Dogs and Suds: Analysis of locations for a dog bar in Vancouver, BC

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Aug 2021
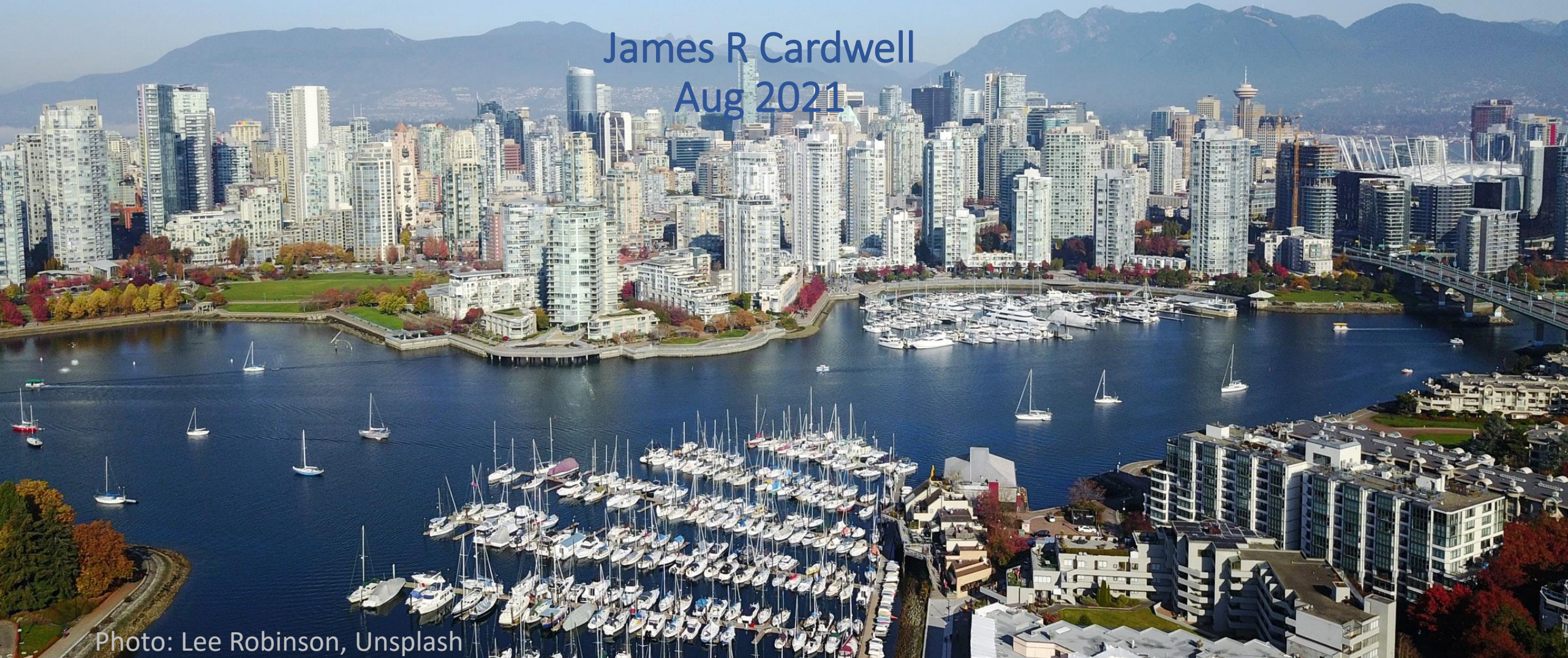
Photo: Lee Robinson, Unsplash
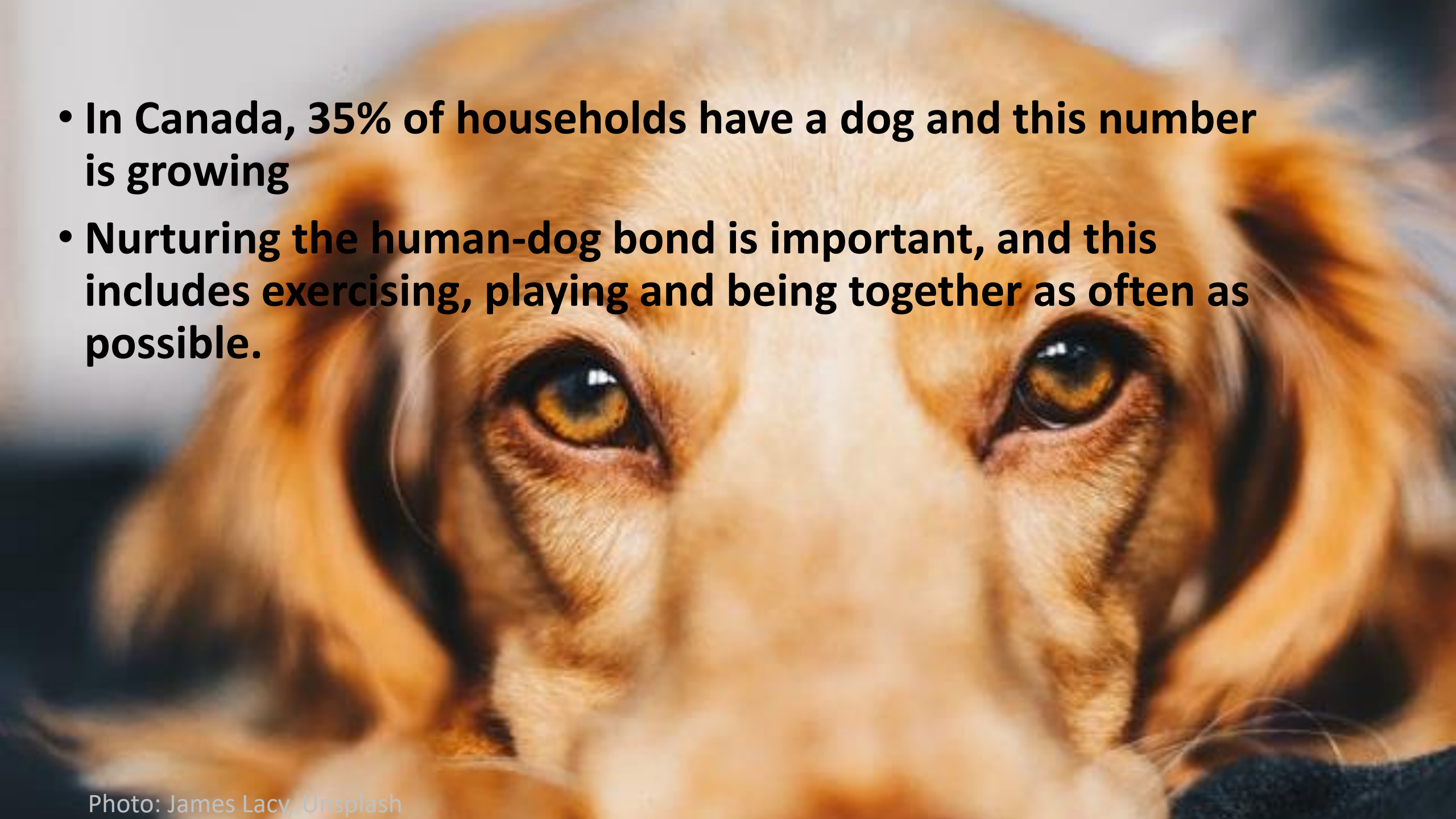
The human relationship with Man's best friend is thousands of years old, and dogs have become a cherished part of our lives.

Photo: Mandy Henry, Unsplash

- **In Canada, 35% of households have a dog and this number is growing**
- **Nurturing the human-dog bond is important, and this includes exercising, playing and being together as often as possible.**

Vancouverites also love their beer:

British Columbia is also home to a growing number of craft breweries, with over 20 new breweries added each year since 2011
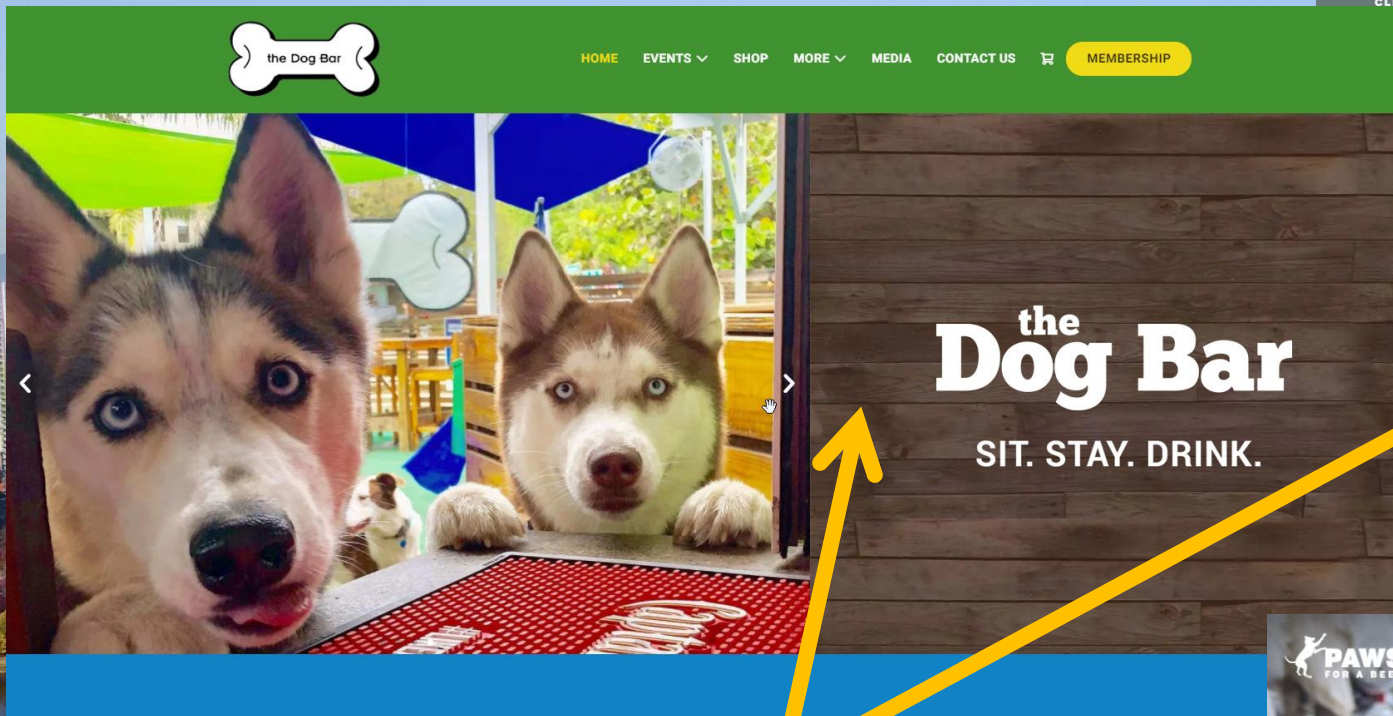
This **explosion** of breweries supports an even larger number of neighborhood pubs and bars with over 300 in the City of Vancouver

Photo: Sigmund, Unsplash

Best of both worlds? An off-leash beer garden – a dog bar!

the Dog Bar
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Taps & Tails is an indoor/outdoor dog park and bar. We know Cleveland, Ohio weather can be harsh on dog owners. However, that doesn't excuse us dog lovers from taking care of our pups! At Taps & Tails, you can exercise and hang out with your dog in a social, comfortable setting while grabbing a beer or a bite to eat. There are bars that allow dogs. We are a dog park that serves beer. So unleash your dog and grab a drink with us.

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PUPPY PLAY SIGNUP
Sign Up

Dog bars exist in the US, but there are none in Vancouver

The Dogs and Suds dog bar would be Vancouver's first dog bar where dog owners can exercise their pet while sipping their favorite beverage, enjoy the company of like-minded dog owners and their dogs can exercise and socialize with other dogs.

Business Problem:

In which Vancouver neighborhood should the new dog bar be located?

Data Sources

1. Wikipedia.com

- **Description**: list and descriptions of the 22 neighborhoods of the City of Vancouver, BC, Canada.

- **Purpose**: to identify the neighborhoods in Vancouver

2. City of Vancouver Open Data Portal

- **Description**: listing of Vancouver's 22 neighborhoods' bounding polygons and centroids

- **Purpose**: to obtain the boundary locations and central point of each neighborhood

3. People, Parks and Dogs Strategy Appendix

- **Description**: PDF document containing a table from the Statistics Canada 2016 census data on dog-owning households in Vancouver Neighborhoods.

- **Purpose**: to obtain data on the density of dog-owning households by neighborhood

4. Foursquare API

- **Description**: An API that can be used by developers to query the Foursquare database of venues, their categories and other attributes.

- **Purpose**: to identify and locate pubs and existing dog parks in Vancouver neighborhoods.

Rationale

- **The Dogs and Suds dog bar should be located in a neighborhood with a high number of dogs – such neighborhoods should have a high need for a new dog park.**

- **The dog bar should be located in a neighborhood with a <u>high</u> number of pubs – pub owners in such neighborhoods have already assessed the demographics, transportation and other success factors and should have a high number of pub-goers that could also be drawn to the dog bar, especially if they are also dog owners.**

- **The dog bar should be located in a neighborhood that is <u>less</u> well served by existing dog parks – the increased need for a dog park should drive customers to the Dogs and Suds dog bar.**

Methodology

- **Obtain data for the names, centroids and boundaries for Vancouver neighborhoods (Data Sources 1 and 2)**
- **Obtain a dataset containing the licensed dogs in each neighborhood (Data source 3)**
- **Obtain a dataset containing existing dog parks in Vancouver (Data source 4)**
- **Obtain a dataset containing existing pubs in Vancouver (Data source 4)**
- **Perform exploratory data analysis to better understand the data**
- **Perform K-Means Clustering to identify clusters of neighborhoods that will be candidates for the dog bar location**
- **Visualize the clusters and characterise the neighborhoods in each cluster to select the final candidates**

Results and Discussion

	ShortName	Name	Polygon
0	AR	Arbutus-Ridge	POLYGON ((-123.15260 49.25723, -123.16488 49.2...
1	CBD	Downtown	POLYGON ((-123.11227 49.29016, -123.10424 49.2...
2	FAIR	Fairview	POLYGON ((-123.14599 49.25712, -123.14540 49.2...
3	GW	Grandview-Woodland	POLYGON ((-123.07702 49.29025, -123.06778 49.2...
4	HS	Hastings-Sunrise	POLYGON ((-123.05649 49.29349, -123.05190 49.2...
5	MARP	Marpole	POLYGON ((-123.10696 49.20416, -123.11153 49.2...
6	RP	Riley Park	POLYGON ((-123.10562 49.23312, -123.11617 49.2...
7	SHAU	Shaughnessy	POLYGON ((-123.15527 49.23452, -123.15508 49.2...
8	STR	Strathcona	POLYGON ((-123.09929 49.28927, -123.09390 49.2...
9	WE	West End	POLYGON ((-123.13768 49.27532, -123.14126 49.2...
10	DS	Dunbar-Southlands	POLYGON ((-123.17017 49.24789, -123.17025 49.2...
11	KERR	Kerrisdale	POLYGON ((-123.17908 49.21556, -123.17564 49.2...
12	KIL	Killarney	POLYGON ((-123.02356 49.20015, -123.03998 49.2...
13	KITS	Kitsilano	POLYGON ((-123.13768 49.27532, -123.14375 49.2...
14	SC	South Cambie	POLYGON ((-123.11599 49.23794, -123.11617 49.2...
15	VF	Victoria-Fraserview	POLYGON ((-123.05683 49.20420, -123.05846 49.2...
16	KC	Kensington-Cedar Cottage	POLYGON ((-123.05659 49.26198, -123.05663 49.2...
17	MP	Mount Pleasant	POLYGON ((-123.10067 49.26913, -123.09692 49.2...
18	OAK	Oakridge	POLYGON ((-123.10562 49.23312, -123.10616 49.2...
19	RC	Renfrew-Collingwood	POLYGON ((-123.02356 49.23479, -123.02357 49.2...
20	SUN	Sunset	POLYGON ((-123.10696 49.20416, -123.10616 49.2...
21	WPG	West Point Grey	POLYGON ((-123.22445 49.27892, -123.20515 49.2...

- **We obtained central points and polygons for the 22 official Neighborhoods in Vancouver**

Licensed Dogs by Neighborhood

- **The Downtown and Kitsilano neighborhoods, followed by Kensington-Cedar Cottage have the most dogs, whereas Oakridge, South Cambie, Strathcona and Shaughnessy have the least.**

Figure 3 – Dog counts by Neighborhood
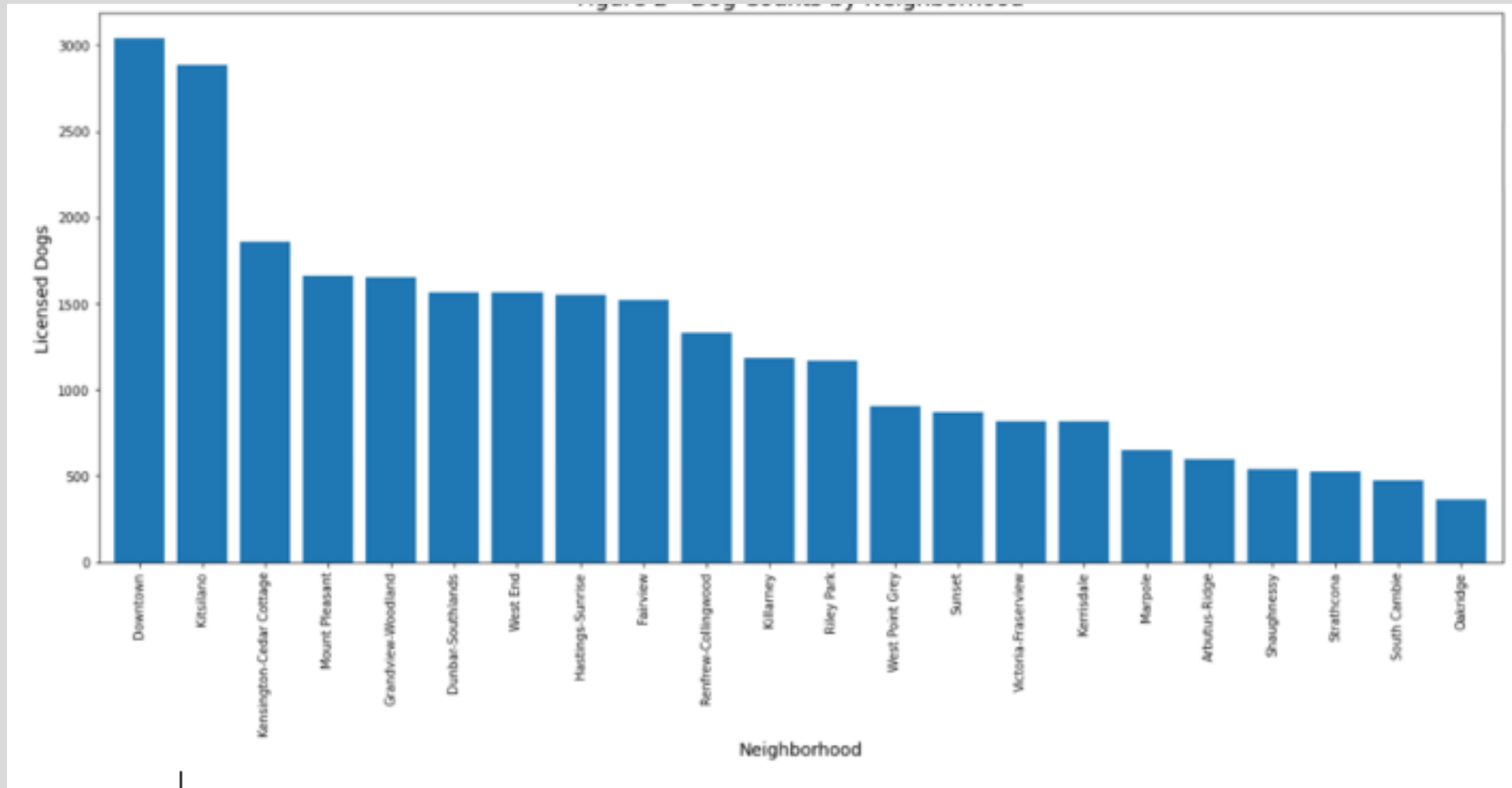
Dog density by Neighborhood

- The bubble chart shows that density of dogs (dogs/hectare) varies significantly across neighborhoods with the highest densities being in West End, Downtown, Kitsilano, Fairview, Mount Pleasant and Grandview-Woodlands neighborhoods.
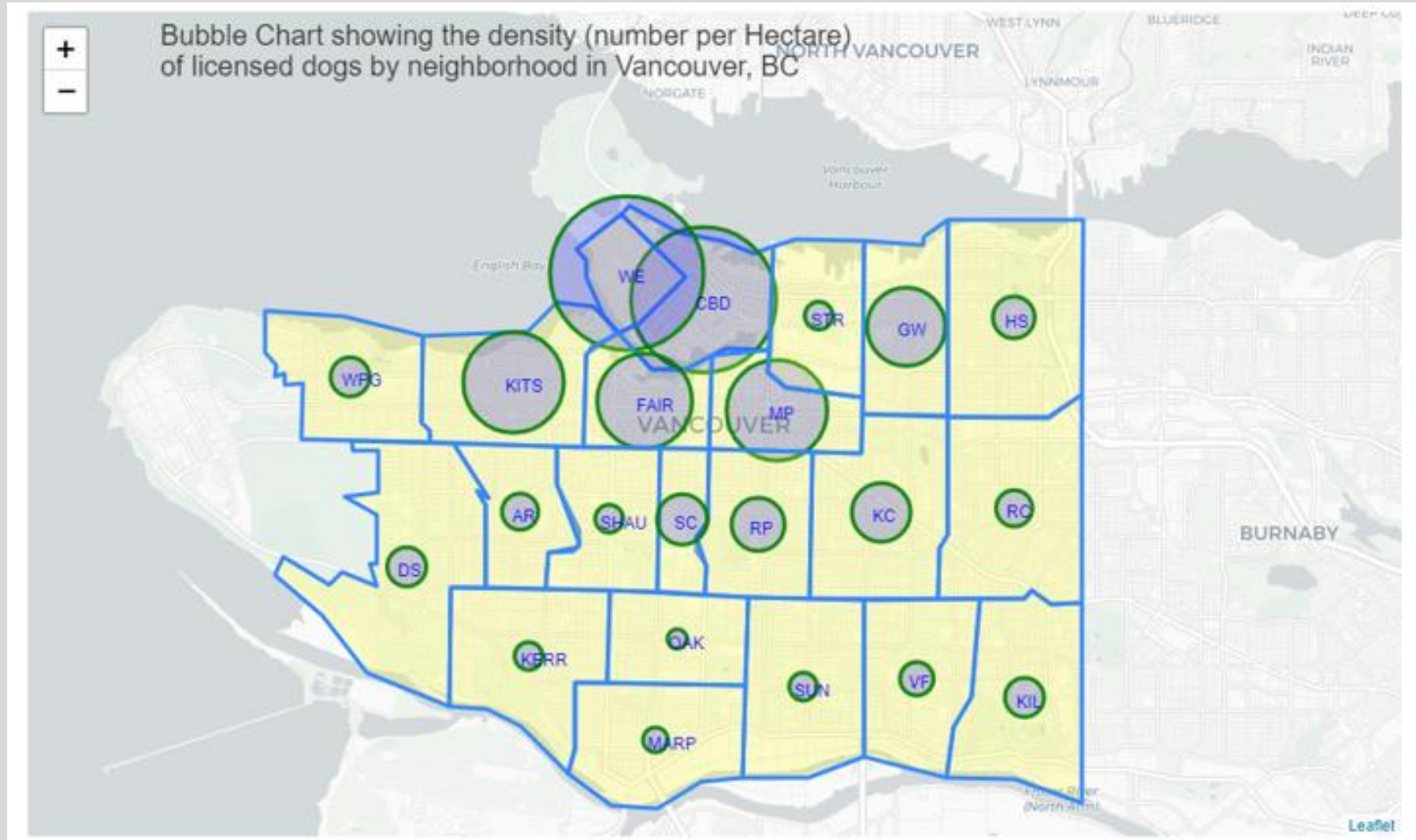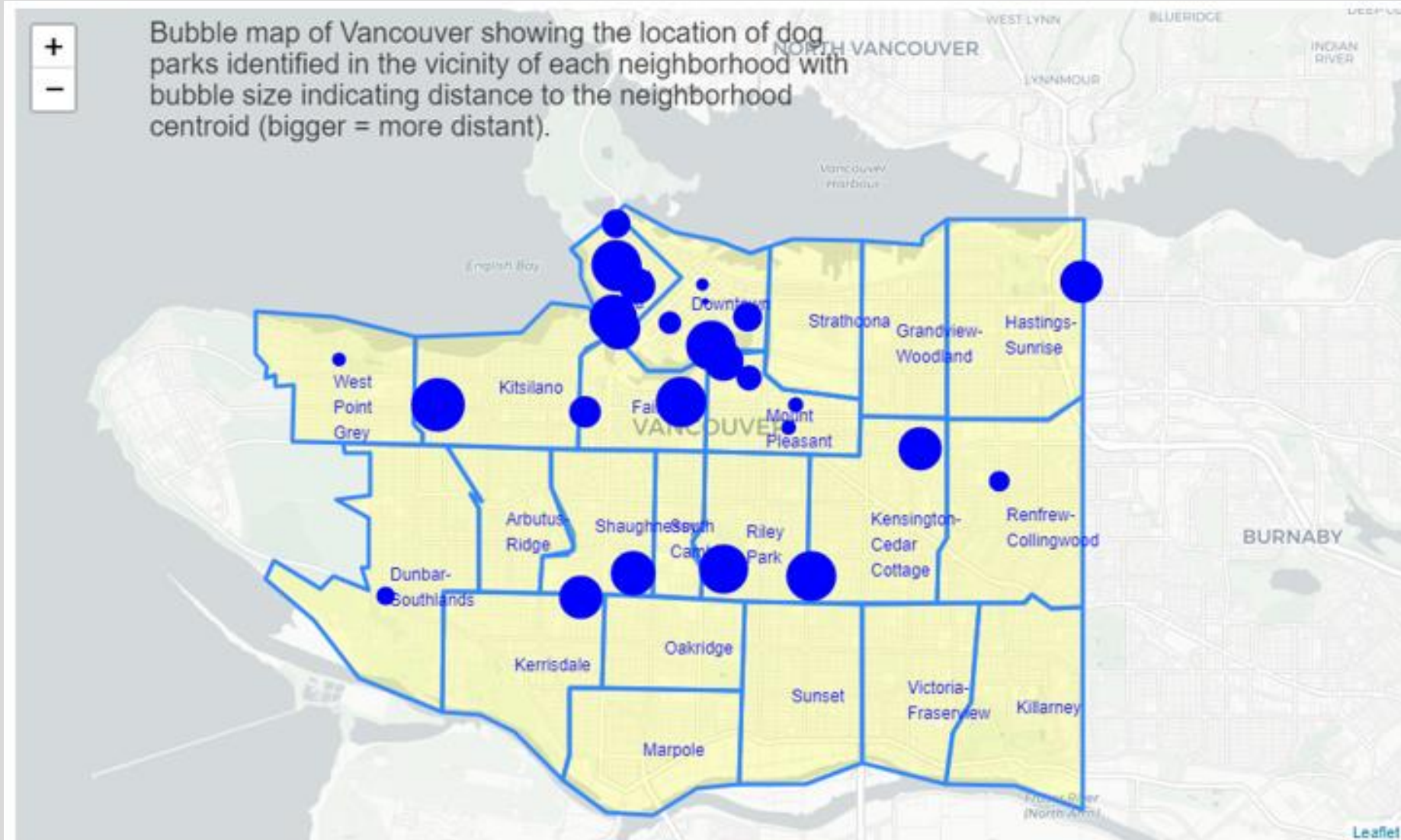
Dog Parks by Neighborhood

- **The Downtown neighborhood has the most dog parks followed by Mount Pleasant, Fairview and Kensington-Cedar Cottage.**
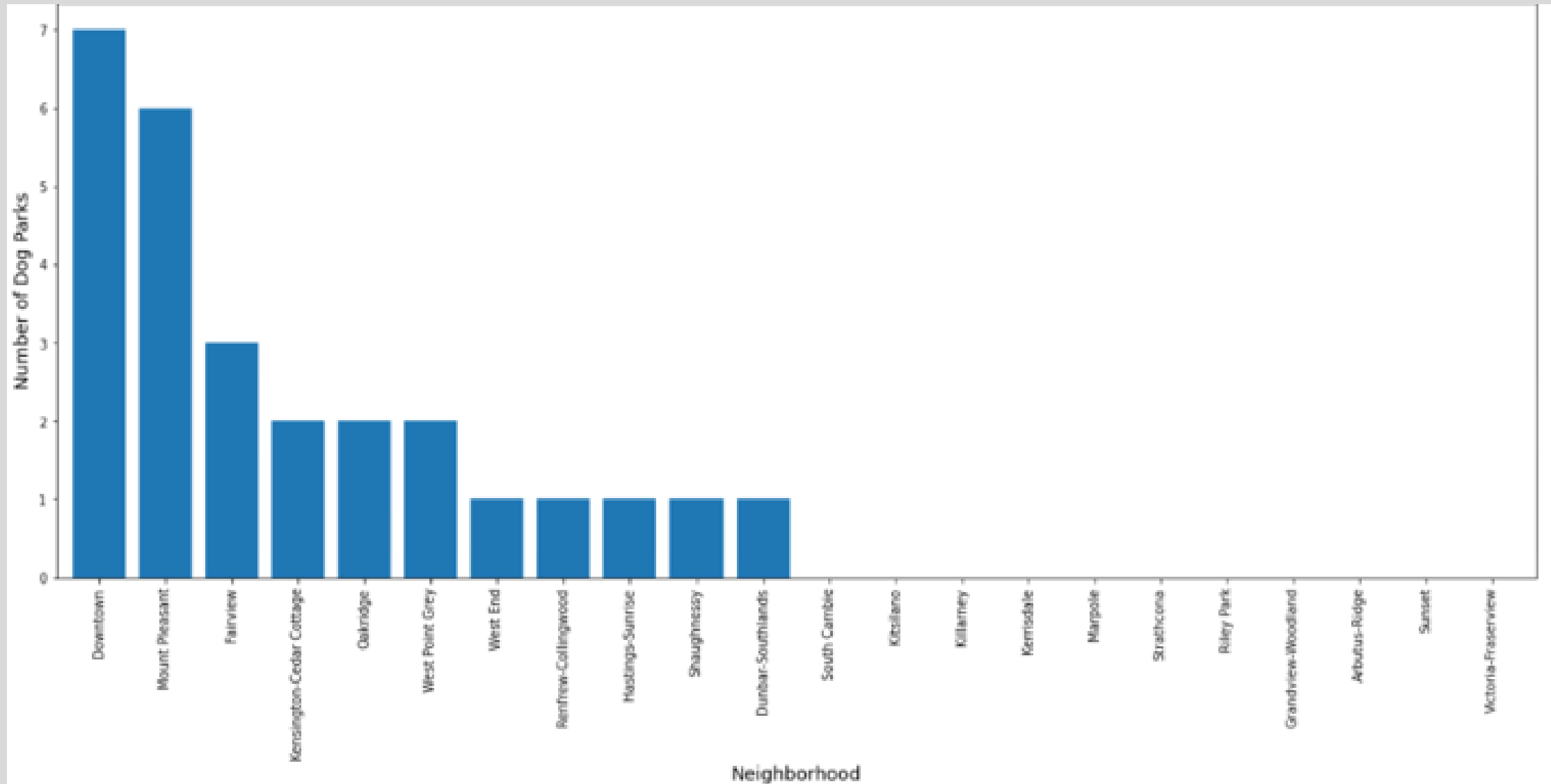
Dog Park locations

- **Several neighborhoods are poorly served by dog parks, having none within 1.5 km of the central point, including Kitsilano which had the second highest number of dogs.**

Bubble map of Vancouver showing the location of dog parks identified in the vicinity of each neighborhood with bubble size indicating distance to the neighborhood centroid (bigger = more distant).
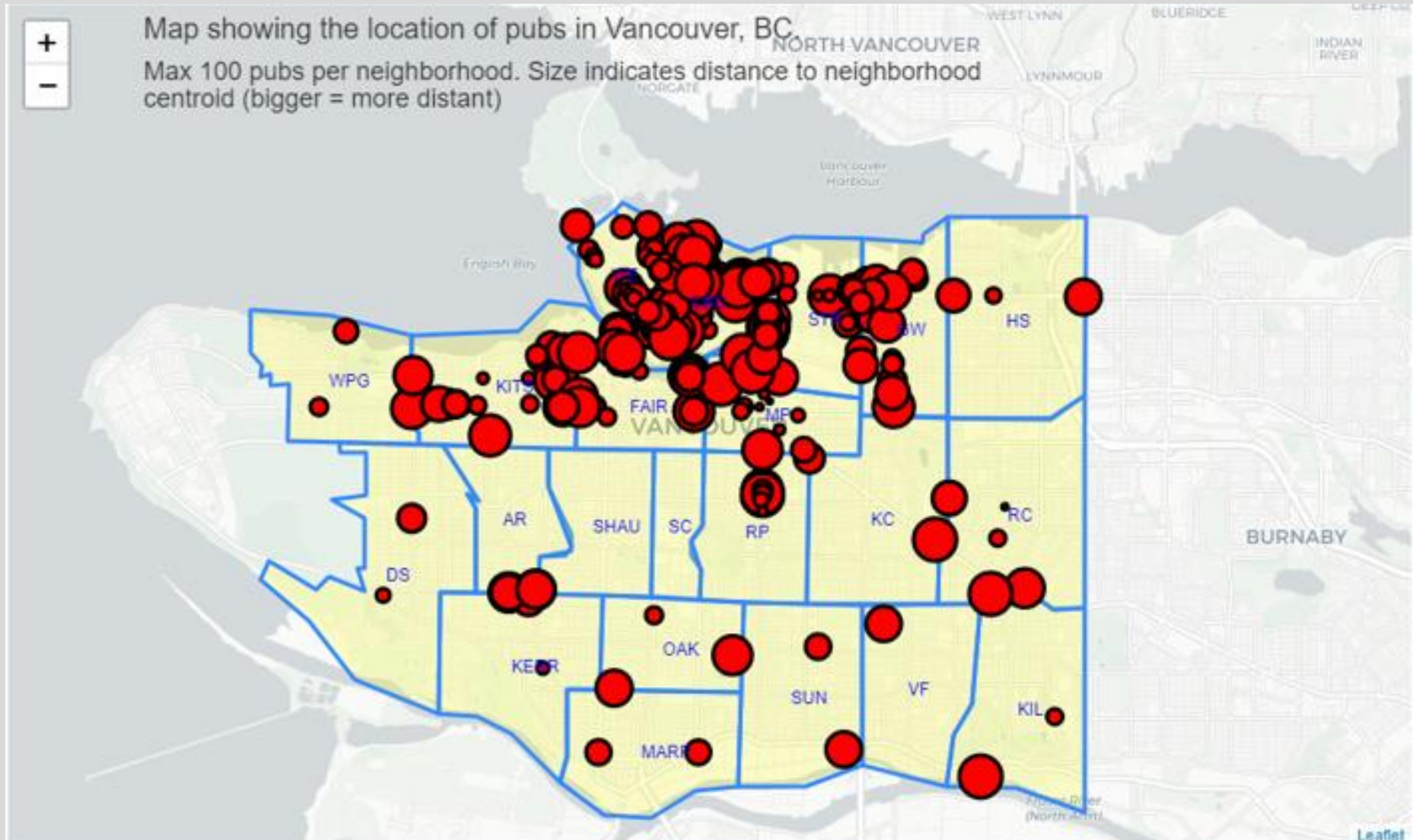
Pubs by Neighborhood

- The data set contained 330 pubs, ranging from none to 74 pubs per neighborhood! The median was 3.5 pubs.
- Downtown, West End, Strathcona, Fairview, Mount Pleasant, Grandview-Woodland and Kitsilano had higher numbers of pubs than the rest.
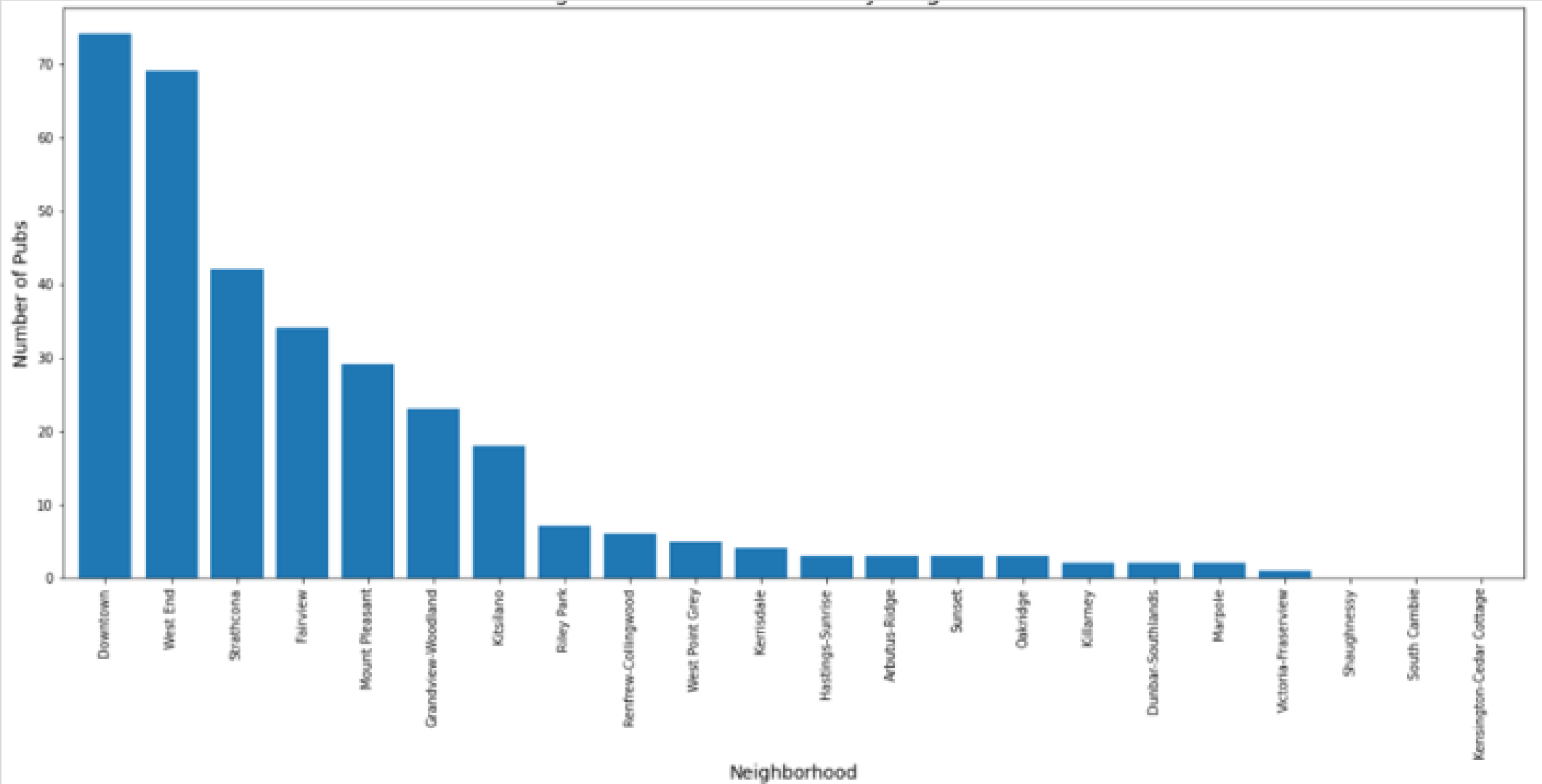
Pub locations

- **Pubs are more frequently found in the northern 1/3 of the city compared with the central and southern neighborhoods.**
- **Pub-going dog owners would be more likely to be found in those areas as well.**

Map showing the location of pubs in Vancouver, BC. Max 100 pubs per neighborhood. Size indicates distance to neighborhood centroid (bigger = more distant)

K-Means Clustering

- **Using normalized data on dog density, pub density and dog park density, we modelled 15 values of 'K' (the number of clusters), and evaluated the optimum value using the Elbow Method (plotting inertia against the # of clusters) tested)**
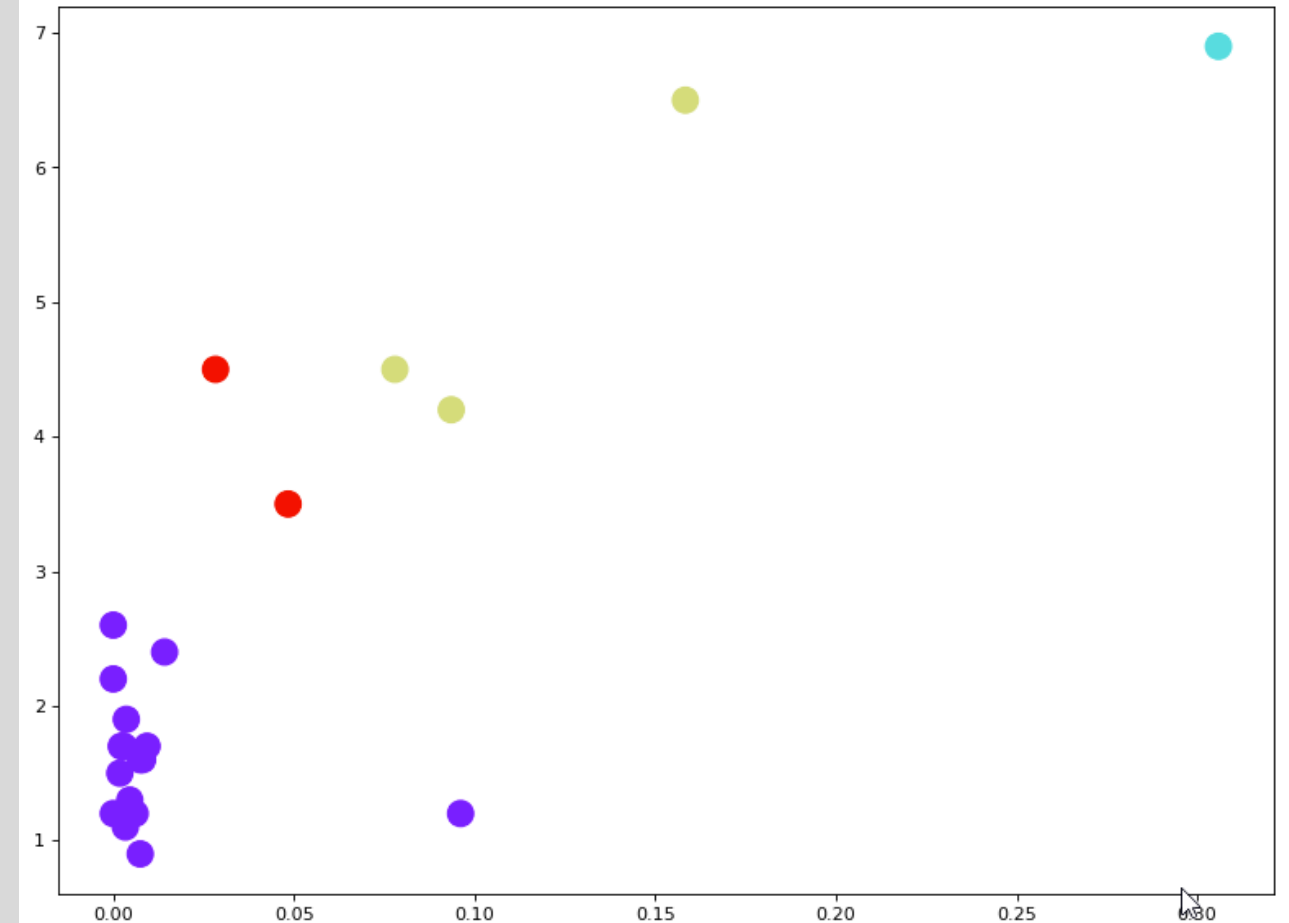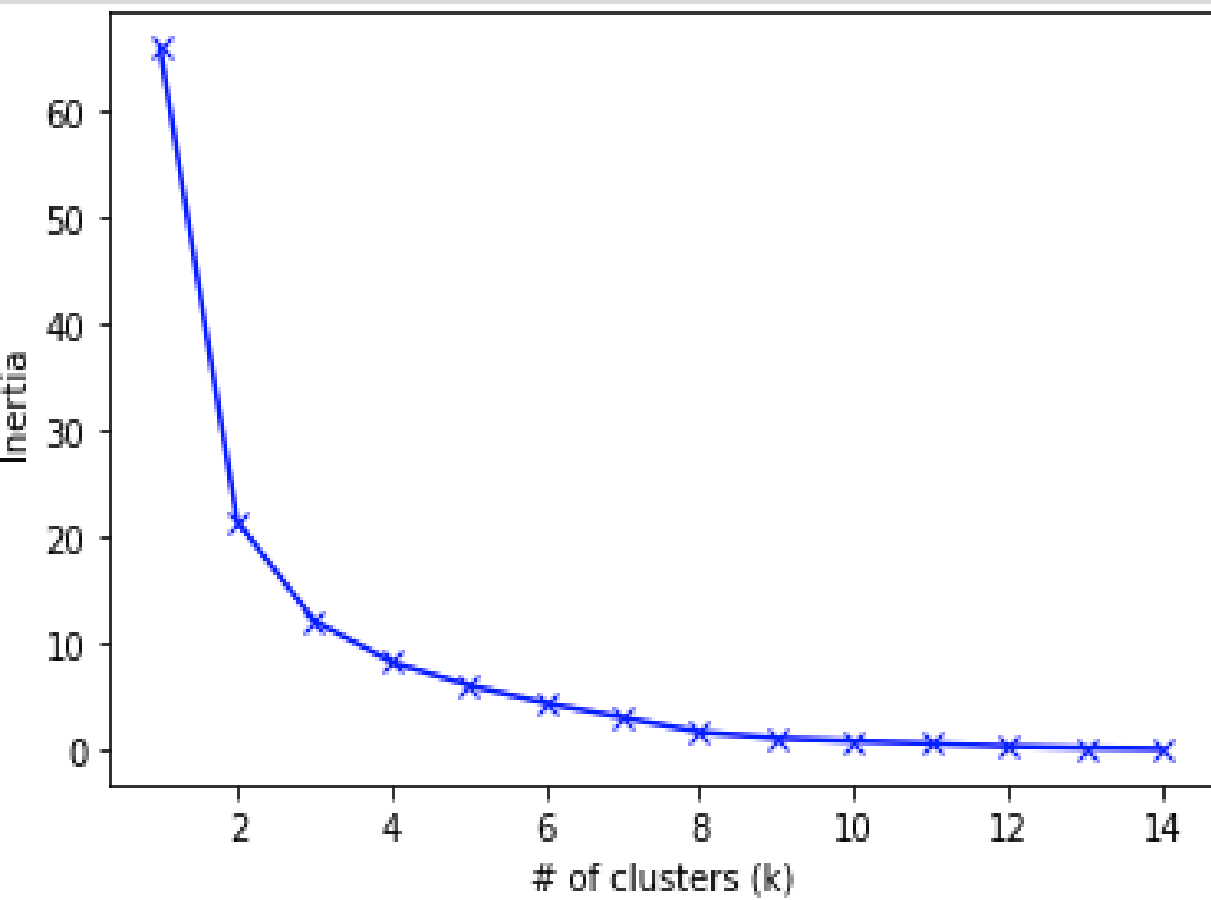
- **The Elbow Method indicated that the optimal number of clusters is 4**
- **A scatter plot of the 22 neighborhoods in which the point's color corresponds to the cluster number showed four clearly distinguishable clusters in the data**

Visualizing the cluster locations

- A choropleth map was used to visualize the four clusters.
- One cluster accounted for 16 of the 22 neighborhoods.
- There was a tendency for the remaining clusters to be located in the north-central section of the city
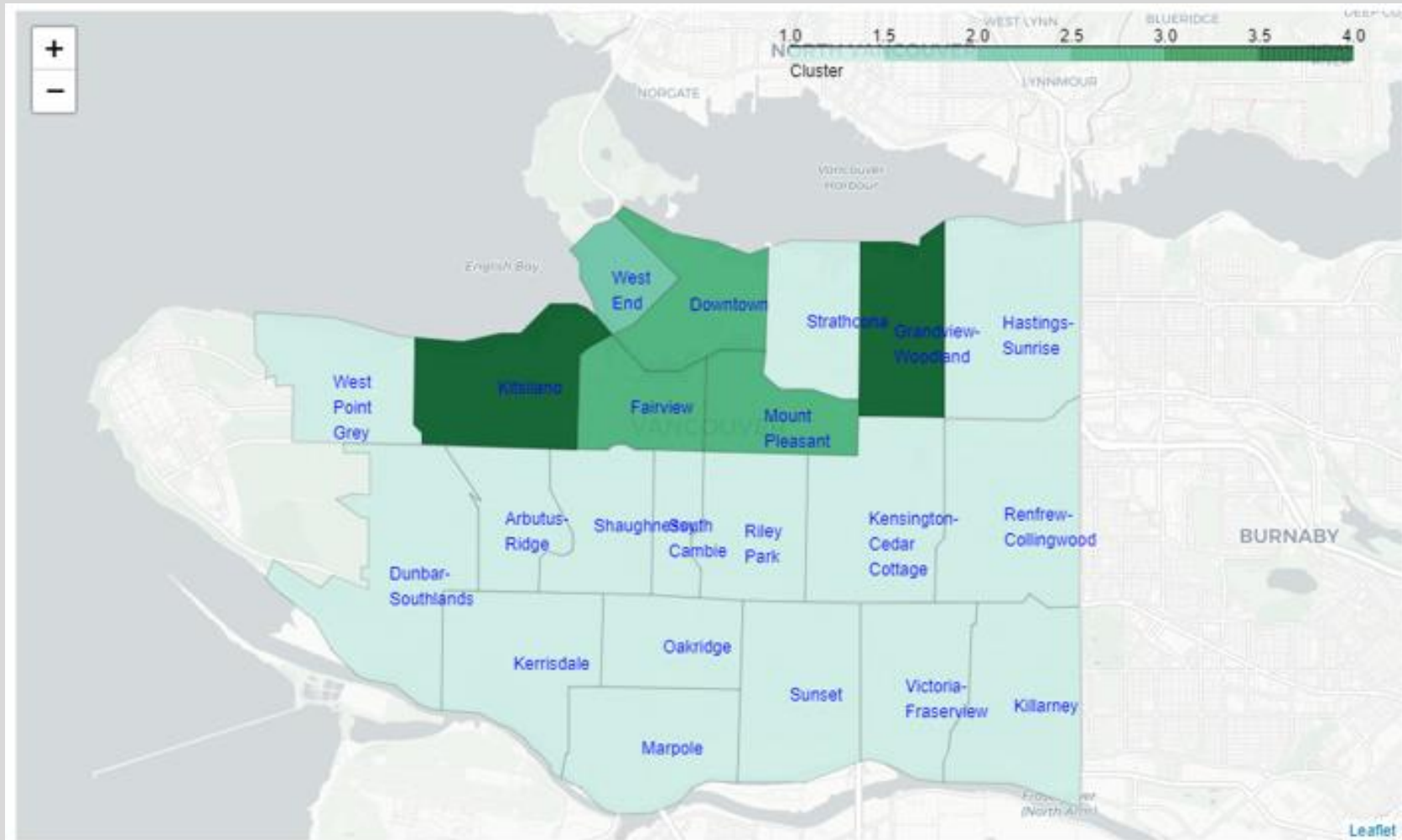
Characterizing the clusters

- **The first cluster accounted for 16 neighborhoods and had low dog density, low pub density and low dog park density. These neighborhoods are not good candidate locations for the dog bar**

- **The second cluster had a single neighborhood with high dog density, high pub density and moderate dog park density. This neighborhood might be a worthwhile candidate, but it is already fairly well served by dog parks.**

- **The third cluster had 3 neighborhoods with moderate dog density, moderate pub density but high dog park density. Again, these neighborhoods may be good candidates, but the high dog park density makes them less than ideal.**

- **The final cluster with 2 neighborhoods (Grandview-Woodlands and Kitsilano) had moderate dog density, moderate pub density but are poorly served by existing dog parks with a median dog park density of 0. These two neighborhoods would be the best candidates in which to locate the dog bar.**

Cluster	Count	Dogs/Ha (median)	Pubs/Ha (median)	Dog Parks/Ha (median)	Recommendation
1	16	1.6 (low)	0.004 (low)	0 (low)	Poor candidates
2	1	6.9 (high)	0.306 (high)	0.004 (med)	Moderate candidates
3	3	4.0 (med)	0.094 (med)	0.015 (high)	Moderate candidates
4	2	4.0 (med)	0.043 (med)	0 (low)	Good candidates

Discussion

Assumptions:

- We made a few assumptions in conducting this study, and they may or may not be significant.
  - For example, we assumed that dog license count reflects the actual number of dogs in each neighborhood. In reality, some neighborhoods with lower income levels may not license their dogs for economic reasons and this would skew the numbers.

  - The dog population data was from 2017 and may be somewhat out of date. However, the impact of using older data should be similar across neighborhoods.

  - The recent COVID-19 pandemic may have resulted in pubs being closed but not removed from the FourSquare dataset. Again, this should have impacted all neighborhoods the same way.

  - We may have underestimated the number of dog parks due to the key words we used to filter the FourSquare API data. This too should have impacted all neighborhoods the same way.

Discussion cont'd

Refinements and future studies:

- There are several opportunities to refine this analysis – some other features could be:
    - Socio-economic status, age and cultural mix of the neighborhoods
    - Analysis of the relative dog-friendliness of existing pubs
    - More fine-grained analysis of the data by avenue/street/block to identify specific addresses

- Finally, location is only one in a large number of factors that will influence the establishment of the Dogs and Suds dog bar. Future studies may need to focus on economic feasibility, the cost of property across neighborhoods, licensing and other factors.

Conclusion

Dog owners love their pets and need to take them out for exercise and socialization.
Dog bars allow them to do so while consuming their favorite beverage in a dog-friendly environment, and in doing so enjoy social interaction with like-minded pub-going dog owners.

In this study we analyzed data from several sources to identify a cluster containing two neighborhood candidate locations for a dog bar.

We conclude that the neighborhoods of Grandview-Woodlands and Kitsilano provide the best mix of a dog-owning population, existing pubs to attract visitors and that are poorly served by existing dog parks and are therefore the best candidate neighborhoods in which to locate Dogs and Suds, Vancouver's first dog bar.

Thank you!

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