Selecting an Ice Cream Shop Location in the Bay County Michigan

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1. Introduction

1.1. Background

I'm looking to move to Bay County Michigan in the near future and looking to open up an Ice Cream shop somewhere in Bay County, this would be a joint venture with a few others. Some of the other stakeholders already have ideas in regards to locations but they are not backed by data or research. As with any business location will be key to the success of the ice cream shop, we will be considering the following for this analysis.

I. "The most important factor to consider when you are selecting a location for your ice cream business is customer convenience." (KaleidoScoops Inc., 2014). Per KaleidoScoop good high traffic areas should include parks, schools, shopping centers, and restaurants.

II. "The average time that a consumer is willing to travel to a local business is 17 minutes and this has little change depending on age groups." (Marchant, 2014).

1.2. Problem

The intent of the work here is to take an unbiased approach to locate potential areas with the high foot traffic required for an ice cream shop to be successful. The intent of this analysis is to cluster different areas based on other nearby venues, once clustered we should be able to consider the areas and drill into the data further to determine which location or locations would make good potential Ice Cream shops.

1.3. Interest

This data will be of interest to anyone looking to open an Ice Cream shop in the Bay County area. It could also be of interest to other desert type shops aside from Ice Cream.

2. Data

2.1. Initial Location Source

We will be using the latitude and longitude of a number of cities, charter townships, townships and unincorporated communities all located throughout the Bay County area. This information will put together manually from Various Wikipedia pages, an example is below.

Name: Essexville
Longitude: 43.611389
Latitude: -83.843611

2.2. Nearby Venue Source

We will then pull data from foursquare via an API to retrieve Venue Name, Venue Latitude, Venue Longitude and Venue Category within a radius from the area of our initial locations. An example of this data is listed below.

Venue: SUBWAY
Longitude: 43.603645
Latitude: -84.069710
Category: Sandwich Place

For the purposes of this analysis, we will use a radius of 1360 meters when using foursquare on a set of coordinates. This number is derived assuming 400 meters take roughly 5 minutes to walk, dividing 400 by 5 we get 80, we can this take 80 and times it by our max walking time of 17 minutes to get 1360.

3. Methodology

3.1.   Initial Location Analysis

The initial list contained 31 locations, these locations covered the major cities, townships and communities throughout the Bay County area. A good majority of these being Rural areas we found many locations didn't even have 10 venues in walking distance. These locations were removed from our analysis as having such a low number of venues nearby made them poor Canidates that didn't merit further analysis. We were left with 7 good Canidates listed below.

Aubrun	25
Bangor Charter Township	17
Bay City	96
Frankenlust Township	13
Linwood	10
Pinconning	12
Pinconning Township	13

3.2.   Common Venue Analysis and Clustering

As previously stated in this paper we were looking for locations with parks, schools, shopping centers, and restaurants nearby. For these reasons we took each area and created a list of the top 10 venue categories nearby. This list of venues was then taken and put into clusters, grouping the locations by similar top ten venues. The clusters and top 10 location can be viewed below.

Cluster 0

	LocationName	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
30	Linwood	Bar	American Restaurant	Post Office	Fast Food Restaurant	Harbor / Marina	Baseball Field	Grocery Store	Bakery	Italian Restaurant	New American Restaurant

Cluster 1

	LocationName	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
3	Pinconning	Cheese Shop	American Restaurant	Grocery Store	Discount Store	Post Office	New American Restaurant	Sandwich Place	Gas Station	Deli / Bodega	Sporting Goods Shop
17	Pinconning Township	Cheese Shop	American Restaurant	Locksmith	Deli / Bodega	Post Office	Sandwich Place	Furniture / Home Store	Business Service	New American Restaurant	Baseball Field

Cluster 2

	LocationName	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Aubrun	Discount Store	Park	Pizza Place	Fast Food Restaurant	Bar	Grocery Store	Pet Store	Design Studio	Optical Shop	Furniture / Home Store
1	Bay City	Bar	Park	Italian Restaurant	Coffee Shop	Pizza Place	Hotel	Fast Food Restaurant	Restaurant	Concert Hall	Gastropub
4	Bangor Charter Township	Convenience Store	Hardware Store	Cosmetics Shop	Sandwich Place	Jewelry Store	Motorcycle Shop	Gas Station	Discount Store	Rental Car Location	Intersection
10	Frankenlust Township	Fast Food Restaurant	Gas Station	American Restaurant	Sandwich Place	Intersection	Fried Chicken Joint	Hotel	Convenience Store	Hotel Bar	Sporting Goods Shop

3.3.   Plotting Clusters on Map

To provide additional context into the potential location the different locations were also plotted on a map and color coded by cluster. The map is list below.

4. **Results**

While all 7 locations looked like they have potential venues that could make them of value, it's clear that areas in cluster 2 have the most valuable venues for an Ice Cream shop. The items that make it the most valuable are the parks and number restaurant types.

Out of the cluster 2 locations we can use the number of venues to further narrow our selection. Doing this you can conclude that Bay City and Auburn have a larger number of venues in walking distance.

Lastly using the map and plotting you can take into consideration the location of each area relative to streets, highways, bodies of water and each other. Doing this you can determine the Bay City location is by a number of streets and a river, while the other locations are for the most part located near major roadways.

5. **Discussion**

5.1. **Observations**

Some noteworthy observations for cluster 1 is that Pinconning has Cheese Shop as the number 1 common venue, that combined with the location of Pinconning on the map (next to major roadways) could make for a unique tourist foot traffic.

Cluster 2 was clearly the most desirable in terms of venues types, looking over the most common venues Bay City and Auburn were the most desirable. Also considering the concert hall in Bay City it appears have the best types of venues for an Ice Cream shop.

Based on the above analysis and data I believe an Ice Cream shop has the most potential foot traffic in the Bay City area. Next steps for anyone interested in opening an Ice Cream shop in this area would require research on real estate options available in the area and gaining an understanding of local laws and regulations for Ice Cream shops.

6. Conclusion

In this analysis we reviewed locations via a number of ways including most common venue types per location, clustering relative to other locations, geographical features of the location and just the share number of venues for a location. Based on the analysis stated we believe Bay City to be the best location for foot traffic in the Bay County area.

7. References

KaleidoScoops Inc., (2014, November 17). How To Find The Perfect Location For An Ice Cream Business https://www.kalscoops.com/how-to-find-the-perfect-location-for-an-ice-cream-business/#:~:text=Placing%20yourself%20in%20a%20high,for%20their%20favorite%20cold%20flavors

Marchant, R. (2014, May 1). Consumers will Travel 17 Minutes to Reach a Local Business. Bright Ideas Blog. https://www.brightlocal.com/research/local-business-travel-times/