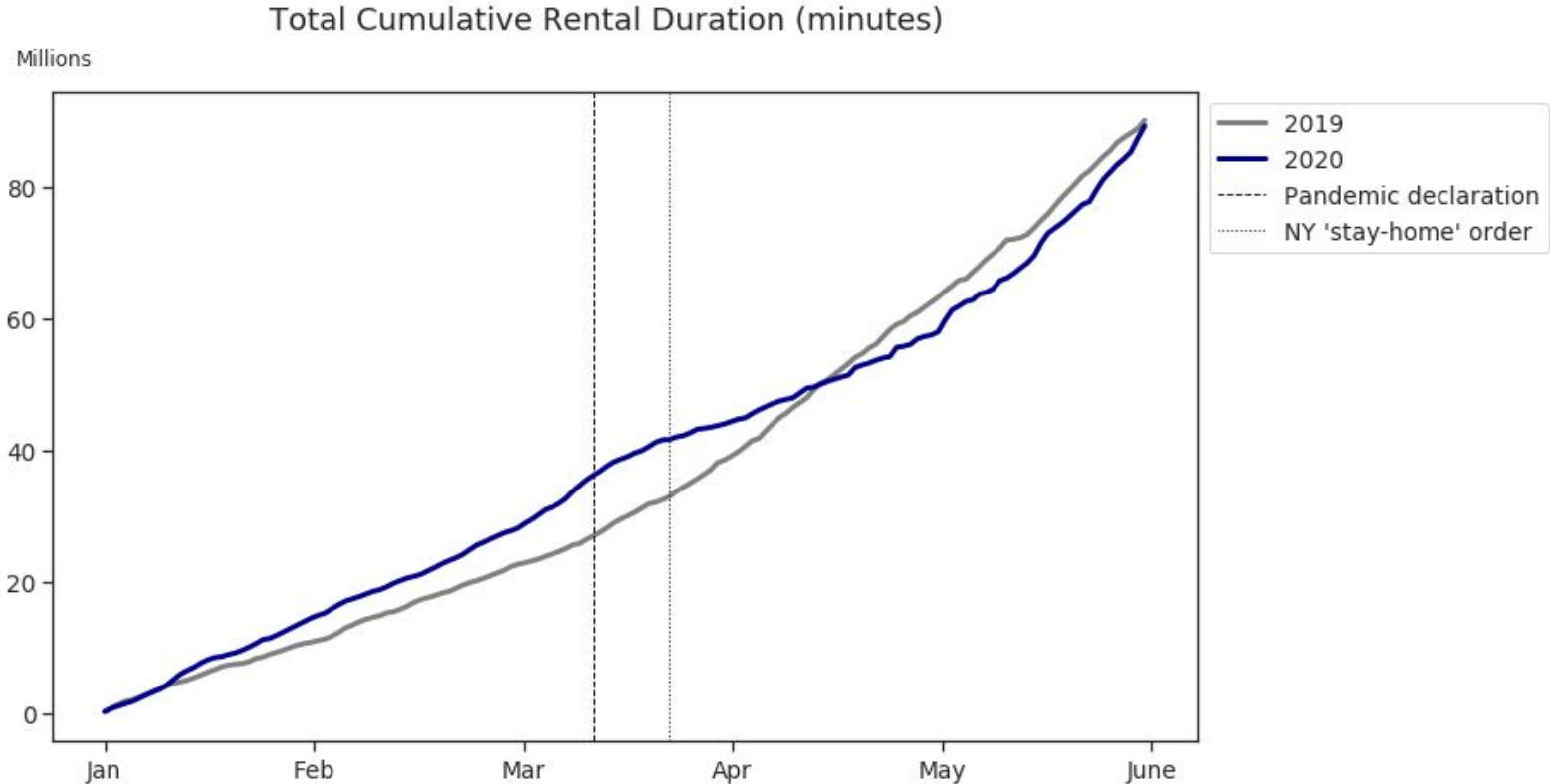

Total Cumulative Rental Count

Rental counts are down, but what about rental duration?

Average Duration Shows Steady Growth

Rental Duration By Month and Year

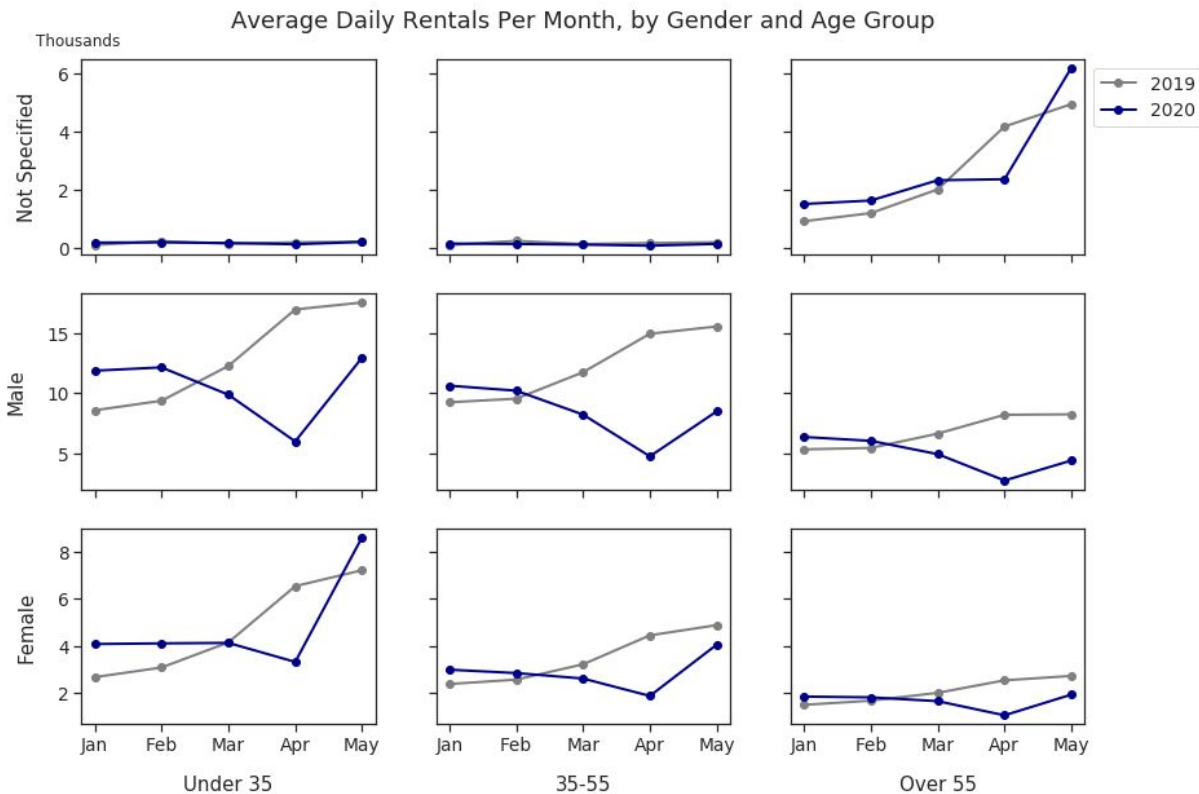# Duration Makes a Comeback After April Decline

Total Cumulative Rental Duration (minutes)

How does age or gender factor into rentals or duration?

Avg Rentals Up in May, Amount Varies by Group

Average Daily Rentals Per Month, by Gender and Age Group

Consistent Growth in Avg Duration for All Groups

Average Rental Duration Per Month, by Gender and Age Group
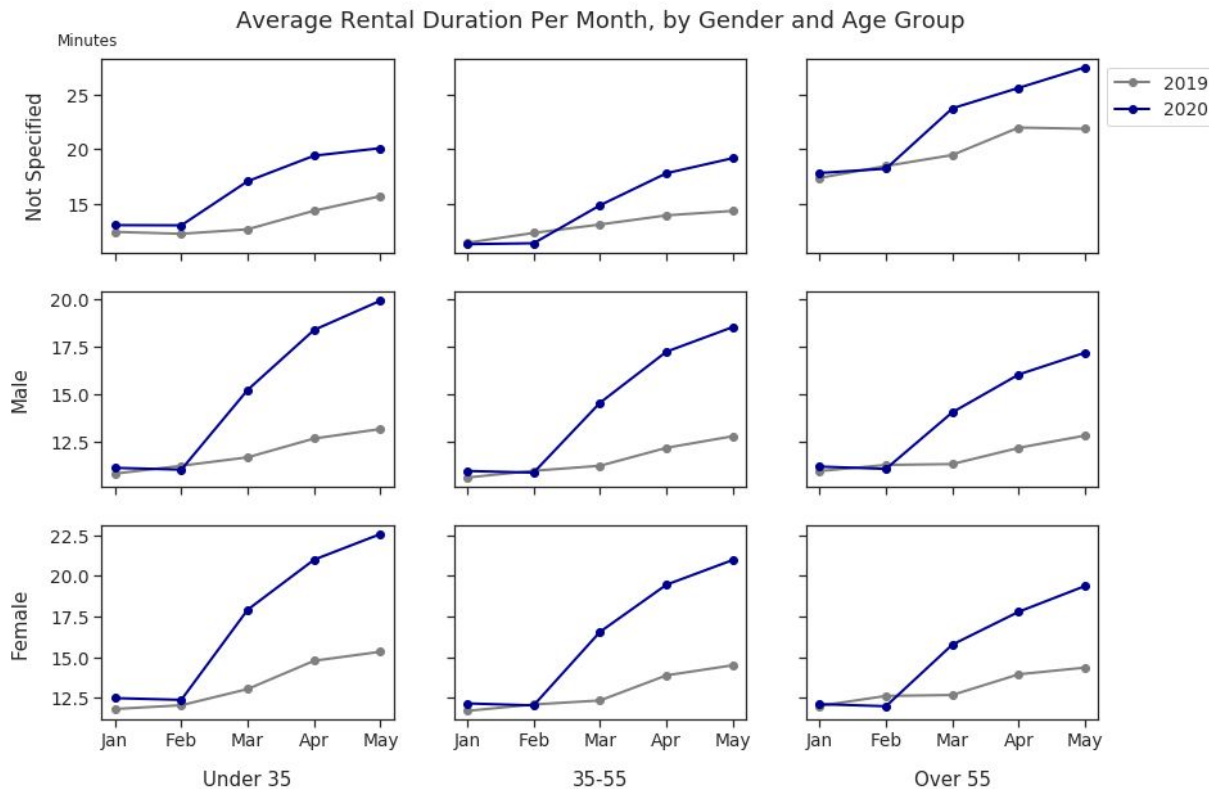
Has rider behavior shifted relative to day & time?

Changes to Weekday Peaks, Weekend Growth

Average Rentals Per Month By Hour, Weekday vs. Weekend
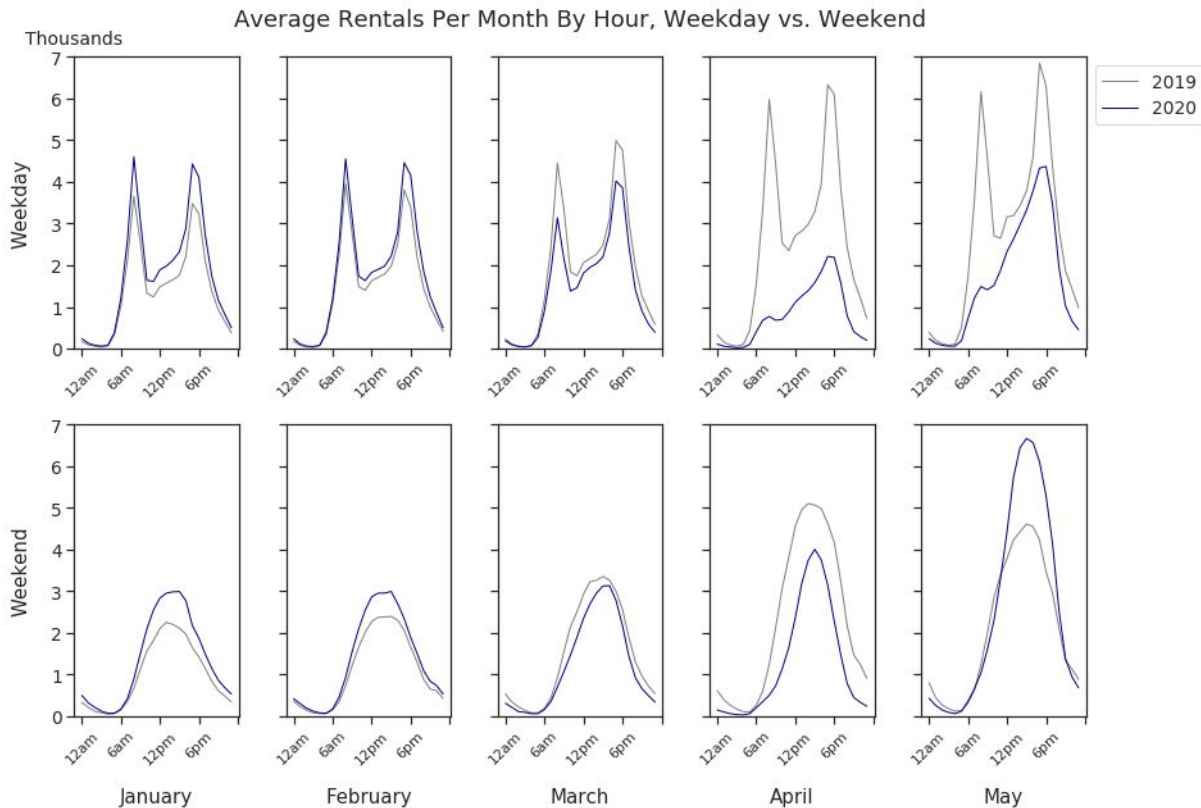
Steady Growth in Avg Duration, March-May

Average Rental Duration Per Month By Hour, Weekday vs. Weekend
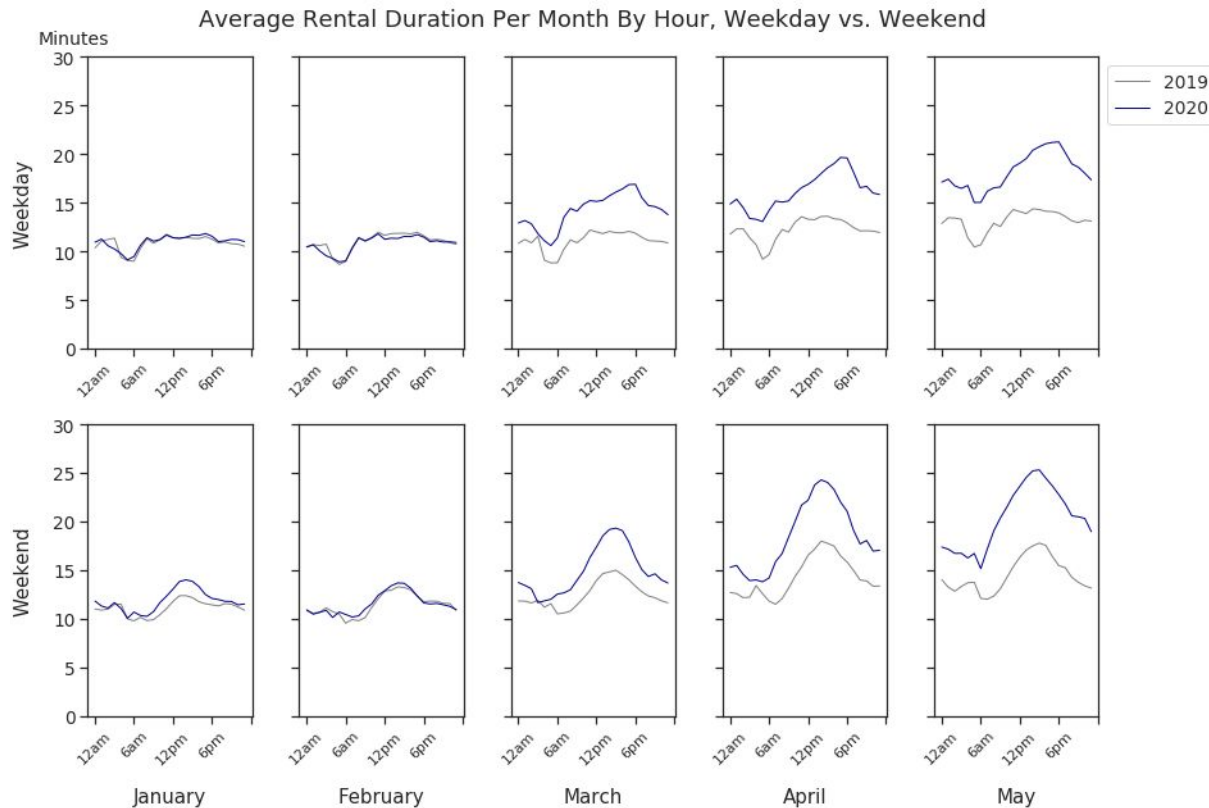
What's the bottom line?

Citi Bike Pricing Model

Customer types:

1. **Annual Subscribers** - $169/yr, unlimited rides up to 45 min ($0.15/min overage)

2. **Casual Customers**

   a. **Day Pass** - $12/day, unlimited rides 30 min in 24 hrs ($0.15/min overage)

   b. **Single Ride** - $3/ride up to 30 min ($0.15/min overage)

Revenue Estimation Assumptions

1. **Subscribership remains flat in 2020**
   a. Subscriber fees <u>not included</u>
   b. Overage fees apply

2. **Standardized pricing for non-subscribers**
   a. All rides priced at $3
   b. Overage fees apply

Revenue Estimation Process

1. Filter out **subscriber** rentals **< 45 min**

2. Calculate overage fees for **subscriber** rentals **> 45 min**

3. Apply a standard price for every **non-subscriber** rental (**$3**)

4. Calculate overage fees for **non-subscriber** rentals **> 30 min**

5. Pivot the data by month and create the plot

Revenue Growth Rides Duration Increase

Estimated Citi Bike Revenue*
(*annual subscription fees not included)
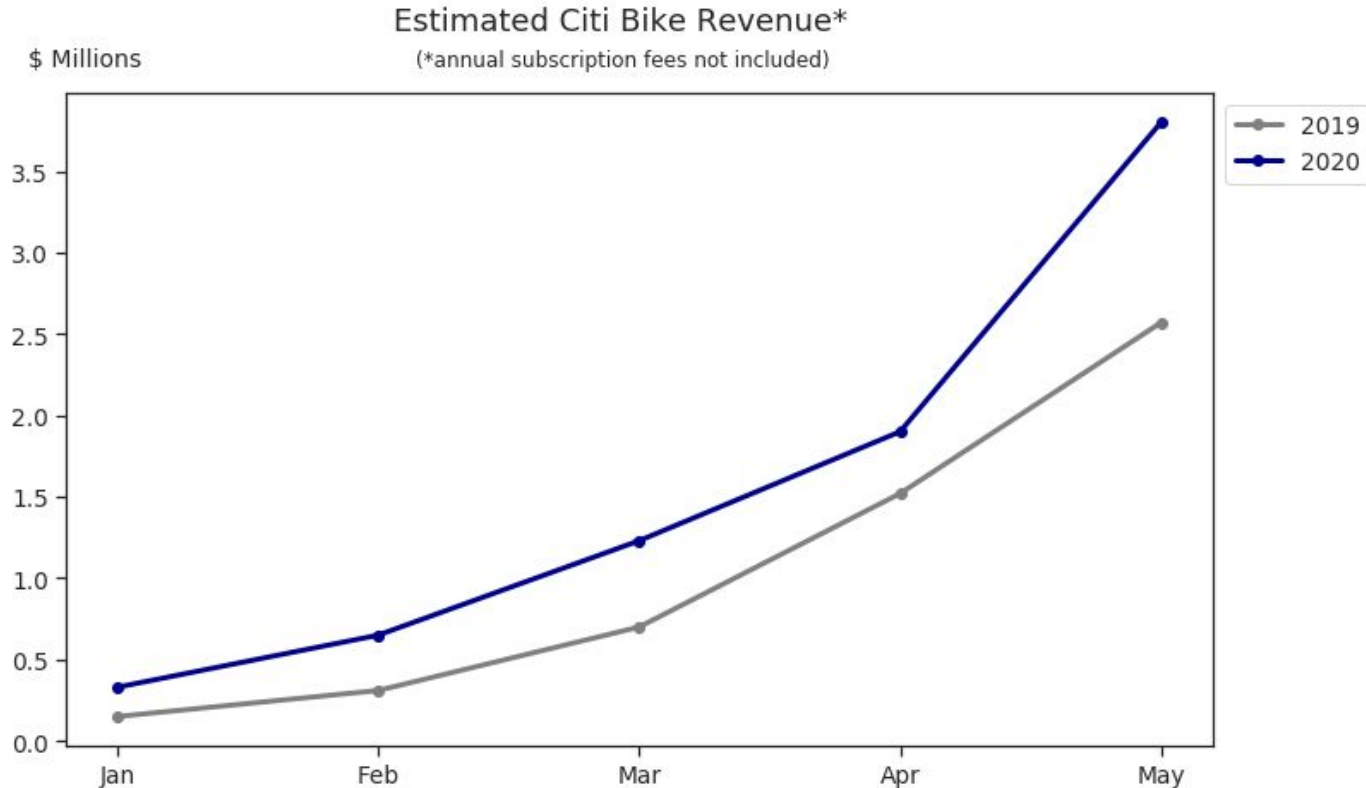
Duration Increases in Depth

	% Trips Over Limit		Total Min of Overage		Overall Avg Duration (min)	
Customer Type	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**
Subscriber	0.80%	2.11%	604,362	1,348,958	11.8	14.0
Non-Subscriber	21.3%	27.6%	2,499,889	4,803,384	23.6	25.7

Can we trust the result?

Factors that could skew the outcome:

1. Subscriber count, 2019 vs. 2020

2. Non-subscriber rental classification

3. Free or other discounted trips

Where do we go from here?

Opportunities for further analysis

1. Detailed pricing analysis / revenue estimation

2. Geographic analysis

3. Analyze birth year spike (1969)

4. Incorporate future months

5. Compare data between similar programs in the US, or worldwide

Thank you!