

**Big Data  
Analytics:  
Getting  
Insights from  
Bike sharing  
Rides**

MUDIT UPPAL

# Bikes in NY

- Citi bikes: A continuously expanding and evolving system: There are currently **7,500 bicycles** in the system, and Citi Bike plans to have **12,000 bikes** and more than 700 docking stations by the end of **2017**.
- NYC has more than **1000 miles of bike lanes**
- Average of **45,000 rides per day** and about **~10 million** each year



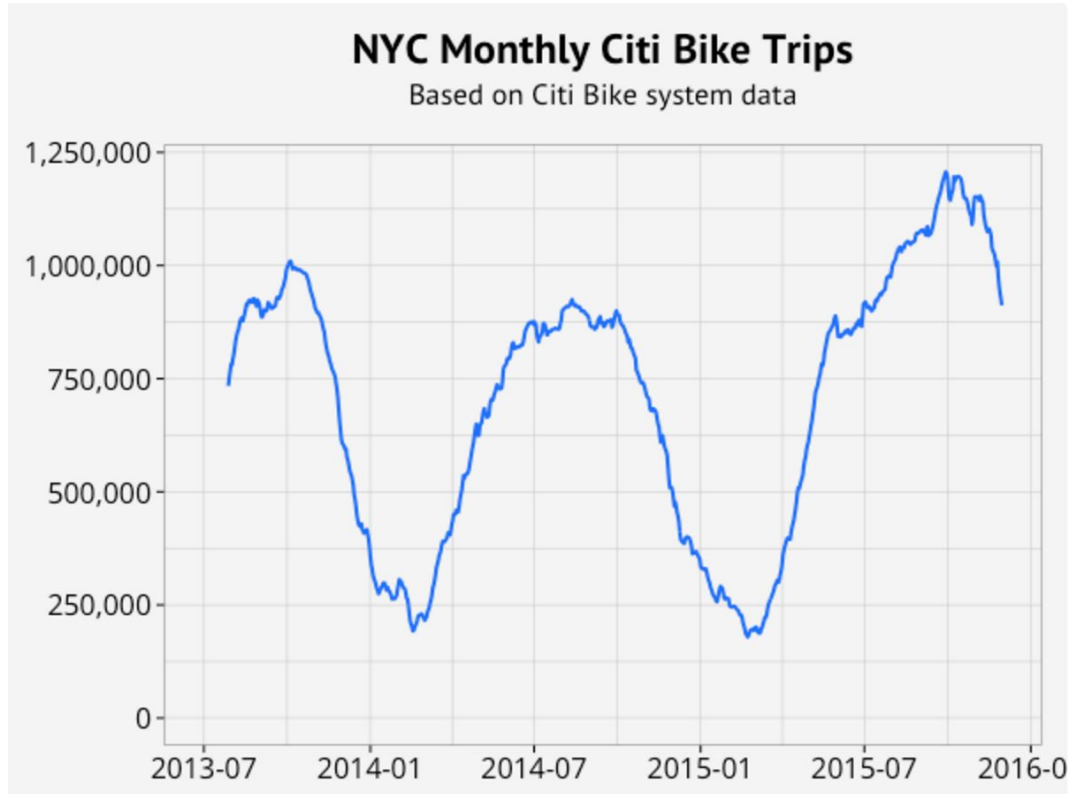
# Project : Overview & Goals

- Analysis of citi bikes in NY, capital bikes share program in DC and Bay area bike share in SF.
- Understand bikes usage in understanding:
  - General Analysis: Weather, Gender etc
  - Carbon footprint: How 'green' are bikes?
  - Bike movement : use cases



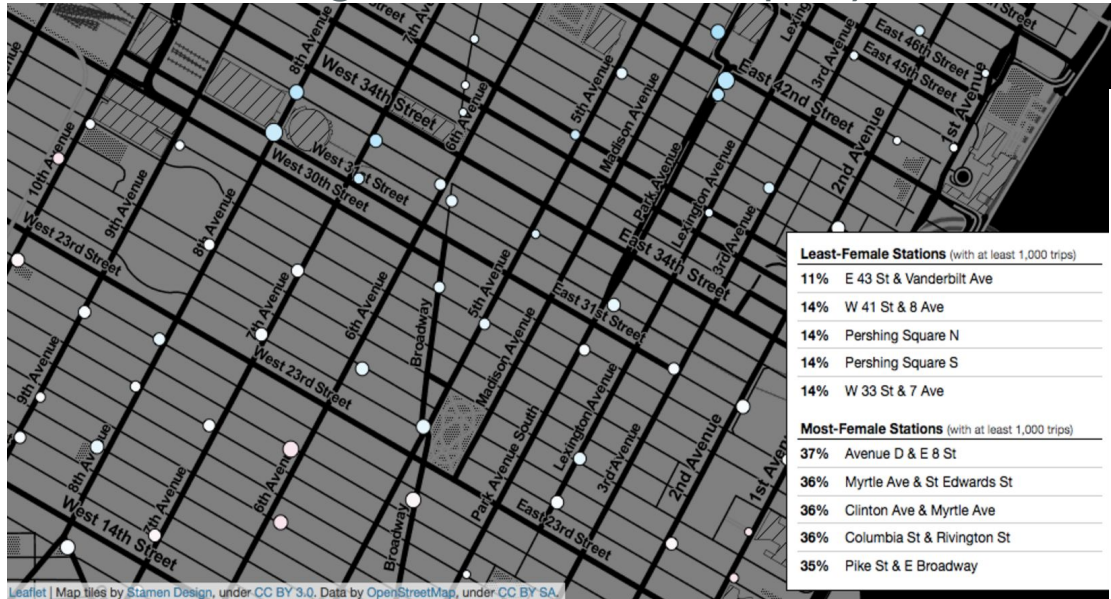
# Basics : Monthly and seasonal usage

Ridership more than double in Spring and summer



# Usage by gender

Only 24% of Citi Bike trips over the first year were taken by women, with some stations clocking as few as 11% of trips by female riders. Why?



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## A Mission for Citi Bike: Recruiting More Female Cyclists

By EMMA G. FITZSIMMONS JULY 7, 2015



Least Female stations: E 43 St & Vanderbilt, W 41 St & 8Ave, Pershing Sq N & S, W 33 St and 7 Ave

# Demo : Greenhouse emissions

Link : <https://github.com/modqhx/bikeProject>

## Environmental Impact

Citi Bike riders burned a total of 71,173,280 calories for the month. Citi Bike offset 925,253 pounds of carbon in March 1, 2016.

# Carbon emissions [CO<sub>2</sub>]

- In the 19 months since its launch in May 2013, New Yorkers have travelled 27.3 million miles using CitiBike.
- The 'greenest' aspect of Bikes share program is the concept of 'rebalancing' : at least 50% of CitiBike trips are from a kiosk to a subway station. **Citi Bike staff rebalanced a total of 38,006 bicycles during the month of March. In addition to our truck rebalancing, re-balancers using bicycle trailers moved bicycles in the Financial District and the East Village.**
- Understanding savings: If you are taking bike, means you are not riding a car. Calculating Negation of 'not riding a car/cab/bus'. Means if 1 person took bike to work, instead of car, he released 4000 less pounds of CO<sub>2</sub> in the air.
- Basic taxi analysis reveals that 26% people travelled less than a mile!! If those 1-mile taxi rides turned into bike rides, it would save the equivalent amount of CO<sub>2</sub> as growing a forest as big as Redwood National Park in California (being from CA), each year.
- 1% taxi rides converted into bikes, he/she saved 94 million pounds of CO<sub>2</sub>



# Demo : Usage patterns

<https://github.com/modqhx/bikeProject>

# Tools

Backend: Postgres database + PostGIS for spatial querying



Frontend: python/pandas + R + Tableau + CartoDB + javascript for animations

# Conclusion

- Ride more bikes!

# Very much an ongoing project ...

Find complete analysis and source code(including other states, DC & SF):

<https://github.com/modqhx/bikeProject>

**Thank you!**

(Prof Soon Chun, Prof Paolo Capillari, Todd Schneider)

QUESTIONS?