



Cartography – Bring Your Data to Life

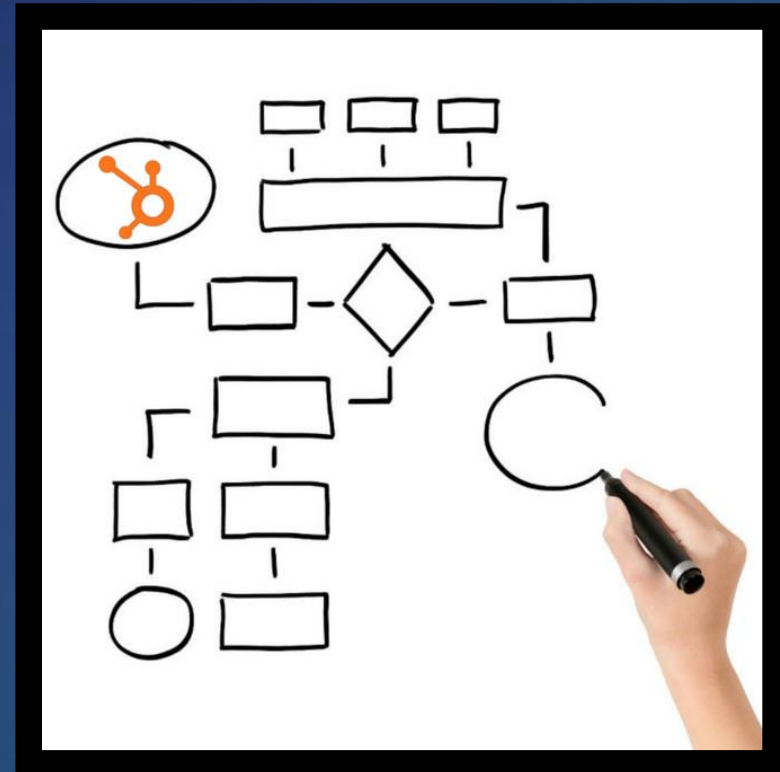
Clint Loveman

An abstract graphic on the right side of the slide. It features a 3D perspective of geometric shapes in shades of blue, orange, and green. Overlaid on these shapes are white topographic contour lines and a cluster of small orange dots, suggesting data visualization or GIS mapping.

**GIS
INSPIRING
WHAT'S
NEXT**

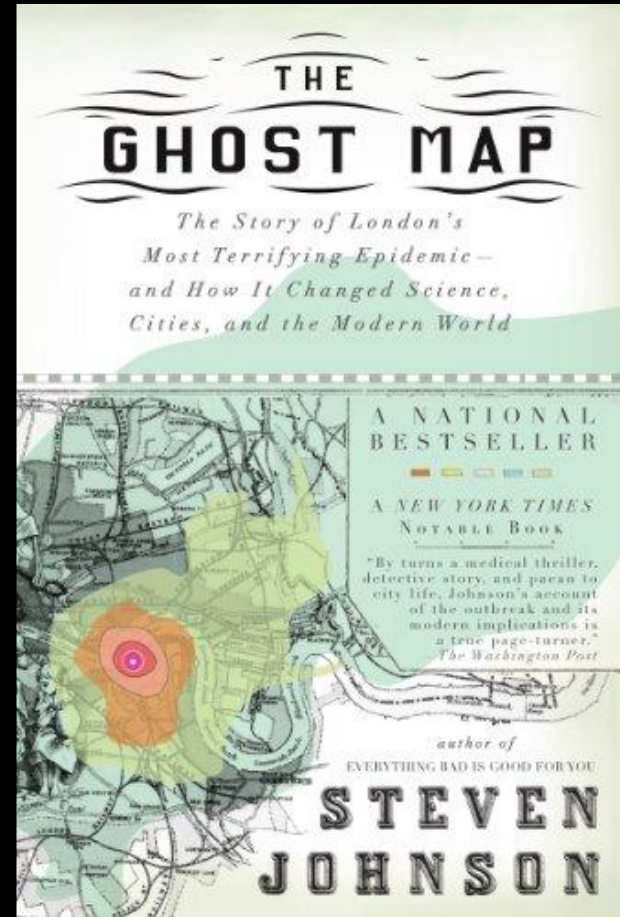
Workflow

CUSTOM IS KEY



Best Workflow Design Begins Open-ended

FREEDOM IN THE LACK OF INITIAL SPECIFICITY



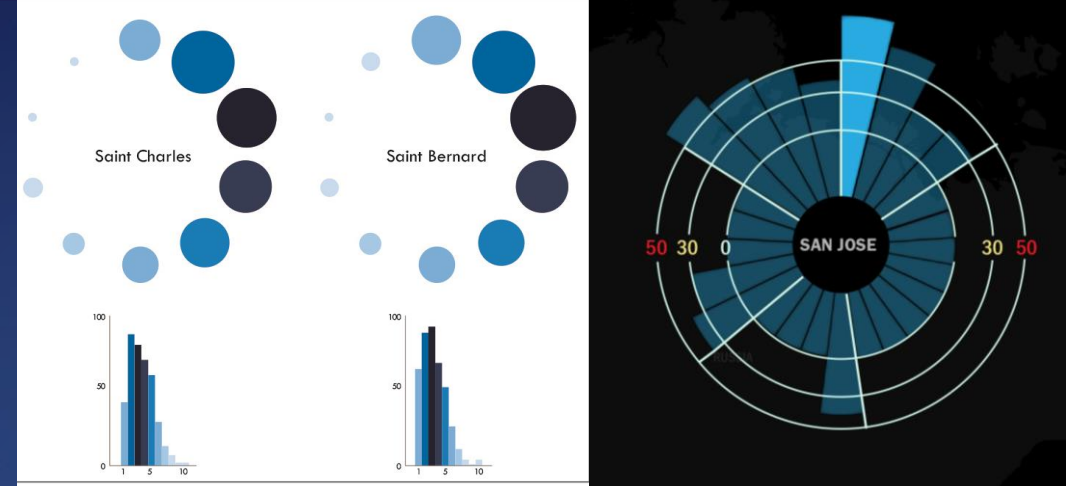
Mapping & Visualization

UNPACKING THE JARGON

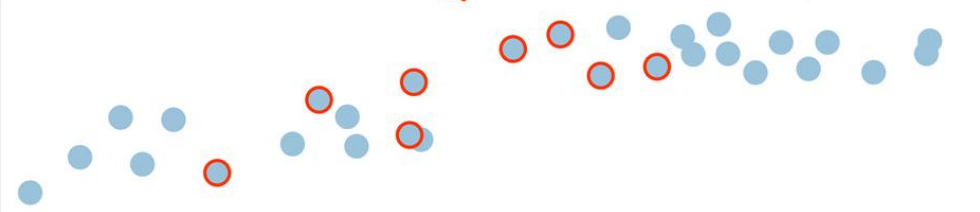
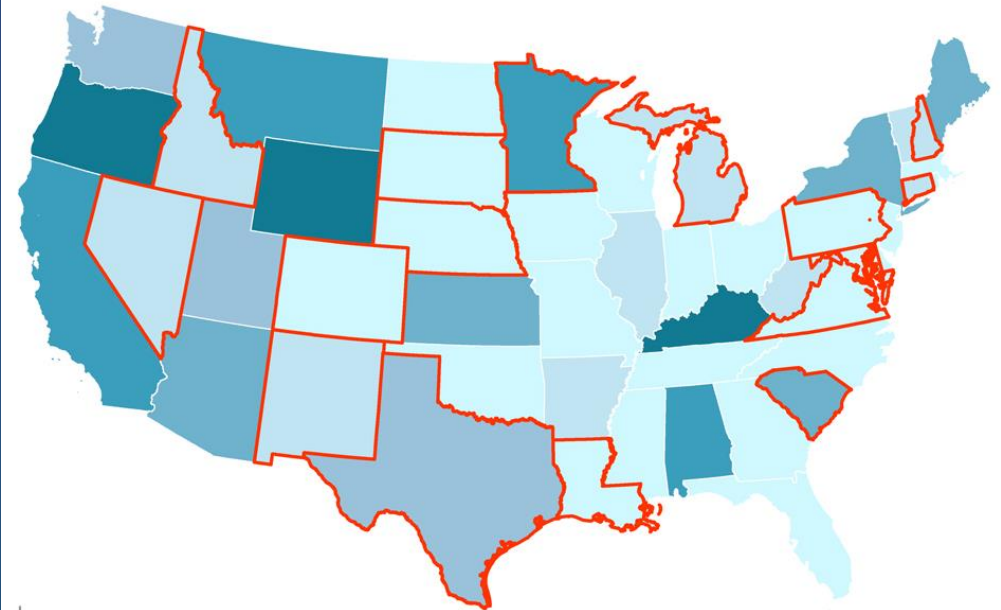
VISUALIZATION – *“The representation of an object, situation, or set of information as a chart or other image”* – Oxford Dictionaries, 2017

INFORMATION VISUALIZATION – *“Information visualization is the process of representing data in a visual and meaningful way so that a user can better understand it.”* – Interaction Design Foundation, 2017 (www.interaction-design.org)

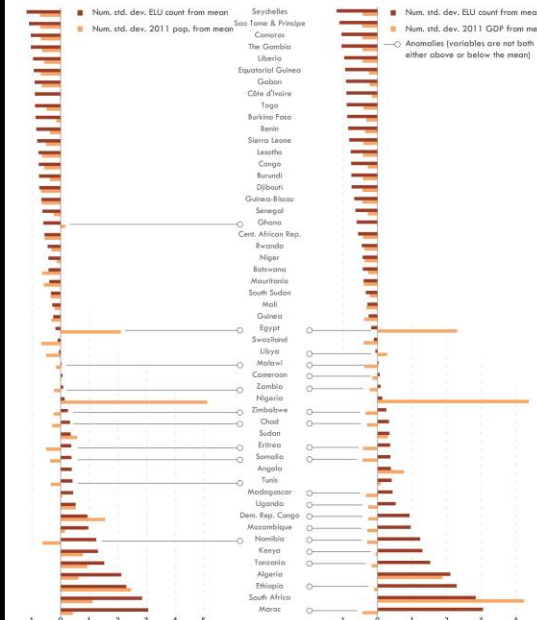
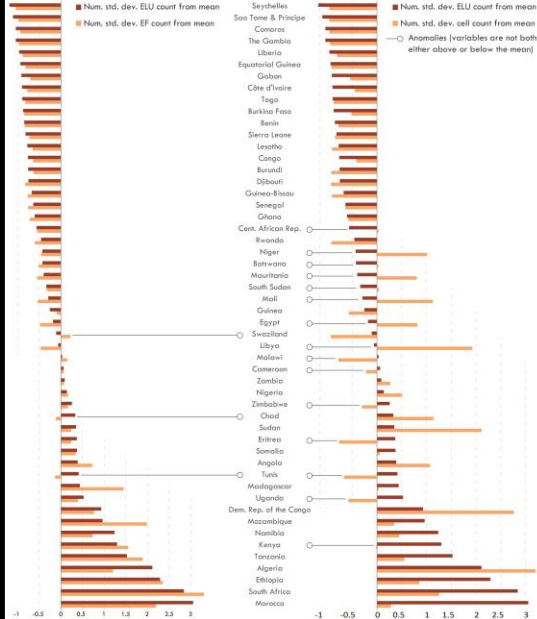
DATA VISUALIZATION – *“Information visualization with datasets.”*



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Comparison of σ for ELU Count & other Variables for African Countries (EF count, cell count, population, GDP)



Correspondence Analysis of African Countries for Boolean Above/Below Median Value



Correlation Matrix of African Countries Variables

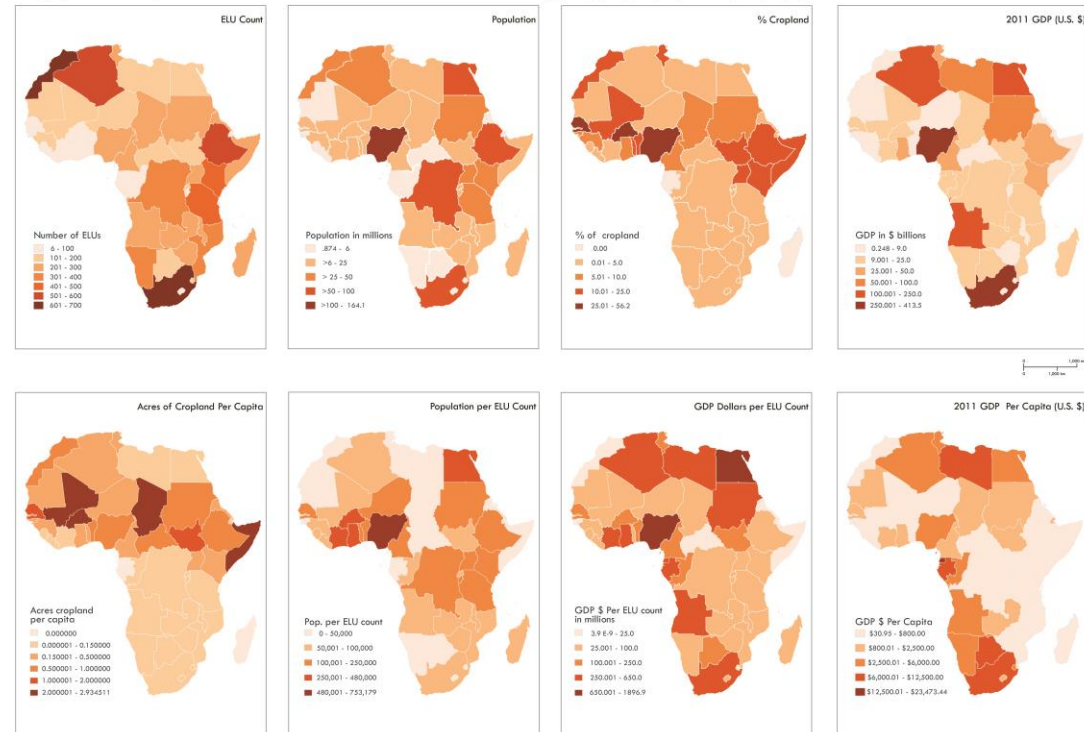
ELU Count	EF Count	2011 Pop.	2011 GDP (US\$)	2011 GDP Per Capita	% Cropland	Acres Cropland Per Cap.	Life Expectancy	Annual Rate of Fertilizer Change*
1	0.744727	0.672581	0.607186	0.724288	0.188774	0.118482	0.347473	0.000000
EF Count	1	0.68173	-0.08836	-0.12035	0.188774	1	0.347473	0.000000
2011 Population	0.68173	1	0.423299	0.480659	0.118482	1	0.090225	0.000000
2011 GDP (US\$)	0.38537	0.374146	0.724288	1	0.22403	-0.12444	0.022955	1
2011 GDP Per Capita	-0.08173	-0.08836	-0.12035	1	0.22403	-0.12444	0.022955	0.022955
Acres Cropland	0.22403	0.118482	0.423299	0.480659	1	1	0.090225	0.090225
% Cropland	0.118482	0.118482	0.423299	0.480659	1	1	0.090225	0.090225
Acres Cropland Per Cap.	-0.06783	-0.10232	0.260223	0.106963	-0.22403	-0.12444	1	0.090225
Life Expectancy	0.022955	0.022955	0.022955	0.022955	0.022955	0.022955	1	1
Annual Rate of Fertilizer Change*	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1

Statistical Exploration of Africa's ELUs & Related Variables

The Countries of Africa



Geographic Summary of African Countries' ELUs and Relation to other Variables (population, % cropland, GDP, acres of cropland per capita)

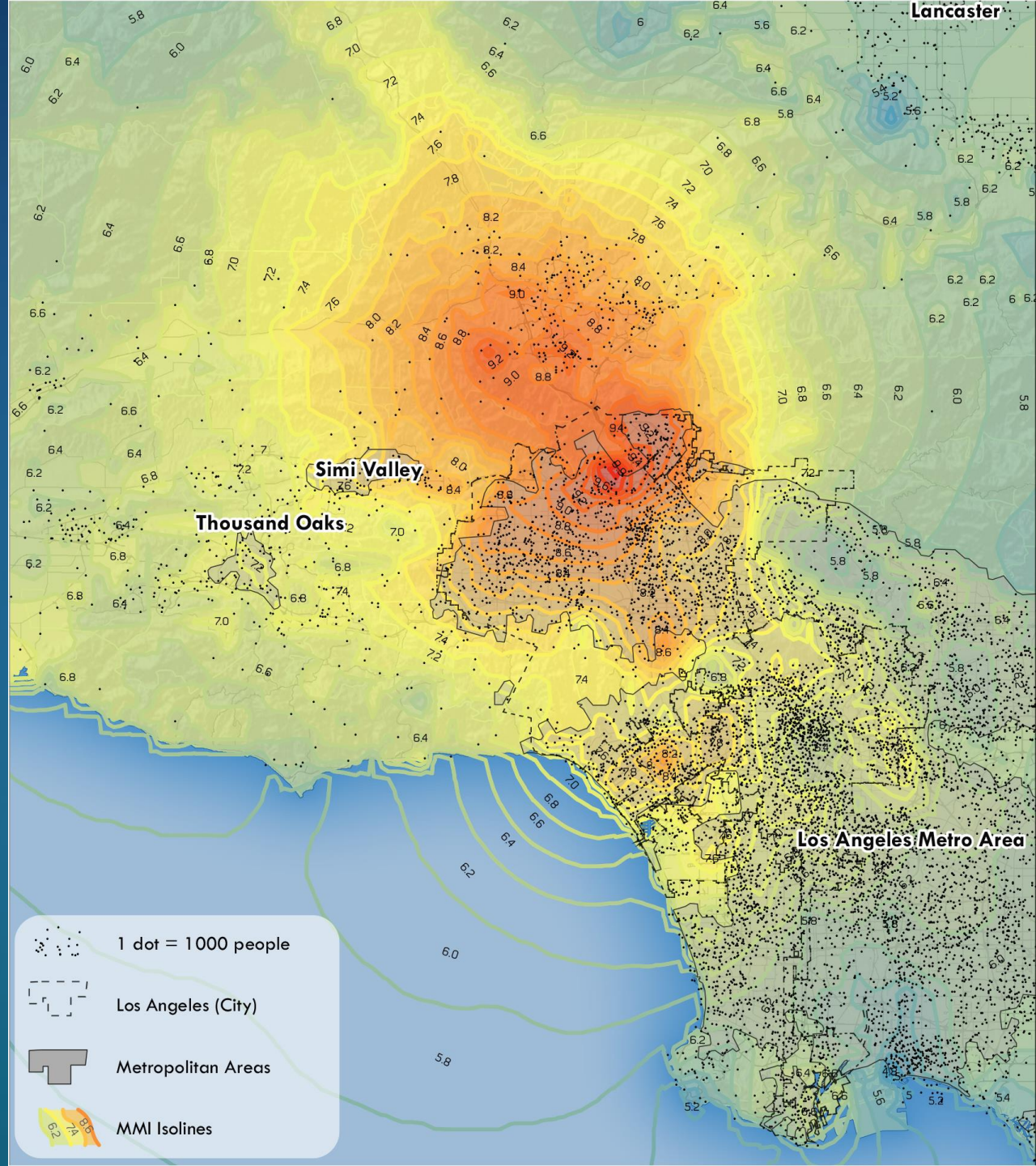


The Right Viz for the Data

OPTIMIZING DATA COMMUNICATION

Point Data

1. Geoprocessing rows and columns into point data is straightforward
2. Point data is the simplest way to indicate location on a map
3. There are several methods to visualize point data



Vancouver, British Columbia

THE RIGHT VIZ FOR THE DATA

Year, Month, Day, Hour, Minute

Neighborhood

FID	Shape	TYPE	YEAR	MONTH	DAY	HOUR	MINUTE	H_BLOCK	N_HOOD
0	Point	Mischief	2003	7	9	23	15	31XX E 58TH AVE	Killarney
1	Point	Mischief	2003	1	12	6	0	8XX PRINCESS AVE	Strathcona
2	Point	Theft from Vehicle	2003	3	29	18	0	18XX W 61ST AVE	Kerrisdale
3	Point	Theft from Vehicle	2003	10	5	23	0	18XX W 63RD AVE	Kerrisdale
4	Point	Mischief	2003	6	29	21	0	31XX E 62ND AVE	Killarney
5	Point	Theft from Vehicle	2003	1	14	12	0	22XX W 37TH AVE	Arbutus Ridge
6	Point	Mischief	2003	10	5	11	45	8XX PRIOR ST	Strathcona
7	Point	Theft from Vehicle	2003	8	30	15	30	4XX BROUGHTON ST	Central Business Dist...
8	Point	Theft from Vehicle	2003	10	16	2	0	60XX YEW ST	Kerrisdale
9	Point	Theft from Vehicle	2003	3	30	22	0	18XX W 64TH AVE	Kerrisdale
10	Point	Theft from Vehicle	2003	9	3	3	10	60XX YEW ST	Kerrisdale
11	Point	Theft from Vehicle	2003	1	31	18	30	24XX W 1ST AVE	Kitsilano

Over 46 thousand records

Type of crime:

Break & Enter Commercial'

Break & Enter Residential/Other

Mischief

Other Theft

Theft from Vehicle

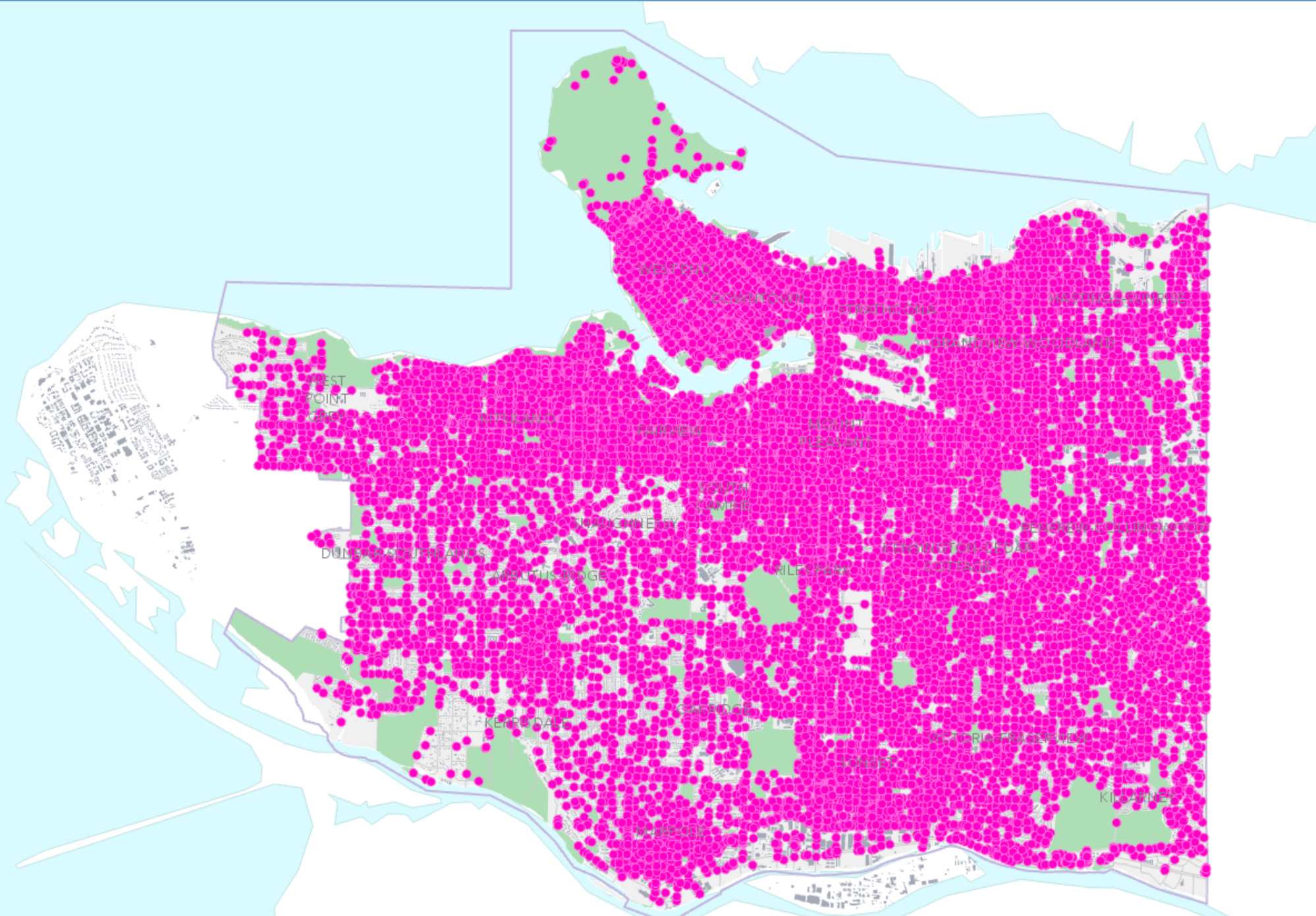
Theft of Bicycle

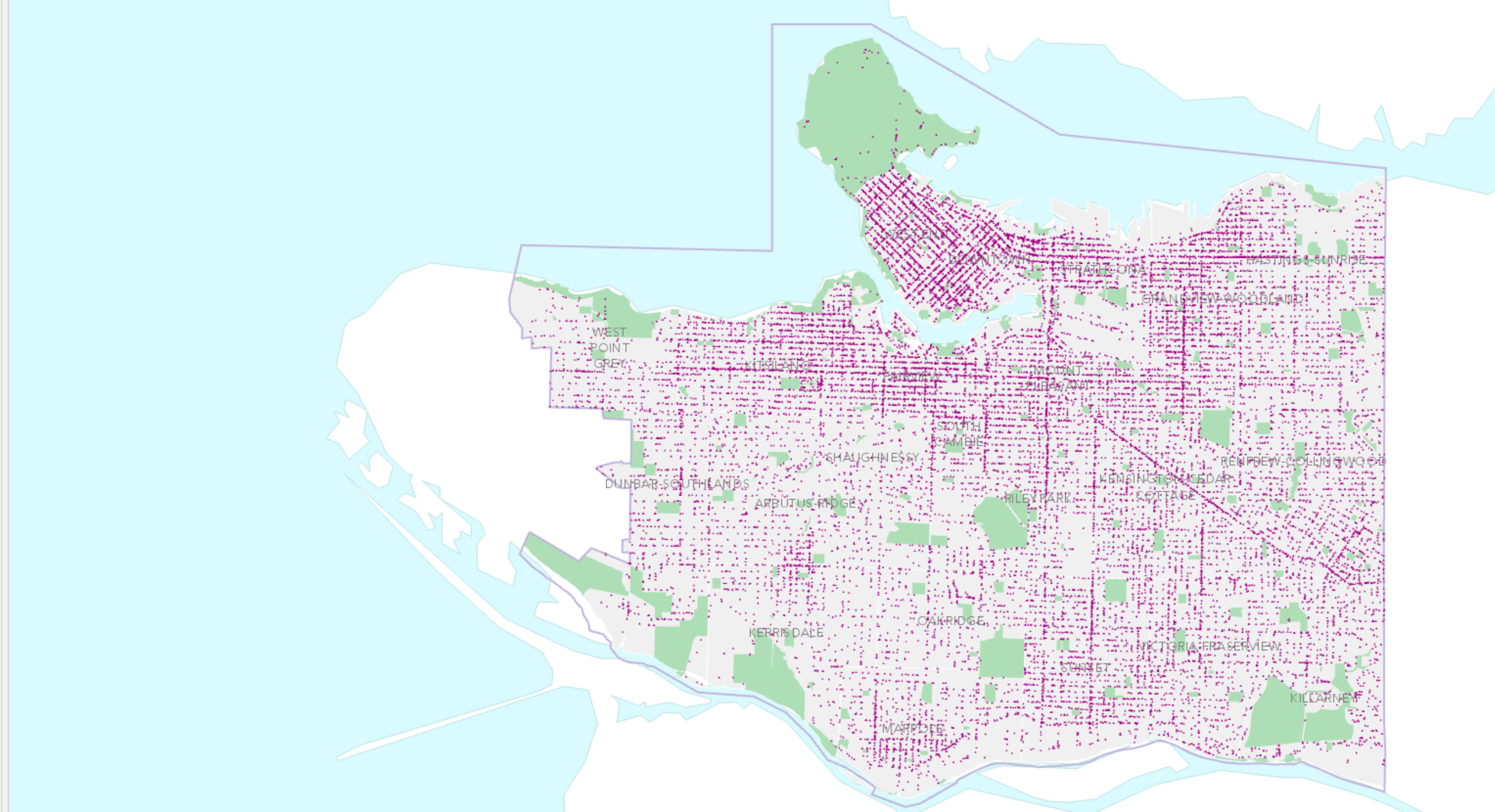
Theft of Vehicle

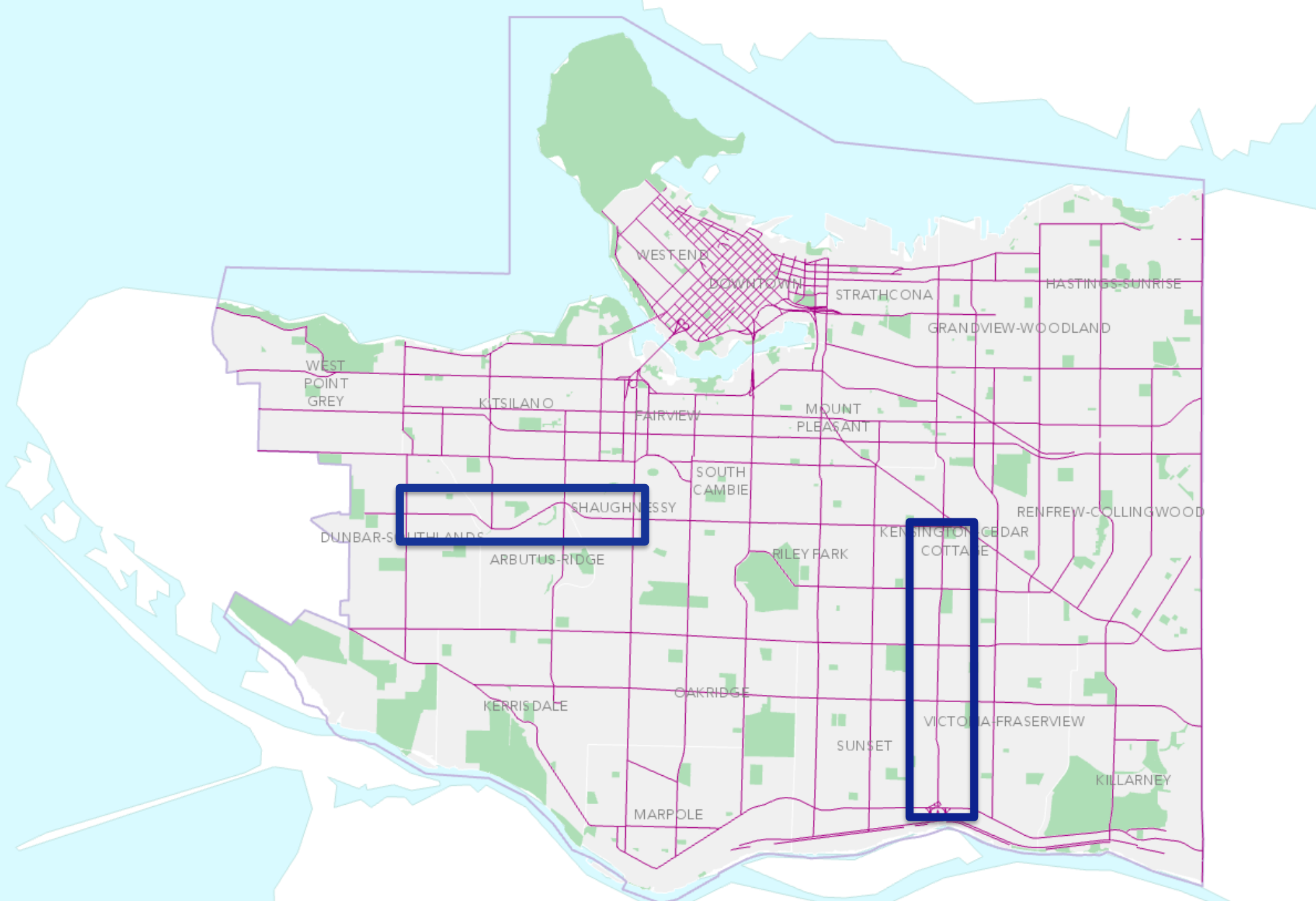
Vehicle Collision

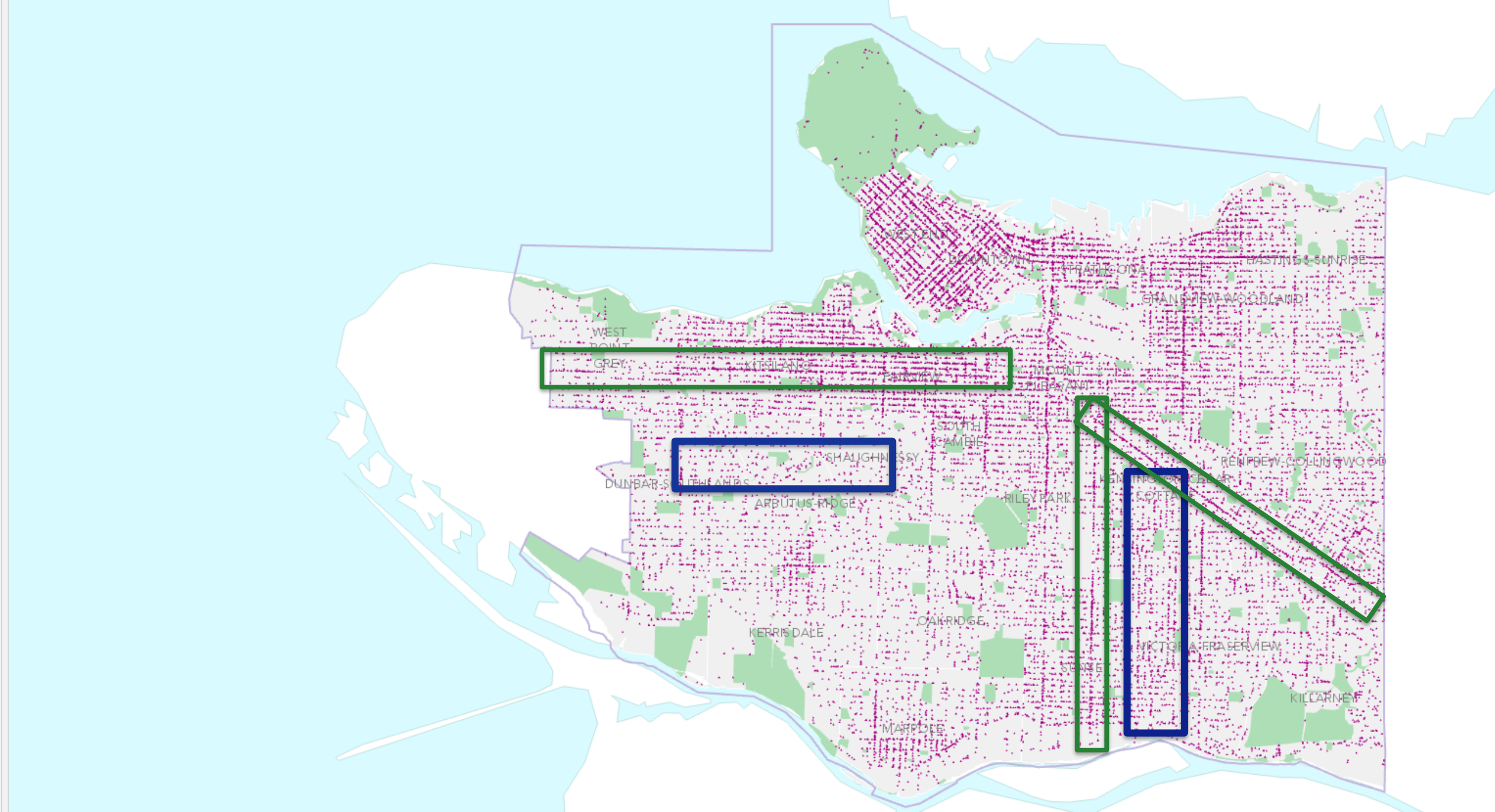
Legal Disclaimer

The release of Vancouver Police Department (VPD) crime data is intended to enhance community awareness of policing activity in Vancouver. Users are cautioned not to rely on the information provided to make decisions about the specific safety level of a specific location or area. All data must be considered offset and users should not interpret any locations as related to a specific person or specific property.









THEFT OF A VEHICLE

THEFT FROM A VEHICLE

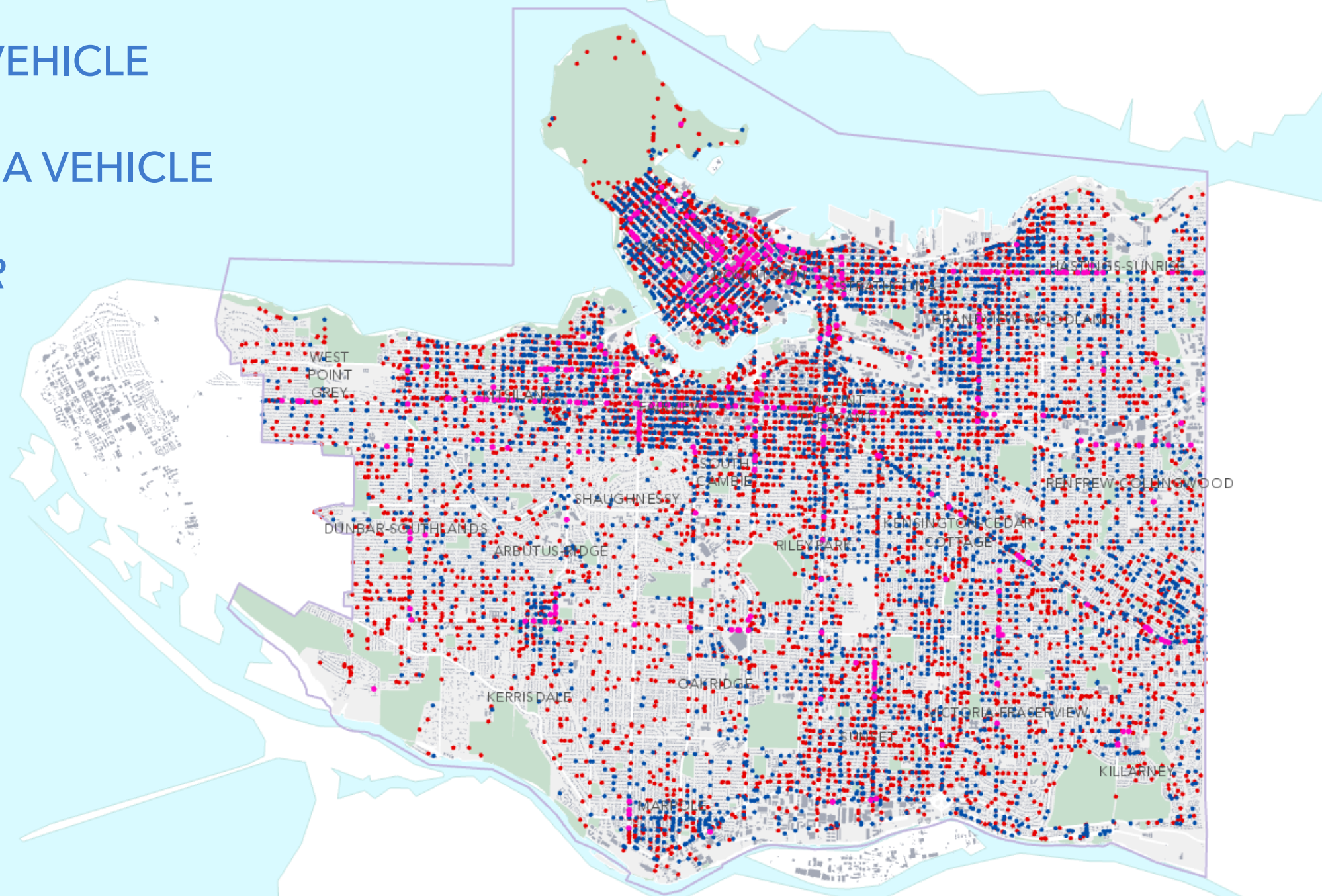
THEFT OTHER



THEFT OF A VEHICLE

THEFT FROM A VEHICLE

THEFT OTHER



WEST POINT GREY

DUNBAR-SOUTHLANDS

KERRIS DALE

OAKRIDGE

MARBLE

SHAUGHNESSY

ARBUTUS RIDGE

SOUTH CAMBIE

RILEY PARK

WILLOW GROVE

STANTON

KENNINGTON CEDAR COTTAGE

SUNSET

VICTORIA GRACERVIEW

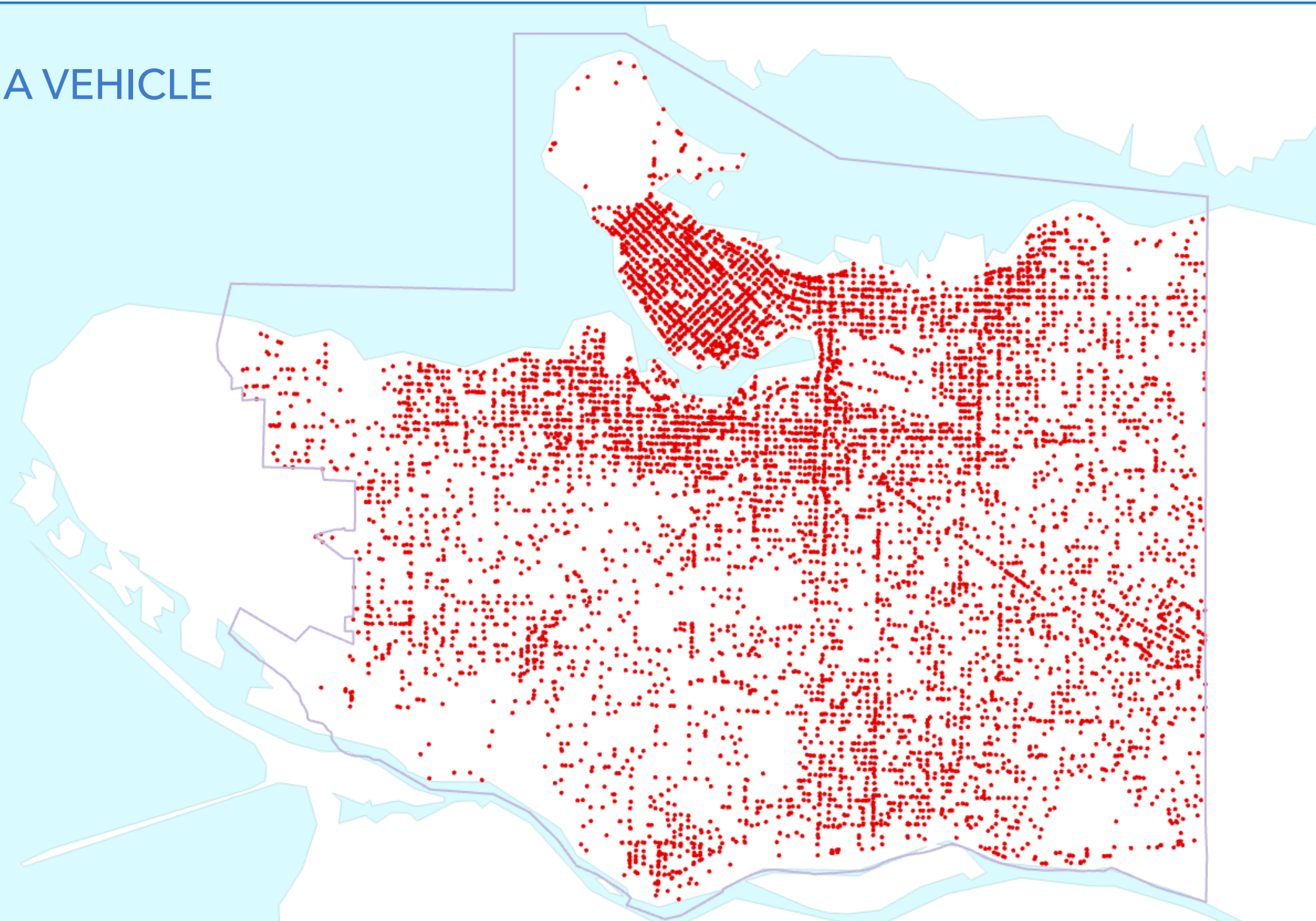
REDFREW COLINGWOOD

KILLARNEY

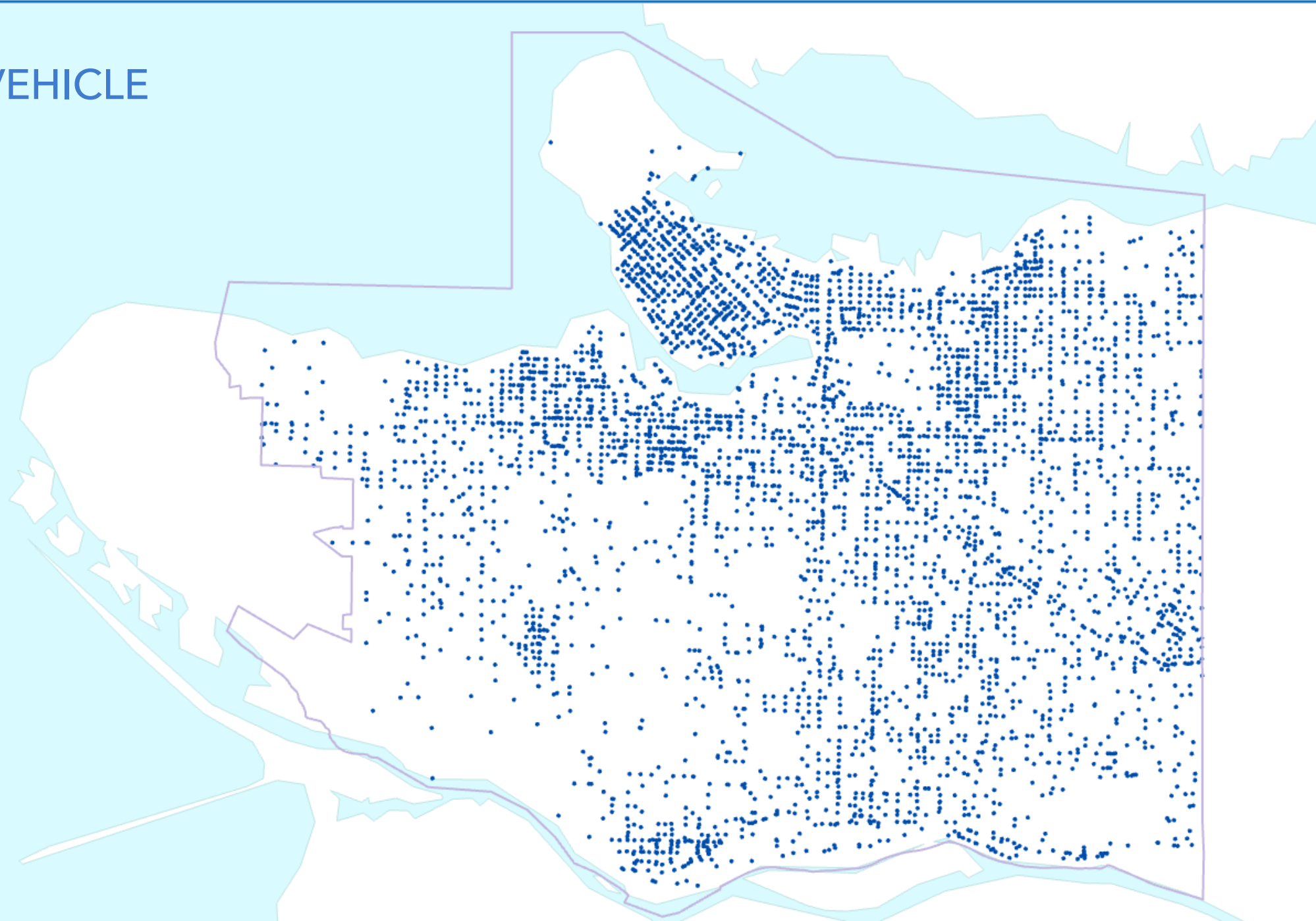
GRANVIEW WOODLAND

HASTINGS SUNRISE

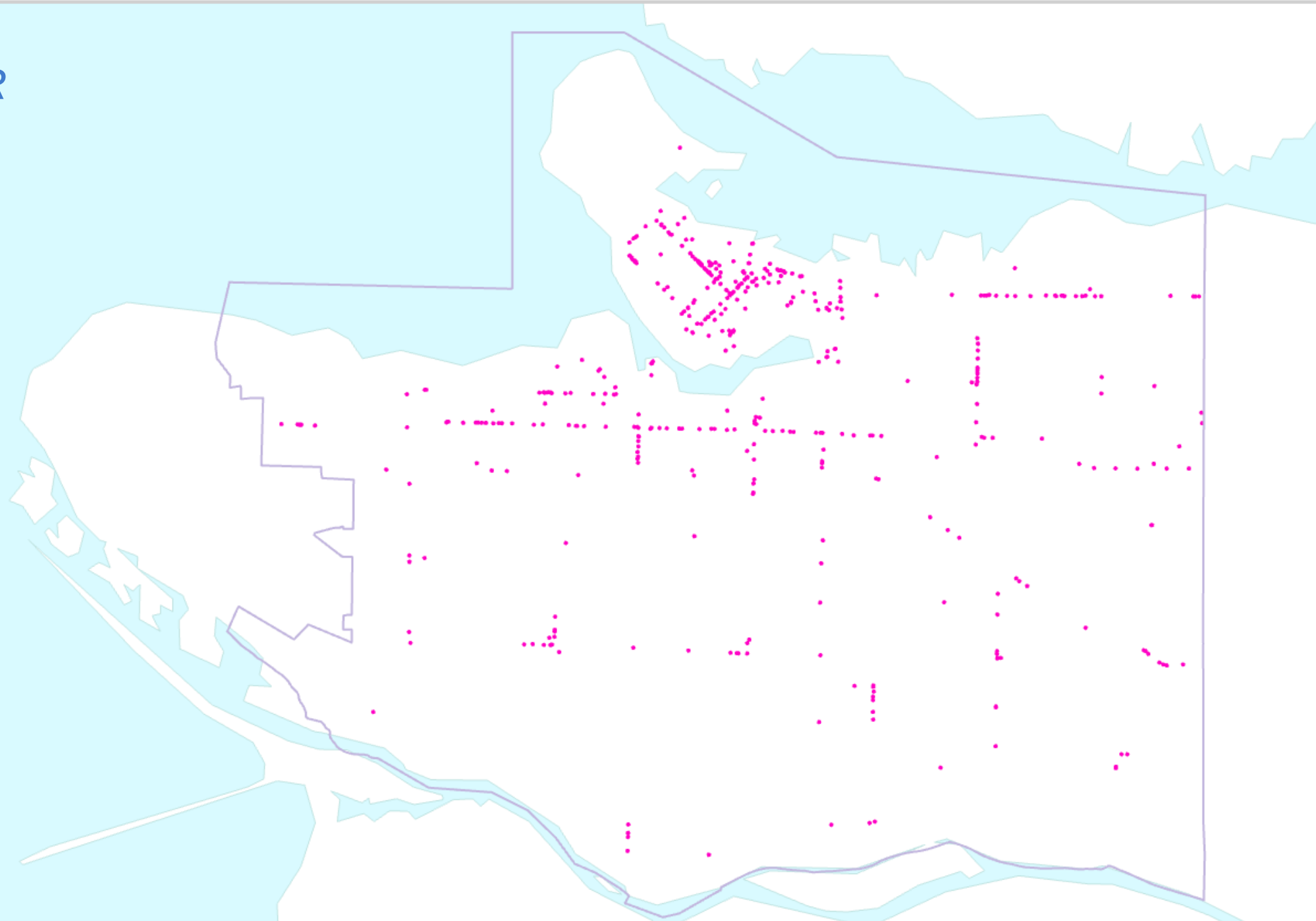
THEFT FROM A VEHICLE



THEFT OF A VEHICLE

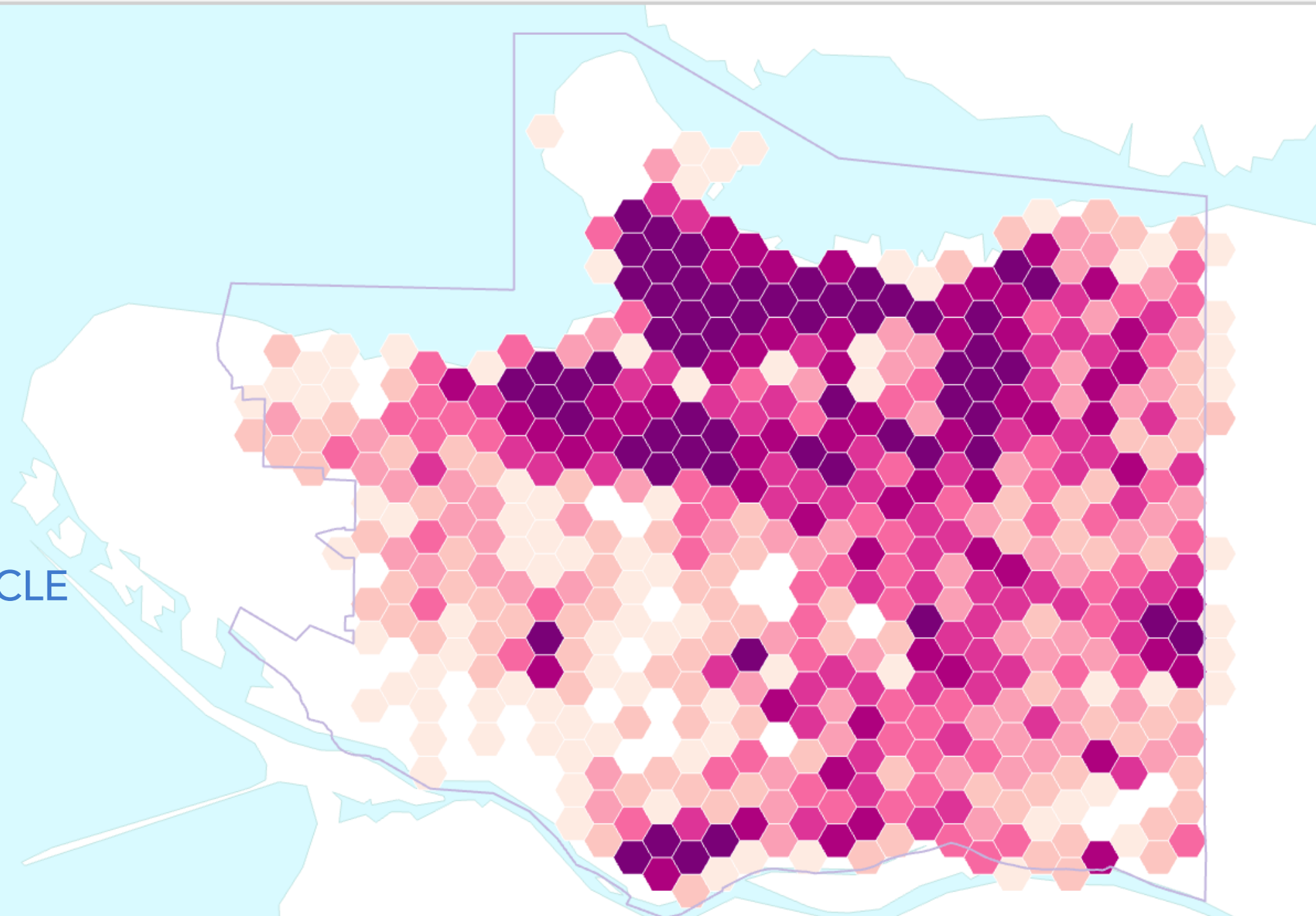
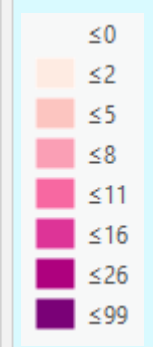


THEFT *OTHER*



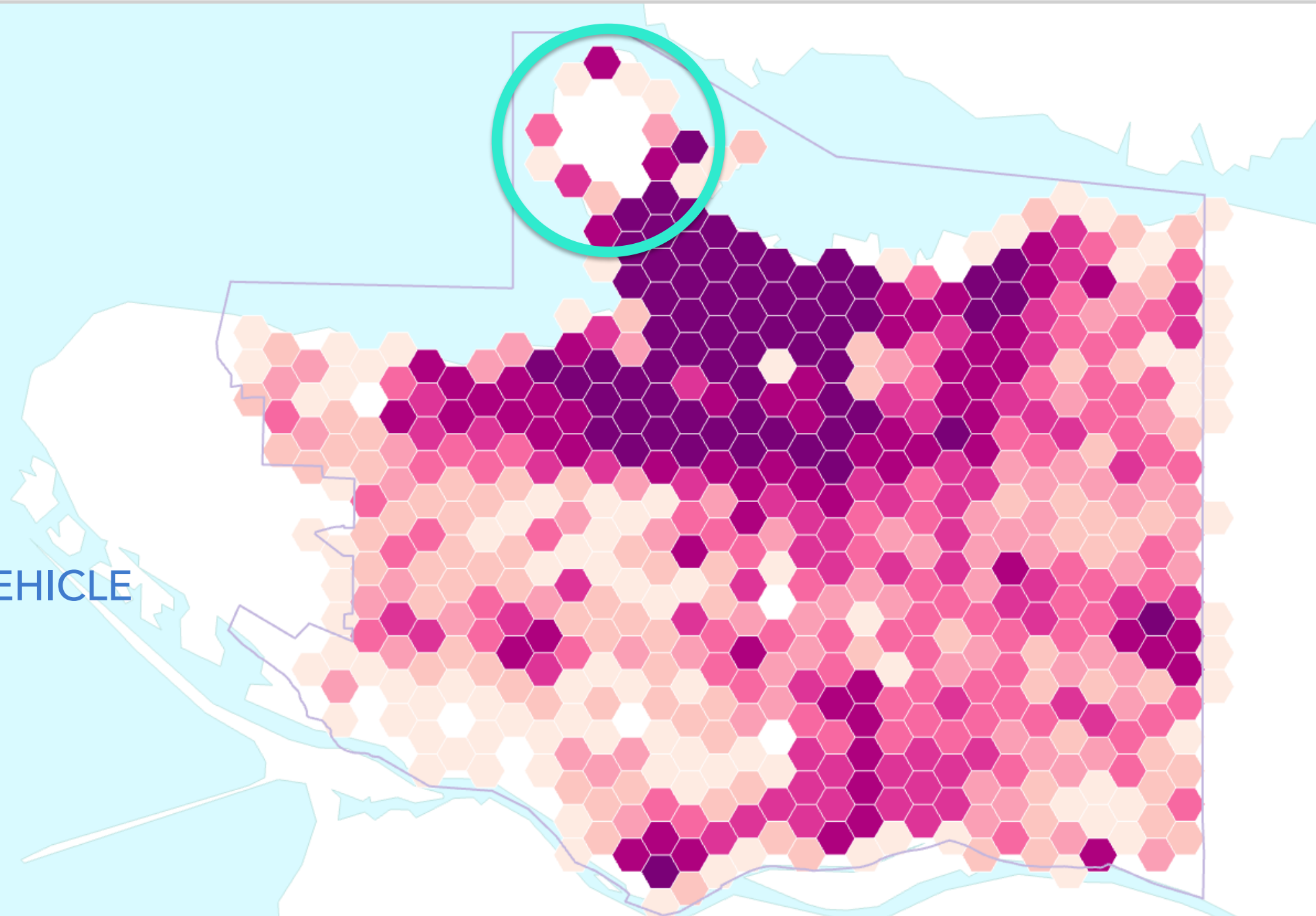
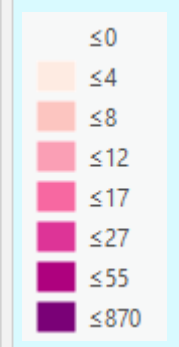
Hex Binning

THEFT OF A VEHICLE



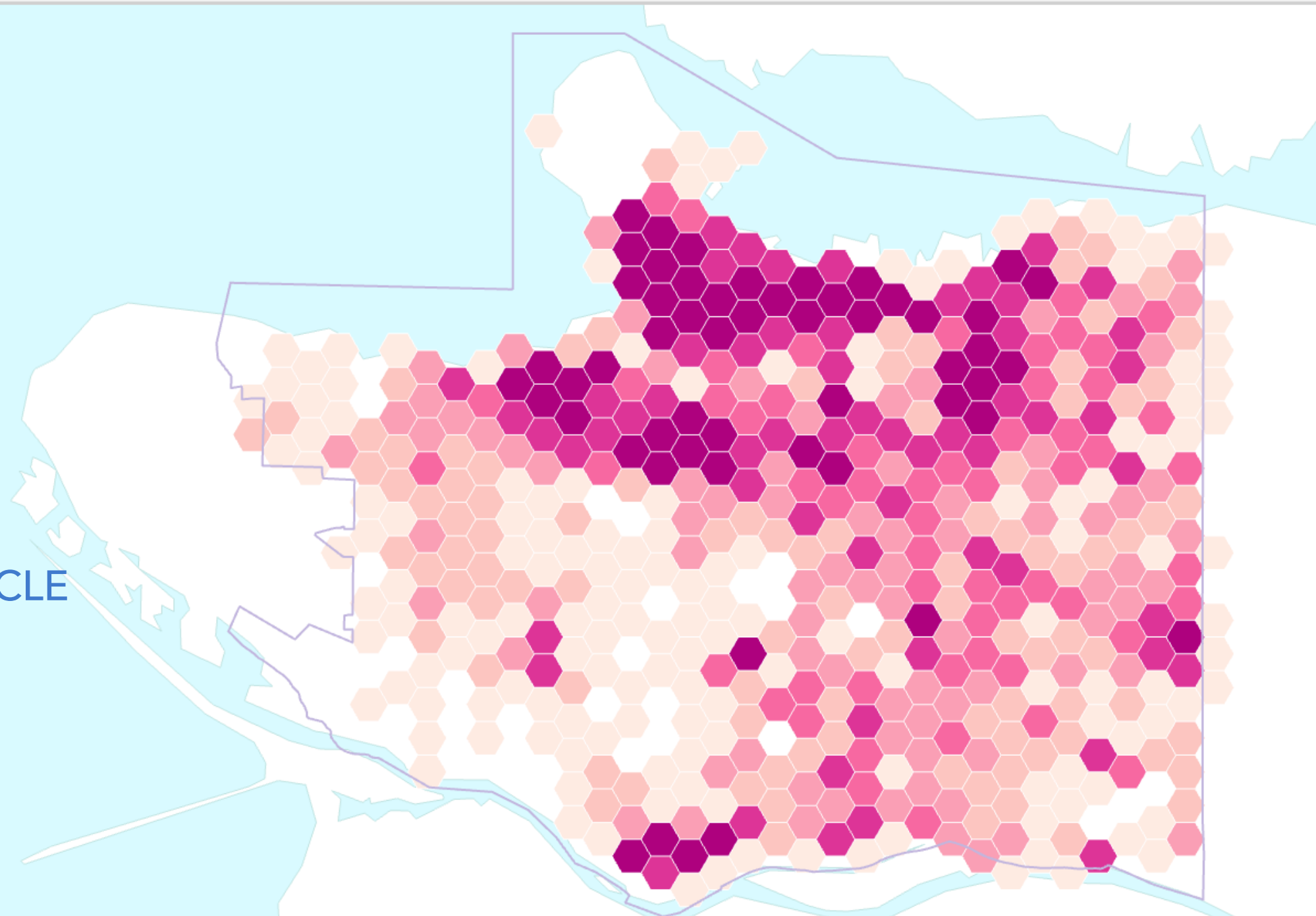
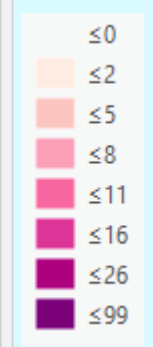
Hex Binning

THEFT FROM A VEHICLE

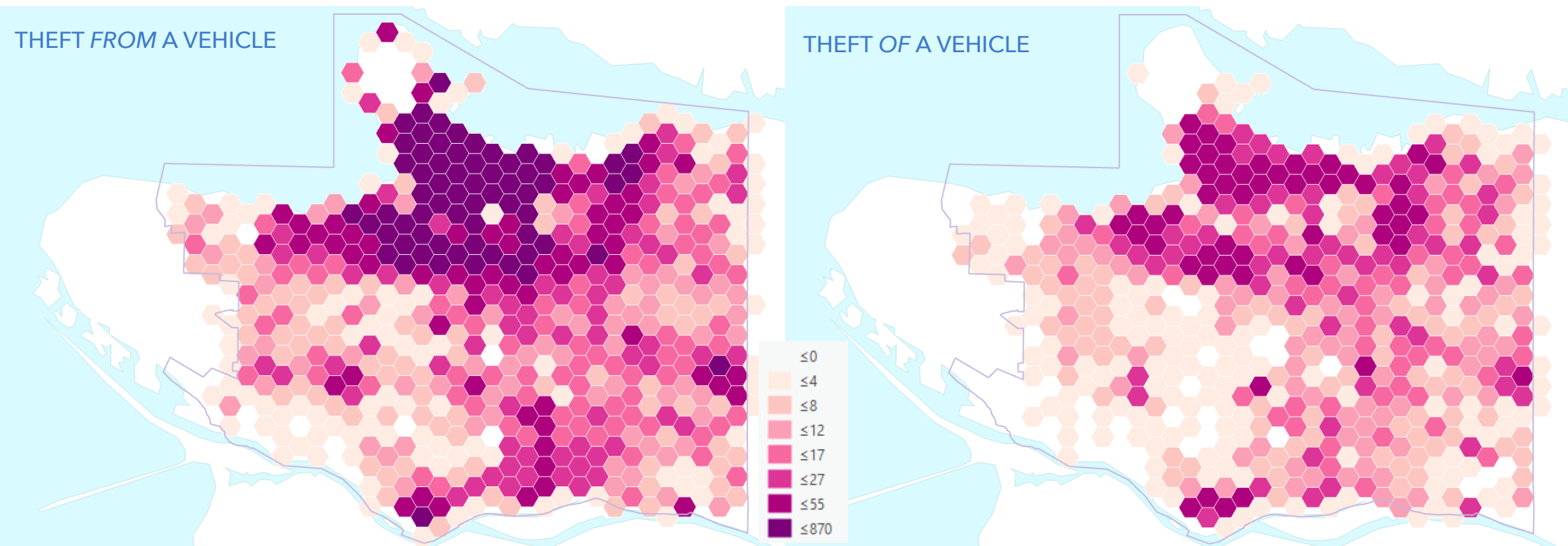


Hex Binning

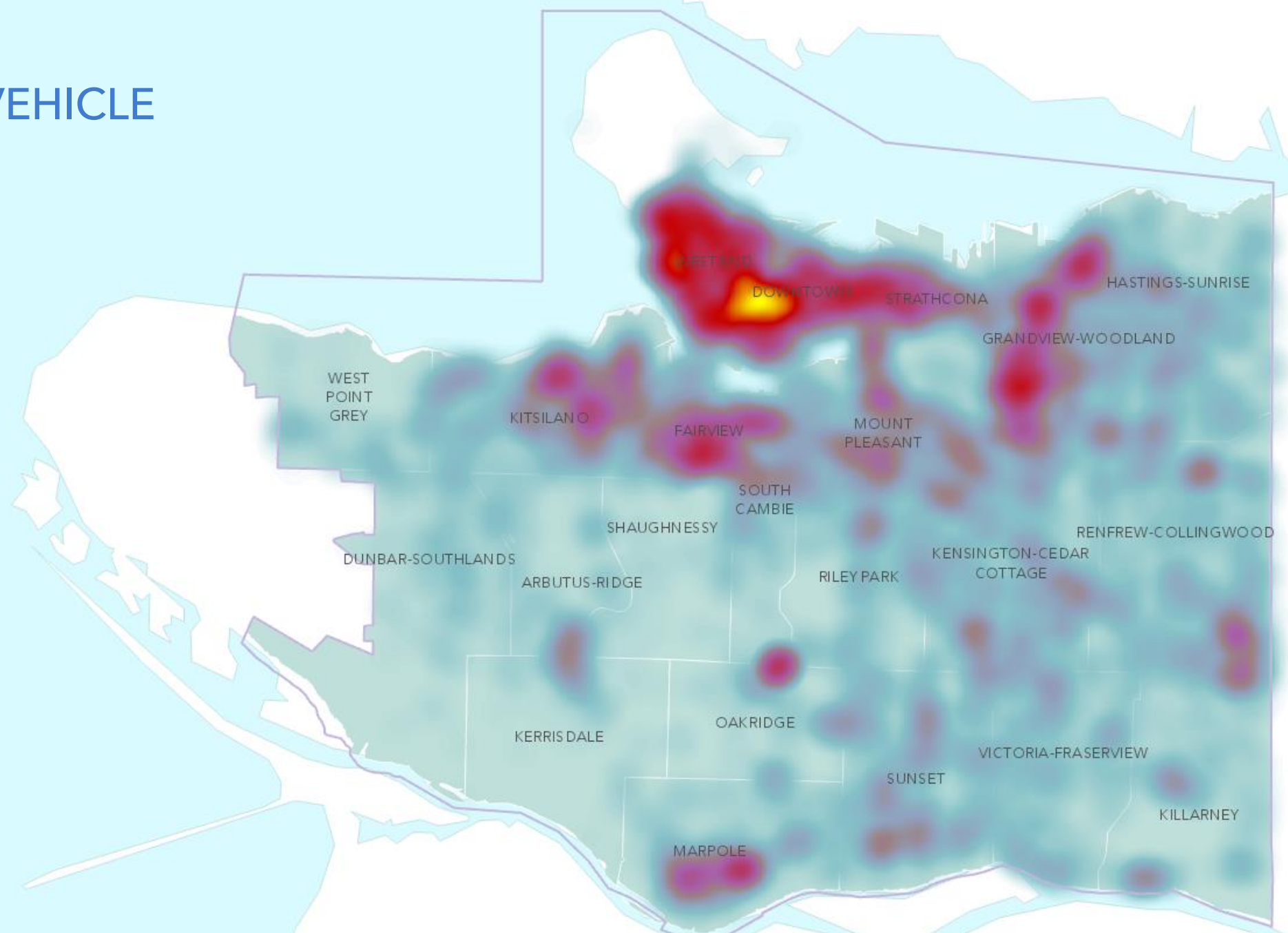
THEFT OF A VEHICLE



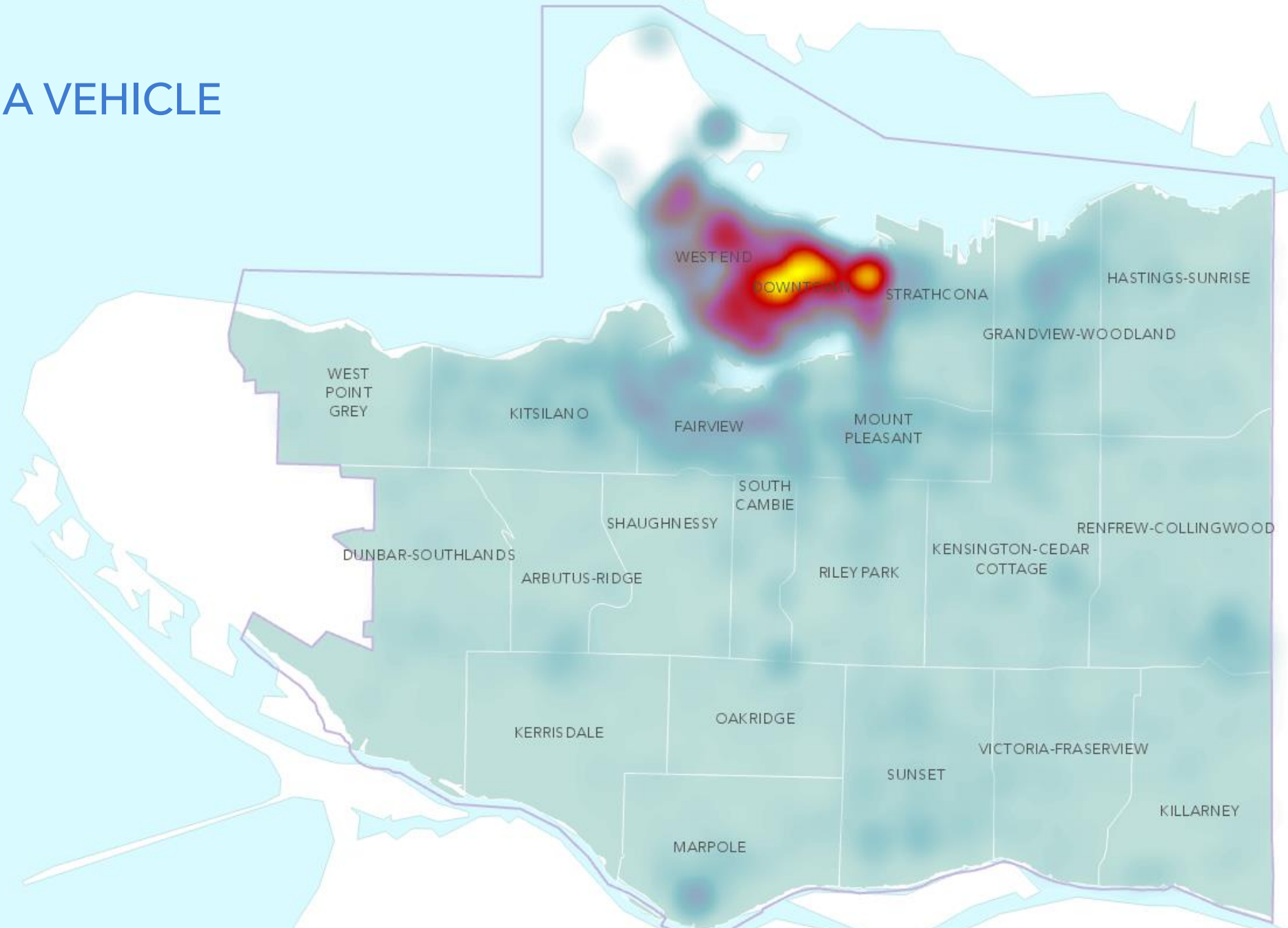
Hex Binning



THEFT OF A VEHICLE



THEFT FROM A VEHICLE



Vancouver, British Columbia

THE RIGHT VIZ FOR THE DATA

- Type of crime:
- Break & Enter Commercial'
- Break & Enter Residential/Other
- Mischief
- Other Theft
- Theft from Vehicle
- Theft of Bicycle
- Theft of Vehicle
- Vehicle Collision


FID	Shape	TYPE
0	Point	Mischief
1	Point	Mischief
2	Point	Theft from Vehicle
3	Point	Theft from Vehicle
4	Point	Mischief
5	Point	Theft from Vehicle
6	Point	Mischief
7	Point	Theft from Vehicle
8	Point	Theft from Vehicle
9	Point	Theft from Vehicle
10	Point	Theft from Vehicle
11	Point	Theft from Vehicle

0 of 46403 selected

Over 46 thousand records

AT&T 8:33 PM 82%





Tweet


 **Edie Punt** @epunt

"Sometimes geography really gets in the way of a map." -@kennethfield at @CdnCarto

5/30/18, 6:16 AM





6 Retweets 21 Likes


   

 **Will Cadell** @geo_will · 5/30/18

Replying to @epunt @kennethfield and @CdnCarto





Sometimes the map gets in the way of geography :)

   4 

 **Captain Alice** @MiniMapM... · 5/30/18

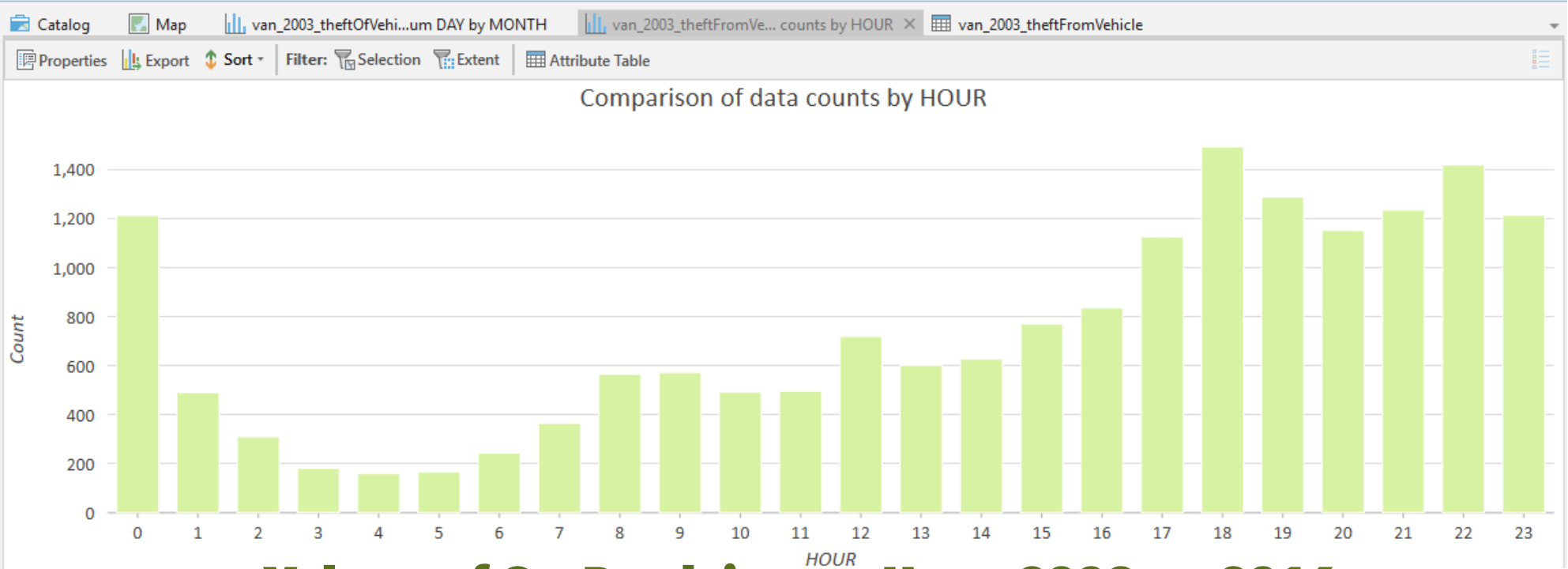
Replying to @epunt @Spatial_Punk and

Tweet your reply

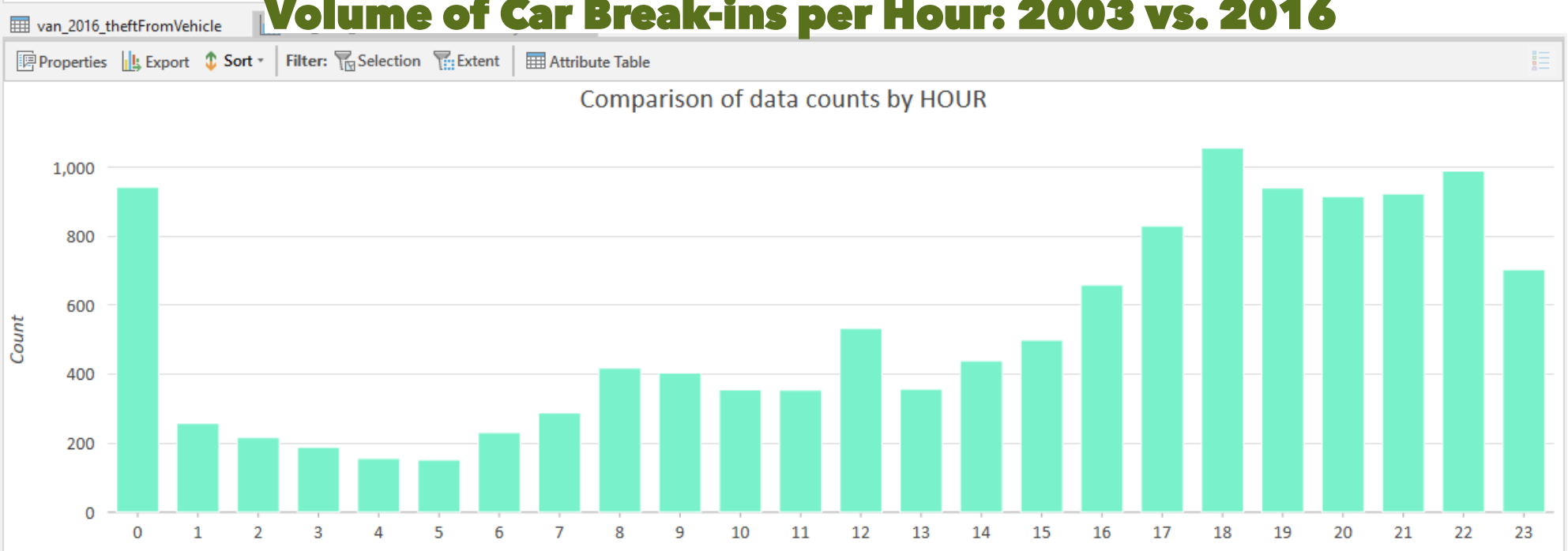
   

Neighborhood

N_HOOD
Killarney
Strathcona
Kerrisdale
Kerrisdale
Killarney
Arbutus Ridge
Strathcona
Central Business Dist...
Kerrisdale
Kerrisdale
Kerrisdale
Kitsilano

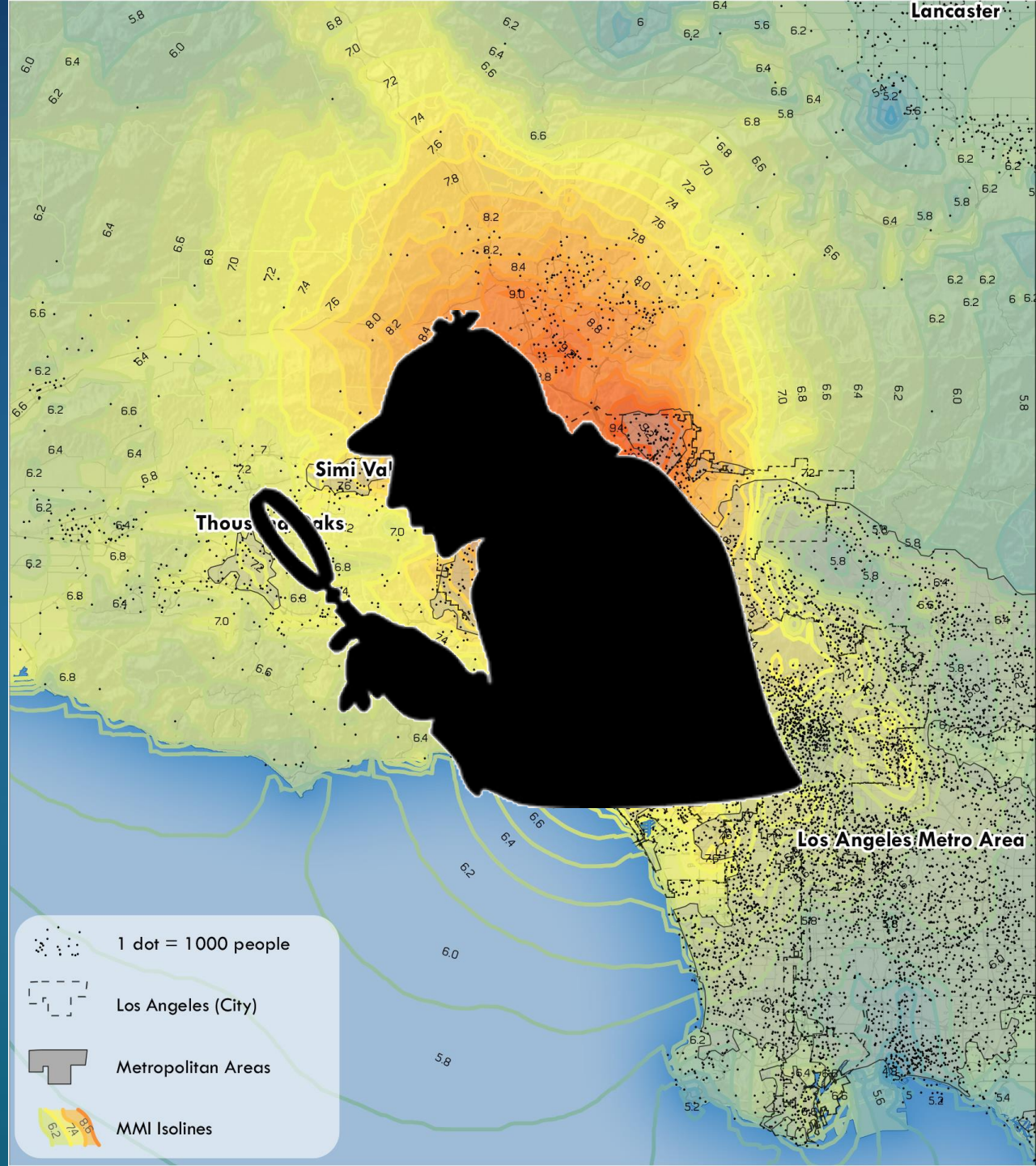


Volume of Car Break-ins per Hour: 2003 vs. 2016



Summary

- Open-ended & curious
- Develop and (dis)prove assumptions
- Plot...change symbols & categorize
- Investigate patterns & anomalies
- Isolate & compare
- Try other data viz techniques:
 - different geometry/conversation
 - other data viz diagrams (non-maps) and attributes

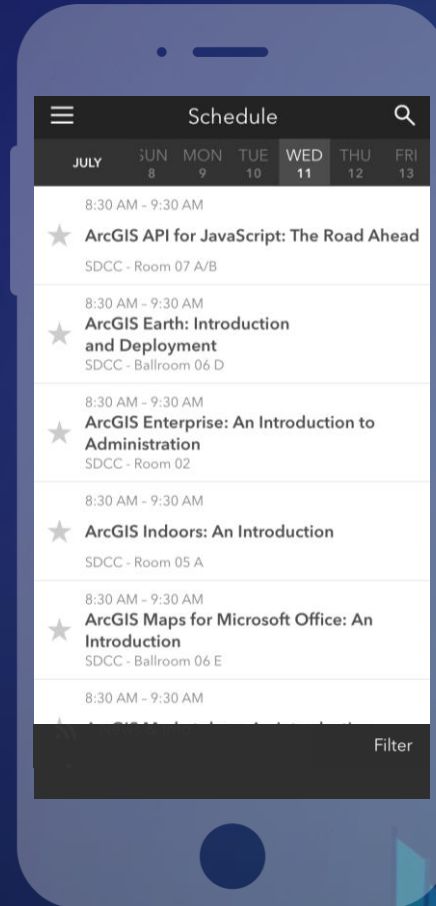


Please Take Our Survey on the App

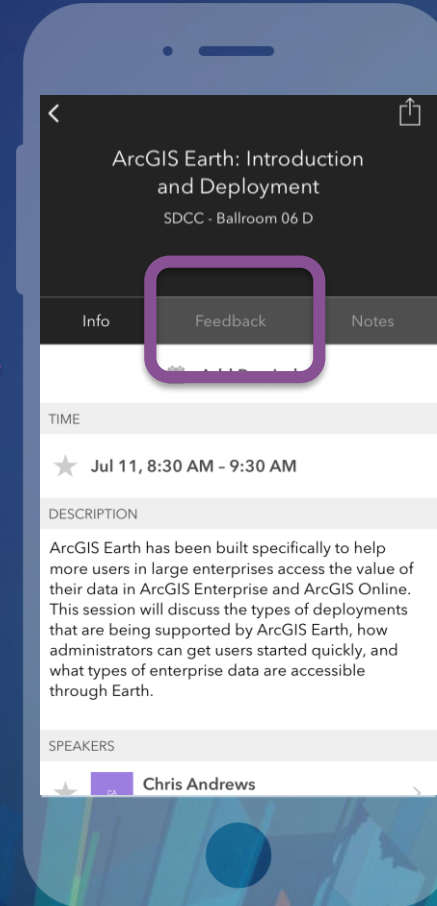
Download the Esri Events app and find your event



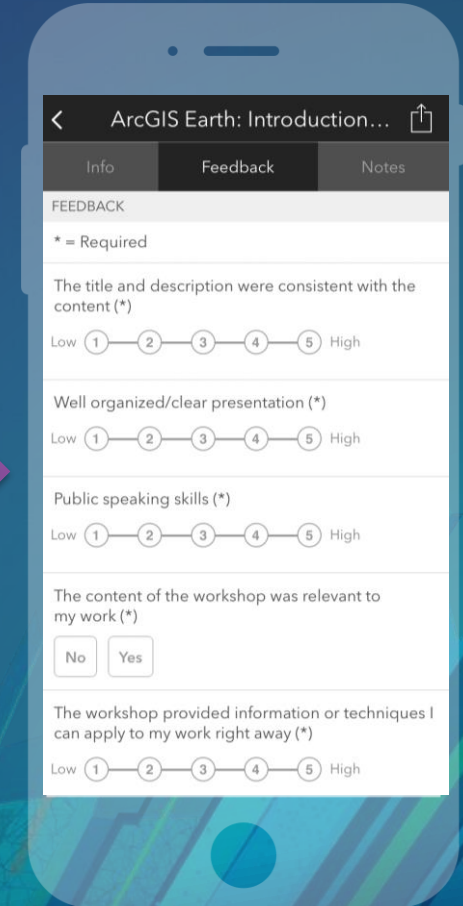
Select the session you attended



Scroll down to find the feedback section



Complete answers and select "Submit"





esri

**THE
SCIENCE
OF
WHERE**