

MGMT 586

Final Project – NYC Bikeshare

Authors - Hrishikesh Umesh Bhatt, Prashast Vaish

Introduction

New York City's bikeshare system, commonly known as Citi Bike, is one of the largest and most popular bikeshare programs in the United States. Launched in 2013, it provides residents and visitors with a convenient, eco-friendly, and affordable mode of transportation across the city's boroughs. Users can rent bikes from docking stations located throughout the city and return them to any other station. The system supports both casual riders and long-term subscribers, offering flexible pricing plans. Citi Bike has become an integral part of NYC's transportation network, helping to reduce traffic congestion and promote healthier commuting alternatives while supporting the city's sustainability goals.

Objective

In this project, we aim to analyse the NYC bikeshare data through exploratory data analysis (EDA) and hypothesis testing to uncover key insights that can drive marketing and revenue strategies for the bikeshare program. The main business problem is to identify patterns in user demographics, ride frequency, and station usage that can inform targeted marketing campaigns. Additionally, we will explore opportunities to optimize advertising spot sales on bikes and docking stations, enhancing revenue streams to support the bikeshare's growth and expansion. By understanding user behaviours and preferences, the project seeks to provide actionable recommendations to help NYC bikeshare increase ridership, improve customer engagement, and boost overall profitability.

Data Sourcing & Overview

The dataset for this project was sourced from Kaggle's "New York City Bike Share Dataset," provided by the user '**Nikhil Akki**'. The dataset consists of bikeshare ride details recorded by NYC's Citi Bike system, a popular bikeshare program operating across the city. The data was collected from Citi Bike stations located throughout NYC, representing millions of rides taken by users over a specified time period. The dataset contains information on individual bikeshare rides, including user demographics, trip durations, and details about starting and ending stations. Each row in the dataset represents a single trip taken by a user. The fields include essential details like trip duration, start and end times, station details, and user information such as gender and birth year.

Key Observations & Insights

1. Observation: Males take significantly more rides compared to other genders.

Insight: The majority of riders are male, suggesting that NYC bikeshare is more popular among this demographic.

Recommendation: Focus marketing campaigns on male riders. Explore selling ad spaces to male-targeted brands to generate additional revenue. At the same time, investigate why female ridership is lower and consider creating safety campaigns or offering female-centric marketing to encourage more diverse usage.

2. Observation: Grove St PATH, Exchange Place, Sip Ave, Hamilton Park, Newport PATH, Essex Light Rail, Newport Pkwy, Newark Ave and Brunswick St are by far among the most popular stations (as start and end points)

Insight: These stations represent high-visibility locations with heavy rider traffic, making them prime areas for advertising and promotional efforts.

Recommendation: Utilize these popular stations for targeted ads and promotions. Digital ads can be placed within apps, while physical advertisements such as billboards or posters could drive visibility. These stations could also serve as test locations for service expansions or new features.

3. Observation: A significant number of trips are taken by subscribers rather than one-time users.

Insight: The high proportion of subscribers indicates strong brand loyalty, but there is potential to increase one-time user engagement.

Recommendation: Develop strategies to convert occasional riders into subscribers through promotions or discounts (e.g., offering deals after a set number of one-time uses). For existing subscribers, create loyalty programs or offer perks like priority access to bikes during peak hours to maintain high retention rates.

4. Observation: For Subscribers most trips are concentrated during peak office hours on the weekdays and during weekend afternoons for other customers.

Insight: Peak usage during commute hours suggests that bikeshare is integral to NYC's transportation network for daily commuters.

Recommendation: Ensure bikes are readily available during peak hours by expanding the fleet or redistributing bikes to high-traffic stations. Additionally, commuter-specific deals (e.g., monthly passes or discounts) can increase user retention, while partnerships with

companies targeting office workers can maximize ad visibility. Non paying customers can be targeted over the weekends.

5. Observation: Peak trip durations tend to cluster around short commutes (5-30 minutes).

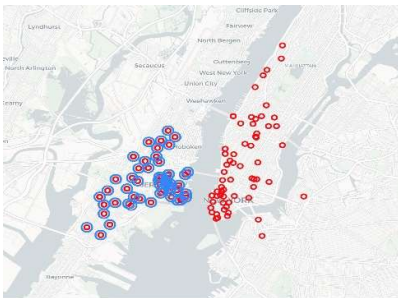
Insight: NYC bikeshare is primarily used for short-distance travel, likely as part of daily commutes or quick trips around the city.

6. Observation: There are clear seasonal or monthly patterns that affect ridership.

Insight: Ride volume may increase during warmer months or specific events, presenting opportunities for targeted marketing and service optimization.

Recommendation: Dynamic peak pricing can be introduced during peak seasons (summer) to capitalize on the high demand

Other Observations:



While the spread of stops is quite extensive in Manhattan and Jersey City, we could consider adding many more stops in other boroughs like Brooklyn, the Bronx and Queens.

Since most offices are in Manhattan, it is important to build connectivity from other boroughs to Manhattan as well

We formulated 2 Hypothesis:

1. Trip duration between Male and Female riders
2. Trip duration between Subscribers and other customers

While we did not find evidence of difference in average trip duration between male and female riders, we did see that customers ride far longer than subscribers on average.

References:

- [New York City Bike Share Dataset \(kaggle.com\)](https://www.kaggle.com/datasets/new-york-city-bike-share-dataset)
- [Citi Bike System Data](#) | [Citi Bike NYC](#) | [Citi Bike NYC](#)