TO 450 Team Fourcast

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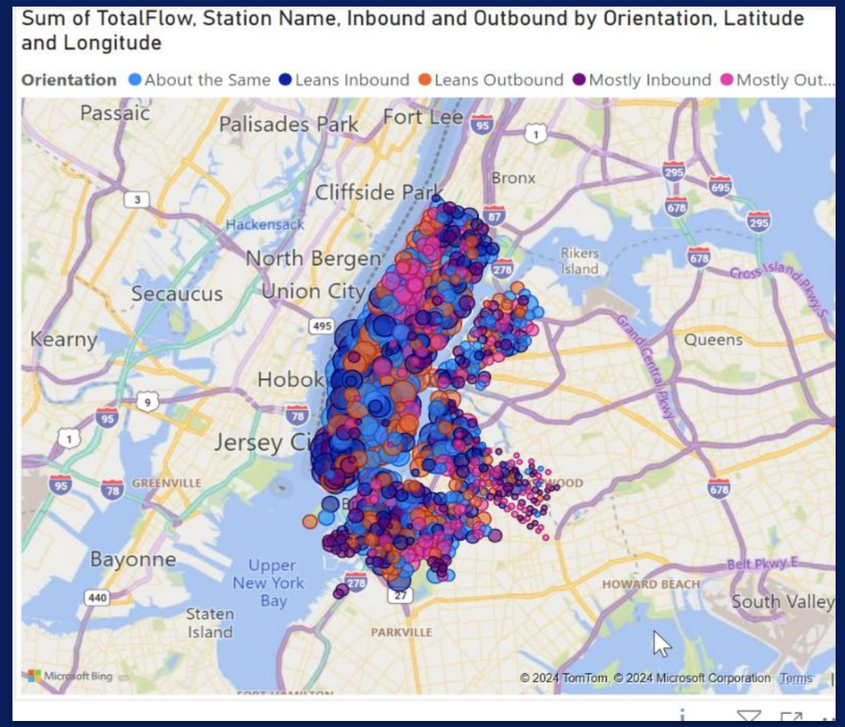
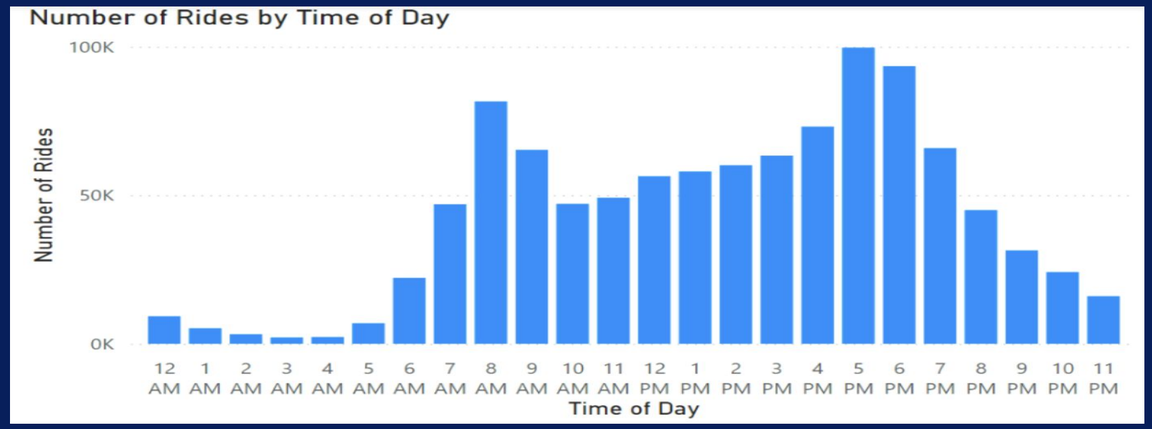
Problem Statement: Citi Bike usage varies in undesirable ways

Underutilized Stations



Peak vs. Non-Peak Hours Usage Variation

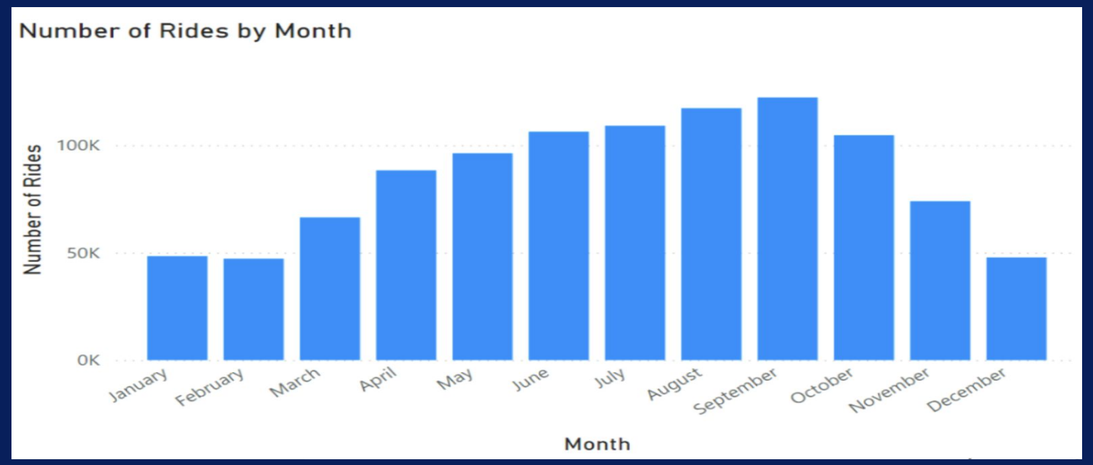


Citi Bike station usage is unbalanced, resulting in some stations having too many bikes, while others have too few.

Bike usage peaks at certain times of day, which means sometimes bikes are hard to find, but other times they are underutilized.

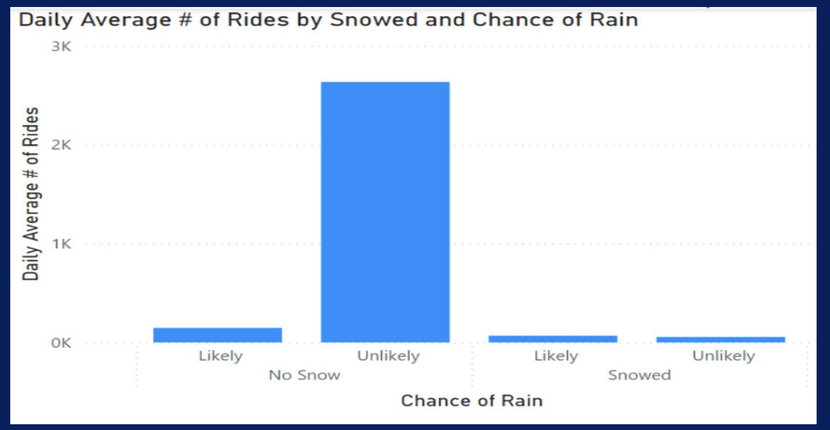
Problem Statement: Bike usage varies in undesirable ways

Temperature Usage Variation



Bike usage is seasonal, which means in the summer we are over-capacity and in the winter we are under-capacity.

Weather Usage Variation



Our bikes go nearly unused in the event of any subpar weather. Our revenue is way too dependent on the weather.

Current Angel Program doesn't effectively change consumer behavior

- It only incentivizes rebalancing. It does not affect weather, time of day, or seasonality
- Bike Angel program requires explicit sign-up, which reduces number of people who use it
- Only affects subscribers, not casual riders
- "Angels" are scamming the program by moving bikes back and forth between stations in order to collect rewards in a loop. The current program incentives ***bad behavior***

r/Citibike • 4 mo. ago
Gerome926

Bike Angel cheaters

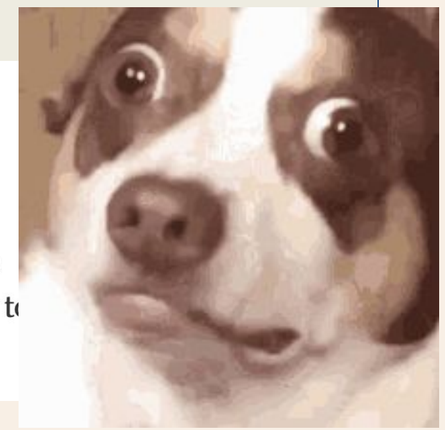
Seeing these people in action is super frustrating as a long time member of the bike angel community. People like this should have their memberships revoked.

I sat and watched a team of 4 guys shuffle bikes from one station on 60th and West End Ave to 59th and West End Ave, clearing out 1 station and waiting for the 15 min window to reset the values and then move all the bikes back to the other station. They literally rinsed and repeated this for hours. They were dripping with sweat, clearly having been doing the cheat job for hours on end, moving bikes back and forth between the two stations.

> "Riders in Sunset Park or Kensington in Brooklyn or University Heights, Fordham, Morrisania, or Fordham Heights in the Bronx would have encountered Citi Bike stations with no bikes or no docks more than 20% of the time during peak hours throughout June and July."
>
> - NYC Comptroller

The Hustlers Who Make $6,000 a Month by Gaming Citi Bikes

The bike-sharing program rewards users who help redistribute bikes around New York City. A few riders have figured out how t turn that into profit.



What does a typical Angel Scam look like?

Empty a Station

Wait ~15 Minutes

Refill the Station

Profit

Our team wants to replace the Bike Angels program with an enhanced program that will incentivize both subscribers and non-subscribers to help Citi Bike efficiently use bikes and balance usage of the system.

Extending Lyft's Solutions to Citibike

SUBSCRIBER BENEFITS

Dynamic Rewards

- Extend partnerships with Doordash, Delta, Hilton, Alaska Airlines, Bilt, Chase, and Mastercard
- Threshold-based rewards, Event-based Rewards
- Aids in Cross-Marketing Opportunities and Brand Affiliation

NON-SUBSCRIBER BENEFITS

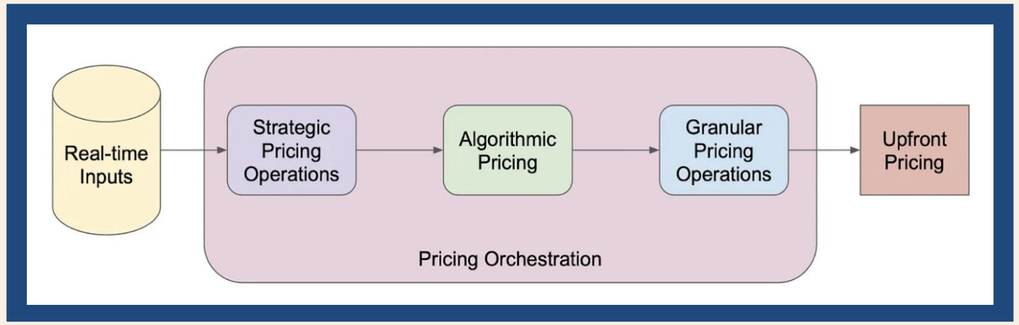
Dynamic Pricing

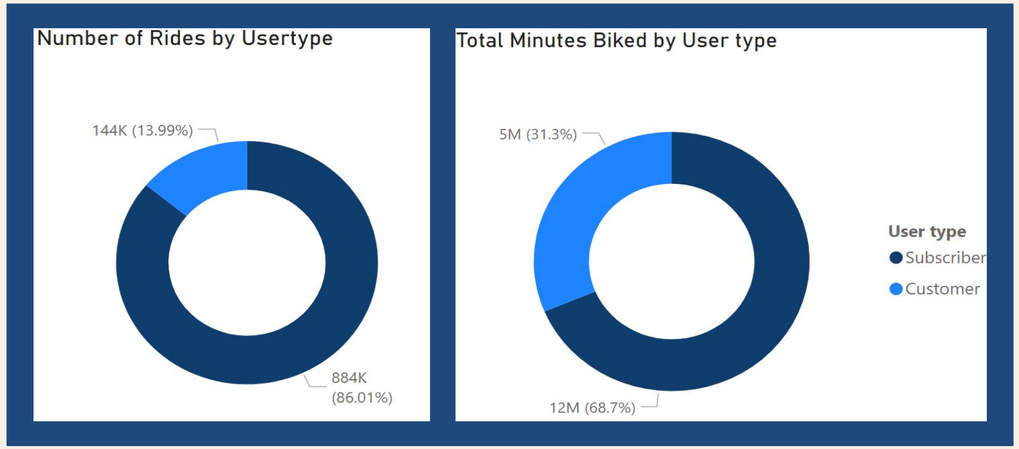
- Personalized ride recommendations, tailored promotions, and responsive customer support through Lyft Technical Synergies
- Real-Time Incentives, Surge Period Shifts
- Aids in Preference Reinforcement and Geographic Targeting

OVERALL BENEFITS

- Added Value
- Increased Engagement
- Broader Audience Reach
- Habit Formation

Time of Day





How:

- **Implement dynamic pricing:** Adjust rates based on time-of-day demand and ride popularity
- **Utilize Lyft's pricing model:** Apply Surge pricing principles to manage peak periods effectively

For Whom:

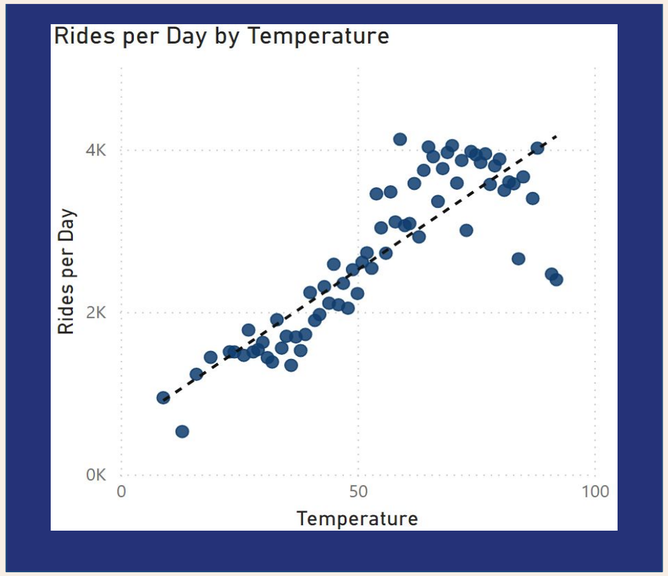
- **Target non-subscribers:** Although casual riders account for 15% of customers, they represent 30% of total ride time.

Why:

- **Drive subscriptions:** Encourage casual riders to convert to subscribers while ensuring bike availability for subscribers during peak hours who are commuting

https://eng.lyft.com/pricing-at-lyft-8a4022065f8b

Weather



How:

- **Factor weather variables into dynamic pricing/rewards algorithm**
    - Temperature, Wind Speed, Snow, and Rain

For Whom:

- **Subscribers & Non-Subscribers:** Lower price or program reward during bad weather to keep them relying on Citi Bike even in poor weather conditions

Why:

- **Increase Revenue:** Currently we make little money on bad weather days. Lower pricing can incentivize usage and recover some of our revenue
- **Increase Loyalty:** Users will use Citi Bike every day, not just sunny days

Routes

How:

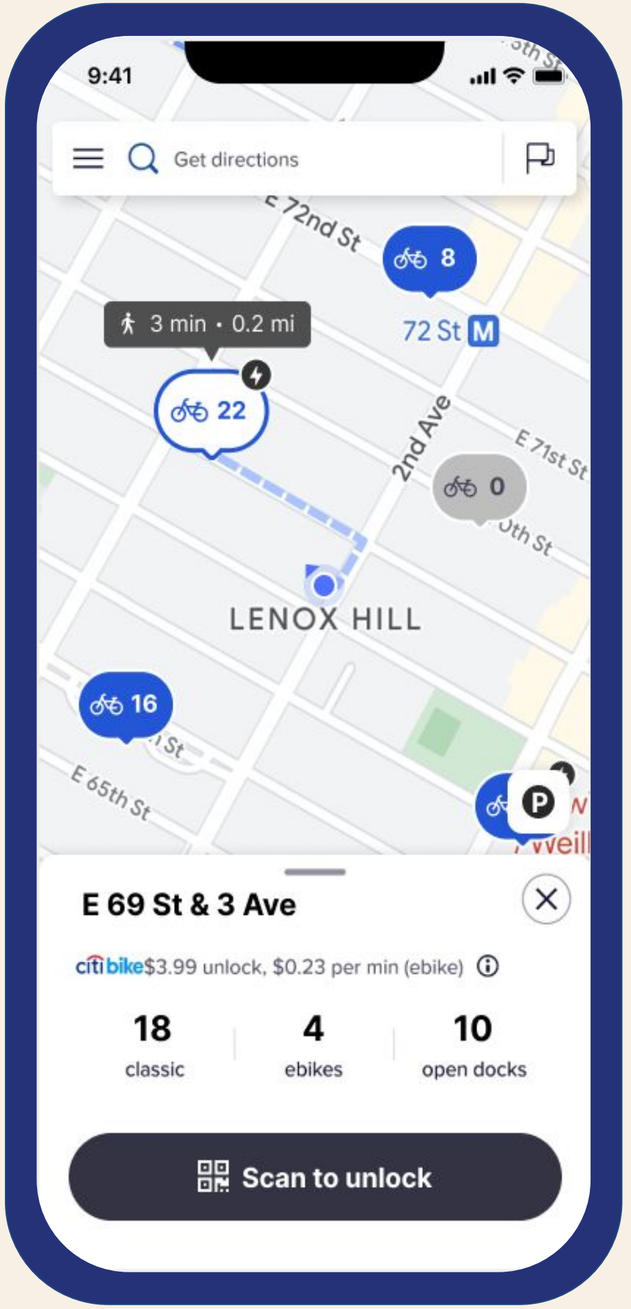
- **Leverage station** ike availability and station capacity
- **Introduce capaci** ram rewarding users for returning aking from high capacity stations.

For Whom:

- **Subscribers and** cing can encourage all cons ors

Why:

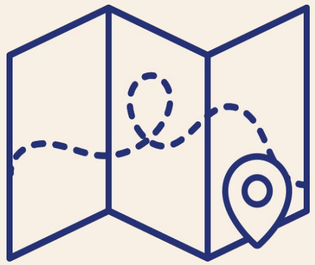
- **Address bike dis** bike flow, particularly on high
- **Prioritize Addres** n the outer edges of the system experience far more unusable stations, disproportionately affecting Black, Latino, and low-income residents” (NYC Comptroller)



Our program will mitigate all challenges

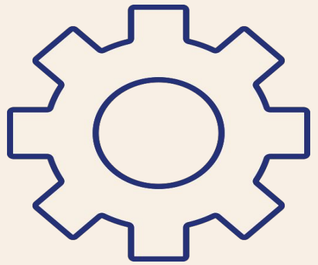
System Abuse

Cap points earned by customers and subscribers to prevent financial losses



Bike Shortages During Transition

Use the existing Ride Angels program while the program is being implemented and users start to take advantage of new program



Costs

Initial costs will exist (rewards, partnerships, software) but will be offset by benefits

Defining and Measuring Success: KPIs and ROI for the Rewards Program

Pain Point	KPI	ROI
Unbalanced Station Usage	• Station utilization/capacity rates • Percentage of stations with poor service in communities with proportionately more Black, Latino, and low-income residents	Cut costs with less labor required for balancing, increasing overall equity by stabilizing supply of bikes
Peak / Non-Peak hours	• Percentage of total rides during non-peak hours • Growth rate of usage of non-peak hours	Increases usage during non-peak hours will lead to revenue increase
Weather Usage Variation	• Ride rate during precipitation and snow • Ride rate during colder months	Decreases risk of lower profits during bad weather, decreases the cyclical nature of demand

Utopia

MODERN & ACCESSIBLE &

INNOVATIVE

EMPOWERED CUSTOMERS

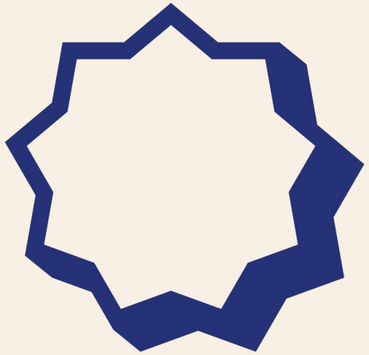
- Riders actively contribute to system efficiency
- Choosing routes & time
- Engage with interactive rewards system

SUSTAINABILITY

- Seen as environmentally responsible through resource optimization + lower reliance on trucks for moving bikes
- Encouraging bike usage during cold and slightly rainy weather conditions

ACCESSIBILITY

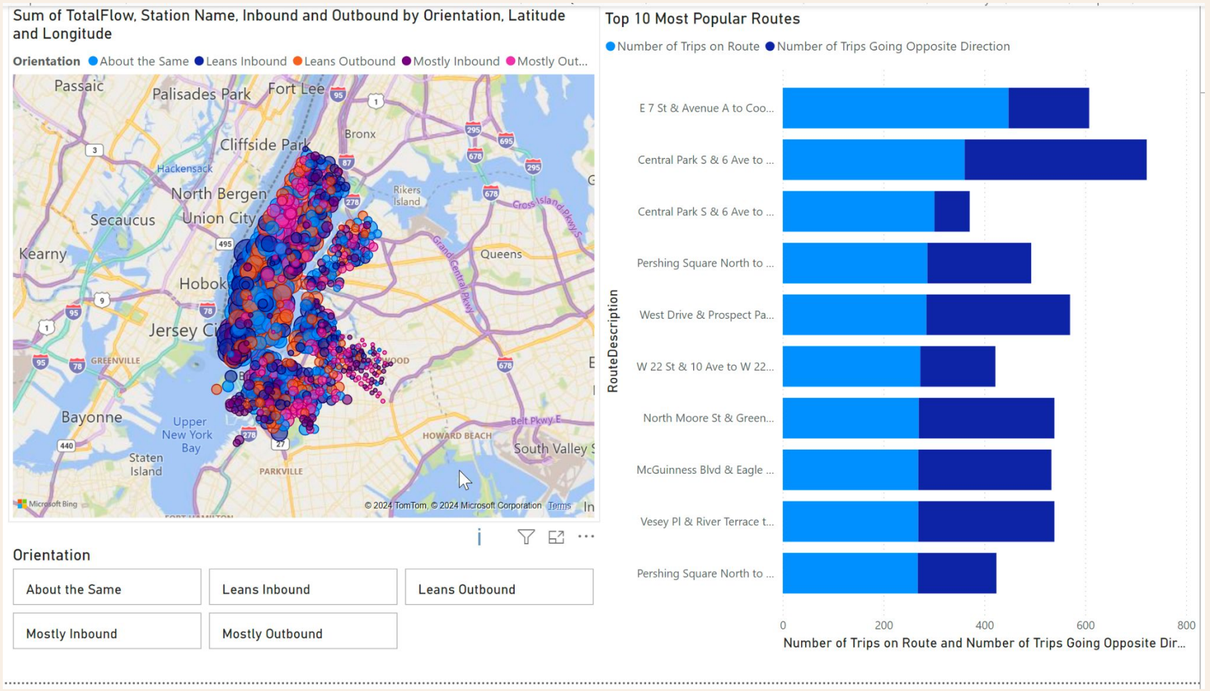
- Increased access for outer edges of NYC map, particularly Black and Latino communities
- Inclusive and reliable for all, offering incentives for weather challenges and non-peak hours

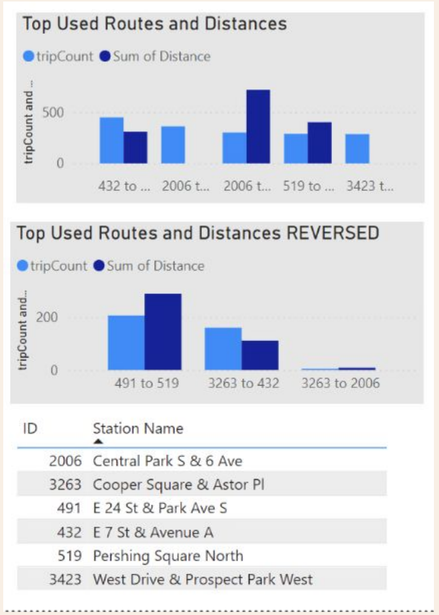


Thank you!

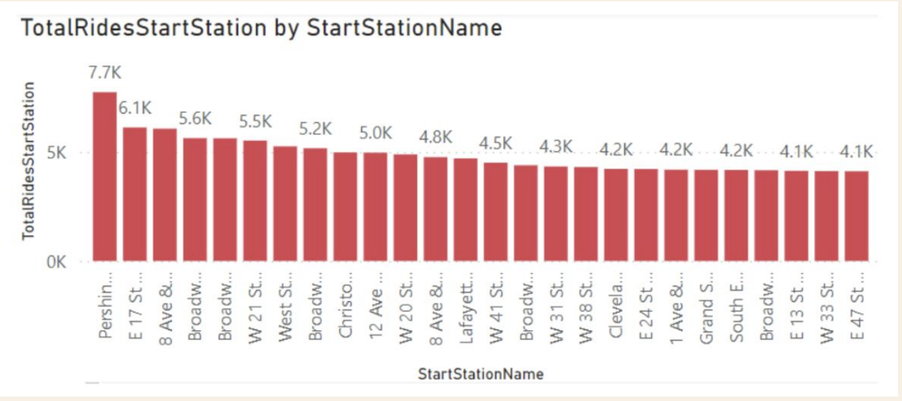
Appendix

Underutilized





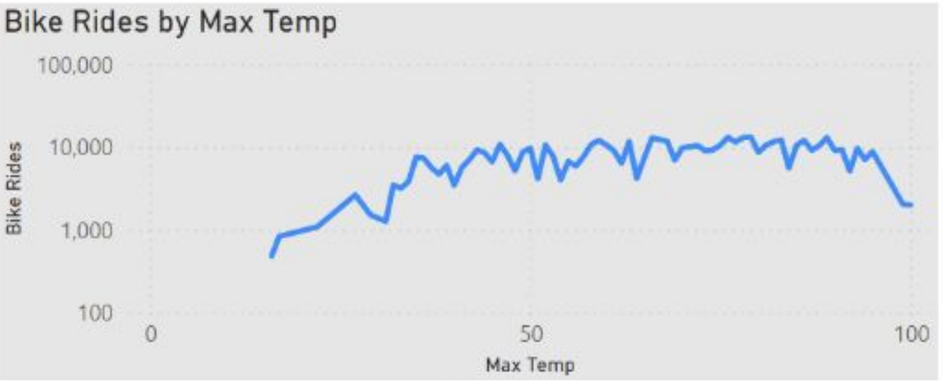
ID	Station Name
2006	Central Park S & 6 Ave
3263	Cooper Square & Astor Pl
491	E 24 St & Park Ave S
432	E 7 St & Avenue A
519	Pershing Square North
3423	West Drive & Prospect Park West

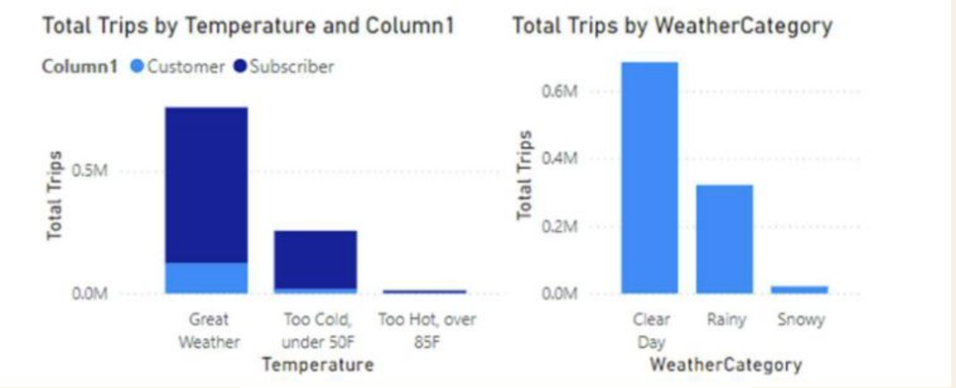


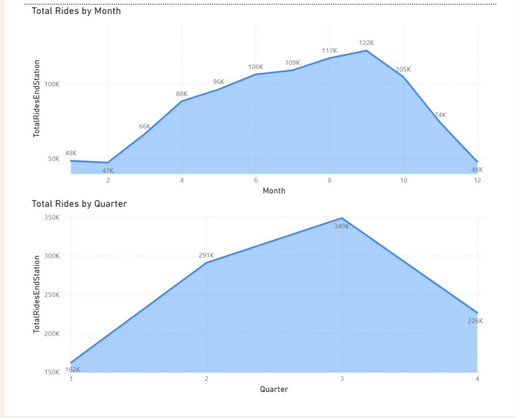
StartStationName	StartStationTrips
Pershing Square North	7742
E 17 St & Broadway	6124
8 Ave & W 31 St	6068
Broadway & E 22 St	5636
Broadway & E 14 St	5627
W 21 St & 6 Ave	5522
Total	**1027581**

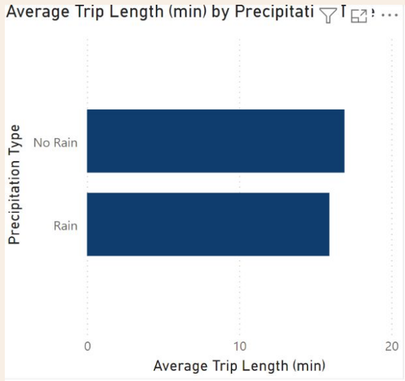
EndStationName	EndStationTrips
Pershing Square North	7724
E 17 St & Broadway	6360
Broadway & E 22 St	6138
8 Ave & W 31 St	6025
West St & Chambers St	5841
Broadway & E 14 St	5660
Total	**1027581**

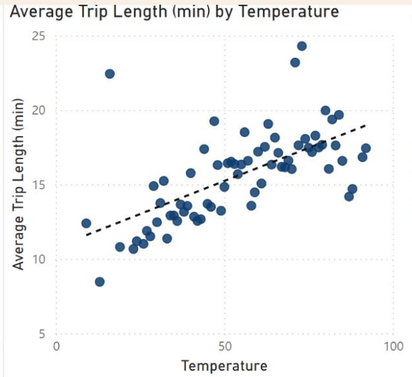
Weather

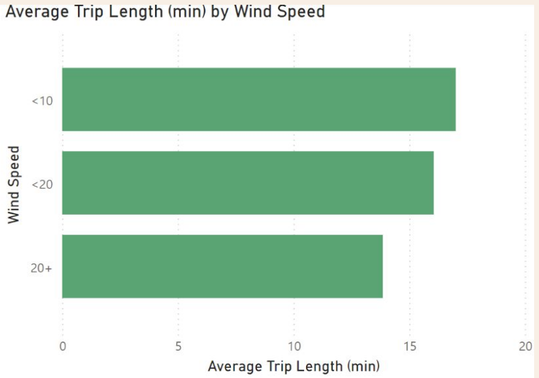

Bike Rides by Max Temp
100,000
10,000
1,000
100
Bike Rides
0
50
100
Max Temp

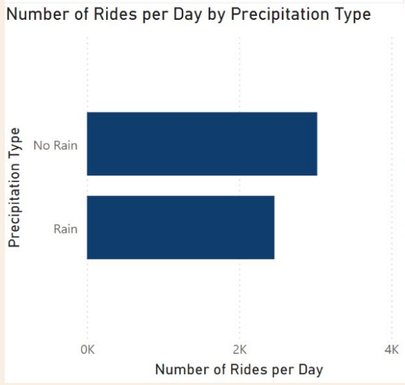

Total Trips by Temperature and Column1
Column1
Customer
Subscriber
0.5M
0.0M
Total Trips
Great Weather
Too Cold, under 50F
Too Hot, over 85F
Temperature
Total Trips by WeatherCategory
0.6M
0.4M
0.2M
0.0M
Total Trips
Clear Day
Rainy
Snowy
WeatherCategory

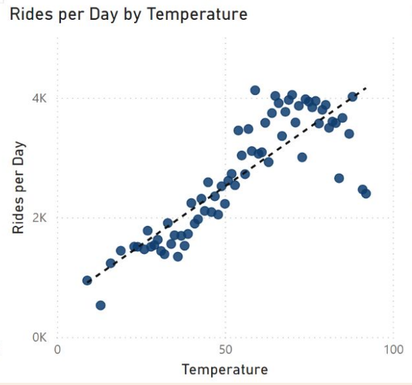

Total Rides by Month
TotalRidesEndStation
Month
Total Rides by Quarter
TotalRidesEndStation
Quarter

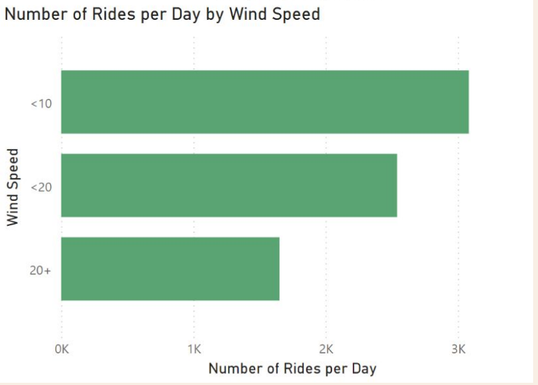

Average Trip Length (min) by Precipitati
Precipitation Type
No Rain
Rain
0
10
20
Average Trip Length (min)

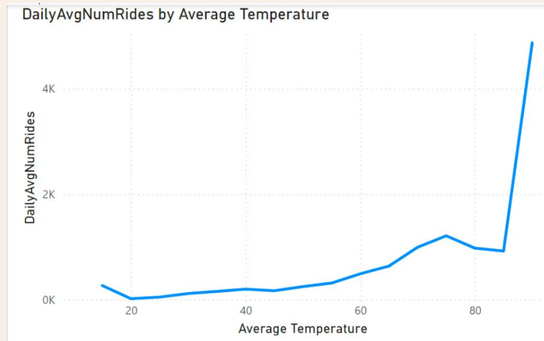

Average Trip Length (min) by Temperature
Average Trip Length (min)
25
20
15
10
5
0
50
100
Temperature

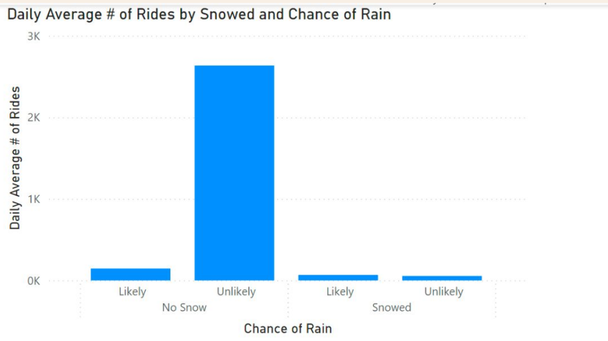

Average Trip Length (min) by Wind Speed
Wind Speed
<10
<20
20+
0
5
10
15
20
Average Trip Length (min)

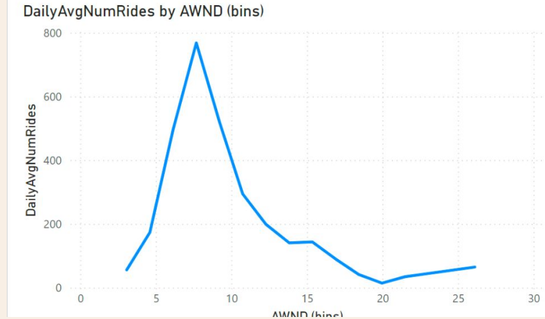

Number of Rides per Day by Precipitation Type
Precipitation Type
No Rain
Rain
0K
2K
4K
Number of Rides per Day


Rides per Day by Temperature
Rides per Day
4K
2K
0K
0
50
100
Temperature

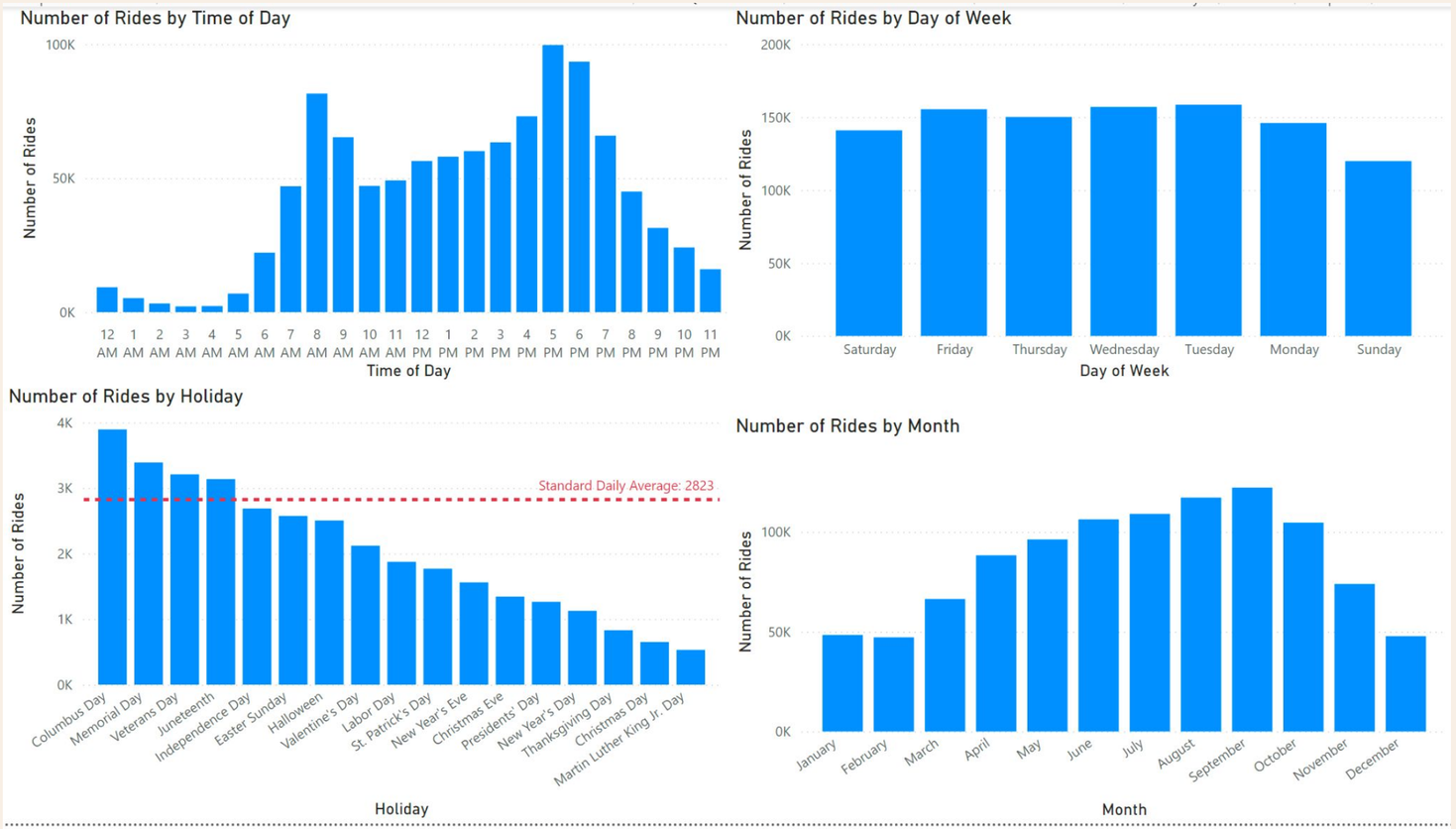

Number of Rides per Day by Wind Speed
Wind Speed
<10
<20
20+
0K
1K
2K
3K
Number of Rides per Day

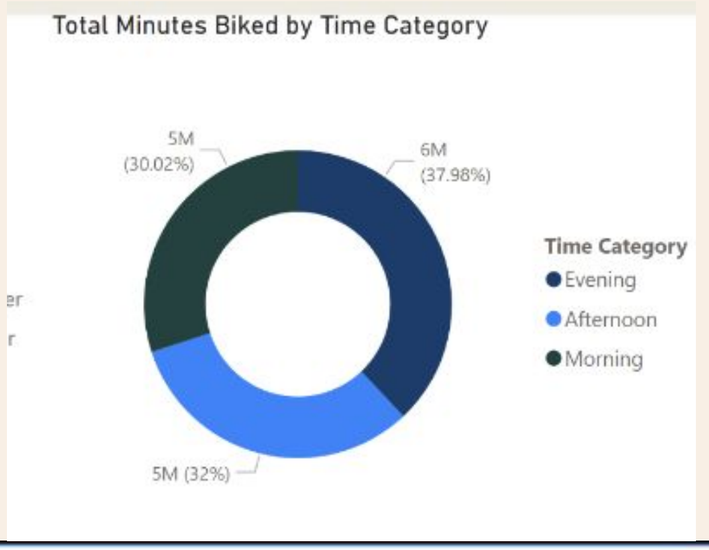

DailyAvgNumRides by Average Temperature
DailyAvgNumRides
4K
2K
0K
20
40
60
80
Average Temperature


Daily Average # of Rides by Snowed and Chance of Rain
Daily Average # of Rides
3K
2K
1K
0K
Likely
Unlikely
Likely
Unlikely
No Snow
Snowed
Chance of Rain


DailyAvgNumRides by AWND (bins)
DailyAvgNumRides
800
600
400
200
0
0
5
10
15
20
25
30

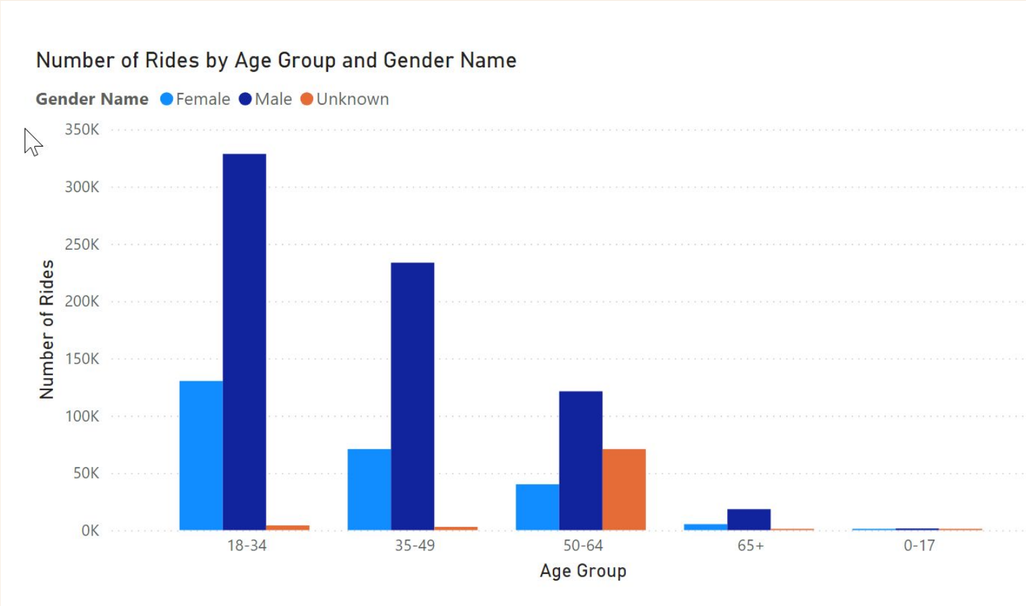
Time of Day


Number of Rides by Time of Day
Number of Rides
100K
50K
0K
12 AM
1 AM
2 AM
3 AM
4 AM
5 AM
6 AM
7 AM
8 AM
9 AM
10 AM
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
8 PM
9 PM
10 PM
11 PM
Time of Day
Number of Rides by Day of Week
Number of Rides
200K
150K
100K
50K
0K
Saturday
Friday
Thursday
Wednesday
Tuesday
Monday
Sunday
Day of Week
Number of Rides by Holiday
Number of Rides
4K
3K
2K
1K
0K
Standard Daily Average: 2823
Columbus Day
Memorial Day
Veterans Day
Juneteenth
Independence Day
Easter Sunday
Halloween
Valentine's Day
Labor Day
St. Patrick's Day
New Year's Eve
Christmas Eve
Presidents' Day
New Year's Day
Thanksgiving Day
Christmas Day
Martin Luther King Jr. Day
Holiday
Number of Rides by Month
Number of Rides
100K
50K
0K
January
February
March
April
May
June
July
August
September
October
November
December
Month


Total Minutes Biked by Time Category
5M
(30.02%)
6M
(37.98%)
5M (32%)
Time Category
Evening
Afternoon
Morning

Total Trips by StartHour
Total Trips
100K
50K
0K
0
10
20
StartHour
Total Trips by DayOfWeek
Total Trips
200K
150K
100K
50K
0K
Tuesday
Wednesday
Friday
Thursday
Monday
Saturday
Sunday
DayOfWeek
266K
PeakDemandAfternoon Trips
151K
PeakDemandMorning Trips

Other Data



1.028M	9682
Total Trips	LongDistanceTrips (>60 mins)
19K	16.60
TotalBikes	AvgDurationMins