

Background and Motivation

The purpose of this project is to understand the current landscape of small businesses in District 4. We want to understand the current landscape of small businesses in District 4 and find features that will attract small businesses to the area while understanding the current issues small businesses face. District 4 is one of the most diverse districts and historically under-resourced in Boston, and current and previous councilors have been working on advocating for this district.

An analysis of the business environment will offer insight into the successes and shortcomings of small businesses in District 4. With this information, District 4 Councillor Brian Worrel can make informed decisions on what aspects to improve upon and focus on to most effectively support small businesses, as well as make District 4 an attractive place to locate to. Allowing small businesses to thrive can improve the community as a whole. With the growing population of chain stores, we are interested in seeing how small businesses are faring in comparison and ways for them to succeed in the community. The data used include the BPDA data, District 4 shapefile, as well as the shape files of the other districts, and data from the Certified Business Directory of certified businesses.

Based on our preliminary analysis described below, we decided to define a “small business” as businesses with fewer employees and/or less annual revenue than a regular-sized business or corporation and limited this to approximately 50 employees. (need to take a look at the annual revenue/if we can get this data). In addition, we determined that this does not include chain businesses with few employees, as chain businesses have select advantages in that the central organization assumes responsibility for the finances of its units.

Data collection and Exploration

Preliminary Analysis:

In our initial exploration of the businesses in Boston dataset, we noted that Estimated_Employment may be a relevant feature to study. Estimated_Employment is the number of employees a business has the resources for, and this may be indicative of the size of the businesses and its success. We filtered out the businesses for each district and discovered that in District 4, most businesses are in the employment range of anywhere from 2 - 10 employees with some operated by the owner only. However, we found one outlier, Fields Corner Store (located just on the border of D4 and D3) with 937 employees. This may be an inaccuracy in the dataset or this means Fields Corner Store is too large to be considered a “small business”.

In comparison with District 6, a neighboring district to some parts of District 4, District 4 lacks the middle ground employment rate that District 6 has. District 6 not only has more business in the 2-10 range, but also in the 10-30 range as well. The number of businesses in the 2-10 range is essentially doubled from D4 to D6. There is also a larger number of non-small

businesses based on the estimated_employment. There may be factors such as district size that contribute to a larger number of businesses in D6 or a larger degree of success, which we will explore in the extension project.

We looked at District 7, which has a similar demographic to District 4, and observed that District 7 also outweighs District 4 in a similar way that District 6 does. There is a healthier middle ground in District 7 of businesses with 10-30 estimated_employment, though not as drastic as District 6. The number of businesses in the 2-10 range is actually very similar to District 4, but differences are apparent/show beyond 10 employees.

The number of businesses in District 4 is 411; based on our definition of small businesses, we found that the number of small businesses in District 4 is __. This preliminary study of the estimated_employment of businesses in District 4, which is indicative of the successes and resources available of businesses in District 4, informs our goal of finding reasons for the failures and successes in District 4.

Base Project Questions:

What businesses exist?

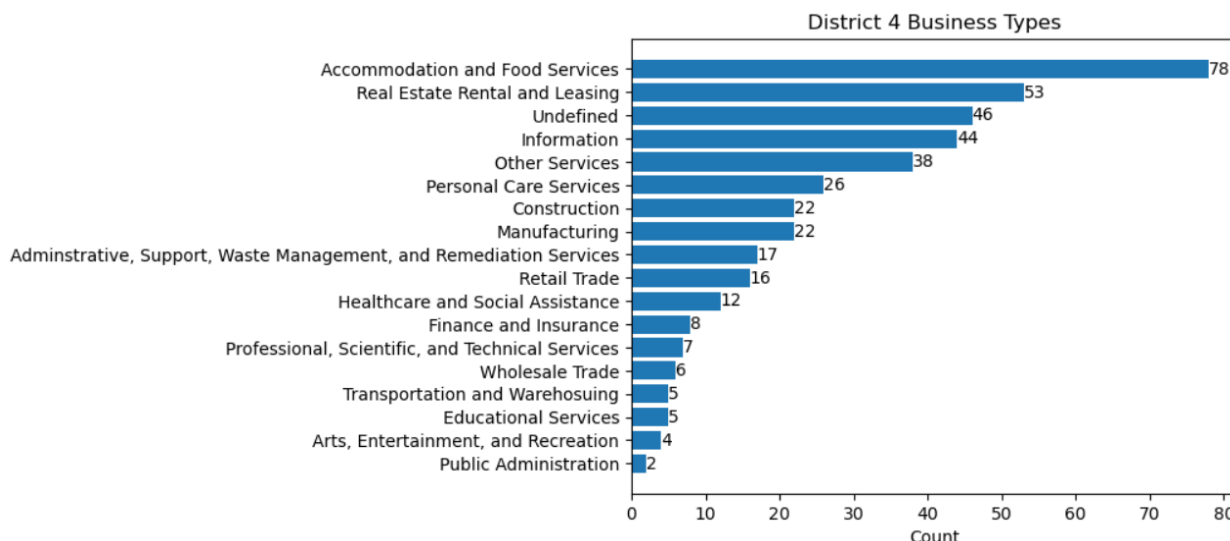


Figure 1. Business Types in District 4

District 4 has a variety of businesses including but not limited to, Full Service Restaurants, Beauty Salons, Financial Transaction Offices. The most prominent business types are accommodation and food services, real estate rental and leasing, information (wireless telecommunication carriers, newspaper publisher, radio stations) and personal care services (Figure 1). Compared to other districts in Boston, District 4 has an overall lower number of businesses. From looking at the two most prominent businesses types in District 4 we can see

that District 4 has the second lowest number of these business types out of the 9 districts (Figures 2 & 3).

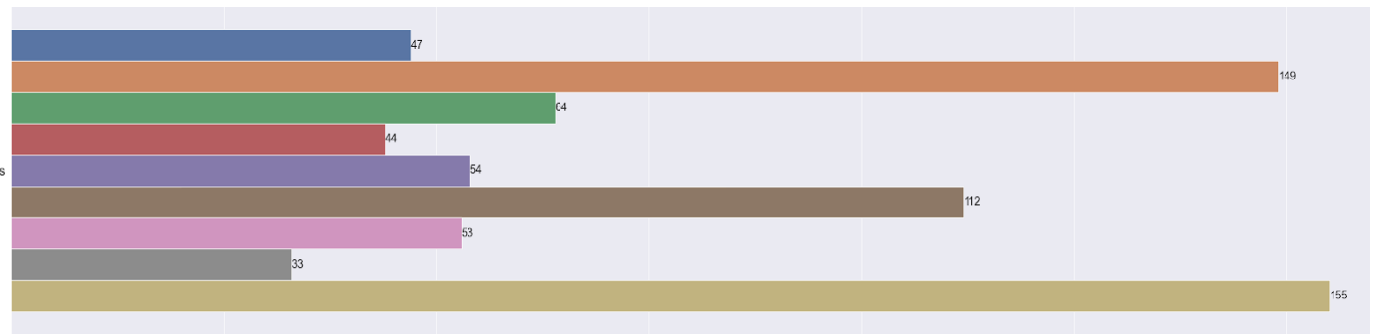


Figure 2. Number of Accommodation and Food Service Businesses Across All Districts

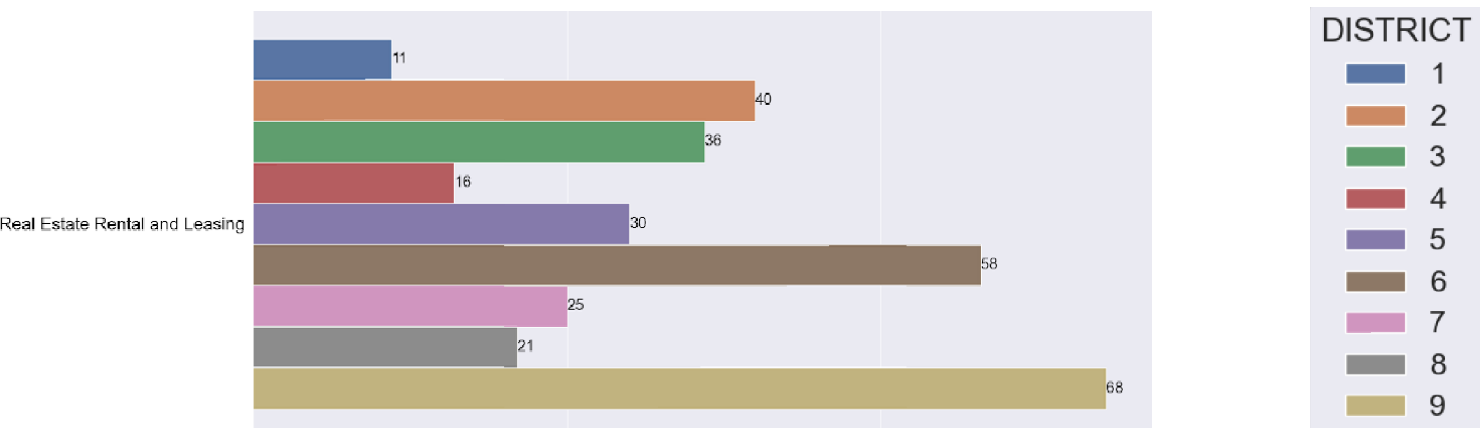


Figure 3. Number of Real Estate Rental and Leasing Across All Districts

What businesses are missing?

Although District 4 covers a large variety of business types, some businesses have plenty of room to grow within the district. There is a limited number of educational services in District 4 – a total of 8 businesses fall into this category which includes schools, tutoring, Brazilian jiu jitsu, and yoga. District 1 has a total of 5 educational services which is comprised of driving schools, sports, and family tutoring, having the lowest number of educational services across all districts. District 6 has the highest number of educational services among all districts with 24 businesses consisting of early care and education, martial arts, yoga, art academy, dance, and driving school. Seeing that District 6 neighbors some parts of District 4, it may be the case that residents of District 4 travel to District 6 in pursuit of some of these educational services that are not present within District 4. Therefore District 4 could benefit from an increase in these services to increase engagement and maintain more business within the district.

We also noticed a lack of services in arts, entertainment, and recreation – there is one fitness center and one fitness instruction site. However, compared to other districts the gap is not as big as it seems. It is still the case that District 4 can benefit from more services in arts, entertainment, and recreation as it is one of the districts with a lower number of such services.

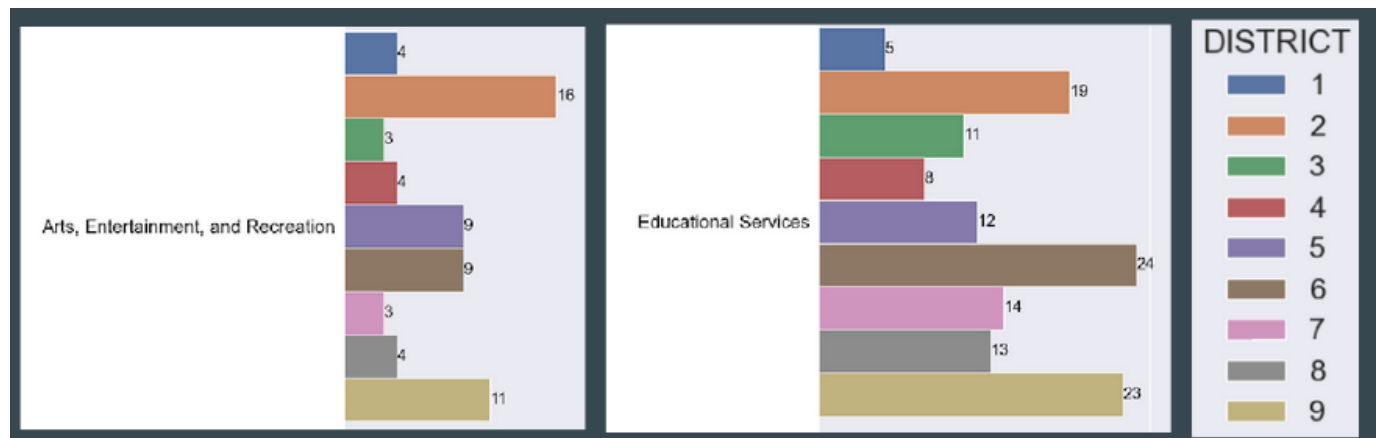


Figure 4. Number of Arts, Entertainment, and Recreation Across Districts

Figure 5. Number of Educational Services Across Districts

How many WBE (women owned) or MBE (minority owned) businesses?

Using the [certified businesses directory](#), we found that only 10 businesses in District 4 have been registered as MBE. Of those 10 businesses, 3 are also woman-owned. The certified business directory dataset contains 680 data entries of businesses from all over the US. To build a more comprehensive picture of the state of businesses in District 4, we plan on exploring the number of businesses in the other districts that have been registered as MBE or women-owned and compare the number between districts. This may reveal information about how accessible it is to be registered, and whether the city council should be advertising these resources to small businesses.

We have downloaded the Massachusetts State Registry of MWBE businesses and will take a look at that.

How many of the businesses are chains vs. independent operators?

Due to no existing dataset that contains all chain store names, we have to create our own dataset using information from websites like [Top 100 Retail Chains 2022](#) and [restaurant chains](#). This dataset will not be comprehensive at all so we can perform only basic chain store cleaning to get independently operated businesses.

Extension Pitch:

Using the employment and spending data, we want to analyze the district's monetary status as it relates to small businesses and compare with other districts to identify areas of improvement for District 4. This extension would analyze the performance of small businesses in District 4. By comparing the performance across businesses, we hope to identify areas of improvement that are likely to aid in the success of a small business. We also hope to identify achievable goals that small business owners entering District 4 can expect to encounter. With this information, our goal is to implement a foundational report on how District 4 can become more appealing to small business owners and furthermore, identify how they can see success.

For a comprehensive overview of the status of businesses in district 4, we plan on finding the number of businesses in each of the other districts and perform some comparison analysis.

We hope to answer the following questions:

Are there any features that can help small businesses?

Types of businesses:

Have to analyze Spending Data Analysis:

- Spending datasets show Change in In-Person Mastercard Spending
 - keep in mind that it only looks at in-person card spending, so data is limited
- From the spending data analysis we can gain an understanding of *what types of businesses* are successful. For example, are food businesses more successful, based on spending, than entertainment businesses?
- We can also look at Yelp dataset and look at the ratings of the types of businesses: are certain types of businesses in District 4 rated higher?

From previous data analysis:

- Food services, Real Estate, Information, and Personal Care Services make up more than half of the number of small businesses in District 4
 - These business types are far more common than the others, meaning they should be more successful
 - Compared to all other districts, D4 has nearly the lowest amount of all those business types

Appealing to new businesses owners of these business types can help push the economy of D4 and further drive development of the smaller and less common business types

Are there any barriers to a business succeeding in District 4?

- Do these businesses tend to spend a lot of capital? More or less compared to other districts?
 - By answering this question, we can see if income or financial resources are necessary for success
- Explore if similar business types in other minority districts perform better or worse
 - This exploration will allow us to observe if success of business types depends on

location/district or the people in the district

- Look at the breakdown of employment data in neighborhoods in district 4 using the Employment Data datasets, focusing on the age category, race, education levels, etc of employees
 - This can show how diverse District 4 is
 - Compare with other district's neighborhoods
 - Pie chart to show breakdown/ratio

Do businesses in District 4 get visibility online?

- Google maps, Yelp, etc.
 - We plan on merging District 4 businesses with Yelp businesses on coordinates (longitude, latitude) to find if any of the District 4 businesses can be found on Yelp
 - This can help inform decisions to encourage small businesses to consider developing online presence and visibility
- Although the dataset is small, we looked at the number of businesses with listed websites on the certified businesses dataset
 - Of the 10 businesses in the boston certified businesses, only 2 have websites, and it is the same website.

	company	services_p	mbe_wbe	small_loca	veteran	disdo_certifi	city_regist	address	city	state	zipcode	contact_ni	contact_ti	phone	fax	email	website
0	EMZ Rainb Laundry se	MBE	SLBE			No	Yes	9 Bowdoin	Dorchester	MA	2124	Caltor McLean		(617) 825-3200			
1	OSA Servic Accountin	MBE	SLBE			No	No	1773 Dorc	Dorchester	MA	2124	Osazee Owens		(617) 287-;(617) 282-5859			
2	OSA Servic Accountin	MBE	SLBE			No	No	1773 Dorc	Dorchester	MA	2124	Osazee Owens		(617) 287-;(617) 282-5859			
3	OSA Servic Accountin	MBE	SLBE			No	No	1773 Dorc	Dorchester	MA	2124	Osazee Owens		(617) 287-;(617) 282-5859			
4	OSA Servic Accountin	MBE	SLBE			No	No	1773 Dorc	Dorchester	MA	2124	Osazee Owens		(617) 287-;(617) 282-5859			
5	OSA Servic Accountin	MBE	SLBE			No	No	1773 Dorc	Dorchester	MA	2124	Osazee Owens		(617) 287-;(617) 282-5859			
6	Boston Go Arts, Enter	MWBE	SBE, SLBE			No	Yes	1486 Dorc	Boston	MA	2122	Shamara R Shamara R		(617) 379-0194			bostongotnext.com
7	Boston Go Arts, Enter	MWBE	SBE, SLBE			No	Yes	1486 Dorc	Boston	MA	2122	Shamara R Shamara R		(617) 379-0194			bostongotnext.com
8	LV Home I Residentia	MBE	SLBE			No	Yes	436 Blue H	Dorchester	MA	2121	Harlen Lar President		(617) 992-4557			
9	LV Home I Residentia	MBE	SLBE			No	Yes	436 Blue H	Dorchester	MA	2121	Harlen Lar President		(617) 992-4557			
10	Noir Essen Unisex Hai	MWBE	SLBE			No	No	1741 Dorc	Dorchester	MA	2124	Kareen Wi Owner		(857) 342-0569			

Does a lack of non small businesses (corporations) negatively impact District 4's landscape?

- Does this affect the number of customers willing to do business in District 4? (travel to District 4 for food, groceries, etc.)
- We would have to check the number of chain stores vs small businesses in each district —chain grocery stores vs local grocery stores etc.
- District 4's customers will primarily come from only District 4 - an important thing to note
- Note what District 4 is lacking in comparison to other districts — health services and educational services that could be focused on to develop district 4
- Compared to District 2 where many customers come from other districts to do business

Our conclusion

We hope to discuss the following after answering the extension project:

A reasonable benchmark for small businesses in District 4

- Essentially - what is an achievable goal for small businesses?
 - available/commercially attractive business types

- available resources (MBE/Small Business certification)
- online presence

Challenges faced

Challenges faced during data collection, exploration, and analysis mainly involved unsubstantial data or inconsistent information across multiple datasets.

- It was difficult at first to filter out which data could be useful/meaningful to us
- Cell phone traffic data does not provide a point of reference previous to 2019 and doesn't span a substantial enough timeline
- Some inconsistencies
 - within a dataset some aspects are not categorized or are categorized inaccurately between multiple datasets
 - some business names not correct on dataset – name may have changed
 - data may be outdated
- Finding Minority owned businesses after seeing such low number MBE certified businesses in the MBE certifications dataset
 - Certified Business Directory dataset is not comprehensive
 - While businesses can put MWBE status on their Yelp pages, the Yelp dataset does not include this information
- Foot traffic and spending data are for a street/neighborhood and not a specific business
 - Can skew information due to District divisions (reword this but essentially a neighborhood can be in more than one district so the information gleaned from the datasets that are only provided via neighborhoods are not exactly accurate to the district)

Suggestions for the future of the project

To be completed after completing the extension pitch