Hello everyone. We are Team 5, made up of Mohamed Elghetany, Jherson Fuentes, and myself, Ryan Wong. And we are eager to discuss a bold new strategy for expanding Acme Gourmet Meal's business.

Introduction

Objective:

Expanding Business Reach Most Effectively

Problem:

Traditional Expansion Expensive

Established Delivery Ineffective

There's no question that AGM would benefit from expanding into new markets and new customers, but that is a troublesome proposition.

AGM has traditionally expanded by introducing new store locations in new cities such as Berkeley, Dallas, and Miami. However, this can be an inflexible and prohibitively expensive proposition, especially in the areas where our target customers live.

The option for incorporating traditional delivery into our existing stores exists. But after analyzing our customer data and traditional delivery options, we realized that this would not be an effective way of expanding our customer base, as this would lead to cannibalizing that store's existing customers at significant cost.

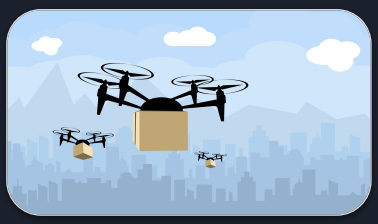
New Expansion Paradigm

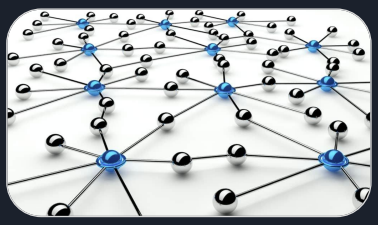
Requirements:

- **Maximize Customer Reach**
- **Minimize Cost**
- **Located in San Francisco Bay Area**

Solution:

- **BART Station Utilization**
- **Low Footprint Expansion Location**
- **Autonomous Delivery Systems**



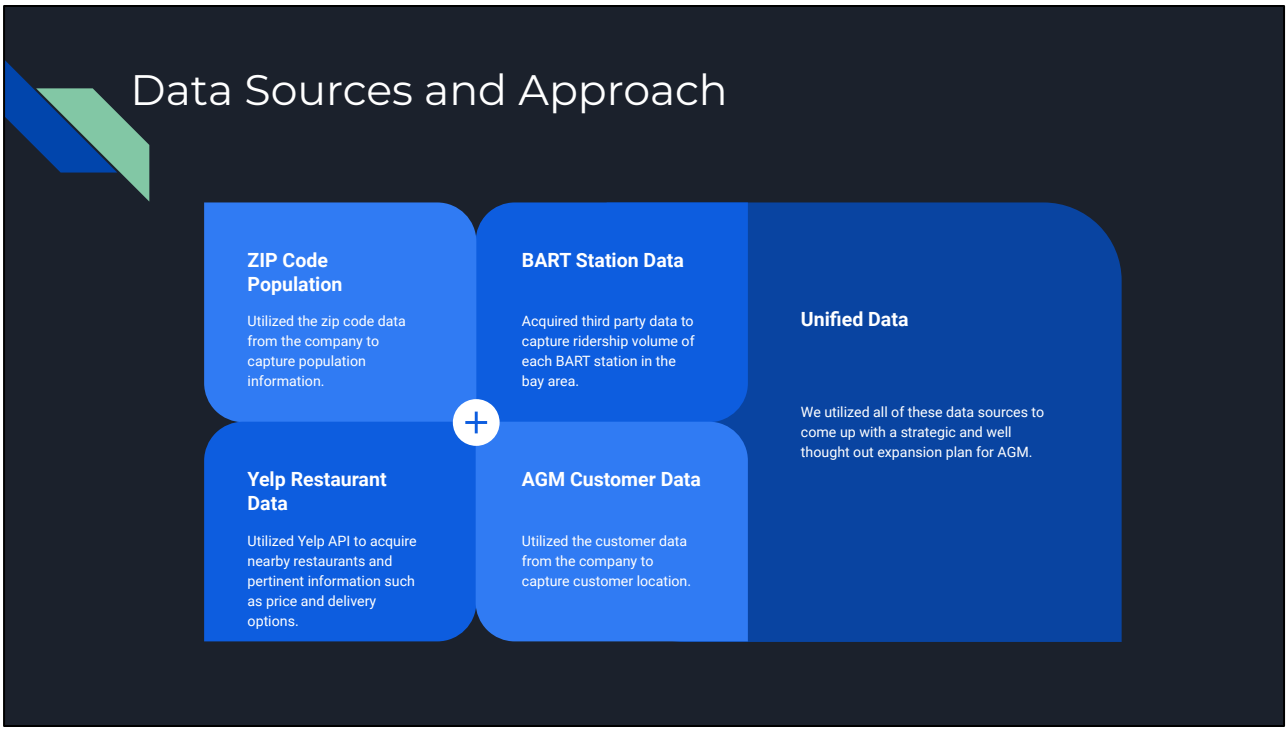


With leadership's requirements that we remain located in the high-density but very costly San Francisco Bay Area, the goals of maximizing customer reach and minimizing costs were simply not feasible with the traditional methods of expansion.

As such, we realized that the optimal solution lies with a pioneering new paradigm: low footprint locations supporting an autonomous delivery network.

Under this paradigm, we can leverage the existing public transit system- namely BART Stations- as operational hubs, from which we will then use autonomous delivery systems to expand cheaply and easily. Rather than having a single group of customers coming to us for meals when convenient, we can instead deliver to many groups of customers on demand.

Supporting this new initiative is a wealth of new and existing data that can be leveraged with SQL databases, Neo4J graphs, MongoDB documents, and Redis stores. This has allowed us to determine the best locations to expand to, the best autonomous delivery method to use, and the best strategy for AGM's expansion.

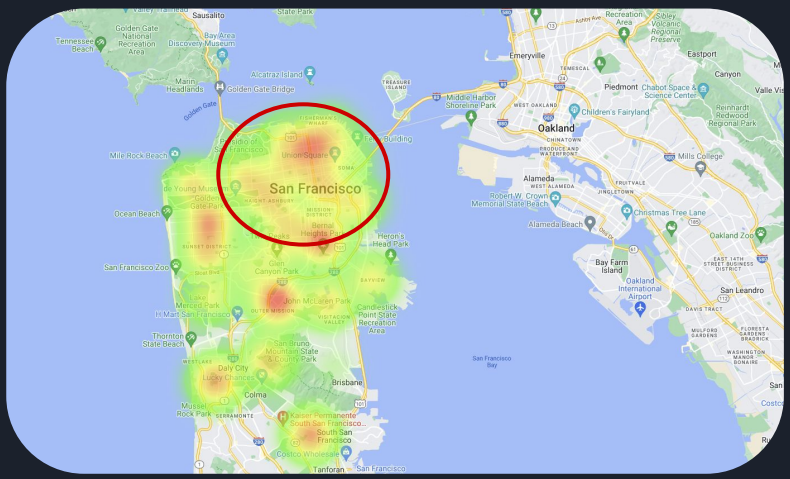


Approach:
In order to come up with the best approach to expanding our business we carefully chose to focus our research on Bay area population, Bart Station ridership, restaurants in a given area, and lastly where do our current customers currently reside.

Ridership is a calculation offered by BART which is the number of people who utilize the transit service on a monthly basis.

- Ridership data by BART https://www.bart.gov/about/reports/ridership
- Ridership data Wikipedia page https://en.wikipedia.org/wiki/List_of_Bay_Area_Rapid_Transit_stations

ZIP Code Population



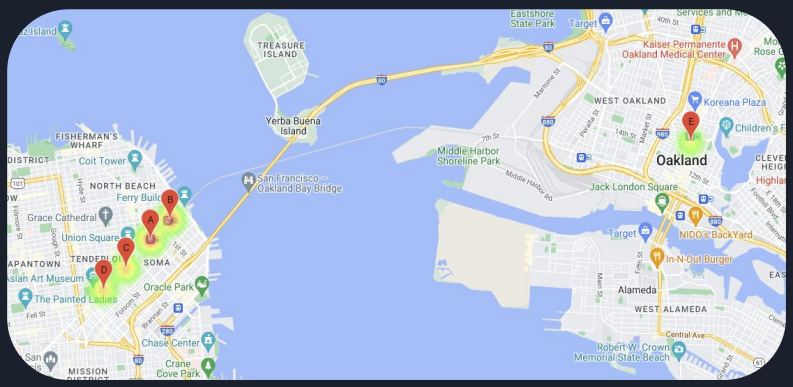
Heatmap of total population

To find area of highest population density

~900k

BART Station Data

Ids	Station	Ridership
A	Montgomery Street	42,494
B	Embarcadero	40,258
C	Powell Street	27,392
D	Civic Center	25,028
E	19th Street	14,267



Ridership

We knew that we wanted to station ourselves out of/nearby a BART Station

Look to maximize ridership for possible pickup location

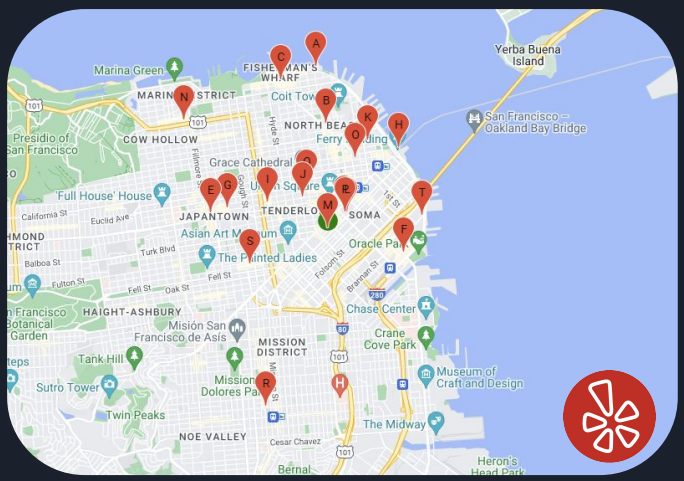
The last three stations have less than 30k in ridership

AGM Customer Data

We also wanted to chose Bart stations that are close to our existing customers so we can provide them with a new convenient ways to get their meals. To do so we looked at our AGM's customers table to know where our existing customers are located

As we can see, most of our customers are within the up right corner (Red circle)

YELP Data



The last dataset we included in our analysis is Yelp Restaurants Data. We wanted to see

- Which stations have the highest number of restaurants around it, because we think that Customers who eat out more are most likely will benefit from our new BART Pickup or delivery
- Get an idea on who would be our competitors around the Selected Bart stations.

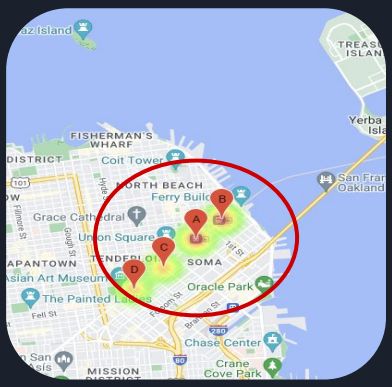
So we used Yelp API to view the restaurant's data within 5 miles radius from the Bart Stations

Chosen Location

Montgomery Station

1st in Ridership
~42K

7th in Population
~900K



Better Coverage

Foodie,100% delivery
20 in 5 miles

Valued Customers
1400

*A: *Montgomery* B: *Embarcadero* C: *Powell Street* D: *Civic Center*

Based on the 4 data sources we discussed, we chose ‘Montgomery BART station’ because

- It is 1st in Ridership with almost 42K passenger a month
- It is 7th in Population (within 5 miles) with 900K people
- It has 20 top rated restaurants around it, with 100% delivery option
- 1400 of our existing customers live within 5 miles of Montgomery
- Last, it covers other stations (Embarcadero, Powell Street, Civic Center)

Meal Delivery Methods

Penguin COFRIDGE CF_24
Pickup Station

Kiwibot 4.0
Delivery Robot

MatterNet M2
Delivery Drone

With the ideal location determined, we now had to decide upon a delivery method to use at that location. Because of their cheap, flexible, and scalable nature, autonomous delivery systems are the ideal fit. We explored three options of interest: self-service pick-up lockers, robotic delivery systems, and drone delivery systems. Pictured here are examples of the most prominent and successful options for each delivery method that we would utilize.

Meal Delivery Specifications

	BART Station Pickup	Delivery Robot	Delivery Drone
Effective Range	1 Mile + BART Riders	4 Miles	6 Miles
New Customers [1]	664	1048	1759
Associated Costs	$500,000 for Locker $600,000 Rent per year	$4.00 per Delivery	$0.88 per Delivery $7,500 per Drone
Currently Available	YES	PENDING SF Regulations	PENDING SF Regulations Technical Improvements

[1] Estimated based on Montgomery Station Location

For comparison, here's a quick overview of each meal delivery method.

The first option would be a refrigerated locker system that would be positioned in BART stations that would service BART riders and the local population. We would have to purchase the locker system itself and pay rent, but can deploy immediately.

The second option is a ground-based delivery robot, using the Kiwibot delivery service to delivery meals to customers. The technology and the customers are there, but the biggest hurdle would be legal restrictions in San Francisco relating to autonomous delivery robots.

The third option is an aerial delivery drone, using our own fleet of Matternet M2 drones to deliver meals to customers. Drones offer improved range and speeds compared to robots, but the technology is relatively new and is not widely used yet. Technical improvements and San Francisco regulations hamper immediate deployment.

Meal Delivery Comparisons

	BART Pickup	Robot	Drone
Predicted Revenues	$2,047,668	$3,227,001	$5,416,312
Predicted Expenses	$700,000	$201,216	$78,050
Predicted Profits	**$1,347,668**	**$3,025,785**	**$5,338,262**
Ready for Immediate Use?	**YES**	**NO** *Est. 1-4 More Years*	**NO** *Est. 5+ More Years*

* Assumptions and calculations are available in the report.

Now for the most important slide: how much money are we talking about here.

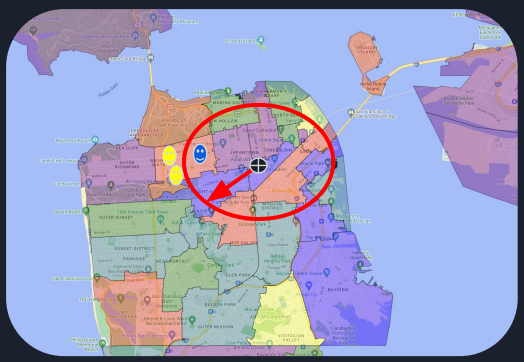
The good news is that, based on all of the assumptions and data we have gathered thus far, all of these delivery methods promise to be quite profitable. As can be seen, simply rolling out a single pickup station in the Montgomery Street BART station will net approximately $1.3 million of profit. Even if you think our new customer model was too optimistic, so long as we get at least one-third of the customers modelled, we are still breaking even on all counts.

The bad news is that, as hopeful as Robot and Drone delivery methods are, they are not available for immediate use due to the aforementioned regulatory and technical hurdles. Given current industry trends, we estimate that both methods will be viable in the next 1-5+ years. BART stations, though? We can roll those out right now.

Limitations and Concerns

Location Limitation
- Population data limitation
- AGM's customer location limitation

Based on Berkeley Store
- New Customer Conversion Data
- Customer Order Frequency, Size Assumptions



Zip code location limitation

We have two types of limitation that we ran into during our research that we would like to highlight

First is what we call, Location based limitation
Second is Based on Berkeley Limitation

For the **Location based limitation**

Both our population calculation and AGM existing Customer population calculation is based on Zip code, which means in order to calculate the population within X miles, we sum the entire population for each zip code within the X miles range, that would result in including customers who are outside the desired X miles but within the zip code.

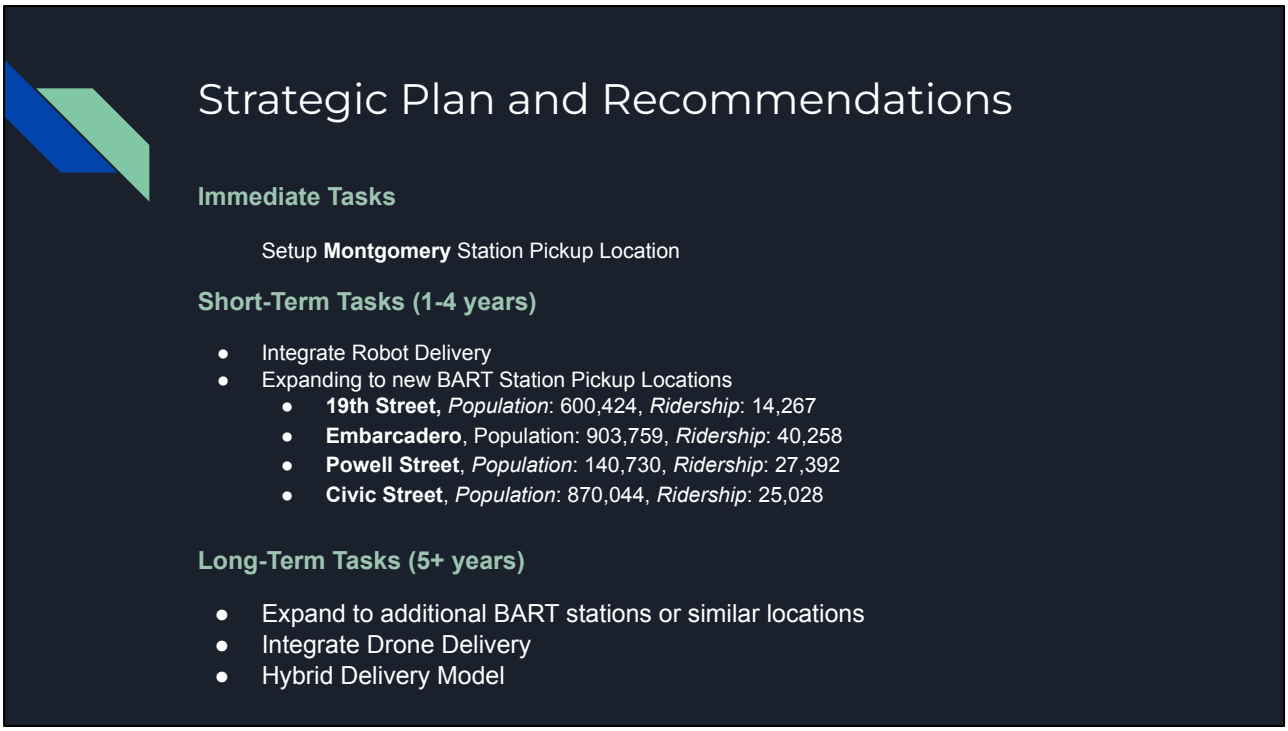
To quickly clarify that, from the picture in the slide, let's assume that we want to get the population within 5 miles of the black dot. We will endup summing all the population for each zip code that intersect with the red circle. So we will endup including the two yellow customers in our calculation, however they live outside the 5 miles range (the red circle).

> To get around this limitation, we will need a more precise customer location data.

For the **Based on Berkeley Limitation** :
We use berkeley Store as a baseline in 2 occasions

First for the New Customer Conversion:
In order to estimate how many new customers we would gain, we used the rate at which Berkeley store gained new customers as a baseline, then applied that baseline to the new delivery methods. However, the rate at which the store gains new customers may differ from the rate at which pickup locations and delivery gains new customers.

Second occasion we used Berkeley as a baseline is with Customer Order Frequency:
We used customer's order frequency and order size from the Berkeley store as a baseline to estimate the frequency and size of the orders for pickups and delivery options. However, that may not be the case, as delivery orders may differ in size and frequency; for example: a customer who orders 100 meals from berkeley store, won't be able to do that using delivery. Further research is needed around this area.



Immediate Tasks

- Our recommendation is to setup the Montgomery Street BART Station.
- Based on our research, it is within the highest populated region in the entire Bay area, has the largest BART riderships, and we believe the area is close to a lot of foodies that would want to try new products.

Short-Term Tasks 1-5 years

1-3 years:

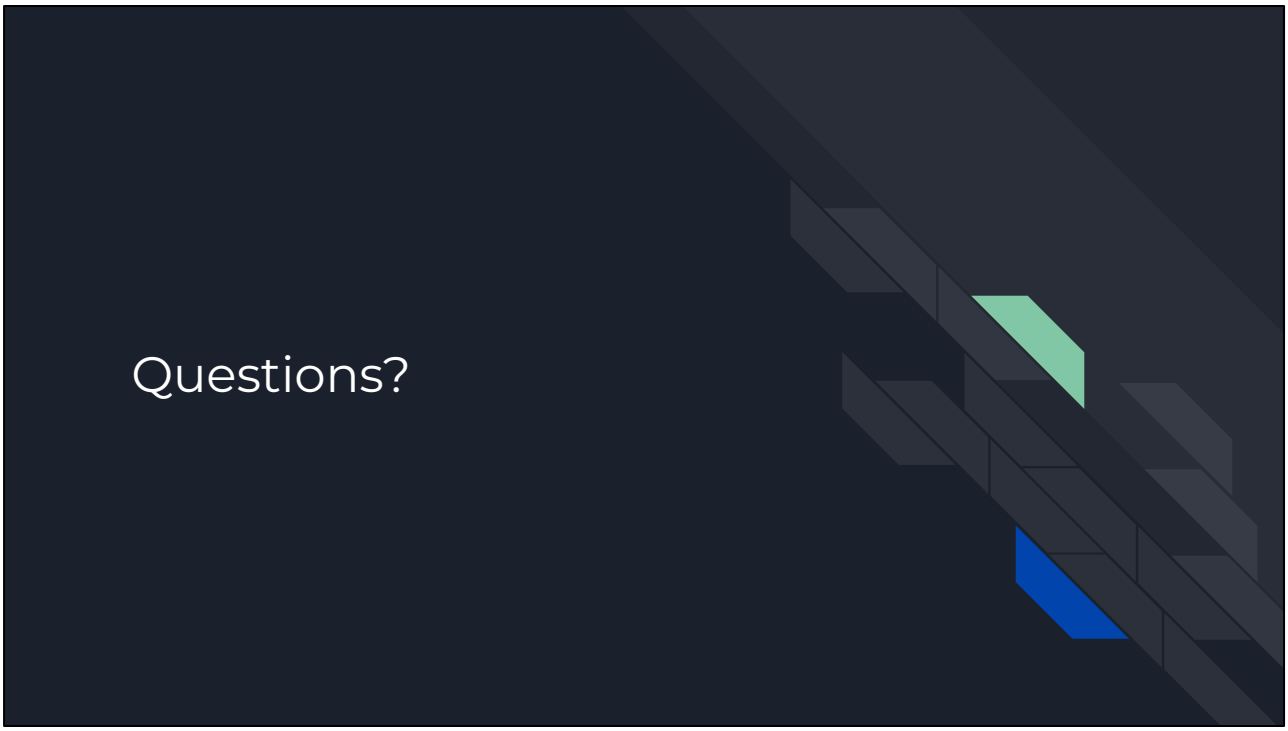
- Our next steps would be to utilize the success we see in our Montgomery pick up lockers and expand the same business model to 4 other BART Stations which are the Embarcadero Station, Powell Street, Civic Center, and 19th st.
- These BART stations were also selected because they have some of the highests ridership figures and are around very high populated areas

3-5 years:

- Around the 3-5 year mark our plan is to star implementing the use of Delivery Robots because as stated in our previous slides, delivery robots are a great way for us to dive into the delivery market with a low expense option that allows us as a company to expand at our own pace.

Though current city restrictions prevent use from using robots today, we believe that San Francisco will easy its regulations within a 5 year period and at that point

- implement a similar model with a low cost of operation. We will continue to research the next location based on population and potential client base.
- Lastly we plan on integrating a drone delivery system as soon as regulations start to loosen within the bay area. This will complete our business model and we should have a full hybrid approach of pick up and delivery options.



Ryan:
Thank you for your time and attention. Are there any questions?