Capstone AAA Projet Martin George mgeorgevienna@gmail.com

Visualization of location data using Folium tools

Reading Excel file in to

In [4]:
```
%matplotlib inline
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
data = pd.read_csv('member_sample.csv', index_col = 0)
```

In [5]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 21344 entries, 0 to 99998
Columns: 112 entries, Individual Key to Was Towed To AAR Referral
dtypes: float64(35), object(77)
memory usage: 18.4+ MB
```

In [6]:
```
data.head()
```

Out[6]:

	Individual Key	Household Key	Member Flag	City	State - Grouped	ZIP5	ZIP9	FSV CMSI Flag	FSV Credit Card Flag	FSV Deposit Program Flag	...	SC Vehicle Manufacturer Name	SC Vehicle Model Name	Fa I
0	10000003.0	10462590.0	Y	NEW HAVEN	CT	6511.0	65111349.0	N	N	N	...	NaN	NaN	
1	52211550.0	4500791.0	Y	WEST WARWICK	RI	2893.0	28933850.0	N	Y	N	...	TOYOTA	CAMRY	AS WREC SER
2	52211550.0	4500791.0	Y	WEST WARWICK	RI	2893.0	28933850.0	N	Y	N	...	TOYOTA	CAMRY	Wr Sc
3	52211550.0	4500791.0	Y	WEST WARWICK	RI	2893.0	28933850.0	N	Y	N	...	TOYOTA	CAMRY	AS WREC SER
4	52211550.0	4500791.0	Y	WEST WARWICK	RI	2893.0	28933850.0	N	Y	N	...	TOYOTA	CAMRY	AS WREC SER

5 rows × 112 columns

In [41]:
```
data[['Tow Destination Latitude','Tow Destination Longitude']].info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 21344 entries, 0 to 99998
Data columns (total 2 columns):
 #   Column                     Non-Null Count  Dtype  
---  ------                     --------------  -----  
 0   Tow Destination Latitude   11813 non-null  float64
 1   Tow Destination Longitude  11813 non-null  float64
dtypes: float64(2)
memory usage: 500.2 KB
```

In [130]:
```
lat_long_0 = data[['Tow Destination Latitude','Tow Destination Longitude']].dropna().iloc[:5000]
lat_long = data[['Tow Destination Latitude','Tow Destination Longitude','Total Cost']].dropna().iloc[:5000]
```

In [106]:
```
lat_long.head()
```

Out[106]:

	Tow Destination Latitude	Tow Destination Longitude	Total Cost
1	41.0	-71.0	32.5
2	0.0	0.0	30.0
3	0.0	0.0	32.5
4	0.0	0.0	30.0
5	0.0	0.0	53.0

In [68]:
```
!pip install folium
```

```
Requirement already satisfied: folium in c:\users\unodc\anaconda3\lib\site-packages (0.11.0)
Requirement already satisfied: numpy in c:\users\unodc\anaconda3\lib\site-packages (from folium) (1.18.1)
Requirement already satisfied: branca>=0.3.0 in c:\users\unodc\anaconda3\lib\site-packages (from folium) (0.
4.1)
Requirement already satisfied: requests in c:\users\unodc\anaconda3\lib\site-packages (from folium) (2.22.0)
Requirement already satisfied: jinja2>=2.9 in c:\users\unodc\anaconda3\lib\site-packages (from folium) (2.11.
1)
Requirement already satisfied: chardet<3.1.0,>=3.0.2 in c:\users\unodc\anaconda3\lib\site-packages (from requ
ests->folium) (3.0.4)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\unodc\anaconda3\lib\site-packages (from request
s->folium) (2019.11.28)
Requirement already satisfied: idna<2.9,>=2.5 in c:\users\unodc\anaconda3\lib\site-packages (from requests->f
olium) (2.8)
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in c:\users\unodc\anaconda3\lib\site-p
ackages (from requests->folium) (1.25.8)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\unodc\anaconda3\lib\site-packages (from jinja2>=
2.9->folium) (1.1.1)
```

In [69]:
```
import folium
```

In [120]:
```
loc_1 = lat_long_0.iloc[0]
```

In [121]:
```
loc_1
```

Out[121]:
```
Tow Destination Latitude     41.0
Tow Destination Longitude   -71.0
Name: 1, dtype: float64
```

In [82]:
```
#loc = data[['Tow Destination Latitude','Tow Destination Longitude','Total Cost']].dropna()
#loc.head()
#loc.shape
```

Out[82]:
```
(11798, 3)
```

In [ ]:
```

```

In [122]:
```
m = folium.Map(location = loc_1)
```

In [ ]:
```

```

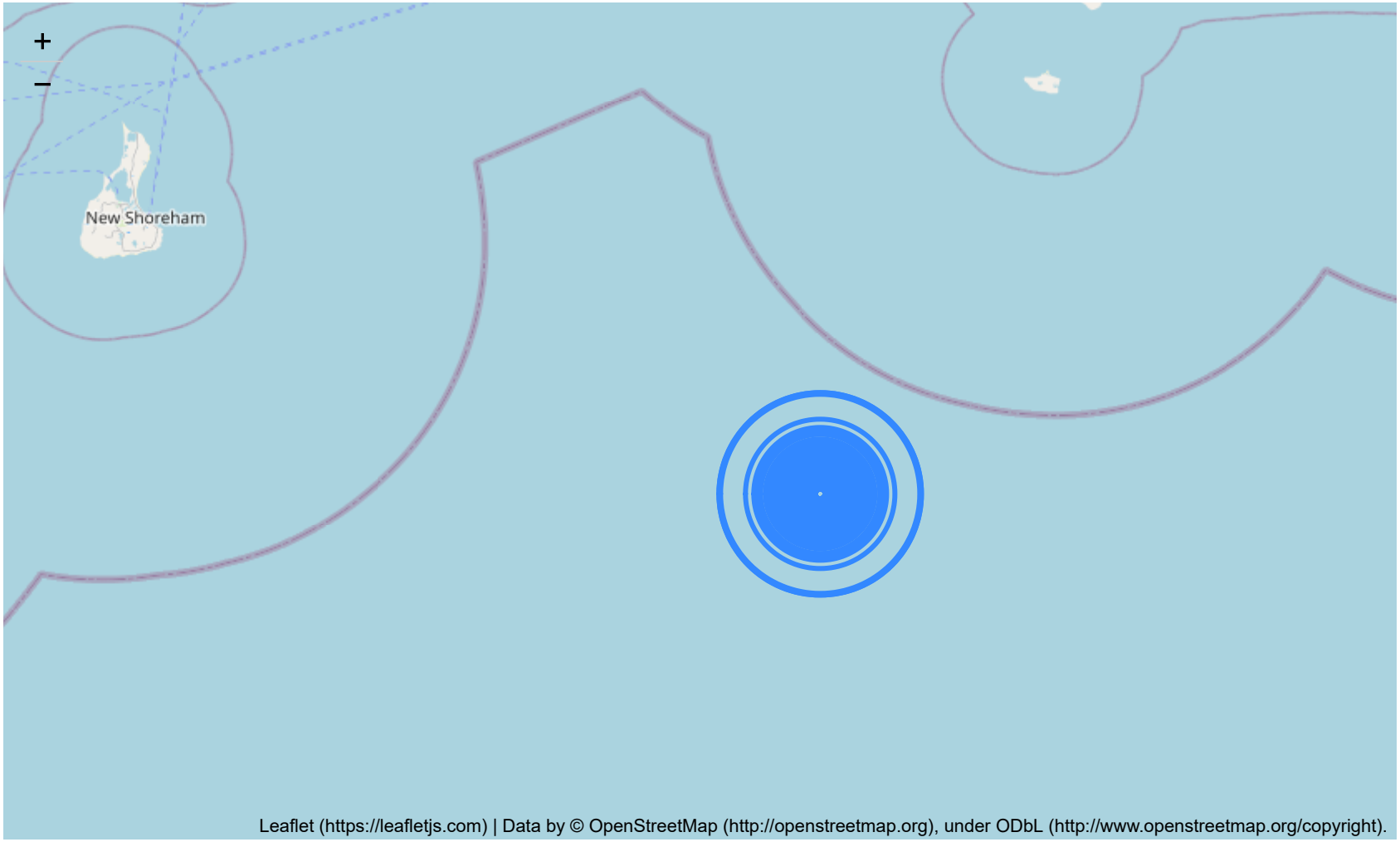
In [131]:
```
def add_marker(x):
    folium.CircleMarker(location = [x[0],x[1]], radius = x[2]/5).add_to(m)
```

In [132]:
```
lat_long.apply(add_marker, axis = 1)
```

Out[132]:
```
1        None
2        None
3        None
4        None
5        None
         ...
16344    None
16345    None
16348    None
16349    None
16354    None
Length: 5000, dtype: object
```

In [133]:
```
m
```

Out[133]:



Conclusion: This graphical visualization clearly shows that some of the existing data on Tow destination is wrong. Circle size shows the how the total cost associated with each Tow.