

# Location for a new animal shelter in Toronto

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## 1 Introduction

There are a lot of street animals and pet cats in Toronto. According to the Canadian Animal Health Institute (CAHI) the amount of pet cats in Canada was about 8.8 million in 2016, up from 7.0 million in 2014. The pet dog population was 7.6 million in 2016, up from 6.4 million in 2014.[2]. On the website of the government of Toronto [4] there are 2.8 million people in Toronto and 230 thousand dogs. According to Owen Mundy[3] who owns the I Know Where Your Cat Lives (IKWYCL) website that crawls information about location of cats from numerous public APIs, Ontario has the largest amount of crawled cat pictures among all first-level administrative subdivisions of Canada. According to IKWYCL, Toronto has the fifth highest amount of crawled cat pictures among major cities all over the world. While a high amount of crawled cat pictures isn't necessarily indicative of an unusually high cat population, it is indeed evidence that Toronto has many pet cats in addition to the 230 thousand dogs.

Since Toronto has a lot of pets Torontonians clearly love animals. However there are always people who abandon their pets. With a large pet population a large population of feral animals appear. According to Toronto Humane Society [5] the number of homeless cats in Toronto is between 20,000 and 100,000. In fact there are so many feral cats in Toronto that the city contributes \$100,000 to help keep the feral cat population under control according to a CBC article.[1] Due to a really large stray cat population Toronto may be in need of animal shelters. Using Foursquare website it is easy to see that there are 4 results for animal shelters including one for an animal hospital without zooming out. On the other hand there are a lot of results for pet stores. To be fair this situation is not unique in Toronto because using a simple search it is easy to see that the amount of animal shelters are also small compared to the amount of pet stores in Boston, MA and Berlin, Germany. Instead of buying a pet adopting one is humane especially in cities as cold as Toronto.

This report is mostly for animal lovers who want to establish their own shelters. I hope that it will be useful in helping more stray animals to find loving homes!

## **2 Data**

We will use the data from Foursquare. In particular we will look up the latitude and longitude of all existing animal shelters, pet stores and cat cafes in and near Toronto. Toronto is divided into neighborhoods according to the first three letters of postal codes. Other data will be retrieved if found to be relevant to the problem when we generate the score later.

## **3 Methodology**

We will use two different methods to solve the problem. First of all we will use clustering to measure neighborhood similarity using k-means because we assume that neighborhoods similar to neighborhoods that are already close to existing animal shelters, pet stores and cat cafes are likely to be wonderful locations for new animal shelters. Secondly we will use a completely different method. We will focus on neighborhoods already close to existing animal shelters, pet stores and cat cafes only and calculate a score based on suitability of the neighborhood. Then we will pick the neighborhoods with high scores.

## **4 Results**

## **5 Discussion**

## **6 Conclusion**

## **References**

- [1] Canadian Broadcasting Corporation, City commits \$100K to reduce Toronto's feral cat population, 2015.
- [2] Canadian Animal Health Institute, Latest Canadian Pet Population Figures Released, 2017
- [3] Owen Mundy, I know where your cat lives, fetched 2018.
- [4] City of Toronto, Dogs in the City, fetched 2018.
- [5] Toronto Humane Society, Toronto Feral Cats, fetched 2018.