Data Product Manager Nanodegree

Applying Data Science to Product Management
Final Project: Developing an MVP Launch Strategy for a Flying Taxi Service

Welcome to your first week at Flyber

Flyber

Section 1: Data Exploration

The existing solution: taxis

Taxis are used for general transportation for non-drivers, mobility for tourists and visitors, and basic mobility in emergencies.

Characteristics of taxi users include:

1. People with lower average household vehicle ownership: disabled, low-income, unemployed, or elderly/retired

2. Working professionals who live/work in or near city centers

3. People traveling to and from the airport

Existing pain points with taxis include:

- Not always available when you need them, where you need them
- Travel time is heavily dependent on traffic conditions at time of travel

Existing pain points with digital ride-sharing services include:

- Low supply in areas with low user-demand (e.g. suburbs, rural areas)
- Travel time is heavily dependent on traffic conditions at time of travel

Hypothesis 1:

A flying taxi service would greatly reduce the travel time between pick up and drop off in congested, urban city centers.

Hypothesis 2:

(a) A flying taxi service would disrupt the taxi industry by creating a new category of revenue opportunities for drivers.

(b) At scale, a flying taxi service would help alleviate traffic congestion in congested urban city centers.

Key facts about dataset

Total number of records: 1048468

Records represented: Individual customer journeys for a taxi pickup/dropoff

Primary key: 'id'

**Date range**: 01/01/2016 to 01/07/2016

Geographical bounds:
- Spans and centralized over the 5 boroughs of NYC
- Extends into NJ
- Outliers scattered across Long Island and NJ

Central tendency measures of dataset

	Average	Median	1st S.D.	2nd S.D.
Duration	962.20 sec	662.00 sec	5,853.30	11706.60
Distance	3.44 mi.	2.09 mi.	4.38	8.76
Passenger Count	1.66	1.00	1.31	2.62
Distance : Duration	0.00401	0.00355	0.00396	0.00792
Price	$24.12	$18.53	50.88	101.76

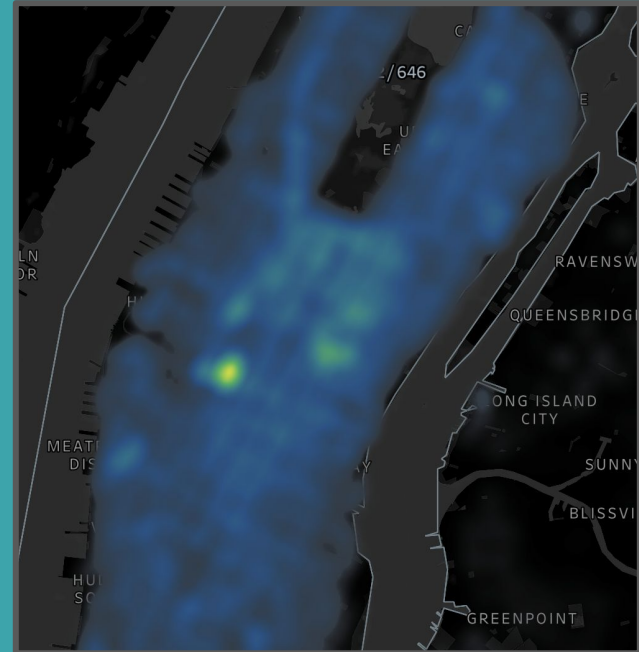# Number of total rides grouped by passenger count
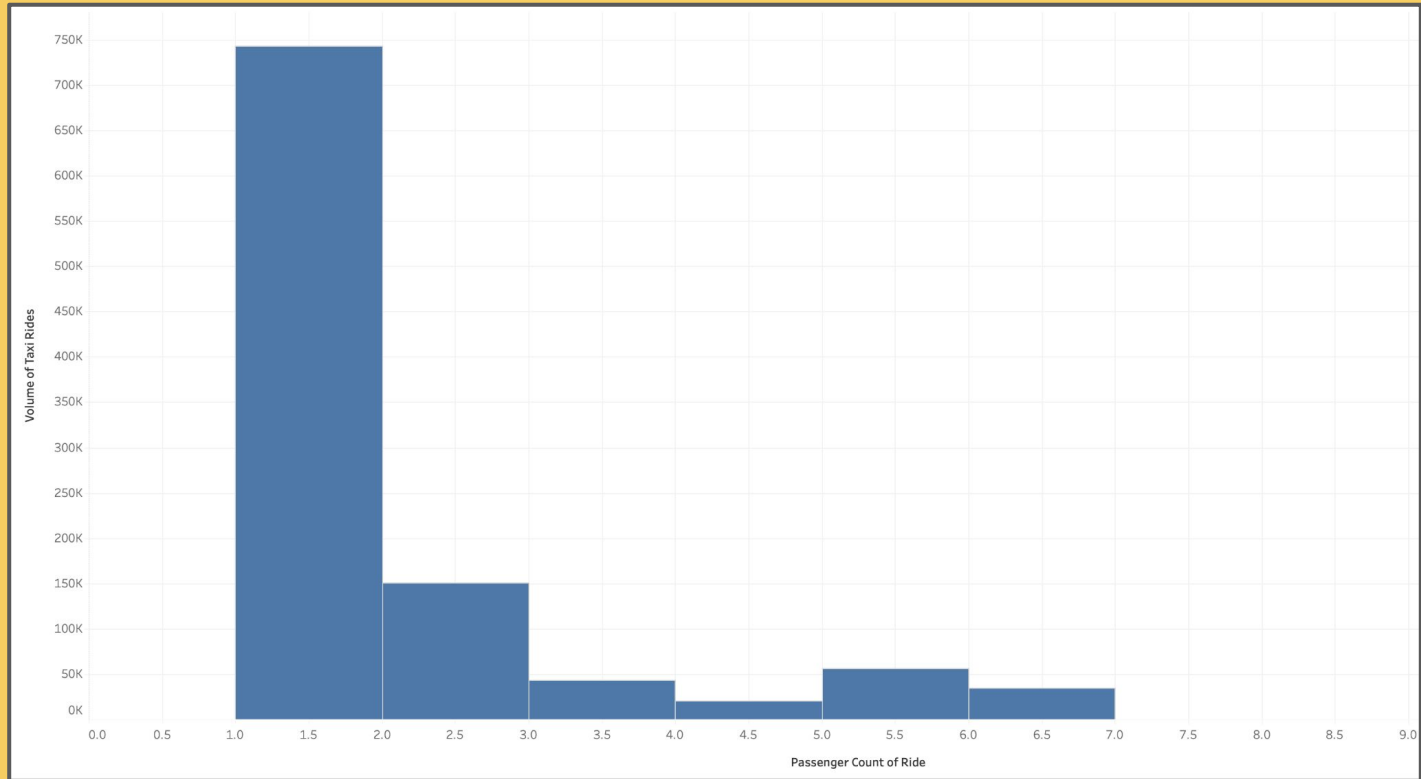
High density of pick-ups:
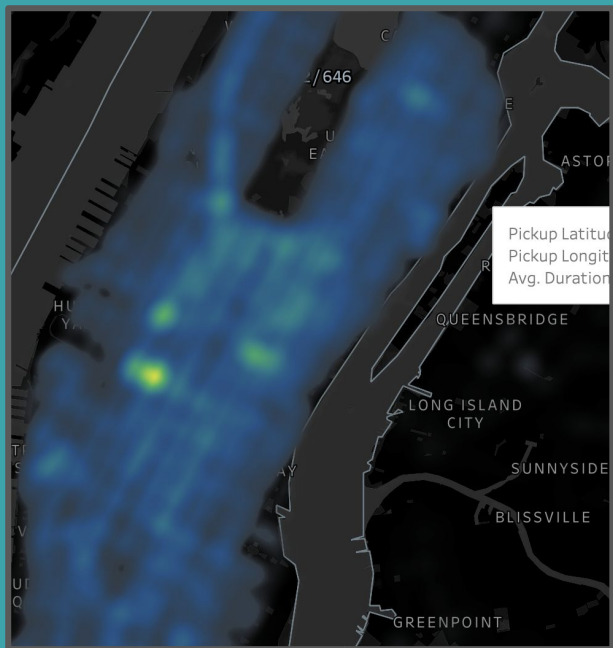
Chelsea, Theater District, Midtown, Yorkville
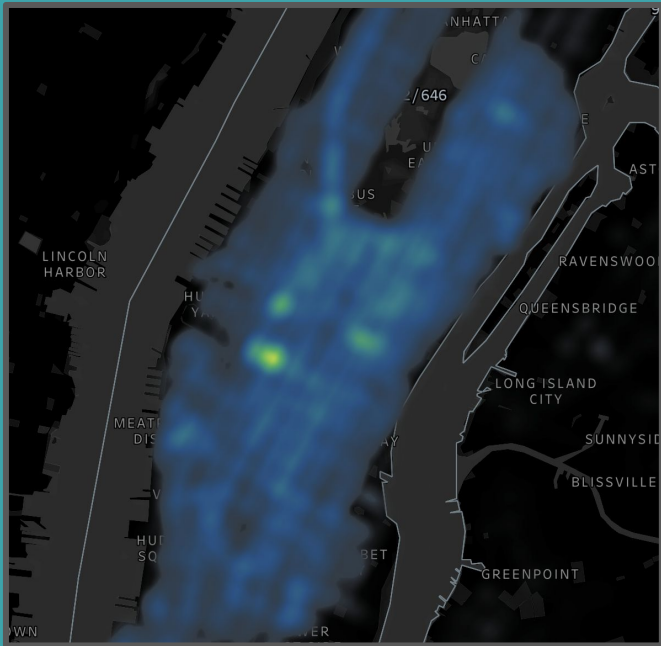
High density of drop-offs:

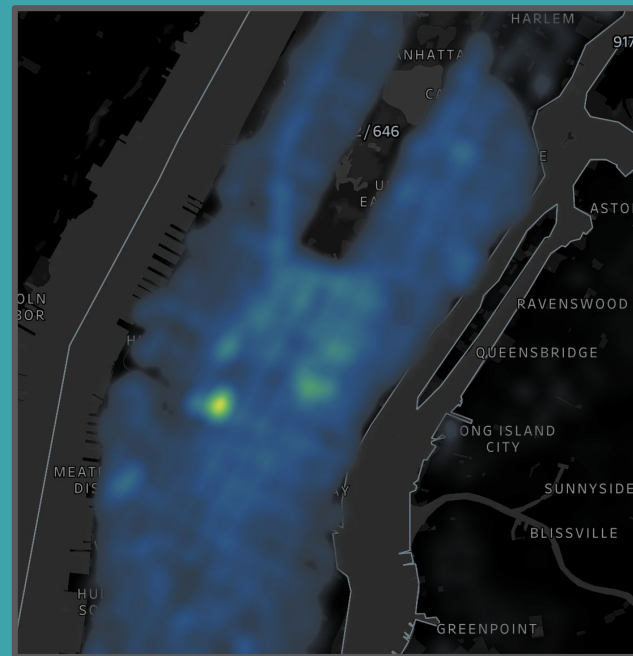**Chelsea, Theater District, Midtown , Upper East Side, Yorkville**

High duration-to-distance ratios: pick-ups

Chelsea, Theater District, Midtown, Yorkville

High duration-to-distance ratios: drop-offs

Chelsea, Theater District, Midtown, Yorkville

Neighborhoods optimal for flying taxi pick-up / drop-off:

1. **Chelsea**
2. **Theater District**
3. **Midtown**
4. **Upper East Side**
5. **Yorkville**

High demand for pick-up / drop-off

+

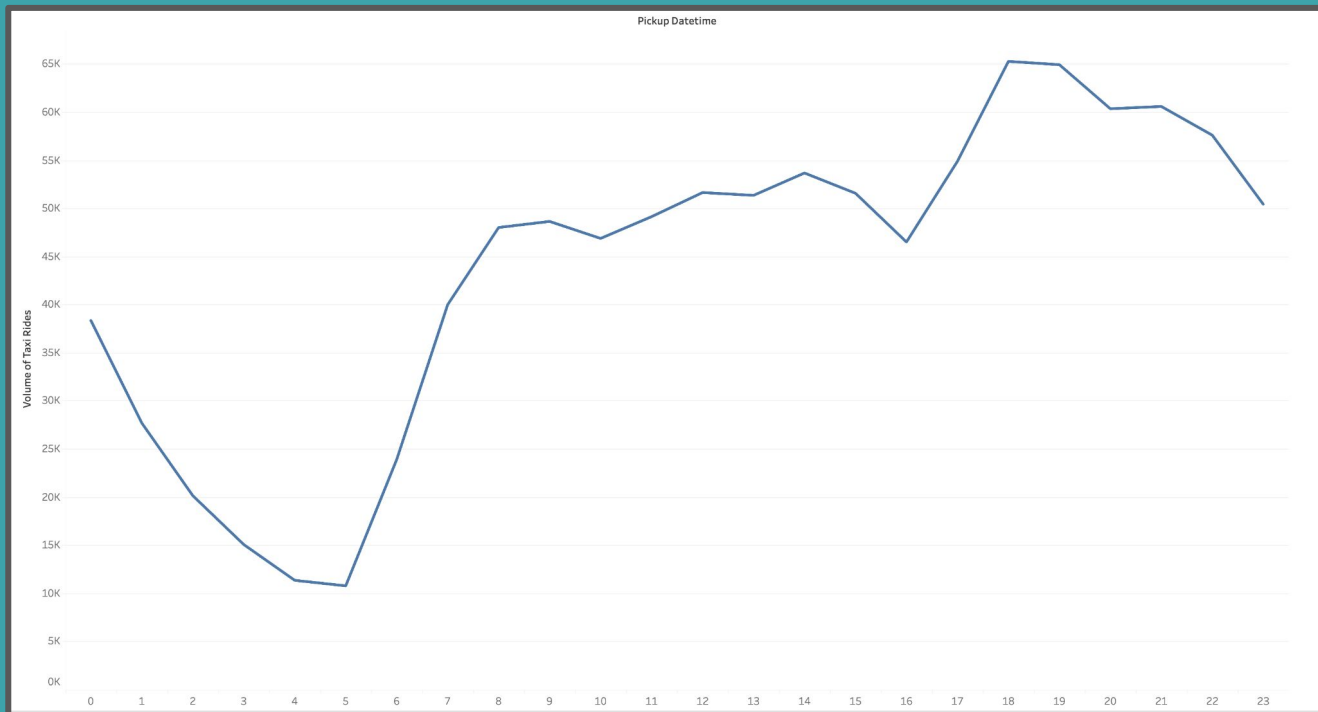High duration travel time over short distances

=

Strong use case for flying taxis

Volume of ride pick-ups by time of day
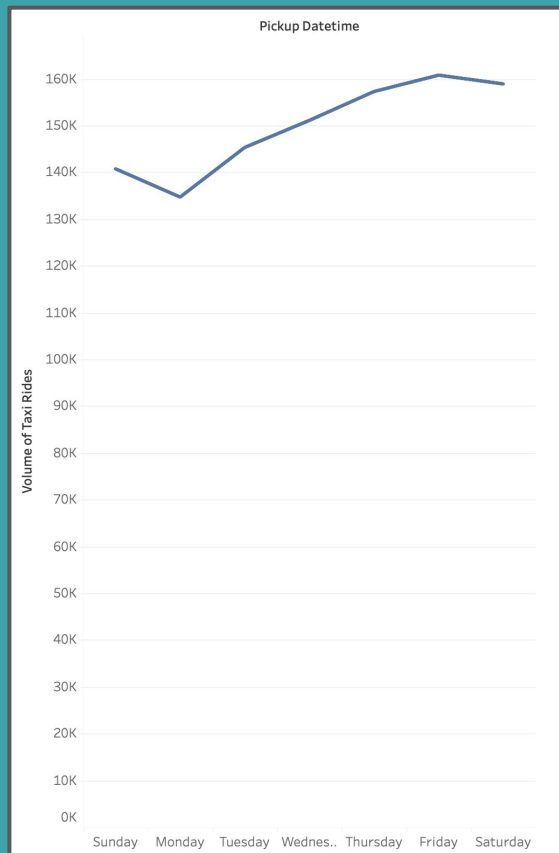
6:00 am - 8:00 am

8:00 am - 4:00 pm

4:00 pm - 11:00 pm

11:00 pm - 12:00 am

Pickup Datetime

Volume of Taxi Rides

Volumes of ride pick-ups by day of week

1. **Wednesday**

2. **Thursday**

3. **Friday**

4. **Saturday**

Pickup Datetime

Volume of Taxi Rides

Volume of ride pick-ups by time of year
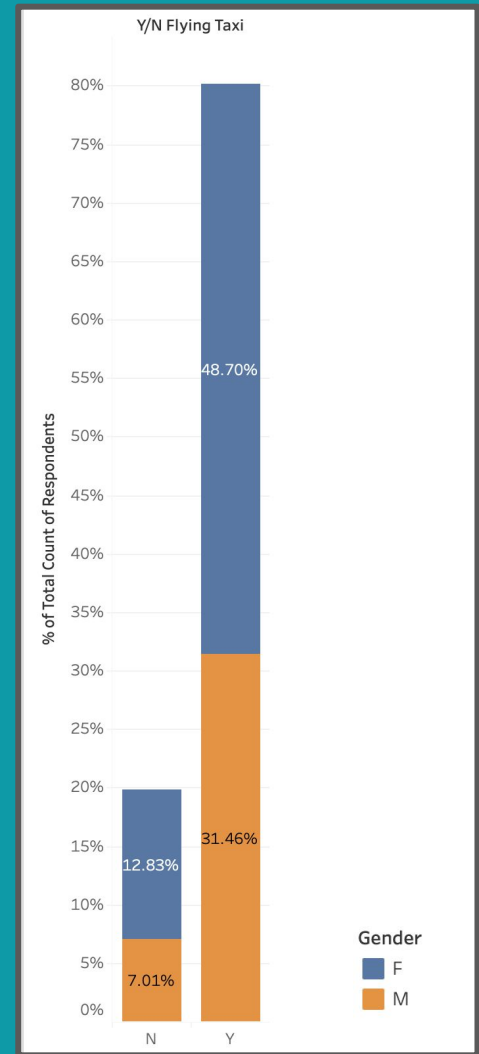
Peak = March to June
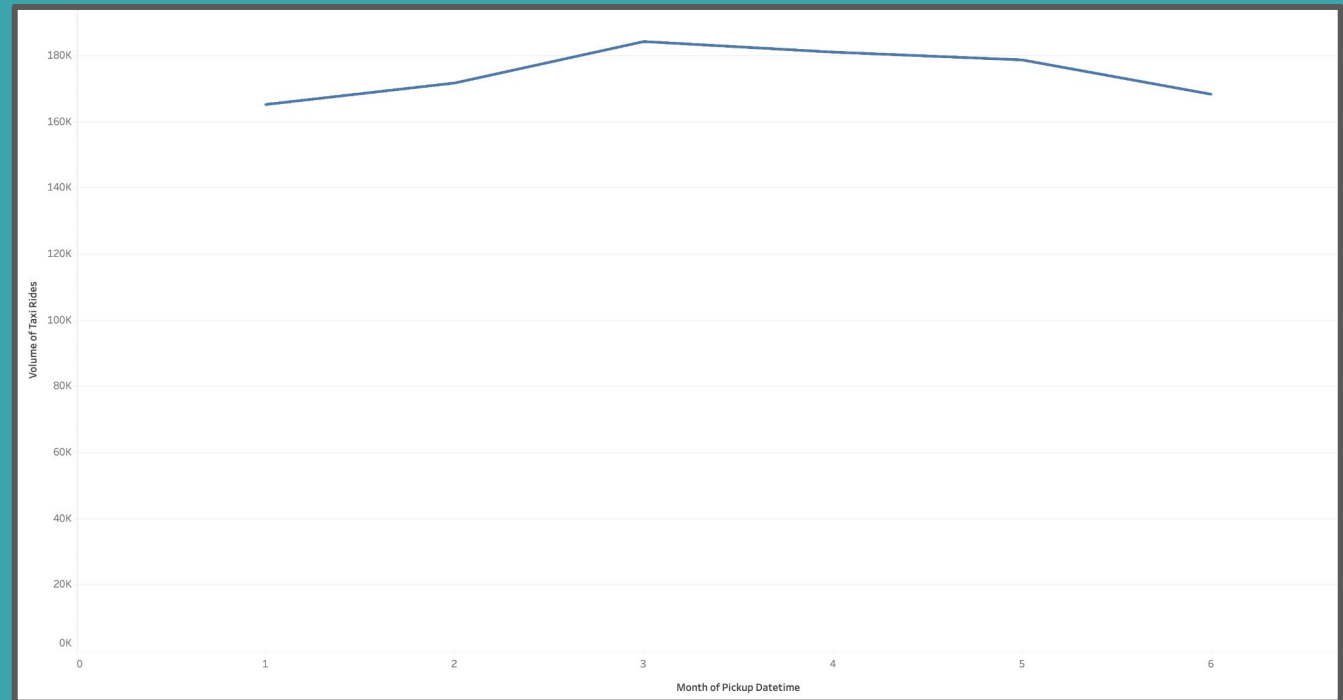
Inclination of Flyber adoption based on gender

Female > Male

Yes >> No

Inclination of Flyber adoption based on age

20 yrs to 70 yrs

Yes >>> No
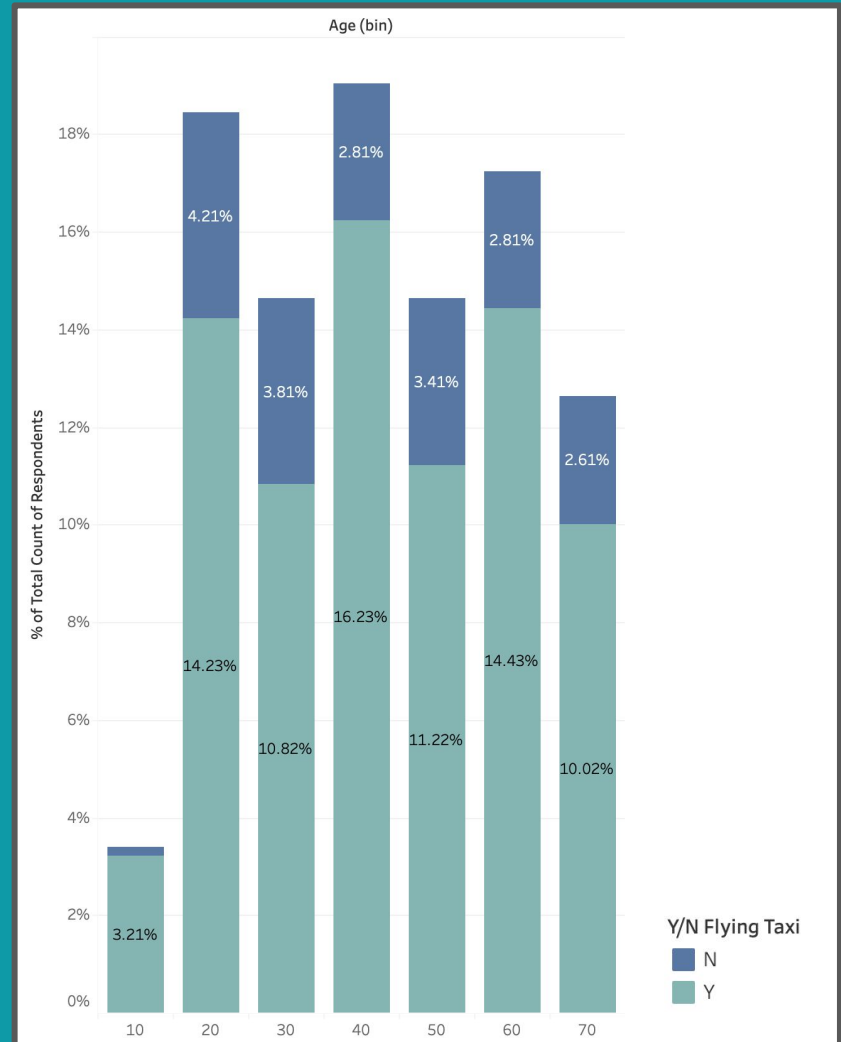
Inclination of Flyber adoption based on income level

Y/N Flying Taxi	Annual Income					
	> $200,000	$0 - $20,000	$20,001 - $40,000	$40,001 - $80,000	$80,000 - $120,000	$120,000 - $200,0..
N	3.01%	1.00%	2.61%	5.61%	4.81%	2.81%
Y	8.42%	4.01%	10.62%	21.24%	18.84%	17.03%

Inclination of Flyber adoption based on neighborhood of residence

1. Midtown
2. Battery Park City
3. Financial District
4. Tribeca
5. Tudor City
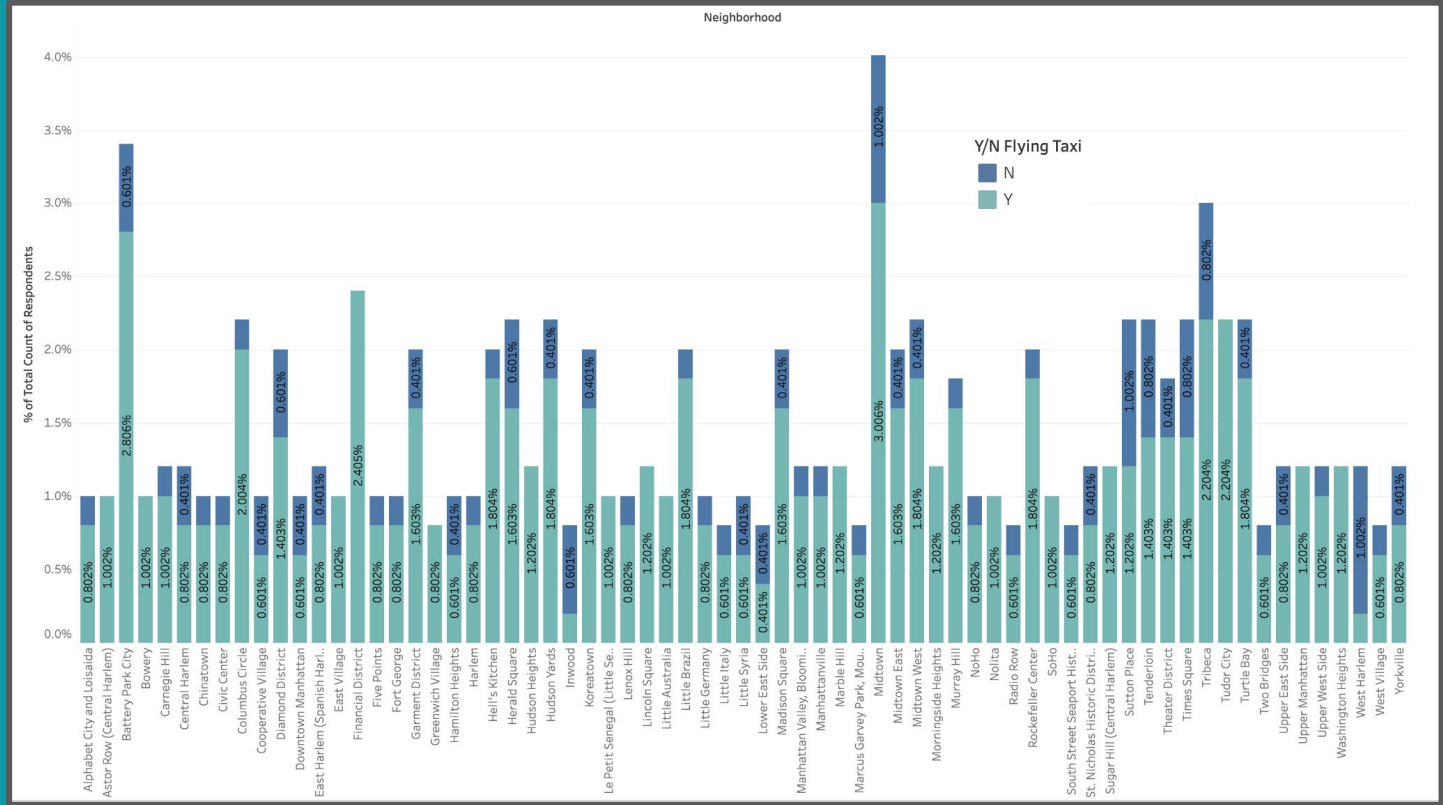
Distribution of potential price per mile based on gender

F	23.2881
M	23.0127

Distribution of potential price per mile based on age
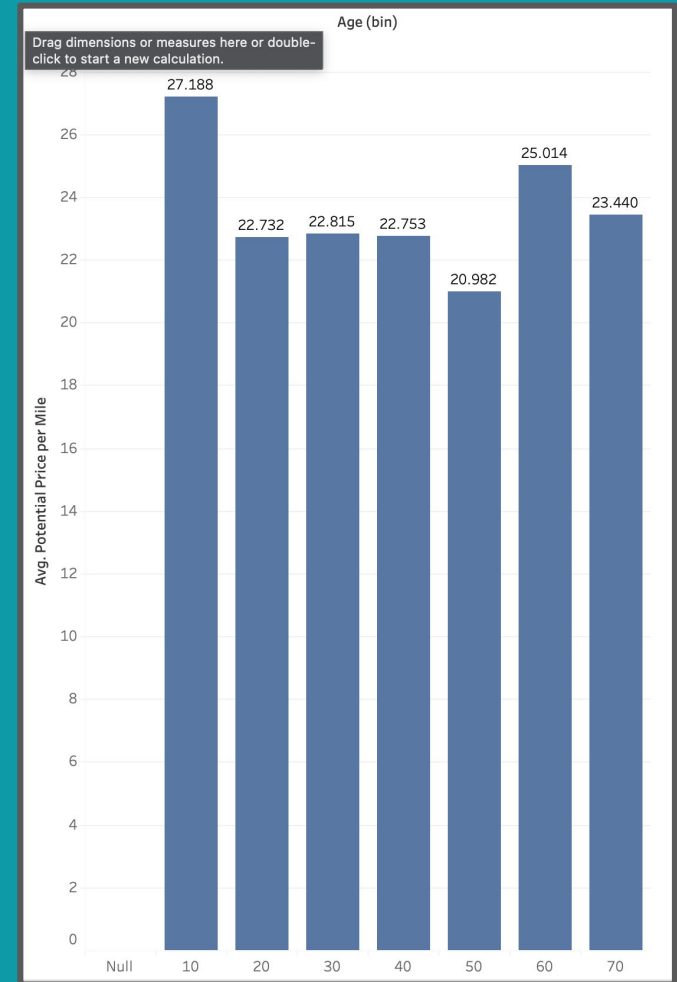
Distribution of potential price per mile based on income level
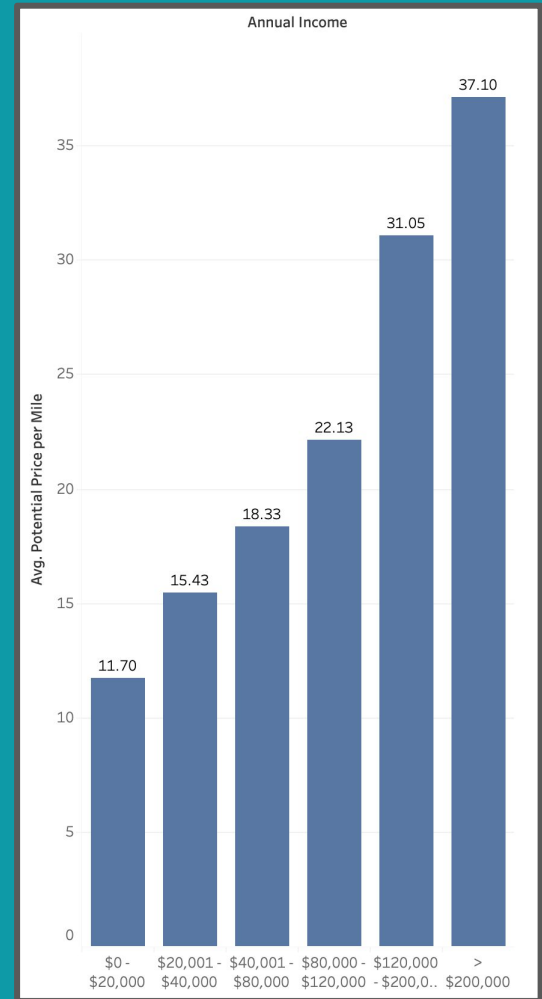
Distribution of potential price per mile based on neighborhood
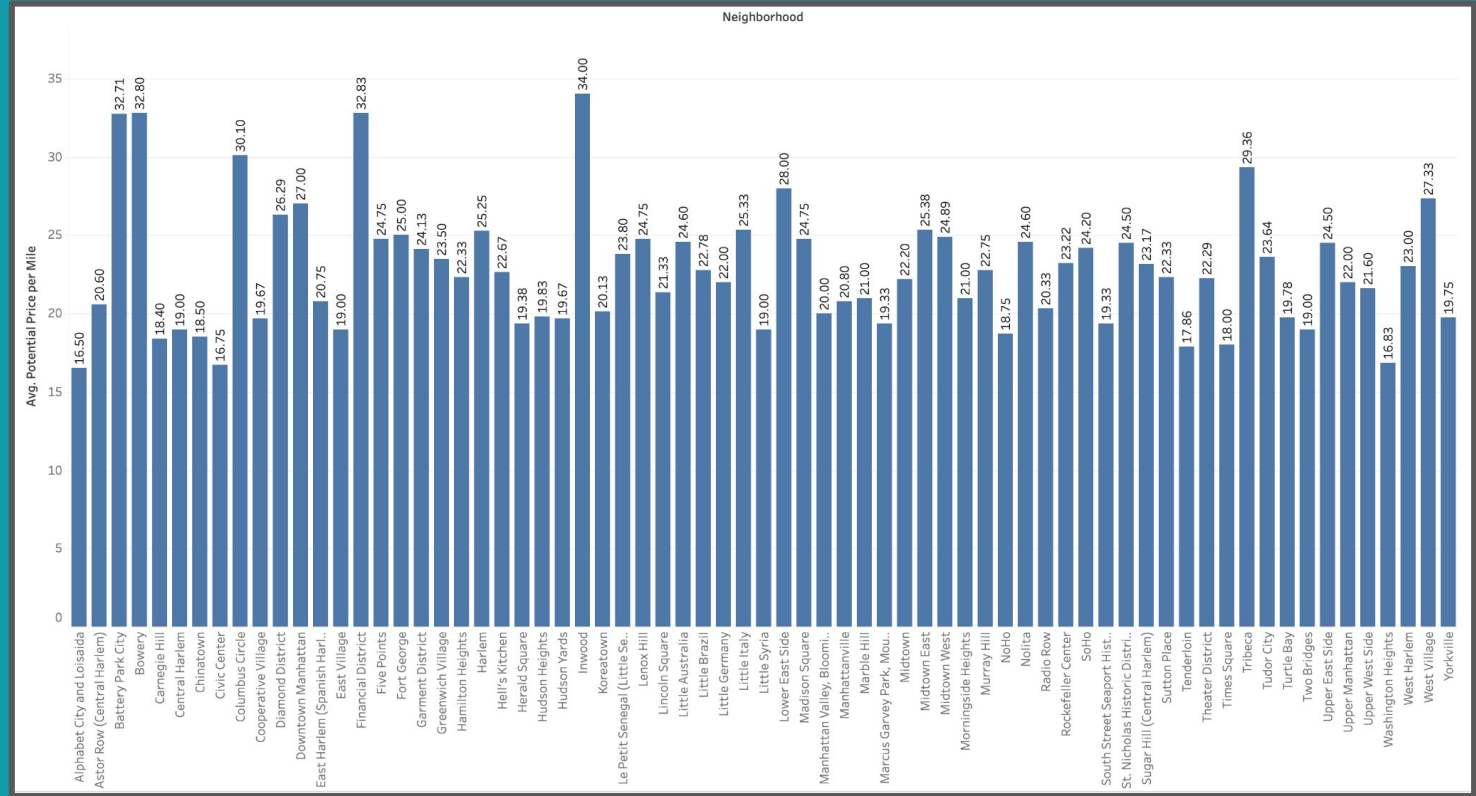
Personas/segments of negative sentiment towards not using a flying taxi car

Concerned for safety	Distrust of pilot
Budget conscious	Satisfied with commute

Section 2: Proposal Synthesis

Identify a product objective for Flyber's launch. Your product objective will guide your KPIs, so identify what Flyber should optimize for. Your objective should be centered around one the following focus areas:

- User Acquisition
- User Engagement
- User Retention
- Profitability

Explain your reasoning. Include both why you feel your focus area is more relevant than the others for Flyber at this time of the product development cycle.

Vision

To bring time-strapped city residents a flying taxi service that connects them between short distances slogged by heavy traffic.

Objective

Provide a low-friction onboarding process for pilots to signup, get approved, and learn standards, procedures, and behavior that ensure all trips provide a safe, reliable, and exceptional experience to passengers.

Justification

Flyber should initially focus on activating new pilots on its platform, since healthy supply is a precursor to driving demand (passengers) in a two-sided marketplace.

Prospective passengers will be uninterested in Flyber's flying car service if its platform cannot reliably satisfy passenger trip requests.

Key Result 1: The average completion time for onboarding from signup to flying to be under 3 months[1]

Key Result 2: The number of pilot approvals encompassing background check, pilot license verification, and ID verification to be >= 90%

Key Result 3: The average accident rate per 1000 trips <= 0.5%[2]

Key Result 4: The average pilot NPS to be above 75

Key Result 5: The average passenger NPS to be above 75

[1]By comparison, Ryanair requires pilots complete a 3-month training period prior to flying a particular aircraft.
[2]By comparison, road accidents amounted to 4.27% of all cars in operation in the U.S.

KPI 1: Average Onboarding Completion Time Per Month

KPI 2: Monthly Pilot Approvals / Monthly Pilot Signups

KPI 3: Daily Reported Accidents / Total Daily Trips

KPI 4: Average Pilot NPS Post-Onboarding

KPI 5: Average Passenger NPS Post-Trip

Times and days of operation run[1]: Friday and Saturday between 4-11 pm.

Number of pick-up / drop-off nodes[1]: 5

Location of pick-up / drop-off nodes[1]: Chelsea, Theater District, Midtown, Upper East Side, Yorkville

Copters vs. homegrown hardware: Flyber should adopt the use of homegrown hardware in its MVP to avoid costly upfront CapEx before validation of product-market fit.

Pricing strategy

❖ Initial pricing should be fixed until sufficient data has been collected to allow for implementation of a dynamic pricing model. Pricing should be set to optimize for growth not revenue.

❖ On average, taxi customers travel 3.4 miles in the New York Metropolitan Area and pay $2.50/mi + $5 (base fare + misc. fees), which amounts to an average $13.50 per trip.

❖ Flyber could reasonably charge $5.00/mi + $10 (base fare + misc. fees) which amounts to an average $27 per trip, or twice the average NYC taxi fare. The price premium seems reasonable for a cost-intensive new service offering its customers significant time savings and convenience benefits.

A/B test sample size calculator

Powered by Intelligence Cloud's stats engine

Baseline Conversion Rate

45 ⇕ %

Your control group's expected conversion rate. [?]

Minimum Detectable Effect

20 ⇕ %

The minimum relative change in conversion rate you would like to be able to detect. [?]

Statistical Significance

95%

Edit

95% is an accepted standard for statistical significance, although Optimizely allows you to set your own threshold for significance based on your risk tolerance. [?]

Sample Size per Variation

250

Baseline conversion rate of 45% based on average onboarding completion rate for guides up to 8 steps based on Pendo research.

Calculating A/B Test Duration

Sample size per variation	250
x	x
Number of variations	2
=	=
Number of beta pilots needed	500
Number of beta pilots needed	500
x	x
Beta pilots acquired per day	10
=	=
Length of experiment	**50 days**

Instrumentation plan

- **Objective**: Provide a low-friction onboarding process for pilots to signup, get approved, and learn standards, procedures, and behavior that ensure all trips provide a safe, reliable, and exceptional experience to passengers.

  - **Key Result 1**: The average completion time of onboarding from signup to be under 3 months.

    - **KPI 1**: Average Onboarding Completion Time Per Month

      - **Event**: onboardingCompleted

Instrumentation plan

- **Key Result 2**: The number of pilot approvals encompassing background check, pilot license verification, and driver's license verification to be >= 90%

  - **KPI 2**: Monthly Pilot Approvals / Monthly Pilot Signups

    - **Event**: signupCompleted

    - **Event**: backgroundcheckPassed

    - **Event**: pilotVerified

    - **Event**: driverVerified

Instrumentation plan

- **Key Result 3**: The average accident rate per 100 trips <= 0.013%

  - **KPI 3**: Daily Reported Accidents / Total Daily Trips
    - **Event**: tripCompleted
    - **Event**: accidentReported

Instrumentation plan

- **Key Result 4**: The average pilot NPS to be above 75

  - **KPI 4**: Average Pilot NPS Post-Onboarding
    - **Event**: pilotnpsSubmitted

- **Key Result 5**: The average passenger NPS to be above 75

  - **KPI 5**: Average Passenger NPS Post-Trip
    - Event: passengernpsSubmitted

Flyber qualitative feedback survey

1. **How likely is it that you would recommend Flyber to a friend or colleague?**

2. **Overall, how satisfied or dissatisfied were you with your trip today?**

3. **Which of the following words would you use to describe our platform?**
   Reliable   High quality   Useful   Unique   Good value for money
   Overpriced   Impractical   Ineffective   Poor quality   Unreliable

4. **How well did Flyber meet your needs?**
   Extremely well   Very well   Somewhat well   Not so well   Not very well

5. **How would you rate the quality of your trip?**
   Very high quality   High quality   Neither high nor low quality   Low quality   Very low quality

6. **How would you rate the value for money of Flyber?**
   Excellent   Above average   Average   Below average   Poor

7. **How likely are you to book a trip with Flyber again?**
   Extremely likely   Very likely   Somewhat likely   Not so likely   Not at all likely

8. **Do you have any other comments, questions, or concerns?**

Summarize everything you have learned into your final proposal
- Identify the target population. Why did you select that target population? What are their pain points?
- Create a product proposal containing claim, evidence, estimated impact, and risks
- Claims should be backed by quantitative evidence, impact should assess market needs/benefits
- Risks involve any known unknowns that we'll still need to monitor post-launch
- State cross-functional stakeholder teams that will need to be involved

Product proposal

- Identify the target population. Why did you select that target population? What are their pain points?
- Create a product proposal containing claim, evidence, estimated impact, and risks
- Claims should be backed by quantitative evidence, impact should assess market needs/benefits
- Risks involve any known unknowns that we'll still need to monitor post-launch
- State cross-functional stakeholder teams that will need to be involved

Pain points - What are the existing issues and/or pain points that they are facing?

Target users - Who are the users that you are targeting to service/build products for?

User impact - What is the potential impact of these proposed solutions to solve the users' pain?

Market impact - How do the proposed solutions fit in with the existing solutions in the market? How do you expect the proposed solutions to shift or alter the market?

Business impact - What is the potential impact of these proposed solutions to the bottom line in terms of revenue, user acquisition, & user retention?

Solutions - What are some of the proposed solutions to alleviate or solve the pain points we called out. This includes the high-level features you'll be building. Also, do be sure to call out what features we will not be building.

Risks & assumptions - What are the known risks & assumptions we are taking with the proposed solution? And what should we do to mitigate the risks, or test the assumptions?

Rollout & launch strategy - This key point may have limited information based on what stage of product development during your time of presentation. What is the rollout strategy in regards to launching this service or product? Will we have an Alpha, Beta, or EAP (Early Access Program), and what features are we planning to have in them

Pain Points

Existing pilots and enterprising rideshare/taxi drivers want monetary side hustles that maximize return on time and allow them to participate in the next evolution of the flying car gig economy.

Target Users

Aspiring flying car pilots who are passionate about passenger transportation, safety, customer service, and continual skill growth and development.

User Impact

Providing flying car pilots (and potentially rideshare drivers) a monetary side hustle that allows them to be among top earners in the gig economy.

Providing passengers the ability to commute short distances in road-congested NYC areas through a time-efficient, on-demand, cost-viable, air-based transportation service.

Market Impact

- **Supplement/complement to traditional taxi and rideshare services**
- **Less burden on the physical infrastructure of inner-city roadways**
- **Less strain on mobility passengers by reducing short-distance travel time in high-traffic NYC areas**

Business Impact

- **Validation of product-market fit for a new, category-defining service**

Solution

A safe and reliable flying car marketplace connecting passengers in need of transportation within specific high-traffic NYC areas with vetted and trained flying car pilots for fast commutes over short distances.

Risks & Assumptions

Safety
- Extensive vehicle testing, certification, and maintenance procedures
- Emergency abort maneuvers, systems, and processes, including for vehicle engine failure

Pilot Training
- In-app onboarding and training management
- In-person orientation and training
- Rigorous Flyber certification process, which includes flying car pilot's test co-developed with regulatory bodies, including the FAA and NYC DOT

Government Compliance
- FAA & NYC Department of Transportation legal coordination, permits/licensure, agency-level discussions and policy proposals

Cross-Functional Team Communication

- **Legal/Compliance**
- **Operations**
- **Product, Data, and Engineering**
- **Executive Management**
- **Government and Public Policy**
- **Customer Success**
- **Marketing**

Rollout & Launch Strategy

- **MVP-marketplace platform with acquired helicopter fleet supply**
- **Experiments on each iteration with a batch of early-adopter pilots with higher base fare and bonus payments**