

# **Expansion for Security device producers in Canada**

## **1.0 Background**

Due to human nature, security is a problem as old as mankind and should be considered along the basic needs of man which are food, water and clothes. In the 21<sup>st</sup> century, the world has advanced technologically with more sophisticated security apparatus in the bid to provide a safer, more secure neighbourhood for our families. With the concept of IOT (Internet of Things) where all our devices are connected to each other via internet connections, technology companies have been exploring the market of smart home alarm systems. Ring being the highest profile company following its acquisition by Amazon. Companies who sell "Smart" Security devices mainly offer their services through a smartphone app which is connected to other devices such as the Home security alarm and micro alarms which can be set off by a potential victim before he or she is attacked. These alarms are sent to the nearest law enforcement agency. They are mainly silent alarms which are more likely to guarantee the safety of the victims.

## **2.0 Business Problem**

Companies need to grow and expand to become more profitable and provide value to a larger market. Not every "Smart Home" company is backed by a tech giant hence for some companies

A classic problem whenever a company wants to expand outside its existing geographical market is where do we expand to? Here the reasons for the expansion differ based on a few factors mentioned below:

1. The overall goal or objective: Is the company pursuing expansion without and being profitable in the long term based on scale?(Tech companies like Uber and WeWork fit into this narrative) or are they targeting a new region that will be as profitable as their current reach and have almost immediate returns
2. The need to enter high growth or high population markets such as the Emerging Markets in order to show steady growth numbers to investors and stakeholders.

## **3.0 The Data**

The target country for this research project is Canada and the neighbourhoods of Fredericton New Brunswick have been selected as a viable neighbourhood for the SME's to expand to.

Leveraging data from Foursquare it is possible based on the company's preference to recommend neighbourhoods through their historic crime rates and check if they have similar features for their expansion. Companies with limited resources but with the aim to expand often need a higher level of certainty that this next region (city or country) will be as profitable as their current ones or in the reverse, avoid cities that are similar to their worst performing regions. From the topic, it is very clear that the interested groups in this research topic are the MSME's or Mid cap organizations who want to be able to supply security device services to multiple regions in Canada but do not have the resources to compete with the massive multi-nationals.

The data has been gathered from Argis open data which has

- 1) Data set of all crimes recorded in the Federicion region for the year 2017.
- 2) Longitude and latitude of the various neighbourhoods in Federicion.

This data will be cross referenced with the Foursquare data to find how many police stations are located within the region and the nearest station in each neighbourhood.

## **4.0 Objective:**

- 1) To identify the best neighbourhood for home security devices
- 2) To identify the best neighbourhood for the wearable devices.

## **5.0 Methodology:**

### **5.1 Data exploration:**

The Federicion data set was explored to understand the frequency of crimes per Neighbourhood and the most frequently occurring crimes. A groupby pandas function was used for this and the average crime per day across the region was calculated. Descriptive statistics were used to understand the nature of the data especially the number of crimes by Neighbourhood.

The Neighbourhoods were then segmented according to their crimes occurences to identify the best neighbourhood to focus on.

### **5.2Machine Learning Algorithm:**

K-Means clustering was used to cluster the different neighbourhoods to back up the visual analysis. The shortcoming of this algorithm is if each neighbourhood has a subset within each group such as this. Another limitation is that the data set is for 2017 meaning it could be less relevant in 2020 and beyond however the data represents a good standpoint for the target audience.

## **6.0 Findings:**

1. From the data set, there are 66 neighbourhoods, 12 Wards and 19 classifications of crime or crime types.
2. For the home security devices, the target crimes are the Breaking and Entry.
  - A) B&E Residence
  - B) B&E Non-residence
  - C) B&E others.
3. For the wearable devices the most suitable crime is theft. Since home security devices are cheaper to produce and maintain, the focus will be on it.
4. There are 4 neighbourhoods without any crime records and have been treated as outliers.

	Neighbourhood	Crime_Code	Crime_Type	Ward	City	FID
993	Knowledge Park	0		0		994
999	Grasse Circle	0		0		1000
1134	Fredericton South	0		0		1135
1449	Wesbett / Case	0		0		1450

Figure 1 Neighbourhoods with 0 crimes recorded

5. The results of the exploratory data analysis were:
  - A) There were on average 22 crimes per neighbourhood while the minimum recorded was 1 crime all year
  - B) 50% of the neighbourhood recorded 9 crimes and below.
  - C) The highest number of crimes recorded were 198. The image below depicts the descriptive statistical tools used.

	Frequency
count	66.000000
mean	22.121212
std	34.879359
min	1.000000
25%	3.000000
50%	9.000000
75%	23.250000
max	198.000000

6. The top 5 neighbourhoods in terms of crime frequency were identified as the best neighbourhoods to start. The next step was to identify the different crimes in these neighbourhoods and pick out the Neighbourhood to start with.

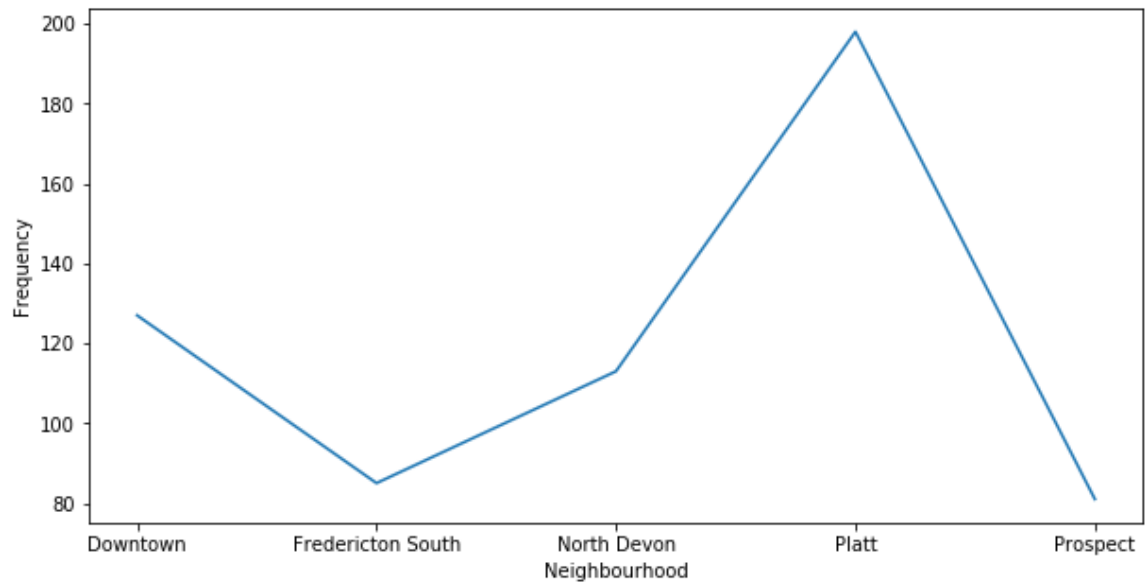


Figure 2 Top 5 Neighbourhoods by crime frequency 2017

7. The top 5 crime types were also identified to see if the market is very viable for the home security devices. B&E Residence is in the top 5 however it is clear that “Theft OTH <\$5000” is the most rampant crime.

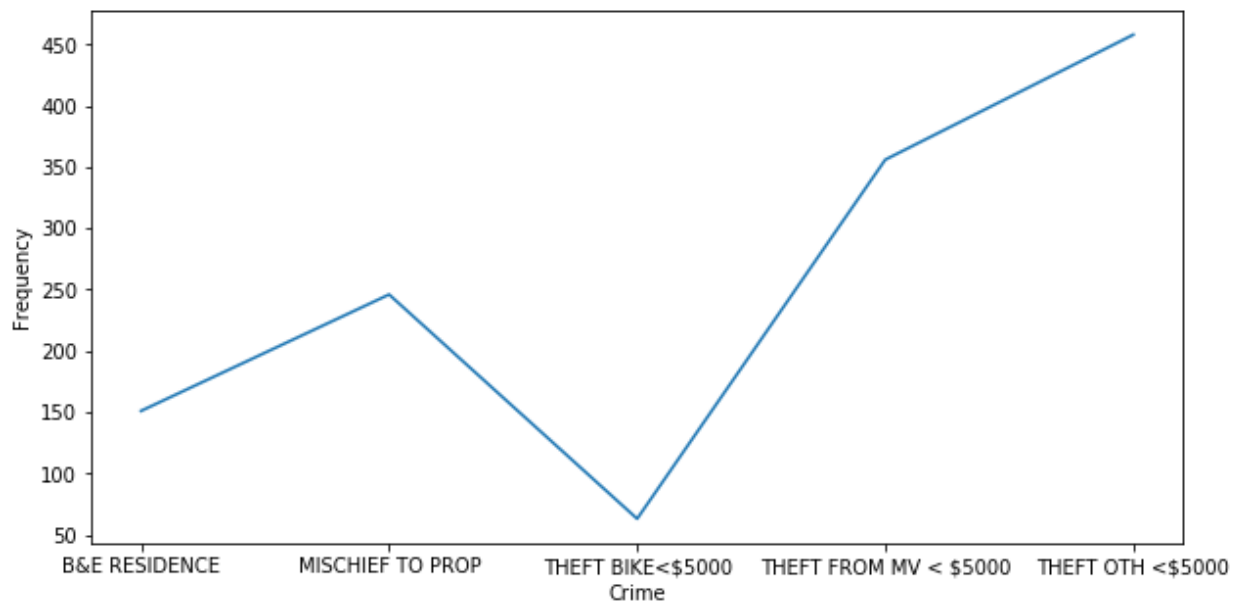


Figure 3 Top 5 crimes committed 2017

8. It is now clear that North Devon Neighbourhood is the perfect neighbourhood to focus the home security devices since it has the highest B&E Residence rate amongst the top 5. Platt is a clear prime market for the wearable devices because it has the highest crime rate and the highest theft rates.

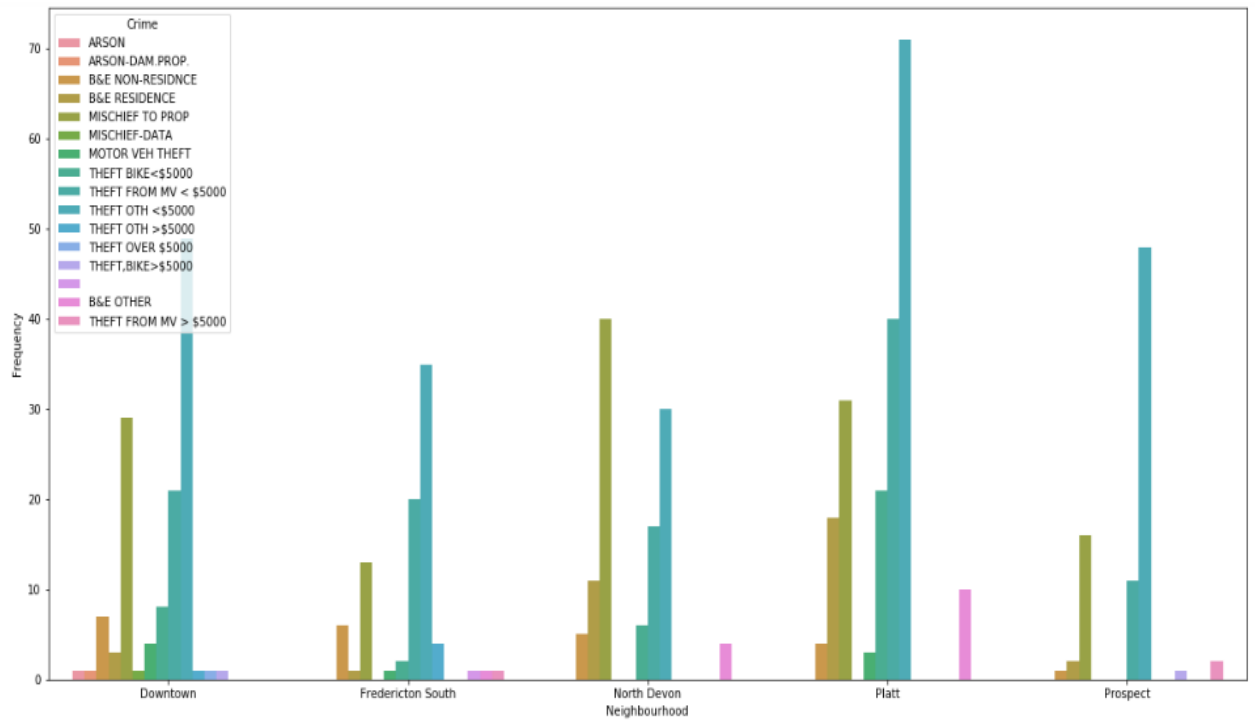


Figure 4 Crimes Committed per neighbourhood

## 7.0 Conclusion:

In conclusion, the North Devon and Platt Neighbourhoods have been chosen as prime neighbourhoods to focus resources on for any security company.